國立政治大學「教育與心理研究」
2009 年 9 月，32 卷 3 期，頁 25-54

合作學習：提升英文文法學習者自我效能與任務價值之靈丹？

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摘　要

為探究合作學習對於英語為外語學習者在英文文法學習動機之影響，本研究進行12週之前測—後測準實驗，參與的大學英文文法班級中，一班藉合作學習進行教學，另一班進行大班文法教學。本研究的兩個研究問題分別探討合作學習對英文文法學習自我效能與任務價值造成的影響，並進一步分析合作學習分別在兩個對照班級內，對於不同屬性的學生，是否為自我效能與任務價值帶來不同程度之影響。本研究分析之資料含研究對象在依變相的前後測成績，資料分析法包括多變量共變數分析、單因子和雙因子共變數分析，與單純效果分析。結果顯示，合作學習對於英文文法自我效能與任務價值有高度正向效應，此外，雖然合作學習對於低、中、高三個能力群皆能提升學習動機，但其效應對於低、高兩個能力群的研究對象尤為顯著。

關鍵詞：合作學習、英語為外語、文法教學、自我效能、任務價值

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收件日期：2008.07.29；修改日期：2008.11.05；接受日期：2009.12.11

Journal of Education & Psychology
September, 2009, Vol. 32 No. 3, pp. 25-54

Does Cooperative Learning Really Enhance Self-Efficacy and Task Value of English Grammar Learners?

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Abstract

To examine the impact of cooperative learning on motivation of English-as-a-foreign-language (EFL) grammar learners, a 12-week quasi-experimental pretest-posttest comparison group research study was designed. Two college English Grammar classes in Taiwan participated in the study, one receiving instruction through cooperative learning and the other through whole-class teaching. Two specific research questions guided the study. The first looked at effects of cooperative learning on self-efficacy, and the second on task value of English grammar learners. Additional exploratory questions examined these questions across subgroups within each class. Data were collected via learners' pretest and posttest scores on the dependent variables. The data were analyzed with MANCOVAs, one-and two-way ANCOVAs, and simple effects. Cooperative learning was found to have large positive effects on self-efficacy and task value of English grammar learners. The results of the exploratory questions indicated that cooperative learning facilitated motivation across all subgroups, but more so with those performing

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Manuscript received: 2008.07.29; Revised: 2008.11.05; Accepted: 2008.12.11

at higher and lower levels. Implications for future research and for curriculum and instruction are addressed.

Keywords: cooperative learning, EFL, grammar instruction, self-efficacy, task value

Introduction

This study investigates the effects of cooperative learning (CL) on English grammar learners in Taiwan. The study provides a systematic comparison of the effects of CL with whole-class instruction (WC). The positive effect of CL on students' learning motivation and achievement has been supported by a large body of research across different grade levels and subject areas in countries such as the United States, Israel, Lebanon, the Netherlands, and Nigeria (e.g., Abrami, Lou, Chambers, Poulsen, & Spence, 2000; Calderon, Hertz-Lazarowitz, & Slavin, 1998; Ghaith, 2003a, 2003b; Johnson & Johnson, 1989; Slavin, 1995; Vaughan, 2002). After being implemented in American classrooms for over a century, this pedagogy has begun to gain attention and interest from EFL teachers in Taiwan, where EFL instruction is still mostly whole-class, teacher-centered rote grammar-translation (Babcock, 1993; Lai, 2001; Su, 2003; Yu, 1993). The purpose of the study was to investigate the effectiveness of CL on students' self-efficacy and task value in the context of an English Grammar course being taken by college students in Taiwan.

Two main research questions were asked. The first was "How does self-efficacy differ between the students in the CL and the WC groups?" The second was "How does task value differ between the students in the CL and the WC groups?" Due to the significant results of the analyses on these major research questions, two secondary analyses were considered. Both added prior English grammar proficiency to each of the research questions as a second factor. Of particular interest to the researchers was the possibility of significant interactions between instructional approach and prior English grammar proficiency.

Theoretical Underpinnings

According to Slavin's (1995) model of cooperative learning, CL ultimately results in gains in learning because the process of cooperation prompts motivation and consequential cognitive activities. Liao (2005) discusses three categories of contemporary motivational theories that underpin CL: expectancy-value theories, goal setting theory, and self-determination theory. Expectancy-value theories suggest that one's motivation to perform a learning task depends on 1) the "expectancy of

success" in the given task and 2) the "value" attached to successfully performing the task (Wigfield, 1994). Expectancy of success is related to how learners (a) attribute their past success or failure, (b) construe competence, and (c) maintain self-esteem. Weiner's (2000) attribution theory assumes that motivation is affected by how people attribute their past performance (i.e., stable, constant, and thus uncontrollable factors versus unstable, temporary, and thus controllable factors). Bandura's (1993) self-efficacy theory maintains that, if people deem competence as "acquired" (controllable), they focus on personal improvement and maintain strong commitment to goals. Conversely, when people deem competence as "inherent" (uncontrollable), they maintain a self-diagnostic focus and recoil from challenging tasks in fear of having to acknowledge low inherent ability. Similarly, Covington's (1992) self-worth theory assumes that learners with low confidence often avoid working hard so that they can attribute failure to level of effort exerted (controllable) to retain their sense of control and self-worth. Together these theories illustrate a picture of individuals' performance expectations and their confidence levels in undertaking tasks. They provide the basis upon which individuals can answer to the question "Can I do this task?" (Dornyei, 2001). Eccles and her colleagues (Eccles & Wigfield, 1995, 2002) have identified four types of task values: attainment value, intrinsic value, utility value, and cost. They provide the basis to answer to the question of "Do I want to do the task?" (Dornyei, 2001). The role of educators is to design instruction that minimizes the fourth type of task value while enhancing the first three so that learners have sufficient motivation to participate in learning tasks.

Locke and Latham's (1990) goal setting theory argues that human behaviors are regulated by goals, and that the setting of personal goals are in turn influenced by factors such as group goals, role modeling, encouragement, and feedback. These factors are compatible with Slavin's (1995) model of CL. For example, the goal setting theory argues that having group goals in addition to personal goals brings about higher goal commitment. Likewise, the model of CL argues that the setting of group goals triggers motivation to learn, motivation to encourage group members to learn, and motivation to help members to learn.

While some critics of CL (e.g., Kohn, 1991a, 1991b) argue that extrinsic motivation triggered by CL can negatively affect intrinsic motivation, CL proponents believe otherwise. Self-determination theory (Deci & Ryan, 1985; Deci, Vallerand, Pelletier, & Ryan, 1991) is quite in line with the CL advocates' perception in this regard. The theory presents four forms of behavior on a continuum based on the degree of internalized motivation. It clearly asserts that extrinsic motivation can facilitate intrinsic motivation and transfer a learner from controlled, extrinsic motivation to self-determined, intrinsic motivation.

Methods

Subjects

The design of the study required the use of college freshman, English grammar classes. The primary researcher sought an instructor of such a course in a private university in the Taichung-Changhua Greater Metropolitan Area of central Taiwan. This instructor agreed to provide the pedagogies based on the design of the study. She also met additional criteria including education, teaching experience, teacher evaluations, professional training, command of English, as well as study and travel experience in an English-speaking country. Last but not least, the instructor had sufficient professional understanding of the pedagogies. She had had eight years' experience in implementing CL and three years employing Student Teams Achievement Divisions (STAD), the particular CL method used in this study. She also had attended seminars and workshops as well as published research papers on CL.

Two English grammar classes being taught by the instructor were used for the study. Forty-two students were enrolled in each class. These students ranked between 40% and 77% on the National Joint Technology College and University Entrance Examination administered to all entering freshmen. Each class was randomly assigned a 12-week treatment (i.e., CL or WC). Pretest and posttest questionnaires as well as an English grammar proficiency test were administered.

In order to be sure that the difference in treatment conditions caused the obtained results, the researchers took measures to reasonably control threats to external validity of the study. For example, the experiment was carried out during the second semester of the

freshman year; in the previous semester, CL methods were used in various teaching and learning occasions of Chinese, History, Art Appreciation, Physical Education, Military Training, and English classes. The goal was to ensure that upon the implementation of the treatment condition, CL would not be novelty or disruption in routine and the subjects' positive or desirable behavior, if any, would not be due to the Hawthorne effect. Additionally, measures were taken to avoid threats to internal validity, such as history, diffusion of treatment, compensatory equalization, and compensatory rivalry (McMillan & Schumacher, 1997: 319).

History. This threat concerns unintended or extraneous events occurring between the pretests and the posttests. During the experiment, the researchers had the control group and the experimental group experience the same activities, with the exception of the treatment. For example, when the experimental class went to an English drama show, the control group did as well.

Diffusion of treatment. When members of the control and experimental groups learn from each other about different treatments, it can create a threat to internal validity. While the researchers recognized the difficulty to completely eliminate the threat, arrangements (e.g., keeping two classes separate in terms of physical proximity, avoiding having interclass activities during the period of the study) were made to keep the two groups as separate as possible.

Compensatory equalization. An inequity occurs if only the experimental group receives a treatment. The inequity could in turn threat the internal validity. To counter the problem, the control group received quality whole-class context-rich instruction for the same duration.

Compensatory rivalry. When variation in treatments is openly pronounced, compensatory rivalry could occur between the experimental and the control groups. The researchers made efforts to avoid the threat by attempting to reduce the awareness and expectations of the presumed benefits of the experimental treatment.

Instrumentation

The Motivated Strategies for Learning Questionnaire (MSLQ) (Pintrich, Smith, Garcia, & McKeachie, 1991, 1993) was used to measure the

subjects' self-efficacy (i.e., performance expectations and confidence levels in undertaking tasks) and task value (i.e., perception on course activities and materials in terms of their interest, importance, and relevance). The theoretical framework that underlines the MSLQ is an adaptation of a general expectancy-value model of motivation (Pintrich & De Groot, 1990) discussed above. Validity was established by the authors (Pintrich et al., 1993).

The questionnaire consists of 14 items addressing aspects of these constructs. Students respond to each item on a modified seven-point Likert scale ranging from "Never true of me" (1) to "Always true of me" (7). Scores were computed by averaging non-missing responses across all items within each construct. Interpretation of each point on the continuum of motivation is provided in Table 1. The scoring system was modified and interpretations provided in the right column for easy understanding of the reader. Examples of a self-efficacy item and a task value item are offered below.

I am certain I can master the skills being taught in this class.

It is important for me to learn the course material in this class.

After the questionnaire was administered, results indicated high internal consistency with Cronbach alphas of .97 and .95 for the self-efficacy and task value subscales respectively.

Table 1 MSLQ Score Interpretation

Score	Response alternative	Motivation
1.00-1.50	Never true of me	None or exceptionally low
1.51-2.50	Rarely true of me	Very low
2.51-3.50	Occasionally true of me	Low
3.51-4.50	Sometimes true of me	Moderate
4.51-5.50	Often true of me	High
5.51-6.50	Usually true of me	Very high
6.51-7.00	Always true of me	Exceptionally high

Before the two groups of subjects received different teaching treatments, a 25-item pretest was administered to evaluate their prior grammar proficiency. These 25 items were selected from four forms of the General English Proficiency

Test (GEPT), namely ER-0001P, ER-0002P, RTI-A, and RTI-B. The GEPT is a step test developed and administered by the Language Training and Testing Center (LTTC) in Taiwan. The test was initially commissioned in 1999 by Taiwan's Ministry of Education as part of its effort to promote foreign-language education and to offer a fair and reliable instrument to assess English proficiency. The four tests contain 160 items totally. The primary researcher scrutinized all 160 items carefully and identified 25 items that measure grammar proficiency on the basic or intermediate level. Test results showed a Cronbach alpha valued at .76, indicating a sound reliability.

Procedure

Procedure for the control group. The instructional design for the control group included the traditional whole-class grammar translation method enhanced with communication-based class activities. For example, before getting into the grammar point in each unit, the teacher used warm-up questions and visual aids to focus the students' attention and to set the context for the grammar point. The teacher invited the students to participate in answering those questions in the whole-class setting to activate their schemata; context-rich activities such as journal writing and editing were also included. In order to maximize the differences between groups, these activities were carried out by the whole-class (e.g., discussion) or individually (e.g., journal writing). The control group used the same teaching materials and covered the same content as the experimental group.

Procedure for the experimental group. In order for CL to be successful, three key elements of CL are essential: heterogeneous grouping, positive interdependence, and individual accountability. CL is not putting students at the same table and allowing them to chat occasionally while they perform their individual tasks. CL is not assigning a project to a group in which one or few students do all the work while the others do nothing but earn the grade. Nor is CL assigning a report to a group in which members divide the labor and then each works individually on his or her share only. CL has a distinct characteristic of being "carefully structured." For group learning to be truly cooperative, the activity has to be structured in a way that certain cooperative elements not only

exist but also co-exist. Therefore, STAD, the specific CL method used in the experimental group, was composed of five carefully structured steps: (1) instruction, (2) teamwork, (3) individual tests, (4) individual improvement scores, and (5) group average improvement points and team recognition.

In the experimental group, before cooperative work began, the students were sorted into heterogeneous groups of four to five members based on the English grammar pretest scores. Care was taken to ensure that each group consisted of learners from high to average to low achievement levels and that the average levels of all the groups were about the same. After the instructor presented her teaching on grammar points, the groups were set to work. The students went over the same grammar exercise materials. But instead of working individually, they worked together with their teammates and helped each other understand the materials through elaborated explanations, peer modeling, peer practice, and peer assessment and correction. Group goals were emphasized to structure positive interdependence within a cooperative group. It should be noted that based on the resource interdependence theory (Johnson, Johnson, & Smith, 1991), teammates often shared the materials instead of having their own copies to ensure process interdependence, an essential ingredient for the success of CL. When there were communicative activities, such as journal writing or topic discussion, the activities were group-based, in contrast to the control group's whole-class or individual approach.

The third essential element for all CL methods is individual accountability. Individual accountability is present only when each group member is held responsible by other members for putting in a reasonable share to the group's final outcome. The following steps in STAD helped ensure individual accountability. After working collectively in heterogeneous groups, the students took grammar tests individually. One's individual test score (ITS) was compared to one's pretest score, and the difference between ITS and the pretest score was one's "individual improvement score" (IIS). The IIS transferred to "individual improvement point" (IIP) (see Table 2). After the "group average improvement point" (GAIP) was calculated (see Figure 1 for the worksheet), the team accomplishments were recognized via the

GAIP (see Table 3). The instructor made it explicit from the onset that she welcomed every group to earn an award and that there would be no limit to the number of groups receiving each award. So students understood that they were not competing with other groups. They would just be working toward group achievement by challenging their personal past performance. Ten percent of a student's semester grade was based on the GAIP. Any points exceeding 10 were considered as bonus points toward a students' semester grade. In addition to IIP and GAIP scores, a student's semester grade was also determined by peer evaluation (by teammates) and cooperative process (as evaluated by the instructor). The comparison chart for the semester grade rubrics of the experimental and the control groups is presented in Table 4.

Table 2 Conversion Table for IIS and IIP

		IIS			IIP
		IIS	≤	-10	0
-10	<	IIS	≤	0	10
0	<	IIS	≤	10	20
10	<	IIS			30

Note. When ITS = 100% (perfect score), IIP = 30.

GROUP NAME:				TEST DATE:	
TEAM MEMBERS Student ID	Name	Test Score	Pretest	IIS	IIP
TOTAL GROUP IIP					
GROUP AVERAGE IMPROVEMENT POINT (GAIP)					

Figure 1 Group average improvement point worksheet

Table 3 Criterion of Group Award

Criterion (GAIP)	Group Award
25	Diamond Cup
20	Gold Cup
15	Silver Cup

Table 4 Comparison Chart for the Semester Grade Rubrics of the Experimental and the Control Groups

Experimental Group		Control Group	
Mid-term exam	30%	Mid-term exam	30%
Final exam	30%	Final exam	30%
Attendance and cooperative process as evaluated by instructor	10%	Attendance	10%
Individual improvement point	10%	Quizzes/exercises	15%
Group average improvement point	10%	Class participation	15%
Peer evaluation	10%		

Fidelity of treatment. To ensure fidelity of treatment, including treatment integrity and treatment differentiation, the primary researcher used various procedures throughout the duration of the study to ascertain that both the experimental and the control groups follow the protocol they should follow. Treatment integrity refers to "the degree to which a treatment condition is implemented as intended" (Moncher & Prinz, 1991: 247), and treatment differentiation refers to "whether treatment conditions differ from one another in the intended manner such that the manipulation of the independent variable actually occurred as planned" (Moncher & Prinz, 1991: 248). The researcher kept frequent face-to-face, email, and telephone communication with the instructor to ensure that the instructor was clear about the necessary steps in each of the instructional methods as well as their differences. In addition, the researcher observed four sessions of class in each group-twice via videotape recording and twice by sitting in the back of the classrooms. The results of the procedures showed that the grammar instructional programs in both the experimental and the control groups were able to be carried out as intended by their individual protocols.

Results

Descriptive Analyses

The demographic data indicated that the two comparison groups were similar in gender distribution and age. Both had approximately one fourth male and three fourths female. The average ages of the students in the CL (M = 18.90, SD = 1.27) and the WC (M = 18.90, SD = 1.25) groups were similar, with about 90% of subjects aged between 18 and 20.

As presented in Table 5, subjects

demonstrated only a moderate level of self-efficacy (M = 3.69 for CL and 3.91 for WC) in completing course tasks before the grammar instruction. While they had some expectation and confidence in carrying out their learning tasks, the students' level of anticipation and self-belief was not high. In addition, the subjects on average attached only moderate levels of value to the course task (M = 3.57 for CL and 3.81 for WC). While they perceived some value upon the course activities and materials, they did not think highly in terms of their interest, importance, and relevance.

After the treatment, the WC group's self-efficacy (M = 4.02) and task value (M = 3.68) showed little change and remained only at the moderate level. In contrast, the CL group showed improvement on both self-efficacy (M = 4.79) and task value (M = 5.16), both of which increased from moderate pretest to high posttest levels. In other words, after the treatment, the CL group on average demonstrated higher expectation and self-confidence in learning and performing and perceived more highly of the course task.

Table 5 Mean Scores for the MSLQ Scales

Group	n	Pretest		Posttest		
				Obtained		Adjusted
		Mean	*SD*	*Mean*	*SD*	*Mean*
Self-efficacy for learning and performance						
Cooperative	42	3.69	1.39	4.79	1.04	4.87
Whole-class	42	3.91	1.43	4.02	1.34	3.94
Total sample	84	3.80	1.40	4.41	1.25	4.41
Task value						
Cooperative	42	3.57	1.09	5.16	.82	5.26
Whole-class	42	3.81	1.16	3.68	1.12	3.59
Total sample	84	3.69	1.13	4.42	1.23	4.43

Inferential Analyses

One-way MANCOVAs and one-way ANCOVAs were conducted to answer the two major research questions. An alpha level of .05 was used for all statistical tests. All the assumptions pertaining to the use of MANCOVA and ANCOVA were satisfied when using these procedures.

Research Question One. The first research question examined group

differences on the measure of self-efficacy. An examination of the results in Table 6 indicated that the CL group's average posttest score on the self-efficacy subscale (M' = 4.87) was significantly higher than that of the WC group (M' = 3.94), $F(1, 81) = 58.77$, $p = .00$. The observed power was 1.00, and the effect size as measured by eta squared (η^2) was large at .42.

Research Question Two. The second research question examined group differences for task value. An examination of the results in Table 7 indicated that the CL group's posttest scores on task value scale (M'= 5.26) were significantly higher than those of the WC group (M' = 3.59), $F(1, 81) = 221.40$, $p = .00$. The observed power was again 1.00, and the effect size was large ($\eta^2 = .73$).

Table 6 One-Way ANCOVA on Self-Efficacy Posttest Scores with Self-Efficacy Pretest Scores as Covariate

Source	*SS*	*df*	*MS*	*F*	*p*
Pretest	87.21	1	87.21		
Group	18.16	1	18.16	58.77	.00
Error	25.03	81	.31		
Total	130.40	83			

Table 7 One-Way ANCOVA on Task Value Posttest Scores with Task Value Pretest Scores as Covariate

Source	*SS*	*df*	*MS*	*F*	*p*
Pretest	47.11	1	47.11		
Group	57.58	1	57.58	221.40	.00
Error	21.07	81	.26		
Total	125.75	83			

Secondary Analyses

In an effort to understand the significant results discussed above, two secondary analyses were examined. These involved adding levels of prior English grammar proficiency as a second factor to the analyses discussed above. Two approaches were taken to divide the subjects into different English grammar proficiency levels based on their pretest performance. The first was criterion-based, using the grammar pretest score to create three categories. Since the

grammar pretest items were selected from the GEPT test banks and the GEPT uses a pass/fail system with 67% as the passing score, the researchers operationally defined those who scored 67/100 and above in the pretest as higher-proficiency students. There were 9 subjects in this category, 3 from the CL group and 6 from the WC group. Subjects were categorized as lower-proficiency students when they were not even half way to the passing score of 67 (i.e., 33 or less). There were 21 students in this category in each group. Those students who scored between 67 and 33 were categorized as medium-proficiency students. There were 33 of these students, 18 in the CL group and 15 in the WC group.

The second approach was norm-based, using the subjects' relative ranking in class to categorize them into various levels. The subjects in the CL class were grouped into 10 cooperative teams, with 4 students in most teams and 5 in 2 teams. Based on the rationale that students' learning motivation and effort could be affected by how they perceived their relative standing among classmates and among teammates (Bandura, 1993; Covington, 1992), and also based on the rationale that in each CL teams the student with a higher English grammar score would tend to have more opportunity to elaborate and explain the concept of English grammar to the group members (Slavin, 1995), the researchers decided to explore the use of three categories. While the grouping of each team remained heterogeneous, the students were categorized into quartiles based on their grammar pretest performance and identified as higher (the top quartile), middle (the middle two quartiles), and lower (the bottom quartile) for further analysis.

Instructional approach and prior grammar proficiency with self-efficacy. The results reported in Table 8 indicated no significant interaction between criterion-based grammar proficiency level and type of instruction, $F(2, 77) = 2.08$, $p = .13$, the observed power = .42, $\eta^2 = .05$, while the main effects of prior grammar proficiency level and instruction were both significant, $F(2, 77) = 5.06$, $p = .01$, and $F(1, 77) = 44.21$, $p = .00$, respectively. The results revealed that the effect of instruction on self-efficacy did not depend on which criterion-based proficiency level was being considered, and vice versa. On the other hand, there was a significant interaction between the

effects of norm-based grammar proficiency level and type of instruction on self-efficacy, $F(2, 77) = 19.76$, $p = .00$. The observed power was 1.00, and the effect size was large ($\eta^2 = .34$). The statistically significant interaction indicated that the effect of instruction on self-efficacy depended on which prior ranking level was being considered.

Table 8 Factorial ANCOVAs for Interaction Effect of Prior Grammar Proficiency Level and Instruction on Self-Efficacy

Source	*SS*	*df*	*MS*	*F*	*p*
Criterion-based grammar proficiency level defined by GEPT standard					
Pretest	21.18	1	21.18		
Prior grammar proficiency level (PGPL)	2.76	2	1.38	5.06	.01
Instruction	12.07	1	12.07	44.21	.00
PGPL x Instruction	.14	2	.57	2.08	.13
Error	21.02	77	.27		
Norm-based grammar proficiency level defined by relative ranking in class					
Pretest	6.39	1	6.39		
Prior grammar proficiency level	4.31	2	2.16	12.24	.00
Instruction	19.87	1	19.87	112.82	.00
PGPL x Instruction	6.96	2	3.48	19.76	.00
Error	13.56	77	.18		

To examine where the significant ranking by instruction interaction effect on self-efficacy took place, three simple effect analyses were conducted, each on the two group means within the higher, middle, and lower ranking, respectively. The simple effect analyses revealed that type of instruction influenced the self-efficacy of the higher ranking students, $F(1, 77) = 26.36$, $p = .00$, the observed power = .99, $\eta^2 = .26$, middle ranking students, $F(1, 77) = 9.53$, $p = .00$, the observed power = .86, $\eta^2 = .11$, and lower ranking students, $F(1, 77) = 92.19$, $p = .00$, the observed power = 1.00, $\eta^2 = .55$. However, results from the interaction plot (see Figure 2) indicated that even though significant differences existed between the two instruction groups across all three ranking levels, the difference between the middle groups appeared to be relatively smaller than the differences of the other two groups.

Instructional approach and prior grammar proficiency with task value. The results reported in Table 9 indicated no

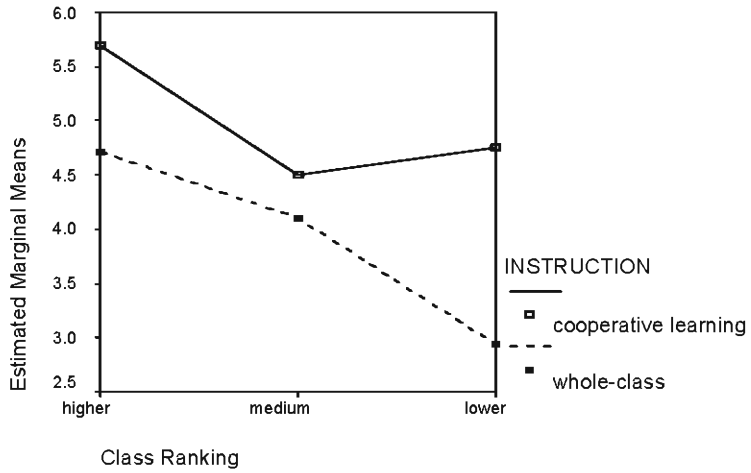

Figure 2 Interaction plot for ranking and instruction on self-efficacy

Table 9 Factorial ANCOVAs for Interaction Effect of Prior Grammar Proficiency and Instruction on Task Value

Source	*SS*	*df*	*MS*	*F*	*p*
Criteon-based grammar proficiency defined by GEPT standard					
Pretest	31.59	1	31.59		
Prior grammar proficiency level	.96	2	.48	1.91	.16
Instruction	34.69	1	34.69	137.77	.00
PGPL x Instruction	.54	2	.27	1.07	.35
Error	19.39	77	.25		
Norm-based grammar proficiency defined by relative ranking in class					
Pretest	4.83	1	4.83		
Prior grammar proficiency level	5.13	2	2.56	13.52	.00
Instruction	47.98	1	47.98	252.90	.00
PGPL x Instruction	1.46	2	.73	3.85	.03
Error	14.61	77	.19		

significant interaction between criterion-based grammar proficiency level and instruction, $F(2, 77) = 1.07$, $p = .35$, the observed power = .23, $\eta^2 = .03$. Significant main effects were found for instruction, $F(1, 77) = 137.77$, $p = .00$, but not for prior grammar proficiency level, $F(2, 77) = 1.91$, $p = .16$). The results revealed that the effect of instruction on task value did not depend on which criterion-based proficiency level was being considered, and vice versa. In contrast, there was a significant interaction between the effects of prior norm-based grammar proficiency level and instruction, $F(2, 77) = 3.85$, $p = .03$, on task value. The observed power was .68, and the effect size was moderate-to-large ($\eta^2 = .09$). The statistical significant

interaction indicated that the effect of instruction on task value depended on which prior class ranking level was being considered.

To examine where the significant ranking by instruction interaction effect took place, three simple effect analyses were conducted, each on the two group means within the higher, middle, and lower ranking groups respectively. Results of the analyses showed that type of instruction influenced the task value of the higher ranking students, $F(1,77) = 55.56$, $p = .00$, the observed power = 1.00, $\eta^2 = .42$, middle ranking students, $F(1, 77) = 117.80$, $p = .00$, the observed power = 1.00, $\eta^2 = .61$, as well as lower ranking students, $F(1, 77) = 113.02$, $p = .00$, the observed power = 1.00, $\eta^2 = .60$. An examination of the interaction plot (see Figure 3) showed that while significant differences existed between the two instruction groups across all three ranking levels, the difference between the lower groups appeared to be relatively greater than the differences of the other two groups.

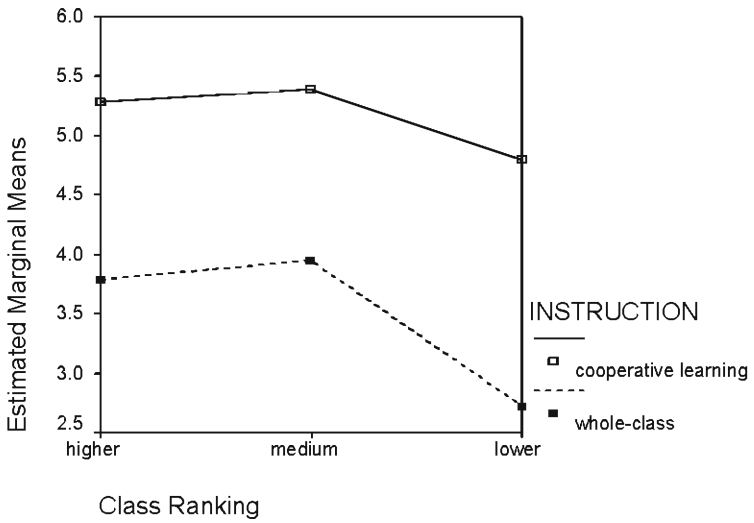

Figure 3 Interaction plot for ranking and instruction on task value

Summary of Findings

The findings of this study are summarized in Table 10 When the effects of instruction on self-efficacy and task value were investigated, the results indicated a consistent pattern in favor of CL. Two secondary analyses were used to

Table 10 Summary of Findings

Independent variables	Dependent variables	Sig.[a]				
Main effects						
Instruction (CL *vs.* WC)	Self-efficacy	Y(CL)				
	Task value	Y(CL)				
Interaction effects			*Simple effects*[b]			
Instruction & norm-based level	Self-efficacy	Y	H-rank CL	*vs.*	H-rank WC	Y(CL)
			M-rank CL	*vs.*	M-rank WC	Y(CL)
			L-rank CL	*vs.*	L-rank WC	Y(CL)
	Task value	Y	H-rank CL	*vs.*	H-rank WC	Y(CL)
			M-rank CL	*vs.*	M-rank WC	Y(CL)
			L-rank CL	*vs.*	L-rank WC	Y(CL)
Instruction & criterion-based level	Self-efficacy	N				
	Task value	N				

Note. CL = cooperative learning, WC = whole-class instruction; Y = yes, N = no; H = higher, M = middle, L = lower.

[a] Parentheses indicate instructional types that were found to be significantly more effective.

[b] Simple effect analyses were conducted as a result of significant interaction effects listed on the left columns.

see if this pattern could be more fully explained. While no interaction effect was found for criterion-based grammar proficiency level and instruction, interaction effects were found for norm-based grammar proficiency level (class ranking) and instruction in both of the motivational scales. In summary, it appears that CL is more effective than WC when considering both self-efficacy and task value. If one looks more carefully at subgroups of different class ranking levels, CL facilitates motivational development across all subgroups, but more so with the higher and lower levels.

Discussion

Generally speaking, students in Taiwan are not much thrilled in learning English grammar. It is often considered a dull and uninteresting course. Nevertheless, results of the present study show that students receiving CL displayed higher sense of efficacy in English grammar learning and performing and attached higher task value to the coursework than those receiving WC grammar instruction. With reference to previous studies on how CL impacted self-efficacy and task value of learners in different content areas, the present study contributes to the existing literature by expanding the repertoire into the subject area of English grammar. Results of the present study indicate that CL brought about higher perceptions of the course

materials and tasks in terms of interest, significance, and usefulness. More specifically, learners receiving grammar instruction through CL thought that they would be able to use what they learned in the grammar course in other courses. They not only thought it important and useful to learn the English Grammar course materials but also found the content area interesting and enjoyable. To sum up, they thought understanding the subject matter of English Grammar was very important to them. Moreover, CL enhanced English grammar learners' performance expectations and their confidence level in mastering grammar-related tasks. In general, students were confident that they would receive a good grade and master the skills being taught in English grammar course. They were not only confident that they could understand the basic Grammatical concepts but also the most complex materials presented.

The higher level of self-efficacy displayed by the CL learners can be explained in light of the expectancy theories that provide the foundation of CL. Learning motivation, according to Weiner (2000), is subject to learners' attributions of past success or failure. Learners who attribute their past performance to stable, constant, and hence uncontrollable factors (e.g., inherent ability) tend to give up more easily on a task and develop less motivation for learning than those who attribute their performance to unstable, temporary, and hence controllable factors (e.g., level of effort). The structure of the STAD cooperative learning method employed in the present study created a situation in which English grammar learners were evaluated based upon the level of personal improvement. This "equal opportunities for success" feature allowed the CL learners to perceive success as something attainable by effort rather than something that could fall beyond reach due to inherent ability or keen competition. Lower achievers might find this feature of STAD motivating as they were given chances to succeed on their own terms instead of having to be constantly compared with higher achievers. Meanwhile, higher achievers might also perceive themselves more in control of their learning because, rather than competing intensively against other higher achievers, their objective was to excel themselves.

The advantage of the self-improvement, equal-opportunity feature

in STAD is also supported by Bandura's (1993) self-efficacy theory, which asserts that learners are more apt to assess their ability by their personal improvement if they perceive competence as acquired skills. The self-improvement feature in the CL group geared away from the traditional ranking system, focused on personal development and helped learners at different performance levels to identify competence as acquired. If the CL students stumbled upon difficult tasks, this feature could allow them to examine the processes such as effort exerted and strategies used and to keep a task-diagnostic focus and concentrate on how to perform successfully instead of maintaining a self-diagnostic focus and falling as an easy victim to stress. In case of disappointing performances, it would be easier for them to recover their sense of self-efficacy because failure mostly meant inadequate endeavor or insufficient knowledge and capacities that were attainable. Perceiving themselves more in control of their own learning by perceiving success as the outcome of hard working and effective strategy use, they could thus become more motivated and ready to face challenges.

Based on Covington's (1992) self-worth theory, in order to maintain a sense of self-worth and self-control, learners with low self-esteem tend to shy away from working hard so that they can attribute failure to the level of effort put forth. In this regard, STAD created a condition in which the CL students at various grammar proficiency levels need not worry about competing with others; they only needed to exert effort to be better than how they had been. When success became more within reach by way of effort, they did not have to shy away from working hard to save their sense of self-worth because now the level of effort and even the possibility of success were both controlled in their own hands.

The CL group also demonstrated higher task value than the WC group. Overall they perceived a stronger relationship between English Grammar course tasks and their current or future goals, attached higher personal importance on performing well upon course learning tasks, and experienced more enjoyment and pleasure when carrying out course-related tasks. The higher task value can be discussed in light of certain CL elements in relation to the model of triadic reciprocality (Bandura,

1986) and goal setting theory (Locke & Latham, 1990). First, peer modeling was a recurring event in the CL group as a result of the heterogeneous grouping and the positive interdependence features. Based on the model of triadic reciprocality, modeling and subsequent social persuasion could shape, lead, and transform the CL learners' thoughts and feelings, enhance stimulation, and arouse their emotions. According to the goal setting theory, the CL learners could obtain higher personal goal setting and goal commitment by observing a higher-performing role model. Secondly, when CL is structured and implemented properly, encouragement and feedback among peers occur because of the individual accountability and the positive interdependence features of CL. During class observations that aimed to ensure treatment fidelity, the primary researcher observed verbal encouragement exchanged among CL learners. She also observed various types of performance feedback, including verbal assessment on academic performance and verbal correction on specific grammar-related tasks among peers, calculation of individual improvement points, and written peer evaluation on social and cooperative performance. Anchored in goal setting theory (Locke & Latham, 1990), the encouragement and performance feedback taking place in the CL group could have facilitated higher goal setting and thus higher task value.

With reference to past studies on how cooperative learning affects Taiwanese EFL students' learning motivation (Chen, 1998; Chu, 1996; Liang, 2002; Lo, 1998; Wang, 2001; Wei, 1996), the present study contributes to the existing literature in several ways. First of all, compared to the studies that used college students and questionnaires (Chu, 1996; Lo, 1998; Wang, 2001; Wei, 1996), the present study extends the findings by specifically looking into task value and self-efficacy, and by employing a different cooperative learning method, i.e., STAD. The methods involved in the other studies included Jigsaw, Group Investigation, and Learning Together. Secondly, in comparison with some of the above-mentioned studies that also used a quasi-experimental research design, the present study extends the findings by enriching the whole-class instructional program with communicative activities to ensure that the control group would also receive quality teaching, by extending the

length of experiment to enhance validity, and by separating the roles of the researcher and the classroom instructor to increase objectivity. Thirdly, the present study utilized a measurement tool with strong validity and reliability to measure student motivation. Finally, in comparison with the studies with a similar research design and the same cooperative learning method (Chen, 1999; Liang, 2002), the present study extends the findings by focusing on a different population (i.e., college versus junior high and high school EFL students) and by employing a different measurement tool to understand student motivation.

Interestingly, while the effects of instruction did not depend on which criterion-based grammar proficiency level was being considered, there were differential effects for norm-based grammar proficiency level (class ranking). This implies that the effects of CL depended on students' ranking in relation to peers rather than on objective performing levels identified by measures such as standardized tests. It is reasonable to assume that the effects depended on how students perceived their relative ranking and subsequent role-taking as a result of the perception. Despite the fact that CL enhanced self-efficacy and task value for students across all grammar ranking categories, the effects were relatively greater for the higher and lower ranking ones. Among numerous possible reasons, the higher grammar ranking students might have particularly profited from their natural explainer roles. The success of group work in the CL class depended immensely on peer discussion and tutoring, that, of course, involved a great deal of presentations of thoughts as well as explanations on the subject matters. The learners, especially the more capable ones in the groups, thus obtained opportunities to articulate and elaborate their preliminary, immature thoughts. Ideas could be cultivated from vague to concrete and from premature to refined during the explanation and elaboration processes. In the meantime, the articulating and elaborating processes could result in active processing of information, cognitive restructuring, and reprocessing of thought (Dansereau, 1988), which, in turn, aided skill development on paraphrasing, summarizing, and synthesizing. As indicated in Figure 4, it is possible that the cooperative learners' elaboration skills are practiced and sharpened through peer

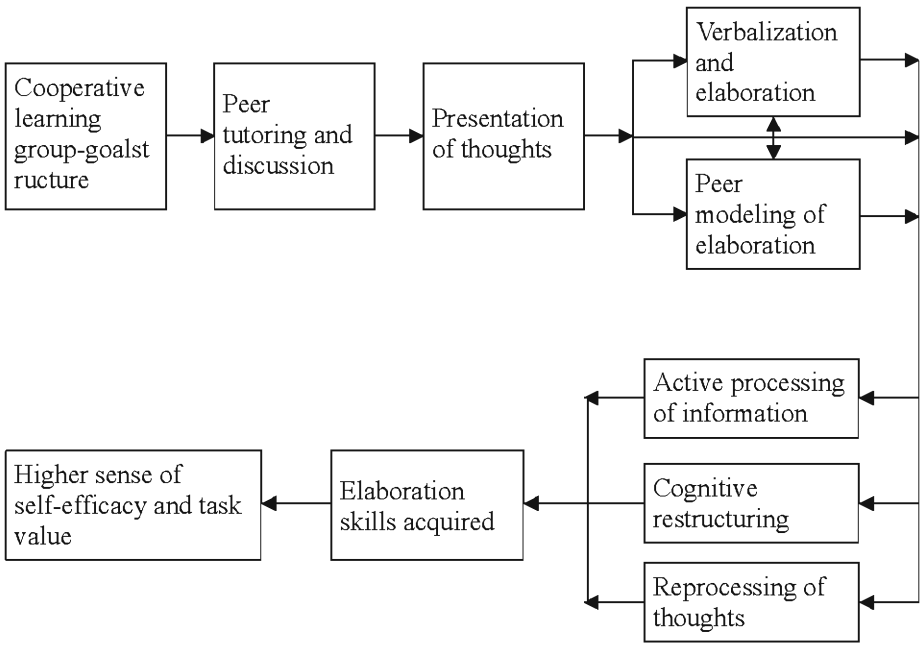

Figure 4 Possible process of how cooperative learning facilitates self-efficacy and task value

practice, peer explanation, and peer modeling, and their sense of self-efficacy and task value enhanced in the process.

As for lower ranking students, after being under-achievers for probably most of their school life, the "equal opportunity" and "self-improvement" structure of the CL method could have helped them perceive learning in a different light. Specifically, they might have come to see competence as acquired skills and that they too had power to make improvement and reach success. According to Bandura (1993), the way people define competence will influence their interpretation of a learning outcome as well as motivation and future actions on learning. The primary researcher of the present study has summarized Bandura's remarks and presents the summarization in the comparison chart below.

Under-achievers in a whole-class learning environment are opt to perceive difficult tasks as personal threats and therefore often choose to dwell on personal deficiencies and shy away from difficult tasks, whereas those of the same level in a CL setting are opt to perceive difficult tasks as challenges to be mastered. With helps from their group members, they tend to maintain a task-diagnostic focus and attribute failure to

Table 11 Effects of Self-Efficacy

People Who Construe Efficacy as Inherent	People Who Construe Efficacy as Acquired
➢ Low self-efficacy	➢ High self-efficacy
➢ Difficult tasks = Personal threats	➢ Difficult tasks = Challenges to be mastered
➢ Shy away from difficult tasks	➢ Approach difficult tasks
➢ Have low aspirations and weak commitment to goals	➢ Maintain strong commitment to goals
➢ Maintain a self-diagnostic focus rather than concentrate on how to perform successfully	➢ Maintain a task-diagnostic focus that guides effective performance
➢ Dwell on personal deficiencies, possible obstacles, and all kinds of adverse outcomes in the face of difficulties	➢ Enhance and maintain efforts in the face of difficulties
➢ Slacken their efforts and give up quickly in the face of failure	➢ Attribute failure to insufficient effort or deficient knowledge and skills that are acquirable
➢ Slow to recover sense of efficacy after failure or setbacks	➢ Quickly recover sense of efficacy following failures or setbacks
➢ Fall easy victim to stress and depression	➢ Have low vulnerability to depression

insufficient effort. To sum up, they tend to have higher self-efficacy and possess the characteristics on the right of the table above.

Although CL enhanced self-efficacy and task value for learners across all grammar ranking categories, the effects were comparatively smaller for the medium ranking ones. In the past literature, Webb and Palincsar (1996) also reported that when working with high ability peers in four-tiered ability groups, medium ability learners missed many opportunities to construct explanations. It is possible that when working in the four-tiered ability group structure in the present study, medium ability learners played more of listener roles than explainer roles and thus missed opportunities to actively process information and practice elaboration skills. Seeing the presence of more-capable peers in their teams, they might have shrunk from responsibilities and allowed themselves to fall into the passive roles of listeners, similar to what they might have normally done in whole-class lecture settings.

Implications for Future Research

The findings of the present study have improved the understanding of the effects of CL on English grammar learners in Taiwan. Implications of the findings can be discussed in terms of research and practice. With respect to research methodology, this study

conducted exploratory analyses trying to explain more fully the results of the major research questions. If the investigation had been concluded with the major research questions, our understanding of CL from the study would have been limited to the differential instructional effects between CL and WC. Conversely, by taking into consideration student characteristics and by utilizing multiple data analysis procedures, we were able to get a clearer picture of how CL and students' relative class ranking interplay. The lesson to be learned from these findings is that, in order to understand the essence of a phenomenon, researchers need to take a close look at their subjects, measurement tools, and data from multiple angles. They then need to be willing to investigate any analyses that have the potential to explain the results or add additional clarification to the phenomenon.

The findings of this study also imply that, in order to enhance learning motivation, instruction needs to be tailored to help learners perceive competence as acquired skills and to enhance their sense of control over learning tasks. For English grammar learners to perceive competence as attainable through efforts and to make them believe their power in making a difference, allowing them to make improvement against their own past performance rather than against their classmates seems a reasonable solution.

The following suggestions for future research have emerged as a result of the present study.

(1) Independent variable: The current study has chosen to investigate the differential effects of CL and WC. It is worth including the combination of these two types of instruction as an additional level of the independent variable in a future study.

(2) Dependent variable: In this study, motivation was explored through self-efficacy and task value. It can also be investigated from a cost-of-task dimension, which was identified by Eccles and her colleagues (Eccles & Wigfield, 1995, 2002) as a different type of task value. Motivation can also be investigated from an extrinsic-versus-intrinsic motivation dimension. Whereas some critics of CL (e.g., Kohn, 1991a, 1991b) contend that extrinsic motivation prompted by CL can deteriorate intrinsic motivation, advocates of CL and self-determination theory (e.g., Deci & Ryan,

1985; Deci et al., 1991; Slavin, 1991; Swezey, Meltzer, & Salas, 1994; Vallerand, 1997) believe that a learner's more controlled and extrinsic motivation can be internalized in a social context and become more self-determined and intrinsic in nature. It is recommended further studies be conducted employing scales that can independently measure different levels of extrinsic and intrinsic motivation so as to examine the relations between different types of motivation and CL. The researchers strongly suggest such a measure be administered at various points during the studies to grasp a better understanding of the level, if any, of the internalization process.

(3) When discussing the interaction effects of CL and prior English grammar proficiency level earlier in this paper, the researchers have postulated that the effects of CL depend on how students perceive their ranking levels in relation to their peers and the subsequent social roles they choose to take as a result of their perceptions. To test the hypothesis, future studies might use analytic techniques drawn from critical discourse analysis to examine classroom and small group discourse.

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