Chapter 18
The Effect of Goal Orientation on Student Achievement

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18.1 Introduction

> There are three things to remember about education. The first one is motivation. The second one is motivation. The third one is motivation.
>
> -Terrell Bell (cited in Maehr and Meyer 1997, p. 372)

Many variables affect the process of reaching education goals. While some of those variables are environmental (Higgins et al. 2005), others are affective ones such as beliefs (Ernest 1989), attitudes (Ma 1997) and motivation (Elliot 1999). The environmental factors which are mostly independent from the individual include variables such as classroom, teacher quality and classroom size, while the affective factors include the perspectives of the individuals towards teaching and learning activities, perceptions of success and the enjoyment from various the endeavors.

All the factors mentioned above are crucial because of their relationship with individuals' achievement either directly or indirectly. Apart from the effects of these factors on achievement, a recent trend in the literature has been to seek the relationship between goal orientation and academic achievement (e.g. Chen and Wong 2015a; Johnson 2012; Weidinger et al. 2016). Many theories in the field of cognitive studies, such as the cognitive development theory of Vygotsky (1980), focus on the cognitive activities which develop understanding and the learning of individuals. Goal orientation theory differs from these theories, and it focuses on the affective domain since it is related with the motivation that guides understanding rather than with the cognitive processes which affect or shape understanding. According to this theory, in order to predict the behavior of an individual who has different motivations the psychological processes of this individual should be

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investigated (Park et al. 2016). Goal orientation examines the reasons or aims behind individuals' behavior (Midgley et al. 1998), it deals with the goals that can bring success and it seeks to find the reasons for which these goals are preferred (Kaplan and Maehr 2007).

Goal orientation is rooted on the theory of Atkinson (1964, as cited in Cellar et al. 2011) which deals with achievement motivation and focuses on the joint influence of motivation to achieving success and avoiding failure. According to goal orientation theory introduced by Dweck (1986), motivation can be guided through performance goals and mastery goals. Button et al. (1996) have also classified goal orientations into two categories: mastery goal and performance goal. Mastery goal orientation is related to learning new things and gaining new skills during the learning process. Mastery goal orientation which is one of the intrinsic motivation sources and is related with the desire of the person is also linked with productivity (Brophy 2005). Students with such goals are aware of the development of proficiency through time and know the importance of effort in achieving proficiency. On the other hand, performance goal orientation is mostly related with factors such as teachers, friends, the environment and family. Performance goal orientation which represents the extrinsic motivation sources of the person (Anderman and Johnston 1998) includes the efforts to satisfy the teachers, friends and the family as well as trying to perform more than anybody else in society in order to feel a valuable individual.

Although the early goal theorists divided goal orientations into two dimensions, some recent researchers have established models with three factors (e.g. VandeWalle 1997) or four factors (Elliot and McGregor 2001). In the four-factor model of goal orientation, the variables of mastery and performance are crossed with the variables of approach and avoid, and the result is a 2×2 framework of goal achievement. Students with mastery-approach goal orientations, mostly prioritize the activities which increase their proficiency level while focusing on their own development. Being aware of self-development is a priority for these students (Brophy 2005). Students with mastery avoidance orientation are the ones who stay away from mislearning and sometimes reject to learn (Pintrich 2000). While students with performance approach participate in tasks in order to prove themselves more successful than others, performance avoidance is related to students who try to stay away from negative critics and to play-act that they are learned (Elliot and McGregor, 2001; Pintrich 2000). These kinds of goals are linked to anxiety, hopelessness and shame (Pekrun et al. 2006). Elliot and McGregor (2001) have established a goal orientation framework as given in Fig. 18.1.

Some examples of this model are given below:

Mastery approach: The goal of Mustafa is to become a successful student in mathematics class, because he loves mathematics.
Mastery avoidance: The goal of Maside is to avoid having any misconceptions during the instructions.
Performance approach: The goal of Buket is to prove to herself and to her family and teachers that she is the most successful student in the class.

Definition

	Absolute/intrapersonal (mastery)	Normative (performance)
Positive (approaching success)	Mastery-approach goal	Performance-approach goal
Negative (avoiding failure)	Mastery-avoidance goal	Performance-avoidance goal

Valence (row label for the two Valence rows)

Fig. 18.1 The 2×2 goal orientation framework (Elliot and McGregor 2001, p. 502)

Performance avoid: The goal of Onur is to avoid being seen as inadequate in biology class.

In the literature, a series of studies examined the relation between goal orientation and academic achievement (e.g. Meissel and Rubie-Davies 2016; Wu 2006; Yeo and Neal 2004). It is expected to have a positive correlation between academic achievement and the approach-orientations, while a low correlation is expected for avoidance orientations. This is because students with avoidance orientations, for instance those who have mastery-avoidance goals, may tend to prefer easy materials or courses. At the same time, students with performance-avoidance goals may hesitate to ask questions and participate in class discussions because they have not learned the discussed subjects well.

The current study examined the effect of goal orientation on student achievement. Furthermore, the moderators that were expected to have a medium effect in this study were identified as follows: (*i*) year of publication, (*ii*) type of publication, (*iii*) country (culture), (*iv*) school subject/assessment type and (*v*) sample group/unit (education level). All these variables, along with the results of previous studies, were used to test the following hypotheses of this study:

H_1 Goal orientation has a positive effect on student achievement.
H_2 Publication type is a moderator for the positive effect of goal orientation on student achievement.
H_3 Sample group is a moderator for the positive effect of goal orientation on student achievement.
H_4 School subject or assessment type is a moderator for the positive effect of goal orientation on student achievement.
H_5 Country is a moderator for the positive effect of goal orientation on student achievement.
H_6 The year of the studies is a moderator for the positive effect of goal orientation on student achievement.

18.2 Method

18.2.1 Study Design

In this study, the effect of goal orientation on student achievement was tested with a meta-analysis design.

18.2.2 Review Strategy and Criteria for Inclusion/Exclusion

To determine the research studies to include in the meta-analysis, the Science-Direct, Proquest and Ebsco academic databases were used to conduct a literature review. For this process, the terms goal orientation and student achievement/student success included in the titles of the studies were used to screen the research studies. The end date for the research studies included in the research was identified as January 2016. Doctoral dissertations and peer-reviewed journals were included in the study.

Many strategies were used to identify the research studies that were appropriate for the meta-analysis of the study. First, a research study pool (426 research studies) was established; it included all studies with goal orientation and student achievement/success in their titles. The abstracts of these studies were reviewed, and all were found to be appropriate to include in the study. In the second stage, all research studies in the pool were examined in detail. The results of the examination found that 154 correlation values belong to 106 different research studies in the pool were appropriate, and the rest was not found to be suitable. The descriptive statistics of the 154 correlation values included in the analysis are presented in Table 18.1.

The criteria for inclusion of the research studies in the analysis study were identified as follows:

- To have the statistical information necessary for correlational meta-analysis (n and r, or R^2 values)
- To be a study measuring the correlation goal orientation and student achievement/success.

Reasons for not including a research study in the meta-analysis:

- Having no quantitative data (qualitative research)
- Not having a correlation coefficient
- Not focusing on student achievement
- Not focusing on goal orientation

Table 18.1 Characteristics of the studies included in the meta-analysis

Options		1	2	3	4	5	6	Total
Type of publication		Thesis/Dissertation	Article					–
	n	37	117					154
	%	24	76					100
Sample group/unit		Elementary school	Middle school	High school	University	Mixed		
	n	17	29	31	76	1		154
	%	11	18.8	20.1	49.4	0.7		100
School subject/Assessment type		Computer	Language	Mathematics	Psychology	Other	Mixed	
	n	9	10	35	10	26	64	154
	%	5.8	6.5	22.7	6.5	16.9	41.6	100
Country		Vertical-collectivist	Horizontal-individualist					
	n	17	137					154
	%	11	89					100
Publication year		…–2000	2001–2005	2006–2010	2011–2016			
	n	21	32	34	67			154
	%	13.6	20.8	22.1	43.5			100

18.2.3 Coding Process

The process was essentially a data sorting process used to ascertain which data were clear and suitable for the study. In this scope, a coding form was developed before the statistical analysis was conducted, and the coding was conducted according to the form. The main aim was to develop a specific coding system that allowed the study to see the entirety of the research studies in general and that would not miss any characteristics of each individual research study. The coding form developed in the study was comprised of:

- References for the research,
- Sample information,
- Type of publication,
- Sample group/unit,
- School subject or assessment type,
- Country,
- The years of the studies,
- Data collection tool(s),
- Quantitative values.

18.2.4 Statistical Processes

The size acquired in meta-analysis is a standard measure value used in the determination of the strength and direction of the relationship in the study (Borenstein et al. 2009). Pearson's correlation coefficient (r) was determined to be the effect size in this study. Because the correlation coefficient has a value between +1 and −1, the r value calculated was evaluated by converting this value into the value as it appears in the z table (Hedges and Olkin 1985). Provided that more than one correlation value is given between the same structure categories in correlational meta-analysis studies, two different approaches are used in the determination of the one to be used in the meta-analysis (Borenstein et al. 2009; Kulinskaya et al. 2008). For this study, (*i*) first, if the correlations were independent, all the related correlations were included in the analysis and were considered to be independent studies, and (*ii*) if there were dependent correlations, then the *highest correlation value* was accepted. A *random effect model* was used for the meta-analysis processes in this study. The *Comprehensive Meta-Analysis* program was used in the meta-analysis process.

18.2.5   Moderator Variables

To determine the statistical significance of the differences between the moderators of the study, only the Q_b values were used. Five moderator variables that were expected to have a role in the average effect size were identified in the study. The first of these considered is the *type of publication* as a moderator in regards to the relationship between goal orientation and student achievement. The second is the *sample group* which was thought to have a role on the average impact of goal orientation on student achievement. The rest are the *school subject/assessment type, country*, and *years of the studies*.

18.2.6   Publication Bias

A funnel plot for the research studies included in the meta-analysis of can be seen in Fig. 18.2. Evidence that publication bias affected the research studies included in the meta-analysis can be seen in Fig. 18.2. A serious asymmetry would be expected in the funnel plot if there were a publication bias. The concentration of plots on one side under the line of average effect size, particularly in the bottom section of the funnel, suggests the probability of a publication bias in the research studies. Evidence for publication bias was observed for the 154 correlation values included in the meta-analysis study.

   A publication bias was observed in the funnel plot, and the results of Duval and Tweedie's trim and fill test, which was applied to determine the effect size related to partiality in the publications that was acquired with the meta-analysis using the
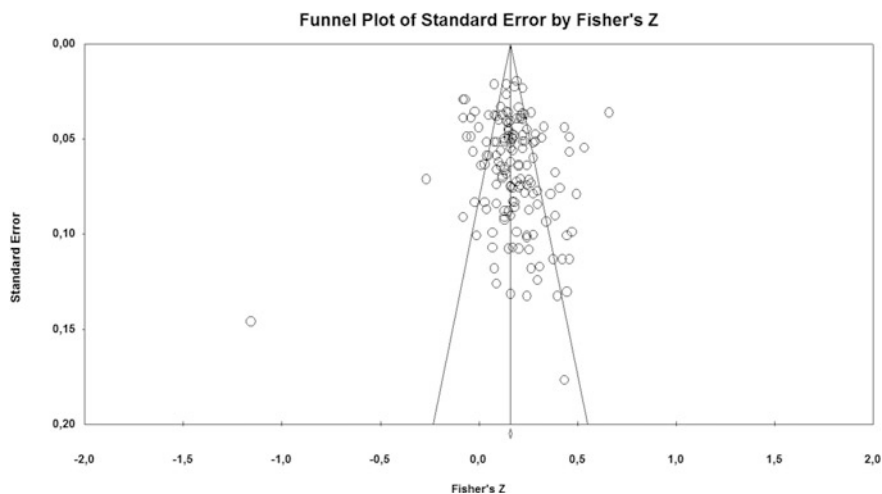

Fig. 18.2 Effect size funnel for publication bias

Table 18.2 Duval and Tweedie's trim and fill test results

	Excluded studies	Point estimate	CI (Confidence interval)		Q
			Lower limit	Upper limit	
Observed values		.17	.15	.19	1077.29726
Adjusted values	38	.12	.10	.14	1856.85663

random effect model, are shown in. As seen in Table 18.2, there is a difference between the observed effect size and the virtual effect size established to correct the effect of the publication bias. The reason for the difference is the asymmetry of the concentration on both sides of the center line and the studies plotted to the left of and above the center line, skewing the symmetry.

18.3 Findings

Table 18.3 shows the results of meta-analysis between student achievement and goal orientation. The findings supported H_1 which argues that there is a positive relationship between student achievement and goal orientation. The effect size of goal orientation on student achievement was calculated to be .17. This value shows that goal orientation has a low level effect (see Cohen 1988) on student achievement.

Results of the moderator analysis showed that H_2 hypothesis regarding the moderator role of publication type on the level of effect of goal orientation on student achievement was not supported. The level of effect of publication type on student achievement was not found to be significant ($Q_b = 1.693$, $p > .05$) in the moderator analysis examined through random effects model. However, publication types included in the meta-analysis such as thesis/dissertation [$r = .15$] and article [$r = .18$] have a low level significant effect on student achievement. The effect sizes of these two publication types are almost the same.

The findings did not also provide support for hypothesis H_3, which the sample group plays a moderator role on the level of effect that goal orientation has on student achievement. Although the moderator analysis did not find a statistically significant difference between the levels of effect between the sample groups ($Q_b = 5.773$, $p > .05$), the level of effect of goal orientation on student achievement is statistically significant for elementary school [$r = .18$], middle school [$r = .13$], high school [$r = .17$], university [$r = .19$] and these effects have been seen to be of a low level, while it is not significant for mixed group [$r = .22$].

Moderator analyses resulted no support for H_4 asserting that school subject is a moderator variable for the effect of goal orientation on student achievement. There is no statistically significant difference in the level of effect for school subjects ($Q_b = 2.627$, $p > .05$). However the level of effect of goal orientation on student

Table 18.3 Findings regarding the relationship between student achievement and goal orientation: Meta-analysis results

Variable	k	N	r	CI (Confidence Interval)		Q	Q_b
				Lower limit	Upper limit		
Student achievement	154	61,191	.17*	.15	.19	1077.297*	
Moderator [Type of publication]							**1.693**
Thesis & Dissertation	37	12,278	.15*	.10	.19		
Article	117	48,913	.18*	.16	.21		
Moderator [sample group]							**5.773**
Elementary school	17	5,888	.18*	.12	.25		
Middle school	29	22,855	.13*	.08	.17		
High school	31	13,759	.17*	.12	.21		
University	76	18,354	.19*	.16	.23		
Mixed	1	335	.22	−.04	.45		
Moderator [School subject/Assessment type]							**2.627**
Computer	9	1,260	.20*	.10	.29		
Language	10	4,282	.18*	.10	.26		
Mathematics	35	20,293	.17*	.13	.22		
Psychology	10	2,298	.14*	.05	.23		
Other	26	4,228	.21*	.15	.26		
Mixed	64	28,830	.16*	.13	.20		
Moderator [Country]							**7.056***
Vertical-collectivist	17	4,020	.26*	.19	.32		
Horizontal-individualist	137	57,171	.16*	.14	.19		
Moderator [Year of publication]							**2.646**
…–2000	21	7,086	.14*	.08	.20		
2001–2005	32	10,570	.18*	.13	.23		
2006–2010	34	12,621	.20*	.15	.25		
2011–2016	67	30,914	.17*	.14	.20		

*$p < .01$
**$p < .05$

achievement is statistically significant for computer [$r = .20$], language [$r = .18$], mathematics [$r = .17$], psychology [$r = .14$], other [$r = .21$] and general achievement [$r = .16$].

Findings supported hypothesis H_5, that country played a moderator role in the effect goal orientation has on student achievement. The moderator analysis showed that the difference between the level of effect of countries was statistically significant ($Q_b = 7.056$, $p < .05$). In this scope, it was found in studies that vertical-collectivist [$r = .26$] and horizontal-individualist [$r = .16$] countries had a low level effect on student achievement. The countries with the highest level of effect were found to be the vertical-collectivist ones.

The research did not find support for H_6 where it was hypothesized that publication year plays a moderator role in goal orientation having an effect on student achievement. The moderator analysis did not reveal a statistically significant difference in the level of effect for publication year of the research studies ($Q_b = 2.646$, $p > .05$). On the other hand, it was found that publication year has a low level effect on student achievement in regard to publications dated before 2000 [$r = .14$], between 2001 and 2005 [$r = .18$], 2006 and 2010 [$r = .20$], and 2011 and 2016 [$r = .17$].

18.4 Conclusion

A total of 154 correlation values which were selected among 106 different studies were included in this meta-analysis aimed at investigating the relationship between goal orientation and academic achievement. Publication type, sample group, school subject/assessment type, country and year of the publication variables were considered as moderators in the current study.

The findings of the meta-analysis show that goal orientation has a low-level effect on student achievement. This result validated H_1, which argued that there would be a positive relationship between goal orientation and student achievement as it is reported by many other research outcomes (e.g. Bayless 2009; Bell and Kozlowski 2002; Cho 2011; Coutinho 2006; Duchesne et al. 2014; Eum and Rice 2011; Gutman 2006; Kitsantas et al. 2009). Thus, it was determined that goal orientation has a positive effect on student achievement. However, the level of mentioned effect was determined *low*. Although this conclusion seems to be unexpected, a meta-analysis study conducted by Carpenter in 2007 revealed similar results (Carpenter 2007). In spite of related studies extending last decade (see Table 18.3), obtained results show that the relation between goal orientation and student achievement has not changed in time.

In the context of moderators, only *country* was found to be a moderator variable. This result is in parallel with the study carried out by Meissel and Rubie-Davies (2016). That is to say, they found that the people who have different cultural backgrounds have different goal orientations. Additionally, there was no significant relationship between publication type, sample group, school subject/assessment type and year of the publication, and student achievement. On that sense, it can be inferred that there is a consistency throughout type of publication. On the other hand, some studies in literature concluded that for any lesson (such as mathematics) positive (e.g. Mägi et al. 2010) or negative (e.g. Peng 2007) relation may be seen between goal orientation and academic achievement. The results obtained in the current meta-analysis study demonstrate that school subject/assessment type is not a significant moderator. Considering time period, the studies which investigate relation between goal orientation and academic achievement appear to be increasing over the years. However, year of publication remain as a consistent variable rather than a moderator.

To sum up, the results of the effect of goal orientation on student achievement is summarized as below:

- Goal orientation has a low-level positive effect on student achievement [$r = .17$]
- The hypotheses H_1 and H_5 were validated while the others were not. In other words, moderator variables of publication type, sample group, school subject/assessment type and year of the publication do not moderate the effect of goal orientation on student achievement, but country variable has been found as a moderator.

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Note. "*" References marked with an asterisk indicate studies included in the meta-analysis. The in-text citations to studies selected for meta-analysis are not followed by asterisks.

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