

## ATELIER GR NUMÉRIQUE, ARDAA

### **Digital evolutions within the research spaces of English didactics: Similarities in intertextual structuring and informational value in ELL productions based on mode of production**

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#### **Introduction**

The research focus of this article was to examine stylistic differences in students' written productions in light of the digital evolution from handwritten to typed productions in English Language Learning (henceforth ELL) settings. At the beginning of the study, it was unsure whether or not the transition from handwritten productions (henceforth HWP) to typed productions (henceforth TP) produced a calculable, noticeable stylistic difference in the final productions. The experimental design was, therefore, conceptualised to assess if the mode of the production led to any differences in the stylistic phenomena, namely intertextual structuring and informational value, of the final TP and HWP. In this study, stylistic approaches to textual production were assessed from both modes of production submitted by 58 B2 (CERF), LANSAD students studying Psychology for Education at a public, French university.

#### **1. Theoretical foundation: Using Biber's multi-dimensional model to assess stylistic diversity in ELL productions**

Biber's, 1991, multi-dimensional (MD) model was a framework that was first quantitative and subsequently qualitative based on the frequencies of linguistic features. It had been applied to ELL texts, both of native and nativised English, including non-native, academic English. The MD model was additionally used by Biber and a team of researchers within an assessment setting to analyse English language phenomena. This was an application that reinforced the methodological selection for the present study. The study used groups of lexico-grammatical features that co-occur with each other systematically as the operational determination of different stylistic features. Understanding stylistic determination would permit an empirical regard into whether a stylistic approach was consistent between the TP and the HWP. Our initial hypothesis was that the mode of production engendered a difference in the final production, with the TP being weaker in construction and informational value.

## **2. Methods**

### **2.1. Experiment population**

The participants in the study were 58 students, aged 18-24 at a public, French university with an intermediate linguistic competence in English (level B2, CERF). The participants were non-language specialists (LANSAD), studying Psychology for Education (Sciences Psychologiques et Sciences de l'Éducation - SPSE).

### **2.2. Experimental design**

The students were asked to listen to two thematically related presentations made by their course colleagues and to create a synthesis of the topics presented in two modes of production: one TP and one HWP. Thematically related topics were scheduled on the same day to ensure a coherence for the synthesis while equally ensuring different topics on each data collection day. Both modes of production were collected from each participant in one unique order: TP first and HWP second. The collection took place during three consecutive course sessions in the final weeks of the students' regularly scheduled English course. The students used keyboards and word processors with all corrective tools disabled for the TP and standard pen and paper for the HWP with no access to external dictionaries or tools.

### **2.3. Corpus**

The primary data that was collected was assembled into a corpus. The corpus was unilingual and hosted various L1s, French being the leading L1 with 46 of the 58 participants being French native speakers. There were 3 native English speakers, 2 native Portuguese speakers and one native speaker of each of the following languages: Arabic, German, Dutch, Hungarian, Indonesian, Créole, Spanish and Tamil. Combined, the sub-datasets represented a total of 23,877 words: 14,017 in the typed dataset and 9,860 in the handwritten.

### **2.4. Data processing**

The HWP were transcribed and both the TP dataset and the HWP dataset were tagged using the Multidimensional Analysis tagger (MAT), (Nini, 2015), based on the MD analysis originally designed by Biber (1991). The criteria for stylistic variation and informational value were then examined quantitatively and qualitatively to determine the overall and particular points of convergence and divergence between both modes.

### 3. Results

#### 3.1. Quantitative Results: No significant differences found in stylistic approaches between modes of production

There was no significant, quantitative difference found in the stylistic approaches (intertextual structuring and informational value) that the participant's used in the present dataset. In order to examine the indicated similarities, a qualitative look was taken into the strongest predictor of the stylistic differences: informational value.

Our starting point for the analysis was our belief that the general goal of an academic text is to be informative. Borrowing from the original framework, within which the assessment of informational value was the first and the largest indicator, we adopted the most salient linguistic feature as the operational parameter to guide the comparison between modes: the noun. As stated in the original framework, "Nouns are the primary bearers of referential meaning in a text, and a high frequency of nouns thus indicates great density of information." (Biber, 1991).

The basis of this theoretical foundation was adapted for the present study and modified to include the three parts of speech (POS) categories that conveyed nominal value: nouns, nominalisations and gerunds. The parameters that were used to verify the form and function of the three POS categories were any combination of the following:

- Introduced by a preposition: A writer with passion.
- Introduced by an adjective, such as the following:
- compound adjective: well-known fact
- comparative/superlative adjective: slower commencement, fastest acceleration
- proper adjective (which are often nouns themselves): French coffee
- participle adjective (which are often in present or past participle form): reading glasses, inspected concept
- Introduced by a determinant, such as the following:
- Articles: a story, the conclusion, Ø human nature
- Demonstrative determinants: this element, that hypothesis
- Possessive and genitive determinants: his thoughts, her reaction, its momentum, etc.
- Quantifiers: two conditions, any person, no smoking, etc.
- Interrogative and exclamative pronouns or adverbs: what theory, which model, how populations, etc.
- Is countable or non-countable: several revolutions, peace
- In a singular, plural or mass form: an incident, several cases, the impact
- Is an event or object referential: torrent, sea

The results showed that the rates for nominalisations remained equally used in both modes of production. They were seen 679 times in the TP dataset, out of 14,017 words. They were seen 558

times in the HWP dataset, out of 9,860 words. The statistical Paired T-Test revealed that the usage was not significantly different in both modes of production with a p-value of 0.379 between modes.

The use of nouns and gerunds, however, was statistically different between modes of production. Nouns were used more frequently in the TP while gerunds were more frequently used in the HWP. Nouns were seen 2,625 times in the TP out of 14,017 words. In the HWP, nouns were seen 1,753 times out of 9,860 words. Concerning gerunds, they were seen 115 times in the TP and 196 times in the HWP. It was noteworthy that nouns had a borderline p-value of 0.0502. Gerunds, on the other hand, had a p-value of 0.000002.

### **3.2. Qualitative analysis: textual structuring and informational value**

The qualitative analysis that follows considered the two aforementioned stylistic criteria: the intertextual structuring employed by the participants and the informational value of each mode, operationalised by the nominal value presented in each text. As a reminder, the quantitative analysis showed the texts to be more similar than dissimilar. Below is a comparison that demonstrated a noteworthy example of this similarity.

<b>TP and HWP - similar structural approach: Participant PN.C1.2019.11.FRN.2</b>	
TP	HWP

<p><b>Self Esteem and motivation are a part of everybody's life. But what are self esteem ? What are the motivation ? And what are the consequence on the daily life?</b></p> <p><b>Motivation</b> is a persistant of a task and the energy we use for it. Then <b>self esteem result</b> to a constant evaluation and it's summary judgement of everything a person can asses about himself or herself.</p> <p>We all have our own idea about what are those but what is important to add is that they both worked together: for exemple, low self esteem will affect motivation. We have two types of motivation. The intrinsic is the idea of going something because of personal accomplishment and a extrinsic motivation which reward of punishment. W</p> <p>We know that low self esteem can have an impact on the motivation. Even if a self esteem is not "black or white" as it was said on a study, low/ impaired self esteem have many consequences. Social media are one of the main reason of low self estime and to put it in a nutshell 60 % of people using it reported that it has an impact on their self esteem in a negative way.</p> <p>If people have a low self esteem, they will automatically loose they motivation. One aspect lead to the others.</p> <p><b>To concluded</b>, what is important to increase self estime and motivation is the importance of letting people express themselves and even making mistakes and to improve the desire of a student to learn something teachers needs te let them do it.</p>	<p><b>What is emotion? Emotion</b> is a result evaluation of the meaning of an event. They are 6 or 8 different emotions, the reaserchs do not agree. Emotion is a very diverse phenomen: psychic, social, physical aspect (...). It is important to know that it is ok to not be able to control emotion but notice them is important first of all, it can help to improve teaching and learning. Then, <b>emotion</b> also help us to understand how we function (body and mind)</p> <p><b>One of the important topic is reflective thinking.</b></p> <p><b>What is reflective thinking? It is</b> the process of revisiting the process you come through to get a result</p> <p>It is also creating and claryfing the meaning of an experience Reflecting thinking need to be a key part for school.</p> <p>According to reflecting thinking, we have several strategies to create an appropriate environment</p> <p>On the one hand we can use an emotionally stable environment</p> <p>On the second hand we can ask questions that seeks reason and evidence</p> <p>Then we can use less structure lesson and last but not least we can use the ETE modules wich is a series creating interdisciplinary problems based on learning modules.</p> <p><b>To conclude</b>, we can add that emotion is an tiny word for a big subject and that their is a huge differents.</p>
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*Table 1: Comparison of inter-contextual structuring of TP and HWP*

Concerning the intertextual structuring, the participant began the TP and the HWP in like manner; introducing the subject through a rhetorical interrogative sequence. In the TP, the sentence that preceded the three interrogative phrases was affirmative and itemised the thematic topics: “*self-esteem*” and “*motivation*”.

TP: “Self Esteem and motivation are a part of everybody's life.”

This was followed by three interrogative clauses that re-introduced the two themes.

TP: “But what are self esteem ? What are the motivation ? And what are the consequence on the daily life?”

Following which, the participant provided a definition, using “*be*” as a main verb to introduce the definition as a subject compliment.

TP: “Motivation **is** a persistant of a task and the energy we use for it”

This was the same approach that was taken in the HWP with the the topic “*emotions*” and further into the production, “*reflective thinking*”:

HWP: “What is emotion?”

HWP: “Emotion **is** a result evaluation of the meaning of an event”

The second interrogative structure in the HWP was preceded by an affirmative clause, in like manner to the TP:

HWP: “One of the important topic is reflective thinking.”

HWP: “What is reflective thinking?”

The latter was also followed by a definition presented by “*be*” used as a main verb.

HWP: “It [reflective thinking] **is** the process of revisiting the process you come through to get a result”.

Three of the four definitions were introduced using “*be*”, the fourth one was introduced by a lexical verb in the TP:

TP: “Then self esteem **result** to a constant evaluation and it’s summary judgement of everything a person can asses about himself or herself.”

Parenthetically, it was difficult to fully analyse the above sentence due to the ambiguity in the use of “*it’s*”, which may have been confounded for the impersonal possessive “*its*”. Finally, the participant ended both modes of production with the same closing formula, “*To concluded*”, in the TP and, “*To conclude*”, in the HWP. Both formulas were written with two different and incorrect orthographies.

The informational value of the production was assessed using nominals as the operative criteria. The above productions are re-presented in the table below with the nominals in bold. Nouns are represented by the tag, NN. Nominalisations are represented by the tag, NOMZ. And gerunds are represented by the tag, GER.

TP and HWP - similar nominal value: Participant PN.C1.2019.11.FRN.2	
TP	HWP

**Self Esteem\_NN** and **motivation\_NOMZ** are a **part\_NN** of everybody's **life**. But what are **self esteem\_NN** ? What are the **motivation\_NOMZ** ? And what are the **consequence\_NN** on the daily **life\_NN**?

**Motivation\_NN** is a persistant of a **task\_NN** and the **energy\_NN** we use for it. Then **self esteem\_NN** result to a constant **evaluation\_NOMZ** and it's summary **judgement\_NOMZ** of everything a **person\_NN** can asses about himself or herself.

We all have our own **idea\_NN** about what are those but what is important to add is that they both worked together: for **example\_NN**, low **self esteem\_NN** will affect **motivation\_NOMZ**. We have two **types\_NN** of **motivation\_NOMZ**. The intrinsic is the **idea\_NN** of going something because of personal **accomplishment\_NN** and a extrinsic **motivation\_NOMZ** which reward of **punishment\_NOMZ**. W

We know that low **self esteem\_NN** can have an **impact\_NN** on the **motivation\_NOMZ**. Even if a **self esteem\_NN** is not "black or white" as it was said on a **study\_NN**, low/ impaired **self esteem\_NN** have many **consequences\_NN**. **Social media\_NN** are one of the main **reason\_NN** of low **self esteem\_NN** and to put it in a **nutshell\_NN** 60 %\_NN of **people\_NN** using it reported that it has an **impact\_NN** on their **self esteem\_NN** in a negative **way\_NN**.

If **people\_NN** have a low **self esteem\_NN**, they will automatically loose they **motivation\_NOMZ**. One **aspect\_NN** lead to the others.

To concluded, what is important to increase **self esteem\_NN** and **motivation\_NOMZ** is the **importance\_NN** of letting **people\_NN** express themselves and even making **mistakes\_NN** and to improve the **desire\_NN** of a **student\_NN** to learn something **teachers\_NN** needs to let them do it.

What is **emotion\_NOMZ**? **Emotion\_NOMZ** is a result **evaluation\_NOMZ** of the **meaning\_GER** of an **event**. They are 6 or 8 different **emotions\_NOMZ**, the **reaserchs\_NN** do not agree. **Emotion\_NOMZ** is a very diverse **phenomen\_NN**: psychic, social, physical **aspect\_NN** (...). It is important to know that it is ok to not be able to control **emotion\_NOMZ** but notice them is important first of all, it can help to improve **teaching\_GER** and **learning\_GER**. Then, **emotion\_NOMZ** also help us to understand how we function (**body\_NN** and **mind\_NN**)

One of the important **topic\_NN** is reflective **thinking\_GER**.

What is reflective **thinking\_GER**? It is the **process\_NN** of revisiting the **process\_NN** you come through to get a **result\_NN**

It is also creating and claryfing the **meaning\_GER** of an **experience\_NN** Reflecting **thinking\_GER** need to be a key part for school.

According to reflecting **thinking\_GER**, we have several **strategies\_NN** to create an appropriate **environment\_NOMZ**

On the one **hand\_NN** we can use an emotionally stable **environment\_NOMZ**

On the second **hand\_NN** we can ask **questions\_NOMZ** that seeks **reason\_NN** and **evidence\_NN**

Then we can use less structure **lesson\_NN** and last but not least we can use the ETE **modules\_NN** wich is a **series** creating interdisciplinary **problems\_NN** based on learning **modules\_NN**.

To conclude, we can add that **emotion\_NOMZ** is an tiny **word\_NN** for a big **subject\_NN** and that their is a huge **differents\_NN**.

<p>All rates were per 100 words</p> <p>NN (nouns): 23.55</p> <p>NOMZ (Nominalizations): 5.02</p> <p>GER (Gerunds): 0</p> <p>Total of linguistic features containing nominal value per 100 words: 28.57</p>	<p>All rates were per 100 words</p> <p>NN: 13.82</p> <p>NOMZ: 5.07</p> <p>GER: 3.23</p> <p>Total of linguistic features containing nominal value per 100 words: 22.12</p>
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**Table 2: Comparison of Informational value operationalised via nominal value found in TP and HWP**

With regards to the informational value, the participant’s use of all three nominals was surprisingly representative of the overall trends found in the macro-analysis of both sub-datasets. He/she used nouns more frequently in the TP, nominalisations equally between both modes, and gerunds more frequently in the HWP. The occurrences of each nominal were normalised based on a frequency of 100 words. Within the TP, the rate of nominals was 28.57 words per 100 words. In the HWP, the rate of nominals per 100 words was 22.12 words. The informational value, assessed via the noun, was, therefore, not largely dissimilar between modes of production.

### **Conclusion and discussions**

The majority of the participant’s texts demonstrated close similarities in their stylistic approaches, namely intertextual structuring and informational value. There were micro differences found in the texts, however, the dissimilarities were not found to be significantly different via a statistical Paired Sample T-Test, and via an individual linguistic comparison of both modes. The mode of production did not, therefore, appear to have a significant influence on the intertextual structuring or on the informational value of the texts.

Although there are eventual didactic concerns tied to the role of new technologies in ELL, the present study can be encouraging for instructors who are faced with the inevitability of students using computers to realise textual production within the context of digital evolutions in English didactics. We were surprised to find that there were no statistically significant differences between modes of production in the areas assessed. The side-by-side qualitative comparison equally went against our initial hypothesis that the TP would demonstrate weaknesses where the HWP would not. It was evidenced via the present comparison that using digital hardware and software to create a textual production did not ebb the two criteria analysed: intertextual structuring and the use of nominals.

Less auspiciously, however, the present study also revealed that the digital tools did not improve or enrich the participants’ performance either. The participants carried their mistakes from one mode of production to the other. This lead us to the conclusion that the same attentions that are



afforded to handwritten textual instruction, which is presently the norm in secondary and higher education classrooms in France, ought to be didactically targeted in digital, written productions in order to render the use of digital tools truly beneficial to students, in opposition to serving as a space of error replication.

The findings of the present study could give way to a subsequent analysis of other stylistic approaches, particularly textual register, textual genre and lexical factors, such as lexical richness, in order to determine if the digital tools had an influence on other textual factors.

### **Bibliography**

- Baker, E., & Kinzer, C. K. (1998). Effects of Technology on Process Writing : Are They All Good? *National Reading Conference Yearbook*, 47, 428-440.
- Baker, W., & Eggington, W. G. (1999). Bilingual creativity, multidimensional analysis, and world Englishes. *World Englishes*, 18(3), 343-358.
- Biber, D. (1991). *Variation across Speech and Writing*. Cambridge University Press.
- Common European Framework of Reference for Languages : Learning, Teaching, Assessment (CEFR)*. (s. d.). 3.
- Goldberg, A., Russell, M., & Cook, A. (2003). The Effect of Computers on Student Writing : A Meta-analysis of Studies from 1992 to 2002. *Journal of Technology, Learning, and Assessment*, 2.
- Hardy, J. A., & Friginal, E. (2016). Genre variation in student writing : A multi-dimensional analysis. *Journal of English for Academic Purposes*, 22, 119-131.
- Kunde, B. (1986, décembre). *A Brief History of Word Processing (Through 1986)*. CIS 50 - Sec. 61, Foothill College, Los Altos Hills, California.
- Nini, A. (2019). Multi-Dimensional Analysis : Research Methods and Current Issues. In *Multi-Dimensional Analysis* (Bloomsbury Publishing, Vol. 1st, p. 67-94). Bloomsbury Academic.
- van der Meer, A. L. H., & van der Weel, F. R. (Ruud). (2017). Only Three Fingers Write, but the Whole Brain Works : A High-Density EEG Study Showing Advantages of Drawing Over Typing for Learning. *Frontiers in Psychology*, 8, 706.