

The Perfect in Swedish Dialogue

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1. Introduction

In the first year of my bachelor I chose to do the Reasoning & Language track because this was the area I was and still am most interested in. When it was time to start to find a subject for my thesis I naturally looked in the Reasoning & Language department first and came across the project Time in Translation. I was immediately intrigued by the short description on blackboard which stated that this project was at the interface of computing science and language and explained that it had recently started, so all help is welcome. I felt that this was the right place for me, not only because of my interests, but also because I would be part of something bigger, I would contribute to an existing project working with a PHD student and several professors. So I sent an email right away and I got a reply that I could meet up with them and another student, Marthe, who was also interested in doing her bachelor thesis within this project.

During our first meeting we discussed what subjects would be available and what sparked my interest. Bert le Bruyn suggested that adding another new language to the project would be an option, such as perhaps Swedish. I shortly thought about the past and remembered that I once wanted to learn all Scandinavian languages, sadly I never really did learn them, so this sparked my interest again. However I was also a bit surprised because it seemed difficult and unnatural to do research about a language you cannot understand yourself, on the other hand I also felt very enthusiastic as it could be an exciting opportunity to really contribute to the project, because it would allow me to add a new language to the project. After a couple of minutes of discussing this option and talking about Swedish, Marthe and I both decided to do our thesis about the Perfect tense in the Swedish language.

In short, the Time in Translation project studies the Perfect tense cross linguistically. The aim is to define how the Perfect is used and translation data are used to investigate this. Languages that are already included and examined in the project are English, Dutch, German, French and Spanish. Recently Farsi has also been added to these languages by a student during her bachelor thesis. The data that are used are chapters from the novels *L'Etranger* and *Harry Potter and the Philosopher's Stone* and their translations.

The results given by Le Bruyn, van der Klis and de Swart in *The Perfect in Dialogue* (2019) show that the behaviour of the Perfect may vary according to whether the specific text is in narrative or dialogue, therefore the source-texts are divided into these two sections. The most precise analysis is acquired by investigating these sections separately.

Because Marthe and I both aimed to investigate the Perfect tense in Swedish, we could make such a division easily; we decided that I was to investigate the Perfect in Swedish dialogue and Marthe the Perfect in Swedish narrative. Because *Harry Potter and the Philosopher's Stone* has been used before, and thus, the English source-text could be used ready-made and a Swedish translation of this novel exists we chose to use *Harry Potter and the Philosopher's Stone* and its Swedish translation as respectively the English and Swedish source-texts for our research.

I formulate my research question as follows: How does the Perfect behave in Swedish dialogue in comparison to English dialogue? To better answer this question I have also composed the following subquestions; 1. Does aspectual class have an influence on the use of the Perfect in Swedish dialogue compared to English?; 2. What is the distribution of the Perfect in Swedish compared to English?; 3. Is the Perfect the default tense in Swedish dialogue?

I define the default tense to be the tense that is most used throughout the source-text and the distribution represents how many times the Perfect is used compared to other tenses.

To answer the Research question I began with an investigation on previous research regarding this subject and an analysis of Swedish and English history and verb tenses. Before I could begin with my own analysis I had to carry out some preparatory work to ready the Swedish text for examination. Those preparations included choosing the source-texts. Because using the whole book as a source-text would have been immoderate in this time frame, Marthe and I started with two chapters and if time would have allowed later add more. Thereafter the Swedish pages had to be scanned and taken through OCR software before aligning the Swedish text on paragraph level with the English text and annotating the Swedish verbs. I could then start my analysis on tense uses in Swedish compared to English.

The paper is structured as follows. I will first elaborate why this subject is relevant within Artificial Intelligence. Then, a historic overview of Swedish and English will be given with a strong focus on the Perfect tense. Subsequently, I will gather information about the Perfect tense and study what others have reviewed before. After assembling this information I will be able to formulate hypotheses for the research question. Finally a report of the actual research will be given, starting with the methodology and proceeding to a presentation of the results. Thereafter, I will elaborate on these results and what they indicate within the field of Artificial Intelligence. Subsequently, I will present possible improvements and suggestions for further research and lastly I will conclude with a succinct answer to my research question. The references that were used can be found at the end of the paper.

Now that I have given a brief introduction into my thesis I would like to take you with me in the next step in this process; Elaborating on the relevance for Artificial Intelligence.

2. Relevance for Artificial Intelligence

2.1 The Importance of Language

I have always been interested in language and I believe it is one of the most important aspects when creating an Artificially Intelligent program. No, I do not mean programming languages, but Natural languages. What we perceive as an intelligent being can differ from one another, but one of the major aspects we see in definitions of Artificial Intelligence is that a program is able to produce and react to natural language. One example of the importance of language is the rise of Chatbots; their main focus is to communicate through natural language. Perhaps we do not want to classify all chatbots as intelligent systems, but it shows an interest in a form of Artificial Intelligence; there is a desire for systems that can behave humanly.

The father of the computer era, Alan Turing, invented a test now called the Turing Test. For this test three participants are needed; one computer program and two human beings. One of the human beings will be the questioner that has to chat with both the other human being and the computer separately, without being able to see, hear or speak to them. The questioner has to distinguish which one is the human being and which one is the computer program, if he/she cannot make this distinction the computer program has passed the test, because it successfully acted as a human being. This task is solely based on the capability of the computer to process and produce natural language. (Andrew Hodges, 2002; published in *Parsing the Turing Test: Philosophical and Methodological Issues in the Quest for the Thinking Computer*, 2008)

Alan Turing stated that if a system were ever to pass the test it would be considered Intelligent. So many things have developed since that time, and so have our definitions of Artificial Intelligence. One definition that I agree with is the one represented in the book "*Artificial Intelligence: A Modern Approach*" written by Stuart Russell and Peter Norvig (2010); A distinction between four kinds of Artificial Intelligence is made, including the classification *Behaving Humanly*, where the Turing Test is used as an example. This states that if a program passed the Turing Test it would not be Artificially Intelligent per se, but rather a system that can behave humanly. In line with Russell and Norvig I also believe that a program can be considered Artificially Intelligent if we can classify it as *Acting Rationally*. According to Russell and Norvig the definition of Acting Rationally includes being able to think rationally, that is to make correct inferences, and to be able to think and act humanly, that is to make inferences if there is no provably correct thing to do, respectively to have human behavioral characteristics such as being able to communicate with natural language. From these properties Acting Rationally arises, i.e. real Artificial Intelligence.

This and the following quote from Russell and Norvig shows the importance of language for Artificial Intelligence.

"All the skills needed for the Turing Test also allow an agent to act rationally. (...) We need to be able to generate comprehensible sentences in natural language to get by in a complex society." (Artificial Intelligence: A Modern Approach, p.1-5)

2.2 Natural Translation.

While we now see that natural language is important for Artificial Intelligence, why is the topic of this thesis important? In this paper I will investigate the behaviour of the Perfect in the Swedish language compared to the English language, so why is this relevant?

The world is internationalizing at a rapid pace, that is why it is becoming increasingly important to be able to communicate with people from all over the world; in all kinds of languages. But instead of learning all existing languages we can make use of translation software. This is not only profitable when humans are communicating with each other, but could also be incorporated in software programs and apps to improve accessibility.

Although automated machine translation has come a long way, it is still not perfect. Not only because basic grammar mistakes are still occasionally made, but also because not all languages have the same preference for verb tenses. This means that even if the translation is semantically and syntactically correct it can feel unnatural to native speakers, because they would prefer another verb tense. For example Schaden (2009) has found that English has a preference for the Simple Past as opposed to the Perfect. Examples of the Perfect and Simple Past are shown in (1).

- | | | |
|--------|--------------------------------------|-------------|
| (1) a. | "We walked to the supermarket." | Simple Past |
| b. | "We have walked to the supermarket." | Perfect |

In order to make a translation feel more natural the right verb tense has to be used, that is why it is essential to study the behaviour of specific verb tenses across languages and how these behave in translation. In order to achieve an explanation of how verb tenses are used start with examining just one verb tense; the Perfect.

3. Historic overview

English and Swedish are Germanic languages belonging to the Indo-European language family. This family consists of ten subfamilies; Anatolian, Indo-Iranian, Greek, Italic, Germanic, Armenian, Tocharian, Celtic, Balto-Slavic and Albanian. Germanic is often divided into three regional groups: Swedish, Norwegian, Danish, Icelandic and Faroese belong to the North; Burgundian, Vandal and Gothic belong to the East and English, Dutch, German and Frisian characterize the West. Both Indo-European and Germanic are believed to be not only families but also languages that were once spoken, however no written records of either have been found. Proto-Indo-European and Proto-Germanic are reconstructions of these languages based on their descendants of which written records have been found.

Considering I will compare the Perfect tense in Swedish to English, it is interesting to investigate what verb tenses existed in the languages they descended from and how these tenses developed. The historic overview of both languages gives us an insight whether these languages may have influenced and maybe even adopted some elements from one another and could show us whether similarities between Swedish and English tense use are likely based on their history. Additionally, the history of both languages may help us better understand their current tense systems.

3.1. Proto-Indo-European

The Proto-Indo-European language, henceforth P.I.E., was probably spoken from roughly 4500 to 2500 B.C. Tenses and aspects are important when investigating verbs. Tenses denote the time in which the action occurred and aspect refers to the flow of time. According to Quiles and López-Menchero (2017) P.I.E. had three verbal tenses: the Present, Past and Future. However, the Future tense is believed to come to exist only since late P.I.E., so not all languages that stem from P.I.E. differentiate this tense. P.I.E. had three verbal aspects, that can be divided into the Stative and the Eventive. The imperfective denotes ongoing or repeated actions. The Perfective refers to a single completed action. Both the Imperfective and Perfective are Eventive aspects. The Stative aspect denotes states of an object and is believed to exist since late P.I.E.

Process	Aspect	Tense	Tense (traditional)
Stative	Stative	(unmarked)	Perfect tense
		(unmarked)	Aorist tense
	Eventive	Present	Present tense
		Past	Imperfect tense

Figure 1. Indo-European aspectual system.

Note. Adopted from *A Grammar of Modern Indo-European* (3rd edition, p. 219)

The aspects developed a connection with tense distinction. Figure 1 shows this connection. It is interesting to see that the Stative was not associated either with the Past nor the Present but had its own tensal meaning; the Perfect tense. The fact that the Perfect is not associated with either Past or Present is something we see in Modern English as well; Modern English has Past Perfect (Pluperfect), Present Perfect and Future Perfect.

Quiles and López-Mencheró (2017) state that the P.I.E. Perfect refers to the state resulting from an action. This is opposite to Modern English; there is a focus on the action that has caused this current state.

3.2. Proto-Germanic

According to P. Lehmann (2014) the P.I.E. tenses, Present, Imperfect, Aorist, Perfect, were simplified to only the Present and Past in Proto-Germanic. Since a Future tense did not exist, the Present tense was used to refer to future time. Some P.I.E. Perfect forms developed into Past tense or Preterite-Presents in Proto-Germanic. According to Fulk (2018) the P.I.E. Perfect had taken on the role of the Past tense.

The Preterite-Presents are verbs that are in Past tense but refer to present time. An example of this is that the word *wait* “I have seen” shifted its meaning to “I know”. (example from *A Grammar of Proto-Germanic*, 2014) It is because you have seen something (action), now you know it (state). The focus on the state rather than the action is similar to P.I.E Stative. Note that these verbs used to describe an action and were therefore eventive, but shifted their meaning to denote a state resulting from that action and therefore became stative. Without knowing the semantics of these words and only being able to see the syntax one would thus still suspect them to be eventive; they traditionally were, however because of the shift in the semantics we denote these with stative aspect instead of eventive aspect. One might thus argue that these verb phrases have stative aspect semantically, but are syntactically eventive.

3.3. English

Proto-Germanic was spoken in a large area and had several different dialects that later developed into languages. As said earlier these can be grouped into North, East and West Germanic languages. One of the West Germanic languages is Anglo-Saxon, or Old-English.

Old-English still only had Past and Present tense and used the Present to refer to future time. According to Hogg (2012) the Past Perfect did exist in Old English and was made with *beon* “be” or *habban* “have” and a past participle, but was not as common as today. Rissanen and Matti (1996) support this view stating that the Past Perfect was sometimes used in Old English, but was not fully grammaticalized yet.

While Old-English developed into Middle-English the Anglo-Saxon peoples were invaded several times by the Vikings who spoke Old-Norse. Helfenstein (1870) states that Old-Norse had a great influence on the development of Middle-English. According to Pardo (2008) the

influence of Old-Norse had a bigger impact on the common people, and therefore on colloquial Middle-English, then on formal, written Middle-English; the latter was influenced by French. This could mean that Old-Norse had more impact on dialogue than on narrative; dialogue is a representation of real conversations, while narrative discourse represents a descriptive story. Old-Norse is also a Germanic language and is the parent language of Old-Swedish. According to Isabelle Maria Soares (2016) “The scandinavian influence over England was widespread in terms of linguistic structures encompassing not only vocabulary, but also syntax and other grammatical changes.” Emonds and Faarlund (2014) found that Old-English had, like Dutch, an object-verb pattern (OV), however Modern-English is, similar to Scandinavian, a verb-object language (VO). They concluded this was due to Old-Norse and could not be an influence from any other language.

The Past Perfect became more common in Middle-English compared to Old-English. It was not yet possible, however, to use a Perfect in the Present tense. The future time was first expressed using the Present tense, but could in Middle-English be done using the Future tense. In Modern-English the Perfect was no longer restricted to the Past tense, but could be used in all three tenses.

Modern-English has three tenses; Past, Present and Future, and four constructions; Simple, Continuous, Perfect and Perfect Continuous. The constructions are associated with the distinction in Perfective and Imperfective aspect, however, this is a widely discussed topic in linguistics and there is no consensus yet. It would, therefore, be immoderate to go into it further. In figure 2 the verb “to eat” is used to illustrate every conjugation in first person in Modern-English.

	Simple	Continuous	Perfect	Perfect Continuous
Present	<i>eat</i>	<i>am eating</i>	<i>have eaten</i>	<i>have been eating</i>
Past	<i>ate</i>	<i>was eating</i>	<i>had eaten</i>	<i>had been eating</i>
Future	<i>will eat</i>	<i>will be eating</i>	<i>will have eaten</i>	<i>will have been eating</i>

Figure 2. Constructions in Modern-English.

3.4. Swedish

One of the North Germanic languages that descended from Proto-Germanic is Old-Norse or Old-Common-Scandinavian, it is the ancestor of Old-Swedish. Old-Norse had three tenses; Past, Present and Future, while Proto-Germanic, its parent language, only had Past and Present. According to Barnes (2008) Old-Norse verbs did not have separate inflections for the Future nor for the Present Perfect and Past Perfect, however both perfect constructions could be made using *vera* “be” or *hafa* “have” plus a past participle. Examples of such perfect constructions are given in (2). (Adopted from *A New Introduction to Old-Norse*; part 1: Grammar, 3rd edition, p. 156-157 examples (3) and (6))

- (2) a. “Fiorfinnr vissi eigi, at Brúsi **haði** upp **gefit** ríki sitt.” Past Perfect
Fiorfinnr knew not that Brúsi had up given realm REFL.POSS.
- b. “Sumir menn segja, at hann **hafi fallit**.” Present Perfect
Some men say that he has fallen.

If there is a focus on the action *hafa* “have” is used and if there is a focus on the state resulting from the action *vera* “be” is used. If the auxiliary in the perfect construction is *hafa* “have” the past participle is called *supine*. Note, though, that the perfect constructions are not the same as the Perfect tense; these constructions develop in Old-Swedish into a Perfect tense made using *hafa* “have” and a supine, the *vera* “be” never developed as a Perfect. The Preterite-Presents that existed in Proto-Germanic continued to exist; the Old-Norse *hon veit* originally meant “she has perceived” but shifted its meaning to “she knows”.

During the development into Old-Swedish and Modern-Swedish, the verb system nearly stayed the same. Although Larsson (2009) states that have-perfect constructions were less common in Old-Swedish, be-perfects became restricted later in Old-Swedish. The perfect constructions from Old-Norse, therefore, developed into the Old-Swedish have-Perfect, however, the Perfect was less common in Old-Swedish than it is in Modern-Swedish. (Larsson, 2009)

Unlike in English, in Swedish verbs do not inflect verbs based on person or number. Figure 3 shows conjugations of five different Swedish verbs; *ha*, *vara*, *plugga* and *tycka*.

	ha (to have)	vara (to be)	plugga (to study)	tycka (to think)
Imperativ (= stem)	<i>ha</i>	<i>var</i>	<i>plugga</i>	<i>tyck</i>
Presens	<i>har</i>	<i>är</i>	<i>pluggar</i>	<i>tycker</i>
Imperfekt (Past)	<i>hade</i>	<i>var</i>	<i>pluggade</i>	<i>tyckte</i>
Perfekt	<i>har haft</i>	<i>har varit</i>	<i>har pluggat</i>	<i>har tyckt</i>
Pluskvamperfekt Past Perfect	<i>hade haft</i>	<i>hade varit</i>	<i>hade pluggat</i>	<i>hade tyckt</i>
Futurum	<i>tänker / kommer att / ska ha</i>	<i>tänker / kommer att / ska vara</i>	<i>tänker / kommer att / ska plugga</i>	<i>tänker / kommer att / ska tycka</i>
Konditionalis	<i>skulle ha / haft</i>	<i>skulle vara / varit</i>	<i>skulle plugga / pluggat</i>	<i>skulle tycka / tyckt</i>

Figure 3. Verb-aspect system in Modern-Swedish.

The Imperfekt is, like the English Past, used to denote something that is now over and completed. The Imperfekt can be accompanied by an expression of time, e.g. *i går* “yesterday”. The Perfekt is used to denote something that started in the past, similar to the English Present

Perfect. The Perfekt can be accompanied by an expression of time that is not specific, e.g. *redan* “already”, or a time that is not over yet, e.g. *den här veckan* “this week”, or with no time specification at all. The Perfekt and the Present Perfect are used when the timing of the event is less important. (3a) is an example of the Imperfekt with a specific time in the past, (3b) is an example of the Perfekt with a non-specific expression of time and (3c) is an example of a Perfekt with a specific time in the past, this combination is not allowed. (example adopted from *Verbs: Learning Swedish 2017*. By Swedish Institute)

- | | | |
|--------|--|-----------|
| (3) a. | <i>Han köpte dem i förra veckan.</i> | Imperfekt |
| | “He bought them last week.” | |
| b. | <i>Har du bott i en korridor tidigare?</i> | Perfekt |
| | “Have you stayed in a corridor before?” | |
| c. | <i># “Har du bott i en korridor i går?</i> | # Perfekt |
| | “Have you stayed in a corridor yesterday?” | |

4. Background

In this section I will review existing literature about the Swedish and English Perfect to better understand and predict the behaviour of the Swedish Perfect. Additionally, it may help interpreting my own results. First I will examine the time frames associated with Swedish and English tenses and their differences, then I will look into the so-called *perfect variation* as described by Rothstein (2006). Subsequently, I will go over some research conducted about the Perfect in other languages and finally, I will examine an analysis of the Perfect broader than sentence level.

Time frame of the Perfect

Larsson (2009) speaks of a Perfect common to all Germanic languages; *“Despite the varying properties of perfects in the present-day Germanic languages, I assume that there is reason to talk about one perfect tense, common to all the languages.”* According to Larsson (2009) and Reichenbach (1947) the Swedish and English Simple Past and Present Perfect both refer to events prior to speech time, they therefore express temporal anteriority. However, the English Present Perfect and the Swedish Perfekt cannot be combined with a past time adverbial, e.g. “yesterday”, but it can be combined with a present time adverbial, e.g. “today”. This might be because the Present Perfect is said to represent an action in the past that is of importance at a later time. (Larsson, 2009; original source: Comrie 1976:52, Dahl 1985)

Reichenbach (1947) introduced three notions; Speech time (S), Reference time (R) and Event time (E). For the Simple Past the Event time and Reference time coincide before the Speech time, while the Event time falls before the Reference and Speech time for the Present Perfect. The Past Perfect states that the Event time is followed by the Reference time which is followed by the Speech time. (For a full explanation of Reichenbachian terms see Reichenbach, 1947, or Rothstein (2006) for an analysis of these terms) The Reichenbachian notions for English tenses are represented in (4). Note that this representation is my own and has not been proposed by either Reichenbach, Rothstein nor Ida Larsson, although similar presentations have been given. It is a representation of Reichenbachian notions in time; “+” shows that the corresponding points in time coincide, while “→” represents that one point in time follows the other, e.g. (E) + (R) means that the Event time and Reference time coincide, while (E) → (R) means that the Event time is followed by the Reference time.

(4) a.	(E)+(R) → (S)	Simple Past
b.	(E)+(R)+(S)	Simple Present
c.	(S) → (R)+(E)	Simple Future
d.	(E) → (R) → (S)	Past Perfect
e.	(E) → (R)+(S)	Present Perfect

f. (S) → (E) → (R) Future Perfect

The Swedish Presens can also be used to refer to an event that happened in the past, under the condition that it is still happening now, and can also be used to refer to an event extending to the future. Additionally, the Swedish Perfekt, unlike the English Perfekt can refer to an event in the future and thus can be used as a future perfect. (Rothstein (2006) and Larsson (2009)) The former is due to the meaning of adverbials in the sentence, such as “since”, and not the verb itself. (von Stechow, 2002) (5a) is an example of a Swedish Presens extending to the past with a since-adverbial, (5b) of Presens extending to the Future and (5c) is an example of a Swedish Perfekt extending to the future. (Adopted from *Participles in time: The development of the perfect tense in Swedish.*, p. 52 & 83 & 91)

- | | | |
|--------|--|-------------------------------|
| (5) a. | <i>Hon är sjuk sedan igår.</i>
She is sick since yesterday.
“She has been sick since yesterday.” | Presens extending into past |
| b. | <i>Hon åker imorgon klockan två.</i>
She leaves tomorrow clock two.
“She will leave tomorrow at two o’clock.” | Presens extending into future |
| c. | <i>Nästa vecka har jag läst klart boken</i>
Next week have I read finished the book.
“Next week, I will have finished reading the book.” | Perfekt extending into future |

Example (5) shows that (4) is not applicable to Swedish tenses because the Swedish Present can refer to an Event the past, the Event time and Speech time, therefore, cannot fully coincide. Larsson (2009) and Rothstein (2006) follow Iatridou et al (2001) in their argument that the Event time and Reference time are intervals rather than points in time and that the Perfect has a so called Perfect Time Span in which the Event time is partially or completely included. Rothstein calls this the *ExtendedNow*-analysis. They then state that in English and Swedish the Speech time is also included in the Perfect Time Span of the Present Perfect. Larsson (2009) argues that if past time adverbials refer to the Perfect Time Span, and not to the Event time, it can justify why these adverbials cannot be used in the Present Perfect in both Swedish and English; the Perfect Time Span of the Present Perfect includes the Speech time, while the past time adverbials such as “yesterday” describe an event that happened and was completed in the past. Example (6) below illustrates this.

- | | | |
|--------|--|-----------|
| (6) a. | “Alexander has always lived in Hengelo.” | Perfect |
| b. | # “Alexander has always lived in Hengelo, until recently.” | # Perfect |

(6a) suggests that Alexander is still living in Hengelo, because the Perfect Time Span includes the Speech time, so Alexander living in Hengelo should still hold at Speech time. But (6b) implies that Alexander does not live in Hengelo anymore and would therefore need the Speech time to be excluded from the Perfect Time Span, therefore adding “until recently” to (6a) would be impossible.

However, as mentioned before, the Swedish Present can extend in the past and the Swedish Perfekt can extend to the future, while in English this is both impossible, so there must be a way to account for the differences in English and Swedish. Larsson (2009) argues that the English Present is coextensive with the Speech time and is, thus, a point in time, while the Swedish present introduces an interval that can extend to the past. She infers, based on a biclausal analysis of the auxiliary verb “have”, that the Swedish Present Perfect then allows the Speech time to precede the Reference time. (for a full description of this analysis see Larsson, I. (2009), *Participles in time: The development of the perfect tense in Swedish.*, sections 3.3.2 - 3.5.2) This means that the Swedish Present Perfect states that the Event time is before the Speech time and that the Reference time either coincides with or follows the Speech time. (7) illustrates time intervals for Swedish based on the Reichenbachian notions for English and the analyses made by Larsson (2009) and Rothstein(2006). I want to emphasize, again, that this is my own representation and interpretation and has not been presented in this exact manner by either Larsson or Reichenbach. In the Swedish representation I also used two more symbols; “ \leq ” means that one interval may precede (and overlap) the other interval, but they may also be completely concurrent. However the first can never occur later than the second, e.g. $(E) \leq (R)$ means that the Event time can be anywhere from before the Reference time up to and including the end of the Reference time. “ \geq ” is indeed the same, only the other way around; two intervals may start at the same point in time, but the first can be extended further in time, e.g. $(E) \geq (R)$ means that the Event time can be anywhere from the start of the Reference time to after the Reference time.

(7) a.	$(E)+(R) \rightarrow (S)$	Imperfekt
b. 1	$(E)+(R)+(S)$	Presens
2	$(E) \leq (S) \ \& \ (R)+(S)$	~ <i>extending to the past</i>
3	$(S) \geq (E) \ \& \ (R)+(S)$	~ <i>extending to the future</i>
c.	$(S) \rightarrow (R)+(E)$	Futurum
d.	$(E) \rightarrow (R) \rightarrow (S)$	Pluskvamperfekt
e. 1	$(E) \rightarrow (R)+(S)$	Perfekt
2	$(S) \rightarrow (R) \ \& \ (E) \geq (R)$	~ <i>extending to the future</i>

Perfect Variation

The fact that the English Present Perfect cannot be combined with specific past time adverbials is sometimes called the *present perfect puzzle* and the fact that the Past Perfect can be combined with such adverbials is sometimes called *the pluperfect puzzle*. (Rothstein (2006) and Larsson (2009)) Rothstein (2006) summarizes the *present perfect puzzle* and the *pluperfect puzzle* as the *perfect variation*. This is illustrated in example (8). (adopted from *A cross-linguistic discourse analysis of the Perfect*, 2007)

- (8) a. # Sara has left at six o'clock. [English]
- b. Sara is om zes uur vertrokken. [Dutch]
- c. Sara est partie à six heures. [French]
- d. Sara ist um sechs Uhr abgefahren. [German]

He describes several attempts to explain the *perfect variation* and why they have failed, all attempts are based on cross-linguistic differences. He describes the semantic contribution of the present tense, the past participle or the auxiliary verb; the semantics of these elements may contribute to the semantics of the Perfect, so a cross-linguistic semantic variation in these elements could have contributed to the cross-linguistic variation in the semantics of the Perfect. Next, Rothstein (2006) depicts why auxiliary selection might have been responsible for the *perfect variation*; some languages can construct Perfects based on “have” and “be” while others can only use one of these auxiliaries to create a Perfect. Subsequently, he explains why scope difference of the adverbial might have been accountable; in some languages the adverbial scopes over the past participle, while in other languages it is the other way around. Additionally, he states that factors independent from the present perfect, so on a more general level, cannot explain the *perfect variation* either, because from this it would follow that the Past Perfect can also not be combined with past time adverbials, however this is a contradiction because the Past Perfect can be combined with such adverbials. According to Rothstein (2006) the scope of the auxiliary verb could explain *perfect variation*; he says that the auxiliary can scope over the past participle in some languages, while in others its the other way around; “*The relation to the perfect variation is obvious: under the assumption that the past participle contains the anteriority meaning of the perfect (...), it selects past time adverbials such as yesterday that modify the event time.*” (*The perfect time span*, p.79) He adds to this that the explanation of the *perfect variation* depends on the meaning of the Perfect and that the relation of the Present tense to the Present Perfect and the cross-linguistic variation of the Present tense must contribute to the cause of the *present perfect puzzle*.

The Perfect across languages

Le Bruyn, van der Klis and de Swart (2019) have investigated what regulates the use of the Perfect in dialogue in Dutch in comparison to English in an exploratory analysis based on *Harry Potter and the Philosopher's stone*. They have found that Dutch makes more use of the Perfect in dialogue than English. Additionally, after splitting the data not only on tense use, but also on

aspectual class, they have found that most Perfect forms in Dutch have been found in eventive verb phrases and the most Past forms have been found in stative verb phrases, and this mapping from state to Past and event to Perfect was most clear where English used the Past. They claim that the Dutch Perfect refers to a state that held at some point, but that it is no longer true at speech time. Because events have intrinsic endpoints, unlike states, they fit well with the Perfect and according to le Bruyn, van der Klis and de Swart (2019) this is why they have found a mapping from events to Dutch Perfect. An example is given to illustrate that in English, events described with the Perfect hold at the time of speech, while in Dutch these events no longer hold at the time of speech and thus another tense is needed;

- | | | |
|--------|--|-----------------|
| (9) a. | “How long have I been in here?” | Present Perfect |
| b. | <i>Hoe lang lig ik hier al?</i>
How long lie I here already?
“How long am I here already?” | Present |

In (9) the subject is still lying “here” and this is expressed by the Perfect tense in English in (9a), however in Dutch the present is used; if this would have been articulated using the Perfect, e.g. *Hoe lang heb ik hier gelegen?*, the sentence would suggest that the subject is not lying here anymore. Le Bruyn, van der Klis and de Swart (2019) conclude that because the Perfect in Dutch denotes events in the past that no longer hold at speech time, it is the default choice for eventive verb phrases. Note that Dutch is, like English, a West Germanic language and recall that Swedish is a North Germanic language. According to Harbert (2007), though, Proto-Germanic first split in NorthWest-Germanic and East-Germanic before a split in the Northern and Western dialects happened.

De Swart (2007) gives an analysis of the Perfect tense across English, French, Dutch and German. The Present Perfect can be combined with a past time adverbial in all four languages, except English; this is the *perfect variation* described above, illustrated in example (8). De Swart (2007) wants to emphasize the relevance of the narrative use of the Present Perfect in French and German, while in Dutch and English the Present Perfect is not preferred in narrative discourse. Concerning the relation between aspectual class and the Perfect; “*The Perfect is an extensional operator that operates on an eventuality e and introduces the result state s of that eventuality as immediately following e.*” (de Swart, 2007) This is in line with what le Bruyn, van der Klis and de Swart (2019) have found about the Dutch Present Perfect; the results suggested a mapping from events to the Dutch Present Perfect.

Schaden (2009) has found that French and German make more use of the Perfect, than English and Spanish. The latter languages make more use of the Simple Past. De Swart (2007) and Le Bruyn, van der Klis and de Swart (2019) have found that Dutch lies in the middle of this division of distribution of the Perfect tense. It is interesting to see where Swedish belongs in this division. De Swart (2007) made the three following claims in *A cross-linguistic discourse analysis of the Perfect.*;

1. The English Present Perfect blocks any temporal relation whatsoever with the event time E. As a result, it does not allow modification by time adverbials (relation with another time) or a narrative use (relation with other events).
2. The Dutch Present Perfect resists temporal relations between E and other eventualities, but not other times. As a result, it allows modification by time adverbials, even though it cannot be used in narrative contexts.
3. The French and German Present Perfect are not subject to any further constraints, which guarantees that they freely combine with time adverbials and can establish discourse relations with other events.

It will be interesting what can be said regarding the Swedish Present Perfect and temporal relations and whether this may help us better understand the Perfect in general.

Analysis on a higher level

The descriptions and attempts to analyse the Perfect that have been presented so far are all on sentence level, however de Swart and Verkuyl (1999) give an overview of an analysis put forward by Lascarides and Oberlander (1993) and Lascarides and Asher (1991, 1993) based on the relations between sentences on a higher level. They argue that rhetorical relations indicate the structure of a narrative text and that such relations have temporal properties; if a rhetorical relation holds between two sentences, then there is a structure between the time of the first and second sentence. They, therefore, assume that events are in a logical structure. The basis of rhetorical relations and relations with temporal structure is the Penguin Principle; if more rules apply to a set of sentences, the most specific relation has priority. The system proposed is called DICE, Discourse and Common Sense Entailment, however nowadays this framework is called SDRT, Segmented Discourse Representation Theory (Asher & Lascarides (2003)), and it uses linguistic and extra-linguistic, above sentence level, knowledge. A discourse interpretation rule for the Past Perfect is proposed: *“A sentence S in the Pluperfect needs to find a sentence S0 in the Simple Past with which S establishes a rhetorical relation R implied in the relation of anteriority: R = Explanation or ...”* (de Swart and Verkuyl, 1999, p. 162 & 163). They do not give rules for the other tenses, however, they do state that the Pluperfect is just an example and that this process shows that tense and aspect can be analysed at the discourse level using SDRT.

5. Hypotheses

In this section I will state my hypotheses, based on the historic overview and background. Recall the research question: How does the Perfect behave in Swedish dialogue in comparison to English dialogue? And the subquestions: 1. Does aspectual class have an influence on the use of the Perfect in Swedish dialogue compared to English?; 2. What is the distribution of the Perfect in Swedish compared to English?; 3. Is the Perfect the default tense in Swedish dialogue? I will go through these questions by first stating my hypothesis for each subquestion one by one and then expressing my general hypothesis for the main research question.

First hypothesis

Does aspectual class have an influence on the use of the Perfect in Swedish dialogue compared to English?

The first Perfect forms we know of existed in P.I.E. and were Stative and as noted before they denoted states resulting from actions. These perfects developed into Proto-Germanic pasts and preterite-presents. The example given of the Proto-Germanic *wait* “I have seen” shifting its meaning to “I know”, might show us that even though the meanings of the perfects were stative in P.I.E. and Proto-Germanic, they originally described events; in the example given above this event is “to see”. Without knowing the semantics of these words and only being able to see the syntax one would thus still suspect them to be eventive; they traditionally were, however because of the shift in the semantics we denote these with stative aspect instead of eventive aspect. One might thus argue that these verb phrases have stative aspect semantically, but are syntactically eventive. I also expressed that the Modern-English Perfect tenses focus on the actions rather than the states result from actions, therefore the focus lies on the event. Based on this I believe that the English Present and Past Perfect are preferred in eventive verb phrases. We know that during the Viking age, Old-Norse had great influence on the development of the English language, however, because the Vikings settled among the Anglo-Saxons for a longer period of time it might be plausible that English had an influence on the development of Swedish as well.

Additionally, we have seen that in Dutch a mapping exists from events to the Perfect and states to the Simple Past and some have stated that such a mapping generally exists for the Perfect. Additionally, Larsson (2009) speaks of a Perfect tense common to all Germanic languages. On account of Swedish history and previous research on eventive and stative verb phrases, I expect that the Swedish Perfect is preferred in eventive verb phrases. This could show itself in the results in two manners; the proportion of Perfekt + Pluskvamperfekt is higher than the proportion of Imperfekt in eventive verb phrases and/or the proportion of eventive verb phrases is higher than the proportion of eventive verb phrases in verb phrases where the Perfekt or Pluskvamperfekt are used.

Second hypothesis

What is the distribution of the Perfect in Swedish compared to English?

In English the Past-Perfect developed in Old-English and became common since middle-English, however, the Present Perfect only came to exist since Modern-English. In Swedish, on the other hand, both Perfects, Perfekt and Pluskvamperfekt, developed from perfect constructions in Old-Norse and became full Perfects in Old-Swedish and common in Modern-Swedish. Even though the Present Perfect developed later, both English and Swedish developed the first forms of Perfects after they split off from Proto-Germanic as separate languages. Additionally, during the development in Middle-English Old-Norse has had a great influence on English, which is shown not only by the vocabulary but also by sentence structure as stated by Emonds and Faarlund (2014), this could go beyond sentence structure to maybe even tense preferences. Larsson (2019) also stated there is reason to speak of a Perfect tense common to all Germanic languages, this may be extended towards the use of the Perfect across this language family. I, thus, predict that the proportion of the Swedish Perfect tenses, i.e. Perfekt and Pluskvamperfekt, compared to the Imperfekt will be roughly the same as the proportion of Past and Present Perfect compared to the Past tense in English.

Third hypothesis

Is the Perfect the default tense in Swedish dialogue?

We have seen that in English the distribution of the Perfect is very narrow; the Simple Past is preferred over the Perfect tense in dialogue. My second hypothesis states that the proportion of the Swedish Perfect tenses compared to the Imperfekt will be very similar to the proportion of the English Perfect tenses compared to the Simple Past. Therefore, I deduce that the Swedish Perfect will not be the default tense; I rather expect the Imperfekt to be preferred over the Perfekt, however I cannot make justified assumptions whether the Imperfekt will be the default tense.

General hypothesis

How does the Perfect behave in Swedish dialogue in comparison to English dialogue?

I believe the Swedish Perfect tenses, i.e. Perfekt and Pluskvamperfekt, to be very similar to the English Perfect tenses as described in hypothesis one, two and three.

As mentioned before the Swedish Perfekt can be used to refer to the future, as a future perfect, while the Present Perfect cannot. The Swedish Perfekt states (1) $(E) \rightarrow (R) + (S)$ or (2) $(S) \rightarrow (R) \ \& \ (E) \geq (R)$, while the Present Perfect only captures the first reading. However, (2), captures both to the English Future Perfect, $(S) \rightarrow (E) \rightarrow (R)$, and the Simple Future, $(S) \rightarrow (R) + (E)$. I, thus, expect that Perfekt will sometimes be used when in English the Future Perfect or the Simple Future is used. To state more clearly; I predict that the Future Perfect and Simple Future can be translated to a Perfekt in Swedish. I shall refer to this as the fourth hypothesis. This is partially supported by the fact that Larsson (2009) translated the Perfekt extending to the future, in example (5c), as an English Future Perfect. I, thus, predict that the Future Perfect is more likely to be found where Swedish used the Perfekt, than the Simple

Future. One might still want to capture a Perfect notion and thus the Future Perfect would be a better fit than the Simple Future.

The Swedish Presens can extend into the past and the future, while the English Simple Present cannot do either. However, the second reading of the Presens, $(E) \leq (S) \ \& \ (R)+(S)$, captures the English Present Perfect; $(E) \rightarrow (R) + (S)$. The third reading, $(S) \geq (E) \ \& \ (R)+(S)$, is not similar to any of the English tenses, though, it is a representation of an event in the present extending to the future. Therefore, I anticipate that not only the English Present, but also the Present Perfect and Simple Future can be translated to a Swedish Presens. This is supported by the fact that Larsson (2009) translated the Presens extending to the past, in example (5a), to an English Present Perfect and the Presens extending to the future, in example (5b), to an English Simple Future. Even though the Swedish Presens can be used to refer to events extending to the past I have reason to believe that the Past Perfect and Simple Past will not necessarily translate to a Presens in Swedish. The Presens can only be used to refer to events in the present that *extend* to the past, while the Simple Past and Past Perfect refer to events that fully took place in the past and therefore not ongoing in the present. I shall refer this as the fifth hypothesis.

Lastly, I believe that the Pluskvamperfekt has a similar meaning as the Past Perfect based on Reichenbachian notions and the analyses made by Rothstein (2006) and Larsson (2009); both have an Event time before the Reference time, which is then followed by the Speech time; $(E) \rightarrow (R) \rightarrow (S)$. I, therefore, predict the Past Perfect will be mostly translated to Pluskvamperfekt. The hypothesis stated above is the sixth and final hypothesis.

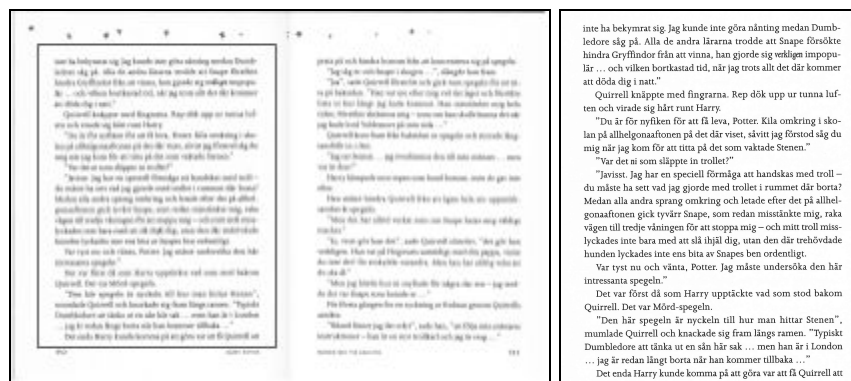
6. Methodology

6.1 Preparation of the source-text

First the corpus has to be chosen. As I stated before, in the project Time in Translation the first Harry Potter novel, *Harry Potter and the Philosopher's Stone*, has been used several times as a source-text before, so the English text based on this is ready-made. To be able to make a comparison between Swedish and English a similar Swedish source-text is needed. That is why the Swedish version of the first Harry Potter novel, *Harry Potter och de Vises Stan*, will be used as the Swedish source. Because using the whole book would be immoderate in a short time frame, Marthe and I started with only two chapters; chapter 1 and chapter 17, because these include a lot of narrative discourse and dialogue respectively, and if time had allowed we could have added more later. Next, the pages of the book have to be scanned in; Scan the pages on highest quality, highest sharpness, highest contrast and switch on background suppression. One scan will automatically include two book pages, as seen in figure 4a.

If you do not have one, download a pdf editor. I used the one available through Utrecht University, so first I downloaded and setup Citrix Workspace App, then logged in on myworkplace.uu.nl and went to the apps to open Adobe Acrobat DC. Because the scans contain two pages each, we have to extract both pages. The pages also contain star drawings in the header and the name of the novel and the page numbers in the footer. We do not want this to go through the OCR as it is not part of the text itself that we are after and it may cause complications as it could be recognized as (non-existing) text.

Crop the scans one by one such that only the text of the first page (left) is extracted, so leave out the header and footer, and save into a separate pdf file. This is necessary because the text from both pages has to be extracted from each scan, in order to do this we have to keep the original scan, so that we can extract the text from the second page (right) likewise. Adobe Acrobat Pro DC automatically turns the pages so they are straight up. Figure 4.a. shows a rectangle on the left page to show how the scan should be cropped to extract the text from the first page. Figure 4.b. shows the result of saving the cropped image to a separate file.



(a) (b)
Figure 4. Example of how to extract text from scans.

Merge all single pdf files into one pdf file, I used Adobe Acrobat DC for this. It is preferable that the pages are in the right order when merging; all page numbers are cut off, so it is not easy to recognize the page order, especially not when you cannot read Swedish. This will aid in aligning the paragraphs to the English corpus later on.

Give the pdf file as input to a high quality OCR software. Bert le Bruyn performed this step for me, he used ABBYY. The OCR recognizes text in the pdf and outputs it as a text document. Next, the text has to be aligned on paragraph level to the English corpus. This can be done in several ways, but I believe it is easiest to split your screen horizontally in half; on one side the ready-made English corpus on the other side the text document acquired by the OCR. Now, make sure that the Swedish paragraphs are aligned to the English ones and that there is a white line between every paragraph.

6.2 Annotation

Now that the Swedish source-text is ready, the verb phrases have to be matched with the verb phrases in English. This is done by hand using the TimeAlign software. This software presents English and corresponding Swedish fragments one by one; In the English sentence a verb phrase is selected in green and you have to select the corresponding verb phrase in Swedish. Once you finish a sentence you can click the “submit” button and TimeAlign will present the next sentence to annotate. The software also gives a couple of options to select before submitting. An example of the TimeAlign software is shown in figure 5.

Annotation

English (original) 17.xml - s198.1

' There are all kinds of courage, 'said Dumbledore, smiling .

Swedish (translated) 17.xml - s198.1

" Det finns alla möjliga sorters mod ", 'sade Dumbledore och log .

- ☐ The selected words in the original fragment do not form an instance of (a/an) *simple past*
- ☒ This is a correct translation of the original fragment
- ☐ The selected words in the original fragment are incorrectly marked as *narration*
- ☐ The translated fragment is not in the same structure (dialogue/narrative) as the original fragment

Comments

Comments

Submit

Figure 5. Example of TimeAlign.

At first I needed some time getting used to the Swedish sentences, so the first few fragments I did took a little longer. However, once I got used to the process it all went faster than I originally predicted. Some translations were not direct, but rather very free, so in these cases finding a corresponding verb phrase was a bit more difficult, but in the end I feel comfortable about each annotation.

6.3 Assigning Swedish tenses

The TimeAlign software gives an excel file as output; it contains every Swedish and English verb phrase. There is a designated column for Swedish tenses which at first is still empty but next the tenses have to be added by hand. First I used a website that gives every conjugation of the verbs *vara* “be”, *hava* “to have” and *visa* “to see”, thus I added these first.

(<https://www.lysator.liu.se/language/Languages/Swedish/Grammar.html#verbs>.) I did so by using the column “w1” and filtered using; *text is exactly* + conjugated verb and then added the correct tense to the column for Swedish tenses. Figure 6 shows an example of the excel file, after all tenses have been added.

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	tense										
																								A	B	C	D	E	F	G	H	I	J	K
id	tense	other l	is corr	is corr	w1	w2	w3	w4	pos1	pos2	pos3	pos4	comm	full fra	source	source	source	source	source	source	source	source	source											
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64071	imperfekt		yes	yes	var				VB					Mr och mi	50563 1.xml	s2.1	were	simple past																
63806	imperfekt		yes	yes	var				VB					Mr och mi	50564 1.xml	s2.1	were	simple past																
63976	imperfekt		yes	yes	godtog				VB					De var de	50279 1.xml	s2.2	didn't hol	simple past																
63778	imperfekt		yes	yes	kunde tänka				VB	VB				De var de	50280 1.xml	s2.2	'd expect	future in the past																
64052	imperfekt		yes	yes	var				VB					De *var* c	50281 1.xml	s2.2	were	simple past																
63848	imperfekt		yes	yes	tillverkade				PC					Mr Dursle	50572 1.xml	s3.1	made	simple past																
63547	imperfekt		yes	yes	var				VB					Mr Dursle	50573 1.xml	s3.1	was	simple past																
63920	imperfekt		yes	yes	hade				VB					Han var er	50353 1.xml	s3.2	did have	simple past																
63908	imperfekt		yes	yes	var				VB					Han *var*	50354 1.xml	s3.2	was	simple past																
63532	imperfekt		yes	yes	tillbringade				VB					Mrs Dursle	50472 1.xml	s3.3	spent	simple past																
63585	imperfekt		yes	yes	kom				VB					Mrs Dursle	50473 1.xml	s3.3	came	simple past																
63571	imperfekt		yes	yes	hade				VB					Mrs Dursle	50474 1.xml	s3.3	had	simple past																
63729	imperfekt		yes	yes	var				VB					Mrs Dursle	50475 1.xml	s3.3	was	simple past																
63972	imperfekt		yes	yes	fanns				VB					Paret Durs	50444 1.xml	s3.4	was	simple past																
63769	imperfekt		yes	yes	hade				VB					Paret Durs	50445 1.xml	s3.4	had	simple past																
63792	konditionalis 1		yes	yes	skul-le avslöja				NN	VB				Mr och mi	50007 1.xml	s4.1	would dis	future in the past																
63834	imperfekt		yes	yes	var				VB					Mr och mi	50008 1.xml	s4.1	was	simple past																
64060	imperfekt		yes	yes	hade				VB					Mr och mi	50009 1.xml	s4.1	had	simple past																
63655	imperfekt		yes	yes	kunde önska				VB	VB			free trans	Mr och mi	50010 1.xml	s4.1	wanted	simple past																
63583	imperfekt		yes	yes	hade				VB					Mr och mi	50011 1.xml	s4.1	had	simple past																
63785	imperfekt		yes	yes	fick				VB					De trodde	50140 1.xml	s4.2	found	simple past																
62813	imperfekt		yes	yes	trouffde				VB					De trouffde	50141 1.xml	s4.2	didn't thi	simple past																

Figure 6. Example of excel file after adding Swedish tenses. The selected column (blue borders) is the column for Swedish tenses.

Next, I create filters using the aforementioned website and by looking up conjugations at nl.bab.la/werkwoorden/zweeds; I recognized patterns and created filters correspondingly. I added the rest of the tenses using these filters, so that I did not have to do so one by one.

Tense	Filter w1	Filter w2	Filter w3
Imperfekt	<i>ends with “de”</i>	<i>is empty</i>	
Perfekt	<i>is exactly “har”</i>	<i>is not empty</i>	
Pluskvamperfekt	<i>is exactly “hade”</i>	<i>is not empty</i>	
Futurum	<i>is exactly “ska”</i> <i>contains “kommer”</i>	<i>is not empty</i> <i>is not empty</i>	
Konditionalis 1	<i>is exactly “skulle”</i>	<i>ends with “a”</i>	<i>is empty</i>
Konditionalis 2	<i>is exactly “skulle”</i>	<i>is exactly “ha”</i>	<i>is not empty</i>

Figure 7. Filters created to add Swedish tenses to excel file acquired by TimeAlign.

After using the specified filters to assign tenses, a couple of hundred verbs were left. I went through them one by one and if I saw that some verbs occurred more than once I filtered to automatically add its tense to all occurrences. Because the file contained more irregular verbs than expected, the process was more time consuming than I originally predicted. There were some verbs of which I really could not figure out its tense, so I marked them with a question mark. Once I finished the whole file, Marthe and I sat down together to check whether our files corresponded; they did partially, and we went through the rest together and updated were needed to make sure that we got all tenses correct.

6.4 TimeMapping

Once Marthe and I were done with assigning Swedish tenses and our files fully corresponded, we sent it to van der Klis and he made the statistics using the TimeMapping software. This software produces descriptive and visual statistics to make a multi-linguistic comparison. To do so n-tuples are made for every existing fragment of corresponding tenses of the n languages. If for one of the languages this fragment does not exist or a translation is not available, no tuple is made for this fragment. The visual statistics are represented in semantic maps; The n-tuples are used as input for an algorithm that calculates the distance between pairs of tuples. The distance is calculated based on their variation in tense; tuples that have a lot of overlapping tenses are closer together than tuples that have a smaller intersection. For the technical settings of the semantic maps I chose to set the dimension on the x-axis to 1 and on the y-axis to 2.

7. Results

The following results are based on chapter 1 and 17 of *Harry Potter and the Philosopher's Stone* and its translation to Swedish. To get an overview of tense use, I will first present the semantic maps of both Swedish and English based on 7-tuples from German, English, Spanish, French, Italian, Dutch and Swedish. Subsequently, I will present tables for precise statistics and analyses.



Figure 8. Semantic map of English based on tense use in German, English, Spanish, French, Italian, Dutch and Swedish dialogue.

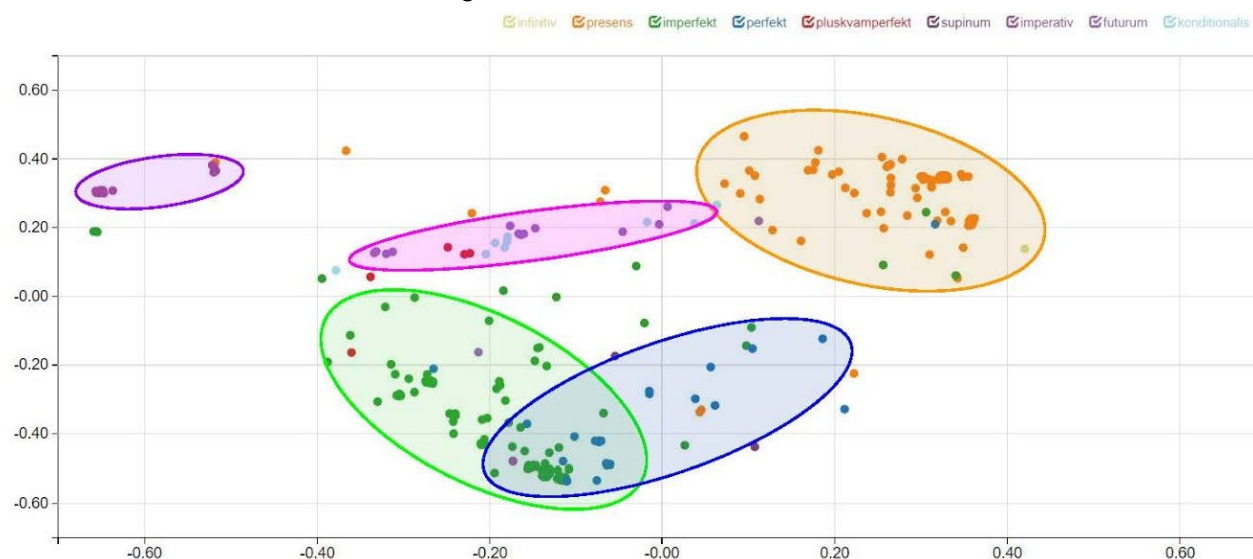


Figure 9. Semantic map of Swedish based on tense use in German, English, Spanish, French, Italian, Dutch and Swedish dialogue. Dimension on x-axis is 1 and the dimension on y-axis 2.

		Presens	Imperfekt	Futurum	Perfekt	Pluskvamperfekt	Konditionals	Imperativ	Infinitiv	Supinum
	total	248	184	24	45	7	14	32	2	5
Simple Present	206	196	6	1	2	-	-	-	1	-
Present cont.	20	17	-	1	1	-	-	-	-	1
Simple Past	172	6	154	-	6	-	-	4	-	2
Past cont.	9	-	9	-	-	-	-	-	-	-
Simple Future	33	11	-	21	-	-	-	-	1	-
Present Perfect	43	11	1	-	31	-	-	-	-	-
Present Perfect cont.	7	1	-	-	5	-	-	-	-	1
Past Perfect	6	-	1	-	-	4	-	-	-	1
Past Perfect cont.	2	-	-	-	-	2	-	-	-	-
Future in the past	19	1	7	1	-	-	10	-	-	-
Future in the past cont.	1	-	-	-	-	-	1	-	-	-
Future perfect in the past	4	-	-	-	-	1	3	-	-	-
Imperative	39	5	6	-	-	-	-	28	-	-

Figure 10. Frequency of tenses in Swedish and English dialogue. Note that a total of 561 verbs have been examined.

	Present Perfect in English			Simple Past in English	
	total	Events	States	Events	States
Perfekt in Swedish <i>Perfect</i>	30	18	7	3	2
Imperfekt in Swedish <i>Past</i>	134	0	0	58	76

Figure 11. Representation of the Past and Perfect in English and Swedish with a split based on aspectual class. Note that the annotated words are a subset of all verbs.

	Dialogue		Narrative discourse	
	English	Swedish	English	Swedish
Present Perfect / Perfekt	43	45	0	0
Simple Past / Imperfekt	172	181	652	704

Figure 12. Perfekt and Imperfekt in Swedish dialogue vs. narrative discourse.

8. Discussion

8.1 Discussing the Results

In this section I will discuss all results; first I will examine the results on the basis of my hypotheses in section 8.1.1 and then I will go over the semantic maps in 8.1.2 and illustrate with some examples.

8.1.1 Examining hypotheses

Using the results, I will go over all six hypotheses and try to verify or falsify each of them.

For my first hypothesis I expected that the Swedish Perfect is preferred in eventive verb phrases and that this could show itself in the proportion of Perfect to Past tense in eventive verb phrases and/or in the proportion of eventive verb phrases compared to stative verb phrases where a Perfect tense is used. Figure 11 shows us that the Swedish Perfekt is more often used to denote events than to denote states in sentences where English uses the Present Perfect or the Simple Past. Thus, the Swedish Perfekt has preference for events over states. This distinction is more obvious where English uses the Present Perfect, although this might be because the Perfekt was predominantly found where English uses the Present Perfect.

Additionally, we can see in figure 11 that events were described using the Perfekt 21 times and using the Imperfekt 58 times and thus, in absolute proportion, events were mostly depicted with the Imperfekt. However, relatively, 70% of all Perfekt forms denoted events, while 43% of all Imperfekt forms denoted events. Thus, not only does the Perfekt have a preference for events, events also have a preference for the Perfekt and the Imperfekt has a slight predilection for states. (10) and (11) present examples of a Swedish Perfekt describing an event and a Swedish Imperfekt describing a state.

- | | | |
|------|---|-----------------|
| (10) | Event | |
| a. | "jag har skrivit ett brev till dem . " | Perfekt |
| | I have written a letter for them | |
| b. | "I 've written them a letter . " | Present Perfect |
| (11) | State | |
| a. | "Han visste alltså . " | Imperfekt |
| | What year this has been | |
| b. | "So he knew . " | Simple Past |

Figure 12 shows that the Swedish Perfekt was never used in narrative discourse, and thus both event and states are described using the Simple Past. From this it follows that the tendency to use the Perfekt in eventive verb phrases is unique to text in dialogue.

My second hypothesis stated that the proportion of the Swedish Perfect tenses, i.e. Perfekt and Pluskvamperfekt, compared to the Imperfekt will be roughly the same as the proportion of Past and Present Perfect compared to the Past tense in English. Figure 10 presents frequencies of all found tenses and tense combinations in Swedish and English in dialogue. Since Swedish does not make a distinction in Simple and Continuous forms, I believe it would be best to investigate the frequencies of the Simple and Continuous forms combined in English. Combining the Simple and Continuous forms of the Present Perfect and Past Perfect we get 58 occurrences in English and 52 occurrences of the Perfekt and Pluskvamperfekt in Swedish, this comes down to 10% and 9% of all examined verbs respectively. In English 181 occurrences of the Past have been found, therefore, the ratio (Past and Present) Perfect to Past in English is 58 to 181, this comes down to 1 to 3,2. In Swedish 184 occurrences of the Imperfekt have been found, the ratio Perfekt + Pluskvamperfekt to Imperfekt, thus, is 52 to 184, this comes down to 1 to 3,5. I believe it is safe to say that my second hypothesis is quantitatively verified; the proportion of the Perfect tenses to Past tense in Swedish is roughly the same as the proportion in English.

Additionally, we see that the Past and Present Perfect are equally used in both languages in general, not just compared to the proportion of the Past (or Imperfekt); If we compare percentage of the use of the Present Perfect and Past Perfect in English to Swedish, the dissimilarity in all cases between English and Swedish is less than or equal to 1 percent. Furthermore figure 10 suggests suggests a similar use of all tenses in Swedish and English; It shows that all English tenses are mostly translated to their corresponding counterpart in Swedish. Additionally figure 12 shows that the Perfekt is used roughly the same amount as the Present Perfect in Dialogue and Discourse, similar to the Imperfekt being used roughly as many times as the Simple Past in both Dialogue and Discourse.

My third hypothesis stated that the Swedish Perfekt is not the default tense and that I rather suspected the Imperfekt to be the default tense. A quick look at figure 10 indeed shows that the Perfekt is not preferred over the other tenses; the Perfekt had only 45 occurrences and the Pluskvamperfekt 7, while the Presens and Imperfekt were found 248 and 148 times respectively. It, thus, turned out that the Imperfekt is the default tense in Swedish dialogue in this source-text. Therefore, my third hypothesis has also been verified with a quantitative analysis.

Swedish Perfekt

My fourth hypothesis stated the Future Perfect and Simple Future can be translated to a Perfekt in Swedish. However, I predicted a preference of Future Perfect over Simple Future where in Swedish the Perfekt was used. Figure 10 presents the frequencies of the Perfekt and its corresponding sources in English. First of all we see that the Perfekt mostly originated from the

Present Perfect, thereafter, in order, Simple Past, Present Perfect continuous, Simple Present, Present continuous. The Perfekt, thus, never originated from the Future Perfect or Simple Future. However, note that no occurrences of the Future Perfect have been found in general. I can neither verify or falsify whether there is a preference of the Future Perfect over Simple future where Swedish used the Perfect. Although the Simple Future did appear, it only has 33 occurrences in general, which comes down to only 6% of all examined verbs. Since this is a very small set we cannot be certain whether some Simple Futures could be translated to a Perfekt either; it might be that if the Simple Future had been used more, a Perfekt counterpart could have been found. Thus, a bigger dataset and/or other source text would be needed to deduce whether the Future Perfect and Simple Future could be translated to a Swedish Perfekt.

Overall these results suggest that the Swedish Perfekt is very similar to the English Present Perfect; It mostly originated from the Present Perfect and Present Perfect continuous, and we know that Swedish does not make a distinction in non-continuous and continuous forms, as can be seen in example (10). (10a) and (10c) show fragments of the Present Perfect and Present Perfect continuous, (10b) and (10d) are the corresponding Swedish fragments.

- (10)a. ' We **'ve had** precious little to celebrate for eleven years . ' Present Perfect
- b. " Vi **har haft** fasligt lite att fira på elva år . " Perfekt
We **have had** dreadfully little to celebrate for eleven years
- c. I **'ve been watching** them all day . Present Perfect cont.
- d. Jag **har iakttagit** dem hela dan . Perfekt
I **have observed** them all day

The Perfekt originated from the Simple Past 6 times. It stands out that 4 out of 6 sentences in Simple Past contain indefinite adverbials such as "never" and "always". One of these is shown in (11).

- (11)a. He never **had** much sense . ' Simple Past
- b. Han **har aldrig haft** nåt vidare förstånd . " Perfekt
He **has** never **had** something more sense

However, because the set of sentences where Simple Past and Perfekt are used is so small, I can not infer whether indefinite adverbials play a role in the translation from Simple Past to Perfekt.

The Simple Present was translated to the Perfekt twice, one of these fragments is shown in (12). This seems to be a coincidence, rather than a pattern.

- (12)a. ' Now , as I **understand** it , the House Cup here Simple Present
needs awarding and the points stand thus:"

- b. " Om jag **har förstått** det rätt är det nu dags att dela ut Perfekt

If I **have understood** it correctly is this now time to share

elevhemspokalen och poängställningen är följande:"

dormitory trophy and score is following:

Swedish Presens

My fifth hypothesis stated that not only the English Present, but also the Present Perfect and Simple Future can be translated to a Swedish Presens. To verify this, occurrences have to be found where the Present Perfect or Simple Future are translated to a Swedish Presens. Figure 10 shows that the Presens mostly originated from the Simple Present and thereafter, in order, the Present continuous, Present Perfect, Simple Future, Simple Past, Imperative, Present Perfect continuous, Future in the past. It makes sense that the Presens mostly came from the Simple Present and Present continuous; the Swedish Presens is used to denote the present time and Swedish does not distinguish in Simple and continuous forms.

- (13)a. ' It 's lucky it 's dark . Simple Present
- b. " Det är tur att det **är** mörkt . Presens
- It is lucky that it **is** dark
- c. ' Hagrid 's **bringing** him . ' Present continuous
- d. " Hagrid **tar** honom med sig . " Presens
- Hagrid **takes** him with himself.

The Present Perfect was next in line as biggest source for the Presens. Figure 10 shows that the Present Perfect was mostly translated to a Perfekt and subsequently to a Presens with eleven occurrences, which comes down to 26% of all Present Perfect occurrences. When investigating the occurrences where a Present Perfect was translated to a Presens, I notice that two constructions are common; "to have" + "got" and "to have" + "to go". In fact, all of the investigated fragments contained either of these constructions. (14a) is an example of a "to have" + "got" construction and (14b) is the corresponding Swedish fragment. (14c) is an example of a "to have" + "to go" construction and (14d) is the corresponding Swedish fragment.

- (14) a. 'Have a Chocolate Frog , I 've **got** loads ...' Present Perfect
- b. Ta en chokladgroda , jag **har** massor ... Presens
- Take a Chocolate Frog, I **have** loads
- c. 'As I say , even if You-Know-Who **has gone** –' Present Perfect
- d. Som jag sa , även om Ni-Vet-Vem **är borta** ... Presens
- As I say, even if You-Know-Who **is gone**...

It is interesting to see that all found Present Perfect - Presens combinations have these constructions, because both are a little different than normal. "Have got" is a unique construction found in English, where in other languages "to have" is used. "Has gone" is constructed from "to have" and "to go", thus two verbs, while *är borta* is constructed with the verb *vara* "to be" and the adjective *borta* "away" / "gone". If we were to translate "has gone" to Swedish using a Perfekt, we would get *har gått*. However, I have not found any fragments where "has gone" was translated to *har gått* "have gone", instead they all contained *är borta* "is gone". All Present Perfects that were translated to a Presens contained either "have got" or "has gone", however, not all Present Perfects containing "have got" or "has gone" translated to a Presens in Swedish; I found one fragment where such a Present Perfect translated to a Perfekt in Swedish. This fragment is shown in (15).

- (51) a. *I mean , he **hasn't gone** , has he ? '* Present Perfect
 b. *Han **har** väl inte **försvunnit** , menar jag ? "* Perfekt
 He **has** surely not **disappeared**, mean I

It stands out, though, that (15a) contains a negation. So, the only Present Perfect containing "has gone" that was translated to a Perfekt instead of a Presens, contains a negation. Additionally, I want to emphasize that all Present Perfects containing "have got" translated to Presens in Swedish. Thus, based on the quantitative analysis, I can conclude that the Present Perfect can be translated to a Presens in Swedish, however, the qualitative analysis suggests that this is only possible when translating "have got" and "have gone" to Swedish.

Next, we will examine whether the Simple Future can be translated to a Presens in Swedish. Figure 10 shows that the Simple Future was translated mostly to a Futurum and thereafter to a Presens with eleven occurrences, which comes down to 33% of all Simple Future occurrences. When examining some fragments where a Simple Future was translated to a Presens I notice that all of the examined fragments in English contain "will" + verb and never "are going to" + verb, even though Simple Future fragments that contain "are going to" have been found. (16a) is an English fragment of the Simple Future constructed with "will" and (16b) is its corresponding Swedish fragment. (16c) is an English fragment of the Simple Future constructed with "are going to" and (16d) is its corresponding Swedish fragment.

- (16) a. *'You **'ll wake** the Muggles !'* Simple Future
 b. *'Sssch !' väste professor McGonagall , ' du **väcker** mugglarna !'* Presens
 Sssh! hissed professor McGonagall, you **awaken** muggles!
 c. *'Well , Voldemort **'s going to try** other ways of coming back ,* Simple Future
isn't he ?'
 d. *'Men Voldemort **kommer** väl **att försöka** ta sig tillbaka på andra* Futurum

But Voldemort **come** surely **to try** take himself back in other
sätt, eller hur ?
 ways, or how?

This may suggest that a Simple Future constructed with “are going to” cannot be translated to a Swedish Presens, while the construction with “will” can. Additionally, I have found fragments where a Simple Future with “will” is translated to a Futurum in Swedish, thus this Simple Future construction does not always translate to a Presens. (17a) is a fragment that contains a Simple Future with “will” and (17b) is its corresponding Swedish fragment.

- | | | |
|---------|------------------------------------|---------------|
| (17) a. | <i>I 'll never drink again !</i> | Simple Future |
| b. | <i>Jag ska aldrig mer dricka !</i> | Futurum |
| | <i>I will never more drink</i> | |

It stands out that the Simple Future constructed with “are going to” in (16c) is translated to a Futurum constructed with *kommer att*, (16d), while the Simple Future in (17a) containing “will” is translated to a Futurum constructed with *ska*, (17b). However, a quick look through several fragments shows that this is just a coincidence; a Future Simple with “will” can be translated to a Futurum with *kommer att* and a Future Simple with “are going to” can also be translated to a Futurum with *ska*. The fragments in (18) illustrate this.

- | | | |
|---------|---|---------------|
| (18) a. | <i>'I 'm going to have a lot of fun with Dudley this summer ... '</i> | Simple Future |
| b. | <i>'Jag ska ha väldigt roligt med Dudley i sommar ... '</i> | Futurum |
| | <i>I will have great fun with Dudley in summer</i> | |
| c. | <i>'But that means he and his wife will die , won 't they ?'</i> | Simple Future |
| d. | <i>' Men det betyder väl att han och hans fru kommer att dö ? '</i> | Futurum |
| | <i>But that means surely that he and his wife going to die</i> | |

Based on the quantitative analysis, I can conclude that the Simple Future can be translated to a Presens, however, the qualitative analysis suggests that only Simple Futures constructed with “will” can be translated to a Presens, however, more research is needed to verify this. Thus I can conclude that the Present Perfect and Simple Future can, in some cases, be translated to a Presens in Swedish and, therefore, my fifth hypothesis is verified.

The Presens also originated from the Simple Past 6 times, however the Simple Present was also translated to the Imperfekt (Swedish Past) 6 times. Therefore I believe that this a normal pattern and not unique to Swedish. When investigating these fragments I noticed that most of them described situations that still hold in the time of speech and it is thus just a matter of

preference whether you want to refer to these situations with Present or Past. (19) presents two of the fragments where Simple Past and Presens were used.

- | | | |
|--------|---|-------------|
| (19)a. | <i>'I always said he was off his rocker , '</i> | Simple Past |
| b. | <i>" Jag har alltid sagt att han är vrickad "</i>
I have always said that he is wicked | Presens |
| c. | <i>I believe your friends Misters Fred and George Weasley were responsible for trying to send you a lavatory seat .</i> | Simple Past |
| d. | <i>Jag tror att dina vänner , de båda unga herrarna</i>
I believe that your friends, those both young men
<i>Fred och George Weasley , bär ansvaret för idén</i>
Fred and George Weasley, carry responsibility for idea
<i>attskicka dig en toaletsits .</i>
sending you a toilet seat | Presens |

Swedish Pluskvamperfekt

My last hypothesis stated that the Past Perfect will be mostly translated to the Pluskvamperfekt. Figure 10 shows that the Pluskvamperfekt is only used where in English the Past Perfect (simple and continuous) or the Future Perfect in the Past are used. Swedish does not have a separate tense for the Past Perfect continuous; all Past Perfect continuous forms were translated to a Pluskvamperfekt. The Future Perfect in the Past was translated to a Pluskvamperfekt once, otherwise it was translated to Konditionalis. (16) shows fragments of the Pluskvamperfekt originating from a Past Perfect continuous and from the Future Perfect.

- | | | |
|---------|---|----------------------------|
| (20) a. | <i>' You 'd be stiff if you 'd been sitting on a brick wall</i>
<i>all day , ' said Professor McGonagall . '</i> | Past Perfect cont. |
| b. | <i>'Ni skulle säkert vara stel om ni hade suttit på en</i>
You would surely be sore if you had sat on a
<i>tegelmur hela dan " , sade professor McGonagall . '</i>
brick wall all day, said professor McGonagall | Pluskvamperfekt |
| c. | <i>Another few seconds and I 'd have got you off</i>
<i>that broom.</i> | Future Perfect in the Past |
| d. | <i>Bara några sekunder till så hade jag fått dig att ramla</i>
Only some seconds till then så had I got you to fall
<i>av kvasten .</i>
off broom | Pluskvamperfekt |

Thus, the Pluskvamperfekt originated only from its English counterparts and is very similar to the English Past Perfect. This is supported by the fact that figure 10 also shows that the Past Perfect was mostly translated to the Pluskvamperfekt; 4 times. Thus, my sixth and last hypothesis is verified.

Now that I have examined my hypotheses based on the results and have tried to verify or falsify them, I will review the rest of the results to get a better understanding of the overall behaviour of the Perfect in Swedish dialogue. The results that remain are figure 8 and 9. In the following section I will give a thorough analysis of the semantic maps presented in these figures.

8.1.2 Semantic maps

The semantic maps in figure 8 and 9 are very similar and thus show us that tense use in English and Swedish correspond to some extent. Analysing these semantic maps thoroughly, we can see the visual representation of some results we have seen thus far and may help visualize my hypotheses as well. In the semantic maps clusters of tenses have formed, I circled all clusters with the associated colors. I will go through each cluster below.

Present and Past

In both semantic maps we see a cluster of the Present tense (orange) in the top right and a cluster of the Past (green) bottom left. The fact that these clusters are so far apart in both languages, means that the tuples constituting those clusters are distinct. This makes sense; the Past and Present denote very different time frames. We do, however, see some Past-tuples (green) in between these clusters; if we click on one of the dots the corresponding tuple is shown. In (21) a tuple is presented that was past (green) in both English and Swedish.

- | | | | |
|---------|--|-----------|----------------------------|
| (21) a. | "Ah - your father happened to leave it in my Possession and I thought you might like it ." | [English] | Simple Past |
| b. | - Ah... Resulta que tu padre me la había dejado y pensé que te gustaría tenerla . - Los ojos de Dumbledorebrillaron - . | [Spanish] | presente
<i>present</i> |
| c. | Il se trouve que ton père l ' avait laissée en ma possession et j ' ai pensé que tu aimerais peut-être l ' avoir | [French] | présent
<i>present</i> |
| d. | "Ah ... si dà il caso che tuo padre lo abbia lasciato a me, e io ho pensato che avrebbe potuto farti piacereaverlo " . | [Italian] | presente
<i>present</i> |
| e. | " Eh - die had je vader toevallig bij mij in bewaring gegeven en ik dacht dat jij hem misschien zou willen hebben , " zei Perkamentus, wiens ogen schitterden van plezier . | [Dutch] | ovt
<i>past</i> |

- | | | | |
|----|---|-----------|--------------------|
| f. | <i>"Aah , es traf sich , dass ihn dein Vater mir anvertraut hat , und ich dachte , dir gefiele er vielleicht ."</i> | [German] | präteritum
past |
| g. | <i>"A , din pappa råkade lämna den i mitt förvar och jag tänkte att du kanske skulle tycka om den."</i> | [Swedish] | imperfekt
past |

It is noteworthy that in example (21) the Germanic languages, English, Dutch, German and Swedish, all use Past tense. It is due to the non-Germanic languages, which all used the Present tense, that this tuple is in between the Past- and Present-clusters.

I also notice that the Past- and Present-clusters in Swedish are a little bit bigger and more towards one another. It seems as though especially the Present-cluster (orange) in Swedish is bigger and contains more tuples. This is probably due to the fact that the Present in Swedish can extend to the future and to the past, while the English Present cannot, and thus has more use than the English present.

Present Perfect

Between the lower end of the Past- and Present-clusters (green and orange) a PresentPerfect-cluster (blue) is presented in both Swedish and English. However, in the English semantic map a very small second cluster of the Present Perfect is shown overlapping the Present-cluster (orange). This cluster in English is probably the representation of the Swedish Presens extending to the past, because the English Present cannot do this; figure 10 has shown us that some Presens in Swedish are Present Perfect in English. Therefore the Present Perfect is needed in some cases where the Swedish Present will suffice. (22) is an example of a tuple in the smaller English Present-Perfect cluster.

- | | | | |
|---------|---|-----------|--------------------------|
| (22) a. | <i>I 've got yeh a present</i> | [English] | Present Perfect |
| b. | <i>" Da fällt mir ein - ich hab ein Geschenk fürdich . "</i> | [German] | präsens present |
| c. | <i>Te he traído un regalo .</i> | [Spanish] | pretérito perfecto comp. |
| d. | <i>" Ah , au fait , ça me fait penser que j ' ai un cadeau pour toi "</i> | [French] | présent present |
| e. | <i>' Questo mi fa tornare in mente che ho unregalo per te ' .</i> | [Italian] | presente present |
| f. | <i>Ik heb wat voor je .</i> | [Dutch] | ott present |
| g. | <i>Jag har en present åt dej .</i> | [Swedish] | presens present |

In the previous section I stated that all Present Perfect fragments that translated to a Presens either used "to have" + "got" or "to have" + "gone". When examining the smaller PresentPerfect-cluster in English I noticed that almost all tuples in this cluster contained "to have" + "got". The tuples in this cluster have a present tense in most other languages, however,

some tuples have other languages that use a perfect tense as well. On the other hand every “to have” + “gone” Present Perfect is located in the bigger PresentPerfect-cluster. In fact, all “to have” + “gone” Present Perfect, except one, appeared in an even smaller cluster within the biggest PresentPerfect-cluster. The only fragment that also contained “to have” + “gone” but that was not translated to a Presens in Swedish is also contained in this mini-cluster. Figure 12 is zoomed in on the PresentPerfect-cluster given in the Semantic maps. 12a shows the English PresentPerfect-cluster and 12b the Swedish Perfekt-cluster.

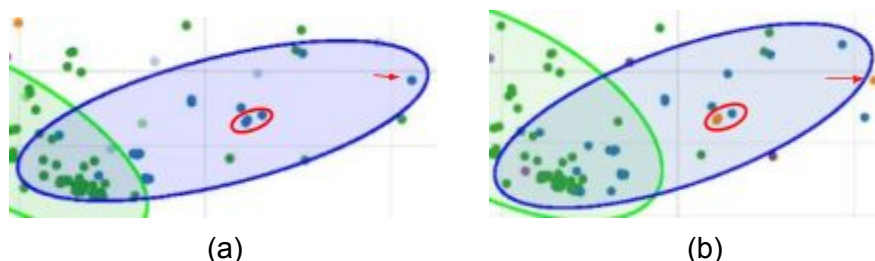


Figure 12. PresentPerfect-clusters in Swedish and English adopted from semantic maps given in the Results.

The mini-cluster containing “to have” + “gone” Perfects is depicted with a red circle, the only one outside this cluster is marked with a red arrow. What is interesting is that the tuple just above the red cluster belongs to the fragment containing the verb phrase “have come”; “to come” has the exact opposite meaning of “to go”. However, it could just be a coincidence that these tuples are so close together.

When clicking on the orange tuples contained in the Swedish mini cluster (red), it stands out that only Swedish uses the Presens for both of these; the other languages use a perfect tense. One of these fragments is shown in (23).

- | | | | |
|--------|--|-----------|--|
| (23)a. | <i>I suppose he really has gone ,
Dumbledore ? ' </i> | [English] | Present Perfect |
| b. | <i>Ich nehme an , er ist wirklich
verschwunden , Dumbledore ?</i> | [German] | Perfekt
<i>present perfect</i> |
| c. | <i>Porque realmente se ha ido ,
¿ no , Dumbledore ?</i> | [Spanish] | pretérito perfecto compuesto
<i>present perfect</i> |
| d. | <i>J' imagine qu' il a vraiment disparu ,
n' est-ce pas , Dumbledore ? "</i> | [French] | Passé composé
<i>present perfect</i> |
| e. | <i>Ma siamo proprio sicuri che
se n' è andato , Silente ? ' </i> | [Italian] | Passato prossimo
<i>present perfect</i> |
| f. | <i>Hij is toch echt verdwenen ,
Perkamentus ? ' </i> | [Dutch] | vtt
<i>present perfect</i> |
| g. | <i>Han är väl verkligen borta ,
Dumbledore ? "</i> | [Swedish] | Presens
<i>present</i> |

Future and Konditionalis

On the higher end between the Past- and Present-clusters (green and orange) we see a purple cluster. This cluster contains the Simple Future as well as the Future in the Past in the English semantic map and it contains the Futurum and Konditionalis in the Swedish semantic map. Because these clusters overlap too much, it would have been difficult to denote them with separate circles, thus I presented these in one circle. The first thing that stands out is that this cluster is bigger in the English semantic map than in the Swedish semantic map. It seems as though the Future-cluster (purple) in English spreads a little more towards the present (the right). This might be accounted for by the fact that the Swedish Presens can be used to refer to events extending to the future, while the English Present cannot. Thus, in some cases where the Presens can be used, the Simple Future is needed in English. An example of a tuple that is in the Presens-cluster in Swedish but in the Future-cluster in English is given in (24).

- | | | | |
|---------|--|-----------|---------------------|
| (24) a. | <i>Not a scar , no visible sign ... to have been loved so deeply , even though the person who loved us is gone, will give us some protection for ever.</i> | [English] | Simple Future |
| b. | <i>Keine Narbe , kein sichtbares Zeichen ... so tief geliebt worden zu sein , selbst wenn der Mensch , der uns geliebt hat , nicht mehr da ist , wird uns immer ein wenig schützen .</i> | [German] | futur I
future |
| c. | <i>Haber sido amado tan profundamente , aunque esa persona que nos amó no esté , nos deja para siempre una protección .</i> | [Spanish] | presente
present |
| d. | <i>Avoir été aimé si profondément te donne à jamais une protection contre les autres , même lorsque la personne qui a manifesté cet amour n ' est plus là .</i> | [French] | présent
present |
| e. | <i>Essere stati amati tanto profondamente ci protegge per sempre , anche quando la persona che ci ha amato non c' è più .</i> | [Italian] | presente
present |
| f. | <i>Geen litteken of iets dat van buiten zichtbaar is ... als iemand zo van je heeft gehouden , blijft dat altijd een soort bescherming geven , ook als die persoon er niet meer is .</i> | [Dutch] | ott
present |
| g. | <i>Inte nåt ärr , inte nåt synligt tecken ... att ha älskats så djupt ger oss nån form av skydd för alltid , även om personen som älskade oss är borta .</i> | [Swedish] | presens
present |

It stands out that in (24) only German and English used the Future, while the other languages all used the Present. However, this is not the case for all English Future fragments that translated to a Presens in Swedish; In most of these fragments more than half of the languages uses the

Future. When investigating some fragments closely from left to right, I first come across one fragment in which only Swedish uses the Presens, a little bit more to the right there is a fragment where only Swedish and Dutch use the Present tense, then a couple where Swedish, Dutch and German all use a Present tense, while the other languages all use Future tense. Subsequently, I notice that the bottom of the English Future-cluster is represented by green tuples in the Swedish cluster, thus Swedish uses the Imperfekt (Past) in these fragments. This might be because English has a Future in the Past, while Swedish does not and therefore may use the past in these cases.

Imperative

The last cluster in the semantic maps is the dark-purple cluster top left; in both languages this is an Imperative-cluster. It stands out this cluster is bigger in the English semantic map than in the Swedish semantic map. This is, however, only due to two tuples and therefore does not say much about the difference in the use of the Imperative in English and Swedish.

8.1.3 Back to the Background

In this section I will go through some claims made by others that I presented in the Background section and examine whether these agree with my results.

Reichenbachian notions

First, I will review the updated Reichenbachian notions for Swedish based on the analyses made by Larsson (2009) and Rothstein (2006). (25) shows the notions updated for Swedish and (26) repeats all Reichenbachian notions for English.

(25)a. 1	$(E)+(R)+(S)$	Presens
2	$(E) \leq (S) \ \& \ (R)+(S)$	<i>~ extending to the past</i>
3	$(S) \geq (E) \ \& \ (R)+(S)$	<i>~ extending to the future</i>
b. 1	$(E) \rightarrow (R)+(S)$	Perfekt
2	$(S) \rightarrow (R) \ \& \ (E) \geq (R)$	<i>~extending to the future</i>
(26)a.	$(E)+(R) \rightarrow (S)$	Simple Past
b.	$(E)+(R)+(S)$	Simple Present
c.	$(S) \rightarrow (R)+(E)$	Simple Future
d.	$(E) \rightarrow (R) \rightarrow (S)$	Past Perfect
e.	$(E) \rightarrow (R)+(S)$	Present Perfect
f.	$(S) \rightarrow (E) \rightarrow (R)$	Future Perfect

Since it is impossible to go through every fragment to determine whether the above statements hold, I will just compare Swedish tense use to English tense use. I, thus, assume that the Reichenbachian notions hold for English tenses. First of all we see that (25a)1 is similar to the English Simple Present, this agrees with my results; figure 10 shows us that the Simple Present was mostly translated to the Swedish Presens and the Swedish Presens mostly originated from the Simple Present. It is, thus, likely that these have a similar meaning. Next, we see that (25a)2 captures both the English Simple Present and the Present Perfect, but also allows for something in between. However, my results suggest that the Swedish Presens can be used where English uses the Present Perfect only when English uses either “to have” + “got” or “to have”+ “gone”. So (25a)2 is too general; it allows too much. My results suggest that the Presens can only extend into the Past when using *hava*, “to have”, or *vara + borta*, “to be” + “gone”. Therefore, the statement should be updated to a more specific notion. However, more research is needed to conclude with certainty what this notion should be exactly. Subsequently, (25a)3 captures the English Simple Present but also allows for the Event time to be after the Speech time, which coincides with the Reference time. My results have shown that the Presens is

sometimes used where English uses the Simple Future, however this was only the case where the Simple Future was constructed with “will” + verb. In the Simple Future the Event time is after the Speech time, this means that the Presens forms described above have their Event time after the Speech time, this agrees with the statement in (13a)3.

When examining (25b)1 we immediately see that it is identical to the statement for the English Present Perfect, this agrees with my results; figure 10 shows us that the Present Perfect was mostly translated to the Swedish Perfekt and that the Swedish Perfekt mostly originated from the Present Perfect. Thus, it is very likely that these have the same meaning. Subsequently, (13b)2 captures the English Future Perfect. However, figure 10, shows that no Future Perfect forms have been found and I can thus neither verify nor falsify the statement in (25b)2. The examined version of (25) is shown in (27).

(27)a.	1	$(E)+(R)+(S)$	Presens	verified
	2	$(E) \leq (S) \ \& \ (R)+(S)$	\sim <i>extending to past</i>	results suggest it holds only under condition <i>a</i>
	3	$(S) \geq (E) \ \& \ (R)+(S)$	\sim <i>extending to future</i>	results suggest it holds only under condition <i>b</i>
b.	1	$(E) \rightarrow (R)+(S)$	Perfekt	verified
	2	$(S) \rightarrow (R) \ \& \ (E) \geq (R)$	\sim <i>extending to the future</i>	not verified or falsified
With	a = Only if English uses; “to have” + (“got” or “gone”) (specific Present Perfect)			
	b = Only if English uses; “will” + verb (Simple Future with “will”)			

Mapping from Events to the Perfect

Le Bruyn, van der Klis and de Swart (2019) claimed that due to events having intricate endpoints and the Dutch Perfect focussing on eventualities with endpoints, a clear mapping from Events to Perfect exists in Dutch dialogue. However, the Swedish Perfekt refers to events in the past that do still hold at speech time and the Perfekt, therefore, does not focus on eventualities with endpoints, but a mapping from Events to Perfect also exists in Swedish dialogue. Although this is reasonably less clear-cut than in Dutch. Thus, adding the Swedish results to the reasoning made by Le Bruyn, van der Klis and de Swart (2019) we cannot conclude, with certainty, that the mapping from Events to Perfect exists because the Perfect focusses on eventualities with endpoints; Swedish is a counterexample for this claim. To deduce whether the Perfect focussing on eventualities with endpoints in *some* languages is in no way related to the mapping from events to Perfect, further research has to be conducted, preferably in other languages; a cross-linguistic comparison of the Perfect and its relation to aspectual class may give clarification.

Temporal Relations

De Swart (2007) made the following claims;

1. The English Present Perfect blocks any temporal relation whatsoever with the event time E. As a result, it does not allow modification by time adverbials (relation with another time) or a narrative use (relation with other events).
2. The Dutch Present Perfect resists temporal relations between E and other eventualities, but not other times. As a result, it allows modification by time adverbials, even though it cannot be used in narrative contexts.
3. The French and German Present Perfect are not subject to any further constraints, which guarantees that they freely combine with time adverbials and can establish discourse relations with other events.

We know that the Swedish Perfekt cannot be combined with past time adverbials and figure 12 shows us that the Swedish Perfekt is never used in my data in narrative discourse. Thus, it seems that the Swedish Perfekt is very similar to the English Present Perfect, which does not allow modification by time adverbials or a narrative use. However, we have seen some differences in the use of the English and Swedish Present Perfect. In example (22) Swedish pairs with all languages except English; English uses the Present Perfect, while the others use the Present. In example (23) Swedish uses the Present and all the other languages use the Present Perfect. It seems as though the Swedish Perfekt is very similar to the English Present Perfect, but also has some similarities with other languages that English does not have.

8.2 Implications within AI

In section 2 I pointed out that automatic machine translation can produce correct sentences that can feel unnatural to native speakers, because languages can have different preferences for verb tenses. Thus, investigating tense preferences across languages can help improve automatic translations between these languages.

As stated earlier Schaden (2009) has found that French and German make more use of the Perfect, than English and Spanish, which have a preference for the Simple Past. Le Bruyn, van der Klis & de Swart (2019) have found that Dutch lies in the middle of these languages. My results have shown that Swedish is very similar to English and therefore prefers the Simple Past as opposed to the Present Perfect. So, we do know now that when translating a sentence containing an English Simple Past or Present Perfect to Swedish, the best choice in Swedish will probably be the Swedish counterpart of the English tense. However, when we want to create automatic translation software we need precise rules that can be taken into account when translating. Based on my results I can calculate the probability of all Swedish tenses in general and given some English tense. Using these probabilities in addition to standard Swedish grammar rules, the automatic translations will not only be correct, but might also feel more natural to native speakers, because tense preferences are taken into account. Figure 10 presents the frequencies for all Swedish tenses. Based on these frequencies probabilities can be calculated using bayes theorem as shown in (28). Bayes theorem states; $P(A | B) = \frac{P(A, B)}{P(B)}$. In words: the probability for A given that we know B is equal to the probability for A and B divided by the probability of B.

(28) Probabilities of verb tenses

- a. $P(\text{perfekt}) = \frac{45}{561} \approx 0,08$
- b. $P(\text{perfekt} | \text{perfect.el}) = \frac{P(\text{perfekt}, \text{perfect.el})}{P(\text{perfect.el})} = \frac{\frac{31}{561}}{\frac{43}{561}} = \frac{31}{43} \approx 0.69$
- c. $P(\text{perfekt} | \text{past.el}) = \frac{P(\text{perfekt}, \text{past.el})}{P(\text{past.el})} = \frac{\frac{6}{561}}{\frac{181}{561}} = \frac{6}{181} \approx 0.03$

In (28) I emphasized that the perfect and past are English tenses (while perfekt is Swedish), by adding “.el” to the English tenses. (28) reveals that the chance of a Perfekt in Swedish is in general 8%, however when translating from a Present Perfect in English this chance increases to 69%. When translating from English to Swedish the translations will, therefore, probably sound more natural if we take into account the probability for a Perfekt based on the tense that was used in English. Based on figure 11 similar calculations to those in (28) can be done for all other Swedish tenses. But what if we want our automatic translator to give even more accurate translations? I have found that the aspectual class of the verb phrase regulates the use of the

Perfekt in Swedish. (29) presents calculations for probabilities based on aspectual class. The frequencies used to calculate these probabilities originated from figure 11.

(29) Probabilities based on aspectual class

$$\begin{aligned}
 \text{a. } P(\text{perfekt} | \text{event}) &= \frac{P(\text{perfekt}, \text{event})}{P(\text{event})} = \frac{\frac{21}{164}}{\frac{79}{164}} = \frac{21}{79} = 0,3 \\
 \text{b. } P(\text{perfekt} | \text{event}, \text{perfect.el}) &= \frac{P(\text{perfekt}, \text{event}, \text{perfect.el})}{P(\text{event}, \text{perfect.el})} = \frac{\frac{18}{164}}{\frac{18}{164}} = \frac{18}{18} = 1 \\
 \text{c. } P(\text{perfekt} | \text{event}, \text{past.el}) &= \frac{P(\text{perfekt}, \text{event}, \text{past.el})}{P(\text{event}, \text{past.el})} = \frac{\frac{3}{164}}{\frac{61}{164}} = \frac{3}{61} \approx 0,05 \\
 \text{d. } P(\text{perfekt} | \text{state}) &= \frac{P(\text{perfekt}, \text{state})}{P(\text{state})} = \frac{\frac{9}{164}}{\frac{85}{164}} = \frac{9}{85} \approx 0,11 \\
 \text{e. } P(\text{perfekt} | \text{state}, \text{perfect.el}) &= \frac{P(\text{perfekt}, \text{state}, \text{perfect.el})}{P(\text{state}, \text{perfect.el})} = \frac{\frac{7}{164}}{\frac{7}{164}} = \frac{7}{7} = 1 \\
 \text{f. } P(\text{perfekt} | \text{state}, \text{past.el}) &= \frac{P(\text{perfekt}, \text{state}, \text{past.el})}{P(\text{state}, \text{past.el})} = \frac{\frac{2}{164}}{\frac{78}{164}} = \frac{2}{78} \approx 0,03
 \end{aligned}$$

It is important to note that the probabilities in (29) are calculated using figure 11 and are, thus, only based on sentences where English used the Present Perfect or Simple Past. They are, therefore, not completely accurate when translating from all English sentences (instead of only the Present Perfect or Simple Past), however it is a valuable first approximation of the influence of aspectual class on the probabilities of the use of the Perfekt tense. (29) reveals that the aspectual class of a verb phrase regulates the use of the Swedish Perfekt. In eventive verb phrases there is a 30% chance that the Perfekt is the best choice, while in stative verb phrases there is 11% chance that the Perfekt is the best choice compared to the Imperfekt. This is not convincingly high, however keep in mind that the Perfect does not occur that much in general; the Simple Past is preferred in Swedish. Thus, when translating from any language to Swedish, it would benefit the translations if the automatic translation software takes into account the aspectual class of the verb phrase. Additionally, when translating specifically from English to Swedish we can include not only the aspectual class but also the probabilities of Swedish tenses given the English tenses. (29b) shows that the probability for a Perfekt given that the verb phrase is eventive and that English used the Present Perfect is 1. This means that, even though different translations can be syntactically correct for a given eventive Present Perfect, we are, based on my results, 100% certain that this verb phrase should be translated using a Swedish Perfekt. (29e) shows that for stative verb phrases that use the Present Perfect in English we are 100% certain that Swedish should use the Perfekt.

My results have shown that the tense that was used in English and the aspectual class of the verb phrase influence the probability for the Swedish tenses. When creating automatic translation software that translates English to Swedish, it would thus give more natural

translations when taking these probabilities into account. The analysis that I have given for Swedish compared to English can be done for all existing languages, and each of these may give us an insight in tense preferences for these languages and may, therefore, eventually help improve all automatic translation software. Since automatic translation software and natural language processing play a big role in artificial intelligence, new knowledge and developments regarding these subjects are a great improvement for the field of artificial intelligence.

8.3 Possible improvements

Historic overview

As stated before, there have not been found any written recordings of P.I.E. and Proto-Germanic. All the information is gathered from reconstruction of these languages and could therefore be incomplete or partially incorrect. The reconstruction of P.I.E. is based on its descendants, among others Proto-Germanic, which itself did not have any written recordings, it is therefore even more difficult to deduce what is and is not true for P.I.E. However, this also makes it more complex to infer what properties of Proto-Germanic were inherited from P.I.E. and what developed on its own. Subsequently, it is more challenging to construe what features of Old-English and Old-Swedish were acquired from Proto-Germanic.

Preparing the source-texts

Before I started annotating I assumed that no major problems would arise from the fact that I cannot read or write Swedish. This was mainly because one of the source-texts is in English and I can read and write English. The Swedish text had to be aligned to English and it seemed there were no real differences between the paragraph structure in English and Swedish. I therefore assumed that with a little help of translation software, such as Google Translate, it would be sufficient to correctly align the paragraphs, select the Swedish verbs corresponding to the selected English ones and add the Swedish tenses. This was true for aligning and selecting verbs, however, adding the correct Swedish tenses proved to be more difficult than expected. Marthe and I both struggled at first to fill in verb tense for all selected words, because we could not find one source that explained all Swedish conjugations; most websites we could find only clarified how to conjugate a couple of words, but we realised these rules did not apply to every word. Therefore, we first had to add the tenses for all verbs that seemed to follow the “regular” conjugation rules that we had found and then we had to do the rest one by one using two websites that gave all conjugated forms of a verb when searching for a specific verb. This process, thus, took more time and effort than expected. It would have helped to have a native Swede look at these verb tenses with us, so that we maybe did not need to look up a couple of hundred words one by one. Or to have a native Swede explain Swedish tenses and conjugations to us before we started to add the tenses. This could have helped speed things up a bit, because now we only used a couple of general rules add the tenses, because we could not find more. But if a Swede had explained Swedish conjugations to us, we may have had more general rules to apply and therefore may have had to do less by hand. Not only would a native speaker have helped make it easier and faster, it could be more reliable as well. When adding tenses one by one we fully relied on the aforementioned websites, but they may as well give faulty conjugations.

Concerning the Swedish source-text

In this paper I assume that the sentences in the Swedish Harry Potter novel are the only translations, even though there may exist alternative translations. It may be best, however, to

also take alternative translations into account. This could be done by asking native Swedish speakers that are able to fluently read and speak English about their intuitions about the translated sentences and, if needed, give alternative translations. Or even more secure; let native speakers give translations of English sentences, without even showing them the original translation. This might take into account the possibility that translators are more likely to translate the sentence in the same way or using the same tense as the original sentence if they have seen the original sentence. However, to use this method, several native speakers would be needed that would give translations to the same English sentences separately, in order to eliminate any personal preferences. This means that you need many participants that all need to translate 1400 sentences. This would take a lot of time and effort and would, in this time frame, be immoderate. The benefit of doing a quantitative analysis is that we are able to analyze about 1400 verbs, but when doing an experimental study there would be fewer possibilities to look at so many different verbs.

8.4 Suggestions for further research

As mentioned before in section 8.1 the results associated with hypothesis four are not enough to deduce whether the Future Perfect could be translated to a Swedish Perfekt. A bigger dataset would be needed, because no Future Perfect's have been found in this source-text whatsoever and too few Simple Future occurrences to make a conclusion. Preferably the dataset would not only be bigger, but also from another source-text. It might be that this specific writer has a personal disfavor for the Future Perfect and the Simple Future, to eliminate this element using another source-text would be best.

When examining the results for hypothesis five, it showed that all Present Perfect that were translated to a Presens in Swedish contained either "have got" or "have gone". Additionally, my results also showed that no Simple Future forms constructed with "are going to" were translated to a Presens in Swedish, while Simple Futures with "will" were sometimes translated to a Presens. It is interesting to examine whether these patterns are just a coincidence or always hold for Present Perfect - Presens and Simple Future - Presens combinations.

These patterns are not only intriguing for English and Swedish translations, but also for defining notions for the Swedish tenses. In 8.1.3 I tried to capture Swedish tenses with Reichenbachian notions based on my results, however it is not yet certain, whether the Swedish Presens can only extend in the Past when using *hava*, "to have", or *vara + borta*, "to be" + "gone". Thus conducting further research about the use of the Presens could also help determine a more precise and certain definition.

Le Bruyn, van der Klis and de Swart (2019) claimed that due to the Perfect focussing on eventualities with endpoints, a mapping exists from Events to Perfect. However my results have shown this mapping in Swedish, while the Swedish Perfect does not focus on eventualities with endpoints. Thus, further research could conclude whether this mapping and the Perfect focussing on eventualities with endpoints in some languages are related with one another.

It is interesting to see Swedish pair with the other Germanic languages, English, German and Dutch, in example (21); they all use the Past while Spanish, French and Italian use the Present. In example (22), however, Swedish pairs with all languages except English; English uses the Present Perfect, while the others use the Present. In example (23) Swedish uses the Present and all the other languages use the Present. In example (24) Swedish uses the Present, similar to Spanish, French, Italian and Dutch, whereas German and English use the Future. In three out of four examples Swedish pairs with Dutch. Further research to compare the use of the Perfect and other tenses in Swedish to Dutch would thus be interesting.

To get a better idea of what regulates the use of the Perfect in Swedish, it might be interesting to also look at the lexical aspect of verbs, or at the different readings of the perfect such as Resultative, Existential and Continuative. Additionally, it would be best to use another source for linguistic analysis of the Swedish Perfect to ensure that results are not based on personal preferences of the translator.

9. Conclusion

In this paper I added Swedish to the Time in Translation project. The aim was to define how the Perfect is used in Swedish Dialogue based on translation data. I investigated the behaviour of the Perfect in Swedish dialogue and have found that the Swedish Perfekt has a preference for events over states, while the Imperfekt has a slight predilection for states. Additionally, the proportion of Perfekt and Pluskvamperfekt compared to the Imperfekt is roughly the same as the proportion of Past and Present Perfect compared to the Simple Past in English and, analogous to English, the Perfekt is not the default tense; the Imperfekt (Past) is. I examined whether the Perfekt could originate from the Future Perfect or Simple Future, however this could neither be falsified nor verified because the Future Perfect had no occurrences in general and the set of the fragments containing the Simple Future was very small. Overall the results suggest that the Swedish Perfekt is very similar to the English Perfect.

The Present Perfect can be translated to a Swedish Presens, however this only occurred where English used “have got” or “have gone”. Additionally, the Simple Future can also be translated to a Swedish Presens, however this only happened with Simple Future forms that contained “will” instead of “are going to”. Lastly, the Pluskvamperfekt is very similar to the English Past Perfect and originated only from its English counterparts.

Furthermore, I have found that aspectual class and English tense influence the probabilities for the Swedish tenses. Thus, automatic translations might feel more natural to native Swedish speakers when these probabilities are taken into account. This has shown that I have found what (partially) regulates the use of the Perfect and how this can be used in Artificial Intelligence.

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