

# ON THE EXISTENCE OF C/Ø ALTERNATIONS IN FRENCH ADJECTIVES: THEORETICAL AND EMPIRICAL QUESTIONS

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## ABSTRACT

French variable adjectives have traditionally been described as undergoing a process of final consonant deletion from the feminine to the masculine form. We review here different analyses that have been proposed to account for this phenomenon, highlighting problems with the theoretical analyses and advances in empirical work on the question. We present an analysis where, by default, French adjectives undergo *no change* (or C-deletion) and variable adjectives are treated as lexicalized irregulars. Finally we propose further avenues of research in psycho and neurolinguistics with French adjectives.

**Keywords:** final consonant deletion, French, adjectives, lexicon, psycholinguistics

## 1. INTRODUCTION

It has long been known that a subset of French adjectives, termed variable adjectives, have final consonants in feminine forms that do not appear in the masculine (see 1, below). These adjectives have been a puzzle for linguists and have been discussed in the context of theories of morphology [2] and phonology [11, 17].

(1)	Masculine	Feminine	Gloss
a.	<i>brun</i> [bʁœ̃]	<i>brune</i> [bʁyn]	‘brown’
b.	<i>grand</i> [gʁɑ̃]	<i>grande</i> [gʁɑ̃d]	‘big/tall’
c.	<i>petit</i> [pɛti]	<i>petite</i> [pɛtit]	‘small’
d.	<i>gros</i> [gʁo]	<i>grosse</i> [gʁos]	‘big/fat’
e.	<i>ouvert</i> [uvɛʁ]	<i>ouverte</i> [uvɛʁt]	‘open’
f.	<i>vieux</i> [vjø]	<i>vieille</i> [vjɛj]	‘old’

As seen in (1), the final consonant on the feminine form seems to be quite arbitrary and is not predictable based on the masculine stem. Except occasionally on forms ending in a nasal vowel in the masculine (e.g., *brun*) that have a feminine form with a final /n/ (e.g., *brune*), however this is not always the case (e.g., *grand* – *grande*). Because of the highly irregular nature of the final consonant found on feminine forms, most

phonological accounts of this phenomenon have proposed some kind of final phoneme deletion rule.

## 2. THEORETICAL APPROACHES AND EMPIRICAL EVIDENCE

### 2.1. Phonological rules

Paradis and El Fenne [11] presented a review of these approaches and concluded that variable adjectives (as well as irregular verbs with similar C/Ø alternations) could be accounted for by postulating a consonant deletion process in the absence of a timing slot either in the lexical representation or in the following word, as seen in (2a-b). Picard [12] disputed this analysis, arguing that it could not account for the data. In particular, a vowel laxing rule exists in Quebec French such that all word final high vowels become lax before ‘laxing’ consonants (as in *petite*). This rule is postlexical and allows us to distinguish the forms for *boyfriend* and *girlfriend* in 2c-d. Consonant deletion must occur before this laxing rule. However, the consonant still appears in 1a-c, indicating that it is a postlexical process.

- (2) a. *petit* [pɛti] *petit insecte* [pɛtʰitɪnskɪt]  
       ‘small.m’       ‘small.m insect’  
 b. *petite* [pɛtɪt] *petite fourmi* [pɛtʰitfurmɪ]  
       ‘small.f’       ‘small.f ant’  
 c. *petit ami* [pɛtʰitamɪ]  
       ‘small.m friend’ = boyfriend  
 d. *petite amie* [pɛtʰitamɪ]  
       ‘small.f friend’ = girl friend

More recently, an optimality theoretic account of the C/Ø alternation was proposed by Tranel [17]. He suggests a process of consonant *insertion* for adjectives, based on the fact that nonstandard varieties of French show -s insertion in cases where quantifiers precede nouns having onsets, such as *six cours* ‘six courses’, alternately pronounced as [sikuʁ] (standard) or [siskuʁ] (non standard). Independently of their theoretical backgrounds, these approaches propose general

phonological processes that are largely based on the notion of parsimony: in these a phonological rule that can be applied in all cases of C/Ø alternation. We will come back to this issue in the next section but, for now, we note that consonant deletion approaches propose a rule from a marked form to a base and default form (the masculine), which is counter-intuitive. Herschensohn [8] has also remarked that no new adjectives are coined into this pattern, signaling that the rule might not be linguistically productive.

## 2.2. Counterevidence: S-insertion and T/Ø alternation

Although we believe we can make a strong case that variable adjectives in French should be considered irregular and that they are lexicalized rather than linked phonological C/Ø alternation rules, two issues remain. One is S-insertion, presented above, the other involves T/Ø alternations, a feature of less standard dialects of French.

S-insertion, discussed in Tranel [17] is proposed as support for a general C-insertion rule for stem final consonants in French. We believe it is implausible for three reasons. First, the consonants that participate in the adjective alternations we described are quite unpredictable from the base and are not all *-s*. Second, the final /s/ in *six* [sis] is systematically produced in oral and non-standard varieties of Quebec French. In fact, the form without a final consonant is quite rare, even in more standard dialects. Third, this form is not restricted to the feminine. More difficult to explain is a process of putative T/Ø alternation.

In some non-standard dialects of French, some adjectives are involved in a process of T/Ø alternation or (ir)regularization. Examples of these are presented in (3).

- (3) a. *légerte* (usu. *légère*) [leʒɛʁt]  
       ‘light, f’  
    b. *crute* (usu. *crue*) [kʁyt]  
       ‘raw, f’  
    c. *laitte* [lɛt] (usu. *laid/laide* [lɛ/ɛd])  
       ‘ugly’ (masculine and feminine form)

According to Baronian [3] a number of these alternations are contaminations. They are analogies to counterparts (often antonyms) and their final consonants. Thus *cuite* ‘cooked’ has contaminated *crute* ‘raw’ and, by analogy with the preceding two, both *mûrte* ‘ripe’ and *pourrite* ‘rotten’ have

arisen, these two last forms attested in Missouri French and some Louisiana dialects [3, 16]. Some cases of stem final *-t* may be relics of word final devoicing in Old French (e.g., *laitte* and *grand*, pronounced [grât] in masculine liaison). Others, such as *pirte/meilleurte* ‘worse/better’, are more difficult to explain. A common feature of all these forms is that they end with a /t/. It could be the case that these signal the development of an agreement inflection rule for feminine forms, all ending in *-t*. For the time being, however, this process is unstable, and, in some cases, can also be observed in the masculine (as with *laitte*), thus making this explanation doubtful.

## 2.3. Empirical studies of French adjectives

Parsimonious rules have inherent appeal because they are expected to be somehow easier to acquire and simpler to store and process in adult grammars. The learner and mature speaker will not have to learn exceptional forms one by one but rather will be able to apply a single rule for all cases of alternation (be they adjectives only, as for Tranel [17] or all alternating forms, as with Paradis and El Fenne [11]). There is an underlying assumption in this approach that all possible rules are better than memory-based learning, especially in early-language acquisition. However, one must consider the possibility that some rules are not very helpful for language learning and that their high level of idiosyncrasy might not, in fact, promote rule-based learning. Consider irregular English verbs with vowel ablaut, as in *sing-sung*. These patterns are not considered to be productive and, even though there is a fair number of verbs of this type in English, it is doubtful that children use ablaut as a rule at the early stages of language acquisition, in particular because this pattern does not have a strong probability of being extended to new contexts outside of its domain of application (i.e., it is unreliable, see Allbright [1]). The same can be said of French adjectives. The empirical data from adult and child language studies point to a number of facts that support the interpretation that consonant deletion or insertion rules cannot account for the data. We present these in turn.

A psycholinguistic study run by Fink [5] has shown that adults overwhelmingly prefer to retain a novel form presented (with or without a final consonant) in a masculine or feminine context, when asked to produce it in the other gender (e.g., the novel form *bravais/e*). In 89% of their

responses, adults do not insert or delete consonants. The use of novel forms in this study was necessary in order to control for previous knowledge of specific adjective forms, and it could be argued that the data are not relevant to true language representation and processing. However, it is possible to study the acquisition of variable adjectives in children, as we can assume that they might not yet have learned specific lexical items. In addition, acquisition studies can inform us on what aspects of a given rule are being picked up on by children. This type of study has been undertaken with children in France [13] and Quebec [14, 15].

Roulet-Amiot and Jakubowicz [13] showed that agreement processes are well established in four-year-old French-speaking children, but that variable adjective mastery lags behind determiner agreement, and is robustly acquired only around the age of six. Royle and Valois [14] elicit adjectives in children aged 3 to 5 years, using a small set of high frequency stimuli. Despite strong mastery of the syntactic structures used (noun phrases with one or two size or colour adjectives) and semantic knowledge of all the adjectives, children showed disproportionate difficulties in producing the feminine variable forms. A small number of children even showed difficulty not only producing but *comprehending* the feminine forms of some adjectives (*verte* 'green' and *brune* 'brown') all the while being able to produce and understand their masculine counterparts.

A sentence repetition and reading study in children aged 10 by St-Pierre and Bédard [15] shows that error rates are low on variable adjectives (less than 2% on average), but that the predominant error type observed is on adjective agreement. No information is given on how errors were modulated by target gender, nor whether they were consonant insertions or deletions. It is important to mention that no reports exist of overregularisation of the C/Ø pattern in spontaneous language corpora, in children or in adults (despite what is shown in 2.2).

### 3. PRODUCTIVITY, LEXICALISATION AND AGREEMENT

#### 3.1. Rule productivity and default patterns

Because overregularisation is expected to arise from productive rule processes, its absence is taken to signal the non-productivity of C/Ø alternations in adjectives. This, in addition to the fact that

neologistic forms are systematically integrated into the language without C/Ø alternations, signals that, in fact, the default rule in French is *no change* [4, 10]. This is supported by Fink's study [5] on adult processing of novel adjective forms.

#### 3.2. Variable adjectives and the mental lexicon

The data from psycholinguistic investigations in adults and children, be they in elicited structures or spontaneous speech, indicate that variable adjective forms must be learned individually and lexicalized. In particular, it is not clear how a rule of any kind implicating C/Ø alternations is useful for acquisition. This is not a flippant argument, as we need to consider what is the usefulness of a rule for the acquisition of a given language (thus, we must not base our theoretical position on parsimony or some other version of Occam's razor). Putting ourselves in the skin of the proverbial child (or alien) learner, what gives?

#### 3.3. The acquisition of agreement

Let us assume for the sake of argument that the child does learn a rule of C/Ø alternation from the feminine to the masculine. What route must she follow? First she will learn the masculine form of the adjective (which is generally the default, and thus at least slightly more frequent than the feminine, except for adjectives such as *enceinte* 'pregnant'). Then she learns the feminine form (if there is one) of the adjective. At some point, after many of these pairs have been learned, the child realizes that there is a relationship between the different adjectives such that a C/Ø alternation exists between the two forms. At this point only does she formulate a 'rule' for consonant deletion. However, for all learned forms, this rule is unnecessary because it is redundant to the previous learning process. Furthermore, because it is not reliable it cannot be extended to newly learned adjectives, it becomes moot. The same argument can be made for a C-insertion rule, as which consonant will be inserted in a given context is highly unpredictable.

The fact that children learning French present specific difficulties with feminine forms of highly frequent adjectives in the context of early acquired structures points to the lexicalisation (and occasionally erroneous retrieval) of variable adjective forms. The fact that a majority of errors found in older children on repetition and reading

tasks are agreement errors also supports this point of view. However, one question that these studies cannot directly address is whether children who are producing these errors are doing so because they have not learned the specific phonological form of a given variable adjective, or rather because they do not fully master agreement. Most of the acquisition studies reviewed here assume that the production of variable adjectives in appropriate contexts has cognitive underpinnings related to agreement checking, and that adjective agreement is acquired at the same time as determiner and other types of agreement. The fact is that we do not know whether this is true.

### 3.4. Experimental studies of agreement

One way to assess the existence of linguistic rules in children is to use the alien learner paradigm [9]. This is essentially a grammaticality judgment task for children, where they have to ‘help’ an alien learn their language by giving it positive or negative feedback. However, this approach only measures a child’s response (yes/no, good/bad) and reveals little about the ongoing cognitive processes involved in the decision-making. A relatively recent methodological development in language processing research is to use electroencephalography (EEG) to track the time course of language processing. By using EEG while presenting participants with specific linguistic events, we can measure changes in brain activation, within millisecond accuracy, related to these events. These changes are called event related potentials (ERPs). It has already been established that ERPs can be elicited using agreement errors in writing (see, for example, Hagoort and Brown [7]). A recent study using this method with auditory stimuli to track sensitivity to disagreement between variable adjectives (or determiners) and nouns has shown that this approach is useful for the investigation of French agreement processing [6]. We are presently extending this approach to children.

### 4. CONCLUSION

We have argued, based on theoretical and empirical evidence, that the C/Ø alternation rule in French may be unnecessary. It is proposed that variable adjective forms are stored in the lexicon, similarly to irregular verbs. If this is the case, then we can make the strong prediction that the processing of these forms should be mediated by

their usage frequency. Further research on child language, and L2 learning using alien learner paradigms, elicitation and ERPs are expected to provide rich data on the issues addressed in this paper.

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