

# What is the relationship between learning words and learning grammatical features

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# Outline

- 1 Background
- 2 Research Questions
- 3 Methodology
- 4 Results
- 5 Discussion & Conclusions

- How do L2 learners develop new features or structures?
- L1 acquisition: link between syntax/ features and vocabulary size (Bates & Goodman 1997).
- Does this apply to second language learners?

## What does it mean to know a word?

- Distinction between receptive and productive knowledge.
- Not just: can you give a translation from L1 - L2.
- Nation (2001) distinguished between knowledge of form, meaning and use.
  - Form: how is the word written? what does it sound like?
  - Meaning: what does this word mean? what other words are associated with it?
  - Use: in what patterns does this word occur? What other types of words occur with this word? where, when and how often can we use this word?

# What are grammatical features?

- Features that cause things to happen at a grammatical level but not necessarily seen in the morphology, e.g. gender, verb movement.
  - French has grammatical gender on nouns (unlike English).
  - Gender is divided between masculine and feminine.
  - Functional feature on determiners and nouns (DP).
  - la <sub>[FEM]</sub> porte <sub>[FEM]</sub> (*the door*)

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  - la <sub>[FEM]</sub> porte <sub>[FEM]</sub> (*the door*)
  - In French all verbs appear before adverbs or negation (verb movement) whereas in English only modals and auxiliaries do.
  - Functional feature on verbs.
  - French: Je regarde souvent la télé (*I watch often TV*).
  - English: I often watch TV.

# Minimalism & the Lexicon

Ouhalla (1991:7-10) suggests

*[T]here should in principle be a distinction between two notions of the lexicon, a grammatical lexicon which contains functional categories and which belongs to the domain of UG, [and] a mental lexicon which contains substantives and which exists independently of UG, that is an autonomous module of the mind/brain.*

Emonds (2002): there is a 'syntacticon' and a 'mental dictionary'.

## Lexical Bottleneck hypothesis

- Within processing literature, role of lexical development is seen as increasingly important.
- Hopp (2015) argues that if learners don't understand a word (frequency effects) they get stuck/ stop processing (causes a bottleneck).
- “greater demands on lexical processing may cause non-native like syntactic processing ... delay effects of structure building.”
- Luoni (2017) found the same effect of vocabulary frequency and productive vocabulary size in oral imitation tests in L2 Italian.

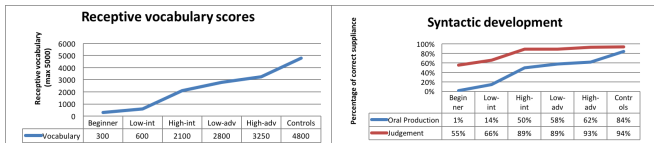


## Other production findings?

- David et al (2009) showed a link between both MLU & production of relative clauses and measures of vocabulary diversity in L2 French.
- Argued for no link with gender on nouns and verb movement.
- Rogers (2014, in press) examined receptive vocabulary size (X-Lex, Meara & Milton 2003) and verb movement in L2 French.

# Rogers, in press

- Verb movement: negation & adverb placement.
- Significant correlations:  $r(74) = .704$ ,  $p < .01$ .
- vocabulary size accounted for approx. 50% of the variance in verb movement scores ( $r^2 = .496$ ).



# Research Questions

- Is there a relationship between the acquisition of vocabulary and grammatical features?
- If so, how do they interact?

# Tasks

- Receptive vocabulary test (X-Lex: Meara & Milton 2003)
- Cloze test (Tremblay 2007)
- Finite Story (Dimroth et al 2010) - written version
- Written story composition task
- Transcribed using CHILDES CHAT conventions.

# Receptive vocabulary test

## French X-Lex Vocabulary Test

Please look at these words. Some of these words are real French words and some are invented but are made to look like real words. Please tick the words that you know or can use. Here is an example:

chien

Thank you for your help.

<input type="checkbox"/> de	<input type="checkbox"/> distance	<input type="checkbox"/> abatte	<input type="checkbox"/> aborde	<input type="checkbox"/> achevé	<input type="checkbox"/> mancher
<input type="checkbox"/> nier	<input type="checkbox"/> convenir	<input type="checkbox"/> arguable	<input type="checkbox"/> bien	<input type="checkbox"/> épée	<input type="checkbox"/> mérite
<input type="checkbox"/> heure	<input type="checkbox"/> réservé	<input type="checkbox"/> curieux	<input type="checkbox"/> sérieux	<input type="checkbox"/> territoire	<input type="checkbox"/> diable
<input type="checkbox"/> souffle	<input type="checkbox"/> changement	<input type="checkbox"/> moment	<input type="checkbox"/> centrale	<input type="checkbox"/> arrêté	<input type="checkbox"/> demare
<input type="checkbox"/> plusieurs	<input type="checkbox"/> spatiale	<input type="checkbox"/> congruence	<input type="checkbox"/> salarier	<input type="checkbox"/> lassitude	<input type="checkbox"/> disablité
<input type="checkbox"/> valiant	<input type="checkbox"/> cartographe	<input type="checkbox"/> exploiter	<input type="checkbox"/> sportif	<input type="checkbox"/> soupçon	<input type="checkbox"/> regarder
<input type="checkbox"/> maximum	<input type="checkbox"/> lequel	<input type="checkbox"/> encher	<input type="checkbox"/> voulu	<input type="checkbox"/> signer	<input type="checkbox"/> brégaible
<input type="checkbox"/> parfois	<input type="checkbox"/> percevoir	<input type="checkbox"/> féminin	<input type="checkbox"/> musculaire	<input type="checkbox"/> organique	<input type="checkbox"/> priet
<input type="checkbox"/> rêver	<input type="checkbox"/> film	<input type="checkbox"/> combattre	<input type="checkbox"/> catéchisme	<input type="checkbox"/> mutandre	<input type="checkbox"/> tronc
<input type="checkbox"/> anglais	<input type="checkbox"/> remporter	<input type="checkbox"/> triparois	<input type="checkbox"/> observation	<input type="checkbox"/> cravate	<input type="checkbox"/> creuser
<input type="checkbox"/> propriété	<input type="checkbox"/> respect	<input type="checkbox"/> coutume	<input type="checkbox"/> entamer	<input type="checkbox"/> indignation	<input type="checkbox"/> solution
<input type="checkbox"/> champfle	<input type="checkbox"/> couvert	<input type="checkbox"/> vaisseau	<input type="checkbox"/> restaurant	<input type="checkbox"/> entours	<input type="checkbox"/> empêcher
<input type="checkbox"/> exprimer	<input type="checkbox"/> pépite	<input type="checkbox"/> fleau	<input type="checkbox"/> foudre	<input type="checkbox"/> aviser	<input type="checkbox"/> inhabit
<input type="checkbox"/> épatour	<input type="checkbox"/> écourt	<input type="checkbox"/> défaut	<input type="checkbox"/> collaborateur	<input type="checkbox"/> aussôt	<input type="checkbox"/> terreste
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<input type="checkbox"/> stock	<input type="checkbox"/> conflit	<input type="checkbox"/> arme	<input type="checkbox"/> ordonnance	<input type="checkbox"/> loi	<input type="checkbox"/> armantaise
<input type="checkbox"/> lendemain	<input type="checkbox"/> clew	<input type="checkbox"/> auditeur	<input type="checkbox"/> véritablement	<input type="checkbox"/> comtesse	<input type="checkbox"/> jérette
<input type="checkbox"/> prévoir	<input type="checkbox"/> fonctionner	<input type="checkbox"/> harpe	<input type="checkbox"/> futur	<input type="checkbox"/> fragment	<input type="checkbox"/> permissable
<input type="checkbox"/> pourcent	<input type="checkbox"/> nitros	<input type="checkbox"/> bassin	<input type="checkbox"/> style	<input type="checkbox"/> opportun	<input type="checkbox"/> wall
<input type="checkbox"/> procédure	<input type="checkbox"/> debout	<input type="checkbox"/> vicinité	<input type="checkbox"/> pochoir	<input type="checkbox"/> récolter	<input type="checkbox"/> charge

Totals:

0 1 2 3 4 5

# Productive vocabulary test



# Cloze test

## Le taux de CO<sub>2</sub> dans l'atmosphère augmente plus vite que prévu

La croissance économique mondiale \_\_\_\_\_ provoqué un accroissement de \_\_\_\_\_ teneur en dioxyde de \_\_\_\_\_ (CO<sub>2</sub>) dans l'atmosphère beaucoup \_\_\_\_\_ rapidement que prévu, selon une étude \_\_\_\_\_ lundi dans les comptes rendus de l'Académie \_\_\_\_\_ des sciences des États-Unis.

Cette étude \_\_\_\_\_ que la concentration des émissions \_\_\_\_\_ gaz carbonique dans l'atmosphère a \_\_\_\_\_ de 35 % en 2006, entre le début \_\_\_\_\_ années 1990 et les \_\_\_\_\_ 2000-2006, passant de 7 à 10 milliards de tonnes \_\_\_\_\_ an, alors que le protocole de Kyoto prévoyait \_\_\_\_\_ en 2012, ces émissions responsables \_\_\_\_\_ réchauffement climatique devaient \_\_\_\_\_ baissé de 5 % par \_\_\_\_\_ à 1990. « Les améliorations dans l'intensité carbonique de l'économie \_\_\_\_\_ stagnent depuis 2000, après trente \_\_\_\_\_ de progrès, ce qui a provoqué cette \_\_\_\_\_ inattendue de la concentration de CO<sub>2</sub> \_\_\_\_\_ l'atmosphère », indique dans \_\_\_\_\_ communiqué le British Antarctic Survey, \_\_\_\_\_ a participé à cette étude.

\_\_\_\_\_ les chercheurs, les carburants polluants \_\_\_\_\_ responsables de 17 % de cette augmentation, \_\_\_\_\_ que les 18 % restant sont \_\_\_\_\_ à un déclin de la capacité des « puits » naturels comme \_\_\_\_\_ forêts ou les océans \_\_\_\_\_ absorber le gaz carbonique. « \_\_\_\_\_ y a cinquante ans, pour chaque tonne de CO<sub>2</sub> émise, 600 kg \_\_\_\_\_ absorbés 54 par les puits naturels. \_\_\_\_\_ 2006, seulement 550 kg par tonne ont été \_\_\_\_\_, et cette quantité continue à baisser », explique \_\_\_\_\_ auteur principal de l'étude, Pep Canadell, du Global Carbon Project. « La baisse de l'efficacité \_\_\_\_\_ puits mondiaux laisse \_\_\_\_\_ que la stabilisation de cette \_\_\_\_\_ sera encore plus \_\_\_\_\_ à obtenir que ce que l'on pensait jusqu'à \_\_\_\_\_ », indique pour sa \_\_\_\_\_ le British Antarctic Survey.

Ces \_\_\_\_\_ obligent à une révision à la hausse \_\_\_\_\_ prévisions du Groupe intergouvernemental d'experts \_\_\_\_\_ l'évolution du climat qui, dans son \_\_\_\_\_ de février, tablait sur l'augmentation de la température \_\_\_\_\_ de la terre de 1,8 °C à 4 °C \_\_\_\_\_ l'horizon 2100.

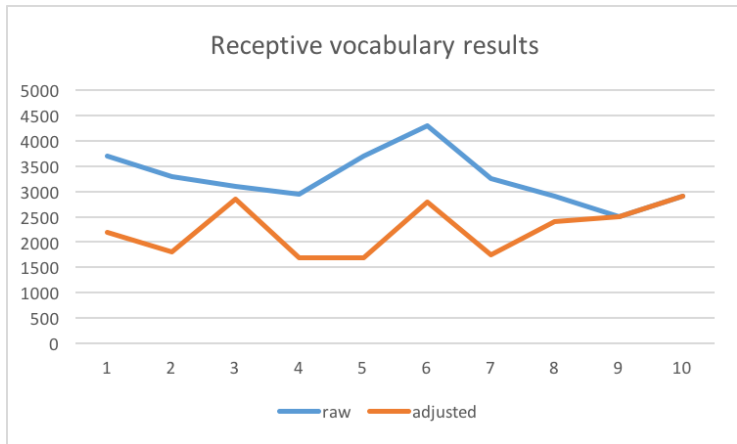
# video clip



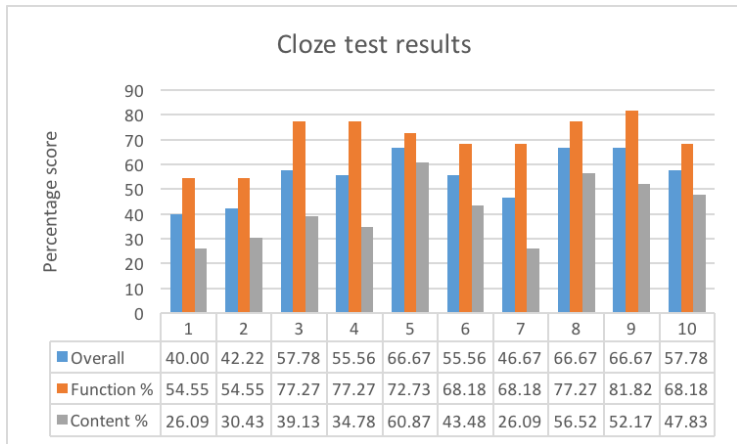
# Participants

- 10 learners of French at UK university.
- had all studied French prior to university
- 4 in first year of French at uni, 6 in final year.
- level B1-B2
- 8 female, 2 male
- Paid £10 to participate.

# Receptive vocabulary (X-lex)



# Cloze test

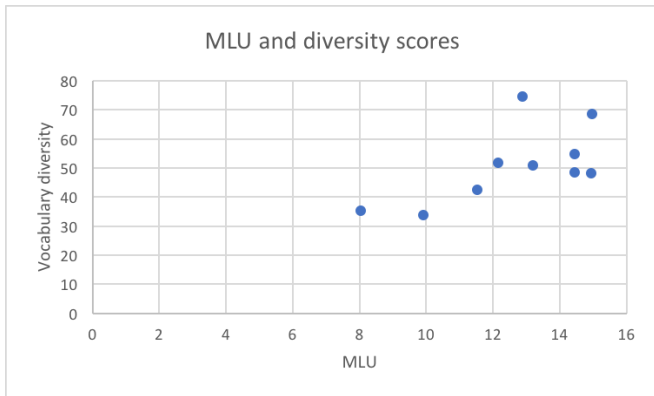


## Overall proficiency relationship

- Is there a link between the cloze test and vocabulary size?
- Overall: no significant correlation.

## Finite story general results

- Following David et al (2009) compared lexical density with MLU.
- Significant correlation  $r=.638$ ,  $p < .05$



## Finite story: grammatical features results

### Nouns

- Total number of unique nouns.
- Correct gender versus incorrect gender (versus changing gender).

### Verb movement

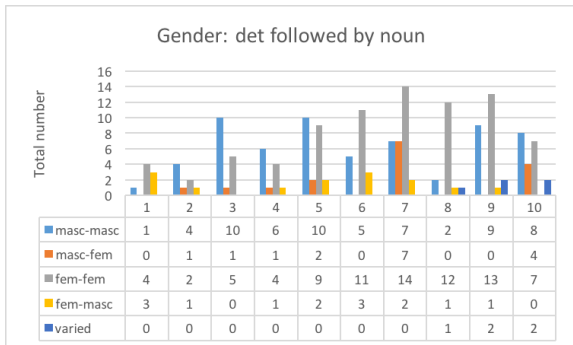
- clear evidence of verb movement (negation, adverbs, quantifiers).

### embedded clauses

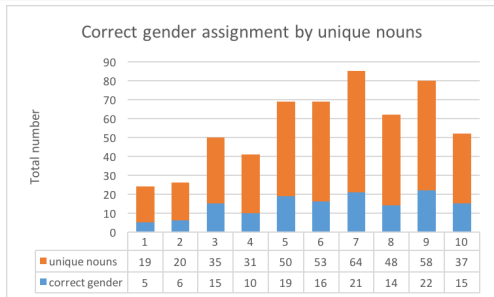
- number of embedded clauses with a relative pronoun.

## Noun results: Gender Breakdown

- Looked at the determiner and then the noun that followed.
- Excluded plurals, ambiguous, e.g. 'leur porte', 'l'appartement'.



## Noun results (gender: unique nouns)



- number of unique nouns and correct gender suppliance.  $r=.937, p < .001$ .
- correct gender and MLU:  $r=.742, p < .05$ .
- correct gender and overall cloze test:  $r=.645, p < .05$ .
- number of unique nouns and lexical diversity:  $r=.754, p < .01$ .
- correct gender and lexical diversity:  $r=.597, p < .05$ .



## verb movement results - how it was counted

- Only include clear cases of movement.
- excluded: e.g. 'Tout est bien' (*All is well*)
- included "Monsieur Rouge ne fait rien et il reste encore dans sa maison parce qu'il a peur." (F04) (*Mr Red does nothing and he still remains in his house because he is afraid*).
- Also counted with suppliance of modals.

## TP results (verb movement)

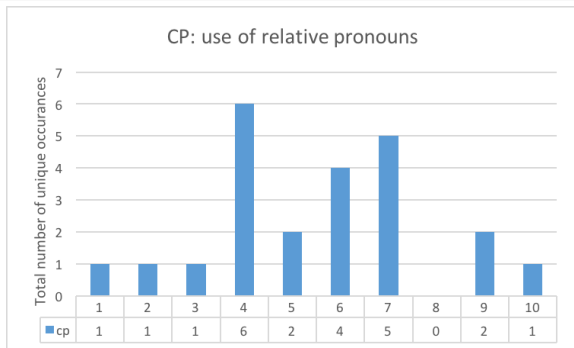
Pearson's one-tailed correlations between:

- number of verbs used and verb movement  $r=.587, p < .05$ .
- number of verbs used and verb movement (inc modals)  $r=.625, p < .05$ .
- number of verbs used and lexical diversity (D)  $r=.664, p < .05$ .
- lexical diversity and verb movement:  $r=.714, p < .05$ .
- lexical diversity and verb movement (inc modals):  $r=.674, p < .05$ .
- No correlation between verb movement and number of unique verbs.

## embedded clauses: what was counted

- Relative pronouns counted (que, qui, lequel).
- Unique instances - if 'pendant que' used 5 times, counted as 1.
- Example: “les pompiers sont enfin arrivés au bâtiment dans lequel vivent Messieurs Bleu Rouge et Vert”. (*The firemen finally arrived at the building where Misters Blue, Red and Green live*).

## embedded clause Results



Pearson's one-way correlation between:

- number of CP clauses and lexical density (D) score:  $r=.683$ ,  $p < .05$ .
- number of CP clauses and verb movement:  $r=.620$ ,  $p < .05$ .

# Discussion

- Used similar methodology to David et al (2009).
- Showed role of lexical density in the acquisition of grammatical features.
- BUT...
- Is there a bottleneck? Something happening with vocabulary that impacts on the syntax?

- Number of unique nouns known leads to greater accuracy with gender.
- Number of verbs used leads to greater target word order (verb movement).
- More verb movement leads to greater use of embedded clauses.
- All structures are related to vocabulary diversity.

## What does this mean for teaching?

- Diversity of vocabulary is key.
- Lack of progress at school level due to lack of verbs?
- Is this true in ab initio classes at university?
- Need to target a range of verbs - not just the most frequent.

# Limitations

- Small sample size.
- Only analysed one written production task.
- Very conservative counts (nouns, verbs).
- Need more detailed analysis in terms of frequency.



Thank you  
Any questions?  
What do you think?

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