SURVEY OF STUDENTS’ FAMILIARITY WITH GRAMMAR AND MECHANICS OF ENGLISH LANGUAGE – AN EXPLORATORY ANALYSIS

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ABSTRACT

In recent years, there has been a great interest in the problems of grammar and mechanics instruction to the freshman English. In this paper, the students’ familiarity with grammar and mechanics of English language has been studied from an exploratory point of view. By administering a survey on the grammar and mechanics in some classes, the data have been analyzed statistically which shows some interesting results. It is hoped that the findings of the paper will be useful for researchers in various disciplines.

KEYWORDS

ANOVA, grammar, hypothesis testing, mechanics, prescriptivist approach, Shannon’s diversity index.

1. INTRODUCTION

As noted by Teorey (2003), although the usage of prescriptivist approach to grammar instruction was rejected by the linguistic community nearly one hundred years ago, its importance in the present day instruction of English language cannot be overlooked. It appears from the literature that not much work has been done on the problem of students’ familiarity with grammar and mechanics of the English language. Certain guessing experiments to measure the predictability (defined in terms of entropy) of ordinary literary English were devised by Shannon (1951). A study to determine the predictability of English whether it is dependent on the number of preceding letters known to the subject was conducted by Burton and Licklider (1955). The variations in the predicting capacities of students learning English as a foreign language were studied by Siromoney (1964). Recently, Joyce (2002) has studied the use of metawriting to learn grammar and mechanics. Using freshman composition, the problems of grammatical errors and skills have been studied by Teorey (2003). In this paper, we propose to study the students’ familiarity with grammar and mechanics of English language from an exploratory point of view. The data have been analyzed statistically. The organization of this paper is as
follows. Section 2 discusses the methodology. The results are given in section 3. The discussion and conclusion are provided in Section 4.

2. METHODOLOGY

A survey consisting of 20 multiple choice questions (see Appendix I) was constructed to test students’ familiarity with English grammar and mechanics in six different courses in the spring semester of 2009. The courses selected were ENC 0021, ENC 1101, ENC 1102, EAP 1640, MGF 1107 and MAC 2233. The survey was administered by the instructors in each of these courses. A total of 121 students participated in the survey the details of which are provided in the following Tables 1 and 2 below.

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Courses</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC</td>
<td>ENC 0021, ENC 1101, ENC 1102, EAP 1640</td>
<td>71</td>
</tr>
<tr>
<td>MAT</td>
<td>MGF 1107, MAC 2233</td>
<td>50</td>
</tr>
<tr>
<td>Total</td>
<td>6</td>
<td>121</td>
</tr>
</tbody>
</table>

Table 2: Survey Respondent Characteristics

<table>
<thead>
<tr>
<th>Gender</th>
<th>Native English Speakers</th>
<th>Non-native English Speakers</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>23</td>
<td>34</td>
<td>57</td>
</tr>
<tr>
<td>Female</td>
<td>29</td>
<td>35</td>
<td>64</td>
</tr>
<tr>
<td>Total</td>
<td>52</td>
<td>69</td>
<td>121</td>
</tr>
</tbody>
</table>

3. RESULTS

3.1 MASTERY REPORT

The total number of questions in the survey was 20. Each question was assigned 1 point. The possible points in the survey were 20. The score unit was assumed to be percent. The minimum % to pass was 60. The mastery report of the survey participants is provided in the Figure 1 below.
3.2 ITEM ANALYSIS

For the standard item analysis report of the survey questions, the participants were divided into three different groups, that is, Group I: (ENC 0021, EAP 1640); Group II: (ENC 1101, ENC 1102); and Group III: (MGF 1107, MAC 2233). The descriptive statistic of the performance of these groups in the survey is provided in Table 3 below.

Table 3: Descriptive Statistic of Group Performance

<table>
<thead>
<tr>
<th>Group</th>
<th>Respondent</th>
<th>Mean Score</th>
<th>Median Score</th>
<th>S. D.</th>
<th>Reliability Coefficient (KR20)</th>
<th>Highest Score (out of 20)</th>
<th>Lowest Score (out of 20)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>32</td>
<td>13.88</td>
<td>13.90</td>
<td>2.75</td>
<td>0.63</td>
<td>20.00</td>
<td>5.00</td>
</tr>
<tr>
<td>II</td>
<td>39</td>
<td>14.03</td>
<td>14.64</td>
<td>2.13</td>
<td>0.44</td>
<td>17.00</td>
<td>9.00</td>
</tr>
<tr>
<td>III</td>
<td>50</td>
<td>14.22</td>
<td>14.27</td>
<td>2.18</td>
<td>0.41</td>
<td>19.00</td>
<td>6.00</td>
</tr>
</tbody>
</table>

Further, the standard item analysis report of the survey questions for the said three groups is provided in the Figure 2 below.

3.3 HYPOTHESIS TESTING: INFERENCES ABOUT TWO MEAN SCORES

This section discusses the hypothesis testing and draws inferences about the mean
scores of two independent samples. Following the procedure on pages 474-475 in Triola (2010) of not equal variances: no pool, the hypothesis testing was conducted for three sets of two independent groups by using the statistical software package STATDISK. The results of these tests of hypotheses are provided below.

(I) INFERENCES ABOUT MEAN SCORES OF ENC AND MAT PARTICIPANTS

For this analysis, we defined the two groups as follows:

**ENC/EAP:** ENC 0021, ENC 1101, ENC 1102, EAP 1640

**MAT:** MGF 1107, MAC 2233

The descriptive statistic of ENC/EAP and MAT participants is given in Table 4 below.

<table>
<thead>
<tr>
<th>Group</th>
<th>Respondent</th>
<th>Mean Score</th>
<th>S. D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENC/EAP</td>
<td>71</td>
<td>13.96</td>
<td>2.44</td>
</tr>
<tr>
<td>MAT</td>
<td>50</td>
<td>14.22</td>
<td>2.18</td>
</tr>
</tbody>
</table>

The results of the hypothesis test to draw the inferences about the mean scores of ENC/EAP and MAT participants are provided in Table 5 and Figure 3 below.

**Table 4: Descriptive Statistic of ENC and MAT Participants**

**Table 5: Hypothesis Testing about Mean Scores of ENC/EAP and MAT**

- Assumption: Not Equal Variances: No Pool
- Let \( \mu_1 = \) Mean Score of ENC/EAP and \( \mu_2 = \) Mean Score of MAT.
- Claim: \( \mu_1 = \mu_2 \) (Null Hypothesis)
- Test Statistic, \( t: -0.6147 \)
- Critical \( t: \pm 1.981298 \)
- P-Value: 0.5400
- Degrees of freedom: 112.3724
- 95% Confidence interval: 
  \(-1.098025 < \mu_1-\mu_2 < 0.5780247 \)
- Fail to Reject the Null Hypothesis
- Sample does not provide enough evidence to reject the claim
(II) INFERENCES ABOUT MEAN SCORES OF NATIVE ENGLISH SPEAKING AND NON-NATIVE ENGLISH SPEAKING PARTICIPANTS

For this analysis, we defined the two groups as follows:

ENG: Native English Speaking Participants

NON-Eng: Non-native English Speaking Participants

The descriptive statistic of ENG and NON-ENG participants is given in Table 6 below. In order to compare the scores of ENG and NON-ENG participants, the respective boxplots are drawn on the same scale in Figure 4 below.

Table 6: Descriptive Statistic of ENG and NON-ENG Participants

<table>
<thead>
<tr>
<th>Group</th>
<th>Respondent</th>
<th>Mean Score</th>
<th>Median</th>
<th>S. D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>ENG</td>
<td>52</td>
<td>73.84615</td>
<td>75</td>
<td>10.36658</td>
</tr>
<tr>
<td>NON-ENG</td>
<td>69</td>
<td>67.68116</td>
<td>70</td>
<td>12.05318</td>
</tr>
</tbody>
</table>

Figure 4: Comparing Scores of ENG (Col. 1) and NON-ENG (Col. 2) Participants
The results of the hypothesis test inferences to draw about the mean scores of ENG and NON-ENG participants are provided in Table 7 and Figure 5 below.

**Table 7: Hypothesis Testing about Mean Scores of ENG and NON-ENG**

<table>
<thead>
<tr>
<th>Assumption: Not Equal Variances: No Pool</th>
</tr>
</thead>
<tbody>
<tr>
<td>Let $\mu_1 = $ Mean Score of ENG and $\mu_2 = $ Mean Score of NO-ENG.</td>
</tr>
<tr>
<td>Claim: $\mu_1 = \mu_2$ (Null Hypothesis)</td>
</tr>
<tr>
<td>Test Statistic, $t$: 3.0182</td>
</tr>
<tr>
<td>Critical $t$: $\pm 1.980468$</td>
</tr>
<tr>
<td>P-Value: 0.0031</td>
</tr>
<tr>
<td>Degrees of freedom: 116.8722</td>
</tr>
<tr>
<td>95% Confidence interval:</td>
</tr>
<tr>
<td>2.119718 &lt; $\mu_1 - \mu_2$ &lt; 10.21026</td>
</tr>
<tr>
<td>Reject the Null Hypothesis</td>
</tr>
<tr>
<td>Sample provides evidence to reject the claim</td>
</tr>
</tbody>
</table>

**Figure 5: Hypothesis Testing about Mean Scores of ENG and NON-ENG**

(III) **INFERENCES ABOUT MEAN SCORES OF MALE AND FEMALE PARTICIPANTS**

For this analysis, we defined the two groups as follows:

M: Male Participants

F: Female Participants

The descriptive statistic of the Male and Female participants is given in Table 8 below. In order to compare the scores of Male and Female participants, the respective boxplots are drawn on the same scale in Figure 6 below.
Table 8: Descriptive Statistic of Male and Female Participants

<table>
<thead>
<tr>
<th>Group</th>
<th>Respondent</th>
<th>Mean Score</th>
<th>Median</th>
<th>S. D.</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>57</td>
<td>69.91228</td>
<td>70</td>
<td>10.79398</td>
</tr>
<tr>
<td>F</td>
<td>64</td>
<td>70.70313</td>
<td>75</td>
<td>12.56308</td>
</tr>
</tbody>
</table>

Figure 6: Comparing Scores of Male (Col. 1) and Female (Col. 2) Participants

The results of the hypothesis test to draw the inferences about the mean scores of Male and Female participants are provided in Table 9 and Figure 7 below.

Table 9: Hypothesis Testing about Mean Scores of Male and Female Participants

Assumption: Not Equal Variances: No Pool
Let $\mu_1 =$ Mean Score of M and $\mu_2 =$ Mean Score of F.
Claim: $\mu_1 = \mu_2$ (Null Hypothesis)
Test Statistic, $t$: -0.3724
Critical $t$: $\pm 1.980123$
P-Value: 0.7103
Degrees of freedom: 118.8560
95% Confidence interval:
$-4.995995 < \mu_1-\mu_2 < 3.414395$
Fail to Reject the Null Hypothesis
Sample does not provide enough evidence to reject the claim

Figure 7: Hypothesis Testing about Mean Scores of Male and Female Participants
3.4 ANALYSIS OF VARIANCE (ANOVA) AND DIVERSITY ANALYSIS

This section discusses the analysis of variance for testing the hypothesis of equality of the mean scores and diversity analysis for testing the hypothesis of evenness ratio of respondent performance based on gender-language spoken. All these analyses were carried out by using the statistical software packages STATDISK and EXCEL.

(I) Respondent Performance Based on Gender-Language Spoken

The performance of respondent based on gender-language spoken is provided in Table 10 and Figure 8 below.

<table>
<thead>
<tr>
<th>Group</th>
<th>Gender – Language Spoken</th>
<th>% of Students Scoring 60 or above</th>
<th>% of Students Scoring Below 60</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Male-English</td>
<td>18.18181818</td>
<td>0.826446281</td>
</tr>
<tr>
<td>AB</td>
<td>Male-Spanish</td>
<td>24.79338843</td>
<td>3.305785124</td>
</tr>
<tr>
<td>BA</td>
<td>Female-English</td>
<td>23.14049587</td>
<td>0.826446281</td>
</tr>
<tr>
<td>BB</td>
<td>Female-Spanish</td>
<td>23.14049587</td>
<td>4.958677686</td>
</tr>
<tr>
<td>BC</td>
<td>Female-Other</td>
<td>0.826446281</td>
<td>0</td>
</tr>
</tbody>
</table>

Figure 8: Respondent Performance Based on Gender-Language Spoken

(II) Analysis of Variance (ANOVA)

Following the procedure on pages 628-631 in Triola (2010), this section discusses the ANOVA for testing the hypothesis of equality of the mean scores of four independent groups based on gender-language spoken, that is, AA, AB, BA, and BB. The results of ANOVA are provided in Table 11 and Figure 9 below. (Note: There was only one female who spoke French and so was included in group BB for analysis purposes.)
Table 11: ANOVA: Hypothesis Testing About Equality of Mean Scores

ANOVA OF AA, AB, BA, BB (BC included in BB)
Alpha = 0.05
Source:        DF:       SS:                     MS:         Test Stat, F:   Critical F:      P-Value:
Treatment:    3    1156.315368     385.438456     2.941614       2.682134     0.036012
Error:          117  15330.461492   131.029585
Total:          120  16486.77686
Reject the Null Hypothesis
Reject equality of means

Figure 9: ANOVA: Hypothesis Testing About Equality of Mean Scores

(III) Diversity Analysis

Applying the Shannon’s Measure of Diversity Index (in terms of entropy) (Shannon, 1948), this section discusses the diversity analysis for testing the hypothesis of evenness ratio of respondent performance based on gender-language spoken, that is, AA, AB, BA, BB, and BC. The results of Diversity Analysis are provided in Table 12 below.

Table 12: Diversity Analysis Based on Gender-Language Spoken

<table>
<thead>
<tr>
<th>Group</th>
<th>Gender – Language Spoken</th>
<th>Proportion (p) of Students Scoring 60 or above</th>
</tr>
</thead>
<tbody>
<tr>
<td>AA</td>
<td>Male-English</td>
<td>0.181818182</td>
</tr>
<tr>
<td>AB</td>
<td>Male-Spanish</td>
<td>0.247933884</td>
</tr>
<tr>
<td>BA</td>
<td>Female-English</td>
<td>0.231404959</td>
</tr>
<tr>
<td>BB</td>
<td>Female-Spanish</td>
<td>0.231404959</td>
</tr>
<tr>
<td>BC</td>
<td>Female-Other</td>
<td>0.008264463</td>
</tr>
</tbody>
</table>
**Hypothesis:** Does the respondent performance (that is, proportion of students scoring 60 or above based on gender-language spoken, that is, AA, AB, BA, BB, and BC, as provided in Table 12 above) suggest more diversity in the groups’ familiarity with the English grammar and mechanics?

The Shannon’s Measure of Diversity Index $H$ and Evenness Ratio $E_H$, where $0 \leq E_H \leq 1$, for the above Table 12, are computed as follows. Note that if $E_H = 1$, there is complete evenness.

$$H = 1.372718$$

$$E_H = 0.852918$$

Since $E_H = 0.852918 \approx 1$, there appears to be complete evenness in the respondent performance (that is, proportion of students scoring 60 or above based on gender-language spoken, that is, AA, AB, BA, BB, and BC, as provided in Table 12 above).

### 4. CONCLUSIONS

This paper discussed the students’ familiarity with grammar and mechanics of English language from an exploratory point of view. A total of 121 students from six different courses, that is, ENC 0021, ENC 1101, ENC 1102, EAP 1640, MGF 1107 and MAC 2233, participated in the survey. The minimum % to pass was 60. Out of 121 survey participants, 90.10 % scored 60 or above. Based on the hypothesis testing, the following inferences were drawn about the survey participants.

1. There was sufficient evidence to support the claim that the mean scores of Male and Female participants were same.

2. There was sufficient evidence to support the claim that the mean scores of ENC/EAP and MAT participants were same.

3. There was sufficient evidence to reject the claim that the mean scores of Native English speaking and Non-native English speaking participants were same.

4. There was sufficient evidence to reject the claim of the equality of mean scores of four independent groups based on gender-language spoken, that is, AA, AB, BA, and BB.

5. There appears to be complete evenness in the respondent performance (that is, proportion of students scoring 60 or above based on gender-language spoken).
It is hoped that the findings of the paper will be useful for researchers in various disciplines.

ACKNOWLEDGMENT

The authors would like to express their sincere gratitude and acknowledge their indebtedness to the students of the courses, that is, ENC 0021, ENC 1101, ENC 1102, EAP 1640, MGF 1107 and MAC 2233, in the spring semester of 2009, for their cooperation in participating in the survey. Further, the authors are thankful to Professor Francia Torres for allowing us to administer the survey in her ENC0021 course and to Mr. Cesar Ruedas for assisting in test item analysis.

REFERENCES


APPENDIX A

Grammar Research Project        Spring 2009

Sentence Structure – Identify the type of sentence:

A. Simple    B. Compound    C. Complex

1. Pat and Rob both work in the industrial complex.
2. While Pat is in the accounting department, Rob is an engineer.
3. Rob works the late shift, so he rarely sees Pat.
4. Pat needs to leave work by 3PM in order to pick up his son from school.

*Verb Tenses and Forms - Which Answer Corrects the Sentence*

5. As I began to write my essay, my computer fell off the desk and broke.
   - A. begins  
   - B. fell  
   - C. breaked

6. Before the pitcher threw the ball, the player ran and stole second base.
   - A. throw  
   - B. runs  
   - C. stole

7. When Kelly saw the dish, he will eat all the food and forget to save some for Saul.
   - A. sees  
   - B. will eats  
   - C. forgot

8. Whenever I study for an exam, I closed my door and turned on my desk lamp.
   - A. studying  
   - B. close  
   - C. turned

*Commonly Confused Words - Which Answer Corrects the Sentence*

9. Drinking too many sodas can effect your health.
   - A. to  
   - B. affect  
   - C. you’re

10. A lot of investors lose money through risky investments.
    - A. A lot  
    - B. lose  
    - C. though

11. The buyers should have tried to accept their offer.
    - A. should of  
    - B. accept  
    - C. they’re

12. Mary would like to take the Design course, but it’s all ready full.
    - A. coarse  
    - B. its  
    - C. already

*Punctuation – Identify the correct sentence*

13. A. After watching the movie, Sally needed to return the DVD, so she borrowed her father’s car.
    - B. After watching the movie Sally needed to return the DVD, so she borrowed her father’s car.
    - C. After watching the movie, Sally needed to return the DVD so she borrowed her father’s car.

14. A. Marco can go to the meeting, but not the party because somebody’s going to his house for dinner.
B. Marco can go to the meeting but not the party because somebody’s going to his house for dinner.

C. Marco can go to the meeting but not the party, because somebody’s going to his house for dinner.

15. A. Samuel took a month’s leave of absence in order to be with his Aunt May, who was very ill.
   B. Samuel took a month’s leave of absence in order to be with his Aunt May who was very ill.
   C. Samuel took a month’s leave of absence, in order to be with his father, who was very ill.

16. A. The new business plan is said to have many advantages, such as maintaining facilities increasing profits and allowing for raises and new hires.
    B. The new business plan is said to have many advantages, such as maintaining facilities, increasing profits and, allowing for raises and new hires.
    C. The new business plan is said to have many advantages, such as maintaining facilities, increasing profits, and allowing for raises and new hires.

Spelling - Identify the misspelled word.

17. It was (a.) truley an (b.) honor to have (c.) known Dr. Livingstone.

18. My brother is (a.) pursuing a (b.) career as a (c.) licenced broker.

19. The (a.) committee was able to (b.) accomodate the new members without (c.) noticeable difficulties.

20. Luis had an uneasy (a.) conscience for having (b.) embarrased Samantha with the (c.) surprise party.