The Effects of Differential Grammar Learning Tasks on L2 Learners' Grammatical Knowledge and Their Beliefs about Grammar Instruction*

Young Ah Cho

(Gwangju University)

Cho, Young Ah. (2018). The effects of differential grammar learning tasks on L2 learners' grammatical knowledge and their beliefs about grammar instruction. *The Linguistic Association of Korea Journal, 26*(3), 1-23. The current study explores the effects of three different types of grammar learning on learners' grammar development and their beliefs about grammar instruction. The three types of grammar learning were the deductive, inductive, and PACE approaches. The participants consisted of 95 Korean College students, and they were assigned to one of those three groups. The study employed a background questionnaire, pre-, post-, and delayed grammar tests, and pre- and post-questionnaires about the learners' beliefs regarding grammar instruction. The findings revealed that the PACE group's performance was greater than any other group in terms of both short- and long-term retention, and the differences between the deductive and inductive groups were seen in the immediate learning process. This study also employed a Learners' Beliefs about Grammar Instrument (LBGI), which showed that the PACE approach had a significantly positive effect on learners' grammar acquisition. Pedagogical implications and suggestions for L2 grammar instruction have been made in the study.

Key Words: deduction, induction, PACE, learners' beliefs, L2 grammar acquisition

1. Introduction

The role of grammar instruction continues to hold an important place in second language (L2) acquisition (Ellis, 2008; Fernández, 2011). One of the most frequently discussed questions on the subject regards two predominant premises: the deductive and inductive approaches (Donato & Adair-Hauck, 2016; Haight, Herron, & Cole, 2007). The deductive grammar approach involves teachers giving explicit explanations about grammar rules, followed by related exercises, while the inductive grammar approach requires learners to discover grammar rules provided through examples (Dekeyser, 1995). Even though these methods represent different areas on the theoretical spectrum of grammar instruction, it can be said that grammar acquisition for both processes is situated with the individual, not with the social aspects of communicative learning development, and this leads to relatively conflicting ideas about its effectiveness (Adair-Hauck, 2007; Erlam, 2003; Lantolf & Poehner, 2014).

Recent research on language teaching has focused on increasing learners' proficiency in real-world communicative contexts, and this had led to new importance being placed on the role of grammar instruction (Bandar & Gorjian, 2017; Pudelek, 2016; Vogel, Herron, Cole, & York, 2011). Wang (2012) argues that this trend shows the importance of having grammar instruction being taught in a way that makes the tasks meaningful and encourages authentic communication. Traditionally, classes were only grammar based. As a result, students were not able to communicate in real-world situations. With 1960's linguistic theories, researchers like Chomsky, advocated for full communicative classes. However, these classes became so focused on communication, they forgot about the importance of teaching grammar. So, learners were able to communicate, but they made frequent grammatical mistakes and often plateau in their target language development. Accordingly, modern academics have started to look for ways to combine grammar instruction and communicative language approaches that meets needs on both sides of the spectrum.

Viakinnou-Brinson, Herron, Cole, and Haight (2012) see grammatical competence as an integral factor in communicative abilities. Based on that, researchers have designed the story-based PACE model to teach grammar in a way that highlights linguistic forms and their usage in contexts by using

integrated discourses or stories (Adair-Hauck, 1993; Adair-Hauck & Donato, 2010; Donato & Adair-Hauck, 1992, 1994, 2016). It is mentioned that PACE instruction could maximize opportunities for meaningful communication and, consequently, lead to learners' more efficient grammatical development (Chametzky, 2014; Groeneveld, 2011).

Researchers have also demonstrated that learners' beliefs are one of the most vital variable, individual differences, and L2 learners' beliefs are closely related to their motivation, learning strategies, proficiency levels, autonomy, classroom activities, and satisfaction with language instruction (Horwitz, 1999; Ma & Cho, 2016; Yang, 1999). Despite the fact that learners' beliefs have mutual influences on L2 development, previous researchers have pointed out that there has been less attention given to learners' beliefs about grammar instruction compared to other language skills (Loewen, Li, Fei, Thompson, Nakatsukasa, Ahn, & Chen, 2009).

As previously stated, many studies have been done to identity the effects of different types of grammar instruction on L2 grammar competence; however, less research has been reported on the comparative results of deductive, inductive, and the PACE approaches on grammar acquisition in the short- and long-term retention. Furthermore, little in-classroom, experimental research has been conducted to explore the relationships between diverse grammar teaching methods and learners' beliefs about grammar instruction for Korean college students. Thus, identifying the relative outcomes from different types of grammar instruction could have pedagogically meaningful implications, and from that, the following research questions have been formulated:

1. How do different types of grammar learning affect L2 learners' short- and long-term grammar knowledge gains?
2. How do different types of grammar learning affect L2 learners' beliefs about grammar instruction?

2. Literature Review

2.1. Different Types of Grammar Instruction in L2 Learning

There exist various approaches to teaching grammar, and those approaches could broadly be categorized into two terms: deductive and inductive approaches. The deductive approach is referred to as being rule-driven learning in which grammatical rules are explicitly presented to learners and then followed by manipulative exercises that apply to those rules (Mohammed & Jaber, 2008; Richard, Platt, & Platt, 1992). The deductive method focuses on form before meaning, and it goes from general rule explanation to specific examples of language use (Wang, 2012). Empirical studies support the view that deductive instruction can be more beneficial to enhancing learners' grammar knowledge, keeping learners from repeatedly making the same mistakes, and further, making them become aware of complicated rules (Lin, 2007; Mohammed, 1993; Norris & Ortega, 2000; Ruin, 1996; Wang; 2012).

On the other hand, the inductive approach requires learners to discover or induce rules from the context and examples, which goes from specific examples of language use to general rule explanation (Wang, 2012). Previous research indicated that inductive instruction could be valuable, especially for low-proficiency learners, and it may also increase learners' motivation to study (Shaffer, 1989; Swaffar & Woodruff, 1978). Nunan (2005) maintained that an inductive method requires deeper processing which can be better than deductive processing for language learning.

Even though the literature agrees that deduction and induction are the predominant grammar instructional methods, still, there are several disadvantages to both (Groeneveld, 2011). More specifically, during deductive grammar teaching, learners mainly focus on grammatical concepts, so they are not provided with comprehensive, meaningful input, and during inductive instruction, learners often fail to gain an accurate understanding of grammatical features by input alone (Adair-Hauck & Donato, 2010; Herron & Tomasello, 1992; Paesani, 2005).

To cover those weaknesses, the PACE model was introduced as a dialogic story-based learning approach (Adair-Hauck, 1993; Donato & Adair-Hauck, 1992,

1994, 2016). Adair-Hauck and Donato (2002) referred to the PACE as a story-based, guided participatory approach, adding that "researchers and learners collaborate on and construct the grammar explanation" (p. 269). That is, the PACE model is a way to develop the meaning and function of grammatical concepts through conceptualized language or well-organized texts, such as stories, poems, song, and cartoons. The PACE included four steps: presentation, attention, co-construction, and extension. During PACE instruction, learners can understand meaningful forms of grammar in dialogic collaboration with their teacher.

There were several empirical studies on the effects of different grammar instruction on L2 grammar acquisition. For instance, Haight et al. (2007) examined the effects of deductive and guided inducive grammar teaching on grammatical features in French courses. In the guided inductive condition, they combined the PACE model and guided inductive model. The findings revealed that learners who were involved in guided, inducive instruction performed better on the immediate test, whereas there was no significant difference between two tasks in the long-term retention. Similarly, Vogel et al. (2011), having recruited French learners, reported that the outcomes of the guided inducive approach were better than those of deductive one in the posttest. Yet, deductive and guided inducive instruction did not show any significant difference over time. In Korea, Ji (2017) investigated the effects of deductive and the PACE instruction on middle school students' grammar gains and English learning attitudes. The results indicated the PACE approach led to a significant improvement for high proficiency learners and also affected low-level learners' positive preference to the PACE grammar lesson.

2.2. Learners' Beliefs in L2 Learning

Learners' beliefs have been seen as one of the main contributing variables in the learning process and also in terms of learning outcomes. Learners beliefs can be defined as metacognitive knowledge, self-beliefs, mental and social representations, attribution, and control-beliefs (Gabillon, 2005). Victori and Lockhart (1995) introduced learners' beliefs as "general assumptions that students hold about themselves as learners, about factors influencing language learning, and about the nature of language learning and teaching" (p. 224).

Grotjahn (1991) suggested that the characteristics of learners' beliefs are highly individual and relatively stable.

In terms of the relation between learners' beliefs and L2 language learning, learners' beliefs toward studying an L2 have a profound effect on learning behaviors, as well as language achievement, and consequently, successful learners are likely to develop insightful beliefs about their learning processes and also their use of learning strategies (Bernat & Gvozdenko, 2005; Oxford, 1990). Even though a great number of studies have been done on the subject to examine diverse L2 contexts, there have a few studies on the correlation between learners' beliefs and L2 grammar instructional settings (Loewen et al., 2009).

Research on learners' beliefs was initiated by Horwitz (1988), who developed the Beliefs About Language Learning Inventory (BALLI) questionnaire in order to investigate learners' and teachers' beliefs. The BALLI consisted of five subcategories: an individual's foreign language aptitude, the difficulty of learning the target language, the nature of language learning, learning and communication strategies, motivations for learning, and expectations. Of these factors, the BALLI contained several question-items related to grammar instruction. Another research study on learners' beliefs about grammar instruction was conducted by Schulz in 2001. The findings noted that students had positive beliefs about explicit grammar instruction in language learning. Loewen et al. (2009) surveyed over 700 college students who were studying languages, and the researchers explored the students' perceptions of grammar instruction and error correction, quantitatively and qualitatively. The researchers designed their questionnaire to ask about the efficacy and importance of grammar and also about negative attitudes towards error correction and grammar instruction. The results showed that learners had diverse perceptions towards grammar instruction and error correction depending on their target language.

3. Methods

3.1. Participants

The participants of this study were made up of 95 first-year college students

who were enrolled in general English classes as a part of their required course work (ages=19-23). They were from three different majors: in-flight services, occupation therapy, and police administration. Based on their self-assessments of overall English proficiency and grammar proficiency levels, given during the background questionnaire, 53 learners (55.8%) rated their overall English proficiency levels as being below 3, and 42 learners (44.2%) reported themselves as a 4 to 5 on the 7-point scale (1 indicates the lowest and 7 the highest level). In addition, most learners (N=77, 81.1%) rated their English grammar proficiency levels as being below 3. Accordingly, it can be assumed that the participants in the present study were low-intermediate proficiency learners. The classes were arbitrarily assigned to one of the three different grammar teaching conditions: deductive grammar instruction (hereafter, DGI), inductive grammar instruction (hereafter, IGI), and the PACE grammar instruction (hereafter, PGI) (see Table 1).

Table 1 Distribution of the Participants

Group	N	Male	Female
DGI	30	7(23.3%)	23(76.7%)
IGI	32	5(15.6%)	27(84.4%)
PGI	33	15(45.5%)	18(54.5%)
Total	95(100%)	27(28.4%)	68(71.6%)

3.2. Instruments

This study used three major instruments: a background questionnaire, pre-, post-, and delayed English grammar comprehension tests, and pre- and post-Learners' Beliefs about Grammar Instruction (LBGI) questionnaires. The background questionnaire consisted of four question-items, asking learners' gender, age, major, and self-assessed English proficiency levels.

The pre-English grammar comprehension test was designed to find out whether the three experimental groups were homogeneous in terms of English grammatical competence. The test included 18 multiple-choice question-items with 6 questions for each grammar concept, worth one point each. In regard to target grammatical features, three grammar points were selected from the English course curriculum: sentence structure, present perfect tense, and

comparisons. The delayed English comprehension test, which had the same question-items as the pre-test, was used to clarify the effects of the different task types from a long-term perspective. Plus, the three post-tests were employed to investigate the effects of the different task types in terms of short-term retention. The three distinct tests contained 10 question-items based on the three target-grammar features, worth one point each. All the question-items and input materials were taken from *Grammar Choice - Intermediate 1* (YBM solution, 2017) and *Grammar Choice - Advanced 2* (YBM solution, 2017).

The pre- and post-LBGI questionnaires, developed by Loewen et al. (2009), was adapted and slightly modified. The researchers originally devised the 37-item questionnaire to elicit learners' beliefs regarding grammar instruction and error correction. In the present study, four categories from the LBGI were used: efficacy grammar (9 items), importance of grammar (2 items), importance of grammatical accuracy (2 items), and negative attitudes to grammar instruction (3 items) (see Results and discussion section for details). A total of 16 items in the questionnaire were rated on a 5-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree).

3.3. Procedure

First of all, the three groups were told to complete the background questionnaire, the pre-English grammar test, and the pre-LBGI questionnaire prior to the experimental instruction. After implementation, each group was involved in different grammar task conditions delivered over a series of three lessons, each lasting approximately 50 minutes. All three treatment lesson plans were conducted dependant on the task intervention, deductive grammar instruction, inductive grammar instruction, or story-based PACE grammar instruction.

In the deductive grammar group, several model sentences, as well as theoretical definitions for the target grammatical features were shown to learners through PPT files to help them identify the grammar rules' functions. The target grammatical points were marked in bold type to raise learners' consciousness to the input. After receiving rule statements and brief illustrations of each target structure, the learners were given a worksheet which contained twelve,

prompting question-items for pattern drills. The tasks involved filling out blanks, correcting underlined words, and rewriting sentences by using grammar concepts they had learned. Finally, the students received corrective feedback on their tasks, and then they took the posttest.

As for the inductive instruction process, learners were exposed to some pictures and related statements through PPT files but not for the definition of grammar rules. The target grammatical points were also marked in bold type. The students were guided to find repeated grammatical patterns and also to generalize grammar rules based on the input they had received. Then, to help learners acquire the target grammar features, they were exposed to several model sentences with implicit explanations of the target grammar concepts. Lastly, they were engaged in tasks which were the same as the ones done during the deductive instruction, and then they took the posttest.

For the PACE approach, a story-based instructional method, students were shown video segments and written scripts from a film, titled *Notting Hill* (Seung, 2006). The input included targeted grammar structures, and the script served as the presentational texts used in the course. According to Donato and Adair-Hauck (2016), teaching materials, such as episodically organized stories, fairly tales, and legends, may be appropriate to present grammatical features in the PACE model, naturally and meaningfully.

The procedures included four stages, as suggested by Donato and Adair-Hauck (2016). First, there was the presentation phase, where episodic story events were presented to learners through video segments. After viewing the video, to draw learners' conscious attention on the grammar form and its meaning, text inputs containing the target grammar points with marked in bold font, were provided by PPT files in the attention phase. Then, learners and the instructor collaborated and negotiated on constructing a concept for the target grammar structures and their meaning by communicating; this was the co-construction phase. During the conversation, learners were supposed to answer prompt questions, which were intended to guide students to understand and generalize the form, meaning, and function of the target grammar. Lastly, learners were engaged in episodic summarization tasks within small groups, where they had the opportunity to communicate using the target grammar forms; this was the extension phase. They also received feedback on group tasks

and took the posttest.

Finally, in order to examine learners' long-term retention rates and their beliefs towards grammar instruction, a delayed test and the post-LBGI questionnaire took place two weeks later.

3.4. Data Analysis

The background questionnaire was computed using of analysis of frequency. Cronbach's alpha coefficients were calculated to check the internal consistency of the LBGI. In addition, the pre- and post-LBGI were analyzed by descriptive statistics and a MANOVA. For the pre- and delayed-grammar comprehension tests, descriptive statistics and an ANOVA were carried out while a repeated-measures ANOVA was also used for analyzing the posttests. To exactly check the significant differences among groups, post-hoc pairwise comparisons were also administered in the study. Statistical data analysis was run by SSPSS 20.0 for Windows.

4. Results and Discussion

4.1. Different Types of Grammar Learning and L2 Grammar Knowledge Gains

The first research question dealt with the effects of different types of grammar instruction on learners' grammar competence in terms of short- and long-term retention. To investigate whether the three groups had similar knowledge of target grammar features before the treatment, descriptive statistics and an ANOVA were run on the pretest (see Tables 2 and 3).

Table 2 The results of descriptive statistics on the pretest (K=18)

Group	N	M	SD	Min	Max
DGI	30	3.97	1.033	2	6
IGI	32	3.91	1.254	1	7
PGI	33	3.85	1.460	2	8
Total	95	3.91	1.255	1	8

K=the number of test items

Table 3 The results of an ANOVA on the pretest

Test	Source	SS	df	MS	F	Sig.	ES
	Between Groups	.220	2	.110	.068	.934	.001
Pretest	Within Groups	147.928	92	1.608			
	Total	148.147	94				

p<.05, *ES*= Effect Size

The mean scores for the DGI were 3.97, the IGI were 3.91, and the PGI were 3.85 out of 18 respectively, showing that there was no significant difference for learners' performance on the pretests (*Sig.*=.934). Therefore, it can be assumed that all the groups had a little grammatical knowledge at the onset of the current study.

Next, to compare the groups' outcomes on the different task types, the mean scores of the posttest were analyzed using descriptive statistics and a repeated-measures ANOVA. Table 4 indicates the results of descriptive statistics on the three posttests.

Table 4 The results of descriptive statistics of the posttests (*K*=10 for each test)

Group	N	Test 1		Test 2		Test 3	
		M	SD	M	SD	M	SD
DGI	30	4.63	1.474	5.63	1.921	6.03	1.829
IGI	32	3.69	1.401	4.69	1.447	4.81	1.554
PGI	33	5.55	2.181	7.06	2.015	7.15	1.661
Total	95	4.63	1.880	5.81	2.049	6.01	1.927

K=the number of test items

The performance of the PGI were superior to the other groups, followed by the DGI, and the IGI across all the three posttests. The results of the repeated-measures ANOVA indicated that there were significant main effect for the test (F=104.691, *Sig.*=.000, *ES*=.240) and groups (F=234.100, *Sig.*=.000, *ES*=.316) with higher effect sizes in the immediate grammar learning process. More specifically, to discover if there were any significant differences, post-hoc pairwise comparisons were administered on the three groups' performance, which is presented in Table 5.

Table 5 The results of post–hoc pairwise comparisons on the posttests

Test	Group		MD (I-J)	Std. Error	Sig.
Posttests	DGI	IGI	1.04*	.344	.010
		PGI	-1.15*	.341	.003
	IGI	PGI	-2.19*	.336	.000

p<.05

As can be seen, significant differences were found among groups, adding that the PACE treatment condition was proved as the most effective grammar teaching approach, followed by the deductive, and then the inductive approaches in the short term. Considering that the learners in the study were low-intermediate, it could logically be said that the PACE instruction could be helpful for relatively low proficiency learners to help them facilitate their own grammar competence. Possibly, this is because the PACE condition draws learners attention to target forms in communicative contexts. In other words, as the PACE instruction is quite different from traditional grammar instruction the learners typically receive in L2 classrooms, this style may trigger unsuccessful achievers' interest and remotivate them to study grammar. On the other hand, outcomes in the deductive group had better improvement compared to the inductive one. The results were partially in line with previous studies which noted that the learners in the deductive treatment yielded more significant performance than those who were in the inductive and control groups (Erlam, 2003; Tode, 2007; Wang, 2012).

In order to assess the effects of the different task types of grammar instruction on long-term retention, descriptive statistics and an ANOVA were used on the delayed test, and the results are displayed in Tables 6 and 7.

Table 6 The results of descriptive statistics on the delayed test (K=18)

Group	N	M	SD	Min	Max
DGI	30	8.23	2.725	4	15
IGI	32	7.50	3.455	3	16
PGI	33	10.21	3.314	4	15
Total	95	8.67	3.366	3	16

K=the number of test items

The mean scores of the PGI are numerically greater than any other group, followed by the DGI, and then the IGI in the long-term grammar learning process, revealing the difference was statistically significant (*Sig.*=.003) with a large effect size (*ES*=.120) (see Table 7).

Table 7 The results of an ANOVAs on the delayed test

Test	Source	SS	df	MS	F	Sig.	ES
Delayed test	Between Groups	128.002	2	64.001	6.285	.003	.120
	Within Groups	936.882	92	10.183			
	Total	1064.884	94				

p<.05, *ES*= Effect Size

To examine where the significant differences laid, post-hoc pairwise comparisons were calculated on the outcomes of the delayed test, and the findings are seen in Table 8.

Table 8 The results of post−hoc pairwise comparisons on the delayed test

Test	Group		MD (I-J)	Std. Error	Sig.
Delayed test	DGI	IGI	.733	.811	1.000
		PGI	-1.979*	.805	.048
	IGI	PGI	-2.712*	.792	.003

p<.05

The results show that the learners in the PACE group achieved significantly higher grammar gains than both learners in the deductive and inductive groups. Here, what is quite interesting is that the difference between the deductive and inductive groups was not significant when compared to the findings on the posttests. This result confirms Tode's (2007) argument, meaning that learners had short-term grammar knowledge gains through deductive instruction, but their gains were not durable. Thus, as Nassaji and Fotos (2011) recommended, deductive grammar teaching should be reinforced through tasks that incorporate collaborative output activities that give learners as chance to collectively employ the correct target grammar structures to complete tasks more appropriately.

As for the effectiveness of the PACE instruction on grammar acquisition, this study supported the previous studies, adding that focusing on form in

communicative contexts can be helpful for learners to obtain grammatical knowledge (Haight et al., 2007; Vogel et al., 2011). Plus, learning grammar through authentic material input in communicative classroom makes learners apply learned knowledge appropriately in the long run. Therefore, instructors should consider implementing more story-based grammar teaching into their classrooms and not rely on merely grammar memorization methods.

4.2. Different Types of Grammar Learning and Learners' Beliefs about Grammar Instruction

The second research question was concerned with the effects of different types of grammar learning on learners' beliefs toward grammar instruction. First, the internal consistency of Learners' Beliefs about Grammar Instruction (LBGI), which had a total of 16 items, was calculated by Cronbach's alpha. The reliability coefficients for the LBGI were .798, indicating a safe instrumental reliability coefficient. Next, Table 9 presents the results for the descriptive statistics for the pre-LBGI.

The total mean scores of the DGI were 3.273, the IGI were 3.469, and the PGI were 3.405 on the pre-LBGI. More specifically, the findings of the study indicate that the factor of negative attitudes towards grammar instruction had the highest scores while importance of grammar accuracy was found to be the lowest. Additionally, learners reported that the factor, efficacy of grammar, as having the second highest scores compared to another factor, the importance of grammar, which had the third highest scores.

Table 9 Descriptive statistics of the pre−LBGI

Subcategories	Group	M	SD	Rank
Efficacy of grammar	DGI (*N*=30)	3.244	.468	3
	IGI (*N*=32)	3.493	.413	1
	PGI (*N*=33)	3.367	.514	2
	sub-total	3.371	.473	2
Importance of grammar	DGI (*N*=30)	3.433	.762	1
	IGI (*N*=32)	3.344	.677	2
	PGI (*N*=33)	3.333	.608	3

	sub-total	3.368	.677	3
Importance of grammar accuracy	DGI (*N*=30)	2.833	.698	3
	IGI (*N*=32)	2.984	.628	2
	PGI (*N*=33)	3.030	.706	1
	sub-total	2.953	.676	4
Negative attitudes to grammar instruction	DGI (*N*=30)	3.544	.570	3
	IGI (*N*=32)	3.802	.573	2
	PGI (*N*=33)	3.818	.612	1
	sub-total	3.726	.593	1
Sub-total	DGI (*N*=30)	3.273	.435	3
	IGI (*N*=32)	3.469	.328	1
	PGI (*N*=33)	3.405	.426	2
Total	Group (*N*=95)	3.385	.403	

According to Loewen et al. (2009), the efficacy of grammar factor pertains to a variety of ways where grammar may be effective for learners studying an L2, and the importance of grammar factor is about the relationships between grammatical knowledge and L2 proficiency, as well as communication skills. The factor, importance of grammar accuracy, deals with the influence of correct grammatical structure on learners' speaking and writing, whereas the negative attitudes to grammar instruction factor are related to teachers' assistance in grammar classrooms.

Next, to closely determine if the participants in the study had markedly different perceptions of grammar instruction, a MANOVA was administered on the pre-LBGI. The outcomes are shown in Table 10. They imply that there was no statistically significant difference in terms of learners' beliefs about grammar instruction among groups (*Sig.*=.399). Thus, it can be said that learners in the three groups had similar perceptions about grammar instruction before the treatment.

Table 10 MANOVA results of the pre-LBGI

Effect		Value	F	Hypothesis *df*	*df*	*Sig.*	*ES*
Intercept	Wilks' Lambda	.013	1695.303	4	89	.000	.987
Group	Wilks' Lambda	.912	1.053	8	178	.399	.045

p<.05, *ES*= Effect Size

In order to identify learners' beliefs about grammar instruction after they were engaged in the experimental treatment, the outcomes of post-LBGI were analysed by using descriptive statistics and a MANOVA. Table 11 illustrates that the overall mean scores for the PGI (M=3.829) were higher than those for the IGI (M=3.527) and DGI (M=3.452) on the post-LBGI. The outcomes also might suggest that the overall mean scores of the post-LBGI were greater than those of the pre-LBGI (refer to Table 9), showing that instruction focusing on grammatical form might help learners have a more positive attitude towards grammar learning.

Table 11 Descriptive statistics of the post-LBGI

Subcategories	Group	M	SD	Rank
Efficacy of grammar	DGI (N=30)	3.404	.551	3
	IGI (N=32)	3.524	.407	2
	PGI (N=33)	3.929	.364	1
	sub-total	3.627	.495	3
Importance of grammar	DGI (N=30)	3.550	.514	2
	IGI (N=32)	3.406	.734	3
	PGI (N=33)	3.924	.601	1
	sub-total	3.632	.657	2
Importance of grammar accuracy	DGI (N=30)	3.100	.648	3
	IGI (N=32)	3.234	.621	1
	PGI (N=33)	3.227	.600	2
	sub-total	3.189	.619	4
Negative attitudes to grammar instruction	DGI (N=30)	3.767	.518	3
	IGI (N=32)	3.813	.610	2
	PGI (N=33)	3.869	.485	1
	sub-total	3.818	.536	1
Sub-total	DGI (N=30)	3.452	.425	3
	IGI (N=32)	3.527	.374	2
	PGI (N=33)	3.829	.327	1
Total	Group (N=95)	3.609	.407	

Tables 12 and 13 indicate the results of a MANOVA on the post-LBGI. The results reveal that there was a significant difference among groups (*Sig.*=.000). Specifically, of the LBGI subcategories, the factor of efficacy of grammar (*Sig.*=.000) and importance of grammar (*Sig.*=.004) showed statistically significant differences among groups.

Table 12   MANOVAs results of the post−LBGI

Effect		Value	F	Hypothesis *df*	*df*	*Sig.*	*ES*
Intercept	Wilks' Lambda	.010	2161.086	4	89	.000	.990
Group	Wilks' Lambda	.707	4.212	8	178	.000	.159

p<.05, *ES*= Effect Size

Table 13 Group comparison of the post−LBGI

Subcategories	Source	*SS*	*df*	*MS*	F	*Sig.*	*ES*
Efficacy of grammar	Between Groups	4.849	2	2.424	12.248	.000	.210
	Within Groups	18.211	92	.198			
	Total	23.060	94				
Importance of grammar	Between Groups	4.651	2	2.325	5.950	.004	.115
	Within Groups	35.954	92	.391			
	Total	40.605	94				

p<.05, *ES*= Effect Size

Table 14 indicates the findings of the post hoc pairwise comparisons. The PGI learners had significantly grater scores than the DGI and the IGI in terms of factors of efficacy of grammar, and the latter two groups were not significantly different.

Table 14 Post−hoc pairwise comparison of post−LBGI

Subcategories	Group		MD (I-J)	Std. Error	*Sig.*
Efficacy of grammar	DGI	IGI	-.1206	.11307	.867
		PGI	-.5256[*]	.11223	.000
	IGI	PGI	-.4050[*]	.11038	.001
Importance of grammar	DGI	IGI	.1437	.15887	1.000
		PGI	-.3742	.15770	.059
	IGI	PGI	-.5180[*]	.15510	.004

p<.05

As for the importance of grammar factor, a significant difference was found between the IGI and the PGI. One reason might account for this finding. Presumably, as the learners in the PACE applied their knowledge into

communicative tasks, intending to practice the target grammar, they placed more value on the efficacy and usefulness of the grammar in comparison to the other groups' learners. Accordingly, it is quite important that authentic communicative input rather than isolated formula exercises be integrated in L2 classrooms.

Additionally, from the perspective of grammar task intervention, the results of the study were consistent to Groeneveld's (2011) study, who argued that PACE instruction may let learners view grammar concepts as a part of language, not just as isolated components, so they could accept grammar as a necessary means to learn language. According to Donato and Adair-Hauck (2016), when learners comprehend the meaning and function of grammar within story-based texts, they will acquire more grammar competence. Thus, this study may infer that learners taking part in story-based grammar instruction will have more chances to collaboratively communicate with their instructor and peers by using grammar they have already learned, which will ultimately give them an awareness of the efficient role grammar knowledge plays in language development, and it may also enhance learners' positive perceptions towards grammar learning.

5. Conclusion

The aims of the current study were to figure out the effects of three different types of grammar learning—the deductive, the inductive, and the PACE approaches—on L2 learners' grammar development and their beliefs about grammar instruction. The findings showed that learners in the PACE group showed the highest grammatical knowledge gains, followed by the deductive group, and then the inductive group in terms of short-term retention. However, in terms of long-term retention, PACE instruction proved to be the most effective approach. As for the learners' beliefs toward grammar instruction, students who participated in the PACE lessons performed better than students in the deductive or inductive groups in relation to the efficacy of grammar factor. Likewise, the PACE group outperformed the inductive group in terms of the importance of grammar factor.

Since the focus of ESL/EFL language teaching has shifted from an attention on language forms to usage of language in meaningful contexts, it is generally accepted that grammatical knowledge could be helpful for language learners to appropriately control their communication skills (Bandar & Gorjian, 2017; Ellis, 2008). In a similar vein, Bandar and Gorjian (2017) stressed that for learners to better focus and notice grammatical patterns in meaningful ways, authentic materials, such as practical drills and tasks, should be provided during the grammar instruction. As with the previous research, learners' expectations may be influential attributors in determining grammar teaching instruments (Borg, 2003; Lowene et al., 2009). Therefore, proper teaching methods need to be integrated into grammar classrooms, which may change learners' positive beliefs and perceptions toward grammar instruction.

This study does have several limitations, however. To closely identify the effects of grammar instructional conditions on grammar learning, the performance of tests needs to be analysed depending on learners' proficiency levels. This study also recommends that longer experimental periods be used in future studies, which would yield more diverse conclusions in terms of both short- and long-term retention.

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Young Ah Cho
Assistant Professor
College of Basic Liberal Arts
Gwangju University
277 Hyodeok-ro, Nam-gu, Gwangju 61743, Korea
Phone: 062-670-2269
E-mail: blanche05@hanmail.net