

Same but different?
Syntax encoded on the written word across languages.

French plural spelling & German noun capitalization

Constanze Weth

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Outline

1. French plural spelling and German noun capitalization as “syntactic markers”
 - linguistic description
 - syntactic awareness required for spelling the syntactic markers
2. Syntactic training for syntactic spelling: Intervention study
3. Interpretation of the results

Syntactic markers

Definition so far...

1. serial graphemic elements that indicate syntactic features:
 - word related as orthographic elements
 - carrying syntactic information > often inflection morphology (i.e., French)
2. unrelated to phonology

(Sandra, 2012; Weth, 2020)

Syntactic markers: French plural spelling

Examples in singular	Examples in plural	Translation of the plural examples
a. <i>Le chien</i> [lə ʃjɛ̃]	<i>Les chiens</i> [le ʃjɛ̃]	The dogs
b. <i>Le grand chien noir court.</i> [lə ɡʁɑ̃ ʃjɛ̃ nwaʁ kuʁ]	<i>Les grands chiens noirs courent.</i> [le ɡʁɑ̃ ʃjɛ̃ nwaʁ kuʁ]	The big dogs black run.
c. <i>Le chien de mes voisins court.</i> [lə ʃjɛ̃ də me vwazɛ̃ kuʁ]	<i>Les chiens de mon voisin courent.</i> [le ʃjɛ̃ də mɔ̃ vwazɛ̃ kuʁ]	The dogs of my neighbour run.
d. <i>Le chien noir qui court est grand.</i> [lə ʃjɛ̃ ki kuʁ ɛ ɡʁɑ̃]	<i>Les chiens noirs qui courent sont grands.</i> [le ʃjɛ̃ ki kuʁ sɔ̃ ɡʁɑ̃]	The dogs black who are running are big.

Syntactic markers: German noun capitalization

	Examples with bare N and expanded NP	Semantic classification of N	Inflection information	Translation of the examples
a.	Er ist _{NP} [Arzt]. Er ist _{NP} [ein guter Arzt].	Proper name	M., S, Nom	He is a doctor. He is a good doctor.
b.	Sie finden _{NP} [Gold]. Sie finden _{NP} [altes Gold].	Mass noun	N, S, Acc	They find gold. They find old gold.
c.	Sie haben _{NP} [Angst]. Sie haben _{NP} [große Angst].	Abstract noun	F, S, Acc	They have fear. They have big fear.
d.	Sie helfen _{NP} [Hunden]. Sie helfen _{NP} [alten Hunden].	Concrete noun	M, P, Dat	They help dogs. They help old dogs.
e.	Sie mögen _{NP} [Tanzen]. Sie mögen _{NP} [schnelles Tanzen]	Nominalized verb	N, S, Acc	They like dancing. They like quick dancing.

Syntactic markers: German noun capitalization

Table 1. Example experimental item in German (with English glosses) in the four different manipulations used in the experiment.

Cap	Det	Critical main clause	Dependent clause
+	+	Morgen wollten sie die Kerzen herstellen, <i>Tomorrow wanted they the Candles make,</i>	obwohl ihnen dazu noch die Dochte fehlten. <i>although to-them for-that still the Wicks lacked.</i>
+	-	Morgen wollten sie Kerzen herstellen, <i>Tomorrow wanted they Candles make,</i>	obwohl es im Sommer auch nachts noch warm war. <i>although it in Summer also at-night still warm was.</i>
-	+	Morgen wollten sie die kerzen herstellen, <i>Tomorrow wanted they the candles make,</i>	obwohl sie nicht viel frisches wachs hatten. <i>although they not much fresh wax had.</i>
-	-	Morgen wollten sie kerzen herstellen, <i>Tomorrow wanted they candles make,</i>	obwohl sie schon elektrisches licht hatten. <i>although they already electric light had.</i>

Cognitive efforts for *syntactic spelling*

- Long and laborious learning process in French and German
- Both spelling domains require syntactic awareness for spelling.

However, as the syntactic information related to both differ, the syntactic awareness required to engage in automatic, syntax-driven anticipatory processing for spelling also differs.

Cognitive efforts for *syntactic spelling*: French

In French, the production rule of plural spelling may be stated:

- if a noun or adjective is plural, add 's';
- if a verb is plural, add 'nt'

(Anderson 1982; Fayol et al., 2006; Jaffré & Fayol, 2013)

Syntactic awareness in relation to plural spelling means:

- to detect the salient surface characteristics of plural spelling, <s> and <nt>,
- to realize that the information of plurality represented in these written markers presents the same information, plural, repeatedly across each word in the NP and across the whole sentence,
- to keep the information activated while writing.

Cognitive efforts for *syntactic spelling*: German

German orthography highlights the head of NP by the use of a capital letter, and hence structures parts of speech visually.

(Bredel, 2010; Fuhrhop, 2011; Maas, 1992; Meletis & Dürscheid, 2022).

Syntactic awareness in relation to noun capitalization means:

- to become aware of the presence of an NP in the sentence,
- to capitalize correctly, a writer must continuously observe whether a given syntactic context is an NP, and if so, they must determine its head (Fuhrhop, 2011; Funke, 2005).

Syntactic training for syntactic spelling

_{NP}[*Les chats*] *miaulent*.

_{NP}[*Les grands chats noirs*] *miaulent*.

Continuous activation of the presence of plurality.

_{NP}[*Hunde*] *lieben* _{NP}[*langes Rennen*].

Identification of the NP and its nucleus across various NP structures (with/without article).

Instruction: Awareness of the NP as an inflected unit

Main didactic methods:

'Jeu des balles d'accord' (Cogis, 2004)

'Dictée sans faute' (Cogis, Fisher, &

Nadeau, 2015; Brissaud, et al., 2011)

Main didactic methods:

'Treppengedichte' (Röber, 1999)

'Testwörter' (Funke, 1995; 2017)

Weth, Dording, Klasen, Fayol, Funke, & Ugen, [under review]

Syntactic training for syntactic spelling

French plural spelling

Le(s) grand(s) monstre(s) vert(s) mangent.

German noun capitalization

Charmante Prinzessinnen essen leckerer, warmes Essen.

leckerer, warmes, tolles Essen
das leckerer, warme, tolle Essen

Syntactic training for syntactic spelling

10 Videos ('10 each), student booklet and Lego bricks (cf. Weth 2017)

French

- Awareness of the NP by emphasizing on the redundancy of plural marking (-s) within the NP and a second marker for subject-verb agreement (-nt)

German

- Awareness of the NP by expanding NP with adjectives
- Emphasis on adjective endings and capital spelling of N

- recognizing, writing, correcting, analyzing
- using Lego bricks to visually emphasize phrase structures

Syntactic training for syntactic spelling

Research Question:

Does a syntactic training in French and German, reflecting on syntactic markers and their encoded syntactic information, have positive effects on syntactic spelling in both spelling domains?

- short- and long-term effects

Syntactic training for syntactic spelling

1. Cross-over intervention study, French and German
2. Syntactic training based on learner videos
3. Sample
 - Grade 4 (n = 176; N = 284)
 - Language of literacy: German
 - since grade 1
 - L2, L3 for almost all students (Luxemburgisch L1 for about 30%)
 - Already instruction in noun capitalization, but not yet nominalized word forms; different approach as in GRASP)
 - Second language of literacy: French
 - since grade 3 (written)
 - L2 for almost all students (L1 for about 10%)

Syntactic training for syntactic spelling

Timeline	Preliminary tests	Group assignment	Pretest	2 weeks	Posttest	2 weeks	Posttest	8 weeks	Follow-up
Test points	T0		T1		T2		T3		T4
Trainings		FR1-GE2 (N = 80)		French		German		--	
		GE1-FR2 (N = 96)		German		French		--	
Tests (German and French)	General spelling Vocabulary Syntactic recoding		Syntactic spelling		Syntactic spelling		Syntactic spelling		Syntactic spelling

n = 176 grade 4 students

Syntactic training for syntactic spelling - tests

French

36 test items

- word categories: N, V, A
- 6 items per word category

18 control items

- N, A, V singular

German

36 test items

- different nouns: CON, ABS, NOM
- different NP structure: DN, AN, N
- 12 items per non type and NP structure

24 control items

- verbs, adjectives

Items coded for analyses:

- Mean of correct plural spelling in French (n=36)
- Mean of correct noun capitalization in German (n=36)

All items from students' textbooks, no complex morphemes, controlled for word frequency, sentence context controlled.

Weth, Dording, Klasen, Fayol, Funke, & Ugen, [under review]

Syntactic training for syntactic spelling - analysis

Generalized Linear Model (GLMM) with three factors for each language:

The influence of spelling (mean correct) in depending on the variables

- test point (T1-T4)
- language (FR, DE)
- group (FR1-GE2, GE1-FR2)

Controlled for: children nested within classes

All 176 participants have participated at three test points (T1, T2, T3).

We tolerated missing data at T4.

Syntactic training for syntactic spelling - results

French syntactic training effects:

The interaction (test point * group) showed that the French syntactic training had a positive significant effect on French plural spelling. ($p < .001$)

German syntactic training effects:

The interaction (test point * group) showed that the German syntactic training had no significant effect on German noun capitalization ($p < .8138$)

Syntactic training for syntactic spelling

Interpretation of these mixed results ...

Interpretation: Syntactic-graphematic differences

_{NP}[*Les chats*] miaulent.

_{NP}[*Les grands chats noirs*] miaulent.

- The NP has a clear form, starting always with determiner.
- Nominalized words are derivations
courir/la course ('to run'/'the running')

_{NP}[*Hunde*] lieben _{NP}[*langes Rennen*].

- The NP has various shapes
- Nominalized words do not show morphological modification (*rennen/(das) Rennen*, 'to run', 'the running')

Interpretation: Syntactic-graphematic differences

_{NP}[*Les chats*] miaulent.

_{NP}[*Les grands chats noirs*] miaulent.

_{NP}[*Hunde*] lieben _{NP}[*langes Rennen*].

- The reflection on plural allows a direct mapping between the syntactic information (plural) and the spelled units (<s>, <nt>).
- The syntactic training must take a detour by featuring words - inflected adjectives - that are not present in the sentence, but could be potentially to determine if a given word is the head of the NP.

Interpretation: Teaching traditions

_{NP}[*Les chats*] *miaulent*.

_{NP}[*Les grands chats noirs*] *miaulent*.

_{NP}[*Hunde*] *lieben* _{NP}[*langes Rennen*].

Teacher feedback: French training (n=14/16)

- All teachers have included aspects from the videos in their regular lessons.
- Teachers have repeated explanations from the videos.
- No teacher believes that the children did not benefit from the training.

Teacher feedback: German training (n=12/16)

- Half of the teachers have included aspects from the videos in their regular lessons.
- Teachers have supplemented explanations from the videos with their own rules from previous lessons.
- Few (3) teachers believe that the children have not benefited from the training.

Conclusions

Same – French plural spelling, German noun capitalization:

1. “syntactic markers” according to the initial definition (Weth, 2020).
2. Both have developed throughout history as part of a reader friendly writing system.

Different:

1. **German:** Identification of the NP and its nucleus across various NP structures.
2. **French:**
 - Continuous activation of the presence of plurality
 - Distinction between within NP and subject-verb agreement

Conclusions

Writing systems encode syntactic information, unrelated to phonology.

Learners need to become aware of the syntactic information encoded in the writing system in order to learn syntactic spelling.

Much research exists in this field in domains of morphosyntax, such as French.

Very few exists on other forms of syntactic information encoded in the writing system.

Note that in both spelling domains learners seem to profit from syntactic training for syntactic spelling.

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- German: Bîlici et al., 2019; Brucher et al., 2020

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THE GRASP TEAM



Constanze Weth



Carole Dording



Lisa Klasen



Sonja Ugen

constanze.weth@uni.lu

Institute for Research on Multilingualism

LUCET –
Luxembourg Center
of Testing