

Derivational Morphology in English-French Acquisition

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1. Introduction

Second language (L2) learners have been observed to make production errors involving derivational morphology (Lardiere 2006). Fourth semester English-French learners produced the following examples in their *journal de réflexion*, informal writing assignments about current classroom topics:

- (1) Les Français sont très **sexualités**.
'the French are very sexuality'
- (2) En Tintin il y a beaucoup de **stéréotypiques** d'Amérique.
'in Tintin there are many stereotypicals of America'
- (3) L'existentialisme est un **philosophique**...
'existentialism is a philosophical'
- (4) Elle est la **vraiment** princesse.
'she is the truly princess'
- (5) Ce film est vraiment **brillamment**.
'this film is really brilliantly'

The derivational suffix on each of the words in bold renders the sentence ungrammatical by changing the syntactic category of the base to one inappropriate for its context; however, the intended meaning is still clear thanks to the base of each derivate.

Lardiere (2006) observed similar phenomena in the written and oral production of Patty, an adult L2 speaker of English (L1 Mandarin):

- (6) I tried to **analysis** what kind of a person M. is
- (7) when my father went **bankruptcy**
- (8) God try to give us his wisdom and **happy**
- (9) and her sister, who is a physical **therapy**

In these examples, the problem is bi-directional; in (6-7) the sentences are made ungrammatical by the presence of an extraneous derivational suffix, whereas in (8-9) the problem is due to its absence.

What these two cases have in common is that the source of each error can be found in the derivational relationship between the word provided and the one intended; it is the over-suppliance (or under-suppliance) of derivational morphology that creates the ungrammaticality. It is interesting to note, however, that the extraneous suffixes in Patty's examples are non-productive, whereas the French learners' suffixes are among the most productive in the language.

The present study seeks to explore these tendencies. We will look at learners' acceptance of derivationally related forms in contexts that are syntactically inappropriate in order to discover whether they are sensitive to the misuse of base and derived forms.

2. Previous research

A first intuition in seeking to explain the learner sentences in (1-5) is that the L2ers simply do not notice the presence of the extraneous suffix. VanPatten (1996) suggests that learners process the “more meaningful” base while failing to attend to the “less meaningful” morphological suffix. Similarly, Jiang (2004) found that adult L2ers were insensitive to the plural *-s* morpheme, suggesting that morphological knowledge is not integrated into L2 competence. These accounts seem promising; however, they refer to phenomena involving inflectional morphology, and may not be able to be extended to derivational morphology. Indeed, as Chomsky (1970) points out, inflectional and derivational morphology must not be assumed to involve the same processes: Inflection deals with functional categories such as Number and Agreement, whereas derivation deals with lexical categories such as Noun and Adjective. Although the status of functional categories is uncertain in L2ers (Vainikka & Young-Scholten 1994, 1996; White 2005; Prévost & White 2000), the lexical categories are generally assumed to be solidly present. Thus, we cannot rely on conclusions from studies of inflectional morphology to account for the phenomena observed here.

Unfortunately, the number of studies dealing with the acquisition of derivational morphology is very small. One key study in L1 acquisition was carried out by Tyler and Nagy (1989) on English-speaking children. They identified three aspects of knowledge of derivational morphology: relational knowledge, the ability to recognize that complex words are related by a common morpheme; syntactic knowledge, the recognition that a derivational suffix marks the syntactic category of the word; and distributional knowledge, the awareness of rules constraining which affix(es) may attach to a base. Since this last one presupposes acquisition of the first two, it follows that the three types of knowledge develop in this sequence. The authors tested fourth, sixth, and eighth graders and found that all groups had at least some syntactic knowledge (although the fourth graders performed nearly at chance), concluding that syntactic knowledge begins to form accurately around the age of nine.

The authors also tested whether the type of suffix, neutral or non-neutral, played a role in acquisition (following Aronoff 1976; Kiparsky 1982; Lieber 1980; Selkirk 1982). However, since both types of suffix do not deviate in the regularity with which they mark syntactic category, it is not surprising that the researchers found no effect for the neutral versus non neutral distinction on the acquisition of syntactic knowledge.

In light of this study, then, it is possible that the L2 French errors reflect acquired relational knowledge of derivational morphology but still-incomplete syntactic knowledge. And if neutrality/productivity of a suffix plays no role in syntactic knowledge, then Patty’s data are not remarkable compared to the French L2ers’. Lardiere (2006) did reproduce the Tyler and Nagy study on Patty to determine the nature of the relationship between her mis-selection of a derivational word form and knowledge of the syntactic contextual requirements for that form. Patty performed well on the task, indicating that she appears to be aware of the syntactic restrictions on derived forms. The errors in her production data, then, suggest a problem with lexical retrieval of the correct form.

The few other studies that have examined derivational morphology in L2 suggest that a factor that does appear to play a role in acquisition is the relative transparency of suffixes in the L2 with respect to the L1 (Clark 1993, Lowie 1998). In his doctoral dissertation, Lowie found that suffixes that exhibited both formal and semantic similarity between languages were the most easily acquired (e.g. *-ity_N/-ité_N*), followed by suffixes with semantic but not formal similarity (e.g. *-ly_{Adv}/-ment_{Adv}*), then suffixes with formal but not semantic similarity, i.e. false cognates (e.g. *-ment_N/-ment_{Adv}*). Interestingly, he also found that learners made more errors in identifying the syntactic category of derived words than they did in identifying the meaning, aligning neatly with Tyler and Nagy’s model of the three aspects of knowledge as well as the types of errors made by my own students.

It seems, then, that there are several factors to consider in accounting for the morphological mismatches produced by French L2ers. Assuming that they do not notice the suffix is not enough; the state of their knowledge of derivational morphology must be assessed, and the transparency of the suffix with respect to the L1 must be considered.

Learners at our institution receive little to no overt instruction on French derivational morphology, although the input is of course rich in derived forms. Quizzes and exams occasionally include reading comprehension questions of the type, “If you know that *N+X* is related to *N*, how might you translate

$N+X$?” Although I have done no systematic analysis of student responses to this type of question, the general impression is that they often fail to see the relationship between the two words or capture the syntactic information contained in the suffix. The goal of this study, therefore, is to investigate whether learners are able to notice that the presence of a derived form in a base context (and vice versa) renders a sentence ungrammatical, and to determine what this (in)ability tells us about the state of their knowledge of derivational morphology.

3. Pilot study

A pilot study was first conducted to test students’ awareness of syntactically inappropriate forms involving derivational morphology. The pencil-and-paper task included three suffixes, *-ique*_{Adj}, *-ité*_N, and *-ment*_{Adv}, attached to commonly-occurring bases to yield 18 quadruples, thus 72 experimental items. (See Figure 1 for experimental words, Figure 2 for a sample quadruple.) Common base words that formed derivatives without phonological mutations were chosen to maximize the likelihood that learners would know the words and not reject valid sentences due to lack of vocabulary knowledge, and the suffixes chosen are highly transparent with respect to English, Types 1 and 2 identified by Lowie (1998).

Figure 1. Base and derived forms per suffix.

<i>-ique</i> _A [N ____]		<i>-ité</i> _N [A ____]		<i>-ment</i> _{Adv} [A ____]	
mélodie	mélodique	fragile	fragilité	lent	lentement
ironie	ironique	solide	solidité	honnête	honnêtement
mythe	mythique	rapide	rapidité	difficile	difficilement
énergie	énergique	simple	simplicité	calme	calmement
économie	économique	timide	timidité	faible	faiblement
allergie	allergique	grave	gravité	facile	facilement

Figure 2. Sample quadruple.

- 2a. C’est un prof très **énergique** en classe.
‘He is a very energetic professor in class.’
- 2b. Ce prof a beaucoup d’**énergie** en classe.
‘This professor has a lot of energy in class.’
- 2c. *C’est un prof très **énergique** en classe.
‘He is a very energy professor in class.’
- 2d. *Ce prof a beaucoup d’**énergique** en classe.
‘This professor has a lot of energetic in class.’

To reduce repetition, the quadruples were split into versions A and B. There were also 14 distracters, yielding a total of 50 items per version. Participants were asked to read each sentence containing a base or derived form, then answer the question, “Does this feel possible to you?” They were to circle YES or NO, and in the case of a NO answer, they were also asked to underline the word(s) in the sentence that had led them to reject it. A total of 24 students participated in this pilot: 12 from a second semester college French class, 6 from fourth semester, and 6 advanced learners.

Raw scores were calculated with respect to expected behavior, i.e. accepting or rejecting an item for the “right” reason, the morphological one; thus the ideal score for grammatical sentences was 3 and 0 for ungrammatical ones. Many subjects rejected items for a variety of other (non-morphological) reasons, e.g. unknown vocabulary, gender, pronouns, spelling. These counted against their raw score.

The mean raw scores by level are given in Figure 3. Note that a negative number indicates how many items were incorrectly accepted; since these are inappropriate syntactic contexts for the form provided, they should be rejected. Accurate acceptance and rejection can be seen to improve by level, with the advanced learners behaving almost ideally.

Figure 3. Mean raw scores by level.

	2 nd sem.	4 th sem.	Adv.
<i>-ique</i>	2.33	2.50	2.67
base	1.92	2.33	3.00
* <i>-ique</i>	-2.75	-2.50	-0.17
*base	-2.33	-2.17	0
<i>-ité</i>	2.33	2.33	2.83
base	2.42	2.33	3.00
* <i>-ité</i>	-2.25	-1.67	0
*base	-2.00	-2.00	0
<i>-ment</i>	2.25	2.00	2.33
base	1.83	2.33	2.33
* <i>-ment</i>	-2.58	-2.17	-0.17
*base	-2.08	-2.00	-0.17

Because the L2 French production data seemed to indicate a tendency to produce derived forms in base contexts but not vice versa, the acceptance of a syntactically inappropriate derivate was compared to that of a syntactically inappropriate base (Figure 4). These mean acceptance rates show that derived forms were accepted slightly more often than base forms in the inappropriate context, but there are not enough data points in this population to be certain whether the difference is significant.

Figure 4. Acceptance of *derived vs. *base.

	2 nd sem.	4 th sem.	Adv.
*derived	2.53	2.11	0.11
*base	2.14	2.06	0.06

In sum, the pilot study showed that intermediate learners had fairly high acceptance rates for sentences containing morphological mismatches, but there did seem to be a trend of improving sensitivity to these mismatches as level increased. It also appeared that learners were more likely to accept a derived form in a base position than vice versa. The results of this pilot study were promising enough to merit further investigation.

4. Present study

The present study featured an expanded instrument containing all four sentences from each quadruple plus more distracters, bringing the total number of items to 108. The same experimental items from the pilot were used, some with minor modifications to avoid problems that had recurred in the pilot. Because underlining errors had turned out to be hit-or-miss in terms of participant responses, the YES-NO follow-up question was replaced with an acceptance scale of 1-5, including a “cannot decide” option. Selecting “cannot decide” was intended to be different from a 3 on the scale, in that “cannot decide” should indicate lack of sufficient vocabulary to make a decision about the sentence, versus a 3 reflecting indecision about the grammaticality of the sentence. A sample item is given in Figure 5.

Figure 5. Sample item.

Jean est un prof très énergique en classe.
 ‘John is a very energetic professor in class’
This sentence feels 1 2 3 4 5 *to me.*

cannot decide

1 = completely unacceptable
 3 = OK
 5 = perfectly acceptable

A total of 68 students participated in the larger study: 23 second semester learners, 26 fourth semester learners, and 19 sixth semester learners completed the task. Mean scores were analyzed for each suffix, *-ique*_{Adj}, *-ité*_N, and *-ment*_{Adv}, in a repeated-measures ANOVA with Form and Syntactic context as within-subjects factors, and with Level as between-subjects factor. This was followed by post-hoc paired sample t-tests. The mean acceptance rates by level are given in Figures 6-8 below.

5. Results.

5.1 *-ique*_A

Figure 6. Mean acceptance rates for *-ique*_A.

2nd (N=23)	Mean	StdDev	4th (N=26)	Mean	StdDev	6th (N=19)	Mean	StdDev
Base	3.31	.85	Base	4.27	.55	Base	4.35	.63
Der	3.82	.81	Der	4.18	.57	Der	4.12	.67
*Base	3.00	.71	*Base	2.93	1.00	*Base	1.72	.75
*Der	2.96	.73	*Der	2.61	.97	*Der	1.83	.72

The ANOVA for *-ique*_A revealed highly significant interactions of form with level, syntactic context with level, and form with syntactic context. There was also a highly significant interaction of form and syntactic context with level. In the post-hoc analysis, fourth semester was found to be significantly different from sixth semester ($p=.006$). Finally, the paired samples t-test showed that for second semester, there was a significant difference for Derived vs. *Derived ($t(22)=4.548$, $p<.0005$) but not Base vs. *Base. For fourth semester, the difference was highly significant for Base vs. *Base ($t(25)=5.551$, $p<.0005$) and Derived vs. *Derived ($t(25)=7.618$, $p<.0005$), and also for sixth semester: highly significant for Base vs. *Base ($t(18)=9.948$, $p<.0005$) and Derived vs. *Derived ($t(18)=8.741$, $p<.0005$).

5.2 -ité_NFigure 7. Mean acceptance rates for -ité_N.

2nd (N=23)	Mean	StdDev	4th (N=26)	Mean	StdDev	6th (N=19)	Mean	StdDev
Base	3.28	.80	Base	4.01	.62	Base	4.35	.70
Der	3.23	.64	Der	4.01	.55	Der	3.97	.66
*Base	2.76	.66	*Base	2.75	.92	*Base	1.62	.59
*Der	2.80	.70	*Der	3.19	1.00	*Der	1.75	.75

The ANOVA for -ité_N revealed both a significant interaction of form with syntactic context and a significant interaction of form and syntactic context with level. The post-hoc found second semester learners to be significantly different from fourth semester ($p=.001$), and fourth semester learners to be significantly different from sixth semester ($p<.0005$). Finally, the paired samples t-test showed differences to be significant for Base vs. *Base ($t(22)=2.433$, $p=.024$) and Derived vs. *Derived ($t(22)=2.376$, $p=.027$) in second semester learners, highly significant for Base vs. *Base ($t(25)=5.651$, $p<.0005$) and Derived vs. *Derived ($t(25)=3.408$, $p=.002$) in fourth semesters learners, and highly significant for Base vs. *Base ($t(18)=10.163$, $p<.0005$) and Derived vs. *Derived ($t(18)=10.083$, $p<.0005$) for sixth semester learners as well.

5.3 -ment_{Adv}Figure 8. Mean acceptance rates for -ment_{Adv}.

2nd (N=23)	Mean	StdDev	4th (N=26)	Mean	StdDev	6th (N=19)	Mean	StdDev
Base	3.11	0.59	Base	3.72	0.66	Base	3.96	0.80
Der	3.20	0.63	Der	3.70	0.68	Der	3.98	0.70
*Base	2.99	0.85	*Base	2.85	0.95	*Base	1.85	0.74
*Der	2.94	0.69	*Der	3.15	0.91	*Der	1.58	0.74

The ANOVA for -ment_{Adv} revealed a highly significant interaction of form with syntactic context as well as a highly significant interaction of form and syntactic context with level. A post hoc analysis showed that only fourth semester was significantly different from sixth semester ($p=.001$). The paired samples t-test found that the difference in second semester learners was not significant for Base vs. *Base or Derived vs. *Derived; however, for fourth semester the difference was significant for Base vs. *Base ($t(25)=4.164$, $p<.0005$) and Derived vs. *Derived ($t(25)=2.404$, $p=.024$), and for sixth semester it was highly significant for Base vs. *Base ($t(18)=7.137$, $p<.0005$) and Derived vs. *Derived ($t(18)=7.610$, $p<.0005$).

In sum, form and syntactic context interact significantly for each suffix, and learners behave significantly differently from each other between the fourth and sixth semesters for each suffix. Also, with the exception of -ment_{Adv} among second semester learners, participants were equally accurate at rejecting base forms in derived contexts (*Base) as they were at rejecting derived forms in base contexts (*Derived).

6. Discussion and conclusion

This study set out to determine whether learners possessed sufficient knowledge of derivational morphology to identify ungrammaticality due to an inappropriately used derivational form, and whether there was a greater tendency to overlook derived forms in base syntactic contexts than vice versa. These results suggest that learners are indeed capable of identifying morphological mismatches, and that their ability to correctly reject ungrammatical sentences improves with proficiency level. Broadly speaking, they do not appear to treat base forms and derived forms differently in judging acceptability, suggesting that they are sensitive both to the presence of an extraneous suffix and to the absence of a needed one. Effects are clearer at higher levels, suggesting that syntactic knowledge begins to solidify around the fourth semester of instruction. However, as observed at the outset of this experiment, production errors are frequent among fourth semester learners, which may point to a performance issue rather than a processing one.

Further research more precisely targeting learner knowledge of derivational morphology is needed. One weakness of this task is its inability to capture participants' attention to (non-)suffixed forms; reading time data could fill this gap. Supplementary written production data is also needed to furnish more examples of morphological mismatches in order to begin determining a pattern of mis-selection. These aspects will be considered in future efforts.

References

- Aronoff, Mark. (1976). *Word Formation in Generative Grammar*. Cambridge, Mass.: The MIT Press.
- Brousseau, Anne-Marie and Nikiema, Emmanuel. (2001). *Phonologie et morphologie du français*. Québec: Éditions Fides.
- Chomsky, Noam. (1970). Remarks on nominalization. In A. Jacobs & P.S. Rosenbaum (dir.) *Readings in English Transformational Grammar*. Waltham: Ginn and Co.
- Clark, Eve. (1993). *The Lexicon in Acquisition*. Cambridge: Cambridge University Press.
- Jackendoff, Ray. (1975). Morphological and semantic regularities in the lexicon. *Language*, **51**, 639-67.
- Jiang, Nan. (2004). Morphological insensitivity in second language processing. *Applied Psycholinguistics*, *25*:4, 603-634.
- Kiparsky, Paul. (1982). Word formation and the lexicon. In F. Ingemann (Ed.) *Proceedings of the 1982 Mid-America Linguistics Conference*, 3-29. Lawrence, KS: University of Kansas Press.
- Lardiere, Donna. (2006, April). *Knowledge of derivational morphology in a second language idiolect*. Paper presented at Generative Approaches to Second Language Acquisition, Banff, Alberta.
- Lieber, Rochelle. (1980). *On the Organization of the Lexicon*. Doctoral thesis, MIT.
- Lowie, Wander. (1998). *The Acquisition of Interlanguage Morphology. A study into the role of morphology in the L2 learner's mental lexicon*. *Rijksuniversiteit Groningen Doctoral Dissertation*.
- Prévost, Philippe & White, Lydia. (2000). Missing surface inflection of impairment in second language acquisition? Evidence from tense and agreement. *Second Language Research*, **16**, 103-133.
- Selkirk, Elizabeth. (1982). *The Syntax of Words*. Cambridge, Mass.: The MIT Press.
- Tyler, Andrea and Nagy, William. (1989). The Acquisition of English Derivational Morphology. *Journal of Memory and Language*, **28**, 649-667.
- Vainikka, Anne & Young-Scholten, Martha. (1994). Direct access to X'-theory: evidence from Korean and Turkish adults learning German. In T. Hoekstra and B. D. Schwartz (Eds.), *Language acquisition studies in generative grammar* (pp. 265-316). Amsterdam: John Benjamins.
- Vainikka, Anne & Young-Scholten, Martha. (1996). The early stages of adult L2 syntax: additional evidence from Romance speakers. *Second Language Research*, **12**, 140-76.
- VanPatten, Bill. (1996). *Input Processing and Grammar Instruction in Second Language Acquisition*. New Jersey: Ablex Publishing Corp.
- White, Lydia. (2005). Syntactic categories in second language acquisition. In H. Cohen & C. Lefebvre (Eds.), *Handbook of categorization in cognitive science* (pp. 515-532).

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