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A Multi-Level Simultaneous Analysis of How Student and School Characteristics are Related to Students' English Language Achievement

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This study examines how student and school characteristics are related to Turkish students' English language achievement in Evaluation of Student Achievement Test (ÖBBS) of 2009. The participants of the study involve 43707 ninth year students who were required to take ÖBBS in 2009. For data analysis two level hierarchical linear modeling was conducted. The findings of the study show that many variables that fall outside of the domain of language related variables influence the foreign language performance of students. Since it creates an awareness of student and school characteristics that are related to English language achievement, the study is significant for foreign language teachers and language teaching policy makers.

Introduction

Studying foreign languages is a multifaceted and intricate process especially for adult learners. While everyone reaches competence in their native languages easily, the level of competence that learners reach in a foreign language varies considerably. As Gass and Selinker (2001) put it, one of the most extensively recognized facts about foreign language learning is that some individuals perform better in learning a second language than other individuals. Therefore, foreign language researchers have been conducting research in order to identify the variables that are related to the variability of foreign language achievement.

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The research on variables that are related to FL achievement contains certain core variables and many optional ones (Dörnyei, 2005). While affective variables, cognitive variables, sociocultural variables, biological variables, and instructional variables form the main categories (Chastain, 1988), age (Lenneberg, 1967), aptitude (Skehan, 1998; Parry and Child, 1990; Dörnyei and Skehan, 2003; Robinson, 2005), intelligence (Gardner, 2004; Armstrong, 1994), anxiety (Horwitz, 2001; Oxford, 1999; Horwitz et al., 1986), willingness to communicate (MacIntyre et al., 2002), motivation (Schumann, 1997, 1999; Schumann et al. 2004; Dörnyei, 2005, 1998; Dörnyei and Skehan, 2003), social and cultural distance (Schumann, 1978; Byram and Feng, 2005; Abrams, 2002), cross-linguistic influence (Odlin, 2003; Kellerman, 1995), and gender (Halpern, 1992; Gurian and Stevens, 2004; Ellis, 1994) constitute the commonly examined variables.

Although these variables have been extensively addressed, only a few studies have investigated these variables concomitantly (Onwuegbuzie et al., 2000, Gardner et al., 1997; Ehrman and Oxford 1995). In addition, the statistics used in those studies that examine these variables simultaneously have several limitations. As Onwuegbuzie et al. (2000) reported in Gardner et al.'s (1997) research, the subject-to-variable ratio was slightly more than 3:1, less than the 5:1 minimum recommended for multivariate analysis which means the subsequent path coefficients likely were unstable. On the other hand, Ehrman and Oxford (1995) reported only zero-order correlation coefficients and considered the impact of each variable in isolation. Moreover, it was not clear how each of the variables relates to foreign language achievement in the presence of other factors (Onwuegbuzie et al., 2000). On the other hand, Onwuegbuzie et al. (2000) used all possible subsets regression analysis to compare the proportion of variance in foreign language achievement explained by cognitive, affective, personality, and demographic variables. Although, their research is a noteworthy contribution to the field of foreign language achievement, it has various limitations since it conducts uni-level analysis to examine educational data. Research has shown that students are nested in classrooms, classrooms are nested in

schools, schools within cities, cities within regions, and regions within countries. Therefore, most of the data gathered from studies conducted in social sciences are entwined, and thus, they display a hierarchical structure (Raudenbush and Bryk, 2002; Hox, 1995; Snijders and Bosker, 1999). For instance, all the students in a classroom have the same teachers and have access to the same classroom opportunities, and all the students in a school participate in the same school system and are exposed to the same school quality. Briefly, students who experience the same conditions display similarities. In this sense, considering the data gathered from these students as completely independent may be problematic. "Traditional statistical procedures can be negatively affected by such nested data because the classroom and school effects differentially impact student performance. These nested data lend themselves well to multi-level or hierarchical linear modeling (HLM) (Klinger et al., 2006, p. 774)." HLM facilitates the analysis of relations occurring at each level, across levels (specify how variables at one level influence relations occurring at another), and assesses the amount of variation at each level (Raudenbush and Bryk, 2002; Snijders and Bosker, 1999). Thus, using Hierarchical Linear Modeling (HLM) during the analysis of multi-level educational data will enable researchers to reach more comprehensive and detailed results (Hox, 2002; O'Connell and McCoach, 2008; Osborne, 2002; Raudenbush and Bryk, 2002; Snijders and Bosker, 1999).

Nearly all countries have foreign language courses or programs in their educational systems that aim to prepare students for interactional necessities of the global world. Since most of the foreign language learning takes places in educational institutions, data gathered from that field are nested and have a hierarchical structure. "The consequences of using uni-level analysis methods on multi-level data are well-known: the parameter estimates are unbiased but inefficient and the standard errors are negatively biased, which results in spuriously 'significant' effects" (Maas and Hox, 2004, p. 128). In this sense, using HLM to examine variables that are related to foreign language achievement will also be more appropriate.

Another problem of the research on variables that are related to FL achievement is its slight emphasis on demographic factors. Research has shown that the more that can be learned about students' demographic characteristics, the better adjustments can be made to the educational environment and interventions designed to help students achieve the educational goals (Astone and McLanahan, 1991). However, foreign language achievement research has basically focused on gender and age as the key demographic variables, while largely paying little attention to other demographic factors such as parent's educational level, sibling number, the availability of a study room at home, the availability of resources that extensively support education (e.g. computer) etc. For instance, studies carried out on the educational level of the parents, socioeconomic status, the size of the family, family structure, and the place of the children within the family showed the influence of family socio-demographic characteristics on the academic achievement of students in general (Georgiou, 1995; Ginsburg and Bronstein, 1993; Sputa and Paulson, 1994; White, 1982). Thus, it is important to increase the number of demographic variables and investigate their relation with foreign language achievement in order to improve the conditions that positively aid foreign language competence.

Context and Research Focus

Many countries periodically measure student achievement through both national and international large scale tests in order to pinpoint students' national and international achievement rank. In Turkey, the Educational Research and Development Department (EARGED), a branch of the Republic of Turkey Ministry of Education (MEB), conducts the Evaluation of Student Achievement Test (ÖBBS) in order to measure student achievement in primary and secondary education. Starting from 2002, ÖBBS has been conducted every three years. Fourth, fifth, sixth, seventh, eighth, ninth, and tenth year students participate in it. It includes Turkish, mathematics, science and technology, social sciences, and foreign language (English) sections (MEB, 2002; 2007; 2009; 2010). In ÖBBS, level evaluation tests and

student and teacher questionnaires are used as measurement tools. Using a multiple choice item type, level evaluation tests, as stated by MEB (2002; 2007; 2009), measures students' learning levels in Turkish, mathematics, science and technology, social sciences, and English courses. On the other hand, student and teacher questionnaires gather data related to the personal information of students and teachers (MEB, 2007; 2009).

ÖBBS provides data related to a wide range of student and school characteristics. Its data structure is hierarchical, and thus, the data that ÖBBS provides is suitable for conducting multi-level analysis in order to identify variables that are related to foreign language achievement. Considering the limited number of research that concurrently focuses on predictors of foreign language achievement and the hierarchical structure of the educational data, the purpose of the study is to conduct a multi-level HLM analysis that investigates how the school and student characteristics in ÖBBS 2009 are related to students' English course achievement. It is hoped that the findings from this study will contribute to the research that examines the relationship among variables of foreign language achievement simultaneously and provide actionable guidelines for foreign language researchers and practitioners.

Method

Research Model

In order to display the relation between the variables, this research follows a relational screening model which describes a situation that existed in the past or still exists in the present. Moreover, the relational screening model does not attempt to change or influence the situations or conditions that individuals or objects belong to (Karasar, 2005).

Sample and Population

The population of the study includes ninth grade students enrolled in schools of secondary education in Turkey. MEB-e-school data

base 2008 data and Level-1 data of Turkey's Economic and Social Development level were used by MEB in order to identify the sample that belongs to ÖBBS 2009. In the Level-1 data Turkey was divided into 12 regions. At least two cities were selected from each region, and the total number of cities selected for the sample was 30. During the selection of the cities the developmental level of the city and how much it represents the region where it is located was taken into consideration. A total of 300 schools selected from those cities form the sample of the study. In light of the study goal, 43707 ninth year students who participated in ÖBBS 2009 were selected from the sample and the population that was identified by MEB-EARGED.

Data and Data Collection

In order to use ÖBBS 2009 data all the required permission was granted by EARGED. Following this procedure, data used for this study was obtained from the ÖBBS unit of EARGED. The data collection tools that were used in ÖBBS 2009 were developed and used by MEB-EARGED. These tools were a student questionnaire and English level evaluation test.

Variable descriptions. The variables selected for the study are English achievement scores, student variables, and school variables.

English achievement scores. In order to identify English achievement, ÖBBS 2009 level evaluation test for ninth grade students was used. This test includes 15 multiple choice items that aim to measure what students gain in their English courses. The level evaluation test was given to the students in four separate forms as A, B, C, and D. KR-20 reliability value related to each form was calculated. The values gathered are 0.57 (A), 0.60 (B), 0.57 (C), and 0.62 (D) (MEB, 2010).

Student variables. The explanatory variables at the student level that were selected for the study were obtained from the student

questionnaire of ÖBBS 2009. These variables are; student's gender, mother's education, father's education, having a private study room at home, having a computer at home, having internet connection at home, having educational software in his/her computer, having literary books, time spared for homework, time spared for studying English, taking private English tutorials, learning difficulty, lack of background knowledge in English, being disturbed by noisy classroom, judging the understandability of the course book ,finding the English course book insufficient, having self-confidence in English courses, time spared for reading books, intrinsic motivation, and being socially active.

School variables. Variables at the school level are; the geographic region where the school is located, the city where the school is located, the educational development of the city where the school is located, the ratio of female students at the school, classroom size, and school type. Of these variables, the geographic region of the school, the city, school type, and classroom size were obtained from the data file. The ratio of female students was found by calculating the ratio of the number of the female students to the total number of students at each school. While determining the educational development of the cities, the development report prepared by Republic of Turkey Ministry of Development (2003) was taken into account. Table 1 shows the descriptive statistics related to the student and school levels.

Data Analysis

Two-level HLM was used to examine how students' English achievement is related to student and school characteristics in ÖBBS 2009. The one way ANOVA, Regression with Means as Outcomes Model, The Random Coefficient Model, and Intercepts and Slopes as Outcomes Model were used in two-level HLM. While SPSS 17.0 and Microsoft Excel were used for data organization, HLM 7.0 was used for hierarchical linear model. The level of the statistics obtained from the study was considered as minimum .05 in the significance test.

Table 1: Descriptive statistics of level 1 and level 2 explanatory variables

Student level variables	**N**	**MEAN**	**SD**	**MIN.**	**MAX.**
Student's gender	43707	1.53	0.50	1.00	2.00
Mother's education	43707	2.54	1.08	1.00	5.00
Father's education	43707	3.11	1.12	1.00	5.00
Private study room	43707	0.69	0.46	0.00	1.00
Computer	43707	0.63	0.48	0.00	1.00
Internet	43707	0.50	0.50	0.00	1.00
Educational software	43707	0.17	0.37	0.00	1.00
Literary books	43707	0.53	0.50	0.00	1.00
Time Spared for Studying English	43707	3.30	1.09	1.00	5.00
Private Tutorial	43707	4.65	0.84	1.00	5.00
Learning Difficulty	43707	0.39	0.49	0.00	1.00
Lack of background knowledge	43707	0.25	0.43	0.00	1.00
Noisy Classroom	43707	0.22	0.42	0.00	1.00
Judging the understandability of the course book	43707	0.15	0.36	0.00	1.00
Finding the course book insufficient	43707	0.13	0.33	0.00	1.00
Self-confidence,	43707	2.52	0.98	1.00	4.00
Time Spared for Reading	43707	3.18	1.05	1.00	5.00
Intrinsic motivation	43707	1.44	0.62	1.00	3.00
Being socially active	43707	38.74	17.55	4.00	109.00
School level variables					
Female student ratio	300	0.49	0.22	0.00	1.00
Classroom size	300	25.88	8.76	2.00	56.67
City	300	30.81	16.71	3.00	81.00
Region	300	3.42	2.02	1.00	7.00
School Type	300	2.75	3.00	1.00	14.00
Educational development of the city	300	.24	1.25	1.00	5.00

Handling missing data

In order to handle the missing data at the student level, listwise data deletion was conducted. In two level (student and school levels) HLM, listwise deletion or pairwise deletion methods are used to delete the student level missing data (Raudenbush et al., 2004). Thus, 11568 missing data was deleted before the statistical analysis. On the other hand, no missing data was noticed at the school level.

Results

Model 1 for the difference of English achievement among schools

Models related to the one-way Anova random effects model which was conducted to examine whether students' ÖBBS 2009 English achievement varies among schools or not are as follows:

Level 1 model (student level model); *English score* $(Y_{ij})=\beta_{oj}+r_{1j}$
Level 2 model (school level model); $\beta_{oj}=\gamma_{00}+u_{oj}$
Mixed model; $Y_{ij}=\gamma_{00}+u_{oj}+r_{1j}$

Table 2 displays the results related to the model.

Table 2. Results for Model 1

Fixed effects		Coefficient	SE	t
Average school mean, γ_{00}		33.307	0.754	44.195
Random effects	Variance component	χ^2	df	p
School mean	168.048	29283.813	299	0.001
Student level effect	190.043			

According to the one-way ANOVA random effects model in Table 2, the mean English achievement for all schools was estimated as γ_{00}= 33.307 with the ratio t= 44.195. Considering these results the

fixed parameters are significant (χ^2_{299}=29283.813, p<.05). Thus, English achievement displays a significant difference among schools.

The one-way ANOVA random effects model separates the total variance that belongs to English achievement score into two components. These components are the variance among students at schools (Level-1) and the variance among schools (Level-2). These components are demonstrated as follows:

$$\sigma^2 / (\sigma^2 + \tau_\beta) = 190.043 / (190.043 + 168.048) = 0.531$$
$$\tau_{00} / (\sigma^2 + \tau_{00}) = 168.048 / (168.048 + 190.043) = 0.469$$

According to these results, while %53.1 of total variance stems from the difference among students, %46.9 is caused by the difference among schools.

Model 2 for the school characteristics related to English achievement

In order to identify the school characteristics that are related to students' English achievement *regression with means as outcomes model* was designed. Primarily, the geographic region where the school is located, the city where the school is located, the educational development of the city where the school is located, the ratio of female students at the school, classroom size, and school type variables were included into the model. The obtained model and results are as follows:

Level-1 Model
$Achievement\ Score_{ij} = \beta_{0j} + r_{ij}$

Level-2 Model
$\beta_{0j} = \gamma_{00} + \gamma_{01}*(Classroom\ Size_j) + \gamma_{02}*(Region_j) + \gamma_{03}*(Type\ of\ School_j) + \gamma_{04}*(Educational\ development\ of\ the\ city_j) + u_{0j}$

Table 3. Results for Model 2

Fixed Effect	Coefficient	SE	t	p
Model For School Means[1]				
INTERCEPT, γ_{00}	33.342	0.618	53.986	0.001
Classroom Size, γ_{01}	-0.273	0.072	-3.800	0.001
Region, γ_{02}	-1.050	0.397	-2.641	0.009
Type of School, γ_{03}	1.768	0.210	8.426	0.001
Educational development of the city, γ_{04}	2.095	0.640	3.274	0.001
Random effect	Variance Component	df	χ^2	p
School mean, u_{0j}	112.085	295	19758.270	0.001
Student level effect, r_{ij}	190.047			

[1]Before the analysis the school level variables were centered around the grand mean.

The results in Table 3 demonstrate that the geographic region where the school is located, the educational development of the city where the school is located, and school type variables are related to English achievement of the students. Of the variables at the school level, the one that has the highest relationship with English achievement is the educational development of the city where the school is located (γ_{04}=2.095, SE=0.640, p<.05). This result displays that schools located in educationally developed cities have higher English scores than other schools.

Coefficients of classroom size and geographic region have negative and significant relationship with English achievement (γ_{01}=-0.273, SE=0.072; γ_{02}=-1.050, SE=0.397, p<.05). Thus, overcrowded classrooms have lower English achievement scores than small classrooms. Also, schools in southeast and east regions of Turkey have lower English achievement than schools located in other regions. The school type coefficient displays a positive significant relationship between school type and English

achievement (γ_{03}=1.768, SE=0.210, p<.05). Science, teacher preparatory, and social sciences high schools have higher English scores than general and vocational high schools.

Finally, χ^2=19758.270 (df=264, p<.05) values obtained from the analysis shows that the four explanatory variables at the school level cannot explain all the variability in fixed effects.

Proportion of variance explained in β_{0j} for regression with means as outcomes model is (168.048-112.085)/168.048 = 0.333. That is 33% of the true between school variance in English achievement is accounted for by explanatory variables.

Model 3 for the student characteristics related to English achievement

The random coefficient regression model was used in order to find the student characteristics that are related to students' English achievement. Initially, twenty explanatory variables were included into the model. These variables are; student's gender, mother's education, father's education, having a private study room at home, having a computer at home, having internet connection at home, having educational software in his/her computer, having literary books, time spared for homework, time spared for studying English, taking private English tutorials, learning difficulty, lack of background knowledge in English, being disturbed by noisy classroom, judging the understandability of the course book, finding the English course book insufficient, having self-confidence in English courses, time spared for reading books, intrinsic motivation, and being socially active. Of the level-1 explanatory variables *having internet connection at home*, *time spared for homework*, and *being disturbed by noisy classroom* variables were omitted from the analysis as their relationship with English achievement was not found as statistically significant. Table 4 displays the analysis results.

Level-1 Model

$$Achievement\ score_{ij} = \beta_{0j} + \beta_{1j}*(Gender_{ij}) + \beta_{2i}*(Mother's\ Education_{ij}) + \beta_{3j}*(Father's\ education_{ij}) + \beta_{4j}*(Private\ Study\ room_{ij}) + \beta_{5j}*(Computer_{ij}) + \beta_{6j}*(Educational\ Software_{ij}) + \beta_{7j}*(Literary\ books_{ij}) + \beta_{8j}*(\ Time\ spared\ for\ studying\ English_{ij}) + \beta_{9j}*(\ Private\ Tutorial_{ij}) + \beta_{10j}*(\ Learning\ Difficulty_{ij}) + \beta_{11j}*(\ Lack\ of\ knowledge_{ij}) + \beta_{12j}*(\ Judging\ the\ understandability\ of\ the\ course\ book_{ij}) + \beta_{13i}*(\ Finding\ the\ course\ book\ insufficient_{ij}) + \beta_{14j}*(\ Self\text{-}confidence_{ij}) + \beta_{15j}*(\ Time\ Spared\ for\ Reading_{ij}) + \beta_{16j}*(\ Intrinsic\ motivation_{ij}) + \beta_{17j}*(\ Socialization_{ij}) + r_{ij}$$

Level-2 Model

$$\beta_{0j} = \gamma_{00} + u_{0j}$$
$$\beta_{1j} = \gamma_{10} + u_{1j}$$
$$\beta_{2j} = \gamma_{20} + u_{2j}$$
$$\beta_{3j} = \gamma_{30} + u_{3j}$$
$$\beta_{4j} = \gamma_{40} + u_{4j}$$
$$\beta_{5j} = \gamma_{50} + u_{5j}$$
$$\beta_{6j} = \gamma_{60} + u_{6j}$$
$$\beta_{7j} = \gamma_{70} + u_{7j}$$
$$\beta_{8j} = \gamma_{80} + u_{8j}$$
$$\beta_{9j} = \gamma_{90} + u_{9j}$$
$$\beta_{10j} = \gamma_{100} + u_{10j}$$
$$\beta_{11j} = \gamma_{110} + u_{11j}$$
$$\beta_{12j} = \gamma_{120} + u_{12j}$$
$$\beta_{13j} = \gamma_{130} + u_{13j}$$
$$\beta_{14j} = \gamma_{140} + u_{14j}$$
$$\beta_{15j} = \gamma_{150} + u_{15j}$$
$$\beta_{16j} = \gamma_{160} + u_{16j}$$
$$\beta_{17j} = \gamma_{170} + u_{17j}$$

Table 4. Results for Model 3

Fixed Effect	Coefficient	SE	t	p
Overall mean achievement, γ_{00}[1]	33.302	0.755	44.131	0.001
Student's gender, γ_{10}	-0.107	0.009	-12.171	0.001
Mother's Education, γ_{20}	0.016	0.005	3.412	0.001
Father's Education, γ_{30}	0.026	0.004	5.905	0.001
Private study room, γ_{40}	0.045	0.009	5.076	0.001
Computer, γ_{50}	0.041	0.010	4.316	0.001
Educational software, γ_{60}	0.030	0.010	2.764	0.006
Literary books, γ_{70}	0.091	0.008	11.502	0.001
Time spared for studying English, γ_{80}	0.028	0.004	6.983	0.001
Private Tutorial, γ_{90}	0.010	0.005	2.128	0.034
Learning Difficulty, γ_{100}	0.020	0.008	2.549	0.011
Lack of knowledge, γ_{110}	0.025	0.010	2.487	0.013
Judging the understandability of the course book, γ_{120}	0.049	0.011	4.284	<0.001
Finding the course book insufficient, γ_{130}	0.028	0.012	2.293	0.023
Self-confidence, γ_{140}	0.057	0.005	12.143	<0.001
Time Spared for Reading, γ_{150}	1.045	0.004	262.536	<0.001
Intrinsic motivation, γ_{160}	1.412	0.011	125.962	<0.001
Socialization, γ_{170}	0.998	0.001	3357.226	<0.001

Random Effect	Variance Component	df	χ^2	p
School Mean, u_{0j}	170.831	265	10303266.123	0.001
Lack of background English knowledge, u_{3j}	0.006	265	305.500	0.044
Intrinsic motivation, u_{4j}	0.023	265	759.285	0.001
Student Level effect, r_{ij}	0.511			

Random Student Level coefficient	Reliability estimates
INTERCEPT1, γ_{00}	1.000
Gender, γ_{10}	0.107
Mother's Education, γ_{20}	0.060
Father's Education, γ_{30}	0.087
Private study room, γ_{40}	0.096
Computer, γ_{50}	0.132
Educational software, γ_{60}	0.112
Literary book, γ_{70}	0.088
Time Spared for Studying English, γ_{80}	0.155
Private Tutorial, γ_{90}	0.053
Learning Difficulty, γ_{100}	0.083
Lack of background knowledge, γ_{110}	0.182
Judging the understandability of the course book, γ_{120}	0.060
Finding the course book insufficient, γ_{130}	0.068
Self-confidence, γ_{140}	0.140
Time Spared for Reading, γ_{150}	0.157
Intrinsic motivation, γ_{160}	0.598
Socialization, γ_{170}	0.177

[1]Before the analysis the student level variables were centered around the group mean.

The gender variable was coded as '1' for female students and '2' for male students. Table 4 shows that there exists a negative relationship between the student's gender and English achievement (*gender* γ_{10}=-0.107, SE=0.009, p<.05). According to this result, female students have higher English achievement scores than male students.

Students' mother's and father's education have a positive significant relationship with English achievement (*mother's education* γ_{20}=0.016, SE=0.005; *father's education* γ_{30}=0.026, SE=0.004, p<.05). This result shows that as a student's mother's and father's education level increases, his/her English achievement also increases.

Having a private study room, computer, educational software in his/her computer, and literary books have positive significant relationship with English achievement (*private study room* γ_{40}=0.045, SE=0.009; *computer* γ_{50}=0.041, SE=0.010; *educational software* γ_{60}=0.030, SE=0.010; *literary book* γ_{70}=0.091, SE=0.008 p<.05). Thus, if a student has a private study room, computer, educational software in his/her computer, and literary books his/her English achievement is higher.

Time spared for studying English and reading have positive significant relationship with English achievement (*time spared for studying English* γ_{80}=0.028, SE=0.004; *time spared for reading* γ_{150}=1.045, SE=0.004 p<.05). Thus, the more time a student invests in studying and reading, the higher scores s/he gets from English.

There exists a positive significant relationship between taking private English tutorials and English achievement (*private tutorial* γ_{90}=-0.010, SE=0.005 p<.05). According to this finding, taking private tutorials is positively related to English achievement.

Of the variables at the student level, learning difficulty, lack of English background knowledge, and having self-confidence in English courses have positive significant relationship with English achievement (*learning difficulty* γ_{100}=0.020, SE=0.008; *lack of background knowledge* γ_{110}=0.025, SE=0.010; *self-confidence* γ_{140}=0.057, SE=0.005 p<.05). Thus, students who do not consider English as difficult have higher English scores than others. Moreover, the ones who have self-confidence and who think that their background English knowledge is inadequate also have better English scores.

Finding the course book insufficient and judging the understandability of the course book variables have positive and significant relationship with English achievement (*understandability of the course book* γ_{120}=0.049, SE=0.011; *insufficient textbooks* γ_{130}=0.028, SE=0.012). Thus, students who

consider the course book insufficient and who can judge the understandability of the course book have higher English achievement scores than other students.

Intrinsic motivation which is a variable of the student level has the highest relationship with English achievement (*intrinsic motivation* γ_{160}=1.412, SE=0.011, p<.05). What is meant by intrinsic motivation in ÖBBS exam is a student's desire and will to attend school for education. This result shows that the higher a student's desire and will to attend school is, the better English scores s/he gets.

Finally, a positive significant relationship was found between being socially active and English achievement (*being socially active* γ_{170}=0.998, SE=0.001, p<.05). Thus, if a student spares time for social activities such as sport, cinema, and theater and meets his/her friends for social activities, his/her English achievement score increases.

The component effects and the hypothesis tests of the variances for random effects show whether these component effects are significant or not. When Table 4 is considered, lack of background knowledge and intrinsic motivation variables display a significant difference among schools (p<.05). The significance of the p value shows that lack of background knowledge and intrinsic motivation are higher in some schools than other schools.

The reliability values of the variables show that the reliability value that belongs to the fixed is high (1.000). This result indicates that $\hat{\beta}_{0j}$, the mean English achievement at schools, is a reliable predictor. Moreover, all the variables at the student level have high reliability values. While intrinsic motivation has the highest value (*intrinsic motivation* γ_{160}=0.598) taking private tutorials has the lowest value (*private tutorials* γ_{90}=0.053). The reliability predictions being more than 0.05 show that these coefficients vary randomly among schools.

Proportion of variance explained in β_{0j} *for* the random coefficient regression model =
(190.043-0.511)/190.043 = 0.997. Thus, adding explanatory variables as predictors of English achievement reduced the within –school variance by 99%.

Model 4: Intercept and Slopes as Outcomes Model

The intercept and slopes as outcomes model was formed in order to find the school characteristics which are related to the school characteristics that have a relationship with English achievement in ÖBBS 2009. In the random coefficient regression model it was observed that two variables at the student level (lack of background knowledge and intrinsic motivation) varied randomly. In order to explain this variability, these two variables at the student level were modeled with the variables at the school level. Of these two variables, while intrinsic motivation has a statistically significant relationship with the school type, the relationship among other variables is not statistically significant. Table 5 displays the results obtained from this model.

Level-1 Model

$$Achievement\ score_{ij} = \beta_{0j} + \beta_{1j}*(Gender_{ii}) + \beta_{2i}*(Mother's\ Education_{ij}) + \beta_{3j}*(Father's\ education_{ij}) + \beta_{4j}*(Private\ Study\ room_{ii}) + \beta_{5j}*(Computer_{ii}) + \beta_{6j}*(Educational\ Software_{ij}) + \beta_{7j}*(Literary\ books_{ij}) + \beta_{8j}*(\ Time\ spared\ for\ studying\ English_{ij}) + \beta_{9j}*(\ Private\ Tutorial_{ij}) + \beta_{10j}*(\ Learning\ Difficulty_{ij}) + \beta_{11j}*(\ Lack\ of\ knowledge_{ij}) + \beta_{12j}*(\ Judging\ the\ understandability\ of\ the\ course\ book_{ij}) + \beta_{13i}*(\ Finding\ the\ course\ book\ insufficient_{ij}) + \beta_{14j}*(\ Self\text{-}confidence_{ij}) + \beta_{15j}*(\ Time\ Spared\ for\ Reading_{ij}) + \beta_{16j}*(\ Intrinsic\ motivation_{ij}) + \beta_{17j}*(\ Socialization_{ij}) + r_{ij}$$

Level-2 Model

$$\beta_{0j} = \gamma_{00} + \gamma_{01}*(Classroom\ Size_j) + \gamma_{02}*(Region_j) + \gamma_{03}*(Type\ of\ School_j) + \gamma_{04}*(\ Educational\ development\ of\ the\ city\ _j) + u_{0j}$$

$\beta_{1j} = \gamma_{10} + u_{1j}$
$\beta_{2j} = \gamma_{20} + u_{2j}$
$\beta_{3j} = \gamma_{30} + u_{3j}$
$\beta_{4j} = \gamma_{40} + u_{4j}$
$\beta_{5j} = \gamma_{50} + u_{5j}$
$\beta_{6j} = \gamma_{60} + u_{6j}$
$\beta_{7j} = \gamma_{70} + u_{7j}$
$\beta_{8j} = \gamma_{80} + u_{8j}$
$\beta_{9j} = \gamma_{90} + u_{9j}$
$\beta_{10j} = \gamma_{100} + u_{10j}$
$\beta_{11j} = \gamma_{110} + u_{11j}$
$\beta_{12j} = \gamma_{120} + u_{12j}$
$\beta_{13j} = \gamma_{130} + u_{13j}$
$\beta_{14j} = \gamma_{140} + u_{14j}$
$\beta_{15j} = \gamma_{150} + u_{15j}$
$\beta_{16j} = \gamma_{160} + \gamma_{161}*(Type\ of\ School_j) + u_{16j}$
$\beta_{17j} = \gamma_{170} + u_{17j}$

Table 5. Results for Model 4

Fixed Effects	Coefficients	SE	t	p
INTERCEPT, γ_{00}	33.302	0.622	53.582	<0.001
Classroom Size, γ_{01}	-0.188	0.062	-3.038	0.003
Region, γ_{02}	-0.777	0.342	-2.274	0.024
Type of School, γ_{03}	1.674	0.197	8.494	<0.001
Educational development of the city, γ_{04}	2.326	0.553	4.203	<0.001
Gender, γ_{20}	-0.107	0.009	-12.171	<0.001
Mother's Education, γ_{30}	0.016	0.005	3.438	0.001
Father's Education, γ_{40}	0.026	0.004	5.990	0.001
Study room, γ_{40}	0.046	0.009	5.184	0.001
Computer, γ_{50}	0.042	0.010	4.344	0.001
Educational Program, γ_{60}	0.029	0.011	2.671	0.008
Literary book, γ_{70}	0.093	0.008	11.686	0.001
Time Spared for Studying English , γ_{80}	0.029	0.004	6.998	0.001
Private Tutorial, γ_{90}	0.010	0.005	2.241	0.026
Learning Difficulty, γ_{100}	0.022	0.008	2.794	0.006
Lack of knowledge, γ_{110}	0.026	0.010	2.592	0.010

Judging the understandability of the course book, γ_{120}	0.049	0.011	4.325	0.001
insufficient textbooks, γ_{130}	0.029	0.012	2.349	0.019
Self-confidence, γ_{140}	0.058	0.005	12.233	0.001
Time Spared for Reading, γ_{150}	1.046	0.004	263.186	0.001
Intrinsic motivation, γ_{160}	1.410	0.011	132.537	0.001
School type, γ_{161}	0.019	0.004	5.410	0.001
Socialization, γ_{170}	0.998	0.001	3333.098	0.001

Random Effect	Variance Comp.	df	χ^2	p
INTERCEPT, u_0	115.880	261	7061236.327	0.001
Gender, γ_{10}	0.003	265	290.445	0.136
Mother's Education, γ_{20}	0.001	265	243.294	0.500
Father's Education, γ_{30}	0.001	265	268.806	0.423
Private study room, γ_{40}	0.002	265	284.642	0.195
Computer, γ_{50}	0.004	265	297.188	0.085
Educational software, γ_{60}	0.004	265	280.251	0.248
Literary book, γ_{70}	0.002	265	240.793	0.500
Time Spared for Studying English, γ_{80}	0.001	265	270.868	0.389
Private Tutorial, γ_{90}	0.001	265	222.075	0.500
Learning Difficulty, γ_{100}	0.002	265	238.670	0.500
Lack of background knowledge, γ_{110}	0.006	265	305.317	0.045
Judging the understandability of the course book, γ_{120}	0.005	265	252.855	0.500
insufficient textbooks, γ_{130}	0.003	265	238.203	0.500
Self-confidence, γ_{140}	0.001	265	280.474	0.246
Time Spared for Reading, γ_{150}	0.001	265	280.361	0.247
Intrinsic motivation, γ_{160}	0.020	264	679.813	0.001
Socialization γ_{170},	0.000	265	292.512	0.118
Student Level effect, $\mathbf{r_{ij}}$	0.511			

A cross-wise level interaction occurred between the school type and intrinsic motivation. There is a positive significant

relationship between these two variables (γ_{31}= 0.019, SE= 0.004, p<.05). Thus, students in science, teacher, and social sciences high schools have more desire to attend to school than students in other programs.

Proportion of variance explained in β_{0j} for the intercept and slopes as outcomes model =
(170.831-115.880)/170.831 = 0.321. This means that 32% of the parameter variation in mean achievement has been explained by explanatory variables.

Discussion and Conclusion

An important finding of the study is the relationship between intrinsic motivation and English achievement. In this sense, students who are intrinsically motivated to attend school have higher English scores than students who lack this type of motivation. According to Dörnyei (1998, p. 121) "intrinsic motivation deals with behavior performed for its own sake, in order to experience pleasure and satisfaction such as the joy of doing a particular activity or satisfying one's curiosity." Research has shown the value of being intrinsically motivated in many applied settings, such as education (including FL education), sport, and work environments (Deci et al., 1999; Wu, 2003; Dörnyei, 2001), since intrinsic motivation promotes autonomy and competence for motivated persistence, performance, and well-being (Brown, 1990; Nakata, 2009). Brown (1994) argues that traditional school settings foster extrinsic motivation, which, over the long haul, focuses students too exclusively on the material or monetary rewards of an education rather than instilling an appreciation for creativity and for satisfying some of the more basic drives for knowledge and exploration. He further states that schools should create a positive and affirming environment which will lead to intrinsic motivation that will result in ultimate success in the long run. The finding of the study supports these arguments since students who had more will and desire to attain school got higher English scores than students who considered attending school as an unpleasant activity.

Another important finding of the study is that female students have higher English achievement scores than male students. There are many studies that provide similar results. For instance Netten et al. (1999) found that males were less likely to study French after Grade 9. Chavez (2001) found that regardless of topics and genres, females got higher scores than males in a reading test. In a study by Thompson (1991), females received higher ratings than males, with gender accounting for 11% of the variance in degree of L2 foreign accent. Gardner and Lambert (1972) found that females surpassed males in French vocabulary acquisition. In Burstall's (1975) research with 6000 children beginning L2 French at eight years old in English primary schools, girls outperformed boys on all tests measuring achievement in French throughout the period of the study. As Ellis (1994) put it women might be better at L2 learning than men; they are likely to be more open to new linguistic forms in the L2 input and they will be more likely to rid themselves of interlanguage forms that deviate from the target-language forms. Moreover, females have higher motivation to learn foreign languages than males (Dörnyei and Clément, 2001; Dörnyei et al., 2006; MacIntyre et al., 2002). Considering the current research findings and the literature that provides similar results, it is important to identify factors that trigger female superiority in FL achievement and to find out potential solutions that can increase male performance in FL learning.

The results of the study reveal that as a student's parent's educational level increases his/her English achievement also increases. Similarly, the literature on student achievement has also shown that parents' educational level is related to student achievement (Haveman and Wolfe, 1995; Jimerson et al., 1999; Campbell et al., 1999; Davis-Kean, 2005). This is because parents with high education levels have higher educational expectations, monitor their children's school work more, and provide more overall educational and social supervision compared to the parents with low educational levels (Jacob and Harvey, 2005). Although, the relationship between parents' educational level and FL

achievement is not a popular topic of FL achievement research, the finding of this study shows that the relationship between these two variables should not be underestimated. Thus, FL teachers should identify their students' parent's educational levels and design interventions in order to prevent academic pitfalls that a parent's low educational level may lead to.

In this study, overcrowded classrooms constitute another factor that adversely affects students' English achievement. Supporting this finding research has found that students in the small classes evidenced superior academic performance compared to those students in overcrowded classrooms (Kozol, 1991; Finn and Achilles, 1999; Akyüz, 2006; Çelebi, 2010). Besides, overcrowded classes negatively affect teachers' ability to produce maximum student achievement (Bennet, 1996; Mosteller, 1999; Nye et al., 2000; Blatchford et al., 2002). According to Tiwari (2008) foreign language education should take place in a small classroom of its own, where pupils can move about, from themselves in triangles, circles, lines, and speak to each other. In order to reduce the adverse effects of overcrowded classrooms on education in general and foreign language instruction in particular, the numbers of qualified teachers and facilities can be increased, and additional resources can be added in order to supply the new facilities.

The findings of the study show that socially active learners who engage in extracurricular activities are more proficient in English than learners who are socially inactive. Research has also shown that extra-curricular activities are just as necessary for building academic and social skills as the regular classes since they have certain benefits on students' social, emotional, and intellectual development (Eccles, 2003; Marsh and Kleitman, 2002; Darling et al., 2005; Mahoney et al., 2003; Metsapelto and Pulkkinen, 2012). Since learning a foreign language contributes to having access to new social networks, students who are socially active may have considered it as a crucial communication event which might have positively affected their English achievement in advance.

The study also reveals that students who have self-confidence in English courses have higher English scores than students who lack it. Noels et al., (1996, p. 248) define self-confidence in language learning as "perceptions of communicative competence and concomitant low levels of anxiety in using the second language". According to Clement et al. (1994) self-confidence is a significant motivational sub-system in foreign language learning situations where there is no frequent contact with native speakers of English. Aida (1994) found that learners with high self-confidence can manage their anxiety more effectively and do not consider foreign language tasks as anxiety provoking. Considering these findings it is important for FL teachers to help their students build self-confidence and to pay close attention to refrain from discouraging behaviors that can lead to the loss of student self-confidence.

The results of the study show that if a student has a private study room, computer, educational software in his/her computer, and literary books, his/her English achievement is higher. Research has emphasized that home resources such as books, computers, and a study room are indicators of family socioeconomic background (Coleman, 1988; Entwisle and Astone, 1994; Duncan and Brooks-Gunn, 1997; Sirin, 2005). Sianou-Kyrgiou (2006) investigated the academic performance of students from different socio-economic backgrounds and found that students from families of higher socio-economic status display better performance since they receive more out-of-school support and the fact that their families are in a better position to supply educational commodities. Similarly Roscigno and Ainsworth-Darnell (1999) examined the effects of home resources such as computer, books, pocket calculator, and dictionary on student achievement and found that home resources have strong and positive effects on student achievement. Thus, reformatory regulations can be put into practice for students who lack home resources, in order to hinder possible academic drawbacks of having a low socio-economic background.

The time dedicated to studying English and reading are related to English achievement. There is a growing body of findings that suggest that extensive academic study time is closely related to academic achievement (Zimmerman et al., 1994; Macan et al., 1990; House, 2004). Moreover, research also found that extensive reading and the time students dedicate to reading at home positively aid foreign language performance (Cho and Krashen, 1994; Mason and Krashen, 1997; Hedgcock and Atkinson, 1993). These findings show that English teachers should encourage their students to develop responsibility for studying at home and extensive reading since they are related to foreign language achievement.

The study results show that students who take private tutorials have lower English scores than students who do not take it. Research related to the effects of private tutoring on student achievement provides contradicting findings. For instance, while Mischo and Haag (2002) found that private tutoring leads to larger improvement in school performance, Bray (1999) reports that it has been banned at various times in several countries such as Cambodia, Korea, Mauritius, and Myanmar as it failed to increase academic performance. According to Mischo and Haag (2002) learner deficits is an important reason that produces demand for private tutoring which might also be the case in this study since students who do not take private tutoring have higher English scores.

In this study, students who considered the course book as insufficient and who judged the understandability of the course book received higher scores than other students. This might be because of the reason that the content of the course book was below the competence level of the students. As Krashen (1977, 2003) argued learners progress in their knowledge of the language when they comprehend language input that is slightly more advanced than their current level. Krashen called this level of input "i+1", where "i" is the language input and "+1" is the next stage of language acquisition. Thus, students who think that the

English course book is insufficient are probably at a more advanced level than what the book presents.

Another finding of the study is the relationship between learning difficulty and English achievement. Students who reported less learning difficulty in English courses received higher English scores than students who experienced learning difficulty. Supporting this finding Chen and Chang (2004) found that students encountering greater difficulties with learning a foreign language also experience higher levels of anxiety which leads to low foreign language achievement. Moreover, MacIntyre (1999) stated that negative experiences are shaped by state anxiety which occurs when learners encounter "difficulties in learning, comprehension, grammar, and other areas." (p. 30). In order to handle foreign language learning difficulties Ganschow and Sparks (1991) suggested that accommodations such as a slowed-down teaching pace, a combined auditory/visual presentation, and direct instruction of language components help to ease classroom learning difficulties.

The study results also show that students who consider their background knowledge of English as inadequate have better English scores. It is possible that students who noticed a deficiency in their background English knowledge dedicated more time to study English in order to close this gap which might have led to an increase of English scores.

The findings on school variables show that the geographic region and the educational development of the city where the school is located are related to English achievement of students. Research on the educational development of the city shows that the higher the educational level is the better educational outcomes will emerge for students (Abbott et al., 2002; Dinçer and Kolaşin, 2009; Goddard et al., 2000). Considering this finding, one of the policies of foreign language education should be to create more opportunities for students living in cities with low educational development through several educational and physical

investments. Schools in southeast and east regions of Turkey also have lower English achievement scores than schools located in other regions. These two regions have lower socio-economic status and level of educational development than other regions. As formerly mentioned, both low socio-economic status of the families and low educational development of the cities are related to student achievement which adversely affect foreign language competence. Thus, these problems need to be revised and remedies to treat these adverse effects should be put into practice by governments in all countries where similar situations are witnessed.

The study results show that the school type variable is related to English achievement. Students in science, teacher preparatory, and social sciences high schools have higher English scores than students in general and vocational schools. Research conducted on the effect of school type on student achievement has revealed that student achievement varies from school to school (Sander, 1999; Witte, 1992). Another noteworthy finding of the study is the relationship between intrinsic motivation and school type. The students in general and vocational high schools have lower desire to attend school than students of other schools. In Turkey, in order to be a student in science, teacher preparatory, and social sciences high schools, students are required to pass a nationwide high school entrance exam. On the other hand, general and vocational high schools do not have such a requirement. Thus, academic achievement and overall intrinsic motivation of students in general and vocational high schools are different from the others.

The overall analysis of the study findings displays that foreign language achievement is influenced by many factors that need to be addressed simultaneously. Many variables that fall outside of the domain of language related variables influence the foreign language performance of students. In addition to linguistic factors, nonlinguistic factors are also a central part of foreign language learning process. Moreover, the number of variables that are related to foreign language achievement reflects the complexity of

foreign language acquisition. As Cook (2001) argued, several factors such as age, aptitude, gender, and most areas of personality cannot be changed by teachers. However, teachers still need to learn how to live with them and provide individualized opportunities for the students. On the other hand, other factors such as classroom size, course book, and availability of opportunities that promote FL achievement can be changed through innovative adjustments and interventions made to the learning environment of students.

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