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Students' Performance in Physical Education: The Role of Differential Achievement Goals and Self-Regulated Learning

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Abstract: The purpose of this study was to examine the relationship between differential achievement goals and self-regulated learning, as well as motivational mechanisms' consequences for performance in physical education. This was done by using the 2 × 2 achievement goals framework, and the cyclical model for self-regulated learning. The participants (N = 571, 51.7% girls) were physical education students in grades 11–13 from two upper secondary schools in Norway. A cross-sectional questionnaire was conducted, and data were analysed with a multiple-regression-based structural equation model. The modified structural model yielded an adequate fit (X^2 = [df = 124] 429.79, $p < 0.01$; RMSEA = 0.07; CFI = 0.93), and results revealed that achievement goals have consequences for students' self-regulation in physical education. More specifically, mastery goals have a positive association with self-regulation, whereas performance avoidance is found to have a negative association. Further, the results support claims that self-regulated learning plays a role in students' performance. Finally, the model showed that self-regulation mediates the relationship between mastery approach goals and performance avoidance goals in relation to performance.

Keywords: physical education; achievement motivation; self-regulated learning; academic performance; structural equation modeling

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1. Introduction

Physical education (PE) is widely seen as an important subject for developing motoric skills and knowledge about healthy living. For instance, stimulating lifelong participation in physical activity is highlighted in the Norwegian curriculum [1]. To achieve such a goal, students' fulfilment of the learning aims can be considered essential. These aims include competence in training, health, sportsmanship, cooperation with other students, and applying effort to reach one's goals [1]. In PE, the learning activities often concentrate on learning through movement. Previous studies on learning and performance in PE have revealed that the content in the subject may create a difference in students' attainment of the learning aims [2–5]. However, there is less knowledge about the influence of social-cognitive mechanisms on performance in PE.

The aim of the present article was to study the relation between differential achievement goals and self-regulated learning (SRL), as well as these mechanisms' consequences for performance in PE. Theoretical models emphasise that self-regulated students set clear and realistic goals, use strategies to adjust their learning, and reflect on the learning activity afterward. Zimmerman [6,7] describes this as crucial for the effectiveness of the learning and a key element for success in the learning process. Further, students' purpose of task engagement seems to influence their learning. In particular, it is claimed that focussing on one's mastery of the task is beneficial. Such mastery goals are associated with positive outcomes, including effort, engagement, and positive feelings [8]. Task goals focussing on performance, on the other hand, are linked to a negative set of processes and outcomes [8,9].

A central definition of SRL is that it involves planning, monitoring, and adjusting one's learning to achieve one's goal [10]. Self-regulation is therefore frequently related to

showing autonomy in the learning situation. Furthermore, achievement goals are defined as the purpose of task engagement where a specific type of goal adopted affects how individuals interpret and experience achievement settings [8]. In achievement goal theory (AGT) it is emphasised that personal goals provide meaning to the activity [11]. The focus is on why individuals have a goal and what reasons underlie students' motivation.

Studying whether motivational and cognitive processes form the basis for students' learning and performance is of interest in order to support and facilitate these. Despite their conceptual similarities, the consequences of achievement goals and self-regulation in PE are rather undefined in research. As pointed out by Zimmerman [6], it is important to see the link between motivational factors and self-regulating processes, and how this influences learning. Thus, including all three variables in the same model seems appropriate. The objective of this study was to investigate the relationship between differential achievement goals and SRL and their influence on performance in PE among secondary school students. The research questions which guided this research were: (a) To what extent is there a relationship between differential achievement goals and self-regulated learning in secondary school PE? and (b) To what extent do achievement goals and self-regulation have an influence on students' performance in secondary school PE?

Students' differential achievement goals have been investigated through the 2 × 2 achievement goal framework produced by Elliot and colleagues [8,9,12–14]. The model is advantageous because it distinguishes students according to which criteria they use to assess their competence and success in the activity. Essential in the 2 × 2 model is the distinction between mastery and performance goals. Students with mastery goals focus on the development of competence or task mastery, while performance goals focus on demonstrating competence relative to other students. Further, motivation in the 2 × 2 model differs as a function of valence [8]; behaviour is instigated by a positive possibility in approach motivation, whereas avoidance motivation is directed by a negative possibility. Previous studies have especially used this model in relation to SRL, as well as explaining different performance outcomes in PE. The two dimensions lead to a 2 × 2 framework consisting of mastery-approach (MAp), mastery-avoidance (MAv), performance-approach (PAp), and performance-avoidance (PAv).

Students with a MAp goal consider competence based on personal attainment in the task [9,14] and will strive to develop and improve their competence. For example, the task that lies ahead is seen as a challenge, and thus creates a sense of engagement, which in turn encourages cognitive and affective responses in the activity to achieve self-improvement [15]. The other mastery goal, MAv, concerns avoiding personal or intrapersonal incompetence in the task [9,14], in addition to focussing on not producing an inferior performance to previous achievements [16]. Students with a PAp goal focus on attaining normative competence [8,16], aiming to perform as well as or better than others in the same group [17,18]. Students with a PAv goal similarly identify competence based on normative considerations but with a focus on avoiding normative incompetence [8]. For instance, Skaalvik [19] points out that PAv includes a fear of being negatively evaluated by others.

Zimmerman's cyclical model [6,7,20,21] is used as a framework to study students' self-regulation in PE (Figure 1). The model provides a holistic view of the learning process from planning to evaluation, and further ensures a comprehensive description of the components in SRL. The model is a dominant theoretical framework used in studies concerning self-regulation in both academic domains and PE. In the cyclical model, a student's learning processes and motivational beliefs fall into three phases: forethought, performance, and self-reflection [7,21]. Since the model is cyclical, this means that the different phases affect each other. Consequently, the outcome of these phases will also have consequences for future participation in cyclical processes.

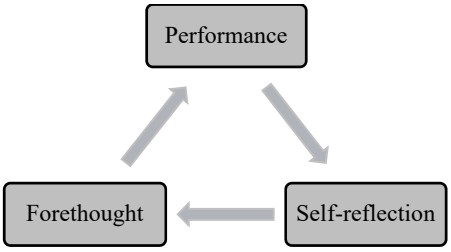

Figure 1. Zimmerman's cyclical model of self-regulated learning [22].

The forethought phase, which occurs before the learning activity, includes task analysis with goal setting and strategic planning, as well as self-motivational beliefs [21,23]. These factors are considered crucial for students' involvement in the upcoming task or activity. The next phase—performance—involves the use of various self-controlling techniques and self-observation, such as imagery, attention focussing, and help-seeking behaviour [23]. Such self-regulating techniques are used during the learning activity where the purpose is to achieve the goals set in the forethought phase. Finally, the self-reflection phase takes place after the learning activity is completed, and this includes students evaluating and responding to their learning by making attributions and adjustments if necessary [24].

1.1. Links from Differential Achievement Goals to Self-Regulation

A central assumption in the cyclical model is that motivational beliefs and self-regulating processes interact through the three phases [25], and it appears that achievement goals are essential for producing SRL in different contexts [8,26–28]. Though this relationship has been mostly found in academic subjects, similar effects are expected in PE. However, previous studies in PE that examine the relationship between achievement goals and SRL are limited. A study by Ommundsen [29] showed that both mastery and the performance motivational climate was related to MAp, which in turn had a positive relationship with metacognitive strategies, searching for help, and effort regulation. In addition, both motivational climates led to PAp, with a positive influence on metacognitive strategies and effort regulation. Performance motivational climate had a relationship to PAv, with a negative effect on effort regulation and a positive association with self-handicapping. Self-handicapping can be seen as a maladaptive form of SRL, including various processes that inhibit learning. Earlier studies by Ommundsen [30,31] also support the proposition that PAv has a positive connection with self-handicapping. A longitudinal study by Cecchini-Estrada and Méndez-Giménez similarly illustrated that MAp had a positive association with SRL [32]. Furthermore, Laxdal and colleagues found that both motivational climates, as well as teacher learning support, had a positive effect on SRL [33].

Findings in the PE context are supported by a series of meta-studies conducted in a variety of school contexts. These studies show that mastery goals are linked to adaptive self-regulatory processes and outcomes for students, whereas PAv has frequently been linked to maladaptive learning outcomes [15,34,35]. Unlike the other three achievement goals, the association between PAp goals and SRL is relatively unclear, with both a positive and a negative relationship experienced in academic subjects [36,37]. Cecchini-Estrada and Méndez-Giménez's study of PE revealed that PAp had no effect on the SRL techniques of planning and self-checking, but a significant positive relation to effort [32].

1.2. Links of Self-Regulation to Performance in PE

In addition to the likely influence of achievement goals on SRL, the theoretical literature on self-regulation indicates that SRL is an important mechanism in predicting students' learning and performance in school. For example, it is emphasised that SRL is a process that involves proactively controlling behaviour, and using different strategies to succeed with personal goals [24]. Previous studies support this to a large degree and show that SRL has a positive relationship with learning across several subjects in school [38–42]. Essentially, the

students who perform better have been found to use self-regulatory techniques more effectively than those who perform less well, particularly in academic contexts [43]. Moreover, studies in PE have been centred around the positive relationship SRL has with the learning of motoric skills. For example, earlier studies from the US highlight a positive connection between the use of self-regulatory strategies and the learning of motoric skills [27,44,45].

Greek researchers later expanded these studies and found similar positive effects of SRL for students' learning of motoric skills and achievement in PE [46–49]. For example, their work shows that students learn more efficiently when they have been instructed in the use of SRL strategies [50–52]. Elliot's study further shows that SRL mediates the relationship between achievement goals and performance, something they supported through two studies in academic subjects [8]. Previous studies from the US also suggest that MAp and the use of SRL (e.g., self-recording and self-talk) led to better learning of motoric skills in PE [44,45,53]. However, the mediating effect of SRL between achievement goals and performance has been given little attention in previous studies in PE.

2. Materials and Methods

2.1. Participants and Procedure

The participants were students from two upper secondary schools in the southern district of Norway. The students were recruited from all three grade levels at the schools, including grades 11, 12, and 13. A total of 634 students received the questionnaire. However, only students who completed the questionnaire were included in further analysis (N = 571, 51.3% women). By using chi-square, it was tested whether there were any differences between the full sample and the final sample. No significant differences related to either gender or age were detected. The final number of students from each grade was thus 310 from grade 11, 161 from grade 12, and 100 participants from grade 13. Due to the ongoing COVID-19 pandemic, students from the first school answered the questionnaire on paper (N = 408), while students from the second school answered online (N = 226). The study had a cross-sectional design and was conducted during February in spring of 2021. Finally, the study was approved by the Norwegian Social Science Data Service (NSD).

2.2. Measures

Achievement goal orientations were measured using Achievement Goal Questionnaire in Sport (AGQ-S: [54]). AGQ-S consists of 12 items measuring the four achievement goals in the 2 × 2-model: MAp, MAv, PAp, and PAv. The questions in AGQ-S are made to measure how students strive for competence or avoid incompetence. Each of the achievement goals was measured using three questions. The latent variable for MAp was constructed with questions 5, 8, and 10 in the questionnaire; for MAv, it was formed with questions 4, 6, and 13; for PAp, questions 7, 11, and 14; and finally, questions 9, 12, and 15 were the latent variable for PAv. Scores are given on a Likert scale ranging from 1 = 'not at all like me' to 7 = 'completely like me'. Examples of items are 'In PE, it is important for me to do well compared to others', and 'In PE, I just want to avoid performing more poorly than others'. The AGQ-S instrument has previously been found to demonstrate suitable validity and internal consistency for measuring achievement goals in sports contexts [54].

A subscale of the Motivated Strategies for Learning Questionnaire (MSLQ: [55]) was used to measure self-regulated learning. The subscale was made suitable for use in the PE context by Laxdal [4]. The MSLQ is based on a cognitive view of motivation and learning strategies, including the use of different cognitive and metacognitive ones. The scale applied is intended to capture the three basic elements of Zimmerman's cyclical model: forethought, performance, and self-reflection. The instrument was composed of nine items measured on a seven-point Likert scale. Here is an example of one included item: 'Before the activities start, I think about the things I will need to do to learn'. MSLQ has previously been shown to have satisfactory construct validity and internal consistency in the academic context [55,56] and in PE [4].

Students' performance in PE was measured by self-reporting grades from last semester. This was done by using the following question: 'What grade did you get last semester?'. The students could answer this question on a scale from 0–7, where the answer 0 was 'not assessed' and 1–6 expressed the grade scale. Higher numbers express greater performance in the subject. Grades are supposed to reflect the students' overall competence in PE [1] and have been widely used in previous studies to measure school performance in relation to SRL [43]. Self-reported grades have been found to correlate strongly with actual grades, and even though students have a small tendency to over-report their performance, self-reported grades are believed to be accurate indicators of actual grades [57,58].

2.3. Statistical Analysis

Data were analysed using Stata software version 16.1. The analysis included testing four exogenous (MAp, MAv, PAp, and PAv) and two endogenous variables (SRL and performance) in a structural model. All variables were measured as latent constructs, except performance, which was directly observed [59]. Estimation of the unknown regression parameters was performed using maximum likelihood (ML). Prior to placing the latent constructs in the structural model, several tests were utilised. Indicator reliability was used to give a sufficient measure of the latent constructs, which could be done since the constructions are reflective. Indicator reliability was obtained from squaring outer loadings and should have been greater than 0.4 for each item [60]. In addition, internal consistency was assessed using Raykov's rho [61], which is considered less exposed to over- and underestimation of scale reliability than Cronbach's alpha [62]. According to DeVellis [63], values over 0.7 are acceptable for internal consistency.

The measurement model, which is a confirmatory factor analysis (CFA), tested the factor structure of each of the latent constructions. As recommended by Kline [64], the model fit was evaluated by using the chi-square likelihood ratio (X^2), the standardised root-mean-square residual (SRMR), the root-mean-square error of approximation (RMSEA), the comparative fit index (CFI), and the Tucker–Lewis index (TLI). As X^2 is compared to a so-called saturated model, non-significant *p*-values are favourable. SRMR and RMSEA should be equal to or lower than 0.1 to be adequate [65,66], and the values for CFI and TLI should be close to, or higher than, 0.9 [67].

There are certain assumptions that form the basis for the analyses. A necessary condition for estimating parameters and testing model fit is that the degrees of freedom are over-identified [68], which was the case for the modified and final model (df > 0). Latent variables must also be assigned a common metric for model identification. Thus, one indicator per latent variable was fixed to 1, meaning that the constructs are standardised [69]. Finally, the data must originate from multivariate normality to be unbiased and effective [70]. This was handled by only including continuous variables in the model.

The theoretical frameworks and previous studies form the basis for a hypothesised model (Figure 2). The model consists of both a measurement part and a structural model as seen below. All modifications of this model were reported.

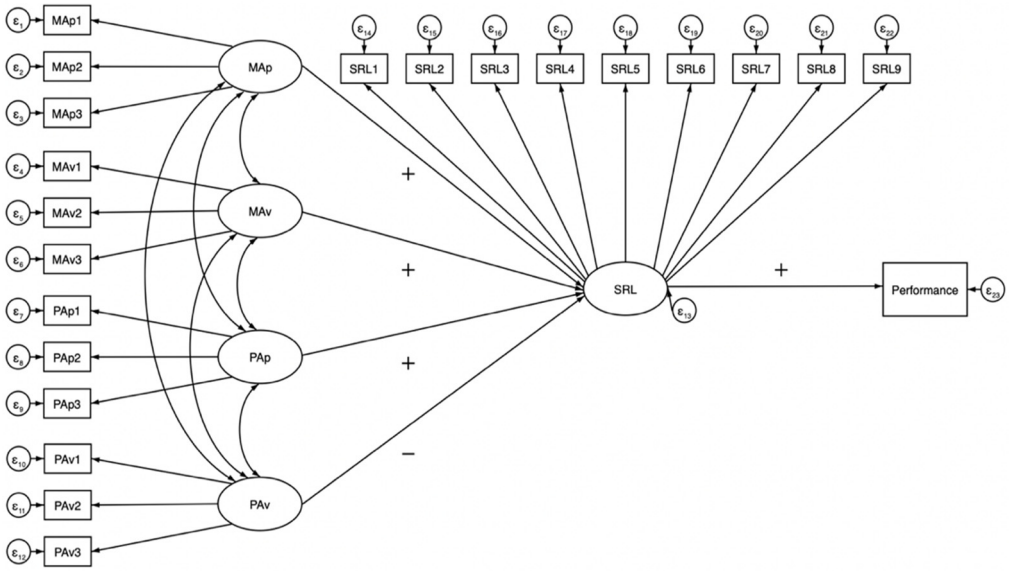

Figure 2. A hypothesised model for the study with predicated effects [59]. MAp = master-approach, MAv = mastery-avoidance, PAp = performance-approach, PAv = performance-avoidance.

3. Results

3.1. Descriptive Statistics and Reliability

Table 1 shows that the means of the four achievement goal orientations ranged from 3.66 to 5.49. The mean for SRL and performance was 3.03 and 4.36, respectively. Statistically significant correlations indicated positive associations between the achievement goals and self-regulation, apart from PAv (r = 0.3, p > 0.01). Likewise, SRL had a positive association with performance (r = 0.13, p < 0.01). The table also demonstrates that all the latent constructs had satisfactory levels of internal consistency, which is expressed by Raykov's rho (>0.7; [63]).

Table 1. Descriptive statistics with bivariate correlation using Pearson's *r*.

Min-Max		Mean (SD)	Raykov´s Rho	1.	2.	3.	4.	5.
1. MAp	1–7	5.49 (1.21)	0.783					
2. MAv	1–7	3.66 (1.58)	0.819	0.15 *				
3. PAp	1–7	3.83 (1.61)	0.810	0.44 *	0.15 *			
4. PAv	1–7	3.86 (1.62)	0.720	0.24 *	0.30 *	0.57 *		
5. SRL **	1–7	3.03 (1.40)	0.866	0.37 *	0.12 *	0.19 *	0.03	
6. Performance	0–6	4.36 (0.97)		0.34 *	−0.04	0.22 *	0.04	0.13 *

* p < 0.01. ** Reported values represent modified scale.

3.2. Confirmatory Factor Analysis

The initial measurement model of the four achievement goals based on the 12-item AGQ-S instrument yielded non-acceptable fit (X^2 = [df = 49] 332.52, p < 0,01; SRMR = 0.12; RMSEA = 0.10; CFI = 0.89; TLI = 0.85). In order to improve the fit of the four-dimensional measurement, model modification indices (MI) were inspected. MI shows the predicted decrease in a model if a fixed parameter is freely estimated [68]. The reduction in X^2 by adding a covariance between the residuals for MAp1 and MAp2 (MI = 65.51) proved to be considerably larger than 3.84 (the value of 3.84 represents the critical value for df = 1) and can be theoretically legitimised. Therefore, the covariance between the residuals for these two indicators was accepted. The following led to an acceptable fit for the measurement model based on AGQ-S (X^2 = [df = 47] 227.59, p < 0.01; SRMR = 0.08; RMSEA = 0.08; CFI = 0.93; TLI = 0.90). A significant X^2 can be tolerated as this tends to be significant with large samples (Mehmetoglu and Jakobsen, 2016).

The initial measurement model for the MSLQ also yielded non-acceptable fit (X^2 = [df = 27] 440.24, $p < 0.01$; SRMR = 0.12; RMSEA = 0.16; CFI = 0.77; TLI = 0.70). Assessment of the factor loadings for the nine-item self-regulation subscale revealed that little of the variance in four of the indicators was explained by the latent construct. This is illustrated by low factor loadings (<0.04) and high residuals (>0.89). Laxdal et al. (2020) experienced the same for these four indicators in their study using the same MSLQ subscale and pointed out that the negative wording of the question may have caused inadequate fit because of an agreeing response (i.e., answering questions positively regardless of their content). Moreover, two of the indicators were reversed in the analysis, as the questions were formulated so that lower values indicated a higher degree of self-regulation.

Following Laxdal [33], the four indicators with low indicator reliability were removed, resulting in a measurement model for the five items with an almost perfect fit (X^2 = [df = 5] 9.71, $p > 0.05$; SRMR = 0.02; RMSEA = 0.04; CFI = 0.99; TLI = 0.99). As mentioned by Kline (2016), the omission of central indicators should always be legitimised theoretically. The indicators omitted were all concerned with the students' focus and perseverance in the activities, and the remaining items included all three basic elements from the cyclical model (forethought, performance, and self-reflection). Hence, it can be argued that the remaining indicators appropriately captured the students' SRL. Furthermore, Raykov's rho showed high internal consistency (0.866) for the five indicators of the latent construct (Table 1).

3.3. Structural Equation Model

The theoretical model (Figure 2) with all the hypothesised paths was tested as a structural equation model. The structural model (Figure 3), with the modifications described above, yielded an adequate fit (X^2 = [df = 124] 429.79, $p < 0.01$; SRMR = 0.07; RMSEA = 0.07; CFI = 0.93; TLI = 0.91). All effects in the model were estimated by standardised beta coefficients (β). Figure 3 below shows the final analysis model, with both a measurement model and a structural model.

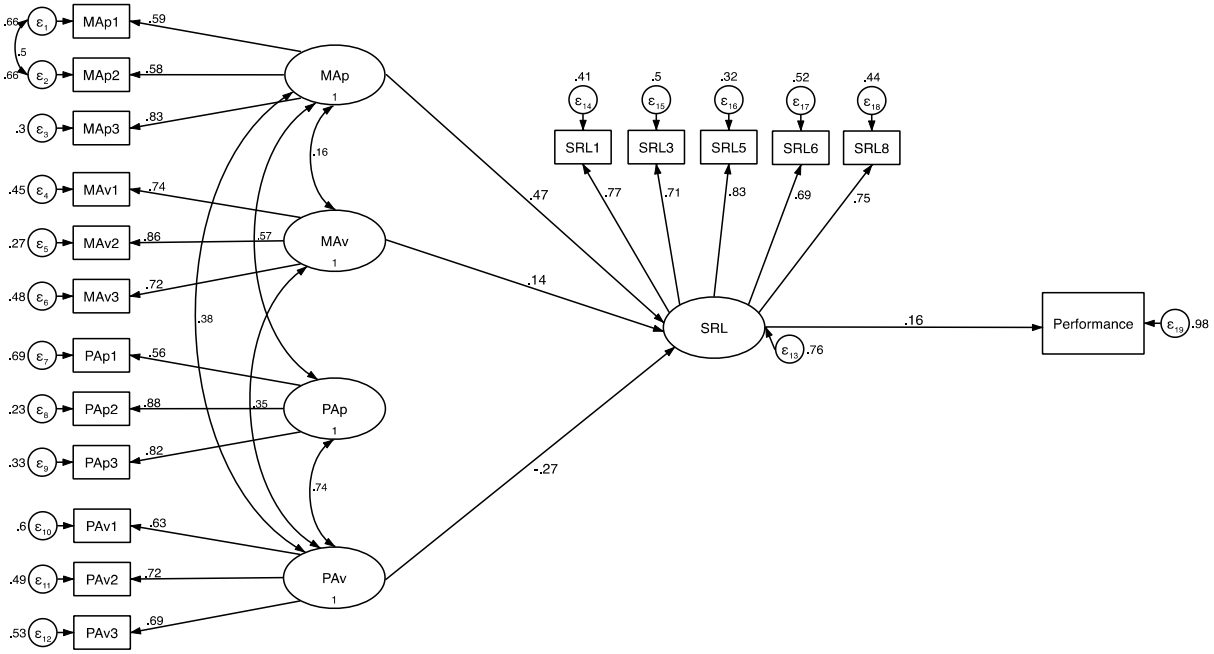

Figure 3. Structural model with standardised beta coefficients (β). Only significant paths are shown.

Results indicated that MAp had a significant and strong relationship with SRL (β = 0.47, $p < 0.01$). The same results occurred for MAv, but the effect was more moderate (β = 0.14, $p < 0.05$). In contrast, the result showed a non-significant relationship between PAp and the

students' SRL ($p > 0.05$). The structural model further indicated a significant and negative relationship between PAv and SRL ($\beta = -0.27$, $p < 0.05$). In line with the theoretical framework, SRL was found to have a significant and positive effect on students' performance in PE ($\beta = 0.16$, $p < 0.01$). The final model revealed that the goal orientations explained 24% of the variance in SRL, and SRL alone explained almost 3% of the variance in performance among the participants.

3.4. Test of Indirect Effects

The indirect effects hypothesised in the model were also tested, where SRL is specified to mediate the effect between achievement goals and performance in PE (Table 2). Results showed a significant path from MAp to performance with SRL as a mediating effect ($\beta = 0.09$, $p < 0.01$). Likewise, a significant path was found from PAv to students' performance through SRL, but this was negative ($\beta = -0.33$, $p < 0.05$).

Table 2. Test of indirect effects with SRL as a mediating variable between achievement goals and performance in PE.

Exogenous Variable	Mediation Variable	Endogenous Variable	Std.Coeff (β)	SD
MAp	→ SRL	→ Performance	0.09 **	0.03
MAv	→ SRL	→ Performance	0.02	0.01
PAp	→ SRL	→ Performance	0.02	0.02
PAv	→ SRL	→ Performance	−0.33 *	0.02

* $p < 0.05$, ** $p < 0.01$.

4. Discussion

The structural model proposed that achievement goals predicted the use of SRL, and eventually performance in PE. Results indicate that the type of achievement goals students adopt have consequences for their level of self-regulation. For example, achievement goals collectively accounted for 24% of the variance in SRL. Furthermore, SRL was found to have both a direct significant and positive effect on students' performance and a mediating effect between some of the achievement goals and performance.

As hypothesised, the relationship between MAp and SRL was positive and significant. This indicates that students who base their participation in PE on intrapersonal mastery with a focus on approaching positive opportunities have an increased involvement in cyclical SRL processes. The positive relationship between the two constructs is in line with previous studies in PE [29,32]. One possible explanation for the positive relationship is that students who score high on MAp strive to do better than in their previous achievements [8]. Students high in MAp will typically seek goals that are challenging, but realistic [17], which is favourable in the forethought phase, and essential for further involvement in SRL. Findings in the present study provide additional support for the notion that mastery goals are beneficial in enhancing SRL [8,21,26].

Likewise, the MAv goal is found to have a significant and positive relationship with SRL, indicating that students aiming to avoid intrapersonal incompetence in PE will have increased engagement in cyclical SRL processes. These findings are in contrast with Cecchini-Estrada and Méndez-Giménez [32], who did not find a positive relationship between MAv and SRL. However, our results correspond better with studies in other school contexts reporting that MAv leads to increased involvement in various SRL techniques in a wide range of subjects [10,71–74]. Studies in PE also illustrate that a mastery motivational climate, which is believed to promote mastery goals, leads to amplified SRL in PE [29,33]. Results in this study thus appear to coincide with these studies. However, the effect of MAp on SRL ($\beta = 0.47$) is stronger compared to MAv ($\beta = 0.14$), indicating that students who adopt MAv goals are not as ambitious in terms of self-improvement [15]. Moreover, MAv goals are generally associated with less frequent use of SRL. The significant relationships

are nevertheless in line with assumptions from the 2 × 2 achievement goal model, where it is claimed that mastery goals promote the use of SRL strategies [8].

The negative relationship between PAv and SRL shows that being motivated based on normative standards, and aiming to avoid failure, is not advantageous in terms of SRL techniques. These findings are not unexpected, as performance goals are not likely to contribute to students' self-regulation [8]. This is also consistent with previous studies showing a negative relationship between PAv and effort-regulation, and a positive relationship with self-handicapping [29–31]. The meta-analysis by Cellar and colleagues [34] also illustrates that PAv is generally associated with a lesser use of self-regulatory techniques. There is consensus in the literature that motivation based on normative standards and a fear of failure is unfavourable for learning and development across contexts [8]. For example, it is claimed that the social comparison dimension related to adopting a PAv goal can lead to defensive self-reactions. Consequently, findings in the present study support the argument that students high in PAv do not engage in further cyclical self-regulatory processes to the same extent as students high in mastery goals.

Laxdal and colleagues [33] found a positive relationship between a performance climate and SRL. However, a performance climate is characterised by social comparison [75] and could lead to PAv for students [29]. Findings in the present study elaborate on this relationship, indicating that one cannot simply cultivate a performance climate and expect positive effects in terms of SRL. A performance climate, with the risk of adding to high PAv, is not favourable for SRL. The results, therefore, provide nuance to the findings of Laxdal [33], indicating that a performance climate is not preferable in PE.

4.1. The Importance of Self-Regulated Students for Performance in PE

The results show a positive relationship between SRL and performance in PE. However, the effect seems to be moderate, and at under 3%, SRL alone accounted for a small part of the variance in performance. The effect is nevertheless significant and suggests that SRL in PE can lead to better performances. This is in line with previous studies showing that various self-regulatory techniques have an influence on learning and performance across school contexts [27,38–48,76–78]. The findings in this study coincide with this and contribute to knowledge about this effect in PE in upper secondary school, a context where research on SRL has been limited.

Self-regulated students systematically activate and maintain cognition, motivation, behaviour, and function to reach their goals in learning situations [79]. These common characteristics of self-regulated students can explain why SRL seems to be beneficial for learning. At the same time, one must take into consideration that the relationship between SRL and performance in this study appears to be moderate. One reason for this could be due to the relatively low level of self-regulation reported in PE versus more academic subjects with mean values above 4.0 [56,80]. In the present study, and in Laxdal [33], the mean scores were relatively low on SRL (M = 3.03 and M = 3.14, respectively). Thus, the results provide support for the notion that the use of self-regulatory techniques is not particularly prevalent in PE.

Results show a significant indirect effect of MAp on performance mediated by SRL. This is in line with previous studies showing that various self-regulatory techniques mediate the relationship between MAp and the learning of motoric skills in PE [44,53]. Likewise, Elliot [81] argues that mastery goals and the ability to self-regulate one's learning are essential for success in the learning process. The positive indirect relationship between the three variables is therefore not surprising. In contrast, PAv had a relatively strong negative effect on students' performance in PE mediated by SRL ($\beta = -0.33$), emphasising the particularly disadvantageous effect of PAv on student performance in PE. This is supported by studies where PAv is generally associated with responses that inhibit learning [15,35,82–84].

4.2. Practical Implications of the Results for Students and Teachers in PE

Results in the present study are clearly in favour of promoting mastery goals in PE. This can be achieved by fostering a mastery motivational climate by encouraging effort, mastery, and development [85]. Previous studies support the proposition that SRL increases in such a motivational climate [29,33]. Accordingly, promoting students' mastery goals is something PE teachers should strive for—especially MAp goals, which seem to affect students' performance through SRL. Other studies link MAp goals to motivation in terms of interest and curiosity [86], and associate MAp with effort, persistence, enjoyment, and a high physical activity level in PE [87–89]. Based on this, stimulating SRL through achievement goals with a focus on intrapersonal mastery seems advantageous.

The results also show that one should not foster students' performance goals in PE, especially not PAv, with relatively clear negative consequences for SRL and performance. Thus, teachers and students in PE should be aware of what adapting performance goals can lead to. Common to the two performance goals are normative comparison and that success is attributed to abilities relative to others. Why this is not beneficial can be explained by the idea that the normative standards are assumed to form the basis for self-esteem and self-worth [90]. In addition to this, in a subject where prerequisites are a part of the assessment of students, one can argue that it will be unfavourable if the students assess their success based on the performances of others.

In addition to fostering a mastery climate, teachers can also help students to adopt mastery goals. For example, PE teachers can help students to choose realistic and clear goals in the forethought phase of the cyclical model. For some students, the learning aims in PE will be more challenging than for others. Breaking the learning aims down into more achievable goals for students with low competence will therefore be essential. This can provide them the opportunity to be motivated by mastery goals. The reason for this is that they will then have the chance to create goals in the forethought phase which can guide them in the performance and self-reflection phase.

Teachers can also raise awareness of the importance of SRL and encourage the use of such techniques. For example, studies show that a student-activated teaching style [91,92] and teacher learning support [33] can promote SRL in PE. Students who get training in the use of self-regulatory techniques learn more efficiently [50–52]. In other words, there are clear signals that teachers and the content of the subject play a central role in the student's degree of SRL. Fundamental to SRL is the idea that students can learn to regulate their learning and thereby take responsibility for it. Since much of the learning activities in PE take place without a teacher in the immediate vicinity, being self-regulated is of great value. In a PE class, there can often be considerable differences between students in skill level. Accordingly, teachers must create a learning environment where everyone can set mastery goals with what seem to be accompanying positive consequences for their self-regulation and performance. The ambition for PE teachers should therefore be higher than just providing physical activity for the students—for example, encouraging behaviours that promote learning.

Several limitations should be recognised when considering this study. Since the study was cross-sectional, any notions of causal attribution concerning the direction of the effects are excluded. Further, modifications of the structural model reduced the study's external validity and make the transfer of psychometric properties to and from other studies challenging. Modifications to the model, however, provided a sufficient fit. Moreover, as the students were recruited from a small number of schools, questions can be raised concerning generalisability. We encourage future research to integrate motivation and self-regulation in the same model, as well as study how motivational mechanisms are linked to learning and performance in PE. Our recommendations for future studies include using intervention studies and longitudinal studies to reveal causal attribution between achievement goals, SRL, and performance to a larger degree.

5. Conclusions

Based on the findings in this study, three main conclusions can be drawn. First, the achievement goals of students have consequences for their SRL in PE. Second, engagement in the cyclical phases influences students' performance in PE, with SRL both having a direct effect on performance and serving as a mediating variable between achievement goals and performance. Lastly, the students do not appear to self-regulate their learning as much as in other school subjects. Thus, it is important for PE teachers to promote students' mastery goals, preferably MAp, which at the same time facilitates SRL in PE.

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