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Paths to Academic Writing in a Globalized World: A Longitudinal Study of Content and Language Integrated Learning in Upper Secondary School in Sweden

Maria Lim Falk

STOCKHOLMS UNIVERSITET, SWEDEN

Per Holmberg

GÖTEBORGS UNIVERSITET, SWEDEN

The study examines how Swedish upper secondary school students' development of written academic Swedish is affected when some or almost all content subjects are taught in English instead of Swedish, so-called CLIL education. The study includes three CLIL groups (125 students) with different amounts of instruction in English, and two non-CLIL groups (75 students). The study comprises a quantitative analysis of the students' use of academic words in 260 texts and a qualitative analysis of the functions of academic words in a smaller corpus of 36 texts. The study shows that the students' acquisition of the norms of academic writing cannot be taken for granted. When the use of L1 is strictly limited, as in total CLIL, the development of the students' advanced L1 academic proficiency is at risk. Interestingly, the study also shows the potential of partial CLIL, as the largest development of academic vocabulary was found in this group.

Cette étude s'intéresse à l'impact de l'utilisation partielle ou quasi-exclusive de l'anglais à l'école (Enseignement de Matières par l'Intégration d'une Langue Étrangère, EMILE - Content and Language Integrated Learning, CLIL), sur le développement par des lycéens suédois d'un langage écrit académique. L'étude porte sur cinq groupes, dont trois utilis-

ent EMILE (125 élèves) et deux non (75 élèves). Ces derniers représentent la majorité écrasante des élèves suédois dont l'enseignement se déroule exclusivement en suédois, langue officielle. Cette étude combine une analyse quantitative et une analyse qualitative de deux mémoires rédigés par les élèves à l'entrée et au milieu de leur scolarité au lycée. L'analyse quantitative (260 textes) s'intéresse à l'emploi du vocabulaire académique. L'analyse qualitative (36 textes) vise à déterminer comment les élèves s'approprient des termes académiques pour produire une prose plus académique.

L'analyse quantitative montre que, contrairement à tous les autres groupes étudiés, dans les textes du groupe EMILE qui utilise le plus l'anglais à l'école, la part de termes académiques suédois n'augmente pas après deux années. La progression la plus forte est constatée dans un groupe EMILE dont l'enseignement mélange anglais et suédois. L'analyse qualitative montre que les textes les plus riches en termes académiques utilisent ces mots pour convoquer des aspects importants de la prose académique (abstraction, style objectif et organisation du texte). Cette étude conclut que si la langue officielle n'est utilisée en classe que dans le cadre de son enseignement et de la littérature, le développement de l'écriture académique stagne. En revanche l'alternance clairement planifiée entre plusieurs langues a des effets positifs.

1. Introduction

In a time of increased globalization, it has become attractive for students outside the English speaking world to choose an education where English is used for subject teaching. In Europe, the spread of the so-called CLIL education, Content and Language Integrated Learning, is a fact (Euyridice, 2006; Smit, 2008). CLIL, an immersion-like bilingual education, offers more contact with the target language (mostly English) without requiring extra teaching hours, since the target language is used for both instruction and writing in so-called content subjects, e.g. mathematics, biology and history. The perspective taken is that language learning is a natural part of the teaching of subject matter. Thus, CLIL offers the use of the foreign language for talking, reading and writing in a wide spectrum of subjects, and is seen as "a kind of language bath which encourages naturalistic language learning and enhances the development of communicative competence" (Dalton-Puffer, 2007: 3). Besides the intention to give the students a broader communicative competence, CLIL is supposed to give faster access to academic English, also without having detrimental effects

on the expected continued development of academic language proficiency in the first language, L1 (Mehisto, Marsh & Frigols, 2008). However, we know little about how the development of first language for school purposes actually is affected when it is replaced by another language in an education like CLIL (Dalton-Puffer, 2011: 189). But we know that learning in educational contexts implies heavy demands on the students' linguistic ability, not least considering that the learning of content is inseparable from learning the language of a particular subject. In view of the fact that the linguistic challenges increase as students progress through school (Schleppegrell, 2004: 4; cf. Coffin, 2006), the academic and specialized language would not be presupposed to be attained by itself, in any language. That means that not even the appropriation of academic and specialized language in the L1 can be taken for granted or can be assumed to progress automatically.¹

This study aims to examining if and, if so, how Swedish upper secondary school students' development of academic Swedish in writing is affected when content subjects are taught in English instead of Swedish. The study includes three student groups (ca. 125 students) following CLIL programs with English as the medium of instruction for some or all of the content subjects. For comparison, two control groups are included (ca. 75 students). With the exception of language classes, these two control groups have all instruction and all writing tasks in Swedish, the official principal language in Sweden, which is naturally the clearly dominant language of instruction throughout the whole education system and is also most of the students' L1. Thus, the overall question concerns CLIL students' and non-CLIL students' development of academic language proficiency in Swedish writing. The developmental perspective is provided for by testing the students' achievements within the same type of writing assignment at two points during their three years at upper secondary school.

1.1. CLIL Education

In 1995, both the Council of the European Union and the European Commission emphasized the need for EU citizens to learn foreign languages (The Council of the European Union, 1995; European Commission, 1995). The bodies endorsed different types of bilingual education, including CLIL. They hold forth that students at secondary school could benefit from studying certain subjects in a foreign language. Within ten years, CLIL was established in 24 of 33 European countries, including Sweden and e.g. France, though involving almost exclusively English (Eurydice, 2006).² In a recent article, English is estimated to be the target language in 95 percent of all

CLIL programs in Europe (Nikula, Dalton-Puffer & Llinares, 2013). However, the extent to which English is used varies a lot, e.g. from one subject, thematic sessions in several subjects to all content subjects. Previous research has shown that differences can be found between countries, within countries, between schools in the same country, and even between classes at the same school (Dalton-Puffer & Nikula, 2006; Mehisto et al., 2008; Lim Falk, 2008, 2012; Sylvén, 2013; Yoximer Paulsrud, 2014). Usually, less than 50 percent of the subjects are taught in English (Nikula et al., 2013). This implantation of CLIL, where certain content subjects still are taught in Swedish, is referred to as “partial CLIL” in our study. However, there are also instances of CLIL where the national or majority language is totally or almost totally replaced, and this we will refer to as “total CLIL.”

Above, we stated that CLIL is an immersion-like bilingual education. The generally successful Canadian Immersion Programs are often pointed out as a model and a source of inspiration for CLIL (Washburn, 1997; Lim Falk, 2008; Dalton-Puffer, Nikula & Smit, 2010; Nikula et al., 2013). The immersions showed that it was possible to use another language than the students’ first language for content subject instruction with positive results regarding both language and content mastery (e.g. Lambert & Tucker, 1972; Swain & Lapkin, 1982; Genesee, 2004). Like immersion, then, CLIL uses non-language content as a vehicle to promote the students’ development of a target language other than their first language (e.g. Genesee & Lindholm-Leary, 2013; cf. Dalton-Puffer, 2011). Yet, there are important differences in conditions and prerequisites for CLIL and immersion, ranging from guiding principles and learning goals to the analysis of sociocultural and linguistic consequences of the programs.

The success in Canada is not only linked to immersion education per se, but reflects socioeconomic and political factors (de Mejía, 2002). They are construed with respect to the current relation between the majority language English and the minority language French. Specified goals are articulated, on the basis of carefully formulated language policies, concerning both target language and L1. These goals, in turn, are closely connected with general criteria for implementing immersions as well as specified demands on teacher competencies. For example, the importance of native language proficiency is emphasized, and consequently support of the first language is a requirement to ensure additive bilingualism, as opposed to subtractive bilingualism where the target language tends to take over and replace the first language in certain domains (e.g. Genesee, 1987; Baker, 2001).

The conditions for CLIL are quite different. First of all, CLIL is about using a foreign language as the language of instruction, which means that its presence outside the classroom normally is limited. Also, the foreign lan-

guage in question is mostly the prestigious global lingua franca English, a fact that affects the formulations of goals, criteria, and not least language policies. However, most often there is no declared policy regulating CLIL education, neither in the national language policies, nor in the education policies. Moreover, there are in general no guidelines or precise learning goals formulated for CLIL, which in turn makes the education hard to evaluate. Regarding the teachers' competence in the target language, there are no explicit demands; the CLIL teachers are normally non-native speakers of the target language English and they are also in most cases content experts rather than language experts. Also, there are no measures to support the supposed continued first language development (e.g. Dalton-Puffer, 2011). These conditions apply well also to CLIL in Sweden generally, and the CLIL programs in this study.

On the whole, there are many questions to be answered concerning the effectiveness and eligibility of CLIL. There is even insufficient empirical evidence for how much the students improve in English and in what respect (Dalton-Puffer, 2011: 186). In her exhaustive monograph on CLIL classrooms in Austria, Dalton-Puffer (2007) states that rationales for the use of CLIL are vague and that this type of education needs to be better grounded in actual research. The research field of CLIL has expanded greatly in later years, evident for example in the increased numbers of CLIL conferences. However, a topic that few researchers engage in is the CLIL students' supposed development in the national language, most of the students' first language (L1), which besides the target language also is a medium of instruction in CLIL education. L1 seems to be taken for granted and the continued development in the L1 seems to be assumed to progress automatically. Previous research indicates the opposite, e.g. Genesee et al. (2006: 225) states that also for native English speakers in English-only school settings, emphasis on English for academic purposes is likely to have the greatest payoff in student achievement. In fact, an earlier study on a smaller scale showed that CLIL students did not have as good command of the subject-based academic language in Chemistry, Physics and History, as did the all-Swedish-instruction control class. In their writing the control students used subject-specific lexis more frequently, technical terms in particular. They also mastered the correct use of them in the linguistic context, and on the whole, produced more adequate content (Lim Falk, 2008, 2015 forthcoming).

1.2. Linguistic Challenges in School

Basically, our perspective on language and learning concurs with the socially oriented perspective taken within Educational linguistics (e.g. Eggins &

Martin, 1997; Schleppegrell, 2004; Llinares et al., 2012), which is the pedagogical ramification of Halliday's Systemic Functional Linguistics, SFL (e.g. Halliday & Matthiessen, 2014). It assumes a mutual dependence between the assimilation of specialized knowledge and the acquisition of subject-specific registers, implying that the two processes are simultaneously involved in learning (e.g. Coffin, 2006). Thus the theory focuses on the role language plays in the demands and challenges of schooling (e.g. Schleppegrell, 2004). These demands are described in terms of genres, i.e. the types of texts that learners have to understand and produce in different subjects, and the linguistic resources used for these texts. Access to this school language, often referred to as academic language, is considered to be a prerequisite for success at school (Rothery, 1996; Schleppegrell, 2004; Holmegaard et al., 2006; Lindberg, 2007; Gibbons, 2002). Especially, the mastering of written academic language is of great importance, as the teachers mainly build their assessment and grading on written exams and essays. Schleppegrell states that

Schooling is primarily a linguistic process, and language serves as an often unconscious means of evaluating and differentiating students. . . . In school, students are expected to use language to demonstrate what they have learned and what they think in ways that can be shared, evaluated, and further challenged or supported. (2004, p. 2)

However, the written academic language proficiency required at school takes time to learn, and it is a challenge for all students, even if it is assumed to be especially difficult for those without an academic background (Schleppegrell, 2004: 6; cf. Carlund et al., 2012) and for those with instruction through another language than the L1 (e.g. Gibbons, 2002; Holmegaard et al., 2006). The challenges can be explained by the characteristics of academic language as decontextualized and cognitively demanding, i.e. less personal, more grammatically complex and with a more specialized and abstract vocabulary compared to the informal conversational language children and young people develop in everyday discourses outside school (e.g. Bernstein, 1971; Halliday & Martin, 1993; Cummins, 1996, 2000; Macken-Horarik, 1996; Schleppegrell, 2004; Holmegaard et al., 2006). Furthermore, the linguistic challenges are assumed to increase throughout school while subjects reach higher levels of specialization (Schleppegrell, 2004: 4; cf. Coffin, 2006). Several studies have shown that it takes between five and ten years for second language learners to develop the academic language proficiency required for success at secondary school level (Thomas & Collier, 1997, 2002; Hakuta, Butler & Witt, 2000; August & Shanahan, 2006).

To facilitate this complex learning process, pedagogical efforts have been made. In fact, the analysis and the description of academic language within Educational linguistics are aiming at developing tools to facilitate teaching and learning in school practice. Special attention has been paid to the possibilities of scaffolding writing in different school subjects by explicit teaching of the required genre structure and grammar (e.g. Macken-Horarik, 1996; Martin & Veel, 1998; Coffin, 2006; Christie & Derewianka, 2008; Llinares et al., 2012). Other pedagogical contributions, outside the research of Educational linguistics, have been directed to general academic vocabulary, attempting to create academic vocabulary resources. These efforts are based on research that single out vocabulary as the most important element for success within school discourse (Saville-Troike, 1984; Nation, 2001; Lindberg, 2007). So far most of them concern English, e.g. The University Word List (Xue & Nation, 1984), The Academic Word List (Coxhead, 2000) and Longman Dictionary of Contemporary English (2009). Recently however, an academic vocabulary resource has been developed for Swedish, named A Swedish Academic Word List, SAWL (Carlund et al., 2012; Jansson et al., 2012).

From previous research, we can conclude that it is assumed to be of great importance that the students acquire academic language for writing, and also that schools accept their responsibility in making this goal achievable. Moreover, the pedagogical efforts made indicate that the development of academic language proficiency is not assumed to be incorporated into the students' repertoire by itself. We assume that this counts for any language, including the development of written academic language proficiency in the L1. In this study, our focus is on the language that is restricted in use by the CLIL education programme, i.e. Swedish. We hypothesize that the actual amount of English medium instruction, or rather the time left for working with Swedish, might affect the students' continued development of a language that is adequate for Swedish academic writing.

2. Research Context, Data, and Method for the Study

The research context for the study is the longitudinal project Content and Language Integration in Swedish Schools.³ The overall aim of the project is to investigate CLIL-students' development of academic language, in Swedish and English, in comparison with equivalent students having instruction totally in Swedish. The results presented in this chapter are the first results from the analysis of student's Swedish texts. The project, however, applies a broad diversity of methods: explanatory and argumentative writing assignments, vocabulary tests, reading comprehension tests, classroom observations,

student questionnaires and interviews with both teachers and students.

In the research project about 200 students, aged 16–18, are followed during their three years in upper secondary school. The students are studying at three different schools (called A, B and C), but are all enrolled in programs preparing for ensuing studies. They can be categorized into five groups with regard to school and linguistic educational context, three CLIL groups with English as target language and two control groups (see Table 9.1). Of three CLIL groups, one takes part in total CLIL (school A), where Swedish as a language of instruction is almost completely restricted to the subject Swedish (including both history of literature and Swedish language studies), about two hours per week. The linguistic environment for the other two CLIL groups (one at school B and one at school C) is that of partial CLIL, with approximately 50 percent of the instruction in English. The two control groups finally (one at school B and one at school C) represent the mainstream type of instruction in Sweden where all instruction and all writing is performed in Swedish (except for language courses in English, French, German, etc.).

Table 9.1. Student groups, linguistic environment, school, and number of students

Group	Linguistic environment	School	# Students
1	Total CLIL	A	50
2	Partial CLIL	B	25
3	Partial CLIL	C	50
4	Non-CLIL	B	25
5	Non-CLIL	C	50

The total CLIL group (school A) differs from the partial CLIL groups not only in the degree English is used. The teachers of this group have, with few exceptions, higher proficiency in English than the teachers in the partial CLIL groups, and the students of this group are more heterogeneous in regard of L1 than the students in the partial CLIL groups. However, all groups in the study, also the total CLIL group, are bound to follow the national Swedish curriculum, and have to fulfil the same overall goals of upper secondary school, as well as the same learning outcomes for subjects that are mandatory to education preparatory programs, e.g. Swedish, English, Science studies and Social studies.

The data for the study reported here consist of student texts from two writing assignments, out of the four Swedish assignments the project group constructed in order to give all students the same tasks. Both assignments

were oriented towards explanations (the other two were not), a typical kind of assignment in the national writing tests, since the Swedish national curriculum explicitly states that students should be prepared for this type of academic writing (cf. The Swedish National Agency for Education, 2012). The assignments were written during the first semester and the fourth semester. In terms of content, the assignments were constructed in accordance with the curriculum, and related to social and science studies. The first assignment required the students to explain why there are such great differences in health and wealth between different parts of the world, and the second one to explain why the two public health problems—obesity and mental illness—increase in Sweden. Both tasks were supplemented with a background information sheet with tables giving some statistics relevant to the topic. The data amounts to 260 texts and is charted in Table 9.2. For a qualitative part of our study the data was narrowed to 36 texts (see below).

Table 9.2. Outline of data

Group	Linguistic environment	School	# Texts Assignment 1	# Texts Assignment 2	Total
1	Total CLIL	A	26	22	48
2	Partial CLIL	B	18	19	37
3	Partial CLIL	C	35	34	69
4	Non-CLIL	B	24	17	41
5	Non-CLIL	C	31	34	65
Total			134	126	260

The method for the first part of the study is an application the recently developed Swedish Academic Word List (SAWL), mentioned in section 1.2, as a tool for the quantitative analysis. SAWL consists of 655 headwords, compiled from a 25-million-word-corpus based on dissertations and scientific articles from fifteen disciplines, and it is (2015) accessible at the webpage for the Swedish Language Bank at University of Gothenburg (<http://spraakbanken.gu.se/ao/>). It was developed to meet university students' need for knowledge of general academic vocabulary, and the principle for word selection was to find an academic-specific vocabulary that is common for all subjects at university, but not part of the everyday vocabulary (Carlund et al., 2012). Thus, the list can be assumed to reflect the significant general academic vocabulary that upper secondary school students need to know to manage higher education. The coverage of Academic Words, AW, was investigated for each of the 260 texts by a programme designed especially for this purpose.⁴ In the

analysis, we were especially interested in differences between the five student groups as well as differences between the first and second assignment. For a more detailed description of SAWL, see Carlund et al., 2012; Jansson et al., 2012; Sköldberg & Johansson Kokkinakis, 2012.

In order to understand the validity of the results we used the first findings as starting point to a more focused qualitative analysis in a smaller corpus. For this purpose, 36 student texts were selected, 18 texts with high frequency of AW (between about 8 percent and 10 percent AW) and 18 texts with low frequency (between about 2 percent and 4 percent AW). Since the aim was to characterize the functions of the AW, and to understand the differences between texts with high and low frequency of AW, and not to make comparisons between the groups (hardly possible in such a limited corpus), the texts were taken from three groups only (group 1, 2 and 4): the three texts from each assignment and group with the highest coverage and the three texts with the lowest coverage of AW.

The method for the second part of the study is a qualitative text analysis within the framework of SFL. According to SFL, language in texts simultaneously serves three broad functions, or metafunctions, namely the ideational, interpersonal and textual (Halliday & Matthiessen, 2014).⁵ The ideational function refers to the linguistic choices that enable speakers to make meanings about the world. From this perspective it is for example relevant to investigate how linguistic resources, here especially the AW, are used in texts to construe meanings on a semantic scale between concretion and abstraction (cf. Martin, 1993). The interpersonal function refers to the linguistic choices that enable speakers, readers, and writers to enact their diverse interpersonal relations. Within this metafunction, a crucial question is how language—and the resource of AW in particular—establishes close subjective relations or more distant objective relations (cf. Holmberg, 2011). Lastly, the textual metafunction comprises linguistic resources for organizing text at different levels, and managing the flow of discourse (cf. Halliday & Hasan, 1989). Also from this point of view we investigate how AW may contribute. The findings, presented in section 3.2, will further concretize the theoretical division of meaning making into the three metafunctions.

The qualitative analysis was accomplished in two steps. Firstly, the 36 texts were analyzed sentence by sentence in copies where all AW was marked, but without regard to the frequency of AW in the texts. After the typical functions of the AW were established, we investigated if there were functional differences in how AW contributed to the meaning of high- and low-frequency texts.

Neither the quantitative nor the qualitative analyses are meant to imply that texts with high frequency of AW are better than texts with low frequency of AW. What we are interested in is to investigate how the texts are adapted to norms of academic writing.

3. Findings

3.1. The Quantitative Analysis of Frequency and Distribution of Academic Words

The number of academic words in this body of data was 1293. This amount contains 345 types, i.e. almost 53 percent of the 655 AW in the wordlist. 35 types of AW occur ten times or more in the texts.

Through the analysis based on SAWL, the coverage of AW is established for all the five student groups, including both the assignments. The analysis shows that the coverage of AW varies between about 1 and 15 percent AW per student text. Table 9.3 charts the average frequency of AW for each group and assignment. Compared with the academic texts in the corpus of SAWL, AW in our data are used approximately half as much. This is not surprising since the students are at the beginning of their upper secondary school education while SAWL reflects the crucial general academic vocabulary required to manage their first year of university studies (Carlund et al., 2012).

Table 9.3. The average frequency of AW in all the 260 student texts (%)

Group	Linguistic environment	School	# Texts Assignment 1	# Texts Assignment 2
1	Total CLIL	A	6.2	5.7
2	Partial CLIL	B	4.0	6.4
3	Partial CLIL	C	4.6	5.7
4	Non-CLIL	B	4.7	5.7
5	Non-CLIL	C	4.0	4.3

The investigation of the coverage of academic words in the texts shows some differences between the student groups and between the assignments. The most striking result concerns the student group 1, participating in total CLIL in school A. The texts from these CLIL student texts had clearly the highest coverage of AW in assignment 1 written during the first semester (6.2 percent). However, the coverage of AW in the assignment written during semester 4 decreased (5.7 percent). The coverage of AW in all the other groups, CLIL or not, increased in the second assignment. The largest increase is found within group 2, one of the student groups with partial CLIL (from 4.0 to 6.4 percent), followed by group 3, the other student group with partial CLIL (from 4.6 to 5.7 percent).⁶

One interpretation of these results, in view of the linguistic environment, is that the development of an academic register suffers from CLIL education

totally in English, while instruction partly in English and totally in Swedish is favorable. In fact, it is a tendency which aligns with previous research on different forms of bilingual education, as they have shown that the bilingual programs where first-language instruction amounts to around 50% have more positive effects, and also more long-term benefits, than e.g. all-English instruction (Krashen & McField, 2005; Rolstad, Mahoney, & Glass, 2005; August & Shanahan, 2006).

3.2 The Qualitative Analysis of Functions of Academic Words in the Texts

The list of AW used for the quantitative part of our study is a product of statistical calculations (Carlund et al., 2012). Therefore, in order to investigate not only the frequencies but also the functions of the AW, a smaller corpus of 36 student texts was analyzed in detail. For this qualitative analysis we used the systemic-functional perspective of metafunctions. This theoretical perspective gives substance to the question about functions of the AW, leading the analysis to focus on three potential contributions to the meaning of the texts: ideational, interpersonal, and textual (cf. section 2 above).

Our investigation shows that use of AW in the student texts may contribute in all three metafunctions—and does so to various extent in different texts. (Examples are given in Table 9.4 below). In the ideational metafunction AW contribute to the construal of abstract and general meanings. A major part of the AW consists of nouns that are used in the texts to represent abstract entities (e.g. Swedish equivalents to reason, ground and development). Further, abstract entities in the texts are modified or related to each other by use of other AW, typically adjectives and verbs respectively (e.g. Swedish equivalents to individual and increased). In the interpersonal metafunction AW are used in lexical and grammatical constructions that express meaning in an objective way, for instance through implicit or non-affective wordings of the writers' judgements (e.g. in constructions with the Swedish equivalents to obvious and consider). Finally, AW are often simultaneously used in the textual metafunction to logically organize the text, signaling either the content of a new passage or the contrast between passages (e.g. using Swedish equivalents to reason or however). Thus, the qualitative functional text analysis shows how the frequency of AW, in itself a raw statistical fact, is tied up with ways of meaning making that characterize academic language.

To give an overview of how AW tend to function in the texts, we have listed examples for each typical function in Table 9.4. The examples are taken from the 35 types that are most frequently used in the corpus of 36 texts, and

the numbers in parenthesis indicate their rank (the Sw. equivalent to reason being the most frequent word).

Table 9.4. The typical functions of AW with examples from the 35 most frequent types

Typical functions of AW in the texts		English equivalents of AW used in the texts for each function
Ideational abstraction	Representing abstract entities	reason (1), ground (2), development (4), cause (5), difference (7), downfall (8), number (9), pressure (16), change (19), opportunity (21), picture (22), history (23), situation (24), prerequisite (29), influence (30), resource (31), solution (34), age (35)
	Modifying abstract entities	individual (15), increased (18), physical (20), economical (25), social (26)
	Relating abstract entities	develop (3), make (6), compare (17), demand (28), form (33)
Inter-personal objectivity	Making implicit modal judgements	obvious (13), simple (14)
	Expressing non-affective judgement	consider (11)
Textual logical order	Signaling content of text or passage	[the first etc] reason (1), cause (5), difference (7)
	Signaling contrast between passages	however, (10)

Since the small corpus for the qualitative analysis was made up of 18 student texts with high frequency of AW and 18 student texts with low frequency it was possible to do some observations of the functional differences between these two subsets of the corpus. Even if it is hard to quantify the way the texts use the functional potential of AW, it seems clear from our analysis that the two subsets show differences not only in frequency but also in function. In summary, it seems to be texts with high frequency of AW that more fully exploit the possibilities to use AW for abstraction, objectivity and logical order.

The 18 high-frequency texts have almost four times as many instances of AW than the 18 low frequency texts (1463 instances compared to 385). However, the qualitative analysis shows that the difference is much more than a matter of verbal frequencies.

The most evident difference between high-frequency texts and low-frequency texts was found to be how AW are used for construal of abstract

meanings. Although all texts use AW for representing abstract entities like reason and difference, only writers of high-frequency texts make substantial use of the possibility to build in more meaning in these abstract noun phrases with modifiers. As shown in the examples below, from two high-frequency texts, such modification sometimes includes other AW:

Example 1. Academic words (bold) in abstract noun phrases (underlined), high-frequency texts.

- (a) To be obese **means** an impoverished **social status**.
- (b) It [the industrial revolution] **arose** for over a hundred years ago and should not have any major **importance** for today's **economic situation**.

The low-frequency texts use, with very few exceptions, a quite limited set of modifiers in corresponding cases: e.g. Swedish equivalents to small/big and high/low.

As regards the interpersonal grammatical constructions of objectivity, almost every text uses the Swedish equivalent to the subjective *I think*. However, only writers of high-frequency texts mix this phrase with the more formal judgements underlined in the examples below:

Example 2. Academic words (bold) in expressions of formal judgements (underlined), high-frequency texts.

- (a) It is **obvious** that the middle of the decade shows a decrease in the proportion of mentally ill.
- (b) Given that eating disorder becomes a bigger and bigger social problem, it can definitely be **related** to the increase of obesity in Sweden, although I do not **consider** it as one of the leading **causes**.

Finally, as regards the use of AW for organization of the texts, the repetition of phrases like *another cause* is a strategy in a majority of the texts, and a common strategy also in the low-frequency texts. However, in half the cases the writers of low-frequency texts reveal grammatical shortcomings in such constructions of causality, which indicates that they have not yet fully acquired this resource.

The typical functional differences between texts with high and low frequency of AW can be exemplified by the excerpts from two texts shown in Table 9.5, in translation from Swedish. The words in bold correspond to Swedish AW in SAWL. The analysis we present of the excerpts is not meant

to imply that the high-frequency-text is a better text than the low-frequency text. However, it is clearly a text that is more adapted to norms of academic language.

Table 9.5. Excerpts from texts with low and high frequency of AW (translated from Swedish)

Low frequency of AW; coverage 2.7 %	High frequency of AW; coverage 10.8 %
<p>I am Swedish, and I have a good life, like many others in Sweden. But if I had been born anywhere else, “a good life” wouldn’t have been a matter of course. We have a small earth with immense class distinctions. The odd thing is that it is possible to see people that rich that they can provide a whole country and people so poor that they can’t get food to their own family, in the same time, in such a limited area. It is a question of fortune where you are born and if you will have a good or bad life, why? Who is deciding that we in Sweden are rich and have a good life, while the people in for example Kenya suffers. We have had the fortune to be born in a country where everyone has the possibility to have an I-phone, what can we do? And why is it like this? . . .</p> <p>(Excerpt from assignment 1, written by a student in a partial CLIL group)</p>	<p>Wealth and health differ considerably in different parts of the world, e.g. Sweden has twenty times higher GNP/inhabitant compared with Kenya, and the predicted length of life is 26 years longer for a Swede than for a Kenyan. To have a change, it is necessary to identify the cause or causes behind these differences, but it is extremely difficult.</p> <p>The fact that the differences regarding health and wealth are huge, might have many different causes. One cause might be that the rest of the continents fell behind Europe during the Industrial revolution. It arose over hundred years ago and should not have a significant importance for the economic situation of today. Still, differences are observed when it comes to the development of countries, and in many of the poor countries old-fashioned methods still are used, e.g. in farming. . . .</p> <p>(Excerpt from assignment 1, written by a student in a partial CLIL group)</p>

The excerpt from the text with high frequency of AW (to the right in Table 9.5) illustrates the three main functions of AW we have found in the writing of explanatory assignments. Firstly, and most noticeable, many of the AW contribute to the abstraction of the text. The student writing this text uses nouns representing abstract entities (Sw. equivalents to change, cause, difference, importance, situation, development and method), modifiers of abstract entities (e.g. economic) and verbs relating abstract entities (e.g. differ). The abstract meanings of this excerpt are typically realized in complex noun groups, which sometimes combine several AW: “the cause or causes behind these differences,” “a significant importance for the economic situation of today.” In contrast, the text with low frequency of AW (to the left in Table 9.5)

relies on a much more concrete way of reasoning. And even if the two AW of this excerpt (Sw. equivalents to matter of course and possibility) express some degree of abstraction, they are used in the rather concrete contexts.

Secondly, the same excerpts illustrate how AW in high-frequency texts also contribute to a more objective style. While the low-frequency text is built up with a chain of pronouns of first and second persons (three I followed by two you and four we), the high-frequency texts establish a more objective point of view. In the latter excerpt the writer uses constructions that express modal judgement implicitly, using two AW: (Sw. equivalent to) *considerable* and *necessary*. In the opening sentence the writer states that “wealth and health differ considerably . . . ,” instead of writing more subjectively for example “we/you must consider that” In the end of the first paragraph the writer concludes that “it is necessary to identify the cause or causes behind these differences,” instead of writing “we must identify why” or even more casual “why is it like this?,” as the other writer put the question in the ending of the first excerpt.

Thirdly, the excerpts (in Table 9.5) also show how AW can make it is easier to organize the text logically and to signal the text structure. The key-word for doing this in the texts with high frequency of AW is the Swedish equivalent of *cause*. In the first paragraph the writer formulates the goal of the text: “to identify the cause or causes” The second paragraph makes it clear that the problem under discussion has “many different causes,” and suggests that “one cause might be” In the paragraph following after the excerpt two other “self-evident causes” are put forward, and the concluding part of the text discusses what might be “the principal cause.” Thus, the nominal realization of causality is used to break down the complexity of the task into pieces that could be neatly ordered. The low-frequency text follows more of a stream of associations. This is indicated already in the opening part of the text, for example by the sequence of different questions that ends the excerpt. The last of these questions—“why is it like this?”—is not answered by the following paragraphs, and therefore functions rather as an exclamation.

It is clear from the qualitative analysis that AW can be much more than an academic flavor added to the text. For students who use AW more frequently, these words are typically tools for making meaning in the abstract, objective, and logically ordered way that is crucial for meaning making in academic writing. Thus, the qualitative analysis validates the quantitative analysis of AW.

4. Summary and Discussion

This study focus on L1 (here Swedish) academic writing in the context of

English medium instruction, so-called Content and Language Integrated Learning (CLIL), in Sweden. CLIL has expanded enormously in European educational settings during the two last decades, at least partly as a way for schools to meet the increased demands on foreign language proficiency (Eurydice, 2006). However, even if the vision is about foreign languages, in practice CLIL is a matter of English, in 95 percent of the cases (Nikula et al., 2013). Still, CLIL is a form of bilingual education, as it involves two languages for content instruction; the national or majority language and English (e.g. Llinares et al. 2012). Despite the fact that CLIL is a bilingual education, not much attention has been directed to the L1 in previous CLIL research (Dalton-Puffer, 2011: 189). This study contributes to the research field, in that it focuses on the understudied L1 in CLIL, and in that it is based on a quite large body of actual student texts written by both CLIL and non-CLIL students. Our main interest was to find out if CLIL students' written academic Swedish language proficiency differs from their non-CLIL peers. We tested them (125 CLIL students and 75 non-CLIL students) in the beginning of upper secondary school (term 1) and then almost two years later (term 4).

The study consists of a quantitative and a qualitative part. The quite large body of data (260 texts) motivated a quantitative method. A recently developed academic wordlist made it possible to analyze the students' use of the academic vocabulary. In this analysis, the coverage of academic words was calculated for each text. We were interested in differences between the five student groups, on the one hand, and between the first and second assignment, on the other hand. In the qualitative part, we wanted to understand the validity of the quantitative findings. We here moved the focus from frequencies of academic words in the student groups and assignments, to functions of academic words in text, in particular differences between texts with high and low frequency of academic words. In the qualitative part, a smaller corpus of 36 student texts was analyzed in detail, by means of systemic functional linguistics. Thus, the qualitative functional text analysis aimed at examining if, and if so, how the frequency of AW is tied up with ways of meaning making that characterize the language of academic writing.

The quantitative analysis showed differences both among the five student groups and between the assignments. In assignment 1, written during the very first semester of upper secondary school, i.e. when the CLIL students only had participated in CLIL for a short time, the students in the total CLIL group (group 1) displayed a relatively high coverage in average (6.2 percent) in comparison with the other four groups (between 4.0 percent and 4.7 percent) (Table 9.3). The result seems to indicate that the total CLIL group was closer to the goal of academic writing from the outset than the other groups,

at least in terms of academic vocabulary. The results for assignment 2, written after almost two years of upper secondary school, show that all the student groups displayed a higher frequency of AW, with the noteworthy exception for the total CLIL group. While an increase of academic vocabulary can reasonably be interpreted as a step forward, towards the attainment of the crucial academic vocabulary needed for higher education in Sweden, a decrease indicates a lack of development. In that case, an interpretation of this result is that total CLIL might interfere with the development of at least one crucial aspect of the language for academic writing. Another interesting result of the quantitative analysis was that the largest increases were found within group 2, one of the student groups with partial CLIL (from 4.0 to 6.4 percent), and group 3, the other student group with partial CLIL (from 4.6 to 5.7 percent). The fact that bilingual education where first-language instructions amounts to around 50 percent is more favorable, concurs with conclusions drawn from a series of research studies where different forms of bilingual educations were compared. The 50-50 bilingual programs had more positive effects, and also more long-term benefits, than e.g. all-English instruction (e.g. August & Shanahan, 2006). Notably, the increase in the partial CLIL groups also is larger than in the non-CLIL groups, though only slightly larger than in one of these student groups.

The qualitative analysis strongly validated the quantitative results. Through the characterization of the functions of academic words and detailed systemic-functional analysis of the functions of the academic words in a smaller corpus with low frequency texts and high-frequency texts, we found that a high frequency of AW was tied up with ways of meaning making that characterize the language: (a) construal of abstract and general meanings, (b) the expression of meaning in an objective way, and (c) the signaling of a logical organization of the text.

To conclude, objectivity and logical order are certainly characteristic features of academic text, and this investigation has shown that the students' acquisition of the norms of academic writing cannot be taken for granted. In a situation where the use of L1 is strictly limited, as in total CLIL, the development of the students' advanced L1 academic proficiency is at risk. This should really be taken into consideration within the process of implementing CLIL education, not least since a series of studies of other forms of bilingual education has pointed in that direction. Interestingly, our study shows the potential of partial CLIL, which also aligns with previous research. However, as mentioned there is still a lack of empirical studies of the efficacy of CLIL, and therefore it is not yet possible to tell what circumstances actually guarantee the benefits of CLIL for writing in both the target language and in L1.

Notes

1. The term “first language”(or “L1”) is used here to refer to the language first acquired by most of the students in a certain national school context, in contrast to the target language of CLIL. Obviously, at group level the situation usually involves also students for whom this “first language” is in fact a language they have acquired later. In our study, it counts for almost 20 percent of the students.
2. In French, the corresponding acronym is EMILE, *Enseignement de Matières par l'Intégration d'une Langue Étrangère*.
3. The project is funded by The Swedish Research Council, 2011-2015. The project team, led by Associate professor Liss Kerstin Sylvé, includes seven researchers and four PhD students from University of Gothenburg and Stockholm University, see http://www.ips.gu.se/english/Research/research_projects/cliss/.
4. Thanks to PhD-student Judy Ribeck, Swedish Language Bank, University of Gothenburg.
5. The term ideational is used in the article for what more technically would be *ideational experiential* (cf. Halliday & Matthiessen, 2013:30, 85).
6. Due to the fluctuation of students between different assignment sessions the differences reported here between total CLIL (school A) and partial CLIL (school B and C) is not statistically significant. However, the negative trend for the students with total CLIL (school A) continues also in the last writing assignment in Swedish (not presented in this chapter). If these final data for AW are taken into account, the difference between CLIL students in school A and the other two CLIL groups is statistically significant ($p = .026$).

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