

# Bilingual Literacy: Narrative Performance in Bilingual Students

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## 1. Introduction

In this paper we will discuss some results from a pilot project on bilingual literacy. We will focus on three students, Heidi, Susan and Carla, all 10 years when the project started, all born in Norway and all of them bilingual in English and Norwegian.

The three students participated in the international PIRLS-study (see Mullis et al 2003), which assesses 10-year old students' reading literacy in the national language (in our case Norwegian). On this background they were selected to participate in a follow up pilot study with the aim of completing the PIRLS picture with a study of linguistic performance in two languages. This study included written and oral narratives in two languages. The following discussion will focus on the written narratives. The oral narratives will only very briefly be touched on in the final discussion.

Lexical measures, such as diversity and density, are often used as indicators of the level of mastering a language, and likewise a rich vocabulary has also been considered as the prominent prerequisite of reading literacy. However, lexical issues are only part of the picture as long as a traditional analysis of lexical issues focuses on the product at the cost of the processes involved in writing two languages. We have therefore chosen to focus on the process. We believe that most pauses are not random stops, but can be considered as traces of the students' language performance in text writing. We will here raise and investigate some rather new assumptions about writing processes related to lexical measures.

## 2. Method

The narratives were collected by means of ScriptLog (Strömquist & Karlsson 2001), a research tool that permits us to study writing online (Holmqvist et al 2002, Wengelin 2002). The writing was conducted with the picture series *Space Story* as an elicitation instrument (Nordqvist et al 2002). *Space Story* – designed especially for 10-year olds – is a story in 8 pictures shown in ScriptLog. The students see one picture at the time and decide themselves when they want to continue on to the next picture. They were allowed to use as much time as they wished, but no aids. The students wrote on a keyboard.

Our study has an overall design of texts performed in a specific order (Figure 1). In the first recording the students first wrote their story in Norwegian. After a 5 minutes' brake followed the second recording, where the students wrote about the same pictures but in the other language. 6 months later, they wrote the same story again, but then starting with English. By this design we carry out assumptions and predictions of a hypothetical bilingual student whose strongest language is considered to be Norwegian. Capital letters indicate major effort, while ordinary letters indicate minor effort.

In condition A the students write the story for the first time, something that will probably demand considerable time spent on planning and structuring. Better writers are expected to have pauses at sentence boundaries or between pictures in *Space Story*, whereas less proficient writers will have a higher amount of pauses between words. The fact that the students are able to formulate their thoughts in their supposed strongest language probably leads to a high number of pauses in contexts related to macro planning of the texts, a minimum of pauses inside words, and also a high lexical diversity value.

We expect condition B to be the most demanding one. The fact that the students have already structured their thoughts in their stronger language and are now asked to write in their weaker language,

will probably lead to a high number of pauses related to macro-planning, high number of pauses inside words with focus on orthography, and also lower diversity than in the first condition due to extensive searches for words and phrases.

Figure 1: Design

June 2002		December 2002	
Condition A: Norwegian	Condition B: English	Condition C: English	Condition D: Norwegian
THINK	THINK	think	think
write	WRITE	WRITE	write

For the group of students, Norwegian is considered to be the strongest language. Capital letters indicate a hypothesized major effort, while ordinary letters indicate minor effort.

Condition C represents the second most demanding condition. It involves the students structuring their thoughts about content and plot, and expressing the thoughts in their weaker language. However, there is no crossing of languages in thinking and formulating as in condition B. Moreover, some traces of memory are evidently retrieved from the recording six months earlier. Therefore, we expect a relatively high degree of pausing related to macro planning, but probably other pause contexts will be more prominent in this condition than in the other English version (condition B), due to the fact that the students this time are writing in English first. The lexical diversity is expected to be higher than in the preceding English condition, both due to the fact that it is the first text in this recording, and due to the correspondence in language when *thinking for writing* (Strömqvist, Nordqvist, & Wengelin 2004; Slobin 1996).

In condition D the students formulate the narrative in their strongest language and for the fourth time. Due to this we expect to find some pauses related to macro planning, but less than in any other conditions and generally little pausing time, and a lexical diversity lower than for most other conditions.

### 3. The students

Heidi is a simultaneously bilingual child. Her mother is Norwegian and her father is English, and she comes from a home with a high index of home education resources (here based on the parents' reports in PIRLS on books in the home, reading activity, household income and parents' education and profession). Heidi had lower specific early literacy skills when starting school than Carla and Susan. Heidi's parents speak English together. Her mother speaks Norwegian to Heidi, her father English, and Heidi speaks Norwegian to both her parents. She has not the same contact with English speaking communities as Carla and Susan.

Susan has grown up with English, Singhalese and Punjabi as her first languages. She was born in Norway and also learnt Norwegian relatively early. Susan comes from a home with a relatively high index of home education resources, and Susan is reported to have had relatively good specific early literacy skills when starting school. Her family has English as their common language. Alone with her mother, Susan speaks Punjabi, with her father Singhalese. Susan has extended contact with English speaking societies.

Carla is a simultaneously bilingual child. Her mother is English and her father Norwegian, and she comes from a home with a high index of home education resources. She went to the English

Kindergarten and learnt to read (in English) before she started school. At home Carla always speaks English to her mother and Norwegian to her father. She generally has extended contact with the English speaking society.

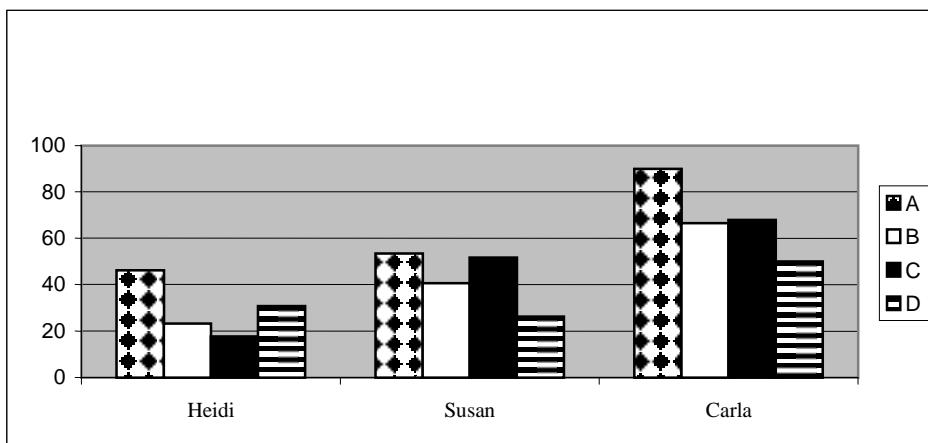
All the students started school at the age of 6, attend local Norwegian state schools, and have had English as a subject since grade 1.

## 4. Results

In this section we will briefly present the results on two issues: Lexical diversity and pauses. Lexical diversity expresses the amount of different words divided on the total number of words, and is measured by means of VOCD (Malvern & Richards 1997). Pauses are studied by means of ScriptLog, and a pause is defined in all contexts as stops of 5 seconds or more. Later on, we will discuss these results more thoroughly and in relation to our already mentioned assumptions.

### 4.1 Lexical measures

Figure 2: lexical diversity



The lexical diversity decreases for all three students between the first and second recording. The effort is highest when the text is unfamiliar. We also notice a difference between Susan and Carla on one hand, whose diversity is always linked to the order of the languages, and Heidi on the other hand, whose diversity follows the language (Norwegian always has higher diversity, no matter order of languages).

### 4.2 Text flow and function of pauses

As already mentioned, ScriptLog makes it possible for us to study the student's pausing pattern. Figure 3 shows how much time each student spends on pausing in relation to total writing time. We see that Carla's pausing pattern is connected to order, as for her diversity, whereas Heidi and Susan's pausing patterns follow the language in the sense that their English texts always have the highest pausing pattern in each recording. We also notice that Carla's four texts are more equal in pausing time than the other two students' texts.

The figure only gives us the overall pausing time, but does not say anything about what kind of pauses the students have. We have therefore defined 3 main pause contexts: 1) Micro contexts, which include pauses inside words and pauses related to correction of the last written word, 2) Macro contexts, which include pauses before major delimiter, pauses after major delimiter and pauses related to correction exceeding the last written word, and 3) Pauses between words. The function of this last pause context is unclear, as we have no traces of what the students do. We believe that there will be differences between stronger and weaker writers as to these different pause functions.

Figure 3: Overall pausing time (part of total writing time)

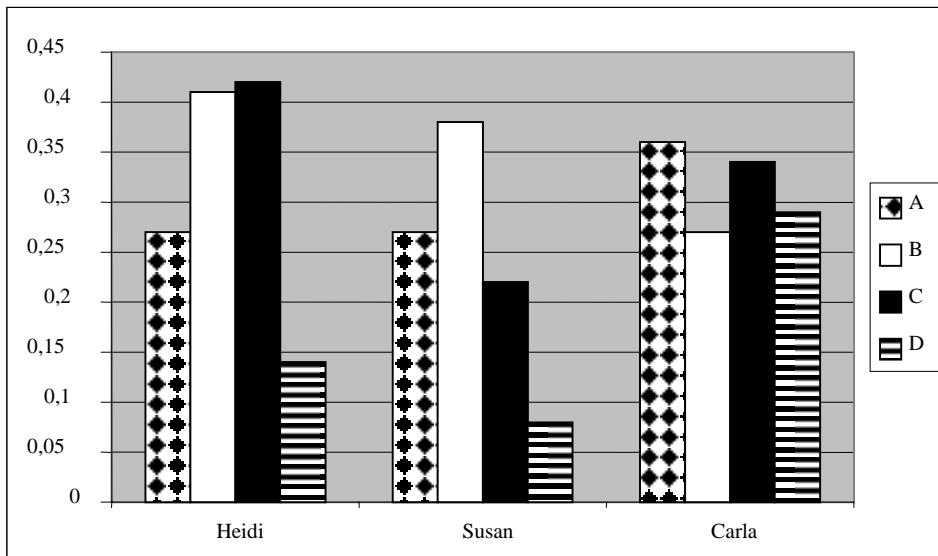


Figure 4a: Micro and Macro contexts, Heidi

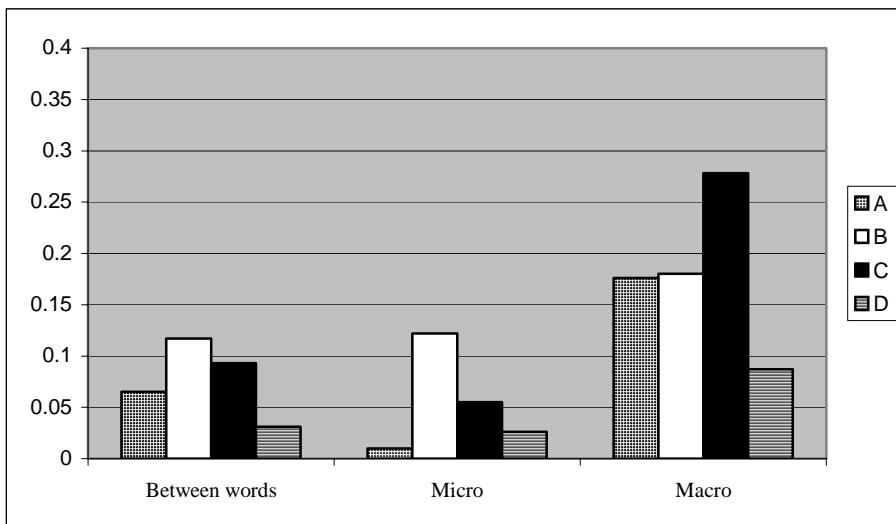


Figure 4b: Micro and Macro contexts, Susan

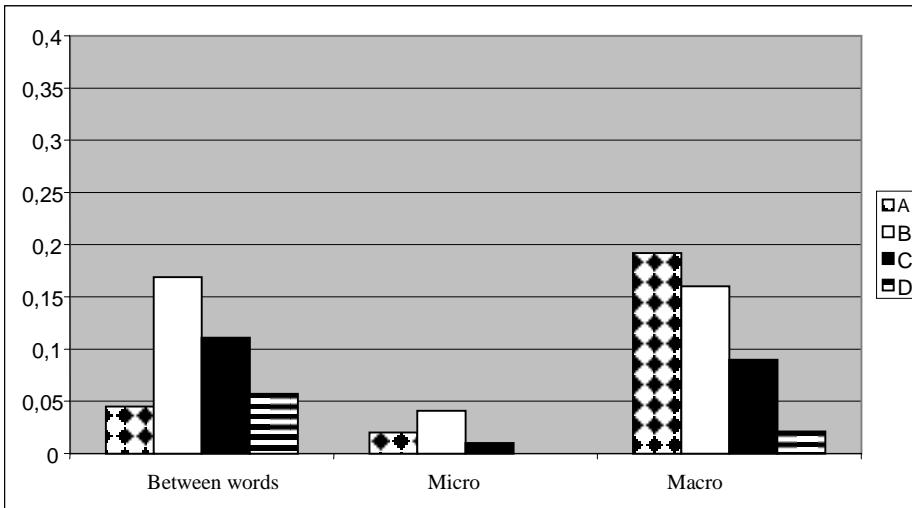
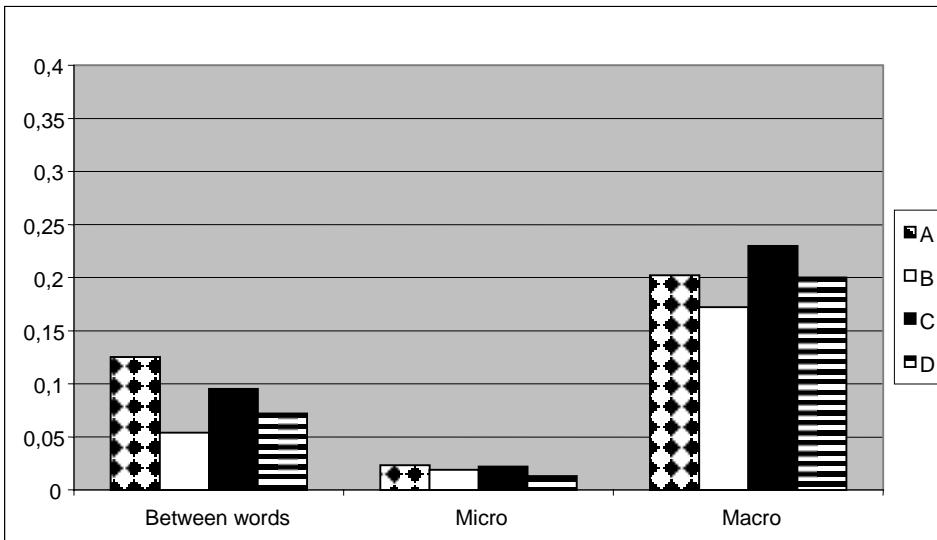


Figure 4c: Micro and Macro contexts, Carla



As far as Heidi is concerned, we see that her two English texts (B and C) distinguish themselves in all the three pause contexts. When it comes to macro pauses, the difference between the English and the Norwegian text is probably more real in the two last recorded texts (C and D) than in the two first (A and B), due to the fact that we expect considerable time spent on planning and structuring in condition A (a pattern that we do see in the two other students' texts).

Susan's most prominent context (Figure 4b) is the one between words, which is associated with both the English texts. Further, the pause context related to macro corrections only occurs in the English text, condition C.

Carla has in fact no clear prominent pause contexts when we compare her texts (Figure 4c), maybe only the time spent related to macro corrections in the English text (condition C).

## 6. Discussion

We will now look at how our three bilingual students fit with the assumptions detailed in connection with the four writing-conditions, and also make some tentative conclusions about the students' different bilingualisms.

### 6.1 Heidi

The analysis of Heidi's written narratives can be said to be somewhat consistent with our initial assumptions, especially when it comes to the two Norwegian texts. When it comes to her English narratives, however, we see that condition C – and not B – is clearly the most difficult for Heidi. This is seen by more pauses and lower lexical diversity than in condition B. In condition C she has to both elaborate the plot and find suitable words in her weaker language. In this condition there is probably also an effect of elaborating the narrative plot, like in condition A. The extra load of pausing time in condition C can be an indication of her difficulty related to both thinking and formulating in English. This would again indicate that Heidi is weaker in English than our hypothetical student.

As mentioned earlier, our pilot project also included oral narratives. Heidi's oral narratives give us an important addition to this picture. They show that she in both languages has problems elaborating a narrative on her own and – more importantly – that she seems to have distinct problems with finding her words, especially in English.

A study of Heidi's narratives shows us a bilingual student who is very uneven in her two languages. Heidi has a lot of pauses on the macro-level in conditions A and C – pauses where she spends time thinking about the plot and finding words. The fact that her texts do not profit from these macro-pauses, so to say, is probably due to Heidi's lack of text experience and perhaps also to a language problem.

### 6.2 Susan

Susan represents a kind of bilingualism that fits very well our predictions about performance. Condition A has a high number of macro level pauses and the highest diversity value, as assumed. Condition B has the largest pausing time, a majority of pauses between words, and also a lexical diversity considerably lower than for the other English text. The condition C could seem to be a challenge to Susan due to her large amount of macro correction – occurring only in this condition. The lexical diversity of this text is nevertheless the second highest in the sequence, a fact that fits with our assumptions. Finally, condition D has the shortest overall pausing time but also the lowest diversity value among all Susan's texts. Here we probably see an effect of decreasing motivation in writing the same narrative several times.

Susan's oral narratives are extensively long and with a pronounced oral style, and thus very different from her written. They show us the following: Firstly, her Norwegian is stronger than her English. Secondly, she has extended textual experience.

A study of Susan's narratives shows us a quadrilingual student whose language performance in her two strongest languages is somewhat in between those of Carla and Heidi and very much in accordance with our hypothetical student. Lexical diversity depends on the order and not the languages. Her diversity in Norwegian (first text) is age appropriate and thus quite satisfactory considered the fact that Norwegian is one of her four languages, and not her home language. Several facts indicate that Norwegian is her strongest language. This is seen by her overall pausing pattern, which seems to be connected with language (as for Heidi) and not with the order. She also has more pauses between words in English. Her high amount of pauses after major delimiter in condition B indicates that she might have some difficulties turning from Norwegian to English in the first recording. This picture is supported by her oral narrations.

### 6.3 Carla

Carla's language performance does not fit with our initial assumptions. True, her diversity is connected to language order, she has a large part of pausing in condition C and her diversity in

condition C is higher than in the preceding English text – all this being consistent with our assumptions. However, she spends more time on pausing in condition A than in B, although B is considered to be the most demanding. Carla's condition B has in fact the lowest pausing time of all her texts, probably an indication of Carla's balanced bilingualism. She also seems to profit from her pauses in quite another way than for example Heidi, even though Heidi has more pauses on the micro level.

Carla's oral narrations show us a student who creates good narratives that follow the basic narration strategies, and who has the needed vocabulary in both languages. She also talks in whole sentences without the hesitations and redundancy characteristic of oral narrations.

A study of Carla's written and oral narratives shows us a bilingual student with a surprisingly equal and high level of competence in her two languages. Taken into consideration some natural decreases in values as a result of the conditions, this is shown by her diversity, but especially by her pausing, which is very similar in the two languages, both on macro and micro level. She has very high diversity in both languages, and she also shows signs of high textual experience.

## 7. Conclusion

As mentioned earlier, Heidi, Susan and Carla all participated in the international PIRLS-study, which assesses their reading literacy in Norwegian. Not unexpectedly, they spread out nicely on the PIRLS scale with Carla obtaining 609,20 points, Susan 543,47 and Heidi 484,71 points (international mean = 500). A study of the students' bilingual *performance* in written and oral narratives has given us a far broader comprehension of their language competence. Heidi has a limited active vocabulary in both languages, and also shows certain difficulties with finding her words. Her language competence in Norwegian seems to be even lower than seen in PIRLS. Carla's result in PIRLS, on the other hand, does not entirely reflect her high language competence. This is of course due to her having developed two languages to a very high level, something that takes time.

In this work, ScriptLog has offered new possibilities in the study of writing processes. Firstly, the study of written texts in this order points at the difficulty of switching language when 'thinking for writing'. Secondly, an interesting finding from our analysis is the lack of correspondence between high pausing time and diversity. Even when we look at some specific pause patterns, we see that the students evidently exploit the pausing time differently. With regard to diversity, a strong student seems to profit from her pausing, probably when searching for the convenient word or phrase, resulting in a high level of lexical diversity. The weak student will search for words in general, with low diversity as a consequence. In our view this fact pinpoints some interesting questions about the writing process, and puts forward a need for more detailed semantic studies in relation to our approach.

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