



## High School Students' Exercise-Related Stages of Change and Physical Activity Self-Efficacy\*

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### ABSTRACT

**Purpose:** The existing literature has shown that the amount of sedentary time during early adolescence is low. This decrease is more pronounced among girls than boys. Therefore, the purpose of this study is to analyze high school students' exercise-related stages of change (ESC) and physical activity self-efficacy (PASE) for overcoming barriers with respect to gender, age, and school type. **Research Methods:** The survey method, which employed stratified sampling based on the total number of students at each school, was used to select participants (n=393). **Findings:** According to the results, male students were at more advanced stages of change and had higher levels of self-efficacy for overcoming barriers than their female counterparts. The distribution of high school

students across the stages of change was: inactive stages (n<sub>precontemplation, contemplation, and preparation</sub>=216, 54.9%) and active stages (n<sub>action and maintenance</sub>=177, 45.1%). Gender [ESC  $\chi^2(4, n=393)=14.64, p=0.01$ ] and the type of school [ $\chi^2(20, n=393)=39.42, p>0.05$ ] were not significantly related to ESC. MANOVA indicated that self-efficacy was related to ESC (Pillai's Trace=0.09,  $F_{(12,678)}=1.92, p<0.05$ ). On the other hand, there was no significant difference in self-efficacy based on age, gender, or school type ( $p>0.05$ ). **Implications for Research and Practice:** The sex of students was a significant variable affecting ESC. In addition, the results indicated that lower level of ESC and less PASE exist among female students. Further research should focus on cultivating girls' exercise habits with the goal of improving exercise behavior intention and self-efficacy for overcoming barriers via stage-specific interventions.

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## Introduction

Physical activity (PA) has numerous health benefits among children and adolescents. Specifically, it reduces the risk of obesity and the development of chronic diseases, such as diabetes (United States Department of Health and Human Services [USDHHS], 2010; World Health Organization [WHO], 2010), cardiovascular disease, and all-cause mortality (Tremblay et al., 2011). It strengthens bones and muscles, improves mental health and mood, decreases depression and anxiety (Centers for Disease Control and Prevention [CDC], 2004), promotes social (Hallal, Victoria, Azevedo & Wells, 2006) and psychological well-being, and improves academic performance (Rasmussen & Laumann, 2013).

The USDHHS (2008) recommends that adolescents should participate in at least 60 minutes of moderate to vigorous physical activity (MVPA) daily in order to enjoy various health benefits. Despite these benefits, PA participation decreases with age among adolescents, particularly during the high school years (Anderssen, Wold & Torsheim, 2013; Currie et al., 2012; CDC, 2004; Janssen, Katzmarzyk, Boyce & Pickett, 2004; USDHHS, 2010). Contemporary research by the WHO has shown that 77–85% of European adolescents do not achieve 60 minutes of daily MVPA (Currie et al., 2012). The research correlates this decrease in PA to a lack of self-efficacy, motivation, and intention. Dumith et al. (2011) reported a clear increase in the amount of sedentary time during early adolescence in a developing country. This is more pronounced among girls than boys. Similarly, the amount of inactivity increased over the course of adolescence (Corder et al., 2015; Sanchez et al., 2007; Azevedo et al., 2014). Accordingly, promoting PA among adolescents is an urgent need.

The Transtheoretical Model (TTM), also known as the Stages of Change (SOC) model, was developed to help change unhealthy behaviors, such as alcohol addiction and smoking (Prochaska, DiClemente & Norcross, 1992). The model explains the behavior change process in the following terms: “people pass through stages toward making a behavior change and each stage is characterized by a particular pattern of psycho-social and behavioral variables” (Hagger & Chatzisarantis, 2005, p. 38). TTM is made up of four main components: (a) SOC, which depend on behavior; (b) processes of change, which depend on behavioral and cognitive processes; (c) self-efficacy; and (d) decisional balance (Prochaska, DiClemente, & Norcross, 1994). In addition, the model is intensively used for cultivating improved exercise behaviors relating to PA, and the SOC are the most widely used aspects of the model. TTM refers to “a person’s readiness (intention) to engage in regular exercise” (Spencer, Adams, Malone, Roy & Yost, 2006). The SOC is a process defined and explained by Marcus and Forsyth (2003), which involves precontemplation, contemplation, preparation, action, and maintenance stages.

Exercise intention research is widely conducted using different samples (Bourdeaudhuij et al., 2005; Hausenblas, Nigg, Downs, Fleming & Connaughton, 2002), but it is typically limited to adolescent age groups (Cardinal, Engels & Zhu, 1998) and by nationality (Bucksch, Finne & Kolip, 2008; Jeon, Kim & Heo, 2014;

Hausenblas et al., 2002). Previous findings have shown that male students tend to display more advanced stages of exercise intention than female students.

The self-efficacy construct is of central importance to exercise behavior. Based on Bandura's Social Cognitive Theory (1986), self-efficacy is defined as the confidence individuals have in their ability to execute specific behaviors (Bandura, 1997). Strauss, Rodzilsky, Burack, and Colin (2001) outlined the psycho-social constructs of physical activity in a review article. Social influences such as family, peers and school, access to physical activities, personality characteristics, self-efficacy (Sallis, Prochaska & Taylor, 2000), self-confidence, and motivation strongly correlate with high PA levels. Among participants aged 10-16 years, physically active students were found to have higher self-efficacy compared to inactive students. Meanwhile, overweight students exhibited a low level of self-efficacy and confidence, which manifested in decreased PA. These findings indicated that participation in PA was related to a high level of self-efficacy (Certel et al., 2015; Dishman et al., 2004; Lewis, Marcus, Pate & Dunn, 2002; Reigal, Videra & Gil, 2014; Robbins, Pender, Ronis, Kazanis & Pis, 2004; Sallis et al., 2000). However, little research has focused on self-efficacy for overcoming barriers related to PA among adolescents (Dwyer et al., 2012; Reynolds et al., 1990; Ryan, & Dzewaltowski, 2002). Another important variable is exercise intention, which has been widely used to identify and promote healthy behaviors (Prochaska, DiClemente & Norcross, 1994; Spencer et al., 2006) among various age groups.

The school-based context, which is related to opportunities in the physical and social environments of the school relating to PA (i.e., indoor or outdoor facilities) is a critical variable. Author and Ince (2013) examined different social and physical environments. Their results indicated that PA self-efficacy correlated with the socio-economic, social, and physical environments. In addition, SOC in different school environments also differed. The use of ecological variables (social and physical) in the school environment was found to be effective for improving PA behavior (Author & Ince, 2014; Langille & Rodgers, 2010).

The Turkish Educational System is centralized and regulated by the Ministry of National Education. The placement and transition from middle school to high school take place when students graduate from middle school. Afterwards, these students are placed into different schools depending on their scores on Transition from Basic Education to Secondary Education (TEOG) exams (Ministry of National Education, 2014). Generally, students with the highest scores on the exam enter science or anatolian high schools. However, students with low exam results enter general, vocational, or multi-program high schools. Limited research has focused on different school types and self-efficacy (Certel et al., 2015; Pesen, 2016) or the ESC behavior of high school students (Author & Gültekin, 2014).

ESC and PA self-efficacy have been investigated among different age groups and nations. However, adult SOC are related to behavioral strategies for change, such as providing one-on-one training, books on relevant subjects, and information as needed (Jeon et al., 2014). Meanwhile, adolescents' SOC significantly correlated with

self-efficacy (Bucksch et al., 2008). A study by Bourdeaudhuij et al. (2005) pointed to sex and age differences. In particular, girls and older adolescents were typically more advanced with respect to the first three stages. Differences between the SOC were related to higher levels of PA of different intensities and within different contexts. Similarly, pre-adolescents' SOCs correlated significantly with gender, age, and grade level (Cardinal et al., 1998). Hausenblas et al. (2002) found that SOC were not significantly related with decisional balance.

Some research related to self-efficacy has been conducted with the adult population, showing that males had higher level of self-efficacy (Yan et al., 2015). Adolescent self-efficacy was similar for both sexes (Citozi, Bozo & Pano, 2013) and it did not mediate the relationship between PA self-efficacy and PA behavior (Plotnikoff, Gebel & Lubans, 2014). Physically active adolescents had higher levels of general self-efficacy (Reigal et al., 2014), and girls had lower levels of self-efficacy than boys (Robbins et al., 2004). Dwyer et al. (2012) also reported that self-efficacy helped overcome barriers to PA and predicted the levels of adolescent PA. Middle school students' self-efficacy was higher in wealthy schools (Author & Ince, 2013). No difference was found among elementary school students with respect to self-efficacy levels (Matthews et al., 2015). A literature review showed that few studies have examined adolescents' ESC and self-efficacy in different school-based contexts. Therefore, the aim of this study is to analyze high school students' ESC and physical activity self-efficacy (PASE) levels with respect to gender, age, and school type. Three research questions are addressed. (1) Is there a difference between gender, type of school and ESC levels? (2) Is there a difference between self-efficacy and ESC? (3) Is there a difference among gender, age, school type, and students' PA self-efficacy levels? This research builds on the hypothesis that gender, age, and school type do not affect the exercise intention and PA self-efficacy levels of Turkish high school students.

## Methods

### *Research Design*

The current study was conducted using a cross-sectional research design based on a survey method (Fraenkel & Wallen, 2003).

### *Research Sample*

Participants in the study were selected using a stratified sampling method, which involved considering the total number of pupils in each high school (grades 9-12) in Canakkale, Turkey. The total number of enrolled students (n=22,491) was provided by the Canakkale District of National Education. Schools that agreed to participate were admitted into the research project. Data were collected from 21 high schools (6 schools within the city of Canakkale and 15 schools in the surrounding province), reaching 25% of each school's student body. The aim was to reach 5% of the province's total high school student population. The target sample included 1,306 participants, and after deleting incomplete questionnaires, the final number of

participants was 1,283 (Table 1). The participation retention rate was 98%. The youngest students in the study were 14 years old, and oldest students were 19 years old ( $n_{\text{male}}=586$ ;  $M_{\text{age}}=16.14$ ,  $SD=1.10$  and  $n_{\text{female}}=697$ ;  $M_{\text{age}}=16.06$ ,  $SD=1.07$ ). The students were randomly divided into three groups for Exploratory Factor Analyses (EFA) ( $n=629$ , 49%), Confirmatory Factor Analyses (CFA) ( $N=261$ , 20%), and Pearson's chi-square and MANOVA ( $n=393$ , 31%) analyses.

**Table 1**  
 Descriptive Statistics for Participants' Gender and School Type

	General	Vocational	Science	Anatolian	Anat. T.T*	Multi-Pr*
Gender	f / % (n=272)	f / % (n=207)	f / % (n=136)	f / % (n=485)	f / % (n=48)	f / % (n=135)
Male (n=586)	119 / 44	105 / 51	63 / 46	234 / 48	7 / 15	58 / 43
Female (n=697)	153 / 56	102 / 49	73 / 54	251 / 52	41 / 85	77 / 57

\*Anatolian Teacher Training

\*Multi-Program

#### Research Instruments and Procedures

ESC: This instrument, which asked participants five questions, was validated by Schumann et al. (2002). The Turkish version was translated and validated by Author and Gultekin (2014) with a high test-retest reliability score based on a 2-week interval [Intraclass Correlation Coefficient (ICC=0.87)]. The questionnaire examined whether individuals exercised regularly "Exercise" was defined as any planned PA of 20 minutes or longer that was intense enough to increase the rate of breathing and cause one to break a sweat. "Regular" was defined as exercising three to five times per week. Participants were asked to select which one out of five statements described them best. Each of the five statements reflected one of the five SOC. Precontemplation: "No, I do not exercise regularly and I do not intend to in the next 6 months." Contemplation: "No, I do not exercise regularly, but I intend to in the next 6 months." Preparation: "No, I do not exercise regularly, but I intend to in the next 30 days." Action: "Yes, I have been exercising regularly, but for less than 6 months." Maintenance: "Yes, I have been exercising regularly for more than 6 months."

*PA Self-Efficacy.* Dwyer, Allison, and Makin (1998) developed the 21-item PASE to overcome barriers related to the PA questionnaire. Limited research about PASE to overcome barriers related to PA has been performed in Turkey. The Turkish version of the questionnaire was validated in a pilot study by the researchers. The PASE was translated into Turkish after permission was granted by the developers. Two independent translators converted the English version of the PASE into Turkish. After reaching a consensus on each item, another translator converted the questionnaire back into English to ensure the quality of the translation, and the final version was prepared. Next, the questionnaire was given to 20 high school students from different types of schools to ensure face validity. In addition, the Turkish version was administered to another 23 high school students at a 2-week interval to

monitor test-retest reliability. Intraclass Correlation Coefficient (ICC) analyses showed a high correlation (ICC=0.89). The instrument examined the confidence level on a five-point Likert scale [(not at all confident (1) to very confident (5)] with which each subject participated in vigorous PA when particular perceived barriers to PA were present (e.g., lack of time because of school work; lack of support from family).

PASE to overcome barriers related to the PA questionnaire was administered to 629 high school students (aged 19 years or younger) from 12 high schools in Canakkale, Turkey. Participants of the study were randomly selected with 49% using for EFA. The original PASE had two factors termed self-efficacy to overcome external barriers and self-efficacy to overcome internal barrier. The 21-item questionnaire had a five-point Likert format ranging from “not at all confident” (1) to “very confident” (5). External barrier-related items were (2, 3, 4, 5, 7, 8, 9, 10, 11, 12, 13, 14) and internal barriers were (6, 15, 16, 17, 18, 19, 20, 21). In addition, item 1 measured global self-efficacy for participation in vigorous PA, but this item was not included in the analysis.

EFA. A sample of the study was examined using Kaiser-Meyer-Olkin (0.91) and Bartlett’s Test of Sphericity, which indicated a significant level ( $p=0.00$ ). In addition, eigen-values higher than 1 were accounted as a factor (Tabachnick and Fidell, 2007). Principal Component Analysis (PCA) with varimax rotation results indicated that there were three factors with eigen-values of 1.0 or greater (Hair et al., 1995). Three factors explained 51.78% of the total variance after removing items 8 and 9. The internal barriers factor accounted for 21.99% of the variance in the set of nine items. Factor 2 external barriers accounted for 17.45% of the variance in the set of five items, and the last factor (time-related efficacy) explained 12.34% of the variance in the set of four items. Factor loadings related to the 18 items of PASE are listed in Table 2.

**Table 2**

*Factor Loadings for Principal Component Analysis with Varimax Rotation of Self-Efficacy in Physical Activity Items: Total Sample (n=629)*

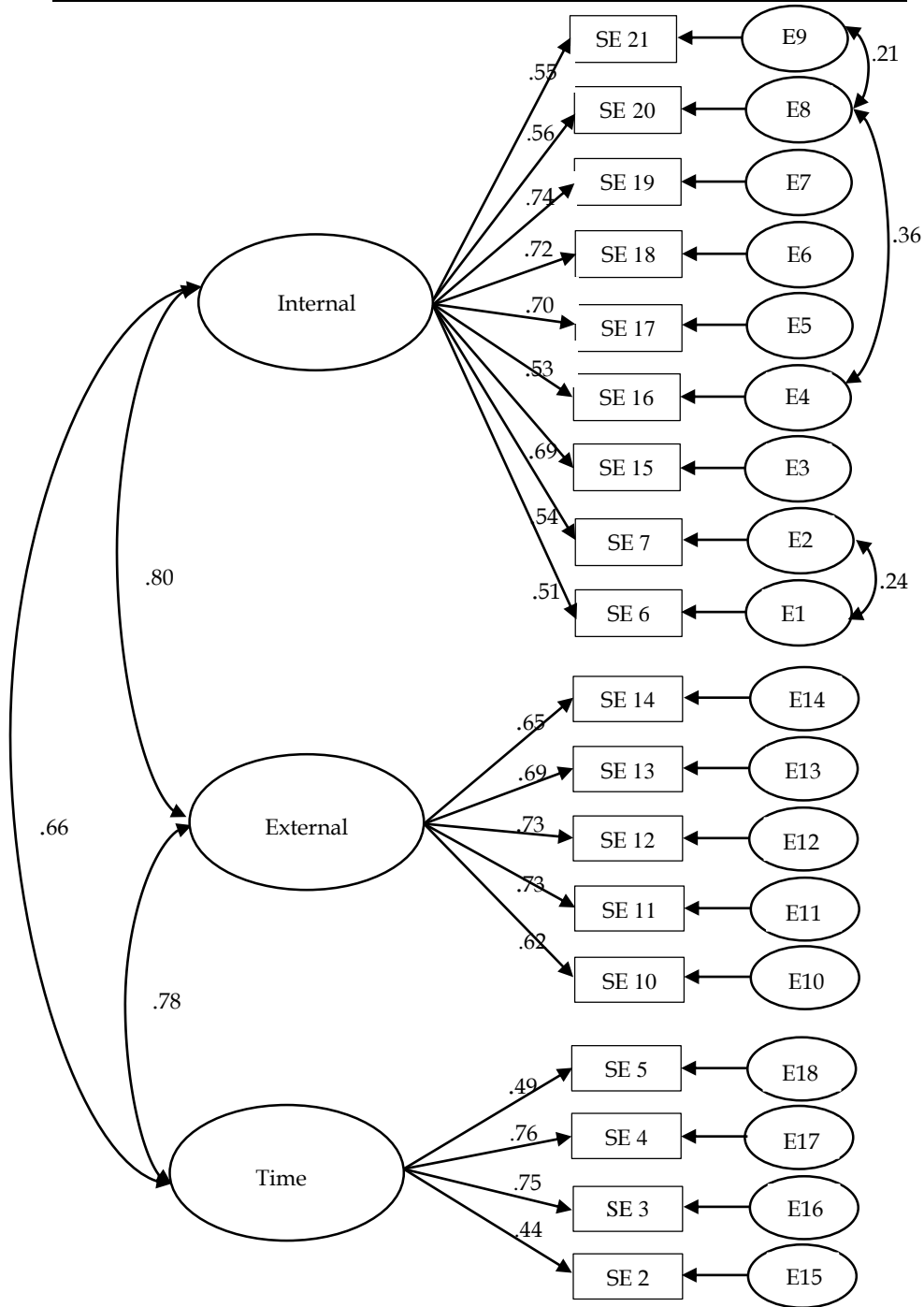
Item number	Component		
	1	2	3
6-If you lack energy (too tired).	0.771		
7-If you lack athletic ability.	0.704		
15-If you are self-conscious (feeling uncomfortable).	0.590		
16-If you have a long-term illness, disability, or injury.	0.648		
17-If you have a fear of injury.	0.605		
18-If you feel stressed.	0.586		
19-If you do not feel in the mood.	0.610		
20-If you feel discomfort (for example, soreness).	0.589		
21-If you do not have fun.	0.491		
10-If you lack a partner.		0.808	
11-If there is a lack of support from family.		0.758	
12-If there is a lack of support from friends.		0.689	
13-If participation costs money.		0.619	
14-If you lack self-discipline or willpower.		0.543	
2-If there is a lack of time due to school work.			0.772
3-If there is a lack of time due to part-time work.			0.726
4-If there is a lack of time due to family responsibilities.			0.508
5-If there is a lack of time due to other interests.			0.627

The internal consistency of the factor-derived subscales was calculated. The nine-item internal barriers subscale (items 6, 7, 15, 16, 17, 18, 19, 20, and 21) had an alpha coefficient level of 0.85, and the five-item external barriers subscale (items 10, 11, 12, 13, 14) had an alpha coefficient level of 0.81. This indicated high internal consistency and reliability. The last subscale, time-related efficacy (items 2, 3, 4, 5), had an alpha coefficient of 0.69.

*CFA:* A series of CFA models were undertaken to evaluate the structure of the PASE to overcome barriers related to the PA questionnaire in the current dataset (n=261). A sample of the CFA was randomly (20%) selected from the study participants (n=1,283).

In this study, the fit for the models was evaluated by four criteria: a non-significant chi-square test, the comparative fit index (CFI), the root means square error of approximation (RMSEA), and the standardized root means squared residual (SRMR). In these cases, a non-significant chi-square was preferred because this indicated a good model-data fit (e.g., no significant differences between the proposed and sample covariance matrix). However, the chi-square statistics are particularly sensitive to sample sizes. Thus, more often than not, this indicates a significant relationship (Byrne, 2001). However, CFI, RMSEA, and SRMR are relatively unaffected by sample size. Thus, these fit indices were also considered complimentary. The choice of cut-off criteria for the fit indices remains a contentious issue. In this study, the cut-off criteria recommended by Hu and Bentler (1999) were used. CFI values greater than 0.95, and RMSEA values smaller than 0.06 were considered indicative of good model-data fit (Hu & Bentler, 1999).

The CFA included three subscales (internal barriers related to PASE, external barriers, and time-related barriers), and this structure was tested using the Analysis of Moment Structures (AMOS) (Muthén & Muthén, 1998–2010). This model demonstrated a good fit based on four of the five absolute fit statistics examined ( $\chi^2=279,657$   $df=129$ ;  $\chi^2/df=2,168$ , RMSEA=0.063, NFI=0.866, CFI=0.922, IFI=0.923, GFI=0.903, RMR=0.063). The model after CFA is summarized in Graph 1. All the variances in Graph 1 were confirmed to be significant, and the smallest z value was calculated to be 3.45. Modifications between items 20–21, 16–20, and 6–7 were applied. The covariance among internal barriers and external barriers was calculated to be 0.80, the covariance among external barriers and time-related barriers was 0.78, and the covariance among internal barriers and time-related barriers was 0.66.



Graph 1. CFA of PASE (n=261)



*Data Analysis*

The appropriate institutional ethics review boards approved all data collection methods, and all participants consented. The methods used for data analysis were descriptive statistics (frequency, mean, and percentage) and the nonparametric Pearson’s chi-square test (Hamarat, 2017). After normality assumptions were checked using MANOVA, a significance level of  $p < 0.05$  was used (Gravetter & Wallnau, 2000).

**Results**

The results of the surveys regarding ESC and PA self-efficacy to overcome barriers related to PA indicated that male high school students in different school types were at more advanced SOC (active stages) than their female counterparts except in Vocational and Multi-Program high schools. Here, the students had higher levels of internal, external, and time-related PA self-efficacy to overcome barriers (see Tables 3-4)

The Pearson’s chi-square test showed that gender [ESC  $\chi^2(4, n=393) = 14.64, p=0.01$ ] significantly correlated with ESC. However, the type of school [ $\chi^2(20, n=393)=29.42, p>0.05$ ] did not significantly correlate with ESC.

**Table 3**

*Descriptive Statistics for Gender and Exercise-Related Stages of Change in Different Types of Schools*

Stages	Gender		School Type					
	M	F	General (M/F)	Vocational (M/F)	Science (M/F)	Anatolian (M/F)	Anat. T.T** (M/F)	Multi-Pr.** (M/F)
Inactive Stages	79	137	43 (13/30)	28 (12/16)	22 (12/10)	87 (32/55)	17 (-/17)	19 (10/9)
Active Stages	94	83	43 (20/23)	32 (14/18)	15 (7/8)	58 (37/21)	4 (1/3)	25 (15/10)
Total	173	220	86 (33/53)	60 (26/34)	37 (19/18)	145 (69/76)	21 (1/20)	44 (25/19)

\*Inactive Stages: Precontemplation, Contemplation, Preparation, Active Stages: Action, Maintenance, \*\*Anatolian Teacher Training, \*\*Multi-Program.

**Table 4**

*Descriptive Statistics for Gender and Physical Activity Self-Efficacy (SE) in Different Types of Schools*

Gender	Self-Efficacy (SE)	High School Type					
		General M/SD	Vocational M/SD	Science M/SD	Anatolian M/SD	Anat. T.T** M/SD	Multi Pr.** M/SD
		(n=86)	(n=60)	(n=37)	(n=145)	(n=21)	(n=44)
Female (n=220)	Int. SE*	2.40/.96	2.22/.94	2.18/.65	2.35/.85	2.38/.98	2.72/.66
	Ext. SE*	2.55/.96	2.71/1.21	2.57/.94	2.03/1.13	2.65/1.02	3.17/1.00
	Time SE	2.41/.90	2.40/.87	2.22/.58	2.36/.99	2.57/.76	3.04/.95
Male (n=173)	Int. SE*	2.46/.98	2.43/1.08	2.38/.73	2.40/1.01	3.67	2.61/.98
	Ext. SE	2.76/1.05	2.43/1.15	2.29/.88	2.78/.101	2.80	2.76/1.13
	Time SE	2.84/1.11	2.43/.95	2.47/0.79	2.82/0.85	2.00	2.18/.81

\*Internal Self-Efficacy, \*External Self-Efficacy \*\*Anatolian Teacher Training, \*\*Multi-Program

Normality assumptions were checked using the Kolmogorow-Smirnov, Skewness and Kurtosis, Box's M, and Levene's Tests ( $p < 0.05$ ). Box's M test violated the assumption. Therefore, Pillai's trace values were reported.

The MANOVA indicated that self-efficacy levels for overcoming barriers related to PA significantly correlated with ESC [Pillai's Trace=0.09,  $F_{(12,678)}=1.92$ ,  $p < 0.05$ ]. However, there was no significant difference in self-efficacy on the basis of a student's gender (Pillai's Trace=0.00,  $F_{(3,224)}=0.03$ ,  $p > 0.05$ ), age (Pillai's Trace=0.04,  $F_{(15,678)}=0.68$ ,  $p > 0.05$ ), or school type (Pillai's Trace=0.05,  $F_{(15,678)}=0.81$ ,  $p > 0.05$ ). Before interpreting the analysis of the ANOVA tests for significance between PASE and ESC, it is important to note that the alpha level was adjusted using the Bonferroni correction method. The alpha level was reduced to avoid making a Type II error (Stevens, 2002). Thus, the alpha level in this step was decreased to 0.016 because of the three subscales measuring self-efficacy. ANOVA results revealed the existence of significant differences among internal ( $F(4, n=393)=3.12$ ,  $p=0.01$ ), external ( $F(4, n=393)=3.24$ ,  $p=0.01$ ), and time-related self-efficacy ( $F(4, n=393)=3.29$ ,  $p=0.01$ ).

## Discussion and Conclusion

To summarize, the findings of the present study revealed low PASE for overcoming barriers related to PA and ESC levels among female high school students in Canakkale, Turkey. Meanwhile, male students were more likely to be in the Active Stages (Action or Maintenance) or possess higher levels of self-efficacy for

overcoming barriers related to PA. ESC differed significantly by gender. PASE was also shown to differ significantly based on ESC. The research questions will be discussed with reference to these findings.

Our findings showed that male students were more often in the “active” SOC compared to female students, who more often described themselves as being in the precontemplation, contemplation, and preparation stages. Similar results have been reported across different nations and age groups (Bourdeaudhuij et al., 2005; Cardinal et al., 1998; Jeon, Kim & Heo; 2014; Nigg & Courneya, 1998). However, gender was not a significant variable in our research. ESC was a significant variable that may help researchers make specific recommendations for how to direct exercise behavior. Therefore, determining the ESC levels of high school students is significant for guiding interventional studies. This might be useful for physical educators, who can tailor their recommendations to students at different SOC when encouraging them to be physically active (Marcus & Forsyth, 2009).

Another critical finding of this study was the difference in ESC among students at different types of schools. Science and anatolian high schools are public schools that admit students with high standardized test scores. Vocational and multi-program schools accept students with lower standardized test scores. School context, student academic success, and the physical environment may affect PA behavior and ESC. It is important to provide PA opportunities in all types of school environments in order for policy-makers to shape students’ exercise behaviors. The use of ecological variables by researchers and physical education teachers in schools may increase students’ ESC, self-efficacy, and PA behavior (Author & Ince, 2014; Glanz, Rimer, & Viswanath, 2008).

Reigal et al. (2014) pointed out that high school students’ general self-efficacy was related to higher levels of PA. Yan et al. (2015) similarly reported gender differences among Chinese and American college students. In both cases, female students exhibited low levels of self-efficacy. The present findings are, thus, consistent with those in the current literature (Dishman et al., 2004; Gao & Harrison, 2005; Reigal et al., 2014; Robbins et al., 2004). This demonstrates that insufficient self-efficacy levels reduce the ability of students to overcome barriers related to PA. Interventional study designs that aim to improve self-efficacy in adolescences, especially among girls, are strongly recommended.

Previous research showed that self-efficacy is a multidimensional construct (McAuley, 1992; Sallis, Pinski, Grossman, Patterson, & Nader, 1998). The current research extends prior knowledge by presenting three constructs: internal barriers, external barriers, and time-related barriers relating to PA. Similar results were described by Dwyer et al. (2012), who reported that multidimensional self-efficacy influences the ability of students to overcome barriers to PA. In addition, PASE constructs positively correlated with ESC. These results suggest that both instruments could be used in PA intervention research targeting self-efficacy to overcome barriers as a determinant of behavior change.

There are several limitations to the current research. First, the PASE and ESC research instruments were dependent on self-reporting. Therefore, we had to assume that participants answered the questionnaires honestly and accurately. Second, while we reached our target sample representation among the province high school students, we did not achieve this threshold of representation at every type of school, particularly at the Anatolian Teacher Training schools. Finally, we recommend that further research be conducted using intervention designs that include participants from additional regions in Turkey.

In conclusion, since female high school students lagged behind their male counterparts in ESC and PASE to overcome barriers related to PA, future studies should focus on developing ways to improve ESC and PASE among girls through stage-specific interventions. Lower stages of ESC and low levels of self-efficacy in students need to be developed with a strong experimental design. In addition, qualitative research investigating different school contexts and underlying reasons for low exercise intentions and self-efficacy is recommended for future research.

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### Lise Öğrencilerinin Egzersiz Davranışı Değişim Basamakları ve Fiziksel Aktivite Öz-Yeterlik Düzeyleri

#### Atf:

- Cengiz, C. & Tilmac, K. (2018). High school students' exercise-related stages of change and levels of physical activity self-efficacy. *Eurasian Journal of Educational Research*, 73, 59-76, DOI: 10.14689/ejer.2018.73.4

*Problem Durumu:* Fiziksel aktivite (FA) ve sağlık ilişkisi farklı boyutlarda araştırılmış ve çocuklarda, gençlerde birçok faydası olduğu kanıtlanmıştır. Özellikle obeziteye karşı riskleri azalttığı, diyabet vb. kronik hastalıkları önlemede etkin olduğu, kardiyovasküler rahatsızlıkları azalttığı, kemikleri ve kasları güçlendirdiği gibi akıl sağlığımızı, ruh halimizi iyileştirdiği, depresyon, endişeyi azalttığı, sosyal ilişkileri ve psikolojik iyi olma halimize katkılar sağladığı rapor edilmiştir. Ayrıca, akademik gelişime olumlu etkileri olduğu belirlenmiştir.

Buna rağmen, lise yıllarında öğrencilerin FA düzeyi ve spora katılımları yaşa bağlı olarak ciddi bir şekilde düşmektedir. Alan yazına baktığımızda erken gençlik yıllarında hareketsiz yaşam tarzının arttığı ve özellikle kız öğrencilerde daha yüksek olduğu görülmektedir. Lise öğrencilerinin egzersiz davranışı değişim basamakları ve FA öz-yeterlik düzeyleri hakkında ulaşılan alan yazında sınırlı bilgi mevcuttur.

*Araştırmanın Amacı:* Bu çalışmanın amacı lise öğrencilerinin FA katılımında engelleri aşmada FA öz-yeterlik ve Egzersiz Davranışı Değişim Basamakları (EDDB) düzeylerini cinsiyet, yaş ve okul türü değişkenleriyle incelemektir. Araştırma soruları ise; (1) Lise öğrencilerinin EDDB düzeyleri ile cinsiyet, okul türü arasında fark var mıdır?, (2) Lise öğrencilerini FA öz-yeterlik ile EDDB arasında fark var

mıdır?, (3) Lise öğrencilerinin FA öz-yeterlik düzeyleri ile cinsiyet, yaş, okul türü arasında fark var mıdır? şeklindedir.

*Araştırmanın Yöntemi:* Marmara Bölgesindeki bir il merkezi ve ilçeleri seçilen çalışmada farklı okul türlerinde okuyan lise öğrencilerine tarama deseniyle ulaşılmıştır. Örnekleme yöntemi, tabakalı örnekleme olup her bir okulda (temsil oranı=%25) katılımcılar belirlenmiştir. İl Milli Eğitim Müdürlüğü ve Etik Kurul onayı ile okullara gidilerek uygun saatler belirlenmiş ve 21 lise (İl Merkezi=6, İlçeler=15) araştırmaya katılmayı kabul etmiştir. Çalışmanın örneklem sayısı ilde okuyan toplam öğrenci sayısının (n=22,491) %5'ine ulaşmak olmuştur. Örneklem sayısı anketler incelenerek boş, yanlış ve eksik olan anketler çıkartılarak (n=1283) olarak hesaplanmıştır. Katılımcılar "Egzersiz Davranışı Değişim Basamakları" ile "Fiziksel Aktivite Öz-Yeterlik" anketlerini doldurmuştur. Veri analizinde betimleyici istatistik, Pearson Ki-Kare testi ve Çok Yönlü Varyans Analizi [Multivariate Analyses of Variance (MANOVA)] uygulanmıştır.

*Araştırmanın Bulguları:* Veri toplama aracı olan fiziksel aktivite öz-yeterlik anketi, açımlayıcı faktör analizi (n=629) ve doğulayıcı faktör analizi (n=261) ile geçerlik ve güvenilirliği sağlanmıştır. Elde edilen bulgulara göre (n=393) erkek öğrencilerin kız öğrencilere göre daha üst egzersiz davranışı değişim basamaklarında ve yüksek düzeyde FA öz-yeterlik seviyelerinde oldukları görülmüştür. Lise öğrencilerinin egzersiz davranışı değişim basamakları dağılımlarına baktığımızda: aktif olmayan basamaklarda (n<sub>egilim-öncesi</sub>, eğilim ve hazırlık=216, 54.9%) ve aktif basamaklarda (n<sub>hareket ve devamlılık</sub>= 177, 45.1%) olduğu saptanmıştır. Egzersiz davranışı değişim basamakları ile cinsiyet [EDDB  $\chi^2(4, n=393) = 14.64, p=0.01$ ] arasında anlamlı fark bulunurken okul türü [ $\chi^2(20, n=393) = 39.42, p > 0.05$ ] arasında istatistiksel olarak anlamlı fark tespit edilmemiştir. Yapılan MANOVA analizi sonuçlarına göre ise FA öz-yeterlik ile EDDB arasında fark belirlenmiştir (Pillai's Trace = .09,  $F_{(12,678)} = 1.92, p < .05$ ). Bu farkın lise öğrencilerinin FA katılımında engelleri aşmada öz-yeterlik ölçeğinin alt boyutlarının tamamından (içsel, kişisel ve sosyal, zaman ilişkili öz-yeterlik) kaynaklandığı görülmüştür. Diğer yandan istatistiksel olarak FA öz-yeterlik ile cinsiyet, yaş ve okul türü arasında anlamlı fark tespit edilmemiştir ( $p > .05$ ).

*Araştırmanın Sonuçları ve Önerileri:* Egzersiz davranışı değişim basamakları ile araştırmaya katılan öğrencilerin cinsiyetin etkili olduğu belirlenmiştir. Kız öğrencilerin düşük düzeyde FA katılımında engelleri aşmada öz-yeterlik ve egzersiz davranışı değişim alt basamaklarında oldukları görülmüştür. İleride yapılacak çalışmalarda kız öğrencilerin FA öz-yeterlikleri ve egzersiz davranış niyetleri esas alınarak basamak temelli deneysel araştırmalar önerilmektedir.

*Anahtar Sözcükler:* Fiziksel aktivite, egzersiz davranışı değişim basamakları, öz-yeterlik, geçerlik, güvenilirlik, lise öğrencileri.