

An Investigation of the Variables Predicting Faculty of Education Students' Speaking Anxiety through Ordinal Logistic Regression Analysis

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Received: August 8, 2016

Accepted: August 31, 2016

Online Published: September 29, 2016

doi:10.5539/jel.v6n1p27

URL: <http://dx.doi.org/10.5539/jel.v6n1p27>

Abstract

The purpose of this study is to determine whether Cumhuriyet University Faculty of Education students' levels of speaking anxiety are predicted by the variables of gender, department, grade, such sub-dimensions of "Speaking Self-Efficacy Scale for Pre-Service Teachers" as "public speaking", "effective speaking", "applying the speaking rules", "organizing the speech content", and "evaluating the speech". Correlational survey model is employed in the study. While the dependent variable of the study is students' "speaking anxiety", its independent variables are gender, department, grade, and such sub-dimensions of "Speaking Self-Efficacy Scale for Pre-Service Teachers" as "public speaking", "effective speaking", "applying the speaking rules", "organizing the speech content", and "evaluating the speech". The research population consists of 2983 students studying at seven departments of Faculty of Education of Cumhuriyet University in the 2015-2016 academic year. The research sample, on the other hand, is composed of 1057 students from seven departments of Faculty of Education of Cumhuriyet University. Data were collected via "Scale of Speaking Anxiety for Prospective Teachers", which was developed by Kinay and Özkan (2014) to determine pre-service teachers' speaking anxiety, and "Speaking Self-Efficacy Scale for Pre-Service Teachers", which was developed by Katrancı and Melanlıoğlu (2013) to determine pre-service teachers' speaking self-efficacy. Data were collected through ordinal logistic regression analysis as the dependent variable was made three-category and ordinal through cluster analysis. According to the logistic regression analysis results, gender, department, such sub-dimensions of "Speaking Self-Efficacy Scale for Pre-Service Teachers" as "public speaking" and "applying the speaking rules" have a significant influence on speaking anxiety.

Keywords: speaking, speaking anxiety, speaking self-efficacy, pre-service teacher, ordinal logistic regression

1. Introduction

Language is the most important communication tool people use to express their feelings, thoughts, wishes, and desires. It is a natural means that allows people to understand each other; a living being that has its own rules and develops only within the framework of these rules; the biggest national institution of a nation; a perfect structure made of sounds; and a system of hidden agreements dating back to unknown times (Ergin, 2003, pp. 3-5).

Language, which is a means of feeling, thinking, and communicating with others, has different skill areas such as listening, reading, speaking, writing, and grammar. Speaking, which is the second most used language skill after listening (Demir, 2010, p. 424) and is considered to be the starting point of reading and writing activities (Temizyürek, Erdem, & Temizkan, 2013, p. 201), is among the basic tools of communication among people. Consistently with this, Nalıncı (2000, p. 130) reports that people spend 50% to 80% of a day by communicating. The same research indicates that of such time spent by communicating, 45% is spent by listening, 30% by speaking, 16% by reading, and 9% by writing. It is clear that speaking follows listening as second mostly used language skill.

Speaking is "a process that starts in mind and ends with the verbal expression of thoughts" (Güneş, 2007, p. 95). In other words, speaking refers to presenting a message created through a mental effort and based on mental accumulation to others via language (Adalı, 2003, p. 27). Speaking is "communicating, expressing, and releasing feelings, thoughts, and wishes through visual and auditory elements" (Ergin & Birol, 2005; Taşer, 2000, p. 27).

According to Calp (2010, p. 191), speaking is a psycho-motor skill in which mental capacity and muscle power are in action and it is the most effective tool allowing communication among people. Demirel and Şahinel (2006, p. 98) define speaking as “the transfer of thoughts, feelings, and information via language, which is composed of sounds”. All in all, it is seen that speaking is defined as inter-personal exchange of feelings and thoughts (Sever, 2004, p. 22).

By its very nature, speaking is a complex structure that has physical (i.e., use of a lot of organs), mental (i.e., planning and constructing feelings, thoughts, and such things intended to be expressed in mind), and psychological aspects (being affected by anxiety, excitement, and so on) (Temizyürek, Erdem, & Temizkan, 2012, p. 201). An effective speaking requires a harmonious functioning of its mental and physical elements. Therefore, grammar rules, the social structure of the language, and capacity to express must go together and in harmony, which is one of the prerequisites of effective speaking (Yıldız & Yavuz, 2012, p. 321). Psychological elements also affect speaking, positively or negatively. To have a healthy speaking, the individual must believe that his capacity to express, good command of language skills, and effective use of body language will make him gain advantage and act accordingly (Kinay & Özkan, 2014, p. 1749). In other words, it is very important that individuals consider themselves competent for speaking. Main obstacles to effective speaking involve speaker-related, speaking-related, listener-related, and medium-related obstacles (Akbayır, 2011, p. 13). Surely, one of the speaker-related obstacles is anxiety.

Burger (2006) defines anxiety as an unpleasant emotional experience that leads to the feelings of distress, panic, fear, and terror. Similarly, Parham (1988) describes anxiety as a psychological state composed of worry, fear, and tension. Anxiety is a psychological state associated with negative situations that may occur in the future (Barlow, 2009; Casado & Dereshiwsky, 2001; MacIntyre & Gardner, 1989; Horwitz E., Horwitz M., & Cope, 1986; Huberty, 2004). Anxiety, which is a result of biological factors and nonspecific stimuli (Hay, 2009, p. 12), refers to an indistinct state of fear that is felt without knowing what the problem is (Morgan, 1998, p. 228). The Turkish Language Association (TDK) (2016) defines anxiety as “Thought that leads to sadness and worry”. Andrade and Williams report that anxiety has a lot of types including personal anxiety, situational anxiety, communication anxiety, and classroom anxiety in general and anxiety concerning grammar use, listening, public speaking, reading, and writing in the classroom environment in particular (Arnold, 2000; Cheng, Horwitz, & Schallert, 1999; Matsuda & Gobel, 2001; Oh, 1992; Saito, Horwitz, & Garza, 1999; Sellers, 2000; VanPatten & Glass, 1999; Vogely, 1998; Young, 1990; cited, Andrade & Williams, 2009, p. 3).

Anxiety manifests itself also in speaking, which is one of the language skills an individual uses to express him/herself. Speaking anxiety makes it difficult for the individual to share his thoughts and knowledge in the society. Publishing the first paper on speaking anxiety, Clevenger took speaking anxiety as a sub-category of communication anxiety, which is a more comprehensive concept. Clevenger stated that speaking anxiety has two components: (1) anxiety felt during daily general communication; (2) anxiety felt during public speaking. Public speaking anxiety differs from general communication anxiety in that it comes out while the individual is speaking before a specific community in particular (Clevenger, 1959). The literature contains a lot of studies dealing with public speaking anxiety (Beatty, 1988; Beatty & Andriate, 1985; Behnke, Sawywe, & King, 1987; Daly, Vangelisti, & Lawrence, 1989; MacIntyre & MacDonald, 1998; Pribyl, Keaten, & Sakamoto, 2001; Wörtwein, Morency, & Scherer, 2015). Speaking anxiety can manifest itself emotionally (e.g., sadness, anger, fear) or physically (fast heart beating and sweating) (Melanlioğlu & Demir, 2013, p. 392). Individuals with speaking anxiety can have difficulty in improving their speaking skills and putting their skills into action. They fear of and avoid speaking, get worried as they are stuck with the idea that they will receive negative criticisms, have difficulty while speaking, do not want to speak, and feel bad (Özkan & Kınay, 2015, p. 1293; Demir & Melanlioğlu, 2014, p. 110). This causes the speaker not to act comfortably, have a shy and fearful attitude, try to finish speaking as soon as possible, avoid making eye contact with audience, have a rise in body temperature, and sweat continuously (Arslan, 2012, p. 223).

Vocabulary and speaking skill are particularly important for teachers, lawyers, politicians, and so on, who have to use language intensely by the very nature of their professions (Beyreli, Çetindağ, & Celepoğlu, 2012, p. 143). As teachers are professionals who train individuals for all occupations, they are among the people who must speak correctly, gracefully, and effectively. Speaking is the most used communication tool by teachers for being a model and transferring their knowledge and skills to others. However, a teacher with speaking anxiety, which is one of the psychological factors influential on speaking, is likely to fail in conducting the teaching process in a sound way by distracting students, negatively affecting their learning, and serving as a bad model. The literature includes research dealing with the variables associated with speaking anxiety (Akkaya, 2012; Arslan, 2012; Başaran & Erdem, 2009; Demir & Melanlioğlu, 2014; Katrancı & Kuşdemir, 2015; Kavruk & Deniz, 2015; Lüle

Mert, 2015; Sevim & Gedik, 2014; Suroğlu Sofu, 2012; Özkan & Kınay, 2015; Temiz, 2013). It is likely that the speaking anxiety levels of pre-service teachers, who are to start their career in teaching—one of the most important occupations, will affect their professional skills. The difficulty experienced by a pre-service teacher in sharing his knowledge, feelings, thoughts, and wishes with others due to certain psychological obstacles will make it difficult for him to succeed in his daily and professional life. It is considered that determining the variables influential on the speaking anxiety levels of pre-service teachers, who are going through a learning-teaching process, and raising an awareness regarding these variables will contribute to the literature.

In this regard, the purpose of this study is to determine whether Cumhuriyet University Faculty of Education students' levels of speaking anxiety are predicted by the variables of gender, department, grade, and such sub-dimensions of "Speaking Self-Efficacy Scale for Pre-Service Teachers" as "Public Speaking" (PS), "Effective Speaking (ES)", "Applying the Speaking Rules (ASR)", "Organizing the Speech Content (OSC)", and "Evaluating the Speech (ETS)".

2. Method

2.1 Research Model

Correlational survey model was used in this study. The relationships identified through survey cannot be interpreted as cause and effect relationships; however, they give some clues in this matter, thereby providing beneficial results in regard to the prediction of a variable when the state of other is known (Karasar, 2006).

2.2 Population and Sample

The research population consists of 2983 students studying at seven departments of Faculty of Education of Cumhuriyet University in the 2015-2016 academic year. The research sample, on the other hand, is composed of 1,057 students from seven departments of Faculty of Education of Cumhuriyet University. The following sample size formula prepared for populations with a specific size was used in determining the sample size of the present study (Yazıcıoğlu & Erdoğan, 2004; Büyüköztürk, Kılıç Çakmak, Akgün, Karadeniz, & Demirel, 2010).

$$\frac{Nt^2pq}{(N-1)d^2 + t^2pq}$$

* significance level .05, sampling error $d = \pm .03$, $p=0.5$ and $q=0.5$

Minimum sample size was calculated to be 341-student. Simple random sampling method was used to form the research sample. In simple random sampling, every element in the population has an equal chance to be included in the sample (Karasar, 2006). In the present study, 1080 students were included in the research sample by forming a heterogeneous group in terms of gender, department, and grade in order to have different student opinions and thoughts. However, at the end of missing value and extreme value analyses, 23 student forms were excluded from the analysis. Thus, analysis was made on the data related to 1057 students.

The Table 1 below presents the distribution of the students in the research population and sample based on gender, department, and grade.

Table 1. The personal details of the students included in the research population and sample

Variables	Population		Sample	
	f	%	f	%
Gender				
Female	2157	72.3	758	71.7
Male	826	27.7	299	28.3
Department				
Pre-School Teaching (PSO)	855	28.7	166	15.7
Elementary School Teaching (EST)	439	14.7	146	13.8
Social Science Teaching (SST)	409	13.7	134	12.7
Psychological Counseling Guidance Teaching (PCGT)	416	14.0	156	14.8
Primary School Mathematics Teaching (PSMT)	203	6.8	125	11.8

Turkish Language Teaching (TLT)	254	8.5	200	18.9
Science Teaching (ST)	407	13.6	130	12.3
Grade				
1 st Grade	737	24.7	288	27.2
2 nd Grade	787	26.4	263	24.9
3 rd Grade	754	25.3	261	24.7
4 th Grade	705	23.6	245	23.2
Total	2983	100.0	1057	100.0

As it is seen in the Table 1 above, the research population consists of 2983 students and the research sample is composed of 1057 students. Of the participating students, 71.7% (f: 758) are female while 28.3% (f: 299) are male. The sample contains students from each department and grade mentioned in the table. Their distribution is showed in the table above.

2.3 Data Collection Tools

Data were collected via “Scale of Speaking Anxiety for Prospective Teachers (SSAPT)”, which was developed by Kınay and Özkan (2014) to determine pre-service teachers’ speaking anxiety, and “Speaking Self-Efficacy Scale for Pre-Service Teachers”, which was developed by Katrancı and Melanlıoğlu (2013) to determine pre-service teachers’ speaking self-efficacy.

“Scale of Speaking Anxiety for Prospective Teachers (SSAPT)”, which was developed by Kınay and Özkan (2014), consists of 40 items and three sub-dimensions (*psychological state, physiological symptoms, anxiety concerning the skill*). This is a five-point Likert-type scale. The rating of the items is as follows: “*always=5*”, “*often=4*”, “*sometimes=3*”, “*rarely=2*”, “*never=1*”. Exploratory Factor Analysis (EFA) indicated that three sub-dimensions of the scale explain 42.34% of the total variance. The factor loadings of the sub-dimensions are as follows: “*psychological state*”: .444 to .716; “*physiological symptoms*”: .479 to .714; and “*anxiety concerning the skill*”: .460 to .502. These sub-dimensions explain 31.34%, 6.30%, and 4.70% of the total variance respectively. Confirmatory Factor Analysis (CFA) was carried out to see whether the factor structure found through EFA would be confirmed or not. The fit indices of the scale determined via CFA are as follows: $X^2=1925.70$ ($sd=737$, $p=.000$), $(x^2/sd)=2.61$, $RMSEA=.069$, $SRMR=.059$, $CFI=.96$, $IFI=.96$, $NFI=.93$, and $NNFI=.96$. All these values indicate that the scale has good fit indices. Cronbach’s alpha internal consistency coefficients for the entire scale and for its sub-dimensions were found to be as follows: entire scale: .942; “*psychological state*”: .927; “*physiological symptoms*”: .839; and “*anxiety concerning the skill*”: .785. The internal consistency coefficient of “Scale of Speaking Anxiety for Prospective Teachers (SSAPT)” for the sample group of the present study was calculated to be .95.

“Speaking Self-Efficacy Scale for Pre-Service Teachers”, which was developed by Katrancı and Melanlıoğlu (2013), consists of 25 items and five sub-dimensions (*public speaking, effective speaking, applying the speaking rules, organizing the speech content, evaluating the speech*). This is a 5-point Likert-type scale. The rating of the items is as follows: “*always=5*”, “*usually=4*”, “*sometimes=3*”, “*rarely=2*”, “*never=1*”. Exploratory Factor Analysis (EFA) indicated that five sub-dimensions of the scale explain 54.329% of the total variance. The factor loadings of the sub-dimensions are as follows: “*public speaking*”: .77 to .48; “*effective speaking*”: .65 to .56; “*applying the speaking rules*”: .70 to .46; “*organizing the speech content*”: .77 to .67; and “*evaluating the speech*”: .71 to .55. These sub-dimensions explain 35.374%, 5.583%, 5.010%, 4.783%, and 3.623% of the total variance respectively. Cronbach’s alpha internal consistency coefficients for the entire scale and for its sub-dimensions were found to be as follows: entire scale: .92; “*public speaking*”: .85; “*effective speaking*”: .80; “*applying the speaking rules*”: .78; “*organizing the speech content*”: .70; and “*evaluating the speech*”: .71. The internal consistency coefficient of “Speaking Self-Efficacy Scale for Pre-Service Teachers” was calculated to be .90 for the sample group of the present study. The internal consistency coefficients for the sub-dimensions were found to be .88, .82, .84, .78, and .78 respectively.

2.4 Data Analysis

Data were analyzed through logistic regression analysis, which is a statistic used in correlational survey models. Logistic regression analysis is an analysis method that allows to establish a regression model without requiring any assumptions such as normality, continuity, covariance, and multivariate normality (Tabachnick & Fidell,

1996). According to Atasoy (2001), the main objective of logistic regression analysis is to establish an acceptable model with a good fit that can identify the relationship between the predicting and predicted variables by using minimum number of variables.

Logistic regression analysis is named depending on the structure of the variable to which logit transformation is applied. While the dependent variable of the study is students' *speaking anxiety*, its independent variables are *gender*, *department*, *grade*, and such sub-dimensions of "Speaking Self-Efficacy Scale for Pre-Service Teachers" as *public speaking*, *effective speaking*, *applying the speaking rules*, *organizing the speech content*, and *evaluating the speech*. *Speaking anxiety*, which is the dependent variable of the study, was subjected to two-step cluster analysis and defined as a three-category variable composed of "low", "medium", and "high" speaking anxiety levels. "Ordinal logistic regression analysis" is employed when the dependent variable is a categorical variable with minimum three choices and an ordinal scale (Ayhan, 2006; Çokluk, 2010; Şerbetçi & Özçomak, 2013). In this study, as speaking anxiety—the dependent variable was transformed into a discrete variable with three categories in the logistic regression analysis and there was also an ordinal relationship between these categories, "ordinal logistic regression analysis" was employed.

In the present study, it was decided to make a "two-step cluster analysis" based on the possibility that the individuals in the heterogeneous dataset came from the same population, and homogenous sub-groups composed of the individuals were created. According to Kayri (2007), two-step cluster analysis can cluster continuous and categorical data properly, and sounder results are obtained in statistical operations after the heterogeneous dataset is divided into homogenous sub-clusters. Two-step cluster analysis was applied to the scores obtained by the Faculty of Education students from "Scale of Speaking Anxiety for Prospective Teachers". To determine the optimal number of sub-clusters, the Bayesian Information Criterion (BIC) was used. It was decided to have three clusters based on the BIC values. By this means, the dependent variable was defined as a three-category variable composed of "low", "medium", and "high" speaking anxiety levels. The Table 2 below presents the results of the two-step cluster analysis of the dependent variable.

Table 2. The results of the two-step cluster analysis of the dependent variable

Variable	Cluster	f	%	Mean	Standard deviation
Dependent variable	1	170	16.1	129.8	12.2
	2	373	35.3	97.6	8.4
	3	514	48.6	67.3	11.2

As it is clear in the Table 2, the two-step cluster analysis indicated the speaking anxiety mean score of 170 students in the first cluster (16.1%) to be 129.8 with a standard deviation of 12.2, that of 373 students in the second cluster (35.3%) to be 97.6 with a standard deviation of 8.4, and that of 514 students in the third cluster (48.6%) to be 67.3 with a standard deviation of 11.2. This being the case; the first cluster includes students with "high" speaking anxiety; the second cluster includes students with "medium" speaking anxiety; and the third cluster includes students with "low" speaking anxiety. The three-category dependent variable was obtained in this way.

In this study, where the ordinal logistic regression analysis was used as the dependent variable had three categories and there was an ordinal relationship between such categories, the students with low speaking anxiety were taken as the "reference category". Hence, the obtained coefficients demonstrate the effects on students' probability of having low speaking anxiety.

2.4.1 Data Preparation

Before the logistic regression analysis was launched, extreme value and missing value analyses were made. 17 forms were excluded from the analysis at the end of the missing value analysis. The data outside the [-3, +3] range were identified through the extreme value analysis, thereby excluding six forms from the analysis. The model was tested over 1,057 data obtained at the end of the extreme value and missing data analyses. In addition, necessary assumptions for the logistic regression analysis were tested. The obtained results are presented below.

❖ *There must be no problem of multicollinearity between the independent variables.*

The analysis is quite sensitive to high correlations between the independent variables. Thus, there must be no problem of collinearity between the independent variables. Multicollinearity occurs when the correlations

between the variables are high ($r > .90$) (Tabachnick & Fidell, 1996). In the present study, there is no problem of multicollinearity ($r < .90$).

❖ *For the dependent variable, there must be no problem of multicollinearity between the independent variables.*

To fulfill this assumption, tolerance and Variance Inflation Factor (VIF) values were calculated. It is expected for the tolerance value to be greater than .02 and the VIF value to be smaller than 10 (Kalaycı, 2010; Field, 2009). The Table 3 below presents the tolerance and VIF values of the predictor variables.

Table 3. The results concerning the assumption of multicollinearity between the independent variables

Variables	TOLERANCE	VIF
Gender	.946	1.057
Department	.990	1.010
Grade	.972	1.029
PS	.323	3.097
ES	.365	2.743
ASR	.350	2.855
OSC	.380	2.630
ETS	.488	2.048

According to the Table 3, the tolerance values range from .323 to .990 for the independent variables and all the values are greater than .02. The VIF values, on the other hand, range from 1.010 to 3.097 for the independent variables and all the values are smaller than 10. Hence, it can be said that the relevant assumptions are fulfilled here.

❖ *Assumption of parallelism must be fulfilled.*

Assumption of parallelism requires that the estimated values of the parameters are equal for all categories of the dependent variable (Şerbetçi & Özçomak, 2013). In other words, assumption of parallelism suggests that the estimated values of the parameters must pass through the same intercept for all categories of the dependent variable (Akın & Şentürk, 2012). To determine the most appropriate logit models, as many models as the binary combinations of the number of the categories are defined, and the parallelisms of sub-models to each other are analyzed (Özdamar, 2013). Chi-square test was used to test the validity of the assumption of parallelism in the logistical regression analysis. The obtained results are given in the Table 4 below.

Table 4. The results concerning the assumption of parallelism in the ordinal logistic regression analysis

Model	-2 Log likelihood (-2LL)	χ^2	sd	p
Null Hypothesis	1589.110			
General	1568.316	20.795	15	.144

H_0 =The estimated values of the parameters pass through the same intercept.

H_1 =The estimated values of the parameters pass through different intercepts.

The Table 4 shows that the assumption of parallelism tested through chi-square test was fulfilled ($\chi^2=20.795$, $p>0.05$). In other words, H_0 is supported. This indicates that each category of the dependent variable (i.e., speaking anxiety) is equal to one another. The overall evaluation of the assumption test results indicated the ordinal logistic regression analysis to be applicable.

3. Findings

This section presents the findings obtained through the ordinal logistic regression analysis. The model fitness information table obtained through the analysis yields the -2 log likelihood (-2LL) value for the model established without the independent variables and the model established with the inclusion of the independent variables. The Table 5 below presents the findings concerning the model fitness.

Table 5. Details about the model fitness

Model	-2 LL	χ^2	sd	p
Only the intercept	2139.509			
Final	1589.110	550.399	15	.000

According to the Table 5, there is a significant difference between the model established with the independent variables and the initial model established without the independent variables ($\chi^2=2139.509-1589.110=550.399$, $p<.05$). This shows the existence of a relationship between the dependent variable and the independent variable.

In the second stage, the goodness-of-fitness results of the model were examined. Based on Pearson's chi-square and deviation statistics, model-data fit is evaluated by the use of the difference between the observed and the expected values (Şenel & Alatlı, 2014; Şerbetçi & Özçomak, 2013; Ayhan, 2006). The Table 6 presents the goodness-of-fit test results of the model.

Table 6. Goodness-of-fit test results

	χ^2	sd	p
Pearson	2002.135	2093	.921
Deviation	1589.110	2093	1.000

H_0 =The model represents the data.

H_1 =The model does not represent the data.

Table 6 shows that Pearson's chi-square value ($\chi^2=2002.135$, $p>.05$) and deviation chi-square value ($\chi^2=1589.110$, $p>.05$) concerning the goodness-of-fitness of the model are not significant. This indicates that H_0 hypothesis is supported, and the model fits the data.

The goodness-of-fitness of the model was also analyzed via pseudo R^2 values in the study. The purpose of pseudo R^2 is to measure and assess the strength of the relationship between the dependent and independent variables (Şenel & Alatlı, 2014). The findings obtained through the analysis are given in the Table 7 below.

Table 7. Results concerning the pseudo R^2 value

Cox and Snell	Nagelkerke	McFadden
.406	.468	.257

As can be seen in the Table 7, the pseudo R^2 values were calculated to be Cox and Snell (.136), Nagelkerke (.158), and McFadden (.074). Mcfadden, Cox-Snell, and Nagelkerke R^2 statistics are the most frequently used R^2 statistics (Şenel & Alatlı, 2014; Şerbetçi & Özçomak, 2013). However, the Nagelkerke value is evaluated as it is difficult to interpret the Cox and Snell value (Field, 2009). The Nagelkerke R^2 value shows what percentage of the dependent variable is explained by the independent variables (Oruç & Özen Kutanis, 2015). Accordingly, the independent variables in the model explain the dependent variable by 46.8% in the present study.

Finally, Wald test should be performed in order to see whether the independent variables are significant or not. Testing the logistic regression analysis via Wald statistics provides the advantage of finalizing this analysis with parameter findings that are non-biased and non-deviating (Çokluk, 2010). The "e exponent" of the Wald statistic needs to be obtained to reveal the odds ratio in order to interpret the model. The odds ratio demonstrates how

many times more or less the likelihood of one event under examination to occur is relative to another under examination. It is calculated through the following equation: “*Odds ratio* = $e^{\alpha+\beta}/e^{\alpha} = e^{\beta}$ ” (Salmi, Desenclos, Grein, Moren, & Bremer, 2015). Field (2009) also suggests the interpretation based on the odds ratio. The results obtained from these analyses are shown in the Table 8 below.

Table 8. Expressing the significance of the parameters of the model

Variables		β	Wald	Odds ratio (e^{β})	p
Dependent Variable	1 (High)	5.847	115.214		.000
	2 (Medium)	8.407	206.885		.000
	Female	-.373	5.321	.690	.021
	Male	0 ^a			
	PSO	-.182	.455		.500
	EST	-.454	2.809		.094
	SST	-.731	6.824	.484	.009
	PCGT	-.352	1.693		.193
	PSMT	-.258	.859		.354
	TLT	-.621	5.922	.540	.015
Independent Variable	ST	0 ^a			
	1 st Year	-.014	.005		.943
	2 nd Year	.175	.792		.373
	3 rd Year	.090	.211		.646
	4 th Year	0 ^a			
	PS	1.040	51.829	2.809	.000
	ES	.153	.812		.367
	ASR	1.163	58.139	3.175	.000
	OSC	-.027	.037		.847
	ETS	.190	2.209		.137

Table 8 shows the results of the significance analyses of the parameters of the model. They indicate that the variables of gender ($p=.021$), SST ($p=.009$), TLT ($p=.015$), PS ($p=.000$), and ASR ($p=.000$) have significant effects on speaking anxiety. Field (2009) states that the parameter significance values corresponding to this statistic have to be smaller than .05. It is stated that the parameter interpretation of the ordinal logistic regression analysis is different and more complicated than binary and multinomial logistic regression analyses, and the “e-exponent” of the estimated parameter values must be calculated to interpret them. Also, the reference categories must be identified, which means interpretation must be made according to the identified reference category. This analysis of parameter significance is called “interpretation according to the odds ratio” (Akin & Şentürk, 2012; Garson, 2012). In this sense, “e-exponent” values are calculated in the Table 8 in order to make interpretation. In regard to the interpretation of the odds ratio, Field (2009) states that an increase occurs if the odds value is greater than 1, and a decrease occurs if the odds value is smaller than 1.

The Table 8 shows that the female students’ probability of having low speaking anxiety is .37 lower than that of the male students. The interpretation according to odds ratio indicates that the odds ratio is .690, which is smaller than 1. That is to say, the female students have a .690 times lower probability of having low speaking anxiety than the male students. All in all, it is possible to say that the female students have higher speaking anxiety levels than the male students.

A significant difference was observed between the students of Social Science Teaching and the students of Turkish Language Teaching. The Social Sciences Teaching students’ probability of having low speaking anxiety

is .72 smaller than that of the Science Teaching students. The odds ratio is .484, which is smaller than 1. This means that the Social Sciences Teaching students have .48 times lower speaking anxiety than the Science Teaching students. The Turkish Language Teaching students' probability of having low speaking is .62 smaller than that of the Science Teaching students. The odds ratio is .540, which is smaller than 1. This implies that the Turkish Language Teaching students have .54 times lower speaking anxiety than the Science Teaching students. The speaking anxiety levels of the students studying Social Sciences Teaching and Turkish Language Teaching are higher than those of the students studying Science Teaching.

A significant difference was observed in terms of "Speaking Self-Efficacy Scale for Pre-service Teachers" sub-dimensions such as "public speaking" and "applying the speaking rules". One unit of increase in the "public speaking" sub-dimension increases the probability of having low speaking anxiety by 1.040 units. The odds ratio of the variable of public speaking is 2.809, which is greater than 1. This indicates that one unit of increase in the "public speaking" sub-dimension increases low speaking anxiety 2.81 times. It means that as the students' public speaking self-efficacy increases, they have lower speaking anxiety levels. A unit of increase in the "applying the speaking rules" sub-dimension increases the probability of having low speaking anxiety by 1.163 units. The odds ratio of the variable is 3.175, which is greater than 1. This means that one unit of increase in the "applying the speaking rules" sub-dimension increases the probability of having low speaking anxiety 3.18 times. This indicates that as the students' self-efficacy in applying the speaking rules increases, they have lower speaking anxiety.

4. Conclusion and Discussion

This study sought to determine whether Cumhuriyet University Faculty of Education students' levels of speaking anxiety are predicted by the variables of gender, department, grade, and "Speaking Self-Efficacy Scale for Pre-Service Teachers" sub-dimensions such as "public speaking", "effective speaking", "applying the speaking rules", "organizing the speech content", and "evaluating the speech".

The results of the logistic regression analysis indicate that the variables of gender, department (e.g., Social Science Teaching and Turkish Language Teaching), and "Speaking Self-Efficacy Scale for Pre-Service Teachers" sub-dimensions such as "public speaking" and "applying the speaking rules" have significant effects on speaking anxiety.

The literature contains dwelling on the variables that are influential on students' speaking anxiety. One of the variables influential on speaking anxiety is gender. It was seen in the present study that the female students have higher speaking anxiety than the male students. Suroğlu Sofu (2012) conducted a master's thesis in which the speaking anxiety levels of pre-service teachers were compared in terms of gender. In that study, it was seen that female students have significantly higher speaking anxiety levels than the male students, which shows the consistency with the results of the present study. Contrary to the results of the present study, Sevim and Gedik (2014) analyzed the speaking anxiety of secondary education students and revealed that male students have higher speaking anxiety levels than the female students. There are also studies reporting that gender is not significantly influential on speaking anxiety. Lüle Mert (2015) and Özkan and Kınay (2015) carried out studies on pre-service teachers' speaking anxiety levels. They concluded that the variable of gender is not a determiner of speaking anxiety. Similarly, Katrancı and Kuşdemir (2015) conducted an experimental study to analyze the influence of the Speaking course practices on pre-service teachers' speaking anxiety levels. They found no statistically significant difference between the female and male preservice teachers in terms of the pre-test scores obtained from the speaking anxiety scale. However, they observed that the female students' speaking anxiety levels decreased following the Speaking course practices. Kavruk and Deniz (2015) carried out a study on middle school students' speaking anxiety. They did not observe any statistically significant difference in the middle school students' speaking anxiety levels in terms of gender. However, the arithmetic mean of their data indicated higher speaking anxiety among the male students than the female students.

Another variable influential on speaking anxiety is department. The present study showed that the Social Science Teaching students and the Turkish Language Teaching students have higher speaking anxiety levels than the Science Teaching students. Temiz (2013) concluded that pre-service Turkish Language teachers have higher speaking anxiety levels than pre-service Music teachers, which is consistent with the result of this study that the Turkish Language Teaching students have higher levels of speaking anxiety. Katrancı and Kuşdemir (2015) carried out an experimental study and analyzed the speaking anxiety levels of pre-service Pre-school, Psychological Counseling and Guidance, Computer and Instructional Technologies, and Science teachers. In that study, the comparison of the pre-service teachers' post-test scores obtained from the speaking anxiety scale indicated a lower level of anxiety among the pre-service pre-school teachers than the pre-service

teachers from other departments. Based on the obtained data, it is possible to say that level of speaking anxiety may differ from group to group by department. The literature also contains studies revealing that there is no significant difference between pre-service teachers in terms of speaking anxiety according to the departments they study. Suroğlu Sofu (2012) concluded in his master thesis that there is no statistically significant difference in the speaking anxiety mean scores of the students from the departments of Pre-school Teaching, Science Teaching, Primary School Teaching, Computer Education, Mentally-Disabled Children's Education, Turkish Language Teaching, English Language Teaching, Psychological Counseling and Guidance Teaching, Social Sciences Teaching, and Mathematics Teaching. Similarly, Temiz (2015) conducted a study with pre-service teachers and concluded that there is no significant difference in pre-service Music, Mathematics, Turkish Language, and Science teachers' speaking anxiety levels.

Another variable influential on speaking anxiety is "public speaking", which is one of the sub-dimensions of "Speaking Self-Efficacy Scale for Pre-Service Teachers". The present study indicated that as students' self-efficacy in public speaking increases, they have lower levels of speaking anxiety. Akkaya (2012) conducted a study to demonstrate pre-service teachers' views regarding speaking problems. In that study, the pre-service teachers stated that not being able to give a public speech is one of the most important problems. According to Jalongo and Hirsh (2010), the fear and anxiety felt by children while they are doing oral reading (due to being judged by their teachers and peers) are combined with public speaking anxiety. Hence, it is possible to say that improving public speaking competency may reduce speaking problems and the anxiety that may appear. Arslan (2012) received university students' views regarding public speaking. The findings of that study reveal that the majority of university students think that educational institutions do not provide the society with people who can easily express themselves in front of people and do not give students adequate opportunity to engage in public speaking. Thus, it can be said that people with low levels of public speaking competency are likely to have speaking anxiety. Similarly, in the study carried out by Demir and Melanlioğlu (2014), despite their willingness to give public speeches, the majority of university students expressed their avoidance of the tasks requiring speaking due to not having a good command of Turkish language, being afraid of giving incorrect or imperfect information, lack of self-confidence, diction problems, worry about not being understood. Public speaking is not a routine activity, and it requires adapting to the process consciously (Ayres & Hopf, 1993). In the light of these data, it is possible to state that public speaking competency may be a variable influential on anxiety.

The last variable influential on speaking anxiety is "applying the speaking rules", which is one of the sub-dimensions of "Speaking Self-Efficacy Scale for Pre-Service Teachers". It was seen in the present study that as the students' self-efficacy in applying the speaking rules increases, they have lower levels of speaking anxiety. The items of this sub-dimension are as follows: "I can make eye contact with the audience while speaking"; "I can speak with a tone of voice that can be heard by the audience"; "I can make emphasis, intonation, and pause while speaking, when appropriate"; "I can speak in accordance with the characteristics of the speech type I have chosen"; and "I can support my speech with appropriate gestures and mimics". Similarly, Başaran and Erdem (2009) state that the speaker's tone of voice, emphasis, intonations, pronunciation, a good breath control, pausing at appropriate points during the speech, a good command of body language, speaking speed, obeying the grammatical rules, and audibility of the speech are important factors for an elegant, accurate, and effective speaking. Akkaya (2012) conducted a study to reveal preservice teachers' views regarding speaking problems and determined that not applying the grammatical rules as well as voice, tone, emphasis, and pronunciation mistakes are important speaking problems. Based on the obtained data, it is possible to say that enhancing self-efficacy in applying the speaking rules will result in an effective, accurate, and elegant speech, leading to a decrease in speaking problems and anxiety.

One of the independent variables of the study is grade. It was found in this study that grade does not have a significant influence on speaking anxiety. The literature contains studies that show a relationship between speaking anxiety and grade. The results reported by Sevim and Gedik (2014) are consistent with the results of the present study. They report no significant difference in secondary education students' speaking anxiety scores in terms of grade. Conducting a study on middle school students' speaking anxiety, Kavruk and Deniz (2015) determined that there is no statistical relationship between middle school students' speaking anxiety levels and grades. However, the arithmetic means of the data indicated that 5th and 8th graders have lower anxiety levels than other grades. Contrary to the results of the present study, Suroğlu Sofu (2012) found out that university students studying in their first and fourth years differ significantly in terms of speaking anxiety. According to the results of that study, first year students have higher speaking anxiety levels than the fourth year students. In addition, conducting a study to explore the speaking anxiety of pre-service Turkish Language teachers, Lüle Mert (2015) revealed that 2nd year students have higher speaking anxiety levels than other graders. Özkan and

Kınay (2015) determined that grade leads to a significant difference between pre-service teachers' total anxiety scores and their scores in all sub-dimensions of speaking anxiety except for physiological symptoms. Furthermore, they observed that preservice teachers' speaking anxiety levels decrease as their grades get higher. Based on the obtained results, it is possible to say that speaking anxiety levels may show different characteristics within different groups.

5. Recommendations

Based on the research findings, the following recommendations can be put forward. Comparative studies can be conducted to detect the variables influential on the speaking anxiety levels of students studying in the faculties of education of different universities. Research can be conducted to reveal the speaking anxiety levels of students from of different grades and of people from of different groups (e.g., teachers, students, faculty members). Mixed models in which both quantitative and qualitative data are employed together can be used, besides the models only making use of quantitative data, in order to demonstrate to what extent the variables associated with speaking anxiety are influential. In this way, multidimensional and in-depth assessments can be made. Experimental studies can also be conducted on speaking anxiety. It can be investigated whether the created course contents and practices lead to a difference in students' speaking anxiety levels. It may be ensured that students speak in front of people more. In addition, guidance may be provided to improve self-efficacy in public speaking and applying the speaking rules. In undergraduate programs, which include environments where students can engage in public speaking, they can be encouraged to express their emotions and opinions easily, to interact with others, and to be more active, eliminating the negative influence created by speaking anxiety. Especially students with high levels of anxiety can be supported to receive help from an expert before they start the teaching profession. Furthermore, the practices in "School Experience" and "Teaching Practice" courses can be used as opportunities to decrease students' speaking anxiety.

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