Effects of Cooperative Learning Methods in German Language Arts on Reading Ability and Social Behavior of High School Students

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Abstract

This study examined the implementation and outcomes of cooperative learning methods in daily school life. In the context of an intervention wait-list control group research design lasting over two years, a group of Austrian students was taught using mainly cooperative learning methods in German language arts. In addition to standardized tests, self and peer report questionnaires assessed reading ability and aspects of social behavior before and after the intervention. Focus group interviews of teachers were used to investigate the implementation of cooperative learning methods in daily class life. The participants were nineteen teachers and 294 fifth and sixth graders from eight different schools at the secondary level. The results show that teachers prefer relatively specific cooperative learning methods. The results also illustrate that students who used cooperative learning methods in German language classes developed significantly better in reading comprehension than the students in the wait-list control group. However, concerning the reports of social behavior, most differences between the two groups failed to reach statistical significance.

Keywords: cooperative learning, implementation, reading comprehension, prosocial behavior

1. Introduction

Cooperative learning is a well examined and documented pedagogical approach that many educational settings increasingly use. In fact, since the 1970s, scholars have conducted a great amount of research to investigate various methods of cooperative learning (Dillenbourg 1999; Johnson & Johnson, 2002; Slavin, Hurley, & Chamberlain, 2003; Huber, 2007; Gillies & Boyle, 2010). Due to the fact that researchers use numerous different kinds of cooperative learning methods, definitions of cooperative learning in the literature vary. One of the most commonly used definitions of cooperative learning is "the instructional use of small groups so that students work together to maximize their own and each other's learning" (Johnson & Johnson, 1999a, p.12).

A considerable number of investigations indicates that appropriately applied cooperative learning (CL) methods may have a positive impact on both academic achievement and social skills of students (Hattie, 2013; Gillies & Boyle, 2010, Slavin, 2008). That being said, teachers often struggle when implementing CL methods. According to Gillies and Boyle (2010), teachers positively experienced CL although they occasionally faced difficulties concerning the implementation. In addition to the required preparation, teachers mentioned that sometimes pupils wanted to socialize rather than work. Moreover, teachers felt challenged when assessing their students' learning gains. When choosing CL methods for teaching their students, teachers need to consider various contextual challenges and incorporate them into their planning. This requires the teachers' commitment in advance (Gillies & Boyle, 2010). Research has shown that the effectiveness of CL depends on the teachers' competence to guide the process or more precisely to prepare the children for CL (Gillies, Ashman, & Terwel, 2008). Gillies (2003) summed up various previous studies she conducted. Her overall results indicated that children benefit more from CL when working in structured groups. She also showed that structured groups take into account that children need to be trained to cooperate (social skills, group interaction) as well as the fact that individual accountability and task interdependence need to be given. Moreover, according to Johnson and Johnson (1999), structured CL methods rely on four principles of: 1) all group members share responsibility for a certain task; 2) heterogeneous group composition; 3) individual responsibility for the group outcome; 4) teacher observation and feedback. Children in structured groups showed more cooperative behaviours, helped each other even when not explicitly requested, used more sophisticated language, engaged in more content-related talk, and achieved higher learning outcomes than the students in unstructured groups. Furthermore, Gillies (2004) reported that schools with a high commitment to CL are more likely to establish structured CL groups. This structured approach led to providing more elaborate peer support, a stronger perception of group cohesion and social responsibility as well as higher learning outcomes.

Slavin (2014) stresses five principles in order to achieve CL's frequently praised benefits (e.g., learning enhancement, social skills). His proposed strategies structure the groups and the usage of CL for students of all ages. Firstly, teams need to be interdependent. This works best in heterogeneous groups (addressing gender, achievement, cultural diversity, etc.) assigned by the teacher rather than students choosing their teams. Secondly, group goals play a crucial

role for success. Therefore, targets need to be set and properly communicated to each group member. Thirdly, the teacher needs to ensure individual accountability. In other words, success depends on all members and each team member must master the content in the end. Fourthly, communication and problem solving skills are the key elements to a functioning team. In order to use the opportunities CL can offer, skills like active listening, explaining ideas and opinions, encouraging the others and completing the tasks are components proposed by Slavin (2014). The last strategy Slavin (2014) recommends clarifies that CL is a powerful method but best used in combination with other teaching structures.

Nevertheless, there is different evidence for effects in cooperative learning and reading comprehension. Due to studies concerning reciprocal teaching (Palincsar & Brown 1984; Brown & Palincsar 1989), Barak Rosenshine (2009) points out that dialogue and communication that are important tools in cooperative learning are useful for enhancing reading comprehension. The author states, "one student asks questions another answers and a third comments on the answer; one student identifies a difficult word, and the other students help to infer the meaning and give reasons for the inferences they made. The emphasis throughout is on a cooperative effort by the teacher and students to bring meaning to the ideas in the text, rather than merely restating the words" (Rosenshine 2009). Thus, the effects of advanced reciprocal teaching might be used in modern cooperative learning methods and foster reading strategies (see below). Although the IES (2010) found ambivalent effects in testing cooperative integrated reading, one study showed statistically significant positive effects for general literacy achievement domain. Nonetheless, there is a general lack of research investigating how well these methods are maintained over time. Usually, mainly shortterm interventions were used, which do not allow researchers to follow the implementation of CL in daily class-life across one school year (Blatchford, et al., 2006; Huber, 2007). Along these lines, Thurston et al. (2010) argue that there is also a general absence of literature regarding the longevity of the reported gains, particularly concerning the efficacy of cooperative learning methods. Therefore, as Blatchford et al. (2006) and Gillies and Boyle (2010) point out, more studies are needed concerning CL in naturalistic settings, rather than in the context of short time experimental manipulations. This is particularly critical given the importance of teachers for the success of cooperative learning in daily class life. Teachers play a crucial role in guiding and monitoring student group activity (Shimazoe & Aldrich, 2010). Hence, it is also the teachers' responsibility to implement and properly carry out cooperative learning methods. Furthermore, implementing cooperative learning methods into practice is more complicated than one might think at first glance, and thus it is not at all guaranteed that the benefits of cooperative learning methods are achieved (Sharan, 2010).

2. Research Objective

This study aimed to evaluate the efficacy of cooperative learning methods in secondary schools in a naturalistic setting over a prolonged period of time. Moreover, it investigated the teachers' implementation of cooperative learning methods. In order to do so, advanced training and teaching materials supported the teachers of fifth and sixth graders in the subject of German. In addition, we evaluated the effects of the implemented methods on achievement

level, pro-social behavior (peer- and self-rating) and reports of direct and indirect aggression (peer- and self-rating) of students. Our working hypotheses were the following:

Hypothesis 1: Cooperative learning methods can be successfully implemented in German language classes over nearly an entire school year. In this regard, successful implementation means cooperative learning methods were used on a regular basis in class, and the teachers were satisfied with the used methods.

Hypothesis 2: It is assumed that the application of cooperative learning methods has a positive impact on achievement in the subject German, in particular on the reading and spelling abilities of the involved students.

Hypothesis 3: The application of cooperative learning methods has a positive impact on social behavior, in particular on the pro-social behavior and the levels of direct and indirect aggression reported by the students.

3. Methodology

3.1 Basic Information And Procedures

An intervention – wait-list control group design evaluated the efficacy of cooperative learning methods. Over a period of two years, from November 2011 until June 2013, three measurements were carried out. The first measurement was conducted in November 2011. Subsequently, the intervention, which included teacher training and the implementation of cooperative learning methods in their classes, took place in the intervention group. The outcomes of this intervention were measured in June 2012. This procedure from the first to the second measurement point can be regarded as a classical intervention – wait-list control group design (Campbell & Stanley, 1963). In the next step, the wait-list control group received the intervention as well. This design functions like a kind of replication with switched panels (Shadish, Cook, & Campbell, 2002). This was mainly done for ethical reasons (Morris, 2005) because results of the first data analysis after the second measurement indicated a significant increase in the achievement level of the intervention group. Finally, the last measurement took place in June 2013. This means, that from autumn 2011 to summer 2012 the concerned students were fifth graders. From fall 2012 onwards, the students were sixth graders. However, the sample was the same only one year later and the students one year older. In order to evaluate the implementation quality of cooperative learning methods, focus group discussions with the involved teachers were used.

3.2 Teacher Training As Basis for The Intervention

A member of the project team trained the teachers in cooperative learning methods, within the framework of an advanced training for German language teachers in cooperative learning methods. All in all, nineteen teachers participated in the training and the empirical study. The teachers were recruited through an advanced training program, for persons interested in cooperative learning methods. They joined the program voluntarily. The first group (eleven teachers) obtained the training in cooperative learning methods in fall 2011 and subsequently implemented the acquired methods in their classes. These teachers and their classes

participated as the intervention group, while the other eight teachers and their classes constituted the wait-list control group. These teachers received the same training sessions one year later. Selection of the teachers for intervention- and wait-list control group was decided based on the date of their registration. The first eleven teachers who wanted to participate in the study were chosen to be the intervention group, whereas the next eight teachers served as wait-list control group during this first intervention phase. The examples of the CL methods were based on the curricular and standard schoolbooks. The teachers received materials for cooperative lecturing designed for the respective level they were teaching (intervention phase one – fifth grade; intervention phase two – sixth grade).

The implementation of cooperative learning was based on the model of Rotering-Steinberg (2010) in which five different stages of implementation are outlined. In the first stage, the orientation stage, the involved teachers were informed about the characteristics, the features and the introduction of cooperative learning methods for German language arts at secondary level. The second stage, the planning stage (Rotering-Steinberg, 2010), was not necessary due to the fact that only German language teachers took part and a further differentiation between different subjects was not required. At the third stage, the training stage (Rotering-Steinberg, 2010), the teachers were trained in three to four different CL methods. At this stage, the teachers met five times (from October 2011 until May 2012) for training units of four hours each. Every unit started with some theoretical input. Subsequently, designated cooperative learning methods were worked out with prepared materials in a practical way. The teaching materials were developed by a member of the project team according to the demands of the teachers. In the fourth stage, the introduction of CL in the German language classes, the teachers were encouraged to use the CL in their classes. In this stage, the teachers used the materials and skills gained at the training to implement specific cooperative learning methods in their classes. Moreover, the teachers were free to decide which of the learned CL methods they implement in class. They were only asked to implement what they deemed appropriate CL in a frequent manner and report it in their self-reports. Finally, at the fifth stage, the reflection and evaluation stage, the experiences of the teachers with cooperative learning methods were evaluated. This happened partly along the school year. The teachers were in contact with the trainer from the project team. However, the main cooperative learning methods were taught in the training program. These methods were Fishbowl (Klippert, 1995), Graffiti (Gibbs, 1987), Tandem Reading (Borsch, 2010), Learning Duet (Wahl, 2004), Placemat (Weidner, 2003), Partner Jigsaw (Huber, 2010), Script Cooperation (Borsch, 2010), Structured Controversy (Huber, 2010), UNESCO-Resource-Pack (Holzinger, 2006), Think-Pair-Share (Müller, 2011), and the classic Jigsaw (Jalilifar, 2010). Tandem reading, for example, is a method were two students read alternatingly short text sections aloud. Their fellow student controlls his/her reading and, if necessary, corrects their partner. This method is suitable in the enhancement of word recognition and reading comprehension. Partner jigsaw is a CL method where two students work together. Each student first reads one text separately and answers questions on it. They then act as expert and explain the content to their partner. In contrast, graffiti is a CL that is mainly used to develop and elaborate new ideas and discuss them in class. Moreover, it is often used as a brain storming method within groups. Along these lines, the method placemat focuses not solely on content, but also on the discussion process to come to a consensus on a specific

theme. In this method students write their opinion to a certain task and discuss the different opinions. At the end they should come to a consensual answer to a specific task. In this regard it is important to mention that structured as well as unstructured CL methods were adopted in this research project. Structures mean content-free ways of organizing social interaction. In this regard a structure proscribe human behaviour for a certain activity (Kagan, 1990).

A project member continually monitored the process of implementation of CL methods. This means the involved teachers and their trainer were continually in contact via email, discussing problems and crucial issues regarding the use of CL methods. Moreover, frequency and application of these methods in their classes were reported in the focus group interviews at the end of the school year. In these interviews the teachers were encouraged to communicate freely about using CL in their classes.

As mentioned above, the classes of intervention phase two (eight teachers) served as the wait-list control group. All of the eight teachers worked in other schools than the teachers of the first intervention group. These eight teachers were asked not to use cooperative learning methods in general in their German language classes until they also had received the training. At the end of the school year, teachers of the wait-list control group reported that they had not used CL in class. Instead they applied mainly traditional teaching approaches based on direct instruction. From October 2012 onwards (intervention phase 2), these eight teachers obtained the CL training in the same way as mentioned before and subsequently implemented these methods in their German language classes. Again, focus group discussions monitored the implementation.

3.3 Sample

In all, 294 students took part in the study of which 240 participated at all three points of measurement. The students were fifth (during intervention phase one) and sixth (during intervention phase two) graders and attended integrative middle schools (NMS: Neue Mittelschule) in Styria, a federal state of Austria. At the first measurement point the students were at the beginning of fifth grade. At the third (which was also the last) measurement point they were at the end of sixth grade. The class size varied between fourteen and twentey-seven students per class, with an average of twenty students per class. This is representative of most of these kinds of schools in Styria. Of these 240 students, 49.7% were female. The students had an average age of 10.88 years (SD: 0.51) at the first point of measurement, 11.48 years (SD: 0.54) at the second point and 12.43 years (SD: 0.47) at the third and final point of measurement. Twenty-four percent of students had a migration background (first or second generation immigrants). Finally, fourteen students had special educational needs.

Nineteen teachers who participated in this study taught the students. Eleven teachers participated in the intervention group and eight teachers in the wait-list control group. As already mentioned, the date of their registration for the training decided the group assignment of the teachers. There are not any reasons to consider that this kind of group assignment systematically biases the outcomes of this study. In fact, comparisons of the means with t-tests revealed no significant group differences in any of the tested dimensions (i.e., reading comprehension, pro-social behavior, direct and indirect aggression). All of the teachers were

female and all of them were full time teachers. They taught German language lessons to their classes at least four times per week, some of them were also the form teachers and, hence, met their classes at least five times per week, whereby one lesson hour lasted forty-five minutes. The teachers had an average teaching experience of 19.6 years (SD: 12.83). Fifteen teachers taught German as their main subject with another subject like history, music or geography as a second subject. Four teachers were special education teachers who also acted as co-teachers in the German language classes.

3.4 Instruments

In order to evaluate the reading achievement of the students, the reading comprehension test ELFE 1-6 (Lenhard & Schneider, 2006) was used. This test consists of three subtests: word, sentence and text comprehension, of which the sentence and text comprehension subtests were used in this study. With *Cronbach's α=*.97 for the sentence comprehension and *Cronbach's α* =.92 for the text comprehension, internal consistencies were " good" to "very good". Both subtests were used in the paper and pencil version and were carried out in a group test setting with the whole class. The research team carried out the tests. This means this paper's first author administered the test and two assistants supported him. The teachers themselves were not present in the class during testing.

The questionnaire "life in class" (Gasteiger-Klicpera, 2001) was used to evaluate pro-social behavior as well as direct and indirect aggression. The questionnaire consists of a Likert scale with five response levels which evaluates the dimensions pro-social behavior, direct and indirect aggression as well as victimization. For this study, the dimensions of pro-social behavior and direct and indirect aggression were used in the questionnaire. Moreover, the questionnaire assessed two different perspectives. On the one hand, self-assessment was evaluated with four items for each dimension. On the other hand, the social behavior of fellow students was evaluated with five items for each dimension. Thus, the questionnaire evaluated the behavior of the students and of their peers. Internal consistency for the direct aggression self-rating was reported to be *Cronbach's α* =.79, and *Cronbach's α* =.71 for the peer rating. For the indirect aggression, peer-rating was reported to be Cronbach's α =.70 and peer rating was reported to be *Cronbach's α* = .65. Furthermore, internal consistency for the pro-social behavior self-rating was *Cronbach's α* =.76 and *Cronbach's α* =.82 for the peer-rating (Gasteiger-Klicpera, 2001). Thus, the consistency of the used scales can be regarded as sufficient to good.

In order to evaluate the teachers' implementation of cooperative learning methods, Bohnsack's (2008) group discussion method was used at the end of the school year, separately one time with the intervention group on two dates (divided groups) after the first year of the duration of the study and one time with the control group after the second year of the study. The group discussion was audio-recorded and subsequently transcribed using the transcription software f5 for Mac. An external moderator who was instructed generally with the main goals of the investigation carried out all group discussions. This person was not engaged in the teacher training and data acquisition. Moreover, the group discussion moderator was instructed to initiate the discussion between the teachers, and to avoid structuring interferences into the

group discussion to some extent. Nevertheless, researchers did ask some questions about the CL strategies that were used. Subsequently, structural content analysis, a specific kind of qualitative content analysis, was used to evaluate the transcript (Kuckartz, 2012). Characteristic for this method is the fact that the coding scheme is not fully determined in advance. More or less, it is a mixture between a fully inductive creation of categories and a broadly deductive category creation which is determined by the research question. Nine main categories and sixteen subcategories were outlined in the group discussion. From the five main categories, two categories are relevant for this research. The main categories were as follows: pedagogical coaching, evaluation, different aspects of the intervention, teacher's roles and responsibilities and CL in daily class life. For this piece of research, mainly the categories CL in daily class life and different aspects of intervention are relevant. The first main category focuses on CL in daily class life. This category consists of three subcategories: the different CL used in class, the selection of appropriate CL in German language arts and the kind of usage of the most commonly used methods in class. For this category the teachers were asked: "Which factors promote the use of CL in the German language arts and, moreover, which factors make it more difficult?" Furthermore, they were asked which cooperative learning methods in particular were used frequently in their German language classes.

The second main category focuses on the different aspects of the intervention like the academic achievement or changes in the social behavior of the involved students. This category consists of four subcategories. The first subcategory considers the academic achievement of the involved student, the second subcategory relates to social learning, the third to mutual learning and the fourth and last one to inclusion. For the second category, the teachers were, for example, asked: "What is the effect of cooperative learning methods regarding the development of achievement."

4. Results

In order to present the results, we will first report qualitative information of the interviews and group discussion with the teachers. This illustrates the implementation's context from the perspective of the teachers involved. Subsequently, the effects of the implemented CL will be shown through quantitative data of the longitudinal development of academic achievement and social competences from first to second measurement. Finally, the further longitudinal development beyond the intervention until follow-up will be presented.

4.1 Results I: Implementation

Since the results of the group discussion remained relatively stable over time, this part of the results section is not subdivided and the results of both teacher groups (the teachers of the first and the second intervention group) are presented together. As the most important factor for promoting the application of CL in German language classes, the teachers mentioned the teacher training they had received. Due to the fact that the trainer prepared a large amount of useful materials in advance, it was easier for them to implement these methods in their daily teaching. This also applies for methods which could be actively tried in the teacher training. One teacher mentioned in this regard: "It was very, very important that we could try some of the methods also in the training before we used them in class." In this regard it is also important to

notice that the two methods, script cooperation and think-pair-share, were not actively trained in the teacher training. One teacher mentioned: "That this is also one reason why I did not use these methods in class."

Among the factors that made it more difficult to use cooperative learning methods in class, teachers primarily mentioned time restrictions. Due to the fact that lessons usually last only forty-five minutes, the less time-consuming CL were preferred. The teachers also mentioned that the ideal time frame for the use of CL would be at least a double unit, i.e., nintey minutes. They also mentioned outdated infrastructure that acted as obstacles for the implementation of specific kinds of learning methods, such as methods that produced a higher level of noise. Finally, the teachers also mentioned concerns about the fact that during these lessons usually not very much is written down. Thus, they could not provide proof of the work done in class for colleagues and parents. The traditional writing in an exercise book, for example, is missed and as one teacher mentioned, "When we have used this [CL], we always had the feeling we didn't have anything substantially fixed in the notebooks [according to the wishes and demands of the parents]." Therefore, the participating teachers mentioned concerns about feelings of uncertainty when using CL. With regard to the question which methods were used most frequently, the participating teachers answered in a consistent way. Finally, CL were mainly used in reading lessons and hardly used in grammar lessons.

Table 1. Number of Cooperative Methods Used in Class

Cooperative learning methods	Number of teachers who frequently used this method (out of n=19)
Fishbowl	5
Graffiti	14
Tandem Reading	12
Learning Duet	2
Placemat	9
Partner Jigsaw	8
Script cooperation	1
Structured controversy	4
UNESCO-Resource-Pack	4
Think-Pair-Share	0
Classical Jigsaw	2

The implementation of the different methods varied widely among the teachers. For some teachers "frequent" use of a certain method meant the use of this method each week, whereas others used it three times during the semester. Although at the beginning of the project the teachers agreed upon fulfilling reports on the frequency of using cooperative methods, at the end the teachers did not comply with this purpose and it was not possible to obtain more precise information. As can be seen in Table 1, a handful of methods was clearly preferred, e.g., Graffiti, Tandem Reading, Placemat and Partner Jigsaw. According to the teachers, these methods were chosen due to less organizational effort and high additional learning value. The less frequent use of all other cooperative learning methods was mainly justified by the lack of time. Moreover, the teachers mentioned the relatively large amount of preparation necessary for these methods as one of the reasons for not using them. One teacher mentioned that the more time consuming cooperative learning methods were difficult to implement. Besides time restriction this teacher also mentioned, "I just have to grow into the more sophisticated methods." Therefore, teachers also prefer more simple methods in order to become familiar with cooperative learning methods. Along these lines, one teacher also explained that some methods required advanced communication skills from the students. Two teachers mentioned this, saying that "Some methods like script-cooperation are not that suitable for the students in my German language arts class" and "Yes, these methods require already good communication skills that cannot be expected especially by younger students."

However, regarding the effects of CL, the teachers reported positive developments. Comments from one teacher such as, "We read Hamlin's Piper by using cooperative learning methods and the content of the story was memorized up to 90% by the students. This stands in sharp contrast to the common method, where usually only 50% of the content is memorized by the students." In addition, the teachers also mentioned the positive impact of cooperative learning methods on children identified with special educational needs. As one teacher put it: "...I work in an inclusive classroom where some children with severe and multiple handicaps are educated together with regular students. […] The use of CL gives us for the first time the possibility of all students working together on one task." Moreover, the teachers mentioned a positive impact on the social behavior and on the social relationships between high achieving students and at risk students in class.

4.2 Results II: Intervention Effects On Reading And Social Competences

The means and the standard deviations of the sentence and text comprehension (ELFE 1-6 test) are presented in Table 2 for the intervention group and the wait-list control group for the first and the second point of measurement.

Table 2. Means and Standard Deviations of the raw scores for the subtests of ELFE 1-6 (Sentence and Text Comprehension)

Subtests	Group assignment	Measurement 1	Measurement 2	N
		M (SD)	M (SD)	
Elfe Sentence	Intervention group	13.27 (4.77)	16.37 (5.28)	155
Comprehension	Wait-list control group	13.00 (4.88)	15.01 (4.32)	89
Elfe Text	Intervention group	12.50 (4.69)	14.37 (4.75)	154
Comprehension	Wait-list control group	12.22 (3.83)	13.60 (4.47)	89

Regarding sentence comprehension, the means show that both groups developed in a positive way. To determine if significant differences exist between the intervention and the control group in reading skills and pro-social behavior, analysis of variances (ANOVA`s) with repeated measurements were conducted. Homogeneity of variances was assured by non-significant Levene-tests. Normality was examined and assured by skewness and kurtosis <1, which was only not the case for the dimensions direct and indirect aggression during the follow-up phase.

Regarding the sentence comprehension subtest, ANOVA revealed a significant main effect in performance from the first to the second time of measurement ($F(1, 242)=107.83$; $p= .000$; $\eta2= .308$) and a significant interaction effect (time x intervention) ($F(1, 242)=4.87$; $p=.028$; $\eta2= .02$). As can be seen in Table 2, both groups show an increase of mean scores over time, but the intervention group develops better than the wait-list control group does. Moreover, the Cohen's d is .28. According to Hattie (2014) this can be regarded as a small effect of cooperative learning methods on reading comprehension. Nevertheless, the proportion of variance explained by the interaction is relatively small.

Regarding the text comprehension subtest, ANOVA revealed a significant increase of mean scores from the first to the second measurement ($F(1, 241)=62.89$; $p=.000$; $\eta2= .21$), but no significant interaction effect (time x intervention) could be found ($F(1; 241)=0.223$; ns). Nonetheless, the students of the intervention group also tended to develop better in their reading comprehension than their counterparts in the wait-list control group (see Table 2).

The means and standard deviations for pro-social behavior, along with direct and indirect aggression, are given in Table 3 for the intervention group and the wait-list control group for the first and the second points of measurement. ANOVAs were also used to evaluate group differences in peer ratings and self ratings of direct and indirect aggression (See Table 3).

Table 3. Means and standard deviations for the dimensions Pro-Social Behavior and Direct and Indirect Aggression.

Dimension	Group assignment	Measurement 1	Measurement 2	N
		M (SD) peer rating / self rating	M (SD) peer rating / self rating	
Pro-social behavior	Intervention group	3.38 (0.91) / 3.59 (0.93)	3.61 (0.87) / 3.74 (0.87)	154/154
	Wait-list control group	3.17 (0.85) / 3.72 (0.90)	3.21 (0.80) / 3.60 (0.84)	89/89
Indirect aggression	Intervention group	4.25 (0.69) / 4.49 (0.55)	4.18 (0.75) / 4.49 (0.55)	154/154
	Wait-list control group	4.18 (0.75) / 4.55 (0.69)	4.10 (0.85) / 4.51 (0.63)	89/89
Direct aggression	Intervention group	4.28 (0.62) / 4.56 (0.65)	4.37 (0.65) / 4.56 (0.62)	154/153
	Wait-list control group	4.05 (0.84) / 4.46 (0.84)	4.07 (0.88) / 4.27 (0.74)	89/89

For peer-rated pro-social behavior scores, ANOVA revealed a significant increase of means from the first to the second measurement ($F(1, 241)=5.5$; $p=.02$; $\eta2= .02$) but no significant interaction effect (time x intervention) ($F(1, 241)=2.52$; *ns*). Nevertheless, the inspection of the means again shows that the intervention group tended to develop better with regard to pro-social behavior than the wait-list control group.

The ANOVA of the self-rated pro-social behavior scores revealed no significant increase of mean scores from the first to the second measurement ($F(1, 241)=0.03$; ns). However, a significant disordinal interaction effect (time x intervention) was found ($F(1, 241)=5.48$; $p=.02$; $\eta2= .02$) in favor of the intervention group (see Table 3). Again, it is important to note that the proportion of explained variance of the interaction is relatively small. Neither significant main effects nor significant interaction effects were found in any of these analyses.

4.3 Results III: Follow-up

As already mentioned, between the second and third time of measurement the wait-list control group received the intervention as well. Thus, both groups were using cooperative learning methods in their German language classes during that time. For both groups, means and standard deviations of their scores in the ELFE 1-6 reading test are presented in Table 4.

Table 4. Means and standard deviations of the raw scores for the subtests of ELFE 1-6 (Sentence Comprehension and Text Comprehension) for the 2nd and 3rd measurement.

Subtests	Group assignment	Measurement 2	Measurement 3	N
		M (SD)	M (SD)	
Elfe Sentence	Intervention group	16.53 (4.88)	18.38 (4.45)	159
Comprehension	Wait-list control group	15.29 (3.94)	17.44 (3.82)	68
Elfe Text	Intervention group	14.64 (4.31)	16.58 (3.40)	159
Comprehension	Wait-list control group	14.10 (4.51)	15.71 (4.05)	68

ANOVAs revealed significant increases in performance from the second to the third time of measurement for both subtests (for the subtest Sentence Comprehension $F(1, 225)=77.19$; $p= .000$; $\eta2= .26$; and for Text Comprehension $F(1, 225)=64.34$; $p= .000$; $\eta2= .22$). In contrast to the intervention phase one, no significant interaction effects (time x intervention) were revealed. That was the case neither for sentence comprehension ($F(1, 225)=.041$; *ns*) nor for text comprehension ($F(1, 225)=.450$; *ns*). The means analysis (Table 4) shows that the performance of both groups increased. Moreover, the achievement level of the students of the wait-list control group reached the level of the students of the (former) intervention group.

In order to evaluate the data concerning pro-social behavior and direct/indirect aggression, the same procedures were used. The means and standard deviations are presented in Table 5 for the intervention group and the wait-list control group for the second and third point of measurement.

Table 5. Means and standard deviations for the dimensions Pro-Social Behavior and Direct and Indirect Aggression

Dimension	Group assignment	Measurement 2	Measurement 3	N
		M (SD)	M (SD)	
		peer rating / self rating	peer rating / self rating	
Pro-social behavior	Intervention group	3.63 (0.87) / 3.75 (0.89)	3.62 (0.89) / 3.73 (0.88)	154/157
	Wait-list control group	3.22 (0.80) / 3.69 (0.77)	3.37 (0.87) / 3.78 (0.84)	89/68
Indirect aggression	Intervention group	4.12 (0.73) / 4.50 (0.48)	4.21 (0.77) / 4.45 (0.60)	154/157
	Wait-list control group	4.14 (0.81) / 4.55 (0.55)	4.21 (0.63) / 4.49 (0.52)	89/68
Direct aggression	Intervention group	4.34 (0.73) / 4.61 (0.53)	4.36 (0.76) / 4.44 (0.84)	157/153
	Wait-list control group	4.14 (0.87) / 4.50 (0.65)	4.41 (0.58) / 4.51 (0.56)	89/68

An ANOVA with repeated measurement was performed to reveal group differences for the scores in pro- social behavior. ANOVAs showed neither significant main effects nor significant interactions (time x intervention) for the self- and peer-ratings (peer-rating main effect: $F(1, 223)=1.12$; ns; self-rating: $F(1, 223)=1.76$; ns; interaction effects peer-rating: $F(1, 223)=1.76$; ns, self-rating: : $F(1, 223)=.83$; ns). Due to the fact that the other dimensions, i.e., direct and indirect aggression, did not meet the criteria for normality (skewness and kurtosis >1), Mann-Withney-U-tests for non-parametric samples were performed. The results of these tests were not significant, neither for the peer-ratings nor for the self-ratings of direct and indirect aggressive behavior.

However, the means analysis shows that at any rate both groups, the intervention group and the wait-list control group, tend to develop in a positive way with regard to direct and indirect aggression. In contrast, the ratings for pro-social behavior stagnate from the second to the third time of measurement (see Table 5).

5. Discussion

5.1 Implementation Of CL In Daily Class Work

The results clearly show that teachers prefer easy to implement and short CL in daily class work. From eleven CL, teachers from the intervention group only frequently used four methods. A few teachers used the other methods but less often. Actually, some of these methods were just applied once. The reasons for this are mainly seen in time restrictions, too much preparation effort and the physical environment in the classroom. These results are aligned with the findings of Gillies and Boyle (2010) and with the work of Kagan (1992). Teachers prefer structured CL that are short and easy to prepare in daily classroom work. Teachers hardly used the longer and more sophisticated CL methods. Nevertheless, even the use of just a few cooperative learning methods had an impact on the reading performance and the pro-social behavior of students in daily class life. Nevertheless, it must be also mentioned that more sophisticated cooperative learning methods were hardly implemented. In fact, restrictions such as infrastructural problems and time restrictions in the daily school life of the participants complicated the usage of specific CL. Moreover, teachers had to get familiar with cooperative learning methods in daily school life. Therefore, this may also influence the implementation, in particular of more sophisticated cooperative learning methods. It seems possible that teachers need more time or specific training to be able to use more sophisticated methods in class. The same is true for students as well. Students need time to adapt to CL and also some methods are not appropriate for every class or age class.

Therefore, it can be assumed that the research hypothesis 1—that cooperative learning methods can be successfully implemented in daily classroom work over nearly an entire school year—can be confirmed as long as this working hypothesis only refers to cooperative learning methods that have a short duration and are simple to conduct. In addition it is very important to notice that changes in the daily instructional style of teachers are very difficult to implement in schools. As teachers are used to a certain method of instruction it takes much motivation, engagement and courage for them to abandon familiar ways and to try to adapt new forms of working with students. Nevertheless this variation in implementation of new methods is a realistic aspect of school life and little changes in instruction can make a difference and are important also if it is not possible to implement the CL methods daily and in an intense manner. For further research, it would be important to record the implementation process in each contributing classroom.

5.2 Reading Comprehension

According to the results, a significant statistical difference was found between the intervention group and the wait-list group for the ELFE subtest Sentence Comprehension from the first to the second point of measurement. Although no significant difference could be found for the ELFE subtest Text Comprehension, the intervention group developed better than the wait-list group. These results are in agreement with previous research about other cooperative learning methods, which pointed out a positive effect on the school performance of the involved students (Austin, 2001; Walther-Thomas, 1997; Huber, 2007; Konrad, 2008; Gastager et al., 2010). Due to the fact that these methods focus on this issue in particular, the frequent usage of

the tandem reading method and partner jigsaw may be responsible for the increasing of the sentence comprehension,.

Furthermore, the results of the follow-up show that the intervention group and the wait-list group develop relatively homogeneously and in a positive way, whereby a positive main effect was revealed for both groups. The lack of an interaction effect during intervention phase two can also be interpreted as an indicator that the students of the wait-list control group after obtaining the intervention developed towards the achievement level of the intervention group in their reading comprehension as well. Additionally, the former intervention group further used CL and, therefore, shows a continuously positive development. Therefore, the continuous increase in performance can be generally regarded as positive, although it could also be possible that the increase in reading abilities is caused by the traditional school lessons. Moreover, the results of the focus groups also indicate that students took a considerable profit from cooperative learning methods.

The results for the reading achievements confirm hypothesis 2 that cooperative learning methods have a positive impact on the achievement levels of the students involved, although the effect sizes are relatively small. Considering the limited frequency and the hours of intervention time in daily school life this is not unusual. For the students, even a slight positive effect makes a difference in daily school life.

5.3 Pro-social Behavior And Direct And Indirect Aggression

According to the results, a significant effect of cooperative learning was only found in the self-ratings of pro-social behavior. In all other dimensions, there were no significant results. These outcomes are in line with the literature, which argues cooperative learning methods only have a slight impact on the socio-emotional level (Thurston et al., 2010). This is also reflected in the results of the present study, where the sizes of observable changes in the case of aggressive behavior amount to just a matter of tenths. This is especially true for the peer- and self-ratings of direct and indirect aggression. Nonetheless, it is important to note that the measured dimensions of the socio-emotional level, i.e., pro-social behavior and aggressive behavior, differ considerably from each other. The development of the pro-social behavior means of the intervention group shows a partially significant or at least positive tendency to develop better than the wait-list control group. This is not true for the direct and indirect aggressive behavior, where no such trends are observed. One reason for this circumstance may be that the constructs of pro-social behavior and direct and indirect aggression rely on different components. Pro- social behavior aims at the altruistic dimension or on how often students try to help other students and on how altruistic and pro-social perceptions and attitudes determine and influence their actions. In contrast, direct and indirect aggression aim at how often students try to harm each other. Thus, both constructs represent different components of socio-emotional behavior. According to our results and theoretically comprehensible, cooperative learning methods have a stronger influence on pro-social behavior than on aggressive behavior. Another reason for this circumstance can be found in the fact that the teachers implemented structured as well as unstructured cooperative learning methods in class. According to the relevant literature, structured CL methods in particular have an impact on the socio-emotional level. Additionally, due to the restrictions the teachers mentioned in the

implementation of CL Methods in daily school life, it could be also the case that the implemented methods and the frequency of usage of these methods were simply too low for significant effects in these dimensions, particularly because the relevant literature does not focus on CL's effect on these dimensions (Thurston et al., 2010). Moreover, teachers play a crucial role in the success of cooperative learning methods. Thus, teachers also need to familiarize themselves with the different CL methods. It is possible that an adaption phase is necessary so that CL methods can be fully effective.

Therefore, hypothesis 3—that the usage of cooperative learning methods has a positive impact on social behavior—is partially confirmed, but is rejected regarding direct and indirect aggressive behavior of the students involved for the most part.

6. Recommendations

The results of this study give an impression of the efficacy of cooperative learning methods in a naturalistic setting. Firstly, it is important to mention that for using cooperative learning methods successfully in class, a series of preconditions must be considered. Reading the appropriate literature does not allow someone to acquire the necessary competencies for implementing cooperative learning methods in class (Rotering-Steinberg, 2010). To enable and support the use of these methods, an adequate training program for teachers is necessary. This is particularly important regarding the key role of the teachers in the successful implementation of cooperative learning methods in class (Sharan, 2010). It is important for teachers that they have the opportunity to try specific CL methods during training. Moreover, a series of seminars with a large amount of coaching and supervision seems most suited for meeting this demand because the teachers should have the opportunity to reflect on the methods they use in their daily classroom work and to adapt to their new role as facilitator and monitor of the learning process of student groups. Furthermore, networking, the sharing of experience as well as discussions about problems that occur when using cooperative methods, are much more feasible in this continuous event format than in a single individual seminar, even when it lasts two days.

It is important to keep in mind that cooperative learning methods can only be used successfully in class if the teachers can rely on well-prepared materials suitable for the subject and the appropriate grade level. Therefore, teacher training courses in cooperative learning methods must provide support for preparing teaching materials as well as for problem solving if difficulties occur. More sophisticated and complex cooperative learning methods can only be implemented in daily class life if fewer time restrictions exist and the infrastructure in the class is suitable for the application of these methods.

Finally, changing the teaching style of instructors and make it more manifold needs long lasting support and coaching. Discovering stable and sustainable methods of CL method implementation in class is an avenue for future research.

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