Perceived Teachers' Goals Scale: Psychometric Properties, Measurement Invariance and Differences across Genders and Grades*

Escala de metas percibidas de los docentes: Propiedades psicométricas, invarianza de medida y diferencias según género y grado escolar

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ABSTRACT

The present study was to investigate the psychometric properties of the perceived teachers' goals scale, the measurement invariance and the differences across genders and grades. Exploratory and confirmatory procedures were applied to the above scale, demonstrating and supporting the underlying dimensionality. The Patterns of Adaptive Learning Surveys-PALS scale was used in a large sample (N = 2 049) including secondary junior (N_1 = 1 342) and senior school (N_2 = 703) students. They responded to self-report questionnaires measuring perceived teacher goals (mastery, performance-approach, and performance-avoidance). The perceived teacher goals the fit measure were: χ^2 = 252.095, df = 63, p < 0.001; CFI = 0.975; TLI = 0.968; RMSEA = 0.040; 90 % CI of RMSEA = (0.035; 0.045); SRMR = 0.038; NFI = 0.967; GFI = 0.998; Reliability measures using Cronbach's alpha and McDonald's omega were all satisfactory ranged between 0.725 and 0.745. In addition, measurement invariance across genders and grades was performed, which along the psychometric properties of the scales support the successful implementation of the present instrument in psychological and educational research. Moreover, gender and grade-group differences in the dimensions of the above scale were examined using analysis of variances, whereas discussion of the findings is provided.

Keywords

achievement goal orientations; perceived teacher goals; self-efficacy; psychometric properties measurement invariance. secondary education.

RESUMEN

El estudio evaluó las propiedades psicométricas de la Escala de Metas Percibidas de los Docentes, examinando su estructura, fiabilidad, invarianza y diferencias según género y grado escolar. Se aplicó la escala Patterns of Adaptive Learning Scales (PALS) en una muestra de 2049 estudiantes de secundaria, divididos en nivel básico (N = 1342) y avanzado (N = 703). Los participantes respondieron

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cuestionarios de autoinforme que midieron la orientación al dominio, al rendimiento con aproximación y al rendimiento con evitación. Los análisis exploratorios y confirmatorios respaldaron la dimensionalidad del instrumento, mostrando adecuados índices de ajuste (CFI = 0.975; TLI = 0.968; RMSEA = 0.040; SRMR = 0.038, entre otros). La fiabilidad, evaluada mediante alfa de Cronbach y omega de McDonald, resultó satisfactoria, con valores entre 0.725 y 0.745. Se comprobó la invarianza de medida entre géneros y grados escolares, lo cual respalda la validez del uso del instrumento en distintos subgrupos. Finalmente, los análisis de varianza permitieron identificar diferencias significativas en las dimensiones de la escala según género y nivel académico. En conjunto, los hallazgos confirman que la escala es un recurso válido y fiable para investigaciones educativas y psicológicas.

Palabras clave

orientaciones de metas de logro; metas docentes percibidas; autoeficacia; propiedades psicométricas; invarianza de medida; educación secundaria.

The Achievement Goal Theory (AGT) of the last decade has been widely used in educational psychology as it can interpret students' attitudes and behavior towards academic learning. AGT suggests the trichotomous model, which can be discriminated into mastery goals, performance-approach goals and performance-avoidance goals, as this model is the most recognizable and acceptable (Elliot & Harackiewicz, 1996). Although 2x2 model was also suggested (e.g., Elliot & McGregor, 2001) it is not supported by all the researchers and it is not observed often especially in students (e.g., Lee & Bong, 2016).

Mastery goals are the most beneficial goals as they are related to adaptive academic patterns in order to comprehend deeply the task. Specifically, students who are mastery-oriented often show high self-efficacy (e.g., Barron & Harackiewicz, 2001; Lüftenegger et al., 2017; Stavropoulou et al., 2023), and they also use strategies in order to master totally the learning task (e.g. Senko, 2019). Furthermore, students who select mastery goals try more and engage in the learning process (e.g., Senko & Dawson, 2017).

On the other hand, performance-approach goals are not such beneficial as mastery goals as its learning outcomes are inconsistent. Students who adopt performance-approach goals try to achieve higher than classmates and endeavor to earn positive comments. Performance-approach goals are associated with positive results when students engage with the task that leads to high learning outcomes and often high achievement (e.g., Al-Emadi, 2001; Church et al., 2001; Pekrun et al., 2009). On the contrary, it may also be related to dysfunctional learning patterns, such as negative emotions (e.g. Bong, 2009) and disrupting behavior (e.g., Sideridis & Stamovlasis, 2014). It is worth mentioning that there are also researches which support no relationship between this specific goal and adaptive learning outcomes (e.g., Senko & Dawson, 2017).

The third achievement goal is the performance-avoidance goal. When someone is oriented towards this goal makes an effort to avoid presenting lack of skills. It is also related to low performance and low interest (e.g., Wimmer et al., 2018). Moreover, this specific category is not associated with adaptive patterns (e.g., Elliot & Hulleman, 2017). Performance-avoidance goals are also associated to disruptive attitudes and cheating behavior (Elliot, 2005; Sideridis, 2005). This goal is also connected with negative emotions, such as anxiety (Kaplan et al., 2002).

The last decades a new perspective has appeared in the scientific field which suggests the multiple goal perspective, which means that a person can adopt two or more goals at the same time. Specifically, there are four types of multiple goals, the specialized goal, the additive goal, the interactive goal and the selective goal (Barron & Harackiewicz, 2001). According to research, the combination between mastery goals and performance-approach goals is the most beneficial combination as students gain mastery of the task from the first goal and high performance from the second goal (e.g., Barron & Harackiewicz, 2001; Schmidt et al., 2020).

Perceived teachers goals

Apart from achievement goal orientations that students adopt in an academic environment, the

stimuli that they perceive play an important role (e.g., Anderman & Maehr, 1994). Teachers often adopt goals and promote them to the learning environment, and these goals can predict students' behavior (Kaplan & Maehr, 1999; Urdan, 2010). Furthermore, teachers' goals are associated to students' goals (e.g., Maulana et al., 2016). When students perceive that their teachers promote clear rules and instructions, recognize errors as part of the learning process and promote deep understanding, effort and mastery of the task then students perceive that their teachers promote mastery goals and for that reason they are mastery oriented (Diseth et al., 2012). According to research, it has been observed that students who are mastery oriented perceive mastery goals from their learning environment (e.g., Bardach et al., 2020). It is also worth mentioning that perceived mastery goals may predict students' engagement (Gonida et al., 2009; Stavropoulou et al., 2023).

On the other hand, when students perceive that their teachers promote those students who have high grades and social comparison is fostered then they perceive that performance goals are promoted. Specifically, when they perceive that accomplishment is fostered they tend to adopt performance-approach goals, whereas when they perceive that the avoidance of failure is promoted then they adopt performance-avoidance goals (Schwinger & Stiensmeier-Pelster, 2011; Wolters, 2004).

Achievement goal orientations between genders and ages

Differences in goal orientations have been identified between genders. Girls, in particular, cooperate more easily than boys, have more perseverance and establish more social relationships (Guan et al., 2006). In addition, an inclination and better performance of girls in artistic activities and languages is identified, while boys in science (Öztürk & Gürbüz, 2013; Wigfield & Eccles, 2002). Several studies show that girls tend to adopt higher mastery goals compared to boys, while the reverse happens for achievement goals (Luo et al., 2011; Meece et al., 2003; Roeser et al., 1996; Schwinger & Wild, 2012). However, Linnenbrink-Garcia et al., (2018) did not identify gender differences in mastery goals and performance goals.

Students' motivation even varies depending on the grade (Diseth & Samdal, 2014). When children start school, e.g. during their primary schooling, they tend to adopt mastery goals, which varies as the grade level increases (Anderman & Young, 1994; Urdan & Midgley, 2003; Xiang & Lee, 2002). Still, studies in younger age students present both the performance-approach goal and the mastery goal, while in older age students' performance-approach and performance-avoidance goals are identified (Senko & Dawson, 2017). High school students are less mastery-oriented and more performance-oriented (Anderman et. al., 1999; Linnenbrink-Garcia et al., 2018; Urdan & Midgley, 2003), which can be explained considering the high demands of the final high school examinations for students' admission to higher education based on a competitive assessment system. Increasing the mastery goal from one grade to another has the potential to bring many benefits yet decreasing it is noticeable and affects the student's performance negatively (Urdan & Midgley, 2003). This occurs primarily during the transition from primary to secondary school but is even more pronounced with the transition to high school.

According to Anderman and Anderman (1999), a decline in mastery goals occurs between ages 5 and 7, while Freeman and Anderman (2005) argue the opposite. Bru et al. (2010) report that, in a sample of Norwegian students, they found no significant changes between ages 5 and 10. Gillet et al. (2012) report a decrease in intrinsic motivation among students aged 9 to 12, while after age 15, an increase in intrinsic motivation becomes evident. In this particular case, the transition from one grade to another plays an important role again. It has even been identified that students' motivation and individual achievement goals are more important for children attending lower secondary school (middle school) than for those attending higher

grades in secondary school (high school) (Diseth & Samdal, 2014).

Students in the early stages of adolescence want to have autonomy in their choices. Obvious changes are therefore identified in individual achievement goals and during students' adolescence (Bong, 2009; Givens-Rolland, 2012; Meece & Miller, 2001). During adolescence, changes also take place in students' behavior and psychology (Urdan & Midgley, 2003). These changes can be enhanced by modifying the school context (Ames & Archer, 1988). During adolescence, students turn their attention mainly to extracurricular activities and this is a major reason why there is a decline in their motivation. According to Urdan and Midgley (2003), students who transit to high school usually become more focused on performance goal and neglect mastery goal. Often, motivation is reduced and behavior is differentiated in adolescents when the learning context changes and achievement goals are promoted compared to mastery goals that existed previously (Meece et al., 2003). However, Gottfried et al. (2001) report that motivation increases during the transition from middle school to high school. Intrinsic motivation increases in the first grade of high school when students begin to become oriented toward specific disciplines (Diseth & Samdal, 2014). This may be the case as in high school students focus on subjects they are most interested in and deemed necessary for their later life and future career (Gillet et al., 2012). When students perceive a transition from the learning goal to the achievement goal or a decrease in the learning goal, there is a decrease in achievement (Urdan & Midgley, 2003).

Assessment in schools related to subject also plays an important role. The transition from middle school to high school is accompanied by more rigorous and standardized assessment, which causes anxiety for students and leads them to adopt performance goals (Anderman & Midgley, 1997). Stamovlasis and Gonida, (2018) report that in Greek primary schools, assessment is not very rigorous, which is not the case in secondary schools, where the subjects, and in particular Modern Greek Language, become more demanding, while assessment becomes more and more rigorous and increases even more in high schools.

Aim of the study and research questions

The present study was to investigate the psychometric properties of the perceived teachers' goals scale, adopted for Greek student population, the measurement invariance and the differences across genders and grades. The following hypotheses were stated:

- The adopted version of perceived teachers' goals scale, holds satisfactory psychometric properties and factorial validity.
-The three dimensions the perceived teacher goals (mastery, performance-approach, and performance-avoidance), demonstrate satisfactory internal consistency coefficients.
- There is measurement invariance of the dimensions of the scale under study across genders and grades.
- There are significant differences between genders and grade-groups in the above three dimensions of the scale.

Method

Participants

The participants in the present study were 2,045 students (aged 13 to 17 years; 49.8% girls) attending junior (N = 1,342) and senior (N = 703) secondary education. Specifically, 543 students were in 7th grade, 502 in 8th grade, and 297 in 9th grade, while 387 students were in 10th grade and 316 in 11th grade. The participants came from 25 schools in Central Macedonia, Greece, with 3 schools from the private sector and 22 from the public sector.

Instruments

The trichotomous model was formulated by employing the Patterns of Adaptive Learning Surveys [PALS] (Midgley et al., 1998) to evaluate three distinct orientations: mastery-goal orientation, performance-approach orientation, and performance-avoidance orientation. Mastery-goal orientation assesses a preference for learning-oriented tasks (e.g., "I find satisfaction in class activities that enhance my understanding, even if errors occur"). Performance-approach orientation measures the desire for success and recognition (e.g., "I would feel a sense of accomplishment if I were the only one capable of answering the teacher's questions"). Performance-avoidance orientation captures the concern for avoiding failure and appearing incompetent (e.g., "It's important to me to avoid looking foolish in front of my classmates"). Each of these orientations is evaluated using a series of survey items. Additionally, PALS (Midgley et al., 1998) was utilized to assess perceived teacher goal orientations, encompassing perceived mastery goals, perceived performance-approach goals, and perceived performance-avoidance orientation. These dimensions include items reflecting students' perceptions of their teachers' instructional priorities. Each dimension of perceived teacher goal orientations is evaluated using a set of five items on the scale.

Procedure

The sample of the current research is an opportunity sample. Ensuring that the research complies with ethical standards, the researcher communicated with the principals of the schools to inform them about the purpose of the research. Having collected consent forms, the questionnaires were distributed to students. They answered in their classroom, while the students who did not participate in the research were engaged in other activities. The questionnaire we used was 7-point Likert scale which included 15 items (5 were related to perceived mastery-approach, 5 were related to perceived performance-approach and 5 to performance-avoidance). This scale has also been used in several researches (Friedel et al., 2007; Stavropoulou et al., 2023; Wolters, 2004).

Analyses

The dimensionality and the structure of Patterns of Adaptive Learning Surveys [PALS] (Midgley et al., 1998) was demonstrated by Exploratory Factor Analysis (EFA) via Principal Axis Factoring (PAF) and consecutively by confirmatory factor analysis (CFA), where multiple fit indexes, such as the chi-square (χ^2), the comparative fit index (CFI), and the root mean square error of approximation (RMSEA), with the usual acceptable values: CFI $\geq$ 0.95, TLI $\geq$ 0.95 and RMSEA $\leq$ 0.05, were used (Geiser, 2013). Reliability was measured as internal consistency via the coefficients Cronbach's alpha and McDonald's omega.

The measurement invariance followed, included four steps. In the first step, the configural invariance, which is the least restrictive model is assessed and served as the base line. In each of the next steps, a more restricted model is examined and compared with the previous one. The second model, is named the metric invariance and concerns the values of factor loadings in each group, testing that the meaning of the construct and the factor variances and covariance are similar across the groups under study. The next model, the scalar invariance, examines whether the item intercepts are equivalent across groups, and if this does not hold, a bias effect might be present, signifying a significant difference between the groups in perceiving the essence of the construct under examination. The last, the strict invariance model concerns the invariance of factor variances and tests if the residual error is equivalent across groups The comparison between invariance models is based on the χ^2 difference test, in tandem with the differences in some core indexes: ΔCFI $<$ 0.01 and ΔRMSEA

< 0.015 for non-rejecting the null hypothesis (e.g., Chen, 2007; Cheung & Rensvold, 2002).

Results

Perceived teacher goals in the classroom

Exploratory Factor Analysis (EFA)

Principal axis factoring (PAF) oblique/promax rotation reveal the number of the underlying dimensions. Bartlett's test of sphericity (χ^2 = 6165.156, $p < 0.001$) and the Kaiser–Meyer–Olkin index (0.813) suggested adequate variance for applying factor analysis. Parallel analysis, along with the Kaiser's Criterion and the corresponding scree plot suggested three-factor structure. The proposed structure is three—dimensional and includes the items (with loading greater to 0.40) showed in Table 1.

The three factors correspond to teacher goals: Mastery, performance-approach and performance- avoidance with eigenvalues 1.899, 1.693, and 1.669 respectively, while the corresponding portions of variance explained were 14.60 %, 13.0 %, and 12.80 % respectively, while the total variance explained was 40.05 %.

Table 1
Perceived teacher goals in the classroom

Variable	Mastery Approach	Performance-Approach	Performance-Avoidance	Uniqueness
Er33_gsmap3	0.652			0.581
E42_gsmap5	0.647			0.605
E28_gsmap2	0.636			0.613
E37_gsmap4	0.602			0.614
E1_gsmap1	0.438			0.806
E30_gsperfap2		0.876		0.373
E39_gspefap4		0.618		0.493
E5_gsperfap1		0.590		0.696
Er32_gsperfap3		0.445		0.558
E31_gsperfav2			0.732	0.454
E40_gsperfav4			0.695	0.546
E45_gsperfav5			0.633	0.617
E13_gsperfav1			0.452	0.784
Eigenvalues	1.899	1.693	1.669	
Variance Explained	0.146	0.130	0.128	
Cumulative Var.	0.146	0.276	0.405	
Alpha, α	0.725	0.746	0.715	
Omega, ω	0.729	0.749	0.723	
Correlation				
1	1			
2	-0.259***	1		
3	-0.029	0.337***	1	
Mean	2.171	1.813	1.969	
SD	0.779	0.734	0.751	

Note. Applied rotation method is promax.
$^{*}p < 0.05$, $^{**}p < 0.01$, $^{***}p < 0.001$

Confirmatory Factor Analysis (CFA) –The measurement model

CFA was applied to the dimensions of perceived teacher-goals in the classroom, and results for the single-factor model were: χ^2 = 2313,923, df = 54, $p < 0.001$, CFI = 0.569, TLI = 0.474, RMSEA = 0.146, SRMR = 0.121, NFI = 0.565. The three-factor model fitted better and satisfactorily to the empirical data possessing the following fit measure indices: χ^2 = 252.095, df = 63, $p < 0.001$; CFI = 0.975; TLI = 0.968; RMSEA = 0.040; 90 % CI of RMSEA = [0.035; 0.045]; SRMR = 0.038; NFI = 0.967; GFI = 0.998]. Comparison of the two models by means of a χ^2 *test* revealed that the three-factor model was substantially improved over the single-factor model ($\Delta_{\chi^2} = 2061.83, df = 9, p < 0.001$). Thus, the hypothesis of the unidimensional structure

was rejected. In addition, by inspecting the standardized residual covariance matrix, which had values smaller than two, the absence of possible model misspecifications was assured. The calculations were carried out in R (via JASP). Table 2 shows the CFA measurement model of the goal structures.

Table 2
CFA measurement model of the goal structures

Factor	Indicator	Symbol	Estimate	*SE*	*Z*	95% Confidence Interval	
						Lower	Upper
Mastery Goal Structure	E1_gsmap1	λ11	0.724	0.031	23.119	0.663	0.786
	E28_gsmap2	λ12	1.052	0.038	28.04	0.979	1.126
	Er33_gsmap3	λ13	1.016	0.036	27.837	0.944	1.088
	E37_gsmap4	λ14	1.129	0.039	29.041	1.053	1.205
	E42_gsmap5	λ15	1.004	0.037	27.427	0.932	1.075
Performance-Approach Goal Structure	E5_gsperfap1	λ21	1.107	0.037	30.307	1.035	1.178
	E30_gsperfap2	λ22	1.388	0.038	36.099	1.313	1.464
	Er32_gsperfap3	λ23	1.463	0.04	36.908	1.385	1.541
	E39_gspefap4	λ24	1.436	0.038	37.768	1.361	1.51
Performance-Avoidance Goal Structure	E13_gsperfav1	λ31	0.884	0.034	25.795	0.817	0.952
	E31_gsperfav2	λ32	1.466	0.042	34.526	1.383	1.549
	E40_gsperfav4	λ33	1.264	0.039	32.496	1.188	1.341
	E45_gsperfav5	λ34	1.077	0.035	30.684	1.008	1.145

Note. All Z values were significant at $p < 0.001$. *SE* = Standard Error.

Reliability analysis

Reliability measures of the three factors were computed using Cronbach's Alpha (α) and McDonald's omega (ω): Perceived teachers' Master Approach goal ($\alpha = 0.725/ \omega = 0.729$), Perceived teachers' Performance Approach goal ($\alpha = 0.746/ \omega = 0.749$), and Perceived teachers' Performance Avoidance goal ($\alpha = 0.715/ \omega = 0.723$). These reliability indices suggest that the present measurements with the PALS-G sub-scales have a satisfactory degree of internal consistency, as was also presented from Gonida et al. (2009) [Table 1]. Omega is actually superior to the traditional Cronbach's alpha measure of reliability in realistic condition reflecting the ratio of true over total variance. It is more appropriate index for non-tau equivalent measurements and more accurate estimation of internal consistency, especially when the assumption that each observable has an identical contribution to the measurement of the latent factor, is violated. We just report both the traditional measure alpha and McDonald's omega for comparison reasons.

Table 1 also shows the correlation matrix of the three dimensions, along with the means and the standard deviations of each factor. Perceived teachers' Master Approach goal is negatively correlated with Perceived teachers' Performance Approach goal ($r = -0.259$, $p < 0.001$) and the latter is positively correlated with Perceived teachers' Performance Avoidance goal ($r = 0.337$, $p < 0.001$).

Measurement invariance

Having ensured validity issues with CFA, measurement invariance was carried out for the two genders. The measurement invariance is a potential hypothesis in psychometrics and for the present scale and population it it addressed for the first time. Table 3 summarizes measurement invariance for gender. The chi-square difference ($\Delta.^2$) test, when comparing each of the invariance models: configural, metric, scalar, and strict invariance model with its predecessor, showed that *p*-values are statistically significant, which might imply a small biases, nevertheless, inspecting the differences in CFI, TLI, RMSEA and SRMR, which are negligible, it be concluded that overall the measurement invariance holds for gender.

Table 3
Perceived teacher goals in the classroom: Measurement invariance for gender and grade

Invariance model	χ^2	*df*	CFI	TLI	RMSEA	SRMR	$\Delta\chi^2$	Δdf	*p*
Model for Gender									
Configural	275.957	121	0.978	0.972	0.037	0.040	275.96	121	
Metric	298.552	131	0.977	0.972	0.037	0.042	22.595	10	0.012
scalar	311.878	144	0.976	0.975	0.035	0.042	13.326	13	0.43
Strict	356.908	157	0.972	0.972	0.037	0.047	45.03	13	0.001
Model for Grade									
Configural	440.038	298	0.980	0.974	0.035	0.050	440.04	298	
Metric	506.302	338	0.976	0.973	0.036	0.054	106.464	40	0.006
scalar	585.117	390	0.973	0.973	0.036	0.057	78.815	52	0.01
Strict	716.848	442	0.961	0.966	0.040	0.065	131.73	52	0.001

Measurement invariance was carried out for the six grade-groups, ranging between grade A-gymnasium to grade B-lyceum. Table 3 summarizes measurement invariance for grades. The chi-square difference ($\Delta.^2$) tests showed statistically significant *p* values, nonetheless, the differences in CFI, TLI, RMSEA and SRMR, are negligible, and thus the overall measurement invariance can be assumed for grades.

Testing the differences among individual characteristics

Differences among individual characteristics were tested via two-way analysis of variance (ANOVA) using the grade and gender as independent variables predicting the perceived teacher goals in the classroom. The analysis revealed statistically significant differences, however with low effect sizes. For the perceived teacher mastery goals, the main effects of gender ($F = 12.68, p < 0.001, \eta^2 = 0.006$) and grade ($F = 10.47, p < 0.001, \eta^2 = 0.02$) are statistically significant, while the interaction gender*grade is not. Figure 1 shows the perceived teachers goals in the classroom as a function of grade and gender. Regarding the perceived mastery goals, girls, in general, appear to perceived higher mastery goals and this appears constant across grades, while, except grade A Gym, boys have lower perceived teacher mastery goals in lyceum.

Regarding the perceived teacher performance-approach goals, the main effects of gender ($F = 8.68, p < 0.01, \eta^2 = 0.004$), grade ($F = 18.45, p < 0.001, \eta^2 = 0.035$) and the interaction term gender*grade ($F = 2.68, p < 0.05, \eta^2 = 0.005$), are statistically significant. Girls tend to declare lower perceived teacher performance-approach goals, while this perceived performance-avoidance goals goal decreases in gymnasium and decreases in lyceum. Regarding the perceived teacher performance-avoidance the main effects of gender ($F = 35.47, p < 0.001, \eta^2 = 0.017$) and grade ($F = 19.29, p < 0.001, \eta^2 = 0.036$) are statistically significant, while the interaction gender*grade is not. Girls tend to declare lower perceived teacher performance-avoidance, goals, while a consistent decline for both genders is observed from grades A-Gymnasium to B-Lyceum.

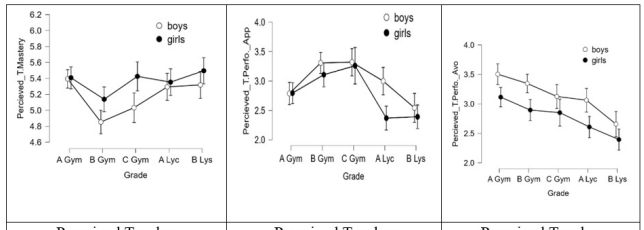

Figure 1.
Perceived teacher goals in the classroom as a function of grade and gender.

Discussion

The adopted version of the perceived teacher goals questionnaire, implemented via PALS (Patterns of Adaptive Learning Surveys) exhibits satisfactory psychometric properties and factorial validity. The study found that the three dimensions of the perceived teacher goals orientations, namely mastery, performance-approach, and performance-avoidance, demonstrated acceptable internal consistency (Hypotheses 1, 2, 3). In addition, measurement invariance across genders and grade levels was demonstrated, ensuring that the relevant concepts are similarly perceived across

genders and grade groups (Hypothesis 4). The results indicate that the scale under study is based on a solid theoretical foundation and could be implemented as a valid means for measuring personal goals and perceived teacher goals in educational settings. Moreover, differences in the mean values of the six dimensions of PALS between the two genders and among grade-groups were found via analysis of variances (Hypothesis 5). Summarizing the current results, can be highlighted that girls adopt more mastery goals than boys, whereas boys tend to adopt higher performance-avoidance goals, results that are in line with previous findings (Diseth & Samdal, 2014; Luo et al., 2011). Performance-approach goals do not differ across genders. Differences among grade-groups were also documented. Mastery goals presented a variability across grades, with an increase from gymnasium to lyceum for both genders. Performance-avoidance goals also showed an increase in gymnasium and a decrease in lyceum for both genders, while performance-approach goals demonstrated a consistent decrease across grades.

Analogously, the perceived teachers' goals our findings revealed that girls perceive that their teachers adopt more mastery goals than boys, whereas boys perceive that their teachers promote more performance-approach and performance-avoidance goals. The perceived performance-approach goals are higher in gymnasium and a lower in lyceum for both genders, while performance- avoidance a goal demonstrated a consistent decrease across grades. These finding suggest that boys and girls, as well as students from different grade levels, may exhibit distinct patterns of personal goal orientations and perceived teacher goals. Further analysis is needed to understand the underlying factors contributing to these differences, which could include societal norms, academic expectations, or motivational influences. The current study also has several limitations that stem from the use of an opportunity sampling procedure and from the fact that one set of cross-sectional data was implemented and the lack of additional test–retest reliability measures. Moreover, issues of content validity might be raised for scales with a small number of items.

However, the finding are in line and support previous reports on PALS implementation (Leondari & Gonida, 2008), while providing more established conclusions by using a large sample and including measurement invariance. The present survey, which has a methodological dimension, bridges the gap between theoretical conjectures and real-world application, by providing a certified instrument that secures valid measurement. Testing the differences across individual characteristics can provide valuable insights to educators and policymakers to design targeted interventions that foster positive goal orientations and academic success for all students. Additionally, researchers should investigate whether these differences persist over time and how they impact academic performance and overall comfort in educational settings.

References

Al-Emadi, A.A. (2001). The relationships among achievement, goal orientation, and study strategies. *Social Behavior and Personality: an international journal, 29*(8), 823–832. https://doi.org/10.2224/sbp.2001.29.8.823

Ames, C. & Archer, J. (1988). Achievement goals in the classroom: Students' learning strategies and motivation processes. *Journal of Educational Psychology, 80*(3), 260–267. https://doi.org/10.1037/0022-0663.80.3.260

Anderman, E. M., & Midgley, C. (1997). Changes in achievement goal orientations, perceived academic competence, and grades across the transition to middle-level schools. *Contemporary Educational Psychology, 22*(3), 269-298. https://doi.org/10.1006/ceps.1996.0926

Anderman, E. M., & Maehr, M. L. (1994). Motivation and schooling in the middle grades. *Review of Educational Research, 64*(2), 287-309. https://doi.org/10.3102/00346543064002287

Anderman, E. M., Maehr, M. L., & Midgley, C. (1999). Declining motivation after the transition to middle school: Schools can make a difference. *Journal of Research & Development in Education, 32*(3), 131–147. https://psycnet.apa.org/record/1999-05484-001

Anderman, E. M., & Young, A. J. (1994). Motivation and strategy use in science: Individual differences and classroom effects. *Journal of Research in Science Teaching, 31*(8), 811-831. https://doi.org/10.1002/tea.3660310805

Anderman, L. H., & Anderman, E. M. (1999). Social predictors of changes in students' achievement goal orientations. *Contemporary Educational Psychology, 24*(1), 21-37. https://doi.org/10.1006/ceps.1998.0978

Bardach, L., Oczlon, S., Pietschnig, J., & Lüftenegger, M. (2020). Has achievement goal theory been right? A meta-analysis of the relation between goal structures and personal achievement goals. *Journal of Educational Psychology, 112*(6), 1197-1220. https://doi.org/10.1037/edu0000419

Barron, K. E., & Harackiewicz, J. M. (2001). Achievement goals and optimal motivation: Testing multiple goal models. *Journal of Personality and Social Psychology, 80*(5), 706-722. https://doi.org/10.1037/0022-3514.80.5.706

Bong, M. (2009). Age-related differences in achievement goal differentiation. *Journal of Educational Psychology, 101*(4), 879-896. https://doi.org/10.1037/a0015945

Bru, E., Stornes, T., Munthe, E., & Thuen, E. (2010). Students' perceptions of teacher support across the transition from primary to secondary school. *Scandinavian Journal of Educational Research, 54*(6), 519-533. https://doi.org/10.1080/00313831.2010.522842

Chen, F. F. (2007). Sensitivity of goodness of fit indexes to lack of measurement invariance. *Structural Equation Modeling: A multidisciplinary journal*, 14(3), 464-504. https://doi.org/10.1080/10705510701301834

Cheung, G. W., & Rensvold, R. B. (2002). Evaluating goodness-of-fit indexes for testing measurement invariance. *Structural Equation Modeling, 9*(2), 233-255. https://doi.org/10.1207/S15328007SEM0902_5

Church, M. A., Elliot, A. J., & Gable, S. L. (2001). Perceptions of classroom environment, achievement goals, and achievement outcomes. *Journal of Educational Psychology, 93*(1), 43-54. https://doi.org/10.1037/0022-0663.93.1.43

Diseth, Å., Danielsen, A. G., & Samdal, O. (2012). A path analysis of basic need support, self-efficacy, achievement goals, life satisfaction and academic achievement level among secondary school students. *Educational Psychology, 32*(3), 335-354. https://doi.org/10.1080/01443410.2012.657159

Diseth, Å., & Samdal, O. (2014). Autonomy support and achievement goals as predictors of perceived school performance and life satisfaction in the transition between lower and upper secondary school. *Social Psychology of Education, 17*, 269-291. https://doi.org/10.1007/s11218-013-9244-4

Elliot, A. J. (2005). A conceptual history of the achievement goal construct. In A. J., Elliot & C. S., Dweck (Eds.) *Handbook of Competence and Motivation*, (pp. 52–72). Guilford Publications.

Elliot, A. J., & Harackiewicz, J. M. (1996). Approach and avoidance achievement goals and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology, 70*(3), 461-475. https://doi.org/10.1037/0022-3514.70.3.461

Elliot, A. J., & Hulleman, C. S. (2017). Achievement goals. In A. J. Elliot, C. S. Dweck, & D. S. Yeager (Eds.), *Handbook of competence and motivation: Theory and Application* (pp. 43–60). The Guilford Press. https://psycnet.apa.org/record/2017-17591-004

Elliot, A. J., & McGregor, H. A. (2001). A 2×2 achievement goal framework. *Journal of Personality and Social Psychology, 80*(3),

501-519. https://doi.org/10.1037/0022-3514.80.3.501

Friedel, J. M., Cortina, K. S., Turner, J. C., & Midgley, C. (2007). Achievement goals, efficacy beliefs and coping strategies in mathematics: The roles of perceived parent and teacher goal emphases. *Contemporary Educational Psychology, 32*(3), 434-458. https://doi.org/10.1016/j.cedpsych.2006.10.009

Freeman, T. M., & Anderman, L. H. (2005). Changes in Mastery Goals in Urban and Rural Middle School Students. *Journal of Research in Rural Education, 20*(1), 1-13. http://www.umaine.edu/jrre/20-1.pdf

Gillet, N., Vallerand, R. J., & Lafrenière, M. A. K. (2012). Intrinsic and extrinsic school motivation as a function of age: The mediating role of autonomy support. *Social Psychology of Education*, 15, 77-95. https://doi.org/10.1007/s11218-011-9170-2

Givens-Rolland, R. (2012). Synthesizing the evidence on classroom goal structures in middle and secondary schools: A meta-analysis and narrative review. *Review of Educational Research, 82*(4), 396-435. https://doi.org/10.3102/0034654312464909

Geiser, C. (2012). *Data analysis with Mplus*. Guilford press.

Gonida, E. N., Voulala, K., & Kiosseoglou, G. (2009). Students' achievement goal orientations and their behavioral and emotional engagement: Co-examining the role of perceived school goal structures and parent goals during adolescence. *Learning and Individual differences, 19*(1), 53-60. https://doi.org/10.1016/j.lindif.2008.04.002

Gottfried, A. E., Fleming, J. S., & Gottfried, A. W. (2001). Continuity of academic intrinsic motivation from childhood through late adolescence: A longitudinal study. *Journal of Educational Psychology, 93*(1), 3-13. https://doi.org/10.1037/0022-0663.93.1.3

Guan, J., Xiang, P., McBride, R., & Bruene, A. (2006). Achievement goals, social goals, and students' reported persistence and effort in high school physical education. *Journal of Teaching in Physical Education, 25*(1), 58-74. https://doi.org/10.1123/jtpe.25.1.58

Kaplan, A., Gheen, M., & Midgley, C. (2002). Classroom goal structure and student disruptive behaviour. *British Journal of Educational Psychology, 72*(2), 191-211. https://doi.org/10.1348/000709902158847

Kaplan, A., & Maehr, M. L. (1999). Achievement goals and student well-being. *Contemporary Educational Psychology, 24*(4), 330-358. https://doi.org/10.1006/ceps.1999.0993

Lee, M., & Bong, M. (2016). In their own words: Reasons underlying the achievement striving of students in schools. *Journal of Educational Psychology*, 108(2), 274-294. https://doi.org/10.1037/edu0000048

Leondari, A., & Gonida, E. N. (2008). Adolescents' possible selves, achievement goal orientations, and academic achievement. *Hellenic Journal of Psychology, 5*, 179-198.

Linnenbrink-Garcia, L., Wormington, S. V., Snyder, K. E., Riggsbee, J., Perez, T., Ben-Eliyahu, A., & Hill, N. E. (2018). Multiple pathways to success: An examination of integrative motivational profiles among upper elementary and college students. *Journal of Educational Psychology, 110*(7), 1026-1048. https://doi.org/10.1037/edu0000245

Lüftenegger, M., Tran, U. S., Bardach, L., Schober, B. & Spiel, C. (2017). Measuring a mastery goal structure using the TARGET framework. *Zeitschrift für Psychologie, 225*(1). https://doi.org/10.1027/2151-2604/a000277

Luo, W., Paris, S. G., Hogan, D., & Luo, Z. (2011). Do performance goals promote learning? A pattern analysis of Singapore students' achievement goals. *Contemporary Educational Psychology, 36*(2), 165-176. https://doi.org/10.1016/j.cedpsych.2011.02.003

Maulana, R., Opdenakker, M. C., & Bosker, R. (2016). Teachers' instructional behaviors as important predictors of academic motivation: Changes and links across

the school year. *Learning and Individual Differences, 50*, 147-156. https://doi.org/10.1016/j.lindif.2016.07.019

Meece, J. L., & Miller, S. D. (2001). A longitudinal analysis of elementary school students' achievement goals in literacy activities. *Contemporary Educational Psychology, 26*(4), 454-480. https://doi.org/10.1006/ceps.2000.1071

Meece, J. L., Herman, P., & McCombs, B. L. (2003). Relations of learner-centered teaching practices to adolescents' achievement goals. *International Journal of Educational Research, 39*(4-5), 457-475. https://doi.org/10.1016/j.ijer.2004.06.009

Midgley, C., Kaplan, A., Middleton, M., Maehr, M. L., Urdan, T., Anderman, L. H., Anderman, E., & Roeser, R. (1998). The development and validation of scales assessing students' achievement goal orientations. *Contemporary Educational Psychology, 23*(2), 113-131. https://doi.org/10.1006/ceps.1998.0965

Öztürk, G., & Gürbüz, N. (2013). The impact of gender on foreign language speaking anxiety and motivation. *Procedia-social and behavioral Sciences, 70*, 654-665. https://doi.org/10.1016/j.sbspro.2013.01.106

Pekrun, R., Elliot, A. J., & Maier, M. A. (2009). Achievement goals and achievement emotions: Testing a model of their joint relations with academic performance. *Journal of Educational Psychology, 101*(1), 115-135. https://doi.org/10.1037/a0013383

Roeser, R. W., Midgley, C., & Urdan, T. C. (1996). Perceptions of the school psychological environment and early adolescents' psychological and behavioral functioning in school: The mediating role of goals and belonging. *Journal of Educational Psychology, 88*(3), 408-422. https://doi.org/10.1037/0022-0663.88.3.408

Schmidt, A., Neubauer, A. B., Dirk, J., & Schmiedek, F. (2020). The bright and the dark side of peer relationships: Differential effects of relatedness satisfaction and frustration at school on affective well-being in children's daily lives. *Developmental Psychology, 56*(8), 1532-1546. https://doi.org/10.1037/dev0000997

Schwinger, M., & Stiensmeier-Pelster, J. (2011). Performance-approach and performance-avoidance classroom goals and the adoption of personal achievement goals. *British Journal of Educational Psychology, 81*(4), 680-699. https://doi.org/10.1111/j.2044-8279.2010.02012.x

Schwinger, M., & Wild, E. (2012). Prevalence, stability, and functionality of achievement goal profiles in mathematics from third to seventh grade. *Contemporary Educational Psychology, 37*(1), 1-13. https://doi.org/10.1016/j.cedpsych.2011.08.001

Senko, C. (2019). When do mastery and performance goals facilitate academic achievement? *Contemporary Educational Psychology, 59*, 101795. https://doi.org/10.1016/j.cedpsych.2019.101795

Senko, C., & Dawson, B. (2017). Performance-approach goal effects depend on how they are defined: Meta-analytic evidence from multiple educational outcomes. *Journal of Educational Psychology, 109*(4), 574-598. https://doi.org/10.1037/edu0000160

Sideridis, G. D. (2005). Goal Orientation, Academic Achievement, and Depression: Evidence in Favor of a Revised Goal Theory Framework. *Journal of Educational Psychology, 97*(5), 366-375. https://doi.org/10.1037/0022-0663.97.3.366

Sideridis, G. D., & Stamovlasis, D. (2014). The role of goal orientations in explaining academic cheating in students with learning disabilities: An application of the cusp catastrophe. *Ethics & Behavior, 24*(6), 444-466. https://doi.org/10.1080/10508422.2013.877393

Stamovlasis, D., & Gonida, S. E. N. (2018). Dynamic Effects of Performance-Avoidance Goal Orientation on Student Achievement in Language and Mathematics. *Nonlinear Dynamics, Psychology, and Life Sciences, 22*(3), 335-358. https://europepmc.org/article/med/29908058

Stavropoulou, G., Stamovlasis, D., & Gonida, S. E. (2023). Probing the effects of perceived teacher goals and achievement-goal orientations on students' self-efficacy, cognitive and metacognitive strategies in writing: A person-centered approach. *Learning and Motivation, 82*, 101888. https://doi.org/10.1016/j.lmot.2023.101888

Urdan, T. (2010). The challenges and promise of research on classroom goal structures. In J. L., Meece, & J. S., Eccles (Eds.), *Handbook of research on schools, schooling, and human development* (pp. 110-126). Routledge. https://doi.org/10.4324/9780203874844

Urdan, T., & Midgley, C. (2003). Changes in the perceived classroom goal structure and pattern of adaptive learning during early adolescence. *Contemporary Educational Psychology, 28*(4), 524-551. https://doi.org/10.1016/S0361-476X(02)00060-7

Wigfield, A., & Eccles, J. S. (2002). Chapter 4 -The development of competence beliefs, expectancies for success, and achievement values from childhood through adolescence. In A., Wigfield, & J. S., Eccles (Eds.), *Educational Psychology, Development of Achievement Motivation* (pp. 91-120). Academic Press. https://doi.org/10.1016/B978-012750053-9/50006-1

Wimmer, S., Lackner, H. K., Papousek, I., & Paechter, M. (2018). Goal orientations and activation of approach versus avoidance motivation while awaiting an achievement situation in the laboratory. *Frontiers in Psychology, 9*, 1552. https://doi.org/10.3389/fpsyg.2018.01552

Wolters, C. A. (2004). Advancing Achievement Goal Theory: Using Goal Structures and Goal Orientations to Predict Students' Motivation, Cognition, and Achievement. *Journal of Educational Psychology, 96*(2), 236-250. https://doi.org/10.1037/0022-0663.96.2.236

Xiang, P., & Lee, A. (2002). Achievement goals, perceived motivational climate, and students' self-reported mastery behaviors. *Research Quarterly for Exercise and Sport, 73*(1), 58-65. https://doi.org/10.1080/02701367.2002.10608992

Notes

* Research article.