



EFFECTS OF PRESENTATIONS AND LEARNING STYLES ON ENGLISH CLAUSE RECOGNITION TASKS

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Abstract

The present study investigates the effects of different presentation styles and learning styles of EFL students on an English clause recognition task. The study addresses the following questions: a) Do different styles of presentation affect EFL learners' performance on recognition of English clauses? b) Do students of different learning styles perform differently on recognition tasks of the three English That-clauses? and c) Do students of different learning styles benefit differently from different presentation styles? A total of 182 students were randomly assigned to four treatment groups (Auditory, Visual, Kinesthetic, and Reading/Writing presentations) based on the results of The VARK Questionnaire. Results indicate significant effects on three different clauses (best on Adjectival), significant differences in learning styles, the interaction between presentation styles and clauses as well as the interaction between presentation styles and learning styles. A complementary effect is assumed to explain the inconsistencies of some of our predictions and the results. More studies concerning presentation and learning styles are necessary for the complementary effect.

Keywords: presentation style, learning style, clausal structures, EFL instruction, cognitive load theory

1. Introduction

A large portion of educational and psychological research in learning and instruction for the past few decades has mainly focused on individual differences (e.g., Corno & Snow, 1986; Cronbach, 1957; Cronbach & Snow, 1977; Jonassen & Grabowski, 1993).

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According to Larsen-Freeman and Long (1991), individual differences may encompass age, social-psychological factors (motivation, and attitude), personality, cognitive style (field independence/dependence, category width, reflexivity/impulsivity, aural/visual, analytic/gestalt), hemisphere specialization, learning strategies, memory. The present study will focus on the aural/visual factor, generally coined as learning styles. Learning styles are defined, by Skehan (1991), as learners' customary pre-dispositions or manners in the course of information processing. Out of learning history or educational background, students of different learning styles may understand and process information differently (Lawrence, 1993). Auditory (aural) learners, for example, prefer to hear information, or more sensitive to audio input, while visual learners prefer to see, or more sensitive to spatial or visual input. As what Wenden (1985) and Oxford (1990) suggested, learning styles, as different from learning strategies, may involve unconscious decision regarding what to process for the input, thus are less likely, if not impossible, to be learned. Besides, there has been a general belief in learning style theory that instructors can render best help to students on the basis of the knowledge of how they learn best, or what their preferred learning styles are (Ellis, 1989). Instructors could always incorporate their instruction styles with those of the students to maximize students' learning outcome. Thus, whether a teacher's instructional style and student learning styles is compatible does play a significant role in the success of instruction (Carrell and Monroe, 1993; Dunn and Griggs, 1995). In the learning styles literature, much of the study has focused on native speakers, be they English or another tongue (e.g. Felder, 1993; Gardner and Hatch, 1989; Grasha, 1996; Harb et al., 1993; Liu and Littlewood, 1997; Matthews, 1991), yet rather rare studies have been conducted on non-native speakers of English, Chinese learners of English, for instance. Such kind of study is of significance in that while non-native learners of English are lacking support of cultural connotations from the target language (English), receiving and processing stimuli through senses become more important, especially during the stage of presentation of language input.

2. Cognitive load and That-clause presentation and processing

From the Cognitive load theory (Sweller, 1999), presentations of input during instruction should take into account learners' limited working memory since only a few elements of current information at any given time can be processed (Miller, 1956). There are solutions for the limited working memory. First, mobilize what is in unlimited long-term memory to structure and organize elements of information from what is being presented in instruction; that is, the adoption of schemas (Chi, Glaser, & Rees, 1982; Larkin, McDermott, Simon, & Simon, 1980). Second, present information in consideration of learners' learning styles. When in information processing, the input will first be received by sensory memory (including visual, audio, kinesthetic), and then sent to the short term memory for further processing. Learners with specific sensory preference, aural for example, are more sensitive to the preferred sensory aspects of the information, while less to other aspects, and thus make a difference in learning from the

presentation. Further, the elements of information from presentation may, in most cases, of its physical nature besides its cognitive relevant nature held in long term memory (schemas). Such a cognitive load caused by physical nature of information may play an important role in what is called extraneous cognitive load, which is generated by the manner in which information is presented to learners and is under the control of instructors. To specify, information presented mostly in one presentation style (e.g., audio), may create extraneous load to learners of another learning style (e.g., kinesthetic or visual). According to cognitive load theory, instruction should be structured in a way to reduce unnecessary extraneous working memory load. (Sweller, 1999; Sweller, van Merriënboer, & Paas, 1998). Therefore, it is logical to assume that presentations that take into account the styles of learners may facilitate reducing cognitive load, thus promoting learning.

On the other hand, there is another cognitive load called intrinsic cognitive load, which is imposed by the intellectual complexity of information. To take the English clauses for example, adjectival clauses, as compared with nominal and adverbial clauses, are the most difficult in sentence processing for non-native learners because of their intrinsic nature (especially when the conjunctions that lead the relative clauses are left out). See the sentences with different THAT-clauses below:

- (1) The teacher said that he could go. (Nominal)
- (2) The rain stopped that he could go. (Adverbial)
- (3) I had the thing that he liked. (Adjectival)
- (4) I learned that he liked the thing. (Nominal)

For Chinese learners, processing sentence (1) and (2) requires the information that 'said' is transitive, while 'stopped' intransitive. And in sentence (3), 'that he liked' is to modify 'the thing,' while in sentence (4), 'that he liked the thing' is the object. Besides semantic aspects, the relative positions of 'that' clauses do play a key role in identifying different clauses. Namely, nominal that-clauses are normally followed by the transitive verbs as objects, adverbial clauses by complete sentence or intransitive verbs, and adjectival by the noun it modifies. Yet, such a tentative description may not be flawless. See the sentences below:

- (5) I had the thing that I can lend it to her. (Adverbial)
- (6) He gave me the thing that I liked him. (Adverbial)

Another piece of information is required for accurate identification; that is, the complete or incomplete structures that is before or behind the conjunction 'that.' For example, in nominal and adverbial clauses, the structures followed by 'that' are always complete, while in adjectival clauses, the structures followed by 'that' are not. Thus, a contingency table can be created as follows:

Table 1: Structures around 'that' in Different Clauses

Clauses	Structures before 'that'	Structures after 'that'
Nominal	Incomplete	Complete
Adjectival	Complete	Incomplete
Adverbial	Complete	Complete

As indicated, the interaction between relative position and the completeness of structures is involved in the intrinsic cognitive load when processing different clauses. Understanding the syntax mentioned above is the high-element interactivity cognitive task for learners with little experience in this area. As a consequence, they impose a high, intrinsic cognitive load because many elements must be processed in working memory simultaneously. Therefore, learning material that is difficult to understand (such as sentences involving different clauses) is difficult due mainly to its high element interactivity, which imposes a heavy load on the working memory (Chandler & Sweller, 1996; Marcus, Cooper, & Sweller, 1996).

According to Sweller (1999), the elements of high-element interactivity material can be separately and individually presented and learned, and only when all the elements along with their interactions are processed simultaneously can they be comprehended. That is, intrinsic load can be altered or reduced if a learning situation is organized in that understanding is not an objective though simultaneous processing of all essential elements must occur for understanding to commence. In the present study, interaction between position and structure in different That-clauses is arranged in a way that they can be processed individually; firstly, the relative position of each of the three That-clauses can be specified, followed by presenting the completeness of each clausal structure. In essence, adjectival That-clauses mainly lie behind the noun they modify, adverbial That-clauses behind the main clause, while nominal That-clauses behind the transitive verb, and such relative spatial relationships of each clause in relation to the main structure of the given sentence can be presented visually to suit the preference of, for example, the visual learners, which is the focus of the present study. Different presentations in accordance with different styles of learners, to take visual presentations as an example, can be elaborated below:

Visual presentation: patterns of Clauses are provided in addition to verbal description (without oral explanation)

- | | | | |
|-----------------------|---|---|------------------------------|
| 1) Nominal Clause: | N | V | [that-(complete)] |
| 2) Adjectival Clause: | N | V | N [that-(incomplete)] |
| 3) Adverbial Clause: | N | V | N [that-(complete)] |

Other presentations, such as Auditory, Kinesthetic, and Reading/writing, can be indicated by Table 1 below.

Table 2: Experiment Design on Different Presentations

Content Presentation	Visual patterns	Verbal description	Oral explanations	Activities
Auditory	X	V	V	X
Visual	V	V	X	X
Kinesthetic	X	V	X	V
Reading/Writing	X	V	X	X

3. Learning styles, presentation styles, and Clause recognition

Learning styles are generally classified into Auditory, Visual, Kinesthetic, and Reading/Writing styles. (Rose, 1985; Fleming, 1986) Auditory learners prefer to take in the information: attend lectures, attend tutorials, discuss topics with other students, discuss topics with your lecturers, explain new ideas to other people, use a tape recorder, remember the interesting examples, stories, and jokes. Visual learners prefer to take in the information: underlining, different colors, highlighters, symbols, flow charts, charts, graphs, pictures, videos, posters, slides, and different spatial arrangements on the page. Kinesthetic (doing) learners prefer to take in the information: all your senses - sight, touch, taste, smell, hearing, laboratories, field trips, field tours, examples of principles, lecturers who give real-life examples, applications, hands-on approaches (computing), trial and error, collections of rock types, plants, shells, grasses, exhibits, samples, photographs, etc. Reading and Writing (R & W) learners prefer to take in the information: lists, headings, dictionaries, glossaries, definitions, handouts, textbooks, readings – library, lecture notes (verbatim), lecturers who use words well and have lots of information in sentences and notes, essays, manuals (computing and laboratory).

It is assumed in the present study that an auditory learner will tend to choose the aural information (i.e., more sensitive to oral explanation in the design), visual learners the visual information (i.e., more sensitive to visual patterns), kinesthetic the hand-on activities (i.e., more sensitive to activities), and reading/writing learners the description text (i.e., more sensitive to verbal description). As to the interactions between presentation styles and clause recognition, since Adjectival clauses can best be reflected by their positions behind the nouns they modify as well as their involving more intrinsic cognitive load, so it is logical to contend that they may be best presented by Visual presentations. On the other hand, different clausal structures can be partly specified by their relative locations (spatial relationships in a given sentence, so Visual presentation is expected to exert most influence on the recognition of these clauses. For between-subject factors, among the four different styles of learners, it is assumed by the present study that Visual learners can be expected to benefit most, which can be further elaborated by taking into account two situations. First, in the situation where visual learners go through non-visual presentations, the visual image of clausal differences can still be initiated for they are visual prone learners. Second, in the visual presentation where visual patterns of each clausal structure are provided, visual learners can naturally benefit most. As to the relationships between presentation styles and learning

styles, it can be assumed by the definitions of learning styles that each style of learners will perform best under the corresponding presentation style. That is, Auditory learners perform best under Auditory presentation, Visual learners under Visual presentation, Kinesthetic learners Kinesthetic presentation, and Reading/Writing learners Reading/Writing presentation.

3.1 Purpose

The purpose of the present study is to examine how different presentation and learning styles (EFL learners) affect performance on an English clause recognition task. In doing so, this study combines instructions and learning styles to investigate whether the results obtained will support the contention that students of different learning style may perform differently on English clause recognition in ESL/EFL educational settings.

3.2 Method

The study aims to explore the effects of different presentation styles and students of different learning styles on English clause recognition in EFL. Specifically, the study addresses the following research questions:

1. Do different presentation styles (Auditory, Visual, Kinesthetic, and Reading/writing) affect intermediate advanced Taiwanese EFL students' performance on English clause recognition task (i.e., nominal, adjectival, and adverbial clauses, respectively)?
2. Do students' learning styles (also Auditory, Visual, Kinesthetic, and Reading/writing) affect intermediate advanced Taiwanese EFL students' performance on English clause recognition task (i.e., recognition of nominal, adjectival, and adverbial clauses)?
3. Do students of different learning styles react differently to different presentations as reflected by performance on English clause recognition task (i.e., recognition of nominal, adjectival, and adverbial clauses)?

4. Design of the Study

The independent variables in the present study include 4 presentation styles (Auditory, Visual, Kinesthetic, and Reading/writing), and 4 styles of learners (A, V, K, and R), whereas the dependent measure is the English Clause Recognition Task in which three clauses are included (N, J, and V). The details can be specified in Table 3 below:

Table 3: Independent and Dependent measure of the experiment

Independent		Dependent (English Clause Recognition Task)		
Presentation Style	Learning Style	Nominal (N)	Adjectival (J)	Adverbial (V)
Auditory	A	X	X	X
	V	X	X	X

	K	X	X	X
	R	X	X	X
Visual	A	X	X	X
	V	X	X	X
	K	X	X	X
	R	X	X	X
Kinesthetic	A	X	X	X
	V	X	X	X
	K	X	X	X
	R	X	X	X
Reading/Writing	A	X	X	X
	V	X	X	X
	K	X	X	X
	R	X	X	X

Note: A: Audio learners; V: Visual learners; K: Kinesthetic learners; R: Reading / Writing learners

4.1 Participants

The participants in this study consisted of a total of 182 students from the sophomore English courses in two universities. They were randomly assigned to four treatment groups (Auditory, Visual, Kinesthetic, and Reading/Writing presentations) based on the results of The VARK Questionnaire. Before the experiments, 47 students of different learning styles (18 auditory, 14 visual, 8 kinesthetic, and 7 reading/writing styles) will receive Auditory presentation, 42 students of different learning styles (12 auditory, 18 visual, 7 kinesthetic, and 5 reading/writing styles) will receive Visual presentation, 46 students of different learning styles (14 auditory, 15 visual, 10 kinesthetic, and 7 reading/writing styles) will receive Kinesthetic presentation, and the remaining 47 students of different learning styles (15 auditory, 17 visual, 9 kinesthetic, and 6 reading/writing styles) will receive reading/writing presentation. Subjects in different treatment groups will receive a 40- minute lesson concerning three kinds of THAT clausal structure (nominal, adjectival, and Adverbial).

4.2 Materials

The material for presentation is a written narrative regarding the definitions and the syntactic structures of the three That-clauses (nominal, adjectival, and adverbial). The content can be divided into 1) Definition, 2) Examples, 3) Summary, and 4) Exercise (Please see Appendix 1). The key points in the four treatment groups are basically the same, except in the way it is presented. For Auditory presentation, the instructor simply introduce the key points through verbal explanation of the text, while for Visual presentation, the relative positions of each different clause are specified through sentence pattern charts (i.e., visual aid). For kinesthetic presentations, the points to be learned are introduced through sentence combination activities, and lastly, for reading/writing presentation, subjects are required to read the text on their own. To measure students' learning styles, the VARK (visual aural read/write kinesthetic) Questionnaire as well as a 15-item pre and post test for Clause Recognition Task was used.

4.3 The Instructional Procedure

A total of four sessions (with each session 30 minutes) were designed for all the subjects in four treatment groups. Four weeks prior to the start of the experiment, the VARK Questionnaire was administered to all the subjects in four different groups. In order to validate the Questionnaire, another three weeks (with each 30 minutes) were spent on semi-structured interview and participant observations. One week prior to the first session of each group, all the subjects were given a pre-test of English Clause Recognition Task (with 15 items in which three different That Clauses were randomly aligned). Then in each of the four sessions, subjects of different groups were given a printed handout of one of the four presentation style formats (Auditory, Visual, Kinesthetic, and Reading/writing). After about 20 minutes of presentation, subjects for each group were required to return the handouts to the instructor after each session to avoid subjects' extra time and energy spent on further review of the material. After the fourth session, a post-test of English Clause Recognition Task (the same 15 items in which three different That Clauses were randomly aligned) were given. Statistical results were analyzed on the basis of the difference between pre-and post test results. Since quantitative means alone are not sufficient to secure the effectiveness and usefulness of the VARK instrument, particularly for non-native learners. A triangular approach utilizing a questionnaire, semi-structured oral interviews, and participant observations were conducted to further validate the learning style measure. A total of 30 semi-structured interviews in a period of three weeks were conducted by the researcher who met with a group of 5-6 subjects each interview at a mutually convenient time in the researcher's office to clarify the items of the Questionnaire and observe to confirm each interviewee's learning style.

4.4 Tasks and Data Collection

The data for the study came from The VARK (visual aural read/write kinesthetic) Questionnaire, and the results from the difference between the pre- and post English

clause recognition tasks. All the data will be analyzed by 4 x 4 x 3 ANOVA mixed measures on SPSS 0.9.

4.5 Statistical Results

It is found that there is a significant difference of improvement among three different clauses; i.e., nominal vs. adverbial ($F=5.54, p=.02$) and adjectival vs. adverbial ($F= 13.39, p<.000$). Further, there is an interaction between presentation style and adjectival vs. adverbial clauses ($F= 3.74, p=.012$). See Table 4 below:

Table 4.4: (presentation style) x 4 (learning style) x 3 (three clauses)
 ANOVA of Within-Subjects Contrasts

Source	Clauses	Type III Sum of Squares	df	Mean Square	F	Sig.
CLAUSES	Level 1 vs. Level 3	18.302	1	18.302	5.544	.020
	Level 2 vs. Level 3	52.872	1	52.872	13.392	.000
CLAUSES * PRESENT	Level 1 vs. Level 3	16.926	3	5.642	1.709	.167
	Level 2 vs. Level 3	44.322	3	14.774	3.742	.012
CLAUSES * STYLE	Level 1 vs. Level 3	14.489	3	4.830	1.463	.227
	Level 2 vs. Level 3	3.562	3	1.187	.301	.825
CLAUSES * PRESENT * STYLE	Level 1 vs. Level 3	31.845	9	3.538	1.072	.386
	Level 2 vs. Level 3	64.326	9	7.147	1.810	.070
Error (CLAUSES)	Level 1 vs. Level 3	547.965	166	3.301		
	Level 2 vs. Level 3	655.346	166	3.948		

a Computed using alpha = .05

From Figure 1, subjects regardless of different presentations and learning types, perform best on Adjectival clause recognition, followed by adverbial clauses and nominal clauses.

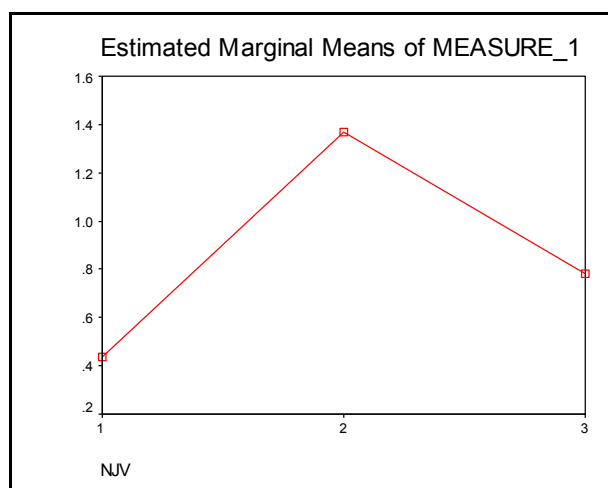


Figure 1: Differences on repeated measure among nominal (N), adjectival (J), and adverbial (V) clauses

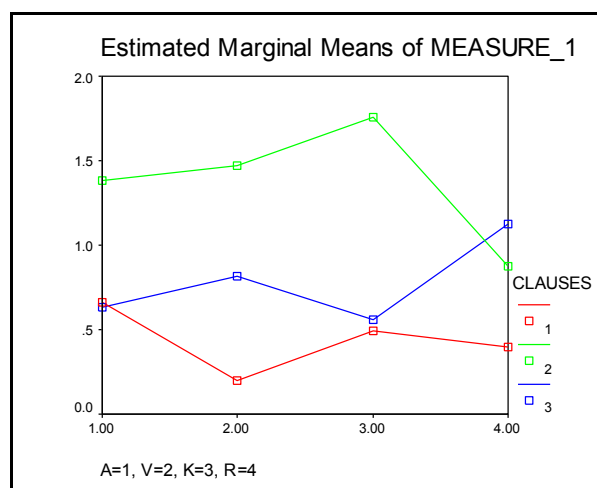


Figure 2: Interaction between clauses (1: nominal; 2: adjectival; and 3: adverbial) and presentations (A: audio; V: visual; K: kinesthetic; R: reading/writing)

From Figure 2, Performance on Adjectival Clauses is best under Kinesthetic presentations, but worst on Nominal Clauses. On the other hand, performance on

Nominal Clauses is best under Reading/writing presentations, but worst on Kinesthetic presentations.

As indicated in Table 5, significance differences can be found in four different learning styles ($F= 3.17, p=0.026$), and in the interaction between 4 presentation styles and four learning styles ($F=1.978, p=0.044$).

Table 5.4: (presentation style) x 4 (learning style) x 3 (three clauses)
ANOVA of between-Subjects Contrasts

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
PRESENT	.464	3	.155	.177	.912
STYLE	8.347	3	2.782	3.178	.026
PRESENT * STYLE	15.656	9	1.740	1.987	.044
Error	145.338	166	.876		

To illustrate, see Figure 3 and 4 below. As is shown, subjects of Visual learning styles perform best in English clause recognition task, followed by Auditory and Reading/writing styles, while worst for Kinesthetic style of learners.

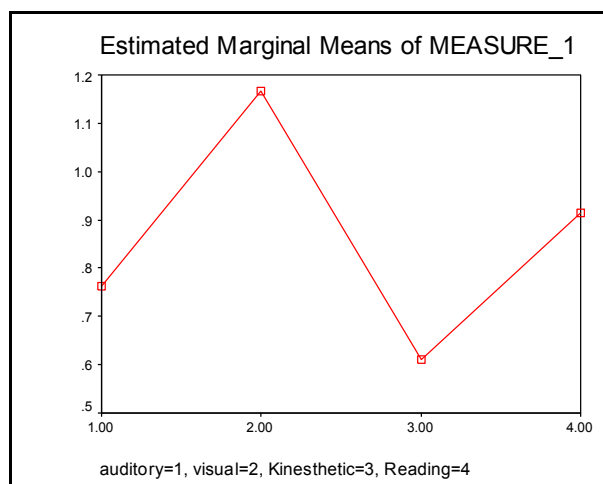


Figure 3: Differences on between subject measure among Auditory (A), Visual (V), Kinesthetic (K), and Reading/writing (R) styles of learners

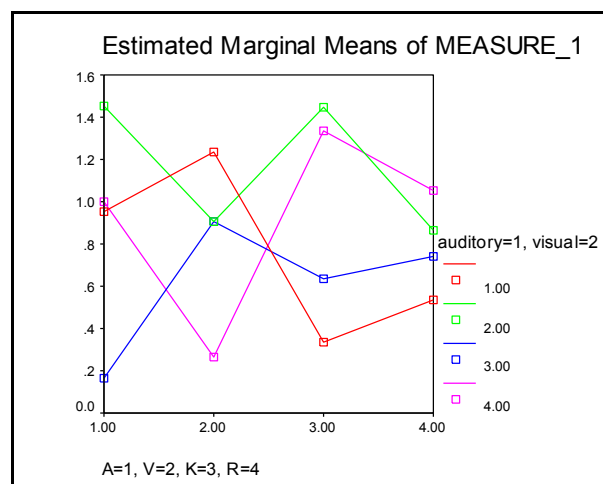


Figure 4: Interaction between subject measure presentation styles Auditory (1), Visual (2), Kinesthetic (3), and Reading/writing (4) and four styles of learners (A, V, K, and R)

Figure 4 indicates that Auditory learners tend to perform best under Visual presentation, while worst under Kinesthetic presentations; Visual learners tend to perform best under Auditory and Kinesthetic presentations; Kinesthetic learners perform best under Visual presentation, while worst in Auditory presentation; Reading/Writing learners perform best under Kinesthetic presentation, while worst under Visual presentation.

5. Discussion

As indicated from the statistical results, there is a significant difference of improvement on three That-clauses recognition, with best improvement on Adjectival clause recognition, which implies more rooms of improvement can be expected for the recognition of Adjectival clauses. This finding is unusual because from our assumption, Adjectival clauses, compared with Nominal and Adverbial clauses, are most difficult especially for Chinese learners in that the position of them in a given sentence is largely different from that in Chinese; that is, the intrinsic cognitive load resulting from elements interactivity in Adjectival clauses is the largest among the others, so that the improvement of them should be the least. Yet as we retrieve the means of each clause in both pre-and post-tests, the performance on the recognition of Adjectival clauses were significantly higher than that of both Nominal and Adverbial clauses. Is it that in the recognition task what is more novel in structure is more readily identified? More studies are necessary to confirm such a phenomenon. So far, we can only argue that recognition of Adjectival structures can be most improved under the design of the present study.

Second, for the interactions between 4 styles of presentation and 3 different That-clauses, it is found that Auditory presentation suits best on recognition of Adjectival clauses, Visual presentation has least effect on Nominal clause recognition, Kinesthetic presentation works best for Adjectival clause recognition, and Reading presentation works best on Adverbial clause recognition. From our assumptions, Adjectival clauses can best be presented by Visual presentations, but why is it that Kinesthetic presentation best help recognize Adjectival sentences? It could be that learners are supposed to do the sentence combination activity included in the Kinesthetic version, which may help learners consolidate the understanding of the rationale that underlies Adjectival clauses. That is, to be able to recognize the most complex structures (e.g., adjectival clauses) requires learners' more psychomotor involvement besides or without provision of visual presentation. On the other hand, since visual patterns cannot fully reflect the differences between Nominal and Adverbial clauses (both clauses are complete in structures), and thus visual patterns exert less influence on recognition of both. As to the effect of Reading/writing presentation on Nominal and Adverbial clauses, it can be assumed that more semantic processing may be involved in the recognition of these two clauses since Visual, Auditory, or Kinesthetic presentations may not fully reflect the differences in both clauses; that is, their differences rely more semantic considerations with reference to the completeness of structures of both. However, all these elaborations require further studies.

As to the between-subject effect, no overall significance was found in four presentation styles, which is inconsistent with our assumptions mentioned earlier that Visual presentation is expected to exert most influence on the recognition of the three clauses. One of the reasons is that the overall effect of different presentations might be neutralized in the design where there are learners of four different learning styles in each treatment group. Chances are that Visual presentations might fit best to, for

example, visual learners, while unfit to other styles of learners. In addition, as mentioned earlier, the differences among different clausal structures cannot be fully specified through visual patterns provided (both structure completeness and relative spatial relations are involved).

For the factor of learning styles, the study found that Visual learners perform best in the overall English clause recognition task (which is consistent with our prediction), while worst for Kinesthetic learners, which could be that when receiving non-Kinesthetic presentations, these learners in different treatment groups (except in Kinesthetic presentation group) can only rely on Auditory, Visual, and Reading aspects of the given material, which do not have direct connection with what they are sensitive to. From cognitive load theory, Kinesthetic learners are expected to experience more difficulties in activating necessary and relevant schemas in long term memory by way of aural, verbal, or visual stimuli. Such logic can also apply to other styles of learners. For example, Auditory and Reading/Writing learners in the four treatment groups can at least partly benefit respectively from the aural or verbal stimuli, which can, to some extent, be less difficult in activating relevant schemas in long term memory.

As to the interactions between presentation styles and learning styles, the results indicates an inconsistency with our assumptions that learners of different styles will perform best when receiving the style of presentation corresponding to their learning styles. In the present study Auditory learners were found to perform best under Visual presentation, and to explain such a result is difficult because the visual patterns provided in the Visual presentation can interfere with Auditory' learners' processing of aural and verbal input. But it is also possible that the visual input under Visual presentation may provide a good frame of reference in grasping the relative spatial relationships among clauses. This is logical in that recognition of different clauses requires the awareness of spatial relationships as well as the structure compositions (complete or incomplete). From the perspectives of cognitive load theory, the visual patterns can serve as the reminder of clausal structures after the semantic aspect of the aural data was processed by Auditory learners. Such logic can also be plausible when explaining why Auditory learners performed worst under Kinesthetic presentations, and the findings that Kinesthetic learners perform best under Visual presentation, while worst in Auditory presentation, because sentence combination activities in Kinesthetic presentations cannot beat the visual patterns in Visual presentations, and, by the same token, for Kinesthetic learners visual patterns serve as good frame of reference, like the situation in Auditory learners, on recognition of different clauses. Lastly, Reading/Writing learners were found to work best under Kinesthetic presentation, while worst under Visual presentation. As mentioned earlier, Reading and Writing (R & W) learners prefer to take in the information in the forms of lists, headings, dictionaries, glossaries, definitions, handouts, textbooks, and readings. And the visual patterns in Visual presentation, compared with Auditory, Reading/Writing, and Kinesthetic presentations, offer least such kind of verbal information to Reading/Writing learners, thus most disadvantageous under Visual presentations. On the other hand, Reading/Writing learners benefit most from the sentence combination activities

provided under Kinesthetic presentation may imply that Kinesthetic information plays the complementary role for Reading/Writing learners in recognition of clauses, much like Visual presentation for Auditory learners, and kinesthetic presentation for Visual learners. The complementary role of various presentations for various learners, as indicated by the findings in the present study, can be summarized in the Table below:

Table 5: Complementary role of presentations to different learner types

Complementary- presentation Learner Types	Aural	Visual	Kinesthetic	Reading/ Writing
Auditory		X		
Visual	X		X	
Kinesthetic		X		
Reading/Writing			X	

6. Conclusion

The present study investigates the effects of different presentation styles and learning styles of EFL students on an English That-clause recognition task. Some of the results of the present study support our predictions, but new discoveries also emerge from inconsistencies in other results. Firstly, do different styles of presentation affect EFL learners' performance on recognition of English clauses? The results indicated that performance on Adjectival Clauses is best under Kinesthetic presentations, but worst on Nominal Clauses. On the other hand, performance on Nominal Clauses is best under Reading/writing presentations, but worst on Kinesthetic presentations. Secondly, do different styles of learners perform differently on recognition tasks of the three English That-clauses? No significance was found from the study. Next, do students of different learning styles benefit differently from different presentation styles? The answer for this question is complicated. Though some of the findings do not meet our predictions, there is an intriguing phenomenon which can be tentatively coined as Complementary effect that may serve to explain the inconsistencies between some of our predictions and the findings concerning the interactions in between-subject variables (presentation styles and learners' styles). That is, future studies may focus on examining the complementary phenomenon on the bases of cognitive load theory and contentions in learning style to clarify the intricacies in the interactions between styles of presentations and learners.

References

1. Carrell, P. L. and Monroe, L. B. (1990, Oct.) Investigating ESL students' learning styles. Paper presented at the Joint Conference of Southeast Teachers of English to Speakers of Other Languages and National Association of Foreign
2. Student Affairs Region VI, Louisville, KY.

3. Chandler, P., & Sweller, J. (1996). Cognitive load while learning to use a computer program. *Applied Cognitive Psychology*, 10, 151–170.
4. Chi, M. T. H., Glaser, R., & Rees, E. (1982). Expertise in problem solving. In R. Stenberg (Ed.), *Advances in psychology of human intelligence*. Hillsdale, NJ: Erlbaum.
5. Corno, L., & Snow, R. E. (1986). Adapting teaching to individual differences among learners. In M. Wittrock (Ed.), *Handbook of research on teaching*, vol. 3, (pp. 605±629). New York, NY: Macmillan.
6. Cronbach, L. J. (1957). The two disciplines of scientific psychology. *American Psychologist*, 12, 671±684.
7. Cronbach, L. J., & Snow, R. E. (1977). *Aptitudes and instructional methods*. New York: Irvington.
8. Dunn, R., Griggs, S. (1995). *Multiculturalism and Learning Style: Teaching and Counseling Adolescents*. Praeger, Westport, CT.
9. Ellis, R. (1989). Classroom learning styles and their effect of training on second language acquisition: a study of two learners. *System* 17, 249-262.
10. Felder, R. (1993). Reaching the second tier: learning and teaching styles in college science education. *J. College Science Teaching* 23, 286–290.
11. Fleming, N. (2001). The VARK Questionnaire. <http://www.vark-learn.com/english>
12. Gardner, H., Hatch, T. (1989). Multiple intelligences go to school: educational implications of the theory of multiple intelligences. *Educational Researcher* 18, 4–9.
13. Grasha, A. (1996). *Teaching with Style*. Alliance Publishers, Pittsburgh, PA.
14. Harb, J., Durrant, S., Terry, R., 1993. Use of the Kolb learning cycle and the 4MAT system in engineering education. *Journal of Engineering Education* 82 (3), 70–77.
15. Jonassen, D. H., & Grabowski, B. L. (1993). *Handbook of individual differences, learning, and instruction*. Hillsdale, NJ: Lawrence Earlbaum.
16. Larkin, H., McDermott, J., Simon, D., & Simon, H. (1980). Models of competence in solving physics problems. *Cognitive Science*, 11,65–99.
17. Larsen-Freeman, D. and Long, M. (1991) *An Introduction to Second Language Acquisition Research*, Oxford: Oxford University Press.
18. Lawrence, G. (1993). *People Types and Tiger Stripes*. Center for Applications of Psychological Type, Gainesville, FL.
19. Liu, N., Littlewood, W. (1997). Why do many students appear reluctant to participate in classroom learning discourse? *System* 25, 371–384.
20. Marcus, N., Cooper, M., & Sweller, J. (1996). Understanding instructions. *Journal of Educational Psychology*, 88 (1), 49–63.
21. Matthews, D. (1991). Learning styles research: implications for increasing students in teacher education programs. *Journal of Instructional Psychology* 18, 228–236.
22. Miller, G. A. (1956). The magical number seven plus or minus two: some limits on our capacity for processing information.

23. [Riding and Rayner \(1998\)](#). R. Riding and S. Rayner, *Cognitive Styles and Learning Strategies*. David Fulton Publishers, London (1998).
24. Rose, C. (1985). *Accelerated Learning*. Accelerated Learning Systems Ltd. England.
25. Skehan, P. (1991). Individual differences in second language learning. *Studies in Second Language Acquisition* 13, 275–298.
26. Sweller, J., van Merriënboer, J. J. G., & Paas, F. G. W. C. (1998). Cognitive architecture and instructional design. *Educational Psychology Review*, 10 (3), 251–296.
27. Sweller, J. (1999). *Instructional designs in technical areas*. Melbourne: ACER.
28. Wenden, A.L. (1985). Learner strategies. *TESOL Newsletter* 19, 1–7.

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