WHAT DOES THE TRANSLATOR DO WHEN SHE TAKES A MOMENT?

Scriptlog-aided analysis of long pauses and dictionary use in a translation process

Candidate's thesis

Sanna Volanen

University of Jyväskylä

Department of Languages

English

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Sanna Volanen
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Käännösprosessin tutkiminen on viime vuosina siirtynyt yhä enemmän lopputekstin tutkimisesta itse prosessin eri osien ja piirteiden tutkimukseen. Tauot ovat yksi tämän prosessin eniten tutkituista piirteistä, mutta tähän asti tutkimukset ovat keskittyneet lähinnä kahden tai maksimissaan viiden sekunnin pituisten taukojen analysointiin. Tämän tutkielman tavoitteena on selvittää, millaista informaatiota käännösprosessin kulusta ja sisällöstä sekä sen kääntäjäkohtaisuudesta saadaan ottamalla tutkimuskohteeksi aiempia tutkimuksia pidemmät tauot sekä sanakirjojen käyttö käännösprosessin aikana.

Tämän tutkielman aineisto kerättiin hyödyntämällä tietokoneohjelmaa nimeltä Scriptlog, joka tallentaa kirjoitusprosessin tai tarkemmin ottaen sen aikana tehdyt lyönnit tietokoneen näppäimistöllä. Aineisto sisälsi kahden naispuolisen yliopisto-opiskelijan suomenkielisestä pohjatekstistä englanniksi kääntämien kohdetekstien Scriptlog-tiedostot sekä koetilanteen aikana muistiin merkityn sanakirjojen käytön. Tästä aineistosta eroteltiin tutkimuskohteeksi pituudeltaan kymmenen sekuntia ja sitä pidemmät tauot. Nämä tauot jaettiin kahteen pääryhmään sen mukaan, johtuivatko ne sanakirjan käyttämisestä vai jostakin muusta syystä.

Tutkimuksessa selvisi, että vähintään kymmenen sekuntia pitkien taukojen tarkastelu toi esiin lähes kaikki sanakirjankäyttötapaukset. Se myös paljasti selkeästi kääntäjien erilaiset prosessityylit: ensimmäinen heistä editoi käännöstään luonnosvaiheessa, kun taas toinen kirjoitti ensin vedosmaisesti ja keskittyi editointiin vasta sen jälkeen. Muut löydökset mukailivat aiempia tutkimustuloksia pitkien taukojen sijainnista ja aiheuttajista käännösprosessissa. Aineiston suppeuden takia tulokset eivät välttämättä ole yleispäteviä ja lisätutkimusta voitaisiin tehdä muun muassa vertailemalla ns. noviisikääntäjiä ja ammattikääntäjiä tai valitsemalla useampia erilaisia pohjatekstejä.

Avainsanat: translation process, long pauses, Scriptlog, dictionary

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1 INTRODUCTION

Translation has been researched from the procedural point of view for several decades. New doors were opened to the researchers when computers were first harnessed in 1985 to gather data of the writing process by creating a program to record the key strokes the writer made on the keyboard. This made it possible to get detailed information about the flow of the writing or translation process more easily, less intrusively than by direct observation or videotaping and more accurately than before. Since then, these kinds of computer tools or text editors such as JEdit, Translog, Inputlog and Scriptlog , in addition to think-aloud protocols and eye-tracking technology, have been widely used in research to study numerous aspects of the writing and translation process, such as writing difficulties due to for example dyslexia, writing development, location, amount and types of online revisions.

Pauses have been a major point of interest, because these tools provide easy access to the information about their length and location and they are widely considered to be indicators of internal thought processes. Most of the research on pauses in writing or translation process has focused on pauses from two to five seconds (for example, Immonen 2006 and Wengelin 2006). Consequently, the studies have mainly revealed the differences between L1 or L2 composing and translation or the differences between a novice and a professional translator.

The present study aims to reveal some aspects of two individual translation processes through comparison done on the long pauses taken by two novice translators during the process. It also tries to show that by excluding the long pauses from the analysis, the researchers have actually excluded one major aspect that induces pauses in translation, that is, the use of dictionaries or other reference material. The present study claims that studying long pauses produces valuable insights on the procedural style of the translator as well as shows how much of the translator’s time is actually used on writing and how much on translating or finding the right words.

2 PREVIOUS RESEARCH ON WRITING PROCESSES

Translation is a complex writing process including not only the basic functions of writing but also interactive use of linguistic memory of grammatical and semantic aspects of two different languages. Thus, it is important to have some understanding of how the writing process works. First, my aim is to present a background view of writing or composing and translating as a process. Then I will look at the research done on dictionary use in L2 writing and translating. Thirdly, I will introduce in short the Scriptlog programme, a computer tool used in the present study. This program or similar programs are also used in many of the studies on translation and on pauses. Lastly, I will discuss previous research on pauses in writing and translation.

2.1 From writing process to translation as a process

In the next chapters, I will first review studies on composing in mother tongue (later L1) and in a foreign language (later L2). Then I will discuss translating a text into a foreign language (L1→L2). The aim of this section is to lay out a background of what lies beneath the product, the finished target text, which is the only aspects of the writing or translation process that the reader or end user usually sees.

2.1.1 Writing process in L1 and L2

The process of acquiring and mastering one's mother tongue starts at a very young age and lasts relatively long. Writing skills start to develop several years later than speech due to the motor skills needed to perform this function and also because the future writer needs to learn the commonly shared system of signs, i.e. the alphabet, to be able to produce texts that fulfil at least their basic communicative purpose. Furthermore, writing or composing a text even in L1 requires quite an extensive vocabulary and involves activating the short-term as well as the long-term memory (later LTM). This complex function of interacting processes has intrigued researchers since the 1980´s when Flower and Hayes constructed their model of *working memory* (later WM) that sees writing as a cognitive process that includes multiple sub processes (Hayes 1996:2). In short, WM is a cognitive tool that functions as a short-term

memory reserve and as an information processing system that uses the LTM when cognitive tasks, such as writing, are performed.

The Flower and Hayes model drew much criticism and thus the model has been not only redrawn by Hayes himself in 1996 but also challenged by other models, such as Kellogg's model (1996:57-71). Recent research in this field includes the studies of Vanderberg and Swanson (2007), which debates what parts of the WM are actually important in writing, and McCutchen (2000). McCutchen (2000:13) puts forth a developmental model with emphasis on the interaction between the WM and the information stored in LTM. She states that skilled writers are able to surpass the limitations of short-term WM and are able to capitalize the LT-WM. While McCutchen's model is a rough sketch based on previous research the Vanderberg and Swanson study (2007:746) empirically shows that a part of WM called the central executive was very much linked with a great number of the elements and abilities employed in writing, such as vocabulary, planning, translating[1] and revision. The three latter components are the main cognitive writing processes of the WM model (Hayes 1996, Kellogg 1996).

If L1 composing is already as complex a process as described above, it certainly does not get any easier when the composing is done in a foreign language. However, Jones and Tetroe (1987) claim that composing in L2 is the same process as L1 composing. Uzawa (1996:283) also found evidence of the similarity of L1 and L2 writing processes in case of metacognitive attention which according to Uzawa (1996:279) includes "strategies for retrieving and organizing information and experiences relevant to the writing topic". Furthermore, several previous researchers, such as Bereiter and Scardamalia (1987, as cited by Uzawa 1996:282 and Nordqvist Palviainen 2007:223), have stated that L2 composing process resembles the writing process of an inexperienced L1 writer.

On the other hand, Jones and Tetroe (1987:55) claim that L1 writing strategies or skills transfer to L2 writing. However, according to their research, the use of a foreign language does put a strain on the 'cognitive capacity' and thus takes a toll on cognitive writing processes, such as revising and monitoring in terms of planning the text which may require

[1] Here the term *translation* refers to the combination of linguistic processes required to reform an idea into written words (Kellogg 1996:60, Hayes 1996:3).

more mental effort in L2 than L1 writing. Jones and Tetroe (1987:53) also state that this phenomenon is not affected by increased L2 proficiency. Furthermore, Uzawa (1996:282) shows evidence that poor L1 writing skills or lack of practice affect the L2 composing.

2.1.2 Translation as a writing process

Translation differs from L2 composing in terms of the ideas being already 'translated' into words and the composition of the text being laid out. Thus, the translation process starts from a different place and has a process somewhat different compared to L1 or L2 composing.

Jakobsen (2002, as cited by Immonen 2006:321) divides the writing process into three stages. The process begins with the *orientation phase* which lasts from the start of the process to the first key stroke of text production. The second phase is called the *drafting phase*, from that first key stroke of text production to the last full stop. The process is concluded by the *revision and monitoring phase*, which is the period after the last full stop of the drafting phase until the process is ended by the writer. However accurate this division may be for L1, or even L2 composing as it is claimed to be the same process, Immonen (ibid.) states that in translation the temporal distribution of these phases changes to accommodate the increased need of revising and monitoring in terms of producing a proper target text. Similarly, Uzawa (1996:282) claims that the subjects were able to focus more of their attention to the equivalence between source and target texts as they were relieved from the task of idea generation and organizing the text.

2.2 Dictionary use

Dictionary use in commonly associated with L2 composing and translating. While using a dictionary to determine a correct translation for a single word can be useful, it also has its pitfalls. When translating, the correct counterpart for a word is not in many cases the first option presented by the dictionary or a Google search. Thus the translator has to have regard for the whole source text as a context and have patience and enough semantic knowledge to make the right choice.

Atkins and Varantola (1997) present an extensive study of dictionary use of 32 Finnish

translation students on various aspects, such as the choice between a mono- and bilingual dictionary, the result of the dictionary searches and how the translators coped with failed searches. Their focus was, however, on the way people generally use a dictionary as the subjects did not do an actual written translation but were asked only to perform look-ups of elements they felt necessary to consult a dictionary on in order to translate the text in question (Atkins and Varantola 1997:3). Their study states that bilingual dictionaries are used 71% of the time in translation which means that in less than one third of cases the dictionary consulted is L2 monolingual. On the other hand, Atkins and Varantola (1997:21) present evidence that it is more difficult to translate from L1 to L2 than the other way around and discuss the effect the L2 proficiency of the user might have on the favourable outcome of the dictionary search. However, Christianson (1997:38) claims that the level of L2 skill does not necessarily go together with the best strategies or results of dictionary use and states in addition that the dictionary users who are successful in their searches use a range of advanced search methods, no matter what their level of L2 skills. According to Atkins and Varantola (1997:26) trained translators are however, due to their training, more aware of the possible pitfalls of translation and dictionary use compared to novices.

While it might be obvious that dictionaries are used in most cases where the source text presents the translator a problem, not all translation problems are solved by a dictionary look-up. Atkins and Varantola (1997:19) show that the success rate of dictionary look-ups on bilingual dictionaries is 64% and on monolingual dictionaries 48%. The unsuccessful look-ups seem to create look-up sequences, if more than one dictionary is available, as suspected by Atkins and Varantola, and, consequently, affect the pauses related to dictionary use.

2.3 Studying pauses in writing and translation

Pauses are considered in writing research to represent cognitive processes, such as problem solving, mental organization or the beginning of a cognitive or translation unit (Immonen 2006:315), that take place inside the writer's brain, the result of which can manifest as text production or in various types of externalized revision. As evidence of that pauses are worth studying as a feature of translation process and as one of the study's major results, Immonen (2006:333) states that "the effect of translation can be observed in pause length at all linguistic levels of the writing process". The difficulty lies in how to define a pause and in

choosing the correct pause length for the study in question. According to Wengelin (2006:111), the most common pause length used in writing research has been two seconds. However, Jakobsen (2003, as cited by Immonen 2006:314) chooses to study the pauses of five seconds or more in length.

The research of pauses in written production was launched by Ann Matsuhashi with her since much quoted study of 1981 that ventured into recording the writing process in real-time to reveal the secrets of the process. Matsuhashi (1981,270) stated that the time that lapses during writing a text is not simply used for writing the words but also for pausing between them. She videotaped the writing-by-hand sessions, studied the body language of the writers during the long pauses and drew some tentative conclusions about the mental processes that took place during the pause. According to Matsuhashi (1981,287), long pauses combined with certain types of body movements were linked to complex decisions involving both micro- and macro level decisions, that is, not only problems such as orthography but also issues with the whole context. In another study, Matsuhashi (1987) moved into studying the revisions the writer did at the *point of inscription*, that is, the point in the text where the writer is currently doing the composing. In this study Matsuhashi (1987,213) discovered that most of the pauses that lead to revisions were long pauses. She also pointed out that it would be interesting to know what kind of revisions took each percentage of the pause time.

Several researchers have followed the path lead by Matsuhashi. One of the more recent studies include the Wengelin (2006) study which examined the writing process realized by typing on the level of micro-context, that is, "the context around a certain transition between two key strokes" (2006,107). She divided these micro-contexts into categories according to their location, length and number of events. According to her data (2006:117), the longest pauses occurred between 1) two strokes of backspace, 2) a letter and a deletion, and 3) between a comma and a letter, in that order. In terms of frequency however, she found that almost 37% of the pauses located between a letter and a comma and about 31% between a full stop and the first letter of a new sentence.

This data backed up the results of previous research on both written and spoken language which state that pauses are usually found more frequently in break points of discourse units, such sentence or clause, and that in these points the pauses tend to be longer than elsewhere in

the text. (Wengelin 2006:117). In the case of monolingual text production, this claim is also supported by Immonen (2006) who compared pause patterns in L1 composing process and a fluent L1->L2 translation. Although Immonen (2006:329) found that the general arrangement of the pauses was similar in both tasks, she discovered that the pauses between paragraphs and sentences were as a rule shorter in translation than in L1 writing. On the other hand, they were longer in translation than L1 writing when it came to clauses and words. In addition, Jakobsen states (as cited by O'Brien 2006:4) that pauses lasting more than ten seconds are located at the beginning and end of the text segment, between paragraphs and more randomly before such pieces of text that present a challenge for the translator.

2.4 Scriptlog

The development of computer key stroke logging programmes, such as Scriptlog (Strömqvist and Karlsson 2002), have provided the research on writing and translation process a tool that is objective as a data-collection method. It records the writing process and gathers detailed and time coded information including every single move the writer or translator makes on the keyboard or with the mouse as well as all inactivity or pauses between key strokes. From the log files gathered by the Scriptlog the researcher can elicit more precise data collections by using the analysis mode of the programme. The researcher can bring forth for example the information on pauses of certain length, a list of deletions made during the process or merely the end result of the finished target text.

Scriptlog, or a programme similar to it, has been used in numerous studies on L2 writing, such as Nordqvist Palviainen's (2007) study that compares the product and process of L2 writing task of twelve Finnish university students writing in Swedish. Other examples of studies utilizing this kind of computer tool include Rothe-Neves' (2003) study on aspects of WM and their influence on translation performance, the Tirkkonen-Condit et al. (2008) on revisions in translation process and the study by Immonen (2006) that makes a comparison of pauses in L1 writing and translation from L1 into L2.

3 THE PRESENT STUDY

3.1 Research question

Translating a text from one language into another is a complex process. It includes writing as well as accessing information stored in the brain's LTM, such as the vocabulary and semantics or syntax, or using reference material, such as dictionaries. The translation task may involve two possibly very different languages, which can make translation very challenging. Translators also need to be aware of any cultural information relevant for the task. However, there is no one correct translation in any case, which means that there are as many target texts for a single source text as there are translators. Every translator has his or her own problem solving and writing strategies and also strengths and difficulties in the language pair in question, for instance Finnish as L1 and English as L2, which amounts to unique processes. One indicator of this can be where and when the writers pause during the process as pauses in text production are considered to indicate cognitive processes such as problem solving, internal revision or organization of the text. Thus, the general research question of the present study is the following: What kinds of insights can a Scriptlog-aided study of long pauses in translation give us on translation as a process individual to each translator? To be more precise, the main questions are

1) What does the data reveal about the individual translation styles?
2) What do the analysis of long pauses reveal about
    a. the dictionary use
    b. other functions, such as revision?

3.2 Subjects and data collection

The data of the present study consist of four translations from Finnish into English of a single source text written on the Scriptlog program. The texts were written by four students of Jyväskylä University who had completed or nearly completed their subject studies in English. All were Finnish native speakers. None of the subjects had systematic experience or formal training in translation. Two of the subjects, the women, were acquired through an email announcement sent to a mailing list targeting English students. The third subject, a male, was

recruited via friendship and the fourth, another male, was an acquaintance of the third subject. The names used later in the text are changed in order to protect the subjects' privacy.

Individual appointments were made for the data collection sessions and they took place in November and December 2009. The locations were chosen by the subjects themselves based on where they would be most comfortable doing the translation. Thus, three of the data sessions took place in the subject's home and one of them in the cafeteria of Jyväskylä University library. The subjects were advised to reserve at least two hours to complete the experiment in order to diminish the effects of preset time constraints and to take the different speeds of translation into account.

The source text (see appendix 1) was a news article published on the Helsingin Sanomat web pages. Originally it contained 247 words, but for the purposes of the present study the headline and one other phrase were omitted, which left the target text at 229 words in length. This text was chosen for its moderate, yet sufficient level of difficulty in order to avoid the translation task being so easy that it could be done without a dictionary, only relying on general knowledge.

The translations were written on a laptop provided by the researcher using the Scriptlog program to record the process. The source text was presented via this program on split screen view beside the window where the translation was to be written. Copy/paste function was disabled in the experiment settings. The process was timed by the program, but the start and finish were in control of the subject. The subjects were briefed in short on the experiment, but were not given any specific purpose for the translation besides following the genre of the original, which was obvious from the source text, and to produce a readable target text. The subjects had two dictionaries in their use: a traditional book version of *Finnish-English General Dictionary* by WSOY (Hurme, Malin and Syväoja 2003) and a CD-ROM version of *Collins COBUILD Advanced Learner's English Dictionary* (2003). These specific dictionaries were chosen because they were readily available in the researcher's own bookshelf. The use of the dictionaries was observed and recorded, for possible later use, to the best of the researcher's abilities by using pen, paper and a stopwatch.

3.3 Methods of analysis

Although the data originally contained four translations I chose to include only two of them, the translations of the female subjects, into the present study. This decision was made because the amount of data gathered from the four subjects was too extensive to be analyzed in the present study which is a Candidate's thesis. The chosen target texts (see appendices 2 and 3) were first analysed quantitatively using the Scriptlog program analysis tools to produce lists of time coded pauses of determined length, in this case equal or more than ten seconds, which were then converted first to Excel sheets and then into figures so that further qualitative analysis could be made more easily. In Tables 1 and 2 (see appendices 4 and 5), the individual pauses are presented and numbered according to the order they appear in the data. This data was cross-referenced with the data collected about the use of dictionaries to determine which of the pauses were created due to looking up a word physically or by changing windows on the screen, meaning the use of the CD-ROM dictionary, and which were due to the writer merely pausing to think, read or to do internal revising. These tables and figures were then used to compare the two female writers and their translation processes. In addition, the Sullivan and Lindgren taxonomy of online revisions was used to aid the analysis of Table 4 (see appendix 7). This taxonomy is introduced below in chapter 3.3.1.

Henceforth, the pauses will be indentified by a reference code such as (P,1,D,34) in which the first capital letter P refers to the subject in question and the first number is the number of the pause. The letter D identifies the pause as dictionary use and the last digit indicates the length of the pause has been in seconds. Alternatively, the second letter can also be O, referring to the pause being a result of other action beside dictionary use.

3.3.1 Lindgren and Sullivan taxonomy on online revisions

Dividing the pauses according to whether they could be linked to dictionary use or not created a need for a tool that could be used to analyze and/or categorize the pauses that were not induced by dictionary use. As these other pauses could safely be assumed to be the result of a normal writing process function, that is, revising, I followed the example of Nordqvist Palviainen (2007) and chose to use the Lindgren and Sullivan taxonomy (later LS-taxonomy) on online revisions.

LS-taxonomy (Lindgren and Sullivan 2006) was developed by the authors in 2006 based on previous work of their own on similar taxonomy. It concentrates on where the revisions happen in the text as well as how they affect the text. Thus, it takes into consideration both the process and the product. This taxonomy was made to cover only externalized revisions, but it will be used in the present study also to explain the internal revisions, as in Nordqvist Palviainen (2007). This is possible because of the use of pause data as a pause preceding an external revision can be seen as a marker of the internal revision process taking place. According to Lindgren and Sullivan (2006:158), the information gained from the pause data carries more importance for the LS-taxonomy than for other similar taxonomies. Thus, it seemed suitable to be used also in the present study which relies and focuses mainly on pause data although the pause criteria used in LS-taxonomy is only two seconds or more.

In the writing process the externalized revisions, such as deletions and the following rewrites are

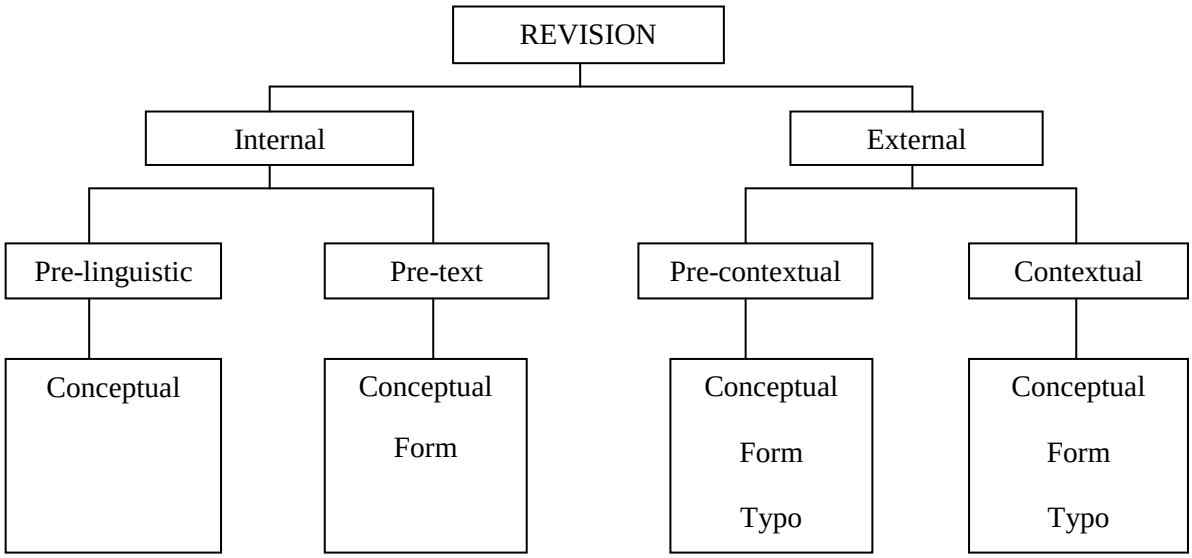

Figure 1. Division of revisions according to type and location (Lindgren and Sullivan 2005[2]).

usually the only evidence of the editing process. However, when combined with the pause data, they reveal more of the internal process that the writer goes through when doing any given revision recorded by the Scriptlog.

[2] This paper is merely an earlier version of the Lindgren and Sullivan 2006 study mentioned in the bibliography. It is only used here as a reference because the 2006 paper did not contain the original Figure 1 recreated above but referred to another chapter in the book where this figure was presented.

The LS-taxonomy divides revisions as shown above in Figure 1. On the first level the revisions are divided into internal and external revisions and the external revisions are divided further into *pre-contextual* and *contextual.* According to Lindgren and Sullivan (2006:159), *a* pre-contextual revision is one that done at the point of inscription. A contextual revision, on the other hand, is done inside previously completed section of the text and thus usually includes mouse or cursor movements away from the point of inscription. Lindgren and Sullivan (1006:172) divide contextual revisions further into revisions of form and revisions of concepts. The first group contains revisions such as typography and spelling, grammar, punctuation and format as well as revisions that don't change the meaning. The second group of conceptual revisions includes the revisions of text-based micro- and macro structure or of topic and audience.

4 COMPARING THE PROCESSES OF TWO TRANSLATORS

Computer-based analysis tools can provide the researcher with useful data, but as it is usually in the form of tables or lists of figures, it on its own does not reveal much before it is analysed also by other means. In this chapter, the data gathered by the Scriptlog and through observation will be analyzed qualitatively by comparing two of the subjects, the females Tiina and Päivi. First, I will take a general look at the process. Second, I will discuss the pauses induced by the dictionary use and, thirdly, the rest of the pauses employing the LS-taxonomy introduced in chapter 3.3.1.

4.1 The general style of the translation process

The process was recorded by the Scriptlog in total and provided general statistics such as the total time of the task. Tiina's total process time was 100 minutes, whereas Päivi completed the translation in 67 minutes. The total process time as such does not give us much information besides showing that there is variation between translators. Both subjects produced a target text that contained the same number of paragraphs as the source text, which agrees with Immonen's (2006:320) observation that if specific information on how the source text is going to be used is not given to the translator, they tend to produce a translation a long the lines of the source text. In words, the target texts were 380 for Tiina and 388 for Päivi

from the 244 words of the source text. This indicates further that the total process time does not directly correspond with the length of the product.

While the subjects were doing in the experiment, the process was observed from nearby and, while the main motive was to record by hand when and which dictionary they used, it also created an opportunity to see the process unfold first hand. During the first experiment, in which the subject was Tiina, it became clear that by watching her writing, pausing to read or to use a dictionary her style of approaching the translation task could be also seen. Later, as Päivi was doing the experiment, it became evident that these two subjects clearly had different styles of approaching and managing the translation, that is, very different processes. Furthermore, the observations were backed up by the visual information provided by the figures produced from the pause data (see below Figures 2 and 3).

Merely by looking at the figures that present a kind of survey of the process, it is apparent that these two translators plot a very different course through the translation task. As I examined the data in more detail, I found several differences. The first was the beginning of the task: From Tiina's chart and Table 1 (see Appendix 4) we can se that she starts the task with a long, close to two minute pause (T,1,O,116) whereas Päivi's chart (and Table 2, Appendix 5) only shows a half a minute pause as the first one. This was backed up by my visual data as I had

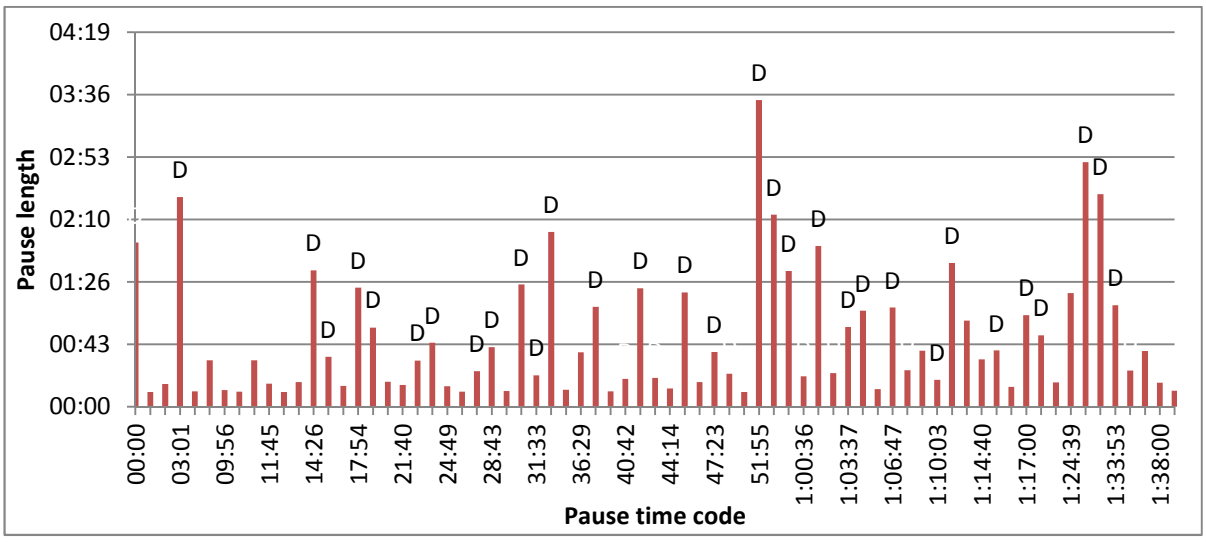

Figure 2. Over ten second pauses in the translation process of Tiina with added markers of dictionary use (D).

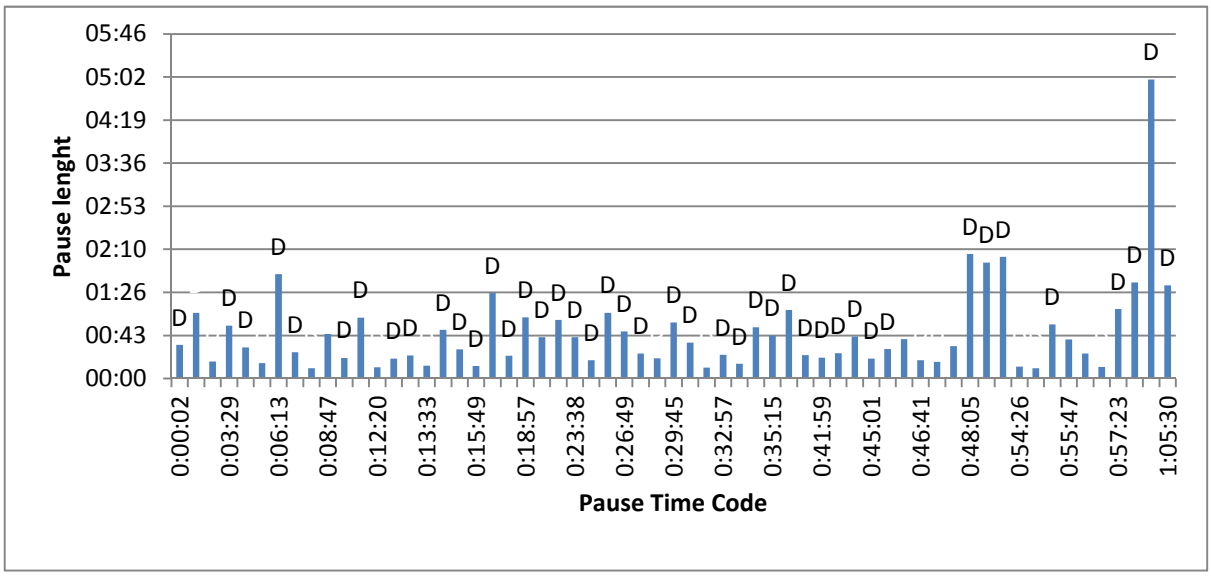

Figure 3. Over ten second pauses in the translation process of Päivi with added markers of dictionary use (D).

observed how Tiina first read the whole source text before starting to write and Päivi, on the other hand, went almost straight to the keyboard and started writing. Secondly, the end of the task also shows a difference between the two as Päivi takes the longest pause in all the data, about five minutes (P,60,O,300) and Tiina's chart shows that the four last pauses are all under 40 seconds. My observations concur with this data, because Päivi read the target text through at the end whereas Tiina used the final minutes of the task making minor corrections, such as fixing typos and agreement errors.

All in all, Tiina seemed to produce the target text with more care right from the start, reading first the whole source text, then working through paragraph after paragraph with revisions and finally, reviewing the product for errors or places needing additional revising. Päivi's style was more straightforward and consisted of producing a rough version quite quickly and then doing the necessary revising. These two styles seem to concur with the two writer types identified by Galbraith (1999, as cited in Lindgren and Sullivan 2005:82) who divided writers into high self-monitors and low self-monitors. The more rapid translation style would depict Päivi as a low self-monitor who generates the text through writing. Tiina on the other hand would likely be characterized as a high self-monitor according to her pause profile which shows more planning or in this case pauses that indicate that she read bigger source text segments at a time before realizing the translation than Päivi.

Päivi's strategy of producing a rough draft was, presumably, close to doing first a literal translation. According to Dimitrova (2005, as cited by Tirkkonen-Condit et al. 2008:14) translators can use literal translation as a method of extending their WM as the preliminary translation segment realized on the screen acts as a token of a larger text segment and aids the translator to decide whether it need to be revised or not. My data suggest that Päivi knowingly employed this strategy in her translation. Furthermore, this indicates that she probably had more knowledge of translation strategies compared to Tiina.

The difference of translation styles can also be seen from the data and Table 3 (see Appendix 6), where I have gathered temporal information of the two processes. As mentioned above in 4.1, the total process times of Tiina and Päivi were 100 minutes and 67 minutes, respectively. However, the time distribution over the *orientation phase*, the five paragraphs or *the drafting phase* as well as time used for the final phase of *revising and monitoring* show how they actually used their time. These phases are analyzed below in more detail excluding the orientation phase, which was so short in both cases that it does not provide much insight. The time difference in the orientation phase is assumed to result from how far the subjects read the source text before starting to write, meaning, for example, one sentence versus the first paragraph or more.

In total, Tiina's pauses covered 56% of the total process time and in Päivi's case this was 69%. From Table 3 we can see how their pauses were divided between the three phases of the process introduced in chapter 2.1.2. It shows that Tiina used 55 minutes 56 seconds on her drafting phase, which converts into 56% of total production time. Päivi used 42 minutes and 52 seconds or 64% of her process time drafting. In terms of pausing time, the two subjects did not differ from each other significantly in this phase: Tiina paused for 29 minutes 9 seconds, which is 52% of the time she used in drafting phase, and Päivi for 24 minutes ten seconds, which is 56%. However, the data show a significant distinction between the two translators in the final part, that is, the phase of revising and monitoring. Even though Päivi spent less time on this phase than Tiina, 32% of her total process time against Tiina's 42%, she spent 93% of this time pausing whereas Tiina spent 59% of this phase on pauses.

4.2 Dictionary use and pausing

As the translator's task is mostly about finding the correct correspondents for the words and concepts of the source text, it is normal and generally accepted that they use reference material, such as dictionaries. In the light of the WM model, dictionary use can be seen as a cooperative action facilitating or aiding the retrieval of semantic or lexical information in addition to the information in LTM. Using reference materials can be more or less time-consuming depending on factors such as the difficulty of the source text or the translator knowledge on the topic, which is why I wanted to identify the long pauses created due to the use of dictionaries in the pause data.

I have combined the manually collected data of dictionary use with the Scriptlog pause data in order to demonstrate how many of the long pauses were the result of this aspect of the process. In Figures 2 and 3 presented at pages 16 and 17, the dictionary use has been indicated by a letter D on top of the column but it is not identified which dictionary has been used in each case. This information is available in Tables 1 and 2 (see Appendices 4 and 5) where I have marked the use in separate columns according to the dictionary.

I analysed the manual data and put it into chart form which shows how the use was divided between the two dictionaries as number of incidents and percentages (see below Charts 1 and 2). From these charts we can see that as a total Päivi used the dictionaries 48 times whereas Tiina used them 33 times. In general, I noticed already during the session that Päivi seemed more comfortable using the CD-ROM version of Collins Cobuild than Tiina. From Päivi's dictionary use, 69 % was WSOY (manual, bilingual) and 31% Collins (electronic, monolingual), whereas Tiina used the WSOY 26 and Collins 7 times, or 79 % and 21 % of the time, respectively. This might be evidence of a difference in L2 skills between Päivi and Tiina according to Atkins and Varantola (1997: 34), who suggest that the individuals with higher L2 competence use monolingual dictionaries more frequently than bilingual dictionaries. In general, these results are in agreement with their results of the division in the use of a monolingual L2 dictionary versus a bilingual dictionary.

The higher incident number in Päivi's case can be partly explained by the fact that she seemed to use the two dictionaries back to back or together on several occasions. This behavior has

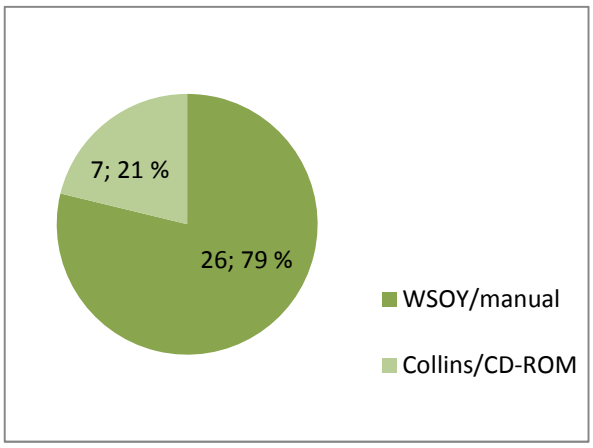

Chart 1. Dictionary use, subject: Tiina.

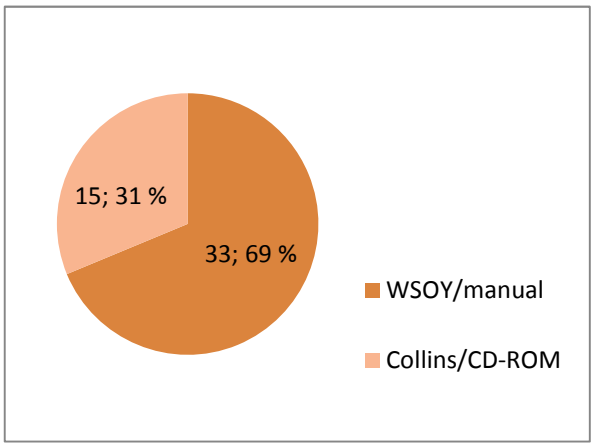

Chart 2. Dictionary use, subject: Päivi

been categorized as one single instance in Figures 2 and 3, but has been again addressed in more detail in Table 1 and 2 where the time codes of such instances have been placed on the same row. In Table 2, there are also two incidents where Päivi has used both dictionaries more than once during one pause. In these cases (P,49) and (P,51), the additional time codes are placed under the row that has the pause identification number. During my observation, I noticed 15 of these incidents, but as they did not all concur with a more than 10 second pause, they do not show in the data of the present study. Similar behavior was reported also by Atkins and Varantola (1997:12), whose data showed that even if 57% of the look-ups were single dictionary operations, one in four consisted of the use of two dictionaries. The high-end of this phenomenon is represented in my data by Päivi's pause (P,49,D,48) which includes four look-ups. Tiina, on the other hand, only had two incidents that showed a secondary look-up, (T,65,D,169) and (T,66,D,147), at the very end of the revision phase. This would suggest further that she was either unfamiliar with the use of CD-ROM dictionary or that her L2 proficiency level was not the same as Päivi's. This could only be verified by a language proficiency test, such as TOEFL.

In terms of the use of time, the use of dictionaries took Tiina 40 minutes 44 seconds (40.7%) of the total process time and Päivi 39 minutes and 25 seconds (58.8%). In the *drafting phase*, Tiina used 23 minutes and 13 seconds or 41.5% of total writing time of 55 minutes 56 seconds for dictionary look-ups, whereas Päivi used 20 minutes 41 seconds or 48.3% of the 42 minutes 52 seconds it took her to write the five paragraphs. In the final phase of *revision and monitoring*, the difference is the clearest: Tiina spent 41 minutes 20 seconds in this phase and 17 minutes 31 seconds of it was taken up by dictionary look-ups, which means 42.2%.

Päivi, on the other hand, used 21 minutes 39 seconds on the revision phase and 16 minutes 46 seconds or 77.4% of it to use the dictionaries. This result together with the earlier observations on Päivi's style of approaching the translation task could suggest that she did most of her revisions, or at least the ones involving dictionary look-ups, in this phase. However, considering the low number of the look-ups, the data indicates more reasonably that she devoted more time in this phase to look up and revise those parts of the text she had bigger problems with in the drafting phase, in which she either used a literal translation or a rough estimate based on a quick dictionary look-up and/or her LTM.

Still, Figures 2 and 3 show that Tiina had a more constant pause profile throughout the process with recurring sequence of two or three DPs followed by one or two OPs. In drafting phase, Tiina had 18 DPs and 22 OPs. Päivi's pauses were mostly DPs, 31 pauses being DPs and only 9 OPs, in drafting phase up to pause (P,43,D,20) which occurred in the end of drafting phase. In the final phase Tiina also had almost even numbers of DPs and OPs, the first number being 13 and the second 14. Here Päivi had the same number of both, that is, 9 DPs and 9 OPs, but the DPs were longer than the DPs in the drafting phase. This data concurs with the percentages presented above at the end of chapter 4.1 and shows that Päivi's pausing style varied more across the phases of the process than the way Tiina used pauses.

One curious difference in dictionary use between Tiina and Päivi is that in Päivi's case the first long pause (P,1,D,34) includes the use of dictionary as do also the only pauses that fall in between paragraphs 1 and 2, pauses (P,4,D,53) and (P,5,D,31). In Tiina's case, there are two long pauses in the beginning, (T,1,O,114) and (T,2,O,10), and two pauses that fall in between paragraphs, the first ,(T,6,O,32), between 1st and 2nd and the second, (T,33,O,11), between 3rd and 4th, of which none is a dictionary pause (later also DP).

4.3 Other pauses

In terms of time usage, the other pauses (henceforth OP) took significantly less time of the total process than the DPs, which was expected. Tiina spent 5 minutes 56 seconds (10.6%) of writing time in drafting phase on 22 OPs and Päivi, 3 minutes 29 seconds (8.1%) on her nine OPs. In the revision phase, Tiina had 6 minutes 52 seconds of OPs whereas Päivi only 3 minutes 26 seconds, that is 16.6% and 15.9% of the revision phase time, respectively.

In Table 4 (see Appendix 7), I have gathered more detailed information on the OPs that occurred within the drafting phase of the five paragraphs. I have marked the actions that occurred before and after each pause to present the immediate context in which they took place. This way the externalized revisions can be used to try and explain the internal revisions, or at least they can be linked together.

The pauses that occur after punctuation concur with Jakobsen's list (see chapter 2.4) of probable locations of pauses of ten or more seconds as they are at the beginning or end of a sentence or phrase. According to the LS-taxonomy, pauses at these locations are linked to pre-contextual revisions because the location is, in fact, the point of inscription. It is probable that during pauses, such as (T,10), (T,18) and (T,34), Tiina was reading the next source text segment to be translated, but in pause (T,37) she clearly reviewed the segment she had just finished and decided to revise it, which is shown in Table 4 as a deletion after the pause. Päivi also had one similar instance, pause (P,33), where she made a deletion after a comma and replaced the deleted segment with *that.* This could indicate that she had made a simple typo due to the differences in punctuation between Finnish and English but it could also be that she decided to use a different sentence structure. The evidence of mouse movements on the other hand indicates that both subjects did also revise the text elsewhere than in the point of inscription. These revisions are categorized as contextual in the LS-taxonomy. Both Päivi and Tiina made only three contextual revisions in the drafting phase, but it can be assumed that their distance from the point of inscription was not great as the writers' focus has most likely been on the context close to the point of inscription, such as the sentence currently in translation.

The biggest difference between Päivi and Tiina was however in the number of deletions. Tiina made eight deletions whereas Päivi made only two. This, yet again, seems to indicate that Tiina revised more already during drafting, but as the data does not include the final part of the process or the complete deletion data, the evidence cannot be used to determine which translator made more deletions overall. However, an attempt was made to elicit the deletion data from the Scriptlog recording but it failed in Tiina's case, which could indicate that she had made so many deletions that the program could not compile a file of them. But, the number of deletions made in the drafting phase does concur with the earlier notion about the

writer types. In other words, they correspond in terms of Tiina being a high self-monitor by Table 4 showing evidence of her monitoring the translation and this action resulting in multiple deletions before she had completed the drafting phase. However, it cannot be determined how well this categorization work when the writing task in question is in fact a translation. It could be that the choice of translation strategy affects this aspect of the process more than the translator's writer type as these writer types are, supposedly, mainly used to characterize the writers' of monolingual writing tasks.

5 DISCUSSION

The present study set out from generally reviewing the characteristics of the writing process in the mother tongue or L1, composing in a foreign language or L2 and, finally, the translation of an L1 text into L2. Then it reviewed research on dictionary use in L2 writing and translation highlighting the pros and cons of the use of dictionaries as reference material in these processes. Moving closer to the area of interest in the present study, Scriptlog programme was introduced as a data collecting method as well as a tool for analysis in studies on temporal and cognitive aspects of the writing process. The types of data made available by this programme then brought us to the study of pauses in writing and translation processes.

The present study aimed to find out what kinds of insights studying the long pauses of ten seconds or more could give on the individual translation process. One of the main findings was that focusing on pauses this long revealed the overall style of the subjects' process as well as the fact that dictionary look-ups take a major part of the time used on both the whole process and its distinct sections. In addition, the data concurred with previous research pointing out the locations of some of the long pauses in translation.

It needs to be kept in mind that the data of the present study includes only two translations by two novice translators. In order to gain more general results, for example on how the distribution of dictionary pauses versus other pauses reflect the overall process style of the translator, more extensive data collection could provide an answer, although it would also increase the work load of the comparative analysis. There are also human limitations that may have had some effect on the results of this study as the observation of the dictionary use was

done manually. The use of Translog instead of Scriptlog would have made it possible to use the dictionary integrated in the Translog programme as one of the dictionaries, but as a number of translators, at least novice translators such as second language learners, still use traditional, manual versions rather than electronic dictionaries, I still would have chosen to include the WSOY dictionary in this kind of study.

Future studies could be made on the lines of previous research on translation, that is, by comparing the processes of novice translators and professionals, to reveal, for example, how the temporal aspects of the dictionary use change over levels of competence or types or difficulty levels of the source text. On the other hand, it could also be studied how the translator's familiarity with the dictionary or dictionaries used in the translation affect the amount of time needed to perform the look-ups, as in this study the dictionaries were chosen by the researcher, not the translator. Also, it might be interesting to see if there were consistencies or differences in the writing styles of same writers/translators over writing tasks varying from L1 writing to L2 writing to translation from L1 into L2, or also from L2 into L1.

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Appendices

Appendix 1 : the source text

Raha-automaattiyhdistys (RAY) on tuohtunut Applen iPhone-puhelimelle tehdystä Pajatzo-pelistä. RAY vaatii pelin tekijää lopettamaan tuotteen kauppaamisen.

Raha-automaattiyhdistys vaatii tietotekniikkayhtiö Applen sovelluskauppaan Pajatzo-pelin tehnyttä Elias Pietilää lopettamaan pelinsä myynnin. Yhdistyksen mielestä Pietilän digitaalinen Pajatzo on nimen, ulkoasun ja muiden tekijöiden osalta jäljitelmä RAY:n mekaanisesta Pajatso-pelistä. Yhdistys vetoaa vaatimuksessaan tavaramerkkilakiin, lakiin sopimattomasta menettelystä elinkeinotoiminnassa ja tekijänoikeuslakiin. Erikoista asiassa on, että RAY:llä ei ole voimassa olevaa tavaramerkkiä Pajatsolle. Pajatzo on puolestaan alusta saakka Pietilän ohjelmoima digitaalinen peli.

Sopimaton menettely elinkeinotoiminnassa edellyttää, että toinen osapuoli hyödyntää tuotteensa markkinoinnissa toisen tuotteen goodwill-arvoa, joka tarkoittaa aineetonta liikearvoa ja hyvää mainetta. Kuluttajaa ei saa harhauttaa tuotteen todellisesta alkuperästä.

Goodwill-arvon loukkaus pitää usein sisällään ajatuksen, että kilpaileva tuote on laadullisesti heikompi kuin alkuperäinen tuote, se vaikuttaa alkuperäisen tuotteen kysyntään tai tarjontaan ja haittaa toisen elinkeinotoimintaa.

Joka kerta kun Pietilän Pajatzo-pelin käynnistää iPhonella, puhelimen ruudulle ilmestyy teksti Elias Pietilä presents Pajatzo. Applen sovelluskaupassa hän myy peliään omalla nimellään. RAY vetoaa siihen, että Pajatsoon liittyy goodwill-arvoa, jonka yhdistys kokee itselleen tärkeäksi, koska se on suomalaisten keskuudessa laajasti tunnettu rahapeli. "Pajatso on meille marginaalinen tuote suhteessa raha-automaattiyhdistyksen koko liikevaihtoon, mutta sen brändi on meille erittäin tärkeä. Se tuottaa vuositasolla liikevaihtoa viitisen miljoonaa euroa", sanoo Raha-automaattiyhdistyksen rahapelitoiminnan johtaja Janne Peräkylä.

Pietilä on tarjoutunut myymään kehittämänsä Pajatzon RAY:lle, mutta asiasta ei ole neuvoteltu. Viime joulukuussa myyntiin tullut peli on tähän mennessä tuottanut Pietilälle liikevaihtoa 2 400 euroa. Raha-automaattiyhdistyksen pyynnöstä asia on siirretty keskuskauppakamarin liiketapalautakunnan ratkaistavaksi. Lautakunnan päätös ei ole oikeudellisesti sitova vaan sen jälkeen käsittelyä voidaan jatkaa tuomioistuimessa.

Appendix 2: Tiina's target text

The Finnish Slot Machine Association (Fi. RAY) is irritated by a game called Pajatzo which has been designed for Apple Phone.RThe associationis demanding the game producer to withdraw the product from the market.

The Finnish Slot Machine Association s demanding Elias Pietilä, who designed the Pajatzogame for Apple, to sendselling the game. According to the associate,o the name, l theayot and other actors of digital Pajatzo are similar to RAY the association'shanical Pajtso game. The In its demands, tssociation is pleading to the the law of trademarkoplaw of inappropriatehactions the trade market and to th the yright. A laws a matter of fact, RAYThe Finnish Slot Machine Associationes not have a valid trademark for Pajatso which makes this case unusual. Pajatzo, on the other hand, has been from the beginning a digital game programmed by Pietilä.

Unapproved actionsin tr theade market require that one party takes advantage of another p'soduct I goowill-valuen m theirarketing. The goodwill-value meis understood to behe m immaterialarket value and good reputatio. T of a product consumer cannot be mistaken from the actual origin of the product. Violation/ofainst the goodwill-value in oftencludes te idea of having a competing product with lower quality which affects to the supply and demand of the original product somehow hardoes harm foraits dide marketing

Every time whe Pajatzo- game is loaded in ionone, a ext Eli'as Pietilä presents Pajatso ap'pears to the screen. In Apple's sofapplication tware store Pie,tila sells the game by his own name. Ray The Finnish Slot game Associationading s that Pajatso is connected withwill-value tha and the associationeriences thisitimportant since Pjatso is a wellidelyown gambslot machine gameFinlby Finnsajatso is a marginal product to us when considering our whole turnover but the brand is very important tonnually it produces sales of five million euros", says he nne Peräkylä.

from the Finnihs Slot Machine Association

Pietilä has offered to sell the Pajatzo he designed forto the Finnihs Slot game Associationt the matter has not been negotiated. LaThe game released lt December has so far produced Pietilä turnover of 2 400 euro. The RASlot Machine Associationas requested the central commercial trading house to solve thi issue. The decision made in the commercial trading house is not legally valid b and thushe procedure can be continued in the court of law.

Appendix 3: Päivi's target text

The Finnish Slot Machine Association (RAY) is indignant at the Pajatzo game made for Apple iPhone. RAY demandsthat the game makerstops selling the product.

The Slo Machine Association insdemandst Elias Pietilä, who madecreatedPajatzo game for theothe placation ofstore the leinformatics company Apple. , stops selling his gameAccording to the association, Pietilä's digital Pajatzo is an imitation of RAY's mechanical Pajatso game both in relation to its name, appearance and other factors. The association bases its demand on trlaws on ademark, unfir procedure in the trade and copyright. What is unusual about the case is that RAY does not have possessed trademark for Pajatso. Pajatzo then ,again has b,een programmed by Pietilä from the very start.

Unfit procedure in trade requires that one party exploits the other party's goodwill value n the marketing of its product. , which means nonmaterial business value and good reputation. The consumer should not be diverted from the true origin of the product. Violating the goodwill value often contains the idea that the rival product has is ofr quality than the original product, that it affects the demand or sell of the original product and hinders the other's line of business.

Every time Pietilä's Pajatzo game is started on iPhone, the text "Elias Pietilä presents Pjatzoa" appears aon the screen. In the Apple application store he sells the game inhis own name. RAY appeals to the fact that Pajatzo is connected with goodwill value that the association finds important because it is a widely known ggambling ame among Finns. "Pajatso is a marginal product to us in relation to the entiresturnover/ales association, but its brand is very important to us. It produces an annual turnover of five million euros", says the manager of the g, ambling games business fo the Finnish Slot Machine Association Janne Peräkylä.

Pietilä has offered to sell Pajatzo that he invented, but the issue hmatter been regotiatnd. The game that was brought to sales last December has so far brought Pietilä 2a 400 euros worth s turnoverDue to the request of the Finnish Slot Machine Association, the matter has been transferrreferredved by the Cecouncil on business practice of the ntral Chamber of Comerce of Finland. The decision of the council of business practice is not legally binding b,ut the handling of the matter can be continued in court of justice.

Table 1. Time coded pause data and dictionary use, subject: Tiina.

			DICTIONARY USE					DICTIONARY USE					DICTIONARY USE	
Id.No	TIME	PAUSE	WSOY	Collins	Id.No	TIME	PAUSE	WSOY	Collins	Id.No	TIME	PAUSE	WSOY	Collins
1	00:00	01:54			26	29:48	00:11			51	1:06:21	00:12		
2	01:54	00:10			27	30:06	01:24	0:30:19		52	1:06:47	01:09	1:06:49	
3	02:30	00:16			28	31:33	00:22	0:31:29		53	1:08:00	00:25		
4	03:01	02:25	0:02:56		29	32:52	02:01	0:33:09		54	1:09:09	00:39		
5	07:18	00:11			30	35:53	00:12			55	1:10:03	00:19		1:10:30
6	09:11	00:32			31	36:29	00:38			56	1:10:34	01:39		1:11:10
7	09:56	00:12			32	37:34	01:09	0:38:46		57	1:12:45	00:59		
8	10:54	00:10			33	39:29	00:11			58	1:14:40	00:33		
9	11:07	00:32			34	40:42	00:19			59	1:15:16	00:39	1:15:10	
10	11:45	00:16			35	41:01	01:22	0:40:55		60	1:16:31	00:14		
11	12:51	00:10			36	42:58	00:20			61	1:17:00	01:03		1:17:00
12	13:11	00:17			37	44:14	00:13			62	1:21:23	00:49	1:21:20	
13	14:26	01:34	0:14:35		38	45:07	01:19		0:45:09	63	1:22:17	00:17		
14	16:26	00:35	0:16:19		39	46:39	00:17			64	1:24:39	01:19		
15	17:05	00:14			40	47:23	00:38	0:47:27		65	1:27:23	02:49	1:27:59	1:27:37
16	17:54	01:22	0:17:51		41	49:12	00:23			66	1:30:25	02:27	1:30:47	1:29:40
17	19:39	00:55	0:19:38		42	51:31	00:10			67	1:33:53	01:10	1:33:50	
18	21:05	00:17			43	51:55	03:32	0:52:22		68	1:36:30	00:25		
19	21:40	00:15			44	55:56	02:13	0:56:11		69	1:37:20	00:39		
20	23:05	00:32	0:23:07		45	58:50	01:34	0:58:46		70	1:38:00	00:16		
21	23:59	00:44	0:23:54		46	1:00:36	00:21			71	1:39:23	00:11		
22	24:49	00:14			47	1:01:02	01:51		1:01:20					
23	25:29	00:10			48	1:03:02	00:23							
24	28:02	00:25	0:27:55		49	1:03:37	00:55	1:03:30						
25	28:43	00:41	0:28:41		50	1:04:46	01:06	1:04:40		**Tot.**	**1:40:10**	**56:19**	**26**	**7**

NOTE: The shaded areas indicate the pauses within each of the five paragraphs of the text.

Table 2. Time coded pause data and dictionary use, subject: Päivi.

			DICTIONARY USE											
Id.No	TIME	PAUSE	WSOY	Collins	Id.No	TIME	PAUSE	WSOY	Collins	Id.No	TIME	PAUSE	WSOY	Collins
1	0:00:02	00:34	00:22		26	0:24:29	00:18	24:35		50	0:50:10	01:56	50:18	
2	0:00:52	01:06			27	0:25:34	01:06	25:40	26:10	51	0:52:24	02:02	52:25	53:32
3	0:02:03	00:17			28	0:26:49	00:47	26:53	27:23				53:57	
4	0:03:29	00:53	03:29		29	0:27:55	00:25	27:58		52	0:54:26	00:12		
5	0:04:28	00:31		04:05	30	0:29:11	00:20			53	0:54:42	00:10		
6	0:05:20	00:15			31	0:29:45	00:56	29:45	30:20	54	0:54:53	00:54		55:07
7	0:06:13	01:45	06:20	06:32	32	0:31:01	00:36	31:07		55	0:55:47	00:39		
8	0:08:07	00:26	08:00		33	0:32:12	00:11			56	0:56:27	00:25		
9	0:08:33	00:10			34	0:32:57	00:24	32:55		57	0:56:54	00:12		
10	0:08:47	00:45			35	0:33:23	00:15	33:24		58	0:57:23	01:10	57:50	
11	0:10:25	00:21	10:26		36	0:34:20	00:51	34:18		59	0:58:34	01:36		59:05
12	0:11:01	01:01	11:06		37	0:35:15	00:43		35:15	60	1:00:18	05:00	1:00:38	
13	0:12:20	00:11			38	0:37:26	01:09	37:27		61	1:05:30	01:33	1:05:50	1:06:22
14	0:12:41	00:20	12:40		39	0:40:03	00:23	40:02						
15	0:13:05	00:23		13:12	40	0:41:59	00:21	42:00						
16	0:13:33	00:13			41	0:42:37	00:25	42:45						
17	0:13:58	00:49	14:02		42	0:43:54	00:42	43:58						
18	0:14:52	00:29	14:58		43	0:45:01	00:20	45:01						
19	0:15:49	00:13	15:49		44	0:45:25	00:30		45:27					
20	0:17:07	01:26	17:09	18:02	45	0:45:55	00:40							
21	0:18:33	00:23	18:40		46	0:46:41	00:18							
22	0:18:57	01:01	19:00		47	0:47:07	00:17							
23	0:21:05	00:41	21:08	21:30	48	0:47:27	00:32							
24	0:22:23	00:59		22:31	49	0:48:05	02:05	48:34	48:10					
25	0:23:38	00:41		23:43				49:00	48:40	**Tot.**	**1:07:02**	**46:20**	**33**	**15**

NOTE: The shaded areas indicate the pauses within each of the five paragraphs of the text.

Table 3. Time distribution of the paragraphs, used writing and pausing time and number of pauses per section.

	Tiina									**Päivi**								
			Writing time	**Pausing time**								**Writing time**	**Pausing time**					
Orient. phase *			2:54	0	-	2:46	4	2:46	4			2:31	1:58	3	0	-	1:58	3
Draft. phase																		
Paragr.	Start	End		D		O		All		Start	End		D		O		All	
1	2:03	9:11	7:08	2:25	1	0:27	2	2:51	3	0:35	3:28	2:33	0	-	1:23	2	1:23	2
2	9:43	23:48	14:05	4:58	5	2:24	9	7:22	14	4:59	16:38	11:39	5:47	9	1:35	5	7:22	14
3	23:55	39:28	15:33	6:46	7	1:25	5	8:11	12	16:41	27:42	11:01	7:24	9	0	-	7:24	9
4	39:39	49:46	10:07	3:19	3	1:31	5	4:50	8	27:43	38:52	11:09	5:19	8	0:31	2	5:50	10
5	49:47	58:50	9:03	5:45	2	0:10	1	5:55	3	38:53	45:23	6:30	2:12	5	0	-	2:12	5
	Sum total		**55:56**	**23:13**	**18**	**5:56**	**22**	**29:09**	**40**	**Sum total**		**42:52**	**20:41**	**31**	**3:29**	**9**	**24:10**	**40**
Final phase			**41:20**	**17:31**	**13**	**6:52**	**14**	**24:23**	**27**			**21:39**	**16:46**	**9**	**3:26**	**9**	**20:12**	**18**
Whole text			**100:10**	**40:44**	**31**	**15:21**	**38**	**56:19**	**71**			**67:02**	**39:25**	**43**	**6:55**	**18**	**46:20**	**61**

NOTE: Dictionary use involving both dictionaries has been counted here as one incident.

* This section includes the orientation phase and also the pauses that occurred between paragraphs because they could not be identified as part of either the preceding or the following paragraph.

Table 4. Location of pauses not related with dictionary use within the paragraphs, i.e. the drafting phase.

Tammy				**Phoebe**			
OP*	lenght	Location between words/action		OP	lenght	Location between words/*action*	
Id. No	(s)	Before	After	Id. No	(s)	Before	After
3	0:16	is	***deletion***->has	2	1:06	Association	is
5	0:11	***mouse movement***	The	3	0:17	over	***deletion***->at
7	0:12	demanding	Elias Pietilä	6	0:15	insists	that
8	0:10	Apple	**(comma)**	9	0:10	***mouse movement***	application
9	0:32	to	stop	10	0:45	***mouse movement***	commercial
10	0:16	**(full stop)**	According	13	0:11	**(full stop)**	The
11	0:11	***deletion***	has	16	0:13	***mouse movement***	**(comma)**
12	0:17	***deletion***	***deletion***	30	0:20	Apple	application store
15	0:14	***deletion***	their	33	0:11	**(comma)**	***deletion***->that
18	0:17	**(full stop)**	It				
19	0:15	***deletion***	Unusual				
22	0:14	in	trade market				
23	0:10	***mouse movement***	***mouse m.+del.***				
26	0:11	Consumer	***deletion***				
30	0:12	to the	of the				
31	0:38	for	trading				
34	0:19	**(full stop)**	In				
36	0:20	pleading	to				
37	0:13	**(full stop)**	***del.*->(full stop)**				
39	0:17	***mouse movement***	”Pajatso				
41	0:23	head of	gambl				
42	0:10	so far	produced				

*OP = other pause

NOTE: In case of the marking *del.->,* the action or word written after the arrow indicates what the writer did after completing the action of deletion.