Does working in asymmetrical pairs in class lead to better results than working individually?

- A study of an 8th grade English class in Sweden

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ABSTRACT

According to former brain surgeon, Nils Simonson, Swedish schools are wasting their students’ time by using teaching methods that lead to poor memorization, namely reading and listening as separate activities. He instead suggests that the students use methods that lead to better memorization. The study described in this rendering focuses on two of Simonson’s suggestions – discussion and peer teaching.

This work accounts for a study, in which Swedish 8th grade English students were working in asymmetrical pairs, i.e. pairs composed by students on different levels of achievement. The study was aimed at finding an answer to the thesis question of whether working in asymmetrical pairs led to a larger or smaller improvement, on a final grammar test, than the improvement of the rest of the students in the class, who were working individually, and thus formed a control group for the study.

The result was that the students in three out of four asymmetrical pairs improved their results more than the control group. Since one of the students in the fourth asymmetrical pair had been absent, they had only been working together during half the period of the study. This probably explains why their improvement was only on the same level as the improvement of the students in the control group. The answer to the thesis question is therefore that working in asymmetrical pairs led to better results on the final grammar test, than working individually. If the results of the participating students are divided into different groups, we also find that the students with the lowest results on the initial grammar test were those who improved their results the most, which could possibly be explained by a better room for improvement.

Due to the short time range of the study, it was limited to one class, and the generalizability of the study is hence very low. However, it could potentially serve as a pilot study for larger research projects. My main idea of future research is thus to expand the study to a larger number of students. It would also be interesting to incorporate students on all levels of achievement into a similar research project.

This work incorporates predominant teaching science theory, such as socio-cultural theories, and influential second language acquisition theory, such as the input hypothesis, the output hypothesis and focus on form instruction.
KEY WORDS

Asymmetrical pairs, peer teaching, second language acquisition, teaching science, socio-cultural theories.
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1. INTRODUCTION

1.1 The idea of the study

During a work experience as a language teacher, my supervisor showed me an article by former brain surgeon Nils Simonson (Göteborgsposten, 2007) about how we can optimize our memory. In this article, the author claimed that the teaching methods in Swedish schools were out of date. My supervisor and I discussed this, and after a while I came up with an idea of how some of Simonson’s theories could be tested. The quintessence of these theories is accounted for below.

According to Simonson (2004:75) we remember 10 % of what we see and 20 % of what we hear. Accordingly, Simonson claims that our students do not memorize 80-90 % of the received information during reading and listening as separate activities. Since these activities are common in Swedish schools, Simonson claims that we are wasting the students’ time. He suggests other activities, which he claims will enhance the students’ learning. My study focused on two of these suggested activities.

One of the suggested activities was discussion which, according to Simonson, leads to a memorization of 70 % of the information. Another suggested activity was peer teaching which, according to Simonson, leads to a memorization of 95 % of the information. Since both these methods were in line with predominant theories in teaching science, such as socio-cultural theories, theories about interaction and theories about second language acquisition, I decided to perform a study in order to test whether it was true, that these two activities would lead to an enhanced memorization.

Due to the short time available for the study, it was limited to one 8th grade English class. Eight students were selected to work in asymmetrical pairs, i.e. pairs composed by students on different levels of achievement. If Simonson’s theories were to be validated, the more successful student should be able to memorize 95 % of the information by teaching it, and the less successful student should be able to memorize 70 % of the information by discussing it. The twelve students in the class, who were not selected to work in pairs, formed a control group for the study, and were not informed about the study methods of the other eight students.
1.2 Aim and purpose

The smaller aim of this work is to compare the results of the participating students on an initial grammar test, to their results on a final grammar test that they took after having worked in asymmetrical pairs for a month, and to perform an analysis on the results of this comparison. The larger purpose is to find an example of a more efficient teaching method than the methods that we are using in Sweden today.

My thesis question for this work will therefore be to establish whether the eight students working in asymmetrical pairs improved their results more, or less, than their classmates in the control group who were working individually. I will also establish whether Simonson’s percentages are validated, or not, by the results of my study.

As explained in the introduction, Simonson’s ideas could be linked to a number of the theories that I had been studying on the teacher programme, which was the main reason to my interest in his article. Through the connection to teaching science and second language acquisition theory, I ensured that my choice of subject for this work had a potential of rendering answers, which would be useful for language teachers in general, and for my own teaching practice in particular. Another goal was to create a basis for continued research. Since I had not before come across theories about teaching by a brain surgeon, I also found this combination especially intriguing.

The choice of eight students was based on their results on the first grammar test. (See 3.2). Since they were chosen because of the fact that their level of achievement on the initial grammar test was either low, or rather high, these eight students did not comprise a representative sample of all Swedish 8th grade English students.

The aim was rather that the students in the asymmetrical pairs should represent students on low and rather high levels of achievement, in order to allow for an improvement in level with Simonson’s percentages, for learning through discussion and learning through teaching, respectively. The selection was achieved by analyzing the results of all the students in the class from an initial test on the subject that they were supposed to be working on. This subject was common irregular verbs.
2. THEORETICAL BACKGROUND

Both discussion and peer teaching involve interaction, and can accordingly be linked to central theories in teaching science, such as socio-cultural theories by for example Lev Vygotsky (1978). Both discussion and peer teaching can also be linked to theories about second language acquisition, by for example Stephen D. Krashen (1983), Merrill Swain (1998) and Michael Long (1991). These theories will be presented in this chapter.

2.1 Socio-cultural theories about learning

This chapter introduces and compares theories about learning through interaction, which are influential in teaching science in general, and which have been important for my study in particular.

2.1.1 Learning as social

Even though Lev Vygotsky’s research was performed during the 1920s and the 1930s, he is still very influential in the teaching science domain. Since my study was designed to test whether conversation and peer teaching would lead to better results than individual work, Lev Vygotsky’s socio-cultural theories about learning (1978) are highly relevant to my study.

Vygotsky was the second child of eight in an educated family (Sandra Smidt, 2009:7). Every night, the ten members of his family were discussing different subjects or reading novels to each other (8). This may have been where Vygotsky’s view, of all learning as social (14) and passed on from more expert others (25), was born. According to Smidt (16), it is likely that Vygotsky and his seven siblings were teaching one another.

One of Vygotsky’s central theories is the theory about the zone of proximal development (1978:86). He describes this zone as the “level of understanding” that a person can reach through dialogue with more expert others, who have reached a higher level of problem solving. According to Vygotsky, a student should therefore be taught at a level, which is above the student’s present level, but which is low enough for the student to be able to understand with the assistance of a more expert other.
In a school situation, the more expert other could be another student or the teacher. In accordance with Vygotsky’s theories about the zone of proximal development, having each student pair in my study consist of one more successful student and one less successful student on an initial test, assured that the less successful student would be working with a more expert other. When it came to the more successful students in the asymmetrical pairs, the study had an interesting twist.

2.1.2 Contesting ideas to the Zone of Proximal Development

Simonson’s ideas about learning through teaching are related to Vygotsky’s ideas about the zone of proximal development, but Vygotsky’s focus is rather on the development of the less prominent student, than on the development of the more expert other. According to Vygotsky’s theories, the more expert other would have to work with another person at an even higher level of problem solving, in order to reach his/her personal zone of proximal development and learn. Since Simonson’s highest percentage of learning comes from the activity of teaching a person who is at a lower level of problem solving, Simonson’s and Vygotsky’s ideas are accordingly in contradiction. This contradiction adds to the interest of my study.

Swedish linguist Ulrika Tornberg (2009:86) describes research from the USA, according to which students solve problems in a better way when they are working in groups than during classroom lessons. According to this research, the groups should be heterogeneous, i.e. asymmetrical. This research implies that it is possible to learn from working with students on both higher and lower levels of problem solving, which accordingly correlates to the respective ideas of both Vygotsky and Simonson.

Ingela Valfridsson (2009:45) explains how it is possible that students on different levels of problem solving can both benefit from working together, by stating that it is obvious that the tutee is helped by working with a “more capable peer”, and that the development of the “more capable peer” comes from being challenged by questions and demands about explanations from the less capable student. Her theory about learning from working with a less capable student stands in contrast to Vygotsky’s theory about the zone of proximal development, but is in line with Simonson’s ideas about learning through teaching.
2.1.3 Peer teaching

Research cited by John Biggs (2003:112) also shows that both tutor and tutee benefit academically from peer teaching. What is especially interesting about this research is that the tutor benefitted more than the tutee, just like Simonson’s percentages are suggesting. Biggs believes that the reason for these results is that the tutors were more active than the tutees, since this research was performed on larger groups. In my study, the interaction was facilitated by the fact that the students were working in pairs. Accordingly, they had equal possibilities of being active in the process.

Peer teaching with groups is more common than peer teaching with pairs (Biggs, 2003:113). In my study, the peer teaching was performed with same-class pairs initiated by me and the class teacher but, according to Biggs, peer teaching groups or pairs initiated spontaneously by the students usually have good results as well. He also describes how New Zealand tertiary institutions give course credit for peer tutoring, since they believe that teaching a subject deepens the students’ cognitive understanding. This is also in line with Simonson’s highest percentage of memorization.

Furthermore, Biggs (2003:114) cites research by Chalmers and Kelly (1997), which describes successful student-led groups in Australia, the USA and the UK. The authors give five examples of benefits to the students from peer teaching, out of which three also apply to the students in my study. First, the students were working in a friendly environment, where they did not have to be afraid of asking questions that might seem unintelligent. Second, the tutors had insight into the material that the tutees were covering. Third, the tutors had inside knowledge about how they managed.
2.2 Theories about second language acquisition

This chapter introduces and defines influential theories within the area of second language acquisition, and links influential language teaching methods to my study.

2.2.1 The Monitor Theory

During the 1970s, Stephen D. Krashen introduced a controversial theory called the monitor theory, according to which there were two separate systems of language learning, called acquisition and learning (Krashen & Terrell, 1983:30). Acquisition was the unconscious process of language learning by using it in a natural context. Learning was the conscious process of language learning, for example at school or in language courses (18). Since these systems were considered as separate, Krashen and Terrell stated that learning the rules of a language did not have an effect on the students’ development of communicative skills (27). The theory was controversial because it criticized common language teaching methods, which were mainly focused on repetitive practice of grammatical rules and reading (26). The monitor theory was one of the most influential theories in second language acquisition in the 1970s and early 1980s (Larsen-Freeman & Long, 1991:240).

2.2.2 The Input Hypothesis

In accordance with the monitor theory, Krashen and Terrell co-founded a methodology called the natural approach (1983:20), based on a set of hypotheses which, according to the authors, formed a coherent theory together (25). The most fundamental of these hypotheses is Krashen’s input hypothesis, according to which language acquisition can only occur by obtaining comprehensible messages (1). These messages are called input. In order for acquirers to progress, they should be exposed to a language that is a level above the learner’s current level (32). This is in line with Vygotsky’s theories about the zone of proximal development (1978:86).

Krashen was the first linguist to formulate theories about language learning in an accessible way (Moira Linnarud, 1993:51). Since his theories were easy to grasp, a lot of scholars had an opinion about them and criticized them. Tornberg (2009:40) states that Krashen’s theories are untenable today, since they are considered impossible to test through empirical research. Regardless, these theories have been indicative for further research and they have also spawned a lot of fruitful debate.
2.2.3 The output hypothesis

In contrast with Krashen’s theories, Merrill Swain (1998:64) claims that knowledge about a language is crucial, and that input does not suffice in order for students to develop the productive side of a language; speaking and writing (65). Swain’s output hypothesis implicates that learning occurs when a student is lacking a word or an expression, i.e. when there is a gap in the student’s knowledge that the student is trying to fill in (67). She claims that the student then notices how different language elements function, which enables the student to try new forms and structures.

Thus, Swain’s output hypothesis has common features with Stephen Pit Corder’s error analysis from 1967 (1981:8), in which Pit Corder claims that making mistakes leads to learning and, furthermore, that the learner’s systematic language errors show how far in the learning process the learner has come. Pit Corder distinguishes between mistakes and errors (Larsen-Freeman & Long, 1991:59), stating that mistakes can, for example, be caused by fatigue or excitement, but that errors cannot be self-corrected, since they reflect the learner’s current stage of language development.

Pit Corder further states that trying to research and explain errors leads to interesting conclusions about language learning, and that errors should be seen as proof that the learner is in the active process of hypothesis testing, a process that will eventually lead to an acquisition of the rules in question (1981:60). Consequently, Pit Corder claims that errors should not be seen as something that should be prevented (59).

2.2.4 Interaction and Focus on Form

Michael Long (1991) claims that interaction is a condition for language learning. Since interaction involves both input and output, his theories can be said to both comprise parts of Krashen’s input theory, and parts of Swain’s output hypothesis. Long has for example performed research together with Krashen, and contributed to the same series of applied linguistics as Swain (a series he also co-edited), which shows that these researchers and their ideas are closely interconnected.
Within the series mentioned above, Swain and Long both contributed to a book about *focus on form instruction*, often abbreviated *FonF instruction* (Doughty & Williams, 1998). In their introductory chapter, the editors state that neither grammar-based instruction nor meaning-based instruction alone leads to complete second language acquisition (11). According to Doughty and Williams, the reawakening of interest in form is attributed to a seminal work by Long, from 1988 and 1991, where he distinguished between a *focus on formS* (such as for example verb endings) and *focus on form* (3).

According to Long, the difference between these methods is that, while a focus on formS is **limited to** a focus on formal elements of language, FonF instruction leads to a focus on such elements. Within FonF instruction, focus on form is either triggered by problems with comprehension, or by problems with production, but the primary focus of FonF instruction is always meaningful activity (4).

Long defines a focus on formS as an isolation of linguistic features from context or communication (3). As a result, the opposite of a focus on formS is a *focus on meaning* (4). FonF instruction can thus be seen as a compromise between these opposites, and Doughty and Williams also state that their “intention is to find a pedagogically sound and empirically grounded position between the two stances” (11).

The study method of the students in my study has been close to FonF instruction, since the students have been using a communicative approach in order to study formS (the most common irregular English verbs).

### 2.2.5 The effect of conversation on language learning

Conversation comprises most of the influential theories about second language acquisition, and should therefore be seen as a fundamental part of language teaching. Throughout the period of my study, the eight students working in pairs have, for example, been using all the theories mentioned so far in this chapter to some extent, since they have been engaged in conversation in English. They have both been exposed to, and have been exposing, each other to the English language. There has thus been both input and output. There has certainly been interaction and there has most probably also been error analysis. The importance of conversation is
further explained by Valfridsson (2009:34), who sees it as obvious that conversation is important for language development.

Valfridsson claims that all learners benefit from collective problem solving (2009:44), and states that these ideas build on socio-cultural theories about teaching. She suggests that eventual positive effects on language learning, through conversation about linguistic phenomena, are also analysed within this area of research (34) and that students can compare their hypotheses, and help each other find solutions that would have been difficult for them to find on their own, in a conversation about the language in question. She also claims that it supports language learning considerably to become aware of one’s own thoughts and language (35). Valfridsson thus agrees with Swain (1998:64), to whom she also refers in this text (2009:35), that knowledge about a language is crucial to language learning.

Like the work of Long (1991), Valfridsson’s work comprises the other theories mentioned in this chapter. Long’s and Valfridsson’s theories have a lot in common but, when Long is talking about interaction, Valfridsson chooses to talk about conversation. The common denominator of their work are the socio-cultural theories, originally formulated by Vygotsky. Since the idea of this study came from an article by Simonson, who prefers to talk about discussion, I have chosen to use this term, rather than the terms of interaction and conversation, throughout the rest of this work.

In his article, Simonson writes about discussion and peer teaching as a means of learning in general. Valfridsson here stresses the importance of conversation for language learning in particular, which provides evidence that Simonson’s ideas are relevant for my study, even though he was not writing about second language acquisition.
3. METHOD AND PERFORMANCE

3.1 Method
As mentioned above, Simonson’s theories were tested by a case study in a Swedish 8th grade English class. At the end of the study, I also performed interviews. These interviews were not intended to provide any answers to the thesis question, but to evaluate the students’ thoughts and feelings about participating in this kind of project.

In order to test the effects on learning by both peer teaching and discussion, the students had to be working collectively. The decision to have the students work in pairs was made because I assumed that the peer teaching would be more effective, if the peer teacher only had one peer upon whom to focus. The evaluating interviews were also made in pairs so that the students would be able to continue finding answers collectively.

3.2 Selection
When the students had taken an initial verb test, I decided that the most successful students on this test would not be selected for the asymmetrical pairs, since there was little room for improvement for them. Some had already achieved the 95% of correct answers, which the more successful students in the study were supposed to achieve through peer teaching, if Simonson’s theory about learning through peer teaching were to be validated.

Valfridsson (2009:35) states that it is an advantage if students working in groups have a friendly relationship. The four pairs were therefore formed with the class teacher’s help, in order to avoid putting students who had issues with each other in a pair. Since I thought that around 50% was a natural upper limit for the group of low achievers, and since four of the students had less than 52% of correct answers, the number of students working in asymmetrical pairs turned out to be eight.

The four students who were chosen as peer teachers had between 72% and 85% of correct answers on the initial test. The four least successful students on the initial test had between 36% and 51% of correct answers on the initial test. If Simonson’s theory about learning through discussion were to be validated, the students in the group of low achievers on the initial test were supposed to attain 70% of correct answers on the final test.
The twelve students in the class who were not selected to work in pairs were working on the irregular verbs in a separate room and, since they all chose to work individually, just as expected, they formed a perfect reference group for the study. The eight students in the pairs were instructed not to tell the other twelve students what they were doing differently.

Since there was little room for improvement for the most successful students on the initial verb test, and since the improvement of the two groups was going to be compared, it could be argued that these four students should not have been participating in the control group either. I decided to include them, first because I assumed that the control group was supposed to include a larger number of students than the group on which the study was focused, and second because I wanted students on all levels of achievement to be represented in the study. In order for the comparison between the two groups of students to be fair, I will discuss the improvement of the control group both with and without the results of the most successful students on the initial test.

3.3 Procedure

I gave the students working in pairs a short introduction to Simonson’s percentages, but explained that they did not have to feel any pressure to attain the percentages in his theories. If they did not, it would only mean that our study had not validated his theories, which would be as good a result as any. The students in the pairs seemed happy to be chosen and all accepted my offer to participate. They also liked the fact that they were keeping a secret from the rest of the class.

Their twelve classmates in the control group were not as happy, since they were curious about what was going on in the other room. I promised them that they would find out in the end of the study period. (They also made me promise that I would bring the whole class ice cream by the end of the study.) The whole class was informed that there would be a final test after a month, in order to see if they had improved their knowledge of the irregular verbs. One 60 minute lesson per week was dedicated to the study. In total, the study was four hours long, plus one hour where the results were presented and the interviews performed (and ice cream distributed to the students).
Since I was in class at the university, I was only able to supervise two of the four lessons of the study. The other lessons were supervised by the class teacher. We were only observing the students, and did not help them in their work. In order to isolate Simonson’s percentages of learning by peer teaching and discussion as study objects, the students received no instructions about how they were supposed to be working, neither in the peer teaching group, nor in the control group. If I had instructed the students to work in specific way, the study object would have been contaminated by other methods, and the results of the study would in that case not provide answers to other questions than my thesis question.

While observing the students, I did not take any notes about the methods that they were using. The sole goal of the observations was to make sure that the students in the peer teaching group continued to work in their asymmetrical pairs, and that the students in the control group continued to work individually.

3.4 Reliability and generalizability

The subject chosen for the students’ tests was grammar and, more specifically, common irregular verbs. The reason for this choice was that the results had to be easy to measure and compare. Otherwise said, it had to be easy to see whether the answers were correct or not. The same verbs were tested on both tests, but in different sentences and in a different order. The conjugations of the verbs were also the same in both tests. The maximum score on both tests was 55 points. Since there was no risk of misinterpreting either the test results, or their comparison, the results of the study can be seen as reliable. Pairs 3 and 4 were only working together during parts of the period of the study, and their results can therefore be seen as less reliable than the results of pairs 1 and 2.

The generalizability of the study is very low. The study would have to be performed on a much larger number of students, and in a lot of different subjects, in order for any generalizations to be allowed to be made. Consequently, the results of the study only say something about the students' learning in this particular class, but they also provide a basis for further research. The study could possibly serve as a pilot study, for a larger project that would have greater empirical validity.
3.5 Ethical considerations

During the study, the less successful students on the initial test were referred to as students A1 to A4 and the more successful students as students B1 to B4. The pairs were referred to as pairs 1 to 4 and the twelve students in the control group were referred to as students C1 to C12. The students’ results were shown on an overhead with these “student codes” by the end of the study, and the students were only informed about their own results. To ensure the anonymity of the participants in the study, the town, school and class names are not mentioned in this work either.
4. RESULTS AND DISCUSSION

In this chapter, the students’ results will be presented and discussed in relation to the idea of this study.

4.1 Improvement of the students working in asymmetrical pairs

On average, the students working in the asymmetrical pairs improved their test results by 29%. The largest improvement was to be found in the test results of students A1-A4, who on average improved their test results by 59.5%. Students B1-B4 on average improved their results by 12%. The single best improvement was made by student A2, who improved her test result by 100%, from 23 to 46 points. The best improvement by a peer teacher was made by the other student in pair 2, student B2, who improved his test result by 20%.

In order for Simonson’s theory about learning through discussion to be validated, the final result of students A1-A4 was supposed to be 70% of correct answers. Their average result on the final test was 72% of correct answers. In order for Simonson’s theory about learning through peer teaching to be validated, the final result of students B1-B4 was supposed to be 95% of correct answers. Their average result on the final test was 90.5%. This may look like a possible validation of one or both of Simonson’s percentages, but as the following account will show, there were actually substantial differences in the individual results of these eight students.

4.1.1 Pair 1 – Large improvements

Student A1 had 36% of correct answers on the initial test and 58% of correct answers on the final test. Hence, this student did not attain the 70% of correct answers needed to validate Simonson’s theory about learning through discussion. Student B1 had 72% of correct answers on the initial test and 84.5% of correct answers on the final test. This student did not attain the 95% of correct answers needed to validate Simonson’s theories about learning through peer teaching. The method of working in asymmetrical pairs still led to a considerable improvement for both these students. Thus, the study was a success for both of them.
4.1.2 Pair 2 – A possible validation of one of Simonson’s percentages

Student A2 had 42% of correct answers on the initial test and 83.5% of correct answers on the final test. Hence, this student attained a much higher percentage of correct answers than the 70% needed to validate Simonson’s theory about learning through discussion. Student B2 had 82% of correct answers on the initial test and 98% of correct answers on the final test. This student attained a little more than the 95% of correct answers needed to validate Simonson’s theory about learning through peer teaching. Thus, the study was a huge success for both students in this pair, and the result of student B2 can be seen as a possible validation of one of Simonson’s percentages.

4.1.3 Pair 3 – Another possible validation of one of Simonson’s percentages

Student A3 had 51% of correct answers on the initial test and 90% of correct answers on the final test. Hence, this student also attained a much higher percentage of correct answers than the 70% needed to validate Simonson’s theory about learning through discussion. Student B3 had 84% of correct answers on the initial test and 91% of correct answers on the final test, and came close to the 95% of correct answers needed to validate Simonson’s theory about learning through peer teaching.

The study was thus a success for both of the students in pair 3 as well but, since student B3 did not feel comfortable with the peer teaching, he was replaced by student C11 during the last lesson. I had noticed that the students in pair 3 were experiencing some difficulties, but thought that it would be wrong to change the conditions of the study. I also thought that their results would be especially interesting to analyze, since they had been struggling a little. Their main problem was that student B3 felt incapable of teaching and explaining how he had been studying the verbs. One interesting angle is also that student A3 is usually a successful student. I assume that student B3 felt intimidated, by finding himself in a situation where he was supposed to teach someone, who usually does not need any assistance.

During a lesson when I was not present, student B3 told his class teacher that he did not feel comfortable participating in the study. The class teacher then decided to replace student B3 with student C11, which was a correct decision, from an ethical perspective, even though it lead to a risk of contaminating the eventual results.
Student C11 said during the interview that her motivation to participate in the asymmetrical pairs during this single lesson was high, since she felt happy to be chosen to join the students in the other room and find out what they were doing. According to student A3, she learnt more from the class with student C11 than from the other three classes together, since she felt motivated finally to work with a peer teacher, who enjoyed being in that position.

Since the conditions in pair 3 changed during the study, their results should be considered as less reliable than the results of the other asymmetrical pairs. It is after all possible that the improvement of student B3 could indicate that he learns more from working individually, than from working in pairs. It is also possible that he learned a lot from peer teaching, even though he was struggling with it. The interview with this student did not provide any answers to these questions.

4.1.4 Pair 4 – Slightly better results
Student A4 had 51% of correct answers on the initial test and 55.5% of correct answers on the final test. This student’s results were far from the 70% needed to validate Simonson’s theory about learning through discussion. Student B4 had 85% of correct answers on the initial test and 88% of correct answers on the final test. This student did not attain the percentage needed to validate Simonson’s theory about learning through peer teaching either. The explanation is probably that student B4 was absent on two occasions, and was replaced by student B2, who was then teaching two students, but was apparently more focused on teaching student A2.

4.2 Improvement of the students working individually
The improvement of the twelve students working individually ranged from -1.5% of correct answers to +18% of correct answers. The average improvement of the C-students was 7%. The study can be seen as a success for the entire class, except for student C4, who performed a little less well than on the initial test.

If we exclude the most successful students on the initial verb test, i.e. students C9-C12, from the control group, students C1-C8 improved their results by 19.5 %. That means that these students improved their results more than the peer teachers, who improved their results by 12 %. Since students C1-C8 were working individually, this contests the ideas of both Simonson and Vygotsky about learning through
interaction, and especially Simonson’s percentages of learning through reading as a separate activity (10 %), and learning through peer teaching (95 %).

The respective average improvements of the different groups of students:

1. The least successful students on the initial verb test  + 59.5 %
2. The students working in asymmetrical pairs  + 29 %
3. The students working individually (without C9-C12)  + 19.5 %
4. The whole class  + 14 %
5. The peer teachers  + 12 %
6. The control group (with C9-C12)  + 7 %
5. CONCLUSION

On average, the students working in asymmetrical pairs improved their results much more than the students who were working individually, which is the answer to the thesis question of this work. The results of the study may have come close to validating Simonson’s percentages on average but, individually, the differences between the results were too wide. Consequently, the study did not validate Simonson’s respective theories about learning through discussion and peer teaching. The title of this work is composed by a question, to which the answer depends on what is meant by better results. If larger improvements are seen as a better results, it is true that working in asymmetrical pairs led to better results in this class.

If better results are instead interpreted as a larger number of correct answers on the final test, the answer is that working in asymmetrical pairs led to slightly better results on average, but to slightly worse results if we consider the range of results in the respective groups. The control group had an average of 43.5 points on the final test, with results ranging from 33.5-54.5 points. The asymmetrical pairs group had an average of 44.5 points, with results ranging from 30.5-54 points. In conclusion, the final results of both groups can be seen as quite similar.

Vygotsky’s theories imply that students have to work with more expert others in order to learn (1978:86). Tornberg (2009:86) and Valfridsson (2009:45) state that it is possible to learn from working with students on both higher and lower levels of achievement. Biggs (2003:112) and Simonson (2004:75) claim that the best results come from teaching a subject. The results of this study were that all the students except one improved their results, but that the ones who improved their results the most were the students who were taught by a peer teacher. The result of the study is therefore in line with Vygotsky’s theory about learning by working with more expert others, but since all the methods used in the study led to improvements, all the above theories can be said to have been successful in the study to some extent.

From observing the students while they were working in asymmetrical pairs, I believe that the major reason to the huge success of three of the low achievers was that they felt less insecure about asking questions when they were working with another student, which is also one of the advantages with peer teaching mentioned above (Biggs, 2003:114). As I will argue below, I believe that the reason to their success...
could also be that they had a much larger room for improvement than the other students in the class.

5.1 Future research

If we exclude the most successful students in the control group, we find that the least successful students in both groups were those who improved their results the most. Students A1-A4 improved their results by 59.5% and students C1-C8 improved their results by 19.5%. A possible explanation for this could be that there was simply better room for improvement for these students. One idea for future research could therefore be to study the importance of room for improvement.

It would also have been interesting to study why these students performed better after only four more hours of practicing. Was it because they put in some more time and effort, or did it have anything to do with their motivation? Did they all feel more motivated to study, since they were participating in a study? Did they perhaps even feel pressure to perform well?

It would probably have been easier to analyze the results if none of the students had had any prior knowledge of the subject that they were supposed to study. One idea for a future project could therefore be to compare the results of students working in pairs and students working individually on a newly introduced subject.

Furthermore, my study only answered the question I asked in the title in part, since only low and rather high achievers were selected for the asymmetrical pairs. In order for the students chosen for a similar study to be representative of a larger population, several entire classes would have to be working in asymmetrical pairs, and several other classes would have to form a large control group, where the students were working individually. This would also allow for generalizations to be made, based on the results.

Another idea would be to use the method in other subjects than English and/or other areas than grammar. If more than one subject were tested in the same study, the researchers could also analyze the impact of the subject chosen on the efficiency of the method. Yet another idea would be to provide the students with less information about the aim of the study, so that they would not be aware of what the different theories were expecting them to achieve. On the other hand, it would also have been
interesting to provide the students in the control group with more information, since I believe that this might lead to a higher level of motivation.

The methods chosen for this study were a case study and an evaluating interview. It would also have been interesting to perform and analyze observations of the work in the respective groups. I could also have performed more advanced interviews and transcribed them in order to perform a deeper analysis of the results of my study.

The connection between teaching science and research on the brain is a connection that I find especially intriguing. There are probably many ways of continuing to explore this connection, and I believe that there is a lot to win from working with researchers in different areas than your own.
6. REFERENCES


Appendix I - The final grammar test

Name: ______________________________________________________________

Points: _____ / 55

Choose the right verb forms. Good luck!

1. meet       They had __________ us before.
2. break      She has _______________ her arm.
3. plan       Did you __________ your weekend? Yes, I ____________ it carefully.
4. get        What time do we __________ back from the trip?
5. be         Where has he __________?
6. be         They __________ not there when I arrived.
7. show       Has she __________ you the book?
8. stop       I __________ the car at the red light.
9. be         I __________ in England last spring.
10. wait      __________ for us, please!
11. write     Did Thomas __________ the story? No, Karen __________ it.
12. cry       That little girl never __________.
13. throw     Who __________ the ball?
14. be        Tom and Kate __________ not engaged.
15. know      I __________ you would come.
16. have      Many British families __________ pets.
17. find      I haven't __________ my keys.
18. forget    You had __________ to set the alarm.
19. drive     Can he __________ a truck?
20. find  They couldn’t __________ their way home.

21. choose  Did she __________ the red dress or the pink skirt? She __________ the red dress.

22. start  Has the test already __________?

23. build  We __________ a new house in 2002.

24. feel  How did she __________? She __________ happy.

25. be  They __________ tired this morning. I __________ full of energy.

26. try  He always __________ his very best.

27. talk  Can I __________ to her, please?

28. be  Have they __________ to Australia?

29. hurry  She __________ to school every morning but she is always late.

30. read  Every night, he __________ a story before he goes to sleep.

31. try  I will __________.

32. say  She didn’t __________ anything.

33. sleep  I have never __________ outdoors.

34. take  Why does she always __________ the bus? She __________ it because she is too lazy to walk.

35. study  I am going to __________ law.

36. grow  The tree __________ a whole metre last year.

37. steal  I am sure that she has __________ that jacket.

38. go  Where did he __________ for the holidays? He __________ to Canada.

39. eat  This morning, we __________ bacon and eggs.
40. drive  Why do they __________ so slowly?
41. help  I could __________ you with your homework.
42. cut  The cook __________ all the tomatoes in one minute.
43. plant  I am going to __________ flowers in my garden.
44. fly  Did you __________ to Ireland? No, I __________ to Scotland.
45. forget  She will never __________ that day.
46. have  We have __________ a wonderful time.
47. be  __________ he still in the hospital?
# Appendix II – Statistics

<table>
<thead>
<tr>
<th>Student</th>
<th>Points Test 1</th>
<th>Percent Test 1</th>
<th>Points Test 2</th>
<th>Percent Test 2</th>
<th>+/-</th>
<th>Percent +/-</th>
</tr>
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<td>A1</td>
<td>20</td>
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<td>32</td>
<td>58 %</td>
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<td>+ 60 %</td>
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<tr>
<td>A2</td>
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<td>+ 23</td>
<td>+ 100 %</td>
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<tr>
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<td>90 %</td>
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<td>+ 77 %</td>
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<td>55,5 %</td>
<td>+ 2,5</td>
<td>+ 9 %</td>
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<tr>
<td>B1</td>
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<td>+ 20 %</td>
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<tr>
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<td>+ 3 %</td>
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<tr>
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### Averages

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### Together

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<td>46,5-54</td>
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<td>+3 - 20 %</td>
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<td>Group A+B</td>
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<td>55,5-98 %</td>
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<td>+3 - 100 %</td>
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Appendix III – The interview guide
First of all I would like to thank you for participating in the study and congratulate you on your improved results on the grammar test. I am now going to ask some questions about how you have been working. I hope that you feel that you can say what you really think now that we have known each other for a while, even if you have something negative to say.

How has your collaboration been working?

Why do you think that it has been that way?

How do you feel about your own results?

Why do you believe that you got those results?

Would you have wanted to change anything that I or you did during the study? If yes, what?

Have you felt unmotivated or motivated during the study? Why?

Do you prefer to work individually or in pairs? Why?

Would you like to work in pairs again in the future? Why/why not?