Assessing the Metacognitive Reading Awareness of Finnish High School Students

Bachelor's Thesis

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Tiivistelmä – Abstract

Kyky lukea akateemisia tekstejä englannin kielellä on entistä tärkeämpi taito kolmannen asteen koulutuksessa. Pohja tälle taidolle muodostuu toisen asteen koulutuksessa, eli useimmiten lukiossa. Toisen kielen – useimmiten siis englannin – opetussuunnitelman neljäs kurssi keskittyy lukustrategioiden opettamiseen. Lukustrategioita opetetaan, koska niillä on tutkitusti merkitystä etenkin haastavissa toisen kielen teksteissä, joita oppilaat tulevat kohtaamaan. ”Strategia” ymmärretään usein tietoiseksi prosessiksi, jossa lukija on tietoinen käyttäessään strategiaa. Tietoisuuden ollessa mukana puhutaan *metakognitiivisista* lukustrategioista. Näiden strategioiden käyttöön on luotu kysely, jota tämä tutkimus soveltaa.

Tässä tutkimuksessa kysely teetettiin keskisuomalaisen lukion oppilailla. Oppilaat edustivat eri ikäryhmiä: kolmatta kurssia käyviä (N=19) ja kuudetta kurssia käyviä (N=22). Oppilaat vastasivat kyselyyn, jossa he arvioivat omien metakognitiivisten lukustrategioidensa käyttöä. Tämän lisäksi kysyttiin ikää, sukupuolta, äidinkieltä, päivittäistä lukemisen määrää ja mahdollisia jatko-opintohaaveita. Tarkoituksena oli analysoida oppilaiden suosimia strategioita ja tutkia esiintyykö kahden ryhmän välillä eroja. Myös jatko-opintohaaveiden oletettiin vaikuttavan, sillä huonommin lukevat oppilaat tuskin haluavat jatkaa opintojaan. Sukupuoli otettiin mukaan analyysiin, sillä Suomessa sukupuolten välillä on havaittu merkittäviä eroja lukutaidon ja lukutottumusten osalta.

Kahden eri ryhmän välillä ei havaittu merkittävää eroa, mikä voi viitata siihen, että lukustrategioita opetetaan tasaisesti lukion aikana. Motivaatiossa jatko-opintoihin ei kyetty löytämään eroja, sillä kaikki oppilaat pyrkivät jatkamaan opintojaan. Sukupuolten välillä havaittiin eroja: naispuoliset oppilaat omasivat suuremman tietoisuuden lukustrategioista, mutta ero tietoisuudessa ei ollut tutkimuksen pohjalta niin suuri, kuin se oli 15-vuotiaiden Pisa-testeissä. Tutkimuksen suppeuden vuoksi lisätutkimuksia vaaditaan tämän tutkimuksen pohjalta.

Asiasanat – Keywords Metacognition, Reading, High School, EFL, Reading Strategies, Metacognitive, MARSI, Gender Differences, Secondary to Tertiary

Säilytyspaikka – Depository JYX

Muita tietoja – Additional information

Table of Contents

1 INTRODUCTION

Academic education is traditionally built upon the requirement that students are willing and capable of reading and comprehending tremendous amounts of complex texts pertaining to their chosen field of study. Before that, primary and secondary education focus on textbooks and written materials as sources of learning. The ability to comprehend written language is essential: we seem to live in a world of texts. This is shown in the fact that the most basic way to measure the educational level of a country is the literacy rate: the percentage of the people able to read, write and perform basic calculations. The written world also increasingly consists of texts in English, even outside English-speaking countries. This is especially true in the modern scientific community; the predominance of English seems to be unquestioned, as approximately 90% of articles in scientific journals are published in English, rather than any other language (Björkman 2013: 9).

The major role of English in the scientific community is reflected in tertiary academic education in countries, such as Finland, where English is a Foreign Language since the language community is much smaller. Generally, even if lectures and instruction are in Finnish, scientific articles and course books might be only available in English, and knowledge of English is taken for granted. For a native Finnish-speaking student, this means that as academic texts might be complex in content and cognitively challenging even in the native language, the additional challenge of reading scientific texts in the foreign language of English may become a significant obstacle for academic study.

Reading academic texts in a foreign language therefore requires three things: first, sufficient language skills; second, previous knowledge on the topic to understand the content; and third, the possession of sufficient *reading strategies*. It is reading strategies that the present study focuses on, specifically, metacognitive reading strategies. Metacognition refers to a conscious approach to thinking, and therefore metacognitive reading is a conscious approach to reading. Most of the previous studies have either investigated metacognitive awareness of students in secondary *or* tertiary education, but students in secondary education as potential future tertiary education students have not been investigated as thoroughly, especially in the Finnish context. This approach is justified, as universities generally expect even first-year students to already possess a high level of EFL reading skills, which includes metacognitive reading skills and awareness of them.

The present study focuses on students in secondary education, who may aspire to tertiary education. The method of the study consists of explaining the theoretical background; offering context for the teaching of metacognition and metacognitive reading strategies; and finally by conducting a small quantitative study on two classes of Senior High School Students in Central Finland.

2 METACOGNITION AND READING STRATEGIES

The term ‘metacognition’ was first introduced and coined by the American developmental psychologist John H. Flavell in 1976 (Iwai 2011: 151) in his article: “Metacognitive aspects of problem solving.” It is derived from the word cognition by adding the Greek-derived morpheme ‘meta’ to it. It literally refers to cognition about cognition, or thinking about thinking. According to Flavell’s original definition metacognition refers to “one’s knowledge concerning one’s own cognitive processes and outcomes or anything related to them” (Flavell 1976: 232 cited in Iwai 2011: 151). In addition, the aspect of controlling one’s own cognitive processes has subsequently seen as an ingredient in metacognition, therefore the term metacognition encompasses both the aspect of knowledge and the aspect of controlling one’s own thinking (Flavell 1978: cited in Carrell, Gadjusek and Wise 1998: 100).

More recently, metacognition has been linked to developmental psychology and educational psychology, as metacognitive processes are necessary in problem-solving and the learning of problem solving in various tasks. Reading, instead of being a passive process, is also a cognitively challenging task especially in the case of academic texts. The link between metacognition and reading has been researched starting from the 1990s and, the link has been clearly established by extensive studies in the 2000s. However, there are still areas where further studies are needed.

2.1 Development of Metacognition

Modern advances in cognition science suggest that metacognition develops via the child’s reciprocal interactions with others at early infancy, when the child learns to influence the cognitive states of others (Brincka and Liljenfors 2013: 86). Particularly the early caretaker-child dyadic interaction has a significant role in the development of metacognition. In addition, the modern view of metacognition is less restrictive than Flavell’s original theory, as the modern definition does not involve an explicit, algorithmic approach to cognition, but is more concerned with any managing of cognition (Brincka and Liljenfors 2013: 86). However, Cromley (2005: 187-188) cautions that metacognition develops unevenly in different areas, and notes that child students do not regularly check their work or question it, for example, by internally asking whether they have understood the task at hand. Nevertheless, although there is some controversy on how early metacognition develops in

children (Brincka and Liljenfors 2013: 90-92) most teenagers should already possess metacognitive awareness.

2.2 Reading and Students

Reading in an efficient manner is of tremendous importance. This is especially true for students in high school and beyond, who have to absorb new information largely via written texts such as textbooks, articles and nowadays webpages as well. Reading, especially in a foreign language such as English in the Finnish context requires, in addition to sufficient vocabulary and the understanding of grammar, also the activation of the reader's previous knowledge of the subject (Li and Munby 1996: 199). Other researchers (Iwai 2011: 152; Cromley 2005: 190) see the role of background knowledge also as part of metacognitive strategies, as it has an effect on the monitoring process the reader must utilize. However, one reason why skilled readers may use more monitoring during reading is that they recognize words automatically, which comes with practice, or they may have more background knowledge on the topic and thus read more critically and thoughtfully.

For students who struggle with reading, a positive mental disposition is essential. Research has shown that students who view intelligence as a fixed, inborn trait are reluctant to push themselves beyond their comfort zone, while students who have a mindset that allows for growth are motivated to acquire resources, such as good mental habits, to read more efficiently (Urquhart and Frazee 2012: 38-41). Arguably this is especially important for EFL and English for Special Purposes (ESP) students, as foreign language learning also requires growth and conscious effort. This is especially relevant in EFL and ESP contexts in tertiary education, as the texts encountered there are often cognitively challenging even for native language users.

2.3 Metacognitive Reading Strategies

The field of metacognitive reading strategies has inspired research, discussion and debate since the 1990s. Carrell et al. (1998: 97-100) distinguish between deliberate "strategies" utilized by readers and more subconscious "skills" possessed by the readers. The distinction is rather problematic for the purposes of comparing readers of different levels, as it can be

deduced that advanced, frequent readers may utilize what have originally been strategies on a subconscious level. Although the aforementioned researchers may make a distinction on the basis of conscious use, more recent research by Cromley (2005: 189) does not, noting that skilled readers may utilize metacognitive strategies without being aware of doing so.

Studies on metacognitive reading strategies generally divide them into three broad groups (Iwai 2011: 152-153; Carrell et al 1998: 101-108). This is typically done on a chronological basis: strategies utilized before, during and after the actual reading process. Before reading, the reader may utilize metacognition by activating previous knowledge on the subject based on the headline, for example. During reading, the reader may adjust the reading speed, skimming parts of the text that are not seen relevant and slowing down, or reading aloud parts that are important. Of course, deciding which parts are relevant is an important metacognitive strategy. After the reading, the reader may relate the text to the previous knowledge and critically assess it, and ponder on questions related to the text and what further knowledge might be of importance. The reader, before, during and after the reading needs to consciously understand the goal of the reading, or the purpose of reading the text.

Strategies for reading are particularly important when learning a foreign language, as reading helps language acquisition. This leads to the relation between reading and language being bi-directional: language skills are related to reading (Li and Munby 1999: 199) but reading can also be a tool to increase language skills. Based on this, it is likely that a metacognitive approach to reading, and specific vocabulary strategies such as inferring a meaning from context or explicit, systematic dictionary work when inference is impossible, will increase the students' general language skills. Also, some metacognitive strategies may have a positive effect on other aspects of language learning. Decoding and "word attack" (Cromley 2005: 219-220) help the students to figure the pronunciation of a word. Reading a challenging text aloud is a typical strategy, meaning that even oral communication skills may be improved by proper strategies for reading. Also, familiarity with written texts in the target language will be of help in writing, especially since metacognitive strategies have helped the students to pay attention to the organization of texts in the target language, and specific content areas within it. Finally, metacognitive reading strategies can help students develop positive mind habits and motivation, as they will approach reading from a viewpoint of a cognitive problem-solving task that they have control over, and teachers may further increase their abilities and confidence as readers by specific troubleshooting advice (Urquhart and Frazee: 33-44).

The method of classification and measurement of awareness of metacognitive reading strategies has inspired plenty of research and discussion. There are studies that have investigated differences between L1 and ESL college students in the US (Sheorey and Mokhtari 2001) and between ESL and EFL college students (Karbalaie 2010). These studies have been conducted using a Likert-scale questionnaire with 30 questions. The questionnaire (Mokhtari and Reichard 2002) has undergone minor revisions afterwards, but is still in use. (Karbalaei 2010: 165). Studies on metacognitive reading strategies may also reveal those differences between readers, and the results may then be applied to the designing of instruction on reading strategies (Karbalaie 2010: 175-176). Additionally, the metacognitive strategies used by EFL students of low language proficiency have been studied (Genc 2011), which can be relevant for teachers and education planners when they seek to address the needs of students who struggle with language learning. Measurement-based research on metacognitive reading strategies in the Finnish context seems to be rather limited currently.

2.4 Teaching of Metacognitive Reading Strategies in Finland

There appears to be a general consensus on the beneficial nature of the teaching of metacognitive strategies (Iwai 2011: 153-157). This is reflected in the relative importance the Finnish high school curriculum places on reading strategies both in L1 and L2, which is often English.

The Finnish high school curriculum advocates the teaching of reading strategies specifically in the fourth course of the L2 senior high school syllabus (Opetushallitus 2003: 100). The syllabus mentions, by a rough translation: “strategies for reading with understanding”, which clearly implies metacognitive reading strategies, as defined above. Whether the strategies taught in the course correspond with the approaches mentioned by Cromley (2005: 195-199) or Urquhart and Frazee (2011: 33-34), is unclear. However, in Finland there is considerable autonomy for teachers and schools to define the contents of the courses, and the guidelines mentioned in the syllabus represent broad goals and the weighting of a course. Generally, EFL teaching in Finnish secondary education is gradual and holistic, in other words, students do not take individual courses that pertain to a specific area, but are instead taught by their English teacher during a longer time period. Therefore it is likely that reading is taught during other courses as well. It is also likely that strategies that pertain to reading in general that are

taught in other subjects, such as Finnish, may contribute to students' array of metacognitive strategies to choose from.

In Finland, PISA-tests have revealed a particularly wide gender gap in the ability to comprehend text, almost 60% among 15-year-olds (Brozo, Sulkunen, Shiel, Garbe, Pandian and Valtin 2014: 587-588). The difference was mainly caused by girls' greater reading enjoyment and time spent on reading. Consequently, initiatives to increase reading among boys have been in effect. However, as discussed earlier, reading effectively also requires specific strategies for comprehension. At the time that the present study was conducted, research on Finnish high school students' gender differences in metacognitive reading strategies was limited.

3 THE PRESENT STUDY

Most studies have focused either on primary or secondary education, or tertiary education like the aforementioned ones (Sheorey and Mokhtari 2001; Karbalaie 2010; Genc 2011). However, the research on the link between metacognitive reading strategies and the desire of students in secondary education to continue their education is currently missing.

The present study sought to contribute to the research on metacognitive awareness of reading strategies by studying the favoured strategies of Finnish Senior High School students in a school located in Central Finland. The study used a quantitative approach based on a questionnaire that has been widely used to investigate metacognitive reading strategies.

3.1 The Research Questions

Due to the important role that metacognitive awareness of reading and strategic approach to reading play in the self-perception of students as capable readers of school-related and academic texts, especially for EFL students who have a current or future need to read academic texts in English, the present study sought to find an answer to the following research questions:

1) What types of metacognitive reading strategies are Finnish high school students aware of using, and what types of strategies are perceived as being used most and least?
2) Do background variables affect the awareness of the type and the frequency of metacognitive reading strategies perceived to be used by the students: gender, average amount of reading of any texts per day, future aspirations for tertiary education if there are such aspirations?
3) Is there a connection between metacognitive reading strategy awareness and the fourth course in the Finnish high school curriculum, which is explicitly devoted to reading strategies?

The results, especially those of the students with plans to continue their studies in tertiary education were compared to the findings of previous studies using a similar questionnaire. Gender is a particularly important background variable to be considered, as there is a

significant gender gap in reading achievement in favour of Finnish girls, and boys are overrepresented among lower achievers (Brozo et al. 2014: 586-588).

3.2 The Study Participants and the Gathering of Data

Two classes of senior high school students in a high school located in Central Finland were chosen for the study. The first group (N=19) were currently attending their first year in senior high school, corresponding to tenth grade in other countries, while the second group (N=23) were attending their second year, corresponding to eleventh grade in other countries. The first group was studying their third secondary education course in English, while the second one was studying their sixth. As mentioned before, the students answered anonymously, and no information that can be traced to an individual student was collected.

For the physical gathering of the data, the teachers of the students gave their permission to administer the questionnaire in the beginning of a lesson. Both groups were advised to answer honestly, emphasizing the fact that the questionnaire is not an exam or a competition, and the researcher was present to answer any questions regarding possible ambiguities. During the questionnaire for both groups of students, their English teacher was also inconspicuously returning the results of a vocabulary quiz the students had completed in a previous lesson. While this might have provided some additional distraction, as students also wanted to see their exam results, and in some cases discussed them with each other or the teacher, the conditions were the same for both groups. In addition, both teachers allowed a generous amount of time for the questionnaire, and the students were not under pressure to answer in haste.

3.3 The Questionnaire

The study was conducted using a Finnish-language questionnaire that was based on a questionnaire called Metacognitive Awareness of Reading Strategies Inventory (MARSI) developed by Khouider Mokhtari and Carla Reichard in 2002 (Appendix A). The original questionnaire is in English, but due to the concern that the Finnish EFL high school students might not possess sufficient language skills to comprehend all the questions, the contents were translated into Finnish as accurately as possible (Appendix B). However, the translated test still instructed the respondents to answer the questions in the context of reading English

academic text. The test was also modified to be anonymous and to not include the self-assessment part of MARSI, which is designed for educational purposes. However, some additional background information was collected.

The 30 questions from MARSI had a Likert-type scale of possible answers, ranging from 1: I never or almost never do this to 5: I always or almost always do this, with the numbers from 2-4 corresponding with approximately 25%, 50% and 75% of usage respectively. The abbreviations for the question categories in MARSI – GLOB for Global Reading Strategies ,PROB for Problem-Solving Strategies and SUP for Support Reading Strategies – were not visible in the modified version, but were later used for the purposes of the analysis. The three categories contained:

1) **Global Reading Strategies (GLOB)** category contains *thirteen* questions that deal with preparation for reading, including pre-reading, skimming, applying reading to previous knowledge, decisions on the importance of parts of text and the use of clues, non-textual elements and typography to aid comprehension.
2) **Problem-Solving Strategies (PROB)** category contains *eight* questions that concern the behavior of the reader when encountering specific problems during reading such as increased difficulty in the text or losing concentration, or strategies designed to prevent problems such as adjustments to reading speed or pausing occasionally.
3) **Support Reading Strategies (SUP)** category contains *nine* questions that are not as intrinsically related with just reading as the questions in the other categories, for example additional physical activities such as reading aloud, underlining and taking notes, the use of tools such dictionaries, and also post-reading activities such as going back and forth in the text for connections or discussing it with others.

For the subsequent analysis, the answers were analyzed both on the level individual strategies by categorizing the most and least used strategies, and the total scores of the three categories. The answers were grouped based on the background variables gathered in the questionnaire.

4 RESULTS AND DISCUSSION

The results of the paper questionnaire were turned into digital format and analyzed based on the average scores of each group and subgroup. The main focus of the analysis was the favored strategies used by the high school students participating in the study. These results were then reflected on based on the previous studies mentioned.

4.1 The Background Variables

The two classes of students, which were already previously mentioned, were labelled for the purposes of analysis as **Group A** for the younger, 16-17-year-old students attending the third course, and **Group B** for the older, 17-18-year-old students on their sixth. Group A (N=19) consisted of eight male students and eleven female students, while Group B (N=22) had eight males and fourteen females. There were originally nine males in the latter group, but one answer sheet had to be discarded due to inconsistencies. All of the students in both groups were studying English as an EFL language, and were studying it as their main choice for L2 language. Data were not collected on the students' additional language studies and knowledge, but since the school is Finnish, all the students also study Finnish and Swedish, the two official languages of Finland, as the study of both is legally mandatory. The native language of the students was in all but two cases Finnish, and the two exceptions were a bilingual Finnish-Swedish student and a student whose native language was another Finno-Ugric language. These two students belonged to Group B and were female.

The other background variables collected for the second research question were future aspirations for tertiary education and their types, and the average amount of reading of *any* texts the students did per day, based on a hypothesis that avid readers may possess a greater awareness of reading strategies. Students who enjoy reading have been noted to be more proficient readers (Brozo et al. 586-588) and the gender disparity in reading engagement is a major factor in the gap in proficiency (Brozo et al. 588). The question for future aspirations was framed in a way that takes into account the compulsory military service for adult male citizens in Finland, which women also have an option of choosing, and the fact that many Finnish young men plan to complete it right after secondary education when they turn 18. Therefore all of the students were advised to mention their plans regardless of the military

service (Appendix C). All of the students mentioned plans of continuing their education, except for one blank answer from the student without native understanding in Finnish. The types of education sought, if known, are discussed in detail in the following chapters.

For the average amount of reading, many of the students seemed to have difficulties in estimation and reported a range rather than an average, for example 30-120 minutes, which was then averaged for analysis. Most of the students averaged around 120 minutes, with the lowest self-reported amount being 30 minutes, and the highest 330 minutes. The possible ambiguity of the question needed to be considered, the study participants may or may not have defined reading some texts in multimodal environments, such as texts in computer games, social media or subtitles in television shows as *reading texts*, but focused only on traditional types of texts such as books and magazines in measuring their reading time. There may have been individual differences in the interpretation.

4.2 Observations on the Younger Group of Students

Group A (N=19) was further divided by the types of education the students reported seeking after secondary education. Six of the participants reported plans to continue education after high school but did not know yet where. Ten participants aspired to continue their education in the field of medicine, one female (f) among them in veterinary medicine to be exact. Three participants were grouped in the category 'Other', which included computer science for a male student (m), physics (m) and natural sciences (f). Overall, the students in Group A seemed to be highly ambitious and future-oriented in their aspirations for tertiary education, and some even reported a specific city that contains an educational facility for the field they had mentioned. Based on reading times, group A was divided into those who read less than 120 minutes, those who read between 120-180 minutes, and those who read more than 180 minutes per day.

In the awareness of metacognitive reading strategies, the group as a whole measured themselves (see Appendix A) as having medium to high awareness in all the categories. In particular, Problem-Solving Strategies (PROB) were known and reported to be used by all of the participants. Scores for this category were the highest of the three for all the subgroupings, and consistently above 3.5, which is defined in MARSI as the lowest score that indicates high awareness. Female respondents measured themselves slightly higher (3.94)

than males (3.78). Global Reading Strategies (GLOB) showed a gender disparity as well: the males surveyed reported higher scores (3.54) than the females (2.92) on this subcategory. Type of education sought does not seem to make an independent difference here, as most of the females (9) planned to continue in med school. Amount of reading does make a difference, but only slightly, and not beyond reading 120 minutes per day. Finally, Support Reading Strategies (SUP) seemed to be the least known and used category, with the least-reading group reporting a low score (2.19). Here, there appears to be a connection between the amount of reading and SUP strategies, as the scores increase with the amount of reading, and the only category that scored above three (3.28) was the group that estimated reading above 180 minutes per day.

On the level of specific strategies favoured by the students (see Table 1), all of the four strategies the female students perceived as using the most belonged to the PROB category: PROB11, *I try to get on track when I lose concentration.* PROB16, *When text becomes difficult, I play closer attention to what I'm reading,* PROB8, *I read slowly and carefully to understand what I'm reading*, and PROB27, *When text becomes difficult, I re-read to increase my understanding.* The results resemble those of Iranian EFL students in a previous study (Karbalaei 2010: 174) to a high degree, as the same four Problem-Solving Strategies were also among four of the five most used strategies by the Iranian students, whose most used strategy was *Using reference materials,* which corresponds with SUP15, which in turn was the fourth least used strategy for female students in group A. The three least used strategies of the female students were GLOB7, *I think about whether the content of the text fits my reading purpose,* GLOB22, *I use typographical aids like bold face and italics to identify key information* and SUP28, *I ask myself questions I like to have answered in the text.* The low reported scores to these questions were in contrast to generally average scores in the GLOB category and were a major reason why the average GLOB score of females was lower than that of males. In addition, the types of strategies female students favour and disfavour suggest that while the students understand the importance of self-monitoring for problems, they do not display a conscious tendency to relate the reading of factual texts to their personal purposes.

As readers, males also reported high awareness of the strategies in PROB subscale and, like females, reported PROB11, *getting back in track after losing concentration* as the favoured strategy, followed by PROB30, *I try to guess the meaning of unknown words or phrases*. The

males also perceived themselves using the Global strategies GLOB3 and GLOB25 to a high degree, which refer to *I think about what I know to help me understand what I read,* and I *check my understanding when I come across conflicting information*. The least favoured strategies used by male students all belonged to the SUP category, with the lowest perceived use being for SUP12, *I underline or circle information in the text to help me remember it*, and SUP5, *When text becomes difficult, I read aloud to help me understand what I read*. The findings suggest male students perceive themselves as critical and attentive readers, as reflected in high reported GLOB and PROB scores. Based on the low perceived use of all Support Strategies, male students were unaware of the importance of additional activities, such as underlining, that could support reading comprehension or they were unwilling to use those strategies. The low reported usage of reference materials for the Finnish EFL readers in group A differs from the Iranians, but a possible reason in addition to the cultural context is the different educational context (senior high school vs. college). Perhaps the types of factual texts in English that Finns in secondary education read do not require the use of reference materials or separate dictionaries, unlike the reading of academic texts in tertiary education that are not chosen for the purposes of EFL instruction.

Table 1: Most and least used strategies of the younger students (group A)

	Females		**Males**	
	Strategy	Avg. Score	Strategy	Avg. Score
Most used	PROB11	4,36	PROB11	4,50
2nd most	PROB16	4,36	PROB30	4,38
3rd most	PROB8	4,18	GLOB3	4,13
4th most	PROB27	4,18	GLOB25	4,13
4th least	SUP15	2,27	SUP15	2,50
3rd least	SUP28	2,18	SUP2	2,00
2nd least	GLOB22	2,09	SUP5	1,88
Least used	GLOB7	1,59	SUP12	1,88

4.3 Observations on the Older Group of Students

The older students, or group B, was also divided by types of education sought. Like the students in group A, every respondent had plans to continue their education, except for the non-native student, who left the question blank. There was variation in the plans of the students after high school, with medicine being again the most popular single choice (n=6). Four students wrote economics, two had technical university as their choice, four were undecided on the subject and six were grouped in 'others'. The others were political science, Art University, nursing in English, biology, law school and sports science. Group B also displayed wide variation in estimated reading time per day, with the lowest reported amount being 30 minutes and the highest 330 minutes.

In contrast to group A, where the total average values of reading strategies for female and male students were close to each other but the specific strategies differed, female students in group B (Appendix D) rated their use of metacognitive strategies higher in all categories. The biggest difference was observed in Global Reading Strategies (3.51 vs 2.73), indicating a high and average score, followed by Support Reading Strategies (2.78 vs 2.22), indicating an average and low score respectively. The males reported high scores (3.64) in Problem-Solving Strategies, but still lagged slightly behind the females (3.92).

On a level of individual strategies, female students perceived themselves as using strategies from GLOB and PROB subcategories, while most of the lowest rated strategies were from the SUP subscale, apart from GLOB22, which was: *I use typographical aids like bold face and italics to identify key information*. The highest rated specific strategies were GLOB25, *I check my understanding when I come across conflicting information*, PROB30, *I try to guess the meaning of unknown words or phrases*, PROB27, *when text becomes difficult, I re-read to increase my understanding* and GLOB17/PROB11, *I use tables, figures, and pictures in text to increase my understanding,* and *I try to get back on track when I lose concentration*. The strategies that were perceived to be used the least were SUP28, *I ask myself questions I like to have answered in the text*, GLOB22 *I use typographical aids like bold face and italics to identify key information,* SUP12 *I underline or circle information in the text to help me remember it* and SUP15 *I use reference materials such as dictionaries to help me understand what I read*. Overall, female students in group B seemed to have an awareness of a wide array of strategies and were using them, and there were no strategies that were completely

neglected. Although they did pay attention to tables and figures, typographical features were not perceived to be noticed nearly as often.

All of the strategies that male students rated as the most often used belonged to the PROB subcategory. They shared the use of PROB27, PROB30 and PROB11 with their female compatriots, but also perceived themselves as using PROB8, *I read slowly but carefully to be sure I understand what I'm reading*. The lowest rated strategies all belonged to the SUP category: with underlining and circling (SUP12) being rated as never used by almost all of the respondents. Other strategies that male students rarely reported using were SUP2, *I take notes while reading to help me understand what I read*, SUP5, *When text becomes difficult, I read aloud to help me understand what I read* and SUP9, *I discuss what I read with others to check my understanding*. Overall, male students in group B seemed to be aware of the importance of strategies in situations where problems that require solving occur, but like their younger counterparts, were unaware of or unwilling to use helpful top-down strategies to increase comprehension such as taking notes, underlining and circling or discussing the reading with others. It is possible that the male students simply did not want to devote the extra effort, e.g. writing notes, required to make use of supportive strategies. However, male students reported slightly higher use of references such as dictionaries, SUP15, than females in the group (2.75 vs 2.43), which suggests that male students in the group might have been less proficient EFL learners, as use of reference materials was favoured by less proficient readers, while underlining and reading aloud are used seldom (Genc 2011: 656).

Table 2: The most and least used strategies of the older students (group B)

	Female		**Male**	
	Strategy	Avg. Score	Strategy	Avg.Score
Most used	GLOB25	4,46	PROB27	4,25
2nd most	PROB30	4,25	PROB30	4,13
3rd most	PROB27	4,21	PROB11	4,00
4th most	GL17/P11	4,14	PROB8	3,88
4th least	SUP15	2,43	SUP9	2,00
3rd least	SUP12	2,43	SUP5	1,88
2nd least	GLOB22	2,36	SUP2	1,63
Least used	SUP28	2,21	SUP12	1,25

4.4 Differences and Similarities between the Age Groups

Both of the groups analysed consisted of rather ambitious students, as all had plans to continue in tertiary education. There was more variation in the older group regarding the field of study. Prevalence of medicine as a choice might have been due to the prestige it enjoys as a science, and the fact that it is an option that clearly leads to a specific profession. It could also then have been a 'default' choice to answer for some students who might not have been aware of all the possible choices. This could be a possible reason for it having been less popular for the older student group. Some answers that were categorized as 'undecided' included medicine as well, but were not grouped there if they were tentative, such as having "medicine? Not sure." in the answer. Students who reported a distinct plan other than medicine or economics seemed to also possess good reading strategies, especially in the younger group.

The third research question concerning the effect of the fourth course in the curriculum on reading strategy awareness cannot be unambiguously answered, due to the fact that despite the small differences between the groups in total, there were differences in the types of strategies between the groups. Most noticeably the female students in group B possessed higher overall Global Reading Strategies than the ones in group A. In particular, the average scores for some strategies that were significantly low for group A, such as GLOB7 were much higher for group B. It is possible that these strategies were taught to the older group during the fourth course. The male students in group B reported notably lower usage of strategies than the younger males, but displayed a similar pattern of low usage of Support Reading Strategies. The gender differences in favoured and disfavoured strategy types were more evident in the younger group i.e. there was a greater variation in types of strategies.

Overall, despite the aforementioned ambiguity in the results, the fourth course of the Finnish senior high school curriculum in English did not seem to have a direct connection with an increase in overall metacognitive reading strategy awareness and there was direct connection between the slight difference in age and reading strategies.

5 CONCLUSION

The results of the study revealed that Finnish Senior High School students mostly possessed similar awareness of reading strategies as college students in previous studies. This could be seen as an indication that the Finnish high school system is successful in teaching metacognitive strategies to the students and thus preparing them for tertiary education. The gender differences in strategy awareness were observable, but not as significant as might have been predicted by the PISA scores, which suggests that the difference in reading ability might be caused mainly by other factors or it does not exist in senior high school students. However, some strategies seemed to be gendered, such as underlining texts.

5.1 Implications

The first and second research questions on the types of strategies and the background variables affecting strategy use provided some answers on the metacognitive reading strategy awareness of Finnish senior high school students. All of the background variables could not be investigated by the study, such as the desire to seek tertiary education as there were no participants who did express such desire. The only clear differences were observable between the male and the female students. Although the overall average scores in the three categories of metacognitive strategies did not differ to a significant extent, the types of strategies favoured by male and female students were different. This was especially clear in the older group of students. In the older group, the male students' favoured strategies were similar to those of low-proficiency college readers (Genc 2011: 656).

The third research question on the effect of the fourth course in the L2 high school curriculum on reading strategy awareness revealed no clear connection. This might indicate that the fourth course – the one that is dedicated to the teaching of reading strategies – did not differ from other courses, and the teaching of reading strategies was done gradually. A critical interpretation of the data might suggest that explicit teaching of reading strategies in English was missing, as the older group did not rate their usage of strategies higher than the younger one. In fact, the older male students reported lower usage of most strategies than the younger ones. In particular, the beneficial strategy of underlining was shunned almost completely by the older male students. This might suggest that the importance of underlining is not stressed during the fourth course, or that underlining texts was considered a gendered

behaviour in the context of the particular Finnish high school or even Finland in general, in a similar manner that the hobby of reading was more associated with girls and women.

The observable gender differences revealed in conjunction with the concern raised by the discrepancy in PISA results suggests that further research on the gender differences in reading habits from the angle of reading strategy use is needed. In addition, the teaching of metacognitive reading strategies should be investigated further by analysing the learning materials and how teachers instruct their students in reading strategies. It is possible that there is a significant variation in the instruction between different schools and classes, as teachers might have a bias in instructing the use of strategies they themselves use the most. Therefore, one area of further research could then be the reading strategies of teachers or aspiring teachers still attending their pedagogical and subject education. For future teachers, the fact that strategies in the category of support strategies (SUP) were the least favoured could suggest that these strategies should be specifically focused on in the instruction of reading strategies.

It should be noted that the instructional context of the particular high school chosen for the study might not be applicable to other high schools, as the school in question is rather selective about the students based on grades received in previous education. In other words, it is likely that the participants consisted of high-achieving Finnish senior high school students, which would be consistent with the ambitious plans the students reported in the background part of the questionnaire.

5.2 Limitations and Future

The questionnaire used by the present study was based on The Metacognitive Awareness of Reading Strategies Inventory (MARSI), which has undergone some revisions. One is specifically designed for EFL contexts. However, the test questions remain basically the same. In regard to the test itself, it is noticeable that all groups in present and previous studies (Karbalaei 2011; Sheorey and Mokhtari 2001; Genc 2011) were observed as rating their use of some select Problem-Solving Strategies, such as in particular: *I try to get back on track when I lose concentration* (PROB11 in this version) highly, even if the averages for other questions were low. Although the test has proved to be an efficient measurement tool for reading strategy use, the wording and framing of a particular question may accidentally bias

the participants toward certain answers. To continue the example of the PROB11 question, the question framed the necessity of the strategy to a specific context with ‘when’ unlike some other questions that may or may not be applicable to a particular text. Further, the particular question allows for leniency in the successful application of the strategy with ‘try’ while allowing the participant to define what counts as ‘trying’.

Similarly, some strategies may not be applicable to *all* academic texts, such as underlining books from a library, which is discouraged. Even though many respondents might infer that the question does not cover the texts where the strategy is not applicable, more literal-minded respondents would still affect the average scores in a quantitative analysis. Perhaps the questionnaire itself could be investigated further, for example by investigating how the participants understand a particular question.

The limited scale of the present study means that the results gained by it might be only applicable to the particular school in question. It should be noted that the particular school was considered to be one of the most demanding senior high schools in regard to applicants, which meant that the lower-achieving students from primary education did not partake in the questionnaire, as they had likely entered vocational schools or other high schools. This might be especially relevant for the gender differences, as the fact that female students outnumbered the males in both groups suggests that fewer boys had enrolled in the high school in question. This could explain why the gender differences were not as significant as the nearly 60% difference observed in PISA-tests among 15-year-olds. One further limitation was that the groups studied were relatively small compared to some of the other studies cited. Most importantly, the important variable of reading performance by the participants was not measured in any way. Therefore the results in gender differences, for example, might have been caused by differences in reading ability instead.

Further studies could address the gaps in the present study. The groups could be selected from average high schools, they could involve more participants and the reading proficiency could be measured along with the awareness of metacognitive reading strategies. In addition, Finnish college students reading complex texts could be the focus of study, as such research currently does not exist in the Finnish context. In the context of secondary education, students attending Content Language Integrated Learning (CLIL) in English could be compared to students attending regular education mainly in Finnish. As Finland has two official

languages, a possible angle for comparison could be the metacognitive reading strategy awareness in English by Finnish native speakers and Swedish native speakers, to investigate the effect of L1 on EFL reading. Also, bilingualism and metacognition could be researched in relation to reading.

5.3 Conclusion

The overall metacognitive reading strategy awareness of Finnish Senior High School students seemed to be quite high for both younger and older students. This suggests that at least the participants in question possess necessary metacognitive awareness of reading skills to succeed in tertiary education, assuming that their other academic skills and language skills are also at a similarly high level. Some gender differences were observable especially in the older group, with male students reporting lower frequencies of strategy use than females. The fourth course in the high school curriculum did not seem to increase the students' awareness of reading strategies.

The types of metacognitive strategies used by the students largely belong to the group of Problem-Solving Strategies, which is more in line with previous findings on strategy use by EFL students and differs from the strategies used by ESL students (Karbalaei 2011, 174-175). However, the types of English texts that the students in Finnish high schools read are almost exclusively designed for language instruction. The students likely encounter other types of texts as well, and will encounter challenging academic English texts in tertiary education.

In conclusion, the present study found out that Finnish high school students with aspirations for tertiary education use may metacognitive reading strategies frequently. Although the individual differences were significant, the pattern of results indicates that high schoolers were not inclined to use support reading strategies as much as other types of strategies. The results suggest that reading strategy instruction in Finland should be investigated further to gain a more thorough understanding of the development of reading strategies during EFL studies. Such studies could find practical application in the design of reading strategy instruction.

BIBLIOGRAPHY

Björkman, B. (2013*). English as an Academic Lingua Franca: An Investigation of Form and Communicative Effectiveness*. Berlin: De Gruyter.

Brincka, I. and Liljenfors, R. (2013). The Developmental Origin of Metacognition. *Infant and Child Development.* 22, 85-101.

Brozo, W. Sulkunen, S. Shiel, G. Garbe, C. Pandian, A. and Valtin, R. (2014). Reading, Gender, and Engagement: Lessons from Five PISA Countries.

Carrell, P. Gadjusek, L. and Wise, T. (1998). Metacognition and EFL/ESL reading. *Instructional Science* 26, 97–112.

Cromley, J. (2005). Metacognition, Cognitive Strategy Instruction,and Reading in Adult Literacy. *Review of Adult Learning and Literacy* 5, 187-204.

Genc, H. (2011). Paper and Screen: Reading Strategies Used by Low-Proficient EFL Learners. *Sino-US English Teaching* 8 (10), October 2011, 648-658.

Iwai, Y. (2011). The Effects of Metacognitive Reading Strategies: Pedagogical Implications for EFL/ESL Teachers. *The Reading Matrix* 11 (2), April 2011. 150-158.

Karbalaie, A. (2010). A Comparison of the Metacognitive Reading Strategies Used by EFL and ESL Readers. *The Reading Matrix* 10 (2), September 2010. 165-180.

Mokhtari, K. Reichard, C. (2002). Assessing Students' Metacognitive Awareness of Reading Strategies. *Journal of Educational Psychology* 94 (2), 249–259.

Opetushallitus. (2003). Lukion opetussuunnitelman perusteet. http://www.oph.fi/saadokset_ja_ohjeet/opetussuunnitelmien_ja_tutkintojen_perusteet/lukiokoulutus

Sheorey, R. Mokhtari, K. (2001). Differences in the Metacognitive Awareness of Reading Strategies among Native and Non-Native Readers. *System* 29 (4), December 2001. 431-449.

Urquhart, V. and Frazee, D. (2012). *Teaching reading in the content areas: if not me, then who?* (3rd ed.). Alexandria, Virginia: ASCD.

Appendix A: The Original Test

Metacognitive Awareness of Reading Strategies Inventory (MARSI) Version 1.0

Kouider Mokhtari and Carla Reichard © 2002

DIRECTIONS: Listed below are statements about what people do when they read academic or school- related materials such as textbooks, library books, etc. Five numbers follow each statement (1, 2, 3, 4, 5) and each number means the following:

- **1** means "I **never or almost never** do this."
- **2** means "I do this **only occasionally."**
- **3** means "I **sometimes** do this." (About **50%** of the time.)
- **4** means "I **usually** do this."
- **5** means "I **always or almost always** do this."

After reading each statement, **circle the number** (1, 2, 3, 4, or 5) that applies to you using the scale provided. Please note that there are **no right or wrong answers** to the statements in this inventory.

TYPE	STRATEGIES	SCALE				
GLOB	1. I have a purpose in mind when I read.	1	2	3	4	5
SUP	2. I take notes while reading to help me understand what I read.	1	2	3	4	5
GLOB	3. I think about what I know to help me understand what I read.	1	2	3	4	5
GLOB	4. I preview the text to see what it's about before reading it.	1	2	3	4	5
SUP	5. When text becomes difficult, I read aloud to help me understand what I read.	1	2	3	4	5
SUP	6.I summarize what I read to reflect on important information in the text.	1	2	3	4	5
GLOB	7. I think about whether the content of the text fits my reading purpose.	1	2	3	4	5
PROB	8. I read slowly but carefully to be sure I understand what I'm reading.	1	2	3	4	5
SUP	9.I discuss what I read with others to check my understanding.	1	2	3	4	5
GLOB	10. I skim the text first by noting characteristics like length and organization.	1	2	3	4	5
PROB	11. I try to get back on track when I lose concentration.	1	2	3	4	5
SUP	12. I underline or circle information in the text to help me remember it.	1	2	3	4	5
PROB	13. I adjust my reading speed according to what I'm reading.	1	2	3	4	5
GLOB	14. I decide what to read closely and what to ignore.	1	2	3	4	5
SUP	15. I use reference materials such as dictionaries to help me understand what I read.	1	2	3	4	5
PROB	16. When text becomes difficult, I pay closer attention to what I'm reading.	1	2	3	4	5
GLOB	17. I use tables, figures, and pictures in text to increase my understanding.	1	2	3	4	5
PROB	18. I stop from time to time and think about what I'm reading.	1	2	3	4	5
GLOB	19. I use context clues to help me better understand what I'm reading.	1	2	3	4	5
SUP	20. I paraphrase (restate ideas in my own words) to better understand what I read.	1	2	3	4	5
PROB	21. I try to picture or visualize information to help remember what I read.	1	2	3	4	5
GLOB	22. I use typographical aids like bold face and italics to identify key information.	1	2	3	4	5
GLOB	23. I critically analyze and evaluate the information presented in the text.	1	2	3	4	5
SUP	24. I go back and forth in the text to find relationships among ideas in it.	1	2	3	4	5
GLOB	25. I check my understanding when I come across conflicting information.	1	2	3	4	5
GLOB	26. I try to guess what the material is about when I read.	1	2	3	4	5
PROB	27. When text becomes difficult, I re-read to increase my understanding.	1	2	3	4	5
SUP	28. I ask myself questions I like to have answered in the text.	1	2	3	4	5
GLOB	29. I check to see if my guesses about the text are right or wrong.	1	2	3	4	5
PROB	30. I try to guess the meaning of unknown words or phrases.	1	2	3	4	5

Appendix B: The Questionnaire Used

Lukustrategiakysely:

Ikä:

Sukupuoli:

Äidinkieli:

Milloin aloitit englannin opiskelun koulussa?

Kuinka paljon luet keskimäärin päivittäin (mitä tahansa tekstejä) noin puolen tunnin tarkkuudella?

Aiotko jatkaa opiskelua lukion jälkeen? Jos aiot, mitä ja missä? Huom. mikäli aiot pitää välivuoden tai suorittaa ase- tai siviilipalveluksen heti lukion jälkeen, voit silti ilmoittaa, minne aiot sen jälkeen hakea, jos tiedät.

Ohjeet

Vastaa alla oleviin kysymyksiin. Kysymykset käsittelevät asiatekstien lukemista englanniksi, eli esimerkiksi koulukirjat, sanoma – tai aikakausilehdet, Wikipedia, tietokirjat tms.

Ympyröi numero, joka vastaa mielipidettäsi siitä, kuinka teet kysyttävää asiaa lukiessasi.

1: En koskaan, tai juuri koskaan tee näin.

2: Teen näin vain joskus (selvästi alle puolet ajasta).

3: Teen näin toisinaan (noin puolet ajasta).

4: Teen näin yleensä (selvästi yli puolet ajasta).

5: Teen näin aina tai lähes aina.

1 Minulla on päämäärä mielessäni, kun luen. 1 2 3 4 5

2 Teen muistiinpanoja lukiessani, jotta ymmärtäisin lukemaani. 1 2 3 4 5

3 Mietin mitä tiedän auttaakseni lukemista. 1 2 3 4 5

4 Vilkaisen tekstiä etukäteen, jotta tiedän, mitä se käsittelee. 1 2 3 4 5

5 Jos teksti on vaikea, luen ääneen ymmärtääkseni. 1 2 3 4 5

6 Teen yhteenvedon luettavastani ymmärtääkseni tärkeät kohdat. 1 2 3 4 5

7 Mietin, vastaako tekstin sisältö tavoitteita, jotka asetin lukemiselleni. 1 2 3 4 5

8 Luen hitaasti, mutta tarkasti varmistaakseni, että ymmärrän tekstin. 1 2 3 4 5

9 Keskustelen lukemastani muiden kanssa tarkistaakseni, että olen ymmärtänyt. 1 2 3 4 5

10 Katselen tekstin läpi etukäteen, jotta tiedän sen pituuden ja muotoilun. 1 2 3 4 5

11 Jos keskittymiseni herpaantuu, pyrin pääsemään uudelleen lukemiseen kiinni. 1 2 3 4 5

12 Alleviivaan tai ympyröin tietoa tekstistä muistaakseni sen paremmin. 1 2 3 4 5

13 Säädän lukunopeuttani luettavan mukaan. 1 2 3 4 5

14 Päätän, mitkä kohdat luen tarkkaan ja mitkä sivuutan. 1 2 3 4 5

15 Käytän muita tekstejä, kuten sanakirjaa lukiessani. 1 2 3 4 5

16 Kun teksti vaikeutuu, keskityn lukemiseeni enemmän. 1 2 3 4 5

17 Käytän kuvia, taulukoita ja kaavioita joita tekstissä on ymmärtääkseni. 1 2 3 4 5

18 Pysähdyn ajoittain ja mietin lukemaani. 1 2 3 4 5

19 Käytän aihevinkkejä (esim. sanoja, joista voi päätellä mitä teksti käsittelee) ymmärtääkseni lukemaani paremmin. 1 2 3 4 5

20 Uudelleenmuotoilen asian omin sanoin (vaikka mielessänikin) ymmärtääkseni aiheen. 1 2 3 4 5

21 Yritän kuvitella tai nähdä asian mielessäni, jotta muistaisin paremmin. 1 2 3 4 5

22 Käytän muotoiluasetuksia (kuten kursivointi ja lihavointi) löytääkseni olennaisimmat asiat tekstistä. 1 2 3 4 5

23 Analysoin ja arvostelen lukemani kriittisesti. 1 2 3 4 5

24 Palaan taaksepäin, ja hyppään eteenpäin tekstissä löytääkseni toisiinsa liittyviä asioita. 1 2 3 4 5

25 Kun törmään ristiriitaiseen tietoon, tarkistan asian uudelleen. 1 2 3 4 5

26 Pyrin arvaamaan, mistä luettavani kertoo, kun luen. 1 2 3 4 5

27 Kun teksti vaikeutuu, luen uudelleen ymmärtääkseni paremmin. 1 2 3 4 5

28 Kysyn itseltäni kysymyksiä, joihin haluaisin vastauksen lukiessani tekstiä. 1 2 3 4 5

29 Tarkistan, ovatko arvaukseni tekstistä oikein vai väärin. 1 2 3 4 5

30 Pyrin päättelemään, mitä itselleni tuntemattomat sanat ja lauseet tarkoittavat. 1 2 3 4 5

Appendix C: Statistics for the Younger Group (Group A)

Group A	**ALL (n=19)**	**Female (n=11)**	**Male (n=8)**	**Undecided (n=6)**	**Medicine (n=10)**	**Other (n=3)**	**<120minutes (n=6)**	**120-180min (n=8)**	**>180min (n=4)**
GLOB	AVERAGE								
1	3,66	3,77	3,50	3,50	3,65	4,00	3,67	3,69	3,75
3	3,74	3,45	4,13	3,83	3,40	4,67	3,33	3,63	4,25
4	3,16	3,00	3,38	3,00	3,20	3,33	2,83	3,25	3,25
7	2,14	1,59	3,00	3,00	1,55	2,67	1,50	2,36	2,50
10	2,89	2,55	3,38	3,17	3,00	2,00	2,50	3,00	3,25
14	2,97	2,50	3,63	3,50	2,45	3,67	2,50	3,31	3,00
17	3,63	3,36	4,00	4,00	3,50	3,33	3,50	3,63	3,75
19	3,53	3,73	3,25	2,83	3,80	4,00	3,50	3,75	3,25
22	2,42	2,09	2,88	2,83	2,20	2,33	1,83	3,13	2,00
23	3,21	2,73	3,88	3,33	2,60	5,00	2,50	3,63	3,00
25	3,84	3,64	4,13	3,83	3,80	4,00	3,67	3,75	4,00
26	3,42	3,18	3,75	3,50	3,30	3,67	2,67	3,75	3,75
29	2,68	2,36	3,13	2,50	2,40	4,00	2,00	3,00	2,50
SCORE	40,66	37,95	44,38	40,67	38,85	46,67	36,00	42,31	42,25
AVG.	**3,18**	**2,92**	**3,54**	**3,30**	**2,99**	**3,59**	**2,77**	**3,39**	**3,25**
PROB									
8	3,84	4,18	3,38	3,33	4,40	3,00	4,00	3,50	4,25
11	4,42	4,36	4,50	4,50	4,40	4,33	4,33	4,50	4,50
13	3,47	3,36	3,63	4,00	3,00	4,00	2,83	4,00	3,50
16	4,11	4,36	3,75	3,83	4,10	4,67	3,67	4,38	4,25
18	3,68	3,64	3,75	3,17	4,00	3,67	3,83	3,50	3,50
21	3,11	3,36	2,71	2,60	3,40	3,00	2,67	3,38	2,67
27	4,11	4,18	4,00	3,67	4,40	4,00	4,00	4,13	4,25
30	4,18	4,05	4,38	4,33	3,85	5,00	4,00	4,19	4,25
SCORE	30,76	31,50	29,75	29,00	31,55	31,67	29,33	31,56	30,50
AVG.	**3,87**	**3,94**	**3,78**	**3,71**	**3,94**	**3,96**	**3,67**	**3,95**	**3,93**
SUP									
2	2,47	2,82	2,00	2,00	2,80	2,33	2,00	2,50	3,25
5	2,50	3,00	1,88	2,17	3,11	1,33	1,80	2,50	3,75
6	2,53	2,36	2,75	2,50	2,60	2,33	2,00	2,25	4,00
9	2,74	2,73	2,75	3,17	2,70	2,00	3,00	2,75	2,50
12	2,71	3,32	1,88	2,50	3,05	2,00	2,00	2,94	3,75
15	2,37	2,27	2,50	3,00	2,10	2,00	2,00	2,88	2,25
20	3,37	3,36	3,38	3,00	3,40	4,00	2,83	3,13	4,25
24	3,05	2,64	3,63	3,50	2,60	3,67	2,33	3,38	3,25
28	2,53	2,18	3,00	2,50	2,30	3,33	1,83	2,75	2,50
SCORE	24,08	24,32	23,75	24,33	24,25	23,00	19,33	25,06	29,50
AVG.	**2,69**	**2,73**	**2,64**	**2,70**	**2,72**	**2,56**	**2,19**	**2,78**	**3,28**

Appendix D: Statistics for the Older Group (Group B)

Group B	**ALL (n=22)**	**Female (n=14)**	**Male (n=8)**	**Undec. (n=4)**	**Medicine (n=6)**	**Econ. (n=4)**	**Tech (n=2)**	**Other (n=6)**	**<120 min (n=9)**	**120-180 (n=6)**	**>180 (n=7)**
GLOB	AVERAGE										
1	3,41	3,50	3,25	3,50	3,67	3,00	2,50	3,67	3,00	3,67	3,71
3	3,45	3,50	3,38	4,25	3,17	3,25	2,00	3,83	3,11	3,83	3,57
4	3,27	3,64	2,63	4,00	3,83	2,50	2,50	3,00	2,78	4,00	3,29
7	2,41	2,64	2,00	3,00	2,17	2,25	1,50	2,67	2,22	2,83	2,29
10	3,36	3,71	2,75	3,50	3,83	3,75	2,50	2,83	3,44	3,83	2,86
14	3,68	4,07	3,00	4,50	4,33	2,75	1,50	3,83	3,44	3,83	3,86
17	3,61	4,14	2,69	4,00	3,67	2,88	3,50	3,83	3,67	3,58	3,57
19	3,59	3,71	3,38	4,50	3,83	2,25	3,50	3,67	3,22	3,83	3,86
22	2,23	2,36	2,00	2,50	2,17	3,00	2,00	1,67	2,00	1,83	2,86
23	3,14	3,50	2,50	3,50	2,83	3,25	2,50	3,33	3,22	3,33	2,86
25	3,95	4,46	3,13	4,33	4,17	3,50	4,00	3,83	4,33	4,50	2,83
26	3,18	3,57	2,50	3,75	3,17	2,75	3,00	3,17	3,00	3,50	3,14
29	2,64	2,86	2,25	3,75	2,17	1,50	2,00	3,33	2,22	3,33	2,57
TOTAL	41,75	45,36	35,44	48,00	43,00	36,63	33,00	42,67	39,67	45,92	40,86
AVERAGE	**3,23**	**3,51**	**2,73**	**3,77**	**3,31**	**2,82**	**2,54**	**3,28**	**3,05**	**3,53**	**3,19**
PROB											
8	3,73	3,64	3,88	3,25	3,33	4,00	4,00	4,17	3,89	4,00	3,29
11	4,09	4,14	4,00	4,25	4,17	3,25	4,00	4,50	3,78	4,50	4,14
13	3,68	3,86	3,38	3,50	3,83	4,25	3,00	3,50	4,11	3,83	3,00
16	3,82	4,00	3,50	3,50	4,00	3,75	3,00	4,17	3,56	4,33	3,71
18	3,36	3,57	3,00	4,00	3,50	3,25	3,00	3,00	3,44	3,33	3,29
21	3,45	3,71	3,00	3,75	4,00	2,75	3,00	3,33	3,33	2,67	4,29
27	4,23	4,21	4,25	4,25	4,17	4,25	3,50	4,50	4,33	4,33	4,00
30	4,20	4,25	4,13	3,63	4,50	4,00	3,00	4,83	4,22	4,17	4,21
TOTAL	30,57	31,39	29,13	30,13	31,50	29,50	26,50	32,00	30,67	31,17	29,93
AVERAGE	**3,82**	**3,92**	**3,64**	**3,77**	**3,94**	**3,69**	**3,31**	**4,00**	**3,83**	**3,90**	**3,74**
SUP											
2	2,34	2,75	1,63	3,00	2,75	2,00	1,00	2,17	2,17	2,83	2,14
5	2,41	2,71	1,88	3,75	1,83	2,50	1,50	2,33	2,78	1,33	2,86
6	2,41	2,50	2,25	3,25	1,83	2,50	1,50	2,67	2,22	2,83	2,29
9	2,68	3,07	2,00	3,75	2,50	3,00	2,50	2,00	2,89	2,50	2,57
12	2,00	2,43	1,25	2,75	1,83	1,50	1,00	2,33	1,78	1,83	2,43
15	2,55	2,43	2,75	2,50	2,33	3,00	2,50	2,50	2,44	2,33	2,86
20	3,18	3,21	3,13	3,25	3,33	2,75	2,50	3,50	2,67	3,33	3,71
24	3,36	3,71	2,75	4,00	3,67	3,25	2,00	3,17	3,33	3,67	3,14
28	2,27	2,21	2,38	2,25	2,50	2,50	2,00	2,00	2,44	2,50	1,86
TOTAL	23,20	25,04	20,00	28,50	22,58	23,00	16,50	22,67	22,72	23,17	23,86
AVERAGE	**2,58**	**2,78**	**2,22**	**3,17**	**2,51**	**2,56**	**1,83**	**2,52**	**2,52**	**2,57**	**2,65**