

CORRELATING LINGUISTIC PERFORMANCE WITH COGNITIVE, EDUCATIONAL AND SOCIO-AFFECTIVE VARIABLES IN SLA

Dutch and English CLIL in French-Speaking Belgium

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OUTLINE

1. Introduction: Content and Language Integrated Learning (CLIL)
2. Research project: “Assessing CLIL in French-speaking Belgium: an integrated approach”
3. Preliminary findings
4. Conclusions

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1. INTRODUCTION

Content and Language Integrated Learning (CLIL)

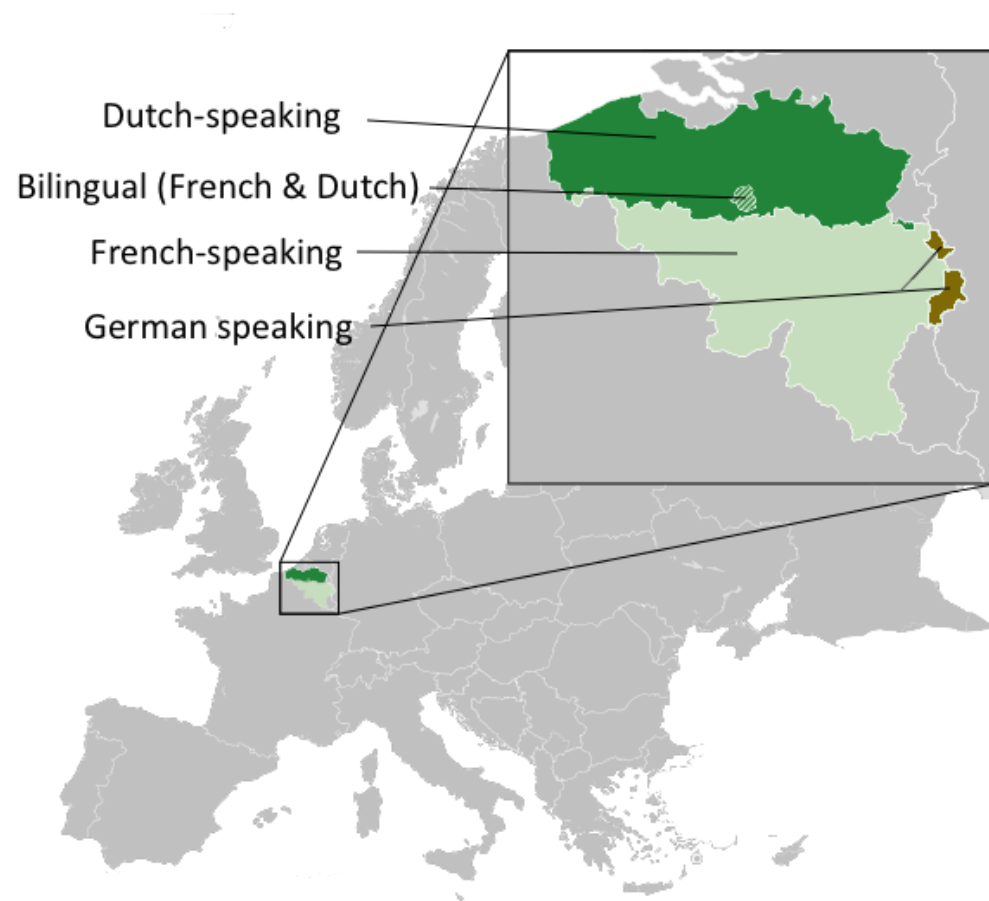
CLIL vs Immersion

- ‘[t]here are at least thirty-three different designations for some type of “bilingual education”’ (Baetens Beardsmore 2009: 208)
- **Immersion:** tends to be associated with the Canadian efforts (started in 1960s)
- **CLIL** (*Content and Language Integrated Learning*): has become a popular and widespread practice (and term) in Europe (Coyle, Hood & Marsh 2010)
 - a didactic method in which school subjects are taught in a target language
 - an innovative method to foster multilingualism on a large scale and promoted by the European Union
 - **EMILE** (*Enseignement de Matières par Intégration d'une Langue Etrangère*)

CLIL vs Immersion

- **Main and shared objectives:**
 - fostering of bi-/multilingualism
 - societal reasons
- **Differences:**
 - the language of instruction: in CLIL the target language is considered a foreign language
 - starting age of the learning: earlier starting age in immersion than CLIL

CLIL in Belgium



- In French-speaking Belgium:
 - 2/3 of the CLIL schools have CLIL in Dutch and 1/3 in English
 - 8-13 h/week in target language

- Linguistic, educational and socio-economic issues at stake:
 - Bi-/multilingual workers needed on the job market (Mettewie & Van Mensel, 2009)
 - Language learning often seen as problematic (Janssens 2008; Ginsburgh & Weber 2006)
 - Polarisation of the two main linguistic communities (Dutch- and French-speakers) for economic, social and political reasons
 - Separate educational systems



Is CLIL effective?

YES...

- Several surveys have confirmed that CLIL learners outperform non-CLIL learners as far as target language test scores are concerned.

Cf. Admiraal et al. 2006, Dalton Puffer 2011, Lasagabaster 2008, Lorenzo et al. 2005, Ruiz de Zarobe 2008 & 2010, ZydatiB 2007

- a wider, more varied and more sophisticated vocabulary (Jexenflicker & Dalton-Puffer, 2010; Lo & Murphy, 2010; Ruiz de Zarobe, 2010; ZydatiB, 2007)
- As for oral skills: more fluent and more confident (Dalton-Puffer et al. 2008) and better communicative competence (e.g. Wode 1994, Klieme 2006)

BUT...

- In recent years, voices are also beginning to rise downplaying the conclusions drawn from CLIL research

Cf. Bruton 2011, Ruiz de Zarobe 2011, Seikkula-Leino 2007

- Only **limited empirical research** has been conducted to evaluate CLIL effectiveness in relation to learners' linguistic achievement, their cognitive development and the teaching and learning processes with regard to teacher education (Cf. Cheng 2012, Coyle 2007, Coyle et al. 2010)
 - Very few studies on **authentic language use** data / corpora
 - Exact role of a possible **selection bias**? (little inclusion of cognitive variables)
 - Impact of **socio-affective variables**?
 - Impact of **teaching processes**?
 - Actual proportion of the content and language **integration**?
 - Etc.

Integrating advances of SLA and LCR into CLIL research!

Myles (2015):

- more **oral** data (to increase access to implicit knowledge)
- more **varied communicative activities** and tasks to gather L2 data (including tasks encouraging the production of infrequent or rare constructions)
- a range of **different languages** collected
- **all proficiency levels** represented
- **native controls** performing the same tasks as the learners

Meunier (2015):

- new practices/requirements in **longitudinal** learner corpus data collection
- **many variables** recorded as metadata can be used as dependent variables, potential predictors or dynamic factors impacting SLA
- the learners' productions, (...) being representative of **larger groups or populations** (...) but **within-group variability and individual trajectories** can also be accessed
- **L1 production data** should also ideally be collected

2. RESEARCH PROJECT

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**“Assessing Content and Language Integrated Learning in French-speaking Belgium: an integrated approach”
(2014-2019)**



Research team

- 4 PhD-students (Amélie Bulon, Audrey De Smet, Isa Hendrikx, Morgane Simonis)
- 1 post-doc (Luk Van Mensel)
- 6 academics (Benoit Galand, Philippe Hiligsmann, Laurence Mettewie, Fanny Meunier, Arnaud Szmalec, Kristel Van Goethem)



Research aims

Comparison between CLIL and non-CLIL learners:

- What are the differences, if any?
- For which linguistic aspects?
- According to which cognitive, socio-affective and educational factors?

Cognitive



Socio-educational



Linguistic



A large-scale study

- 13 primary schools
- 9 secondary schools
- 928 pupils
- followed longitudinally for two consecutive school years (2015-2016 and 2016-2017)



	CLIL Dutch	Non-CLIL Dutch	CLIL English	Non-CLIL English
Primary school pupils (455)	175	71	103	106
Secondary school pupils (473)	141	114	104	114

Data types collected

Data type	Includes	To investigate	Comments
Corpus data (MulTINCo)	For the <u>same pupils</u>: - Written data <u>L1 French</u> <u>L2 English (CLIL & non-CLIL)</u> <u>L2 Dutch (CLIL & non-CLIL)</u> Control corpus of - L1 Dutch - L1 English - Spoken data <u>L1 French</u> <u>L2 English (CLIL & non-CLIL)</u> <u>L2 Dutch (CLIL & non-CLIL)</u>	Linguistic analyses - Lexical and syntactic complexity - Formulaic language (phraseology) - Intensification	first data collection point done (Oct-Nov 2015); second data collection planned (April-May 2017) Collected (Feb. 2017), but not transcribed/analysed yet

Data type	Includes	To investigate	Comments
Questionnaires	For pupils, parents, teachers, school principals	socio-linguistic variables, SES background data, attitudes and motivation	Collected (Oct-Nov 2015); second collection planned (April-May 2017)

Data type	Includes	To investigate	Comments
Cognitive and psycholinguistic tests	Tests in the L1 Tests in the L2	IQ Non-verbal intelligence Inhibition processes Executive control etc.	first data collection point done (Oct-Nov 2015); second data collection planned (April-May 2017)

Data type	Includes	To investigate	Comments
Classroom observations	Recordings and observation grids	e.g. L1 vs L2 use Focus on form Type of feedback Use of non-verbal cues	Done (Feb 2017), being transcribed

Data type	Includes	To investigate	Comments
Focus groups	Small groups Semi-guided interviews	Qualitative analysis of a number of previous findings	Done (Feb 2017), being transcribed

Results of data collections

- A super big database with lots of variables and dense information per subject
- L1 and L2 data
- Options for longitudinal studies
- Options for stats of all sorts (descriptive, multivariate analysis, mixed-effect logistic regressions, etc.)
- Options for analysis of entire cohorts as representative of a particular population (CLIL vs non-CLIL, Dutch vs Eng)
- Options for analysis of students' individual paths

3. SOME PRELIMINARY FINDINGS

cf. Bulon, Hendriks, Meunier & Van Goethem (forthc.)

Linguistic complexity in written data

- L2 proficiency: “a person’s overall competence and ability to perform in L2” (Thomas 1994)
 - ➔ 3 components: Complexity, Accuracy, Fluency (CAF) (Housen et al. 2012)
- Complexity as a valid indicator of L2 proficiency (Ortega 2012, Bulté & Housen 2015); possibility of quantitative measurement
- Impact of CLIL on written complexity?
 - Yes, significant differences found between the writing of CLIL and non-CLIL for all measures of grammar and syntactic complexity, except for the number of subordinate clauses (Jexenflieger & Dalton-Puffer 2010)
 - But: small samples, only English

Measures of linguistic complexity

Linguistic complexity

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graph TD; A[Linguistic complexity] --> B[Lexical measures]; A --> C[Syntactic measures];
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Lexical measures (Crossley, Salsbuty & McNamara 2011)

- Breadth of knowledge measures (word frequency, lexical diversity)
- Depth of knowledge measures (hyperonymie, polysemy, word associations,...)
- Accessibility of lexical items (word concreteness, word imaginability, word familiarity)

Syntactic measures (Ortega 2003 as cited in Lu 2010; Bulté & Housen 2012)

- Length of production units (clauses, sentences and T-units)
- Amount of embedding or subordination
- Amount of coordination
- Range of surface syntactic structures
- Degree of sophistication of particular syntactic structures

Computational tools

- English: Coh-Metrix

- “analyzes texts on over 200 measures of cohesion, language and readability” (Graesser, McNamara, Louwerse & Cai 2004)

- Dutch: T-Scan

- *Software voor Complexiteits-Analyse van het Nederlands* (Pander Maat et al. 2014)

- French:

- Wordsmith Tools (for word/sentence counts)
- François (2011) for more complex measures

Complexity measures selected

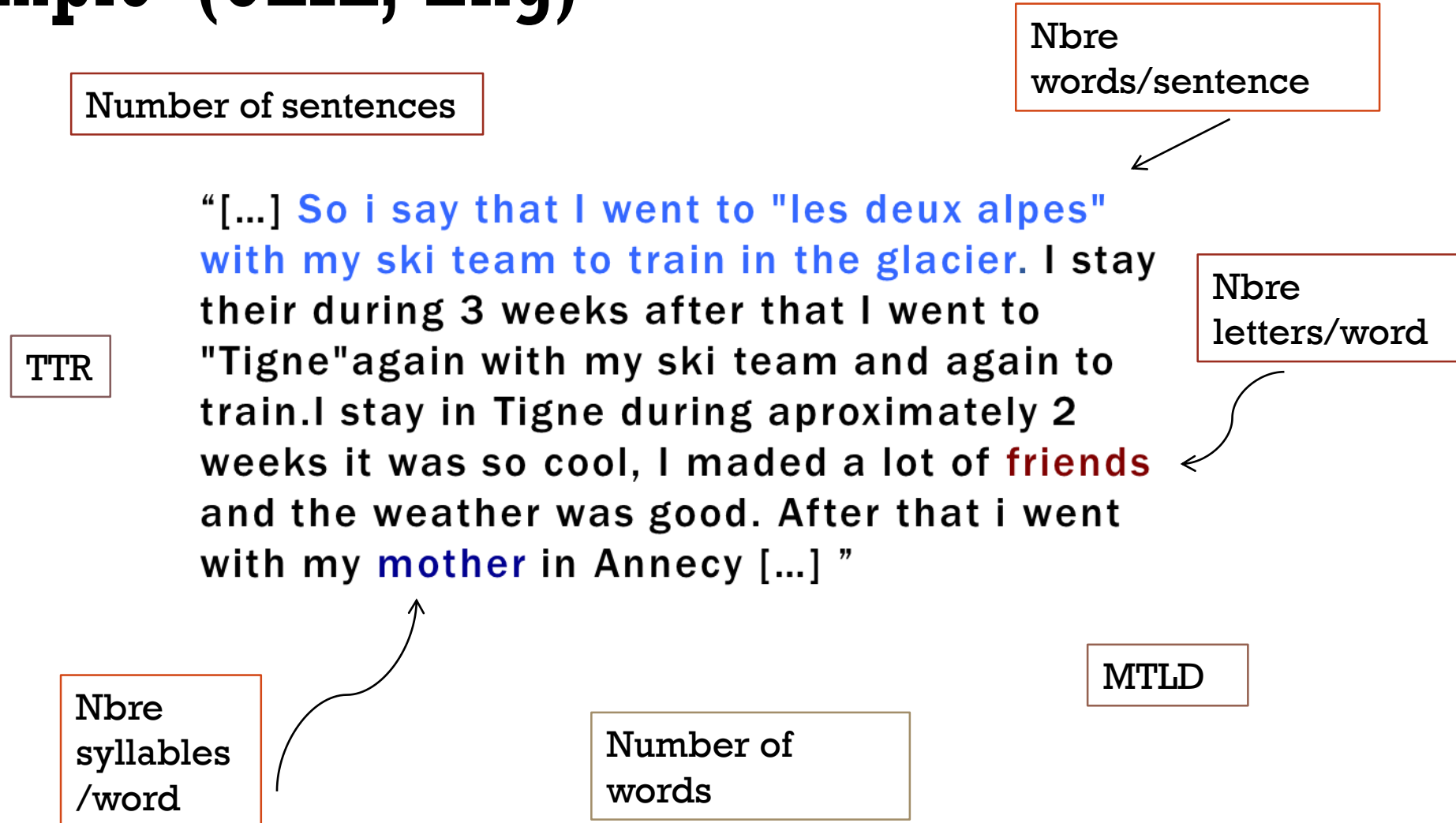
Lexical and syntactic measures
Total number of words
Total number of sentences
TTR = Type-Token Ratio (content words)
TTR = Type-Token Ratio (all words)
MTLD = Measure of Textual Lexical Diversity
Sentence length (number of words per sentence)
Word length (number of letters per word)
Word length (number of syllables per word)

Data collection

- 438 French-speaking learners of English or Dutch in CLIL and non-CLIL
- Fifth year of secondary school; mean age: 16,5
- From October 19th to November 9th 2015 in LLN
- Timed writing task (max. 25 mins) in computer rooms
- E-mails of at least 15 lines: one in L2 (English or Dutch) and one in L1 (French)
- Topics: holidays or party
- 843 productions

	L1 French	L2 Dutch CLIL	L2 Dutch non-CLIL	L2 English CLIL	L2 English non-CLIL
Texts	431	132	100	90	90
Words	131 539	37 209	19 399	29 394	23 747

Example (CLIL, Eng)



Example (Non-CLIL, Dutch)

Number of sentences

Words per
sentence

Syllables per word

Number of
words

“[...] Ik heb veel dingen je te vertellen. Ben je benieuwd te kennen wat vorig zaterdag **geubeurd** ?

Ik ben naar een Halloween **feetsje** geweest. Waarom was je niet daar ? Het was heel tof en ik heb met veel mensen kennisgemaakt, en een mooi jong zeker...

Zijn naam is Peter and he is frans. Hij is heel grappig maar hij kan niet dancen... [...]”

Letters
per word

TTR content
words

TTR all
words

MTLD

Note on methodological issues

- **Text length** – need to select adapted measures (MTLD less effected by text length than TTR)
- **Mistakes** in learners' texts: possible impact on measures, especially lexical ones (e.g. TTR)? (Treffers-Daller, Parslow & Williams 2016; Yu 2009)
 - Pilot study (correction of 20 randomly selected texts for each language) showed that spelling/grammatical/punctuation mistakes did not significantly alter complexity scores
 - Results are based on the original texts (only corrected for punctuation)

Research questions (1)

- Do **CLIL learners** have a **higher L2 proficiency** level than non-CLIL learners? In other words, will we find higher scores for the selected **complexity** measures?

➔ **Hypothesis:** since CLIL programs provide greater exposure to the L2 and appear to be beneficial in terms of overall general competence, we expect higher scores of complexity in the writing of CLIL learners
(Järvinen 2010; Navés and Victori 2010; Ruiz de Zarobe 2010; Gené-Gil et al. 2015; Pérez-Vidal and Roquet 2015)

Research questions (2)

- Do CLIL programs also have an **impact on the learners' L1**? If so, is it positive or negative?
 - ➔ **Hypothesis:** we expect non-CLIL learners to perform equally to CLIL learners in French since research shows that CLIL education does not seem to have a negative impact on the L1 (Braun & Vergallo 2010). Some researchers even report a positive influence of CLIL on the L1 (Wesche 2002).

Results

	L2 DUTCH		L2 ENGLISH		L1 FRENCH	
	non-CLIL	CLIL	non-CLIL	CLIL	non-CLIL	CLIL
Sentences per text	21,0	25,5	22,5	22,0	18,0	19,0
Words per text	194,5	274,0	267,5	328,0	288,0	296,0
Words per sentence	9,0	10,7	11,0	14,5	14,9	14,8
Syllables/morphs per word	1,23	1,27	1,30	1,28	-	-
Letters per word	4,27	4,35	3,86	3,84	4,03	4,06
TTR content words	0,77	0,77	0,70	0,71	0,68	0,68
TTR all words	0,54	0,51	0,49	0,49	0,76	0,77
MTLD	58,5	73,0	60,2	70,4	-	-

Results

- The effect of CLIL on L2 complexity varies according to the language:
 - **Dutch** texts written by **CLIL** pupils were significantly **more complex** than those written by non-CLIL pupils on most measures (except for TTR content words and TTR all words)
 - **English** texts written by **CLIL** pupils were significantly more complex regarding **three** of the complexity measures
- **No influence** of CLIL on the complexity of the **mother tongue** (French)

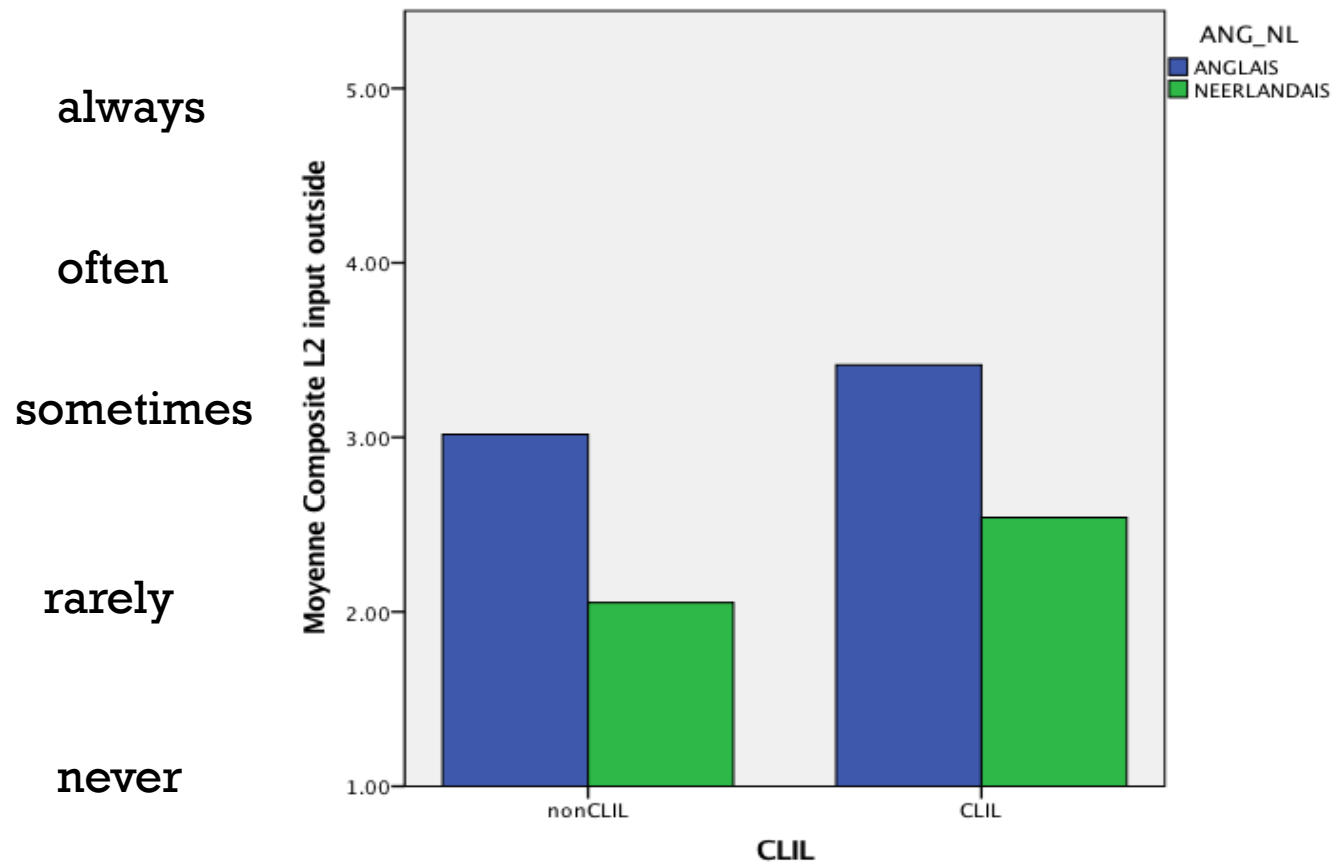
Results

- Many differences found for Dutch
 - **CLIL in Dutch** seems to have **more impact** in fostering L2 complexity than CLIL in English
- Fewer differences found for English:
 - **impact of CLIL in English** is **less evident** compared to CLIL in Dutch
 - **non-CLIL learners of English** may be **more proficient** in the L2 than non-CLIL learners of Dutch

→ **Only a CLIL effect? Other potential explanations:**

- Possible impact of **linguistic similarity**: compared to Dutch, English is linguistically (morphology, syntax, lexicon) more similar to French
- Possible impact of **L2 input outside the classroom** context: greater for English than for Dutch?
- Possible impact of **socio-affective variables**: more positive attitudes towards English?
- Possible impact of **cognitive variables**: IQ CLIL learners in Dutch higher than IQ non-CLIL learners in Dutch?

Possible impact of input outside the classroom

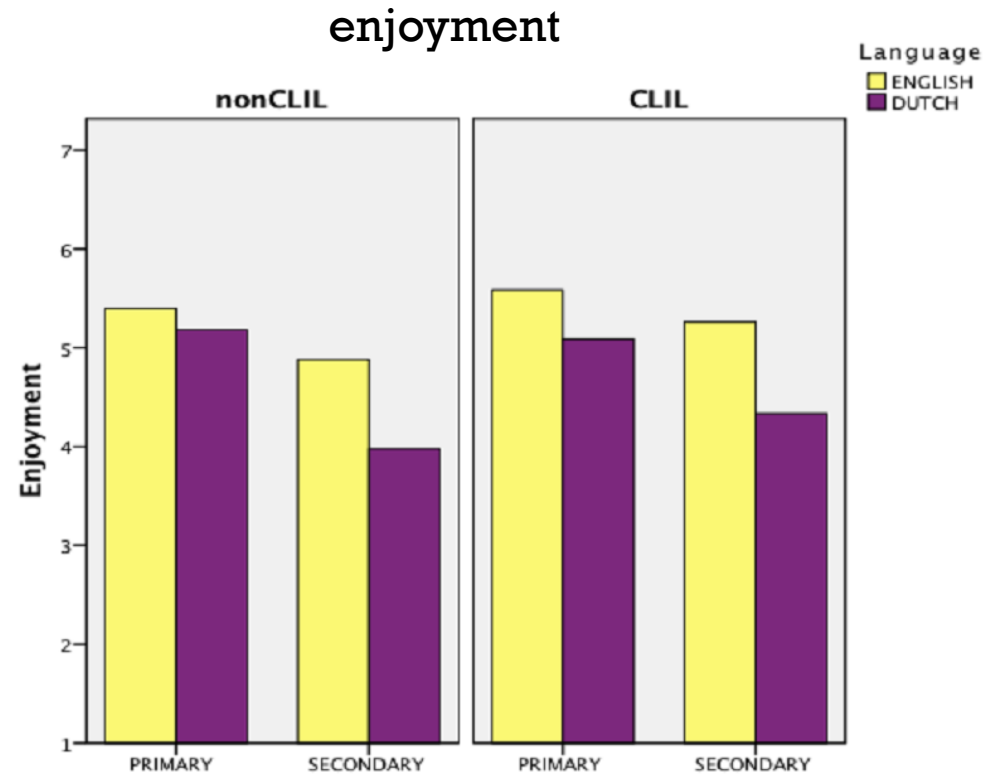
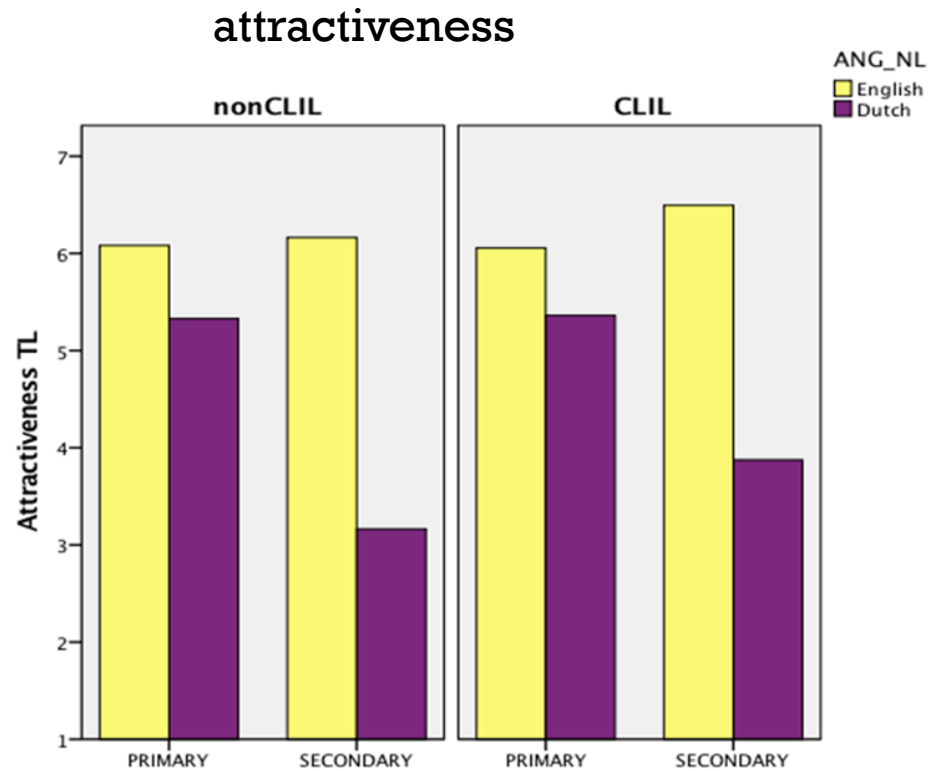


- Composite measure of L2 input:
- Internet use
 - Frequency of target language productive and perceptive use outside school context
 - Frequency of contact with natives outside school context

(Van Mensel et al., in prep.)

Possible impact of socio-affective variables

greater attractiveness and enjoyment of English than Dutch (De Smet et al. 2016)



Possible impact of cognitive variables

- IQ significantly higher in CLIL Dutch than non-CLIL Dutch learners
- Mean IQ (Raven score) per educational type (Mann-Whitney test)

	English			Dutch		
	CLIL	Non-CLIL		CLIL	Non-CLIL	
Mean	43,4	41,8	$U= 3723,5,$ $z= -,935$ $r=-$ $0,125,$ $p > .05$	46,0	42,4	$U=4718,5,$ $z= -3,460$ $r=-0,524,$ $p < .05^*$
Median	43,0	43,0		47,0	43,0	



4. CONCLUSIONS

Assessing CLIL: An integrated approach

Comparison between CLIL and non-CLIL learners:

- What are the differences, if any? **Differences between CLIL and non-CLIL, but not the same for Dutch and English**
- For which linguistic aspects? **Written linguistic complexity**
- According to which cognitive, socio-affective and educational factors? **IQ, attitude towards L2, L2 input in and outside the classroom, ...**

Cognitive



Socio-educational



Linguistic



Giving the floor back to Fanny Meunier:

many variables recorded as metadata can be used as dependent variables, potential predictors or dynamic factors impacting SLA
(Meunier 2015: 396-398)





THANKS FOR YOUR ATTENTION!

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Powerpoint available soon:
<https://uclouvain.academia.edu/KVanGoethem>

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