A quantitative study on the application and comprehension of English connectors by Swedish L2 learners of English in upper secondary schools

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Abstract

This study focuses on L2 learners of English in Swedish upper secondary schools and their ability to comprehend and use connectors in a multiple-choice cloze procedure. Connectors are used in text to signal the text structure and make explicit the relation between text segments. A study by Geva (1992) suggests that with an increased proficiency, learners also improve their ability to comprehend text relations and the use of connectors. The present study applies the suggestions of Geva’s results in a Swedish context. English in Swedish upper secondary schools, is taught at three levels (designated English 5, 6, 7) with increasing difficulty and proficiency level requirements. This study tests the ability to comprehend the context and use the correct connector on pupils in the two mandatory courses (English 5 & 6). Similar to previous studies, the aim is to investigate the relationship between levels of English and the ability to use connectors. This empirical survey investigates the English 5 & 6 pupils’ success in applying the appropriate connector in relation to the level of English they are placed in, in order to analyze whether there is any perceived development, as is presupposed by the English curriculum. Furthermore, the study also aims to analyze what type of connectors the pupils excel at or struggle with and any factors that might affect pupils’ performance. The test consisted of three categories: adversative (6 questions), additive (5 questions), and causal connectors (4 questions), a total of 15 questions, with one point being awarded for each correct response. The results of the two groups were similar and a subsequent t-test revealed that there was no statistical significance between the two groups in any of the categories. This suggests that in the sample which was tested there is no proficiency increase in terms of connectors and comprehending inter-/intrasentential relationships. Furthermore, the results indicate that the pupils are more likely to correctly select the appropriate adversative and causal connectors, but struggled in selecting the additive connectors.
Keywords
connectors, comprehension, intrasentential & intersentential relationships, teaching, coherence, cohesion
1. Introduction

Language is one of the most multifaceted and complex constructions humans have ever developed. For example, in English, Shakespeare’s works and Harry Potter have both been written with a combination of only 26 letters. Furthermore, there is an endless amount of different types of text being written, such as dissertations, academic essays, and different types of expository texts. As a second language learner of English, these different kinds of texts need to be comprehended, and this can at first seem to be a daunting task, as different texts have varying requirements for comprehension. These types of requirements are also present in the curriculum for English in Swedish upper secondary schools. For instance, The Swedish National Agency for Education (Skolverket, 2011) explains that pupils should produce “[o]roral and written production and interaction of various kinds, also in more formal settings, where students instruct, narrate, summarise, explain, comment, assess, give reasons for their opinions, discuss and argue”. The “various kinds” mentioned in the curriculum refer to the content of communication, which states that the production of pupils should relate to their subject areas, societal and working life, as well as current issues.

Swedish upper secondary schools have designed their teaching of English according to the four skills: reading, writing, listening and speaking. Pupils are required to produce within these skills at an increasing level of difficulty, such that e.g. English 7 requirements are higher than the English 5 requirements. The main difference lies in the fact that English 7 requires pupils to read and write more scientific and expository texts. Therefore, these students need additional tools to successfully comprehend such texts, tools they will not have needed in their previous schooling and which are, therefore, an interesting part of the development for ESL learners. However, as described above, English is a vast subject to teach, which in turn means that there are always tradeoffs in terms of what is being learned.

In this thesis, connectors will be investigated in order to measure if connector-proficiency increases between year 1 pupils who study English 5 and year 2 pupils who study English 6. This study employs the view that connectors should be included in the teaching as understanding intra/intersentential relations (i.e. within or between sentences). Including connectors in pupils’ education can benefit the development of effective reading and writings strategies.
In language thoughts, arguments and sentences in written work are ordered according to some form of logical order, and English is no exception. The way to explicitly order expository text and sentences logically is achieved by using conjunctions and various kinds of cohesive devices (Geva, 1992).

The role of the conjunction in a text is to make the organization explicit, and is crucial for comprehension. They help direct the reader’s attention and clarify the relationship between sentences and clauses (Bonnie, Brandt, & Bluth, 1980, p. 731). Furthermore, connectors inform the reader of the textual schemata in text. Therefore, it is vital for students to learn the role of connectives in sentences to understand the logical relationship between sentences and paragraphs, and L2 learners are no exception. This study will investigate the use of English connectors through a cloze multiple choice test on upper secondary year 1 and year 2 Swedish L2 learners of English in order to investigate their ability to comprehend text and thereby apply the correct connectors.

1.2 Background/Literature review
Upper secondary school in Sweden is divided into three years, as are its English courses: English 5, English 6 and English 7, with each level intended to be more advanced than the next, thus requiring the pupils’ proficiency to be greater. This is also evident in the curriculum for each course, where the attention to the structural and stylistic aspects of written English becomes increasingly detailed and specific. For instance, English 5 aims to teach “[h]ow words and phrases in oral and written communications create structure and context by clarifying introduction, causal connection, time aspects, and conclusions” (Skolverket, 2011, p. 3). The present study interprets this as an emphasis is on creating structure on the basis of relatively simple phrases and words rather than ideas and attitudes, which will be the main difference as they move up to English 6. Furthermore, pupils are required to learn “processing of their own and others’ oral and written communications in order to [...] create structure and adapt these to their purpose and situation. This covers the use of words and phrases that clarify causal connections and time aspects” (Skolverket, 2011).

The emphasis on structure becomes evident in the goal for English 6, which explains that pupils should interact and learn “[h]ow structure and context are built up and how attitudes, perspectives and style are expressed in spoken and written language in various genres” (Skolverket, 2011, p. 7); in addition, pupils need to produce work that reveals their
“[p]rocessing of language and structure in their own and others’ oral and written communications, and also in formal context. Adaptation to genre, situation and purpose” is vital (Skolverket, 2011, p. 8).

In English 6 pupils are expected to be taught “[s]trategies to search for relevant information in larger amounts of text […] to understand perspectives and implied meaning” (Skolverket, 2011, p. 7). In addition, the increasing level of required proficiency between English 5 & 6 in the curriculum is explicitly stated, as English 5 “[…] builds on knowledge from the compulsory school or equivalent and English 6 “[…] builds on the course English 5” (Skolverket, 2011, p. 2).

Numerous studies have been made on the effects of different structural components in text in relation to language learners in general and second language learners in particular. Some of these studies will be of significance for this study, which closely relates to previous research.

A study by Sanders & Noordman (2000) which particularly relates to this present study investigated the relation between coherence relations and linguistic markers in text processing. Their survey focused on two specific parts of coherence: the nature of the relation between two segments and in which way this relation is made explicit in the text. They use the view of coherence relations as a starting point. Fundamentally, a coherence relation means the relation between segments; for example, two sentences may construct a cause-effect type of relation, or a problem-solution type. It is these relations that are made explicit by connectives such as however, furthermore, and therefore (Sanders & Noordman, 2000).

Sanders & Noordman (2000) decided to focus on expository texts which were not produced by students, because they claim that it is easier to investigate the influence of structural components in such a text from a linguistic point of view. They found (in consensus with previous research) that linguistic markers affect reading in different ways, depending on the task. In general, connectives help readers process the text quicker and facilitate processing in different ways, depending on the connective and the task. However, they do not affect recollection of what has been read; rather, they seem to help readers comprehend both the content and the structure of the text (Sanders & Noordman, 2000). Furthermore, their linguistic analysis has indicated that “the processing of a connective implies that readers make a match between the relational meaning of the connective and the meaning of the content of the segments” (Sanders & Noordman, 2000). Sanders & Noordman’s study showed that linguistic markers facilitate different processes, depending on the connective, the task and coherence.
relation. This indicates that there is a relation between comprehending connectives and comprehending text.

The study conducted by Sander & Noordman is a part of the basis for this survey, since the present study will focus on investigating comprehension of connectives in relation to development in Swedish upper secondary schools. Sander & Noordman’s study established that connectives facilitate certain reading processes and that connectives are closely related to understanding the context in which they are used. The questionnaire designed for this survey draws upon their view of coherence relations, as it will be central to the correct use of the connectives in the “Fill-in-the-blank” test administered to the participants. Only one connector will be correct within the context of each sentence in the test. This will be further explained in the methods section.

A second relevant study on the relation between conjunctions and ESL/EFL students is one made by Ana Cristina Lauhuerta Martinez (2015). In that study, she states that there is a knowledge gap regarding the relation between ESL/EFL writers’ use of conjunctions and the quality of their writing. Martinez notes that there is not any consensus regarding the significance of conjunctions in text in terms of writing quality and recollection, as some studies have made findings that showed a large significance, while other studies have shown the contrary.

Martinez asked Spanish secondary school pupils to answer “Do you think a school uniform should be worn at the high school?” and using the texts they produced she analyzed the frequency of conjunctions in relation to the text quality. Her study found that there was a statistically significant relationship between the occurrences of conjunctions and the quality of the text.

Martinez’ study illuminates several aspects which will be important for this study. Firstly, she adopts the definition of the use of conjunctions as a cohesive marker proposed by Halliday & Hasan (1976), which is that the cohesive relation of a conjunction refers to “a specification of the way in which what is to follow is systematically connected to what has gone before”. This description of conjunctions will be applied to the present study on connectives, as they fill the same role within a text. Within the context of the study, connectives will be viewed as equivalent to conjunctions, because certain connectives are e.g. subordinating conjunctions (Celce-Murcia & Freeman, 1983). Testing the conjunction comprehension of students involves an understanding of the relation between two segments or sentences. In addition, conjunctions are not cohesive by nature but rather due to their specific meaning. They carry meaning that
presupposes the presence of other components in a text, that is to say, a conjunction cannot stand by itself. Furthermore, Martinez found that conjunctions of additive or causal nature occurred more often than sequentials or adversatives. Martinez’ study has important aspects that will be of significance for the present study, as it gives some understanding of ESL/EFL students’ use of conjunctions. It guides our understanding of how different types of conjunctions are processed by students. Martinez concludes her study by noting that students who employed the use of connectives made their writing more effective and increased its quality. This fact therefore provides a reason to focus more on these grammatical tools in order to improve and develop students’ English. Based on Martinez results regarding the correlation between connectives and quality on pupils’ writing, the present study judges that it also applies to Swedish L2 learners.

Susan R. Goldman & John D. Murray conducted a study on knowledge of connectors as cohesion devices in text in which they compare native and ESL-speakers (Goldman & Murray, 1992). They adopt a division into four types of connectors: additives, causals, adversatives, and sequentials, a grouping which the present study will be drawing upon. However, the study will exclude sequentials because they require longer texts in order to create a satisfactory test question, which was not possible, due to time constraints. Goldman & Murray (1992) examined native and ESL speakers’ knowledge of all four types of connectors, using a multiple-choice test where the participants were required to choose the appropriate connector.

The study by Goldman & Murray (1992) is more intimately related to the present study than the previously discussed research. Their study is specifically related to the present study because of their findings of a correlation between reading comprehension and comprehending the connectors which are appropriate within a given context. Furthermore, the present study will be drawing upon their choice and types of connectors. Goldman & Murray (1992) state that background knowledge contributes to the comprehension of a text, and that depending on the level of knowledge different strategies are adopted by the reader. For instance, if the text being read is within a discourse in which the reader is experienced, then background knowledge will play a bigger role than grammatical and structural aspects of a text in order to comprehend the new information, and vice versa. Their conclusion is that “the less a reader knows in the domain the more important is knowledge of how general linguistic devices may be used to ascertain local and global structure of the text” (Goldman & Murray, 1992). These devices include connectives. Furthermore, Goldman & Murray (1992) found that when their subjects failed to choose the right type of connector the primary reason was due to a failure to
comprehend the text, suggesting that reading comprehension is a vital part of comprehending connectives and the ability to use them correctly.

In parity with previous research, Goldman & Murray found that ESL and native speakers tend to gravitate toward additive and causal connectors and use them more frequently than the other types. However, they also found that students confuse when additive and causal connectors are appropriate, further indicating that the ability to infer logical relations in the text plays a vital role when applying connectors. Their suggestion on how to move forward and develop a deeper understanding of connectors is to focus more on intersentential relationships.

Many aspects mentioned above will be adopted here in some form, and the present study will be drawing upon their approach and translate it into this study’s analysis. For instance, the significance of types of connectors has reoccurred in all previous research which has been reviewed and thus this study will examine if the same phenomenon is present in Swedish L2 speakers of English. In addition, the Swedish school system has, as shown above, presumed an overall progression in proficiency, one part of which is structural aspects. The explicit ordering of structure can be facilitated by connectors, which is the reason for replicating the study on Swedish pupils. Furthermore, the study by Goldman & Murray is part of the foundation that links reading comprehension with the comprehension of connectors and through this approach it is possible to further develop pupils’ understanding of expository text in general and the use of connectors in particular.

“The Role of Conjunctions in L2 Text Comprehension” is a study conducted by Esther Geva (1992), which further emphasizes the role conjunctions play in L2 text comprehension. This is important for the present study, as it is part of the premises that comprise the foundation on which this study will be conducted. She established a possible relationship between conjunctions and L2 text comprehension (1992). During her investigation, she found that the skill of the reader also affects what role a conjunction will play in terms of text comprehension. For instance, a skilled reader has a deeper understanding of these conjunctions, which in turn will allow them to more accurately infer the logical relationship between sentences. For poor readers, conjunctions assume a scaffolding role when processing a text, guiding them through the thoughts and ideas. These aspects mentioned above are relevant for the English proficiency development of Swedish L2 learners as stated by the Swedish School Agency. Furthermore, the design of the sentences in which the connectors will be tested will draw upon Geva’s (1992) study requiring the pupils to comprehend the context in order to apply the connector.
In terms of comprehension of the intersentential relationship, conjunctions/connectives enhanced comprehension at all levels when displayed explicitly (Geva, 1992). Geva also showed, similarly to previous research, that the type of conjunction is closely related to comprehension, where causal and additive connectives proved to be most effective. Moreover, connectives tend to be more effective in their purpose for poor readers, who have more difficulty inferring the inter- and intrasentential relationship than skilled readers.

Furthermore, Geva uses a point of view which is fundamental for this study. Firstly, conjunctions/connectives are used to make the logical relation between sentences and the structure of the text explicit, which in turn affects text comprehension. Secondly, she states that “if conjunctions help to make text organization explicit, and if awareness of text organization is essential for text comprehension it follows that the presence of conjunctions in text should facilitate the instantiation of textual schemata, help to direct readers' attention to important text information, and help in checking information in memory” (Geva, 1992). These thoughts are essential for this study, as the level of connectives comprehension that Swedish upper secondary pupils have will be measured, which in turn will allow the results of the present study to be compared with previous research.

1.3 Theoretical framework
The inter-/intrasentential relationship is often made explicit with the use of connectives. Previous studies in L1 research (Bonnie et al., 1980; Geva, 1992; Goldman & Murray, 1992; Martínez, 2015) have shown that there is a difference in the way skilled and less skilled readers use connectives and their ability to infer implicit logical relationships. Furthermore, L2 research has suggested that L2 readers’ difficulties in comprehending expository text might be linked to an inadequate ability to use and infer logical relations in text (Goldman & Murray, 1992).

The purpose of connectives in text is to make the text organization explicit. Geva states that if awareness of text organization is essential for text comprehension, then it follows that conjunctions should help direct readers’ attention to important aspects in a text (Geva, 1992). In addition, results of previous research have shown that readers at all levels benefit from the presence of explicit signaling in text, such as connectives (Geva, 1992; Goldman & Murray, 1992).

A facilitating factor that has been shown time and again in previous research is the function of the connective/conjunction in the text (Geva, 1992; Goldman & Murray, 1992). Connectives
have been shown to be helpful to both good and bad comprehenders (the term used in Goldman & Murray’s study). Connectives allows good comprehenders to use reading strategies more effectively and the poor comprehenders get to improve their reading strategies; furthermore, research has shown that the presence of connectives allows poor comprehenders to use a more meaningful strategy rather than rote reading strategies (Goldman & Murray, 1992)

As explicated by Alden J. Moe (1979) Halliday & Hasan identify five types of cohesion, which are conjunctions, substitution, ellipsis, reference, and lexical cohesion, which they state are represented in text by particular features. In the context of this study connectives will be viewed as equivalent to conjunctions. This is also supported by researchers Kintsch and van Dijk, who used the term to refer to and, yet, but, etc. (Moe, 1979). The typical function of connectives in text is to provide conjunctive cohesion, making it possible to use connectives as equivalent to conjunctions in this context (Moe, 1979).

Moe (1979) states that Halliday & Hasan as well as Gutwinski agreed that cohesion “is achieved by establishing semantic relationships where the interpretation of some elements in the text depends on that of another” (Moe, 1979). This semantic relationship can be inferred implicitly or stated explicitly through the use of connectors. According to Halliday & Hasan as explained in Moe (Moe, 1979), cohesion is used to show how sentences may be linked together through the five distinct types of cohesion explained above. These cohesion types form so-called cohesive ties which can be inter-/intrasentential. In a coherent text, there are typically words which form cohesive ties, such as connectors. Furthermore, Moe notes that cohesion should not be used as a synonym for coherence.

As explained in Moe, cohesion is a fundamental aspect of a text which is a component of a coherent text, but not equivalent to coherence. Coherence is established by the reader and is achieved when sentences and paragraphs relate to one another. In addition to the five distinct types of cohesion provided by Halliday & Hasan, Moe argues that organization is another crucial factor that has to be present. This organization can be made explicit by using connectors, as they explicitly signal text structure and the logical relation in and between sentences (Geva, 1992).

The above discussion will form the theoretical basis for this study. The sentences which test the connectors are distributed between creating explicit intra- and intersentential cohesive ties using the different connectors. The present study will attempt to test the pupils’ ability to infer the connector needed to form an explicit cohesive tie. As explained in Moe’s article, there are
several important factors contributing to a coherent text, and this study will test one of the five distinct types established by Halliday & Hasan to investigate the pupils’ ability to understand the semantic relationship and apply the correct connective. Furthermore, this study supports the view that “the more implicit the cohesive relationships the more difficult the text is to comprehend” (Moe, 1979). Moe explains that there are elements in cohesive ties and coherence that facilitate comprehension, and that “educators must be aware of the factors which exist within text and which affect the understanding of that text” (Moe, 1979). This study shares Moe’s view and it is, therefore, the different years that will be compared in terms of proficiency to investigate their ability to infer semantic relationships and apply the correct connector, forming an appropriate cohesive tie.

1.4 Aim
The study aims to further research the relation between connectors and text comprehension in L2 learners of English. Furthermore, this study aims to investigate if the development which is suggested in the way English teaching is designed in Swedish upper secondary schools can be assumed. In accordance with previous research, it is hypothesized that pupils in year 2 will succeed better in their application of the appropriate connector. In addition, this is related to the design of the curriculum for English in Swedish upper secondary schools, where each course supposedly requires a higher proficiency level than the previous one. For instance, the assumption is that English 6 pupils are more proficient than English 5 pupils; however, this study aims to investigate if such assumptions can be made. The choice of connectors as a measurement is because of the widespread use of connectors in academic texts. Given that the study is limited in time and sample size it will not be possible to make generalizations about the entire target population. However, this study tests the method used and can thus be applicable to samples that are statistically satisfactory for a general application. The research questions for the present study are:

What is the relationship between the levels of English in upper secondary school and student comprehension of text and connectors?

What type of connectors (additive, causal, contrast) do respondents struggle with or excel in?
2. Method and material

2.1 Test design
The fill in the blank test (FTB) was designed to test three types of connectives: additive (furthermore, in addition, moreover), causal (thus, therefore) and adversative (however, in contrast, nevertheless). This is similar to the method used by Goldman & Murray’s (1992) study. Goldman & Murray (1992) used four connector types: additive, adversative, sequential and causal. Furthermore, the number of questions for each category follows a scheme of 6-5-4 (explained further below), 6 questions on adversative connectors, 5 on additive connectors and 4 on causal connectors; as noted above, sequential connectors will be ignored because they require longer passages in order to be tested effectively, which was not possible due to time constraints. The questionnaire was only given 15 minutes at the beginning of each lesson because the teacher was preparing the pupils for a national test in English, hence the small number of questions.

Goldman & Murray (1992) explain that to avoid confoundment by the respondents they included instances which the frequency per million estimated in the American Heritage Word Frequency Book was greater than 10 (Carroll, Davies, Richman, 1971), which ensured that the connectors being tested were of high frequency. The questions in the present study were designed according to the three categories used: additive, causal, and contrastive. Six instances of contrastive connectives were used, divided equally between: however, nevertheless, and in contrast. Four instances of causal connectives (therefore, thus), and five instances of additive connectives (moreover, furthermore, in addition) were used. The reason for only using moreover once is because it is arguably similar to in addition in terms of use, as well as the practical time constraints limiting the length of the questionnaire. Using moreover once does not limit a specific inter/intrasentential meaning as it would if nevertheless was used only once in comparison to however.

Based on Halliday & Hasan’s (1976) taxonomy, Celce-Murcia & Freeman (1983) used “a functional classification scheme for logical connectors that differentiates among four major types of connectors: additive, causal, adversative, and sequential” (Goldman & Murray, 1992, 505). Celce-Murcia & Freeman (1983) explain that the connector type is determined by the meaning relation they signal. Additives signal some form of elaboration of previous content, and adversatives and causals signal a specific type of elaboration: causal connectors signal a
cause-effect type of relationship, whereas adversative signal contrastive elaborations (Goldman & Murray, 1992).

2.2 Fill in the Blank test
The FTB test was designed using Google Forms and used sentences that put the focus on comprehending the context and applying the correct connective rather than challenging the pupils’ overall proficiency in English. 15 questions were designed to investigate pupils’ understanding of the context in relation to applying connectives. All the pupils attending the school in this study use iPads and other electronic devices in their lessons. This is useful for my study as firstly, it simplifies the actual test-taking and pupils can conveniently answer the questions. Secondly, pupils who may struggle with difficulties such as ADHD and/or dyslexia might benefit from the questionnaire being tested through their iPads, removing the need to write by hand.

The study replicates the multiple-choice, clozed testing from the study conducted by Goldman & Murray (1992). There are, however, significant differences between the studies. Goldman & Murray’s study examined undergraduate native English speakers and L2 speakers of English and how both performed reading informational passages. In addition, the majority, 70 percent, of their L2 speakers had an Asian language as an L1 and the remaining 30 percent consisted of European languages. However, this study differs in that it will investigate Swedish L2 speakers of English at upper secondary level, which means that they will arguably have a lower knowledge level, and all will have followed the same path through the Swedish school system: compulsory school into upper secondary school. Furthermore, because of the time constraints on the pupils’ teacher, the test had to exclude sequential connectives, such as firstly, secondly, in summary, because they require longer passages in order to be tested appropriately. It is crucial for the testing that the passages do not create confusion and a decision was made to exclude sequentials because in shorter passages they might be confused with additives, due to lack of disambiguating context.

2.2.1 Participants
All the respondents in the sample were upper secondary English 5 and 6 students. The test did not include people who have studied the courses as adults. The sample consists of 50 pupils divided between two classes: year 1, which consisted of 24 pupils, and year 2, which consisted of 26 pupils. The pupils attend an upper secondary school located in a suburb of Stockholm. It is a school of arts preparing the pupils for a career in dance, music and drama, as well as an
academic career. The school is quite small, with about 400 pupils and around 20 teachers. This means that all of the pupils in my sample will probably have been taught by the same teacher (a variable which otherwise can have an effect on the results).

The principal and the relevant teacher were contacted prior to the testing. The two classes were at different levels of proficiency according to the English courses in the Swedish school system. The purpose behind this choice was to investigate whether there is a relation between levels of English and comprehension of connectives in the sample.

2.2.2 Procedure
The participants were given 15 minutes to complete the FTB test, as well as a background questionnaire at the end of the test. The English 5 and English 6 pupils were tested on two separate occasions. The background questionnaire’s purpose is mainly to be able to assign the participants to the correct groups (i.e. year 1 or year 2), as their names would not be collected. The pupils first language was asked for, however, only as a way to identify and not to include in the analysis. Before the start of the session the participants were given the chance to ask me questions regarding the study and the design of the test. After the participants completed the test they were given a snack as a small symbolic reward for their assistance in the study.

2.2.3 Scoring
The pupils received a score between 0 to 15, with one point for each correct response. After the tests were completed, an average was calculated for each year to compare the different results. Furthermore, the averages were then used in a t-test to determine the p-value to see whether there was a statistically significant difference. For each answer a percentage was calculated to see how many of the respondents chose a certain incorrect connective. Furthermore, a percentage for the number of correct responses for each type of connective was calculated to indicate where pupils might be struggling in terms of comprehending the context and the connective. This is achieved by testing each connector more than once in different contexts and positions in a sentence. For instance, however was tested at the beginning of a sentence and between two clauses.
3. Results

The results will be discussed in two steps. Firstly, the total correct answers for each year will be presented, including the mean results for each category (contrast, additive, and causal). Secondly, a comparison between year 1 (Y1) and year 2 (Y2) will be presented, including the p-values of the t-tests in each of the categories to investigate if the results are statistically significant. Each question will be assigned Q# which refers to its number in Appendix A; in order to read the full sentence, see appendix A. Furthermore, the purpose of this structure is to create transparency in how the results were analyzed. Fourth, this organization of the results reflects the method through which the data was collected, as well as how it was subsequently analyzed.

3.1 Year 1 pupils

The pupils in year 1 at the upper secondary school that were tested scored a mean result of 10.33 on the 15-question test, which translates into 68.8 % correct answers and a standard deviation of 2.44. A SD of 2.44 is considered as a low value of standard deviation because 2.44 does not vary the results to the extent that it changes how the pupils’ performance should be viewed. Dividing the results into the designated categories suggests that the year 1 pupils who were tested struggled with additives. The mean result for additives was 2.83, which is a percentage of 56.7 %; in contrast, the mean result for numbers of correct responses on contrastive connectors was 4.54, a 75.7 % success rate. This is a higher mean, possibly indicating that pupils in the sample struggle with the application of additive connectors. Lastly, in the third category, causals, the mean score for the Y1 pupils was 2.95, a percentage of 73.9 %. Combined, the scores of each category yield the mean of 10.33.

<table>
<thead>
<tr>
<th>Year 1</th>
<th>Total (max 15)</th>
<th>Additives</th>
<th>Contrastives</th>
<th>Causals</th>
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<tr>
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<td>2.83</td>
<td>4.54</td>
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<td>Mean %</td>
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<tr>
<td>SD</td>
<td>2.44</td>
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Table 1. Summary of results for year 1.

3.1.1 Additives

Investigating the pupils’ responses for the questions testing additive connectors, it is suggested that year 1 pupils were able to use the connector in addition at the beginning of the sentence. The pupils were asked to apply in addition to Q7, which 19 out of 24 were able to apply correctly; however, a similar sentence requiring the connector to be applied at a different place
did not achieve the same success rate. The next sentence where *in addition* was the correct connector, both semantically and grammatically, was Q9, which only 4 pupils were able to answer correctly. The other options available were *conversely* and *therefore*, both of which were semantically awkward. A sentence which produced some interesting results was Q10, which required the use of *furthermore*, which 12 pupils were able to place correctly. The other options were both contrastive connectors (*in contrast* and *however*), neither of which are semantically applicable. This suggests that there is a possible pattern where the placement of the connector dictates the perceived difficulty, and requires comprehension of the context to be applied, as with Q10, where no contrastive ideas were present, but pupils failed to infer the intrasentential relationship.

### 3.1.2 Contrastive
The year 1 pupils were most successful applying the correct contrastive connectors, with the mean of 4.54. The majority of year 1 pupils had 3 correct answers or more out of 6, and they were most successful at using the explicit contrastive connector *in contrast*. The connector was tested twice: in Q5, 22 out of 24 pupils could apply *in contrast* correctly, and in Q6, 17 out of 24 pupils were successful. Even though the results show a high success rate in applying contrastive connectors, the results seem to indicate a possible pattern. Similarly to the instances in additives, pupils appear to struggle when there are main clauses whose ideas need to be connected by a connector rather than the passage starting with a connector. A further indication of this possible pattern might be found in Q6, where 12 pupils were successful in their choice. In contrast, 20 pupils were able to apply *however* in Q2, which follows the same structure as the previous sentence. The difference lies in the options presented to the pupils. In Q2 one option was a causal connector, *as a result*, which seems to have affected the pupils’ interpretation of the sentence, whereas the first sentence only had additive connectors as alternatives, and they clearly do not fit semantically.

### 3.1.3 Causal
Regarding the causal connectors, the pupils seemed to be more successful in terms of their use, possibly because of the clear semantic relationship between the segments. For instance, Q14 was answered correctly by 22 out of 24 pupils. The other alternative answers, both of which were semantically incorrect, were *however* and *furthermore*. This suggests that the year 1 pupils understand the function of *therefore* in the sentence in relation to the context. However, the
year 1 pupils were less successful in applying *Thus* correctly in comparison with *Furthermore*, as well as less consistent. When testing the connector *thus* in Q12, 18 out of 24 pupils were successful; in contrast, only 11 out of 24 managed to correctly select *thus* in Q13, which might be an indication of lacking intersentential comprehension, and therefore, failure to select the correct connectors. In addition, due to limitations and time constraints it was not possible to test their overall proficiency in order to determine whether pupils did not know the word *thus* before, which can be a factor affecting the results. Furthermore, pupils might be more successful selecting the correct instance of *therefore* because it is more common in spoken English, but *thus* is primarily used in written English, hence less likely to be known by pupils (Minugh, p.c). The overall proficiency in the four skills (writing, speaking, listening, and reading) in relation to connectors is a possible subject for future studies.

### 3.2 Year 2 pupils

The pupils in year 2 at the upper secondary school that were tested scored a total mean result of 10.88, which means they had a success rate of 72.6 %, with a standard deviation of 2.34. This is a marginal difference in comparison to the year 1 pupils, which presents very similar results. In terms of the categories, there are, however, some differences. Firstly, the year 2 pupils scored better on contrastive connectors, with a mean of 5.0, which is 83.3 %. Secondly, the mean for correct responses for causal connectors was 3.19, which is a percentage of 79.8 %, with the SD being 0.69. Thirdly, the year 2 pupils’ mean for additives was 2.69, resulting in a percentage of 53.8 %.

<table>
<thead>
<tr>
<th>Year 2</th>
<th>Total</th>
<th>Additives</th>
<th>Contrastives</th>
<th>Causals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>10.88</td>
<td>2.69</td>
<td>5.00</td>
<td>3.19</td>
</tr>
<tr>
<td>Mean %</td>
<td>72.6</td>
<td>53.8</td>
<td>83.3</td>
<td>79.8</td>
</tr>
<tr>
<td>SD</td>
<td>2.34</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Table 2. Summary of results for year 2.*

#### 3.2.1 Additives

The responses for the year 2 pupils were very similar to those of the year 1 pupils. The sentence where the respondents were more successful was Q7, where 18 out of 26 pupils were successful. This is very similar to the success rate of the year 1 pupils on the same sentence, which might indicate that the pupils are succeeding in inferring the correct relationship between the clauses, thus, applying the correct connector. However, pupils in year 2 struggled in applying the correct connector in Q9, where only 3 succeeded. This might indicate a similar pattern as with the year 1 pupils. 14 out of 26 pupils chose the contrastive connector *conversely*, despite the lack of
contrast between the clauses, which might indicate, as with year 1, failure to recognize the intersentential relationship. The year 2 pupils were more successful in applying *furthermore*, with 18 out of 26 pupils being able to apply it correctly in Q10, a result which differs from that for the year 1 pupils, where many failed to infer the correct intersentential relationship. In sum, year 2 pupils seem to rely on contrastive connectors, even though there is no semantic indication, as in Q9.

3.2.2 Contrastive
The year 2 pupils proved to be most successful in applying contrastive connectors, with a mean of 5.0, a percentage of 83.3% and a standard deviation of 1.02. 11 out of 26 pupils were successful in all test instances of contrastive connectors, and none falling below 3/6 correct responses. 25 out of 26 year 2 pupils were successful in applying *however* to Q1, which is the highest success rate in the study. Furthermore, because of the high success rate, it could be argued that the sentence should be removed; however, it becomes interesting in relation to the other tests of contrastive connectors. For instance, 8 year 2 pupils were not successful in applying *nevertheless* Q3, but the same pupils were successful in applying *however*, which might suggest difficulties for those 8 pupils in understanding the connector in relation to the context. In sum, the year 2 pupils were highly successful in the category of contrastive connectors, achieving a mean of 5.0, which is marginally higher than the year 1 pupils.

3.2.3 Causal
Two causal connectors were tested, *thus* and *therefore*; the year 2 pupils were consistent in their application of *therefore* and inconsistent in applying *thus*. When applying *thus* in Q12 23 out of 26 year 2 pupils were successful; however, this number is reduced to 14 out of 26 in the next testing instance of *thus*. The relationship between the clauses in Q13 seems to be difficult to grasp for year 1 and 2 pupils alike. Similarly to year 1 pupils, year 2 pupils chose to apply additive or contrastive connectors in this sentence, which might indicate a failure to understand the intrasential relationship, as they were successful with the previous sentence, which suggests that they comprehend the meaning and function of *thus*. In contrast, year 2 pupils were highly successful in applying *therefore*; however, the structure of the sentence was similar, which might have been a factor. In conclusion, a majority of year 2 pupils were successful in applying causal connectors; however, the results show that even though pupils comprehend the connector itself, it is still the context that might dictate the level of difficulty in the application.
3.3 T-test results

3.3.1 T-test on the total

Figure 1. Comparing the total number of correct answers between year 1 and year 2.

The total number of correct answers as displayed in Figure 1 indicates a similar level of comprehension of connectors. The two curves of each year follow the same pattern, with Y2 pupils scoring slightly higher overall. The mean for year 1 pupils was 10.33 with 2.4 standard deviation, which is slightly lower than year 2 pupils, who had a mean of 10.88 and a standard deviation of 2.34. Using a t-test for statistical significance determined that the p-value was 0.419, meaning that the null hypothesis cannot be rejected, thus indicating that there is no statistical significance between the groups.

3.3.2 T-test result on Additives

Figure 2. Comparing the year 1 & 2 results on additives
The result on additives was unexpected, as the initial expectations were that it would be the category where pupils struggled the least. However, it seems that year 1 & 2 pupils had difficulties applying the correct connector when it was an additive. The mean for year 1 pupils was 2.83 with SD being 0.82, while year 2 pupils achieved a mean of 2.69 with a SD of 1.19. Four t-tests were conducted, one for each category and one for the total score, with additives providing the highest p-value of 0.63. The p-value, as with the p-value above, suggests that the results can be treated as the same: the null hypothesis cannot be rejected and any differences might be coincidental. As Figure 2 shows, the two groups have very similar results and seem to follow the same trajectory, even though there should be a progression, as assumed in the curriculum for English in Swedish schools.

3.3.3 T-test results on Contrastives

![Contrastives](image)

**Figure 3. Comparing contrastive connector results between year 1 & 2.**

Contrastive connectors were the category where year 1 & 2 differed the most in comparison to the other categories. The initial results seemed to indicate that the year 2 pupils grasped this type of connector better than the year 1 pupils, but the mean of both groups showed that the difference is very small, with year 1 pupils having a mean of 4.54 and year 2 5.0. Furthermore, a t-test showed that the p-value was 0.1539, which is the lowest p-value achieved, but even though there are more apparent differences, the null hypothesis was not rejected, suggesting that the differences might be coincidental. Nevertheless, year 1 & 2 pupils’ results seem to indicate that they had the least difficulties with selecting the right connector when the correct connector was a contrastive connector.
3.3.4 T-test results on Causals

As with the other categories, year 1 and year 2 pupils achieve similar results in the sample that was tested. Comparing all the categories tested, the results suggest that the tested pupils struggled when applying additive connectors in sentences. As shown in Figure 4, the pupils in general were more successful applying causal connectors in comparison with additives. However, in the t-test the p-value 0.3379 showed that there is no statistical significance between the results, meaning that as with the other categories, any differences might be coincidental.

Overall, the statistical analysis of the results has suggested that year 1 and year 2 pupils have similar difficulties in terms of selecting the connectors within a given context. The results have suggested that it is comprehension of the context and the intra-/intersentential relationship between clauses that affect how successful L2 learners in Swedish upper secondary school are in selecting the correct type of connector. There is only one occasion (see Figure 4) where a pupil failed to select a single correct connector within a category.
4. Discussion

In this section I will first treat the relationship between Y1 & Y2 and the results of the present study regarding students’ ability to comprehend the inter-/intrasentential relationship and the selection of the appropriate connector. In the second part of the discussion I will treat the second aspect of the study, which is which type of connector the pupils in my sample seemed to excel or struggle in and any possible factors that might have affected their performance.

4.1 The relationship between understanding connectors and English 5/6.

The results of the FTB test seem to suggest that context played a key role for the pupils in their success at selecting the correct connector. When analyzing the data, it suggests that the pupils comprehend the meaning and role of a connector, whether it is adversative, causal or additive; however, the issue lies in identifying this relationship in a sentence. This is based on the observation that pupils who seemed not to know the meaning of a connector failed to select it in all the instances it was called for, whereas both Y1 and Y2 pupils applied connectors correctly in one instance but incorrectly in another. For instance, the sentences *the company is planning to cut staff by over 30 %, thus reducing costs* and *He did not do any of the homework, and thus, he failed the course* illustrates the observed inconsistency. In Y2 only 10 pupils applied the connector *thus* correctly in both instances and in Y1 only 7 were successful in both instances, even though the causal connector had a large mean, both groups seemed to struggle with the connective *thus*. Goldman & Murray (1992) identified a similar source of difficulty in their study as in the present study, which seems to be that pupils struggled to infer the appropriate relation between successive clauses. The results of English 5 and English 6 pupils were very similar, making it difficult to determine if English 6 pupils were more successful in their selection of connectors. The relationship between the different years and their ability to successfully select the appropriate connector has been similar and any differences can be presumed to be coincidental, due to the null hypothesis not being rejected. The result suggests that there is not any difference between Y1 and Y2 pupils in terms of comprehension of text and connectors, possibly indicating that more emphasis needs to be put not only on connectors alone but cohesion and coherence as well as semantic relationships. Thus, it is not possible to presume a straightforward progression in English as presupposed by the Swedish school agency’s English curriculum, at least in this respect. The failure to apply the appropriate connector seem to indicate a lack of comprehension of structural and semantic relationships, requiring an overall improvement in proficiency in order to be able to infer sentence
relationships. Goldman & Murray (1992) found that in order to accurately judge this, it is not enough to learn the basic meaning and function of connectors through isolated use, which will not be likely to lead to improved performance on connectors or increased comprehension. In order to improve their ability to infer the appropriate relationship, pupils need to improve their proficiency at comprehending inter-/intrasentential relationships and how to structure relationships through the use of connectors; it is not a matter of merely developing the comprehension of connectors (Goldman & Murray, 1992). Furthermore, the results of the Y1 and Y2 pupils in this study seem to indicate that in terms of comprehending connectors in the sample, the level of proficiency between Y1 and Y2 pupils is approximately the same, suggesting that no development of this aspect has taken place between the two years.

4.2 Types of connectors

The initial expectations were that pupils in Y1 would find it difficult to select the correct adversative and causal connector and that additive connectors would be the area which they excelled in. Furthermore, the initial hypothesis was that Y2 pupils would have a better result overall and would be able to select the correct adversative and causal connectors. However, the Y1 and Y2 pupils showed similar difficulties in the questionnaire in general, but the results suggest that they are more likely to apply correct adversative and causal connectors, which is contrary to initial expectations. The data gathered from the sample suggest that Y1 and Y2 pupils alike are able to consistently select the correct adversative and causal connectors, and those who answer incorrectly typically mistake an adversative relationship for a causal one. Previous research suggests that text with a problem-solution structure is processed faster, which might also indicate that is easier to infer this type of relationship for Y1 and Y2 pupils (Sanders & Noordman, 2000). This could explain the inconsistency and the pattern where the pupils who were tested mistook causal and adversative connectors, but the possibility of pupils simply lacking knowledge of the words or not being aware of the difference is a matter which could be examined in future research. Sanders & Noordman (2000) found that the coherence relation of a segment affects the processing of the reader; for instance, they found that problem-solution relations were more quickly processed than additive list relations. Even though Sanders & Noordman’s (2000) study investigated recollection, the processing of a segment might be related to the pupils’ abilities to infer the relationship, making the problem-solution structure more recognizable. This would explain the similarities found between Sanders & Noordman’s study (2000), Goldman & Murray’s (1992) and the present study. In all three cases, participants seemed to struggle or be less successful in processing or recognizing an additive/sequential relationship. In the present study, Y1 & Y2 pupils scored a substantially lower mean average
than in the rest of the categories tested, with Y2 scoring a lower mean than Y1. This might be an indication that the pupils who were tested do not have the proficiency needed to infer an additive relationship between sentences, and thus fail to apply it in the FTB test. The semantic meaning of a connector itself might not be the source of difficulty, as prior studies have shown that clause order, and by extension the ability to infer and comprehend inter-/intrasentential relationships, plays a larger role. Causal and adversative sentences have in the present study seemed to be more likely to be inferred correctly by the pupils rather than an additive relationship. In sum, the pupils of the study excelled in adversative and causal connectors and experienced difficulties applying the appropriate additive connector. Consulting previous research, it seemed to be an issue of inferring the relationship between clauses, where sequential and additive clauses seem to be more difficult for pupils to process, and possibly therefore difficult for them to infer such a relationship.

5. Conclusion

The results of the present study suggest that the expected increase in proficiency as stated by the Swedish school agency is not present amongst the pupils who were tested, at least in terms of the comprehension of connectors and the correct application of them. Previous research and other linguists have suggested that in order to successfully select the appropriate connectors, one needs to understand the relationship between segments, as well as the structure. Teaching English connectors as a separate element might mislead pupils as to the overall purpose of the connectors and other linking words. The pupils who were tested in the present study all reported that they had previously dealt with connectors in class and encountered them before, so it is not a matter of unfamiliarity. The results of the study concur with previous research (Bonnie et al., 1980; Goldman & Murray, 1992) that in order to increase the performance of pupils applying connectors, teachers need to develop pupils’ overall proficiency in general, as well as also increasing their comprehension of inter-/intrasentential relationships. It is the relationship that is illuminated explicitly by the connectors and not created by the connectors themselves. The inconsistency suggested by the results seem to indicate a lack in understanding this relationship, and therefore, a focus on that in relation to connectors could be beneficial in future research. Such research would broaden the knowledge of the relation between context and connectors in relation to pupils’ comprehension. Because all connectors except moreover were tested more than once, it was possible to identify the patterns that seemed to suggest that the reason for failing to apply the correct connector was a lack of comprehending the context rather than the
individual connector. In addition, the study’s result suggests that there was not a notable difference between Y1 and Y2 in terms of the accuracy of selecting the correct connector and the proficiency required to infer the correct inter-/intrasentential relationship. However, future research could expand this study by covering more schools, thereby achieving a greater statistical reliability. Furthermore, future studies could expand on the connector test requiring pupils to type those in rather than choosing from a set list, which could test pupils’ ability to infer inter-/intrasentential relationships in relation to a paragraph and overall cohesion and coherence on a deeper level. In conclusion, this study indicates that pupils need training in this more abstract area, regardless of whether they are in Y1 or Y2. This is a pedagogical application, not just a testing issue.

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Author

Ali Al Ansari-Imad
7. References


Appendix A – The FTB test.

Q1 The new students will not be here for at least another five weeks. ________ the university will let them join on Skype.
   a. However
   b. In addition
   c. Moreover

Q2 Tom and Mary shared an umbrella. ________, it was not big enough and they both got wet.
   a. In addition
   b. As a result
   c. However

Q3 I know it was an accident, but the window is broken __________, and you are going to have to pay for it.
   a. However
   b. Moreover
   c. Nevertheless

Q4 She does not earn much, but she loves her job _______.
   a. Nevertheless
   b. However
   c. Furthermore

Q5 ________ to its trading partners in Europe, Russia saw its economy shrink in the mid 1990’s.
   a. In contrast
   b. However
   c. Thus

Q6 It rained the whole of May. ________ June was a very dry month.
   a. In addition
   b. Futhermore
   c. In contrast

Q7 ________ to being a poet, he is a scholar.
   a. In addition
b. However
c. Furthermore

Q8 I want to study German _______ to English.
   a. Furthermore
   b. Moreover
   c. In addition

Q9 She is an excellent dancer. _______, many people are unaware that she also has a beautiful singing voice.
   a. In addition
   b. Conversely
   c. Therefore

Q10 This President is an incompetent leader. _______, his government is financially irresponsible.
   a. Furthermore
   b. In contrast
   c. However

Q11 There is, ______, a reason why climate change is so important, which is that the consequences affect us all.
   a. Moreover
   b. In addition
   c. Thus

Q12 The company is planning to cut staff by over 30 %, ______ reducing costs.
   a. However
   b. In addition
   c. Thus

Q13 He did not do any of the homework, and _____, he failed the course.
   a. Thus
   b. In contrast
   c. Furthermore

Q14 The treasure is not mine, and ______. I am unwilling to take it.
   a. Therefore
Q15 I have never thought of myself as a wise man, and _______ the Nobel prize is not for me.

a. Therefore
b. Furthermore
c. However
Appendix B – Background information

1. Who is your favorite artist?

2. What year are you in?
   a. Year 1
   b. Year 2

3. What is your first language?
   *If you have more than one which do you identify as your best language.*

4. Do you feel that you know how to use connectors like “Therefore”, “However” etc.?
   a. Yes
   b. No
   c. I don’t know
   d. I decline answer

5. How difficult was the questionnaire