

What is the relationship between L2 lexical & syntactic development?

Vivienne Rogers

Swansea University

EUROSLA27
University of Reading 2017



Swansea University
Prifysgol Abertawe

Outline

- 1 Background
 - Vocabulary
 - Syntax
- 2 Methodology
 - Research Questions
 - Tasks
 - Participants
- 3 Results
 - General measures
 - Writing tasks: general measures
 - Writing tasks: Functional features
- 4 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 uninterpretable 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 _[FEM] porte _[FEM] (*the door*)

What are uninterpretable 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 _[FEM] porte _[FEM] (*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: the strong view

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'.

The “Interface” view

The invariant syntactic knowledge which learners have is a template present in the mind of the learner which can be modified by the information inserted within it. There cannot be a driving force for development in the syntax. It follows therefore that that driving force really comes from the lexis. Towell (2003:4)

Lexical frequency effects in syntax

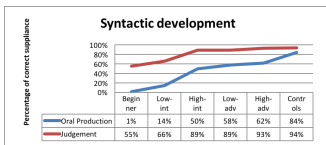
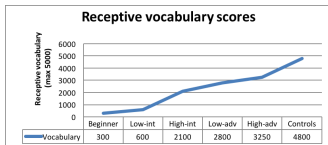
- Within processing literature, role of lexical development is seen as increasingly important.
- Hopp (2015) argues that if learners don't understand a word (frequency effects) they get stuck/ stop processing (causes a bottleneck).
- “greater demands on lexical processing may cause non-native like syntactic 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 (subject & object clefts).

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 & Treffers-Daller (2014) examined receptive vocabulary size (X-Lex, Meara & Milton 2003) and verb movement in L2 French.

Rogers, Playfoot & Milton, 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"/> distancer	<input type="checkbox"/> abatte	<input type="checkbox"/> absurde	<input type="checkbox"/> achevé	<input type="checkbox"/> mancher
<input type="checkbox"/> nier	<input type="checkbox"/> scoutisme	<input type="checkbox"/> arguable	<input type="checkbox"/> bien	<input type="checkbox"/> épée	<input type="checkbox"/> mite
<input type="checkbox"/> heure	<input type="checkbox"/> réservé	<input type="checkbox"/> curiosité	<input type="checkbox"/> scureux	<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"/> demeure
<input type="checkbox"/> planeurs	<input type="checkbox"/> quantité	<input type="checkbox"/> congruence	<input type="checkbox"/> salarié	<input type="checkbox"/> lassitude	<input type="checkbox"/> désabîné
<input type="checkbox"/> vaillant	<input type="checkbox"/> catégorie	<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"/> cracher	<input type="checkbox"/> voulu	<input type="checkbox"/> ager	<input type="checkbox"/> brigable
<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"/> rêves	<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"/> reporter	<input type="checkbox"/> triparaix	<input type="checkbox"/> observation	<input type="checkbox"/> cravate	<input type="checkbox"/> creaser
<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"/> champie	<input type="checkbox"/> couvert	<input type="checkbox"/> vaisseau	<input type="checkbox"/> restauration	<input type="checkbox"/> enrouer	<input type="checkbox"/> empêcher
<input type="checkbox"/> exprimer	<input type="checkbox"/> peintre	<input type="checkbox"/> frein	<input type="checkbox"/> fondre	<input type="checkbox"/> aviser	<input type="checkbox"/> imbuant
<input type="checkbox"/> épanouir	<input type="checkbox"/> écourt	<input type="checkbox"/> défilant	<input type="checkbox"/> collaborateur	<input type="checkbox"/> aussitôt	<input type="checkbox"/> terrestre
<input type="checkbox"/> outre	<input type="checkbox"/> laiser	<input type="checkbox"/> contrainte	<input type="checkbox"/> concession	<input type="checkbox"/> occurrence	<input type="checkbox"/> disputation
<input type="checkbox"/> stock	<input type="checkbox"/> conflit	<input type="checkbox"/> aimé	<input type="checkbox"/> ordonnance	<input type="checkbox"/> loi	<input type="checkbox"/> armanitise
<input type="checkbox"/> lendemain	<input type="checkbox"/> solder	<input type="checkbox"/> auditoire	<input type="checkbox"/> véritablement	<input type="checkbox"/> comtesse	<input type="checkbox"/> jette
<input type="checkbox"/> prévoir	<input type="checkbox"/> fonctionner	<input type="checkbox"/> barbe	<input type="checkbox"/> futur	<input type="checkbox"/> fragment	<input type="checkbox"/> permissable
<input type="checkbox"/> pourcent	<input type="checkbox"/> introus	<input type="checkbox"/> baisser	<input type="checkbox"/> style	<input type="checkbox"/> opportunist	<input type="checkbox"/> outi
<input type="checkbox"/> procéder	<input type="checkbox"/> débaur	<input type="checkbox"/> vicinité	<input type="checkbox"/> pochour	<input type="checkbox"/> récoher	<input type="checkbox"/> charge

Totals:

0 1 2 3 4 5

Cloze test

Le taux de CO₂ dans l'atmosphère augmente plus vite que prévu

La croissance économique mondiale _____ provoqué un accroissement de _____
 teneur en dioxyde de _____ (CO₂) 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 devait _____ baissé de 5 % par _____ à 1990. « Les
 améliorations dans l'intensité carbonique de l'économie _____ stagner depuis 2000,
 après trente _____ de progrès, ce qui a provoqué cette _____ inattendue de la
 concentration de CO₂ _____ 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 CO₂ 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 ce que l'on pensait jusqu'à _____ », indique pour
 sa _____ le British Antarctic Survey.

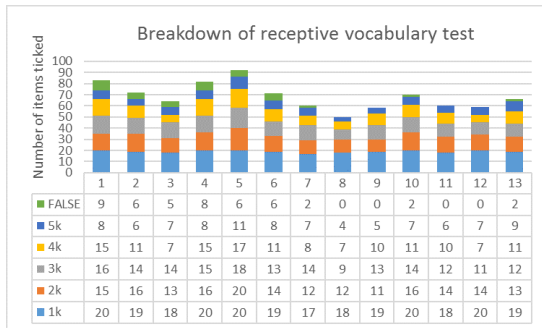
Ces _____ obligent à une révision à la hausse _____ prévisions du Groupe
 intergouvernemental d'experts _____ l'évolution du climat qui, dans son _____ de
 février, tablait sur l'augmentation de la température _____ de la terre de 1,8 °C à 4 °C
 _____ l'horizon 2100.

video clip

Participants

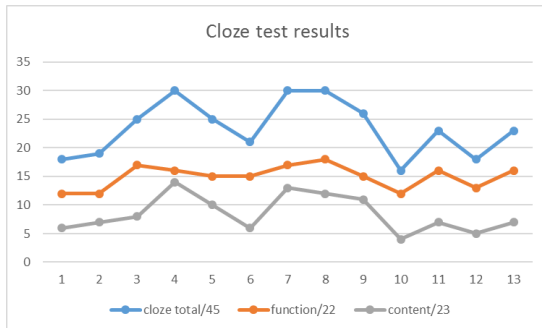
- 13 learners of French at UK university.
- had all studied French prior to university
- 7 lived in France (4-9 mths), 6 had not.
- level B1-B2
- 10 female, 3 male
- Paid £10 to participate.

Receptive vocabulary (X-lex)



	raw	adjusted
Mean	3235	2350
SD	463.9	581.3
Min	2500	1459
Max	4300	3000

Cloze test



Overall proficiency relationship

- Is there a link between the cloze test and vocabulary size?

Overall proficiency relationship

- Is there a link between the cloze test and vocabulary size?
- Yes but only with function words (Spearman's correlations)

Overall proficiency relationship

- Is there a link between the cloze test and vocabulary size?
- Yes but only with function words (Spearman's correlations)
 - raw receptive score ($r=-.549$, $p=.038$)
 - number of 1k words ($r=-.720$, $p=.006$)
 - number of 2k words ($r=-.599$, $p=.031$)

General results

- Following David et al (2009) compared lexical diversity (VOCD) with MLU.
- Spearman's correlation found between MLU and VOCD on film task ($r=-.626$, $p=.025$) but not on own story.
- However, also between adjusted receptive and VOCD on story task ($r=-.882$, $p<.001$).
- No relationship between MLU and receptive measure.

General results continued

Spearman's correlations between:

Film story

- MLU and number of:
 - types ($r=.703$, $p=.010$)
 - tokens ($r=.703$, $p=.010$)
- VOCD and number of:
 - morphemes ($r=.747$, $p=.005$)
 - types ($r=.852$, $p<.001$)
 - tokens ($r=.747$, $p=.005$)

Own story

- MLU and no measure of vocabulary
- VOCD and receptive (as before) but no other measure.
- number of morphemes and
 - types ($r=.962$, $p<.001$)
 - tokens ($r=.999$, $p<.001$)

Functional features

Nouns

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

Verb movement

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

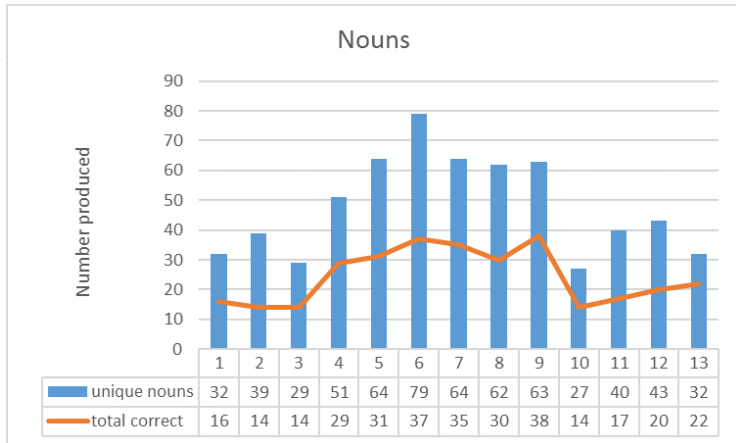
embedded clauses

- number of embedded clauses with a relative pronoun.

Noun results: How counted

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

Noun results (DP)



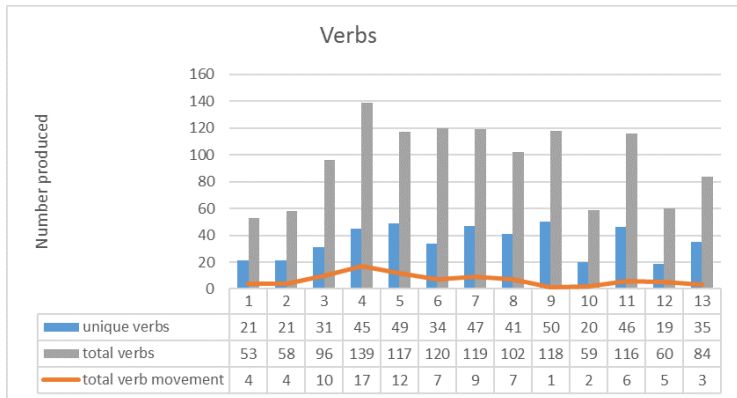
Noun results (gender: unique nouns)

- number of unique nouns and correct gender suppliance.
 - on film story: $r=.745$, $p=.003$
 - on own story: $r=.666$, $p=.013$
 - on combined written: $r=.898$, $p<.001$
- correct gender and MLU (film only): $r=.630$, $p=.021$
- correct gender (film only) and cloze test:
 - on overall cloze: $r=.689$, $p=.009$
 - on function words: $r=.586$, $p=.036$
 - on content words: $r=.562$, $p=.045$
- number of unique nouns and lexical diversity (film only)
 $r=.631$, $p=.021$.
- correct gender and lexical diversity (film only) $r=.740$,
 $p=.004$.

Verb movement: How 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*).

Verb results (TP)



TP results (verb movement)

- No sig correlations with unique verbs (although on story task: $r=.471$, $p=.052$)
- No sig correlations between verb movement and receptive vocabulary size.

TP results (verb movement)

- No sig correlations with unique verbs (although on story task: $r=.471$, $p=.052$)
- No sig correlations between verb movement and receptive vocabulary size.
- Verb movement and MLU (film only): $r=.489$, $p=.045$.
- Verb movement and VOCD (film only): $r=.828$, $p<.001$.

TP results (verb movement)

- No sig correlations with unique verbs (although on story task: $r=.471$, $p=.052$)
- No sig correlations between verb movement and receptive vocabulary size.
- Verb movement and MLU (film only): $r=.489$, $p=.045$.
- Verb movement and VOCD (film only): $r=.828$, $p<.001$.
- total verb movement and overall cloze: $r=.558$, $p=.048$.
 - Verb movement (story) and cloze content: $r=.571$, $p=.041$.

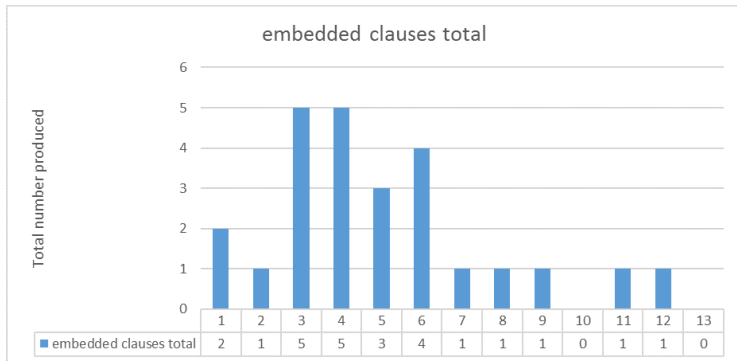
TP results (verb movement)

- No sig correlations with unique verbs (although on story task: $r=.471$, $p=.052$)
- No sig correlations between verb movement and receptive vocabulary size.
- Verb movement and MLU (film only): $r=.489$, $p=.045$.
- Verb movement and VOCD (film only): $r=.828$, $p<.001$.
- total verb movement and overall cloze: $r=.558$, $p=.048$.
 - Verb movement (story) and cloze content: $r=.571$, $p=.041$.
- Total number of verbs used and verb movement: $r=.562$, $p=.046$.
- total number of verbs used and lexical diversity: $r=.720$, $p=.007$.

Embedded clauses: How 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 (CP)



embedded clause Results

- receptive vocabulary (adjusted): $r=.637$, $p=.019$.
- cloze test: no sig correlations

embedded clause Results

- receptive vocabulary (adjusted): $r=.637$, $p=.019$.
- cloze test: no sig correlations
- MLU: embedded clauses (film) with both MLU (film):
 $r=.586$, $p=.035$ & MLU (story): $r=.586$, $p=.035$.
- VOCD: film: $r=.704$, $p=.007$ & story: $r=-.600$, $p=.030$.

embedded clause Results

- receptive vocabulary (adjusted): $r=.637$, $p=.019$.
- cloze test: no sig correlations
- MLU: embedded clauses (film) with both MLU (film):
 $r=.586$, $p=.035$ & MLU (story): $r=.586$, $p=.035$.
- VOCD: film: $r=.704$, $p=.007$ & story: $r=-.600$, $p=.030$.
- unique nouns or verbs: no sig correlations
- total verbs: no sig correlations
- correct gender: no sig correlations
- total verb movement: $r=-.744$, $p=.0040$

Results summary

- Relationship between numbers of unique nouns and correct gender usage.
- correct gender (DP) relates to general proficiency measures (cloze, MLU, VOCD) but not receptive vocabulary.

Results summary

- Relationship between numbers of unique nouns and correct gender usage.
- correct gender (DP) relates to general proficiency measures (cloze, MLU, VOCD) but not receptive vocabulary.
- Relationship between total number of verbs used and verb movement.
- Verb movement (TP) relates to general proficiency measures (cloze, MLU, VOCD) but not receptive vocabulary.

Results summary

- Relationship between numbers of unique nouns and correct gender usage.
- correct gender (DP) relates to general proficiency measures (cloze, MLU, VOCD) but not receptive vocabulary.
- Relationship between total number of verbs used and verb movement.
- Verb movement (TP) relates to general proficiency measures (cloze, MLU, VOCD) but not receptive vocabulary.
- Embedded clauses (CP) relates to general proficiency measures (cloze, MLU, VOCD) AND receptive vocabulary.
- Use of different embedded clauses correlates with verb movement but not correct gender.

So what does this mean?

- In order to produce correct gender then you need lots of (different) nouns.
 - About half of unique nouns were with correct gender (but counted in a particular way).
- In order to produce verb movement then you need to use lots of verbs.

Discussion

- Similar findings to David et al regarding embedded clauses and MLU.
- Contrary results on gender and verb movement (only on the film task).
- BUT...
- verb movement doesn't entail correct gender (contra structural building approaches)

Discussion

- Similar findings to David et al regarding embedded clauses and MLU.
- Contrary results on gender and verb movement (only on the film task).
- BUT...
- verb movement doesn't entail correct gender (contra structural building approaches)
- Strict disassociation between syntax and vocabulary (lexicon) is too strong.
- Does the lexicon need to have certain characteristics (thresholds? associations?) before syntactic features can be acquired?

Limitations

- Small sample size: initial pilot study.
- Only analysed written production tasks.
- Very conservative counts (nouns, verbs).
- Need more detailed analysis in terms of frequency.

Thank you
Any questions?
What do you think?

Contact details

v.e.rogers@swansea.ac.uk

www.viviennerogers.info



@RogersVivienne



ResearchGate

