Substantive Scale Verification: A Likert Scale Analysis and Critique of University Student Pedagogical Activity Preferences

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This paper has two purposes: first, to check for first-year university students' (*N=56*) pedagogical preferences among (12 activities) using a 5-point Likert scale; and second, to see if the Likert scale results match those of another scale, dubbed the Dockert scale, on the same instrument. The Dockert scale asked the students to rank the same activities from 1 to12. For example, if two activities on the Likert scale received the same ranking of 'five', the students were asked to make a distinction as to which of the two they preferred more on the Dockert scale. Therefore, the Dockert scale served as a 'tie-breaker' for the activity choices that received the same Likert score.

The results revealed that these students did in fact have pedagogical activity preferences. Furthermore, the results of both scales differed, albeit slightly. Therefore, a number of questions are raised regarding the use of a single Likert scale and the interpretation of the results of a survey that uses only a single Likert scale must be questioned.

Introduction

It can generally be taken as fact that students respond differently in the classroom to different activities. For example, some students prefer listening to lectures while others prefer to take a more active role and do group-work. This study examines the types of classroom activities students enjoy and/or find motivating in the English as a Foreign Language (EFL) classroom based on their responses to a pedagogical activities survey.

This paper compares the classroom activity preferences of a group of students using two

scale types to rank the activities on a single survey instrument. All students took the classroom activities survey, which consisted of twelve activities typically used in the EFL classroom. Six of these activities are considered to be traditionally common pedagogical activities and are broadly defined as 'traditional' and include activities such as lecture and grammar drills. The other six activities have been classified as 'communicative/task-based' and include more recent communicative activities such as pair-work, info-seek, and problem-solving activities. A subsequent factor analysis of the results was undertaken. Furthermore, the survey consisted of two scale response systems to rank these activities. The first is a 5-point Likert scale ranging from Strongly Dislike (1) to Strongly Like (5). After completing the Likert scale, the students were next asked to rank the activities from (1) most favorite to (5). The differences and similarities between results of the two scales are compared and contrasted. Possible reasons for the differences and similarities are then discussed.

Literature Review

Scale Construction

Substantive scale construction remains no easy task ever since Rensis Likert first invented his now ubiquitous scale (Griffee, 1999). Also, creating good survey statements requires pilot work, some experience, intuition and a bit of creativity (Dornyei, 2001).

Before designing his own scale, the author examined scales used by Dornyei, Clement et al., Dornyei et al. (Dornyei, 2001, 260-269), and Gardner et al (1985) for reference (Appendix). This scale was designed with Japanese learners in mind because according to Gardner and Tremblay "items are developed to be appropriate to the context in which the study is being conducted [and] people are encouraged not to simply take a set of items and administer them unthinkingly in any context." (Dornyei, 2001, p. 190). For example, in Japan, many university students are interested in learning English for the

specific purpose of taking the Test of English for International Communication (TOEIC) since many businesses require a certain score for hiring purposes. Also, many take the Test of English as a Foreign Language (TOEFL) to study at university overseas. Students often take extra courses to learn the skills needed to gain a better score on these tests (Heffernan, 2003). Therefore, the items / activities chosen for this instrument were done so with Japanese learners and their specific goals, typical classroom setting, and cultural situation in mind.

Deciding how to measure learners' attitudes toward various pedagogical activities may appear simple, but in fact constructing a valid and reliable instrument remains quite difficult (Griffee, 1999; Ockert, 2005). Therefore, there are some simple rules to keep in mind when choosing questionnaire statements for a survey. These include the following according to Stone (2003):

1. Avoid factual statements.

2. Do not mix past and present. Present is preferred.

3. Avoid ambiguity.

4. Do not ask questions that everyone will endorse.

5. Keep wording clear and simple.

6. Keep statements short and similar in length.

7. Express only one concept in each item.

8. Avoid compound sentences.

9. Assure that reading difficulty is appropriate.

10. Do not use double negatives.

11. Do not use "and" or "or" or lists of instances.

Classroom Activities

In A Framework for Task-Based Learning, Willis describes a task-based activity to be "activities where the target language is used by the learner for a communicative purpose (goal) in order to achieve an outcome" (Willis, 1996, p. 23). Willis further defines task-based activities under various categories such as listing, ordering/sorting, comparing, problem solving, sharing personal experiences, and creative tasks. (Willis, 1996, p. 23-29).

More recently, Burden has added to this approach in the EFL teaching environment. Burden contrasted these "communicative/task-based" activities with those that are considered traditional such as "grammar exercises" (Burden, 2005, p. 6). Furthermore, Dornyei (2003, p. 14) states: "Thus…tasks constitute the basic building blocks of classroom learning, and accordingly, L2 motivation can hardly be examined in a more situated manner than within a task-based framework. In addition, recognizing the significance of tasks in shaping learners' interest and enthusiasm coincides with practicing classroom teachers' perceptions that the quality of the activities used in language classes and the way these activities are presented and administered make an enormous difference in students' attitudes toward learning; therefore, the study of task motivation is fully in line with the "educational shift."

Therefore, the author's opinions of what is considered a "communicative/task-based" activity compared with a "traditional" activity as well as the positive aspects regarding the utility of a "communicative/task-tasked" approach to EFL teaching are supported in the literature.

Hypotheses and Research Questions

Research Questions

Based on the information above, several research questions were raised. First, do students have preferences for certain pedagogical activities? And if so, will they group by factor analysis according to what several authors consider traditional and communicative activities? Also, since it is possible for a student to rank more than one or even all of the activities equally using a Likert scale, will the Dockert scale serve as a tie breaker: not only in the case of individual students - which it certainly would, but for the whole group, too?

Hypotheses

The above research questions led the author to the following hypotheses:

Hypothesis 1: The participants in this survey will prefer "communicative/task-based" pedagogical activities over "traditional" pedagogical activities. The use of factor analysis will confirm or disconfirm this hypothesis.

Hypothesis 2: Since the Likert scale does not ask participants to make a distinction of preference between answer choices that receive the same score, the Likert and Dockert rankings of the activities will differ in their mean scores. Comparison of the rankings from 1 to 12 of the mean results from both scales will confirm or disconfirm this hypothesis.

Method

Students

The participants were all first year students in a private university in Japan and in the

college of Science and Engineering. During their first two years, the students must take ten English courses including reading, listening, conversation, CALL and presentation. The surveyed students were all in the first semester of their first year and enrolled in one of the author's conversation classes.

Before beginning their first year, students in this college take a TOEIC-like placement test and are streamlined into their respective levels based on their scores relative to other students in their particular major. Students who score in the bottom 15 percentile of this test are placed in lower-intermediate classes and those who score in the upper 15 percentile are placed in upper-intermediate classes. Students in the middle 70 percentile are placed in intermediate level classes. This paper presents results for intermediate level students. Participation in the survey in no way affected students' final grades for the course.

Instrumentation

One dual-scaled psychometric instrument was specifically created for this study: the classroom activities questionnaire (Appendix). The questionnaire was developed to gather data for a course paper at Temple University Japan, Osaka. The course professor offered his expert opinion on the selection of activities throughout the development of the survey.

The classroom activities questionnaire lists twelve classroom activities to be ranked by the students. The first six were teacher or individually oriented activities such as lecture and grammar drills, and will be referred to as "traditional" activities in this paper. The latter six were active and group based, and will be referred to as "communicative/task-based" activities. No distinction was made on this survey to indicate to students that the twelve activities fell into either group.

The questionnaire used two scales to determine student activity preferences. The first is a Likert scale from 1 to 5, corresponding to (1) *strongly dislike*, (2) *dislike* , (3) *neutral*, (4) *like*, and (5) *strongly like*. For the second scale (referred to as the Dockert scale), the

students were asked to rank the twelve classroom activities from 1 to 5, with 1 being their favorite, 2 being second favorite, etc., (Appendix). This is significant because it allows the students to express their favorite classroom activities with more distinction than the Likert scale. For example, using the Likert scale, a student might assign a ranking of 5 to numerous activities and the researcher is led to believe that the student has an equal attitude toward all of them. However, that might not be the actual case. By allowing students to rank their activities from favorite to least favorite, more information regarding activity preference is provided. In other words, by using the Dockert scale in conjunction with the Likert scale, the Dockert scale acts as a tiebreaker.

The survey was first piloted in English by six students: three male and three female. The student's were asked if they understood all of the items, and they agreed except for one student who did not understand the meaning of item number 11 'tasks that are intellectually challenging'. Taking this feedback into account, no changes were made to the instrument, but the author was available to answer any questions that students may have while answering the survey.

Procedures

The survey was administered in the same form as the Appendix to students in two of the author's required Communication courses (*N = 56*) in a classroom setting. All of the participants were in the College of Science and Engineering and first year students. The survey was administered in a paper version and students were encouraged to ask any questions after the instructions were read aloud together. The students were given as much time as necessary to complete the survey. Upon finishing the surveys the author collected them from the students and made sure they were completed correctly.

Analysis

1) Factor Analysis

Factor analysis works by using a series of statistical calculations whose in-depth

explanations are beyond the scope of this paper. However, the principle remains quite easy to grasp once explained using a simple example. Basically, factor analysis, as computed by the Statistical Package for the Social Sciences (SPSS) v13, capitalizes on both the similarities and differences of survey responses both between the entire individual respondent's responses and that then in relation to all other respondents as a whole. Individuals who respond similarly on certain questions will form a factor group because they ' *match*' in terms of what they score high on as well as score low. The author hypothesized that the first six activities could be considered ' *traditional*' and the second six could be considered '*communicative/task-based'*.

2) Likert Analysis

The analysis of the Likert scale is a simple calculation of the means using Microsoft Excel software (Brown, 1988).

3) Dockert Analysis

In order to rank the activities in order of preference from 1 to 12 and compare with the Likert rankings, "5 point" inverted weighted Dockert scores were calculated. To determine this score, an activity received 5 points each time it was ranked #1, 4 points each time it was ranked #2, 3 points each time it was ranked #3, etc. The sum of these points was then divided by the number of students to determine the inverted weighted Dockert score.

Results

Factor Analysis Results

A total of fifty-six students ($N = 56$) completed this survey. The information was first input into Microsoft Excel software by the author. The combined results were then entered into SPSS for analysis. The results for the factor analysis of the twelve pedagogical activities are found in Table 1. The factors converged in five groups and are

labeled according to their underlying variable contents. Worth noting is the fact that activities 7, 10, 12 are in the first factor group which comprises the greatest number of students. These three activities were thought to be 'communicative/task-based' and the results indicate that the participants link them in their own minds as being of similar worth.

The survey as a whole has a Cronbach Alpha of .88, and each of the two sub-sections have Alpha's of .84 (traditional) and .82 (communicative/task-based activities), respectively, for their six activities.

As the author hypothesized, the activities clustered within their various sub-groups with the exception of *tasks that are intellectually challenging* (activity 11). It was originally considered a 'communicative/task-based' activity, but grouped with *dialogue/reading practice from the text* (activity 3), and *translation exercises* (activity 5), both of which are considered to be 'traditional activities'.

Table 1: Factor Analysis Results for Pedagogical Activities.

The twelve variables are marked with a 'v' on the left and the five factor groups are named at the top from left to right.

	Pair / team work	Brains	Writing / translation	Info-seek / movement	Listening
v 07	**0.84**				
v 10	**0.78**				
v 12	**0.81**				
v 03		**0.74**			
v 05		**0.57**			
v 11		**0.66**			
v 04			**0.67**		
v 06			**0.81**		
v 08				**0.75**	
v 09				**0.75**	
v 02					**0.69**
v 01					**0.68**

Extraction Method: Principal Component Analysis.

Rotation Method: Varimax with Kaiser Normalization.

The Dockert Scale: Top Five Analysis Results

Table 2 shows the number of hits each activity received, in addition to the percent of students that ranked an activity in the top five, respectively. The three activities that were chosen as the most preferred were as follows: *listening* (activity 2), *small-group/team activities* (activity 7), *lecture* (activity 1) and *activities where I am moving around the room* (activity 10).

Table 2: Top five based on the Dockert Scale.

	Traditional						**Communicative/Task-Based**					
Activity:	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
No. of times ranked #1	6	15	0	3	1	1	13	4	3	6	0	4
No. of times ranked #2	7	3	2	1	2	4	11	1	5	9	0	11
No. of times ranked #3	10	3	4	3	2	4	8	4	5	4	1	9
No. of times ranked #4	6	8	8	1	1	6	7	4	2	4	4	5
No. of times ranked #5	9	5	2	6	5	5	2	5	6	3	3	4
Total No. of Top five Hits	38	34	16	14	11	20	41	18	21	26	8	33
% of Students Ranking this activity in Top five	68	61	29	25	20	36	75	32	38	47	13	59

Table 3: Classroom Activities, in Order of Preference,

Classroom activities of equal ranking on a particular scale are in italics. Activities that ranked equally on both the Likert and Dockert scale are shaded.

Likert			Dockert		
Rank	Activity	Score	Rank	Activity	Score
1	(7) Small-group / team activities	3.79	1	(7) Small-group / team activities	2.40
2	(1) Lecture	3.63	2	(2) Listening activities	1.82
3	(12) Pair-work	3.61	*3*	*(12) Pair-work*	*1.68*
4	*(10) Activities where I am moving around the room*	*3.48*	*3*	*(1) Lecture*	*1.68*
4	*(2) Listening activities*	*3.48*	5	(10) Activities where I am moving around the room	1.44
6	(9) Problem-solving activities	3.44	6	(9) Problem-solving activities	0.97
7	(8) Info-seek / finding information activities	3.37	7	(6) Grammar drills / practice	0.81
8	(6) Grammar drills / practice	3.27	8	(8) Info-seek / finding information activities	0.79
9	(11) Tasks that are intellectually challenging	3.23	9	(3) Dialogue/ reading practice from the text	0.61
10	(3) Dialogue/ reading practice from the text	3.13	10	(4) Writing exercises	0.58
11	*(5) Translation exercises*	*3.08*	11	(5) Translation exercises	0.37
11	*(4) Writing exercises*	*3.08*	12	(11) Tasks that are intellectually challenging	0.19

Likert Analysis Results

The average Likert scores from the classroom activities questionnaire are shown on the left side in Table 3. They are ranked from top to bottom from 1 st to 11th based on the mean score for each activity, highest to lowest (there was a tie for last place).

Based on the Likert analysis, the top three ranked activities that the students enjoyed, in descending order, were as follows: *small-group/team activities* (activity 7), *lecture* (activity 1), and *pair-work* (activity 12). The Likert ranking system shows that the top three activities that the students enjoyed were essentially the same as the factor analysis with the exception of *lecture*.

Discussion

Comparison of "Communicative/Task-based" vs. "Traditional" Activities: Are there distinctions between the two classifications?

Table 1 shows that the two activity types - "Communicative/Task-based" vs. "Traditional" activities did in fact group together as predicted with the exception of activity 11, tasks that are intellectually challenging. Clearly this item correlates more closely with the "traditional" activities of reading/dialogue practice from the text and translation exercises.

Comparison of Students' Top 5: 'Traditional' vs. 'Communicative/Task-based' Activities

Table 3 shows the results of the distribution of the number of top five hits among the twelve classroom activities. These students prefer 'communicative/task-based' activities compared with the 'traditional' activities. This may indicate to teachers that in order to maintain student interest the majority of the activities in a lesson plan should be communicative/task-based. However, this does not mean that all "traditional" activities are liked less than the 'communicative/task-based' activities. Two "traditional" activities, lecture and listening activities, were well received by the students surveyed.

Comparison of Likert and Dockert Scale Results

Table 2 compares the rankings of the 12 activities between the Likert and the Dockert scales for the students on the left and right side, respectively. It was expected that the rankings from the Likert and Dockert scales should be relatively similar. However, a few discrepancies occurred. Also of note, the least liked activity was different on both scales.

With respect to the highest-ranking activity, the two scales are in agreement with *small-group/team activities* (activity 7) ranking first on both scales. Similarly, pair-work (activity 12) ranked third. However, the second place was *lecture* (activity 1) on the Likert scale while *listening activities* (activity 2) was second on the Dockert scale. Therefore, when comparing the rankings of class activities, several instances indicate the usefulness of the Dockert scale. This clearly establishes the need of the Dockert scale to act as a tiebreaker for activities that are given the same score on the Likert scale, and confirms Hypothesis 2 which claimed.

Conclusion

This paper reports the findings of a dual-scaled psychometric survey of classroom activities. In a typical EFL university classroom environment, there are both intrinsically and extrinsically motivated students. Data from this study indicates that there are similarities and differences in the classroom activities that students prefer. The students prefer *small-group/team activities* and *lecture/listening activities*, closely followed by *pair-work*. As previous research demonstrates, a variety of tasks has a motivating influence in the classroom. According to our data, while this may still be the case, the particular tasks may not always be suited to the students. There are differences amongst the tasks that students prefer - or don't prefer - based on what type of survey instrument is used.

Furthermore, while it may be argued that educators must not simply cater to their students' whims or desires for certain activities to satisfy their preferences for pedagogical methodologies, it certainly would be beneficial for an educator to know how their students prefer to learn and tailor lessons accordingly to help maximize the effectiveness of what needs to be taught at any stage in the learning process. The author hopes that the information gained from this study's findings will be beneficial to the classroom teacher.

References

Brown, J.D. (2001). *Using surveys in language programs*. Cambridge: Cambridge University Press.

Brown, J.D. (1988). *Understanding research in second language learning*.Cambridge: Cambridge University Press.

Burden, P. (2005). The castor oil effect: learner beliefs about the enjoyment and usefulness of classroom activities and the effects on student motivation. *The Language Teacher*, October, 2005, no. 10, 3-9

Dornyei, Z, (2003). Attitudes, orientations, and motivations in language learning: advances in theory, research, and applications. *Language Learning*, *53*, 3-32.

Dornyei, Z. (2001). *Teaching and researching motivation (applied linguistics in action)*. London: Pearson, ESL.

Gardner, R. et al. (1985). Attitude and motivation text battery - revised manual initially prepared by R. C. Gardner, R. Clement, P. C. Smythe and C. L. Smythe as Research Bulletin No. 10 by the Language Research Group, Department of Psychology, University of Western Ontario. Retrieved May 21,
2005 from <http://publish.uwo.ca/~gardner/amtb4e.htm.>

Griffee, Dale T. (1999). Questionnaire construction and classroom research. Retrieved June 17, 2005 from <www.jalt-publications.org/tlt/articles/1999/01/griffee/>.

Heffernan, N. (2003). Building a successful TOEFL program: a case study. Retrieved

June 17, 2005 from www.jalt-publications.org/tlt/articles/2003/08/heffernan.

Irie, K. (2003). What do we know about the language learning motivation of university students in Japan? Some patterns in survey studies. *JALT Journal 25, (1)*, 86-100

Janda, K. Factor analysis: what can factor analysis do for you? Retrieved on November 14, 2004 from www.janda.org/workshop/factor%20analysis/factorindex.htm..

Kachigan, S. K. (1991). *Multivariate statistical analysis: a conceptual introduction.* New York: Radius Press.

Nunan, D. (1992). *Research methods in language learning*. Cambridge: Cambridge University Press.

Ockert, D. (unpublished manuscript). Substantive scale development: how to design, administer, and verify a Likert scale questionnaire for a research project.

Rensis Likert: Business Unusual. Retrieved December 16, 2004 from <http://pages.slc.edu/~psychology/biographies/likert/>

Stone, M. (2003). Substantative scale construction. *Journal of Applied Measurement, 4*, 282-297.

Willis, J. (1996). *A framework for task-based learning*. Essex: Pearson Education Limited.

Appendix: The Classroom Activities Survey.

What classroom activities do you enjoy or find motivating?

Step 1: Circle the number on the right that best matches your opinion.

1 = strongly dislike,   2 = dislike,   3 = neutral,   4 = like,   5 = strongly like

	Strongly dislike	dislike	neutral	like	Strongly like
1. ___ lecture (listen to the teacher and stay in my seat)	1	2	3	4	5
2. ___ listening exercises	1	2	3	4	5
3. ___ dialogue / reading practice from the text	1	2	3	4	5
4. ___ writing exercises	1	2	3	4	5
5. ___ translation exercises	1	2	3	4	5
6. ___ grammar drills/ practice	1	2	3	4	5
7. ___ small-group / team activities	1	2	3	4	5
8. ___ info-seek / finding information activities	1	2	3	4	5
9. ___ problem-solving activities	1	2	3	4	5
10.___ activities where I am moving around the room	1	2	3	4	5
11. ___ tasks that are intellectually challenging	1	2	3	4	5
12. ___ pair-work	1	2	3	4	5

Step 2:   On the blanks on the left side, rank the classroom activities from 1 (most / favorite) to 5 (least favorite).