

The Effects of Differential Instruction and Learning Styles of Low-level L2 College Students' Grammar Acquisition

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This study examined the effects of differential instruction on low-level L2 college students' grammar acquisition and learning styles. One hundred and four university students with low English proficiency level were participated in the study and assigned to the either deductive or the inductive grammar instruction groups. The participants' English grammar acquisition was checked through pre, post, and delayed tests, and a survey adapted from Learning Style Survey (LSS) (Cohen, Oxford & Chi 2002) was administered to measure the participants' learning styles. The results revealed that both of the instructions positively influenced on the learners' grammar acquisition for the long-term retention even though the learners in the deductive instruction group initially showed greater improvement in their L2 grammar knowledge. This study discovered no significant difference among the extroverted, introverted, and mixed learners regardless of the different instructional types while the deductive grammar instruction was more helpful for the L2ers with particular learning style rather than the global and mixed styles for the immediate learning effects.

Keywords: inductive/deductive instruction, grammar acquisition, learning styles, low proficiency level

1. Introduction

One of the ultimate goals of second language (L2) learning is to develop communicative competence in the target language. In order for L2 learners to cultivate communicative competence, developing grammatical competence is essential (Bachman 1990, Brown 2007b, Ellis 1993, Larsen-Freeman 1991) in that successful L2 learners could use their L2

not only appropriately but also accurately (Ellis 1994, 2003, Robinson 2001). Bardovi-Harlig (1999) mentions that for successful L2 learning, grammatical competence may not be a sufficient condition but it may be a necessary condition. A substantial body of research has proved the positive effects of grammar instruction on second language acquisition (SLA) (Ellis 2002, Norris & Ortega 2000, Selinger 1983, Terrell 1991). However, there is no general consensus on the most effective way of grammar instruction to date partly because individual L2ers could prefer to be placed under the particular teaching methods depending on their learning dispositions such as L2 learning styles (Ehrman, Leaver & Oxford 2003).

Over the last couple of decades, quite a few studies have investigated whether grammar instruction has a role to play in SLA (DeKeyser 2003, Ellis 2002, Lee & Wang 2002, Norris & Ortega 2000). Even though previous research showed some benefits of L2 grammar instruction, the results were hardly generalizable to low level L2ers since most studies were carried out targeting intermediate or upper level students. Some other studies have considered learner factors and explored the relationship between L2 learning styles and strategies (Ehrman & Oxford 1990, SHong 2009, SLee 2007, RJeon 2010, Wong & Nunan 2011). However, issues concerning the relationship between formal grammar instruction and individual learning styles have not received much attention in L2 field (J Kim 2011, K Lee 2000). While research on the relationship between learning styles and L2 acquisition demonstrates that successful L2ers usually know their own learning styles and how to manipulate them to improve their L2 ability (Andreou E., Andreou G. & Vlachos 2008, Bailey Onwuegbuzie & Daley 2000, Brown 2007a, J Kim 2011, K Lee 2000), it is hard to tell that most L2ers are aware of their own learning styles and choose their preferred teaching methods in instructional settings. Moreover, for university students with low proficiency level there is little research on the relationship between learning styles and different teaching methods. Then, it would be meaningful to closely investigate whether different instructional types is indeed helpful to improve low level L2 learners' grammar acquisition as normally ex-

pected and whether the effects of grammar instruction might be different depending on L2 learners' learning styles.

2. Literature review

2.1. Inductive and Deductive Grammar Instruction

Research on grammar instruction in L2 has concentrated on determining whether grammar should be taught at all. However, current research has led to a reconsideration of the role of grammar in SLA (Nassaji & Fotos 2004). Nassaji and Fotos (2004) explained that there are some reasons for the reevaluation of grammar as a necessary component of language instruction. One of the reasons is the evidence that L2 learners pass through developmental sequences. According to the learnability and teachability hypotheses by Pienemann (1999), if grammar instruction corresponds with L2ers' readiness to move on to the next level of linguistic proficiency, it is possible to favorably influence L2ers' developmental sequences through formal instruction. The positive effects of grammar instruction in the L2 field would be another reason of the reevaluation of grammar. Ellis (2006) mentioned that any instructional technique drawing learners' attention to specific grammar forms could belong to grammar instruction. He then points out this grammatical form through instruction helps learners to understand it metalinguistically and to process it in comprehension so that they can internalize it. According to Azar (2007), grammar instruction could enhance L2 learners' communicative competence as well as general proficiency level since grammar teaching helps learners to discover the nature of language including the internal structure.

There are two representative teaching methods in L2 grammar instruction, namely deductive and inductive ways. Deductive teaching is when a grammatical structure is presented initially and then practiced in one way or another, while inductive teaching method is when learners are exposed to examples of a grammatical structure and are asked to

find a metalinguistic generalization on their own. Fischer (in Nagata 1997) distinguishes deductive instruction from inductive one, saying “a deductive approach may be required when the foreign language rule is dissimilar and of equal or greater complexity than the native language rule, while an inductive approach may be employed when the foreign language rule is similar or dissimilar but simpler than the native language (p. 521).” Thornbury (1999) explains a deductive (rule-driven) approach presents a rule and is followed by examples in which the rule is applied, while an inductive (rule-discovery) approach shows some examples from which a rule is inferred.

In regard to the characteristics of the deductive and inductive approaches, there are various explanations. A deductive approach not only gets straight to the point, and can therefore be time-saving but also respects the intelligence and maturity of many students, and acknowledges the role of cognitive processes in language learning (Thornbury 1999). An inductive approach coincides with natural language acquisition and conforms more easily to the concept of interlanguage development, helping learners to find a communicative “feel” by allowing students to discover natural rules of language (Brown 2007a).

A number of studies have examined the relative effectiveness of these two approaches and the results have been mixed (Ellis 2006 see also Table 1). Some research discovers that a deductive approach was more effective (DeKeyser 1995, 2003, Erlam 2003, Norris & Ortega 2000, Robinson 1996). Others indicate a clear advantage for an inductive approach (Haight, Herron & Cole 2007, Harmer 1987 Herron & Tomasello 1992). There is also some research showing no significant difference in the effectiveness of the two approaches (E Ock 2008, Rosa & O’Neill 1999). Azar (2007) states that the effects of the inductive and deductive approaches are rather complex and both approaches could be helpful for learners when they are encouraged to figure out grammar patterns for themselves while given explicit information in grammar. Based on the complex results of differential grammar instruction, some researchers suggest that the effectiveness of teaching grammar depends on target grammar complexity (DeKeyser 1995, Robinson 1996, Nagata 1997). The

effectiveness of deductive and inductive instruction may differ for particular linguistic form. For example, while simple rules could best be taught deductively, more complex rules could be taught inductively (Ellis 2006).

Table 1. Effects of the differential grammar instructions.

Research	Advantage	Target grammar
Haight, Herron & Cole (2007)	Inductive instruction	Adverbial pronoun, indirect object pronouns, imperative pronouns, verb, relative pronouns, demonstrative pronouns, partitive articles
Erlam (2003)	Deductive instruction	Direct object pronouns
Ej Ock (2008)	Inductive instruction Deductive instruction	Tense, article, preposition

2.2. Learning Styles

The term learning style has been often interchangeably used with *cognitive style*, *personality type* and *sensory preference*. When cognitive styles are specifically related to an educational context in which affective and physiological factors are mixed, they are generally referred to as learning styles (Brown 2007b). Oxford (2003) defines learning styles as the general approaches that learners use for acquiring a new language or for learning any other subject.

While learning styles could be defined as a general predisposition or characteristics of individuals for the understanding of new information (Skehan 1991, Reid 1995), Wintergerst, DeCapua and Verna (2003) explain that learning styles are a part of an individual's makeup or personality. When learners prefer one type of learning style over another for learning tasks, a learning style preference reflects an individual's own personal predilection for how to learn in a particular situation. Oxford and Anderson (1995) stress the recognition of learning styles in L2 learning and also mention that learning styles have six interrelated aspects:

(1) Cognitive elements include preferred or habitual patterns of mental functioning. (2) The executive aspect deals with the degree to which the person seeks order, organization and closure and manages his or her own learning processes. (3) The affective aspect reflects clusters of attitudes, beliefs and values that influence what an individual will pay most attention to in a learning situation. (4) The social contribution concerns the preferred extent of involvement with other peoples while learning. (5) The physiological element involves at least partly anatomically-based sensory and perceptual tendencies of the person. (6) From the standpoint of behavior, learning style related to a tendency to actively seek situations compatible with one's own learning preferences (p. 203).

In relation to learning styles, many researchers invented learning style lists. Reid (1995) divides learning styles into sensory learning style, cognitive learning style, and affective learning style and Christison (2003) distinguishes between cognitive style, sensory style, and personality styles. Willing (1994) identified four major styles which are communicative, analytical, authority-oriented, and concrete depending on learners' strategy preferences. Ortega (2009) mentions that the most promising model of language learning style is Ehrman and Leaver's Learning Style Model, which was developed in 2003. This model presents nine learning styles and their relevance to SLA. The followings are nine learning styles: field independence vs. dependence, random vs. sequential, global vs. particular, inductive vs. deductive, synthetic vs. analytic, analogue vs. digital, concrete vs. abstract, leveling vs. sharpening, and impulsive vs. reflective.

J Kim (2011) investigated the relationships between Korean high school students' learning styles and the effectiveness of deductive English grammar instruction. The results suggested that most participants are auditory, right brain-dominated, and authority-oriented. Interestingly, those who show high achievement tend to be left brain-dominated and extrovert. Andreou, E., Andreou, G and Vlachos (2008) studied the preference for a specific learning style among L2ers with different gender and major by looking into the relationship of learning styles and L2 verbal fluency task scores. The results showed that the preference for the divergent learning style may be more effective on phonological tasks and the pref-

erence for the accommodative learning style on syntactical tasks implying that the effectiveness of L2 learning styles could be affected by different grammar aspects. Bailey, Onwuegbuzie and Daley (2000) examined the relationship between learning styles and foreign language achievement among university students. The results revealed that higher achievers tend to like informal classroom designs, and that knowledge of whether a learner is responsible for completing tasks or not affects classroom designs and kinesthetic preference. Wong and Nunan (2011) explored the learning styles and strategies of effective and ineffective language learners with university students in Hong Kong. They divided learners into more effective and less effective groups depending on their scores on a standardized public English examination. The study concluded that the dominant style of more effective students was communicative while authority-oriented style was dominant for less effective students.

In order to examine whether two grammar teaching methods — deductive and inductive instruction — have different effects on the low-level students' English grammar acquisition and whether there are different outcomes depending on the learning styles under the grammar teaching methods, two research questions were formulated.

1. How do the different grammar instructions (deductive and inductive) affect English grammar acquisition of low-level college students?
2. How do different learning styles affect English grammar acquisition of low-level college students under the two grammar instruction contexts?

3. Research Design

3.1. Participants

The participants of this study were 104 college students with low

English proficiency level enrolled an 'English grammar' course in a university located in Chonnam province. They consisted of 7 female students and 97 male students (age = 20~26). Since all the participants were from the same department and were ready for a national examination in firefighting, male students were dominant compared to female students. The participants were from two classes of the same course taught by the same experienced instructor. Between the two classes, one class was randomly assigned to the deductive grammar instruction group and the other to the inductive grammar instruction group. Before entering the university, every participant took the Test for the College Scholastic Ability Test (CSAT) and their average English level was below the fifth degree (ranged from the first to the ninth degrees), which could be considered as quite low. In order to better see the participants' level, a simple self-evaluation survey on their English proficiency and follow-up interview were carried out. Over 85 percent of the participants considered their English proficiency level as low and the remaining students as low-intermediate. The follow-up interview revealed that most male students thought that their English ability was not good partly because they were discharged from military service (approximately 80 percent of the male students) and they did not have enough chance to study English during the temporary absence from school.

Table 2. Distribution of the participants.

Group	<i>N</i>	Female	Male
Inductive	56	4 (7.1%)	52 (92.9%)
Deductive	48	3 (6.3%)	45 (93.7%)
Total	104	7 (6.7%)	97 (93.3%)

3.2. Instruments

Two major instruments were utilized in the current study. First, a survey adapted from Learning Style Survey (LSS) (Cohen, Oxford & Chi 2002) was administered to measure the participants' learning styles. LSS is designed to assess learners' general approach toward learning and

consists of 11 parts with 110 question items using the 5 point Likert scale. LSS is for measuring learning styles, especially for L2 learners. LSS modified and supplemented Reid's (1995) Perceptual Learning Preference Questionnaire and Learning Style Indicator (PLSPQ) and Oxford's (1993) Style Analysis Survey (SAS). Both of them have been widely used in L2 research but they have a major pitfall in that they do not include specific question items regarding L2 learning (H Hong 2009). In addition, LSS has commonalities with Ehrman and Leaver's Learning Style Model, which is recommended for the promising model of language learning style by Ortega (2009). In this study, two parts of the LSS, which are extroverted vs. introverted and global vs. particular, were extracted and used to measure the participants' L2 learning styles since the two parts of learning styles have been widely considered as the most important ones in L2 learning styles that could have major influence on L2 acquisition by researchers (Brown 2007b, Ehrman & Leaver 2003, Oxford & Anderson 1995, Zhang 2008). Extroverted learners enjoy a wide range of social and interactive learning tasks, while introverted learners like to do more independent work or work with a person they know well (Cohen, Oxford & Chi 2002). Zhang (2008) explains that extraverts experience the world more through the contact with others than through self-examination or self-study. On the other hand, introverts tend to be unwilling to speak or join in activities with others. Global learners enjoy getting the gist or main idea (Cohen, Oxford & Chi 2002). Since they would like to see a big picture immediately and establish meaning only in relation to the whole, they sometimes miss the important details from a confusing language context (Oxford & Anderson 1995). In contrast, particular learners attend to discrete items and details and remember specific information about a topic well (Ehrman & Leaver 2003). All the questionnaire items were in Korean, which is the participants' L1. The items went through the process of translation and back-translation by the researchers.

In addition, a test with 20 target items and 40 filler items was designed to gauge the participants' knowledge of English relative pronouns, which was the target grammar of this study. Twenty target items were seven

items of subject relative pronouns *who*, *which*, *that*, three items of object relative pronouns *whom*, *which*, *that*, four items of possessive relative pronouns *whose*, *of which*, one item of relative pronouns *what*, and five items of the usage of relative pronouns. The filler items were twenty items of gerunds, ten items of participles, and ten items of comparison. All the questions were taken from *Time for Grammar Intermediate 1, 2* (YBM Si Sa 2011) used as the main textbooks of the course. The test items reflected grammatical components that would be covered in the class over the semester. The same test was used for pre, post, and delayed tests for the current study.

3.3. Procedures

First, all the participants answered the survey asking their learning styles and then, they took the pretest on relatives pronouns. The pretest was carried out to measure the participants' initial knowledge of relative pronouns and to see whether the two groups showed no significant difference in terms of their knowledge of relative pronouns from the beginning.

Shortly after the pretest, the two groups received instruction on English relative pronouns four times — twice a week for two weeks — using different teaching methods. One group received instruction in a deductive way and the other group was taught inductively. A fifty minute class time was allotted to both groups and different handouts were designed and used for each teaching session. In the inductive group, the participants were given handouts which included reading texts. The reading passages and questions were taken from *Reading Spark Level 3, 4* (Langstar Publishing 2009). Topics of the readings were about technological inventions and computers, and every reading passage had relative pronouns. The instructor read each sentence of the reading passage and translated it into Korean, and asked the group to solve comprehension questions. During the classes, the participants of the inductive group were taught concepts of relative pronouns implicitly, and were asked to guess the different usage through examples of passages and make sen-

tences by using relative pronouns. In the deductive group, the participants also received handouts which included the concepts and examples of target grammar, and each class was spent for introducing and explaining the usages of relative pronouns explicitly. The participants of deductive group were taught the different concepts of relative pronouns first and the usages of relative pronouns with diverse examples. In order for the participants of the deductive group to be aware of the target grammar more accurately, they were asked to choose the sentences with incorrect relative pronouns use and correct them. After the two week experiment period, both groups took the posttest with the same items of the pretest. Then, to investigate the retention of learning, the delayed test was conducted. SPSS 17.0 for Window was used for the data analyses and the significance level was set at $\alpha < .05$, nondirectional.

4. Results and Discussion

4.1. Inductive and Deductive Grammar Instruction

We conducted a *t*-test to make sure whether the two groups were not different in terms of the knowledge of relative pronouns with the pretest results. The pretest consisted of a total 20 target items with one point each. The results showed that there was no a significant difference between the two groups. Thus, we assumed that the groups were not different from each other initially.

Table 3. The results of group comparison on pretest

Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>t</i>	<i>Sig</i>	Partial η^2
Inductive	56	6.535	3.219	.429	-.655	.514	.006
Deductive	48	6.916	2.616				

$p < .05$

After the two week experiment period, the two groups took the post-

test using the same test as the previous one. To see whether or not the grammar instruction has an effect on the low-level college students' grammar acquisition, pre and post test scores were initially compared (see Table 4). The results displayed that the grammar instructions have positive effects on the groups. After the experiment period, both of the groups showed numerically higher mean scores (from 6.535 to 8.142 for the inductive group and from 6.916 to 9.479 for the deductive group) and there was a significant difference between pre and post tests scores, indicating that low-level L2 learners could get help from the grammar instructions in L2 class at least for some grammar aspects.

Table 4. The results of mean differences on pre and post tests.

Group	Pretest		Posttest			Sig	Partial η^2
	M	SD	M	SD	t		
Inductive ($n=56$)	6.535	3.219	8.142	3.266	-4.731	.000	.169
Deductive ($n=48$)	6.916	2.616	9.479	3.451	-6.278	.000	.295

$p < .05$

To better answer the first research question asking which grammar instruction could be more effective on L2 grammar acquisition focusing on low-level students, the posttest results of the two groups were compared. As can be seen in Table 5, the two groups' posttest scores were significantly different each other showing the performance of deductive group was better than that of inductive group. Although the two groups were not significantly different initially and both of the teaching methods were useful for enhancing the participants' English grammar acquisition, more specifically English relative pronouns, the results suggest that the deductive grammar instruction could be indeed more helpful for students with low proficiency level to acquire L2 grammatical knowledge. The results of this study were in line with Erlam (2003) and Robinson's (1996), which claimed there was a significant advantage for the group receiving deductive instruction in L2 grammar acquisition. Thornbury's (1999) had remarked that a deductive approach could respect maturity

of students and acknowledge the role of cognitive processes in L2 learning. Considering that the participants of the current study were college students and presumably their level of cognitive ability and maturity would not be low, it might be rather natural that the deductive teaching method had a greater effect on adult L2ers' grammar acquisition.

Table 5. The results of group comparison on posttest

Group	<i>N</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>t</i>	<i>Sig</i>	Partial η^2
Inductive	56	8.142	3.266	.506	-2.026	.045	.038
Deductive	48	9.479	3.451				

$p < .05$

Four weeks after the posttest, all the participants took the delayed test in order to see the long-term retention effects of the two grammar instructions. In Table 6, to investigate whether each instructional method has also positive effects on the learners' long term retention of the target grammar, the pretest and delayed test scores of each group were compared. Both of the groups significantly higher mean scores on the delayed test compared to the pretest scores. The results suggest that the grammar instructions regardless of their types could provide help L2ers to develop their grammatical knowledge even for long-term retention. Considering the rather short instructional period and considerable effect sizes, we may say that both of the groups displayed a meaningful improvement on the target grammar with the help of formal grammar instruction in institutional settings. Interestingly, there was no significant difference between the two groups on the delayed test ($Sig = .916$, Partial $\eta^2 = .000$), which implies that both types of the grammar instruction could positively influence on the low-level L2 college students' grammar acquisition ultimately even though the learners in the deductive instruction group initially show greater improvement in their L2 grammar knowledge. This finding is in line with that of previous research revealing that the inductive instruction could actually have delayed effects in language learning (Fotos 1994, Reber 1989). Recently, Haight, Herron and Cole (2007) also suggest that using a guided inductive instructional

approach had effects on the long term learning of grammatical structures in the beginning-level foreign language classroom. Even though using an inductive instructional approach might not show visible instructional effects immediately, it could bring positive effects eventually through discovery learning if L2ers had long enough instructional periods.

Table 6. The results of mean differences on pre and delayed tests.

Group	Pretest		Delayed test			Sig	Partial η^2
	M	SD	M	SD	t		
Inductive ($n=56$)	6.535	3.219	8.571	3.499	-5.374	.000	.208
Deductive ($n=48$)	6.916	2.616	8.645	3.623	-4.001	.000	.146

$p < .05$

From the findings, we could also say that teachers need to consider the whole instructional time before deciding the most appropriate teaching method considering their students' needs. For instance, if their (low-level) L2 students need to boost their grammar related test scores within rather a short period, it would be better to use a deductive instructional approach.

The overall results demonstrate that low-level adult L2ers could get immediate help from the deductive grammar instruction partly because it is well matched to their maturity and cognitive level. However, this initial advantage was not sustained for long-term retention and both of the instructions were indeed helpful for low-level L2 college students. This is a pedagogically meaningful finding in that even low proficiency level adult L2ers could retain the target grammar information through formal grammar instruction for quite a long time, implying the benefits of grammar instruction not just for intermediate or advanced L2ers but also low-level ones.

4.2. Learning Styles

Individual L2ers have their own learning dispositions such as learning styles. Previous research has discovered close relationship between learn-

ers' learning styles and L2 development. For the current study, two of the most representative learning styles — extroverted vs. introverted and global vs. particular — were selected to closely probe into whether the effects of the two grammar instructions would be different depending on L2ers' learning styles.

We first analyzed how the two different grammar instructions affected extroverted and introverted learners' L2 grammar acquisition using the post and delayed test scores. The pretest results revealed that the extroverted, introverted, and mixed learners of the groups showed no significant differences initially. Same to the pretest results, any significant difference was not found on the delayed test as well as the posttest depending on the learners' specific learning styles (see Tables 7 and 8). That is, the L2ers with extroverted, introverted, and mixed learning styles respectively did not show their preferred instructional ways specifically. While Brown (2007b) mentioned that the effect of extroversion or introversion is not clear in the process of L2 acquisition, Zhang (2008) stated that extroverts are better learners in L2 learning. Similarly, S Hong (2009) said that most high achievers in L2 preferred extroverted learning styles and J Kim (2011) also found that the extroverted learner group showed the highest mean scores among the different learning style groups. Interestingly, the extroverted learners also showed the numerically highest mean scores under the both inductive and deductive instructions in this study, even though the mean differences were not statistically significant. These results could be related to the participants' English proficiency level of the current study. Previous research has stated that high achievers in L2 usually know their own learning styles and how to successfully use their learning styles to improve their L2 proficiency level (Andreou, E., Andreou, G & Vlachos 2008, Bailey, Onwuegbuzie & Daley 2000, Brown 2007a, J Kim, 2011, K Lee 2000). This insinuates that low-level L2ers might not have a change to be aware of preferred teaching methods as well as their own learning styles.

Table 7. The results of learning style comparison on post test (extroverted vs. introverted).

Inductive group			Deductive group			t	Sig	Partial η^2
Posttest	M	SD		M	SD			
Extroverted (15)	8.933	4.267	Extroverted (19)	10.631	4.071	-1.182	.246	.041
Introverted (34)	7.705	2.959	Introverted (26)	8.538	2.873	-1.093	.279	.020
Mixed (7)	8.571	2.070	Mixed (3)	10.333	1.527	-1.310	.226	.028
Total (56)	8.142	3.266	Total (48)	9.479	3.451			

$p < .05$

Table 8. The results of learning style comparison on delayed test (extroverted vs. introverted).

Inductive group			Deductive group			t	Sig	Partial η^2
Posttest	M	SD		M	SD			
Extroverted (15)	9.400	4.272	Extroverted (19)	9.526	4.635	-0.85	.935	.000
Introverted (34)	8.147	2.955	Introverted (26)	8.192	2.800	-.060	.952	.000
Mixed (7)	8.857	4.336	Mixed (3)	7.000	1.732	-.698	.505	.057
Total (56)	8.517	3.499	Total (48)	8.645	3.623			

$p < .05$

To better investigate the effects of learning style (extroverted vs. introverted) on low-level L2ers' grammar acquisition under the same instructional context, we conducted supplement analysis using repeated-measure ANOVAs for each grammar instruction group. In the inductive group, there is no significant finding. On the other hand, there is one statistically significant finding in the deductive group. There is no interaction effects or between group difference. We only found within group difference with time. This result seems to be from the mixed learners of the deductive group since their delayed test scores relatively dropped a lot (from 10.333 to 7.000) compared to those of the other style learners (from 10.632 to 9.526 for extroverted learners and from 8.538 to 8.192 for in-

troverted learners). However, we should take this result with caution since the number of mixed learners ($n=3$) in the deductive group was not large enough to provide any convincing findings.

Psaltou-Joycey and Kantridon (2011) have suggested using learning strategies and teaching activities that match the learning styles. They recommend that teaching activities such as discussion, role playing, and cooperative tasks are suitable for extroverted learners while individual tasks and pair work with familiar classmates are good for introverted learners. If the relationship between learners' learning styles and L2 acquisition were explored using not formal tests but hands-on classroom activities after receiving L2 instruction differently, we might discover interesting findings about learning styles and L2 development.

Next, we looked into the second learning style - global vs. particular. As in the extroverted and the introverted learners, the global, particular, and mixed learners' pretest scores were compared in order to see whether there was any significant difference among the three types of learner groups from the starting point. The pretest results presented no significant difference among the global, particular, and mixed learner groups under the inductive and deductive grammar instructions. To have a clearer picture with regard to the possible effects of learning styles on L2 grammar acquisition under the different instructional contexts, the post and delayed test scores of the learners of different style were analyzed and compared. The results of the post test comparison displayed that the particular learners in the deductive group obtained significantly higher scores than the same learning style learners in the inductive group while the other two learning styles, which were global and mixed, showed no difference (see Table 9). Moreover, the effect size was not small implying that the deductive way of grammar instruction may be more helpful for L2ers with particular learning style.

Table 9. The results of learning style comparison on post test (Global vs. Particular).

Inductive group			Deductive group			t	Sig	Partial η^2
Posttest	M	SD		M	SD			
Global (27)	7.963	3.985	Global (24)	9.041	2.926	-1.090	.281	.023
Particular (27)	8.074	2.302	Particular (16)	9.937	3.714	-2.037	.048	.091
Mixed (2)	11.500	3.535	Mixed (8)	9.875	4.580	-.461	.657	.025
Total (56)	8.142	3.266	Total (48)	9.479	3.451			

$p < .05$

Table 10. The results of learning style comparison on delayed test (Global vs. Particular)

Inductive group			Deductive group			t	Sig	Partial η^2
Posttest	M	SD		M	SD			
Global (27)	8.037	4.099	Global (24)	7.583	2.903	.451	.654	.004
Particular (27)	9.148	2.891	Particular (16)	9.812	4.230	-.612	.544	.009
Mixed (2)	8.000	1.414	Mixed (8)	9.500	3.779	-.531	.610	.034
Total (56)	8.571	3.499	Total (48)	8.645	3.623			

$p < .05$

Based on the results, we could infer that the particular learners in the deductive group seemed to have a better chance to maximize their learning style strength and thus expand their learning potential right after the grammar instruction. Particular learners could sometimes miss a big picture since they tend to more focus on details and specific information about a topic. However, in the deductive instructional context, the particular learners were given the big picture by the instructor and they had a higher chance to concentrate on details and specific information. That is, the particular learners in the deductive group could strengthen their strength and make up for the weakness. However, this significant difference was disappeared on the delayed test as can be seen in Table 10. According to Ehrman and Leaver (2003), global learners try to put meaning to everything first but they miss details, while

particular learners attend to discrete items and details therefore may find important details without regard for large concepts. Based on the results of this study, we could predict that the L2ers with particular learning style would analyze and find grammar rules more effectively and easily right after the deductive way of instruction since the deductive instruction could make up for their potential weakness. However, the initial advantage is not the thing that can be maintained for long-term retention since there was no significant difference on the post test.

As in the previous learning style (extroverted vs. introverted), we conducted supplement analysis using repeated-measure ANOVAs for each grammar instruction group. This was for a clearer picture of the effects of learning style (global vs. particular) on low-level L2ers' grammar acquisition under the same instructional context and there was no statistically significant result, implying that the different instructional style may have a stronger influence than the global, particular, and mixed learning on low-level L2ers' grammar acquisition.

5. Conclusion

This study examined the effects of the two differential instructions on L2 college students' grammar acquisition and learning styles specifically focusing on low-level L2ers. The results discovered that both of the inductive and deductive grammar instructions have positive effects on the L2 acquisition, implying that low level L2ers' grammar capacity could be significantly improved through grammar-based instruction. These are pedagogically meaningful findings considering that most L2ers study their L2 in institutional settings and they could actually enhance their L2 grammar capacity from diverse ways of grammar instructions in their own classrooms. Although the deductive grammar instruction was significantly better than the inductive grammar instruction when producing the immediate teaching effects for low-level L2 college students, both of the instructions were equally effective regarding the long-term retention. This finding suggests that the inductive grammar instruction may

have delayed learning effects especially for the students with low English proficiency in the L2 field (Fotos 1994, Haight, Herron & Cole 2007, Reber 1989).

This study also investigated the effects of the two grammar instructions depending on L2ers different learning styles and two of the most representative learning styles — extroverted vs. introverted and global vs. particular — were selected. Firstly, any significant difference was not found on the delayed test as well as the posttest among the extroverted, introverted, and mixed learners regardless of the instructional types while the extroverted learners obtained the numerically highest mean scores among the groups with different learning styles. Secondly, unlike the results of the first learning style (extroverted vs. introverted), the particular learners in the deductive group marked significantly higher scores on the posttest than the same learning style learners in the inductive group suggesting that the deductive way of grammar instruction could be more helpful for L2ers with particular learning style at least for the immediate learning effects. However, we could find no significant difference on the delayed test among the global, particular, and mixed learners. This study tells us that when the instruction is matched to learners' preferred styles which could be assessed by various models and assessment instruments, L2 learning could be more successful. In addition, this study also demonstrates that teachers need to consider the instructional time before deciding the most appropriate teaching method considering their students' needs, since the effects of the two different instructions on L2ers' grammar acquisition could be different depending on instructional periods.

Considering all the participants of this study were low proficiency level and they said they have had no chance to figure out their own learning styles, this study provided a good opportunity for the learners to assess their own learning dispositions so that they could use them properly when studying their L2 in and outside classrooms. Also, if learners and teachers would strive for balanced learning and teaching styles, the effectiveness of L2 learning could be maximized.

This study was carried out with a rather small number of participants at a specific level of college students with specific target grammar, English

relative pronouns. The results are, therefore, not generalizable to the entire population of L2ers, especially those of very young age or those with higher language proficiency. The results could be different if further research were conducted with other samples.

Oxford (1993) emphasized that L2ers need to identify their learning styles and recognize their strengths so that they could expand their learning potential. Studies have repeatedly shown that matching teaching styles to learning styles can significantly improve learners' academic achievement (Andreou, E., Andreou, G & Vlachos 2008, Wong & Nunan 2011). If future research utilized more diverse hands-on tasks rather than formal tests to explore the relationship between learners' learning styles and L2 acquisition, the research might deliver more meaningful findings to teachers at school settings.

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Appendix

영어 학습 스타일에 대한 설문지

본 설문지는 영어 학습 스타일을 조사하기 위해 작성되었습니다. 각 문항에 대한 정답은 없으며 여러분의 솔직한 답변을 기입해 주시기 바랍니다. 본 설문조사 결과는 연구 이외의 목적으로는 사용되지 않습니다. 각 문항을 잘 읽고 성실히 답변하여 주시기 바랍니다. 감사합니다.

2011. . . .

▣ 다음은 여러분의 영어 학습 스타일을 조사하기 위한 것입니다. 각 문항을 잘 읽고 자신의 생각에 따라 신중한 답변을 하시기 바랍니다. (중복 표시불가)

1: 전혀 그렇지 않다, 2: 어쩌다 그렇다, 3: 가끔 그렇다, 4: 자주 그렇다, 5: 항상 그렇다

	내 용	1	2	3	4	5
1	나는 혼자 공부하는 것보다 여럿이 함께 할 때 더 잘 배운다.	1	2	3	4	5
2	나는 대화에 끼어들어서 쉽게 새로운 사람들을 사귈다.	1	2	3	4	5
3	나는 개인교사와 공부하는 것보다 교실에서 다른 학생들과 공부할 때 더 잘 배운다	1	2	3	4	5
4	나는 낯선 사람에게 잘 다가갈 수 있다.	1	2	3	4	5
5	나는 여러 사람과 교제하면 힘이 생긴다.	1	2	3	4	5
6	나는 먼저 일을 해보고 그 다음에 이해하려고 한다.	1	2	3	4	5
7	나는 내 내부의 생각에 의해 힘을 얻는다.	1	2	3	4	5
8	나는 개인 또는 일대일 게임이나 활동을 좋아한다.	1	2	3	4	5
9	나는 소수의 관심사에 깊이 집중하는 편이다.	1	2	3	4	5
10	나는 큰 그룹에서 일을 하고 나면 지친다.	1	2	3	4	5
11	나는 큰 그룹과 어울릴 때 말을 하지 않고 듣는 편이다.	1	2	3	4	5
12	나는 무언가 시도해 보기 전에 잘 알기를 원한다.	1	2	3	4	5

	내 용	1	2	3	4	5
13	나는 긴 설명보다 짧고 단순한 대답을 더 좋아한다.	1	2	3	4	5
14	나는 사소한 세부적 내용을 무시한다.	1	2	3	4	5
15	나는 전체적인 윤곽이나 그림의 전체모습을 보는 것이 쉽다.	1	2	3	4	5
16	나는 주요 개념을 알면 그것으로 만족한다.	1	2	3	4	5
17	나는 옛날이야기를 할 때 구체적인 사실을 잊어버리는 경향이 있다.	1	2	3	4	5
18	나는 무엇을 완전히 이해하기 위해 구체적인 예를 필요로 한다.	1	2	3	4	5
19	나는 세부적인 사실이나 정보에 관심을 갖는다.	1	2	3	4	5
20	나는 어떤 단어나 구가 새로운 것인지를 빨리 알아낸다.	1	2	3	4	5
21	나는 말을 듣고 빈칸을 채워 넣는 활동을 좋아한다.	1	2	3	4	5
22	내가 농담을 말하려고 할 때 나는 세부적인 사항은 잘 기억을 하지만 결정적인 개그는 잊어버린다.	1	2	3	4	5

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