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RESEARCH ARTICLE

Social Influences of Teachers, Classmates, and Parents on Children's Commitment to Physical Education and Language Education

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Abstract

This study aims to examine the social influences of teachers', classmates' and parents' (i.e., positive reinforcement and punishment) on children's commitment to physical education (PE) and language education (LE). Children from the UK (N = 614; Mean age = 13.05, *SD* = 2.01) completed the Perceived Social Influence Scale (Chan, et al. 2012), and also measures of competence, enjoyment, and effort in either the PE or LE context. Multi-group structural equation modelling (CFI = 0.97-0.98; TLI = 0.96-0.97; RMSEA = 0.03-0.04) showed that social influences from teachers, classmates, and parents explained 33% to 58% variance of the commitment outcomes. Significant differences were observed in the strength of predictions between PE and LE. In conclusion, teachers are the key social agents for children's commitment towards PE and LE. Classmates are more important to children in LE than in PE. The role of fathers' and mothers' social influences on students' commitments to PE and LE appeared to be mixed.

Keywords

Positive reinforcement, Punishment, Teachers, Classmates, Parents, Physical activity, Academic achievement

Children's commitment to academic activities is heavily influenced by significant others such as teachers, classmates, and parents [1-3]. These social agents (especially parents) place high emphases on children's academic performances [4,5], and they often carry a perception that children's participation in physical activity was a hindrance to academic achievements [6]. Although some early studies reported that physical activity participation was a negative factor of academic achievement [7,8], a growing amount of research evidence has supported the role of physical activity and physical education (PE) on children's health, well-being, and academic performance [9-13]. PE has since received increasing attention in the curriculum of UK education [14,15]. With the rise in the significance of PE, it is highly important that teachers, classmates, and parents foster adaptive social environments for optimising children's commitment to both physical activity and academic study. However, past research has not examined how teachers, classmates, and parents collectively exert social influences on children's commitment to PE, in comparison to their commitment to traditional academic subjects such as language education (LE). The aim of this study is to examine the relationship between social influences of these social agents and children's commitment to PE and LE, and whether the relationships were different between the two contexts.

Significant Others and Children' Commitment to School

Research examining the role of teachers, parents, and classmates (or peers) on children's commitment to education has predominantly focused on single rather than multiple social agents [16-20], with very few exceptions. For instance, Wentzel [1] carried out an investigation among 167 sixth-grade students from middle school on how support from teachers and classmates, and family cohesion were positively associated with children's enjoyment in school and effort/attention in class. It was found that children

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enjoyed school more when they perceived having better support from teachers and higher family cohesion, and they placed more effort/attention to class when they perceived having better support from classmates. Similarly, another study by Estell and Perdue [3] among 1364 fifth-grade children examined the predictive values of support from teachers, parents, and classmates on the behavioural (i.e., active and adaptive participation in school activities) and affective (i.e., enjoyment and positive feeling toward school) school engagement of children. The authors found that parental support was positively associated with behavioural school engagement, and classmates' support was positively linked to affective school engagement.

One common phenomenon in the findings of Wentzel [1] and Estell, et al. [3] was that the pattern of results in Pearson's zero-order correlation were different from that of multiple regression. Social influences from teachers, classmates, and parents established significant zero-order correlations with almost all the enjoyment and effort outcomes, but the predictive values of some of the social agents reduced and became non-significant in the regression model because the effects of social influences from other social agents on the outcomes were taken into consideration. This interesting result pattern underscored the importance of taking multiple social agents into account for examining social influences on children, from one social agent in relation to that of another [21,22].

A recent longitudinal study by Song, et al. [2] compared the relative role of support from teachers, classmates, and parents on secondary school (Grade 7 to Grade 9) students' commitment to school and academic performance in Korea. It was found that support from parents and teachers positively predicted adaptive commitment outcomes and academic performance of students, with the support from parents being a stronger and more reliable predictor than that of teachers [2]. The support from classmates also formed negative correlations with maladaptive commitment outcomes (i.e., performance-avoidance goals and test anxiety) of students. In addition to the investigation of support from significant others, Song and colleagues [2] also examined students' perceptions of achievement pressure (i.e., excessive demands) from teachers. Interestingly, achievement pressure and academic support from teachers formed positive associations with test anxiety of students [2]. This pattern of result highlights that significant others may not only provide support, but also exert pressure or have other negative social influences on children [5]. However, the study of Song, et al. [2] only examined achievement pressure from teachers, so the relative roles of pressure from parents and classmates were not revealed, nor were the prediction of students' commitment outcomes in school taken into account.

To summarise, research has documented the importance of studying the relative role of teachers, classmates, and parents on children's commitment to school, but the focus has been centering on social influence in terms of support. Little attention has been placed on examining the maladaptive social influences (e.g., pressure) from significant others.

Significant Others and Children' Commitment to Sport and Physical Activity

The literature with respect to social influences on children's commitment to physical activity and sport may offer some insight into significant others' positive and negative social influences. Particularly, it is posited in competence motivation theory [23] that significant others in sport may give positive (e.g., approval, and support) or negative (e.g., disapproval, and criticism) feedback to children, and affect their commitment to sport behaviours [23,24]. Research findings showed that positive feedback from significant others (e.g., teachers/coaches, classmates/teammates, and parents) were more likely than negative feedback to link to adaptive commitment outcomes such as competence [25-27], enjoyment [28], performance [29], and effort [27].

In addition to the view of competence motivation theory [23], the social influences of significant others on children's commitment to sport and physical activity has also been examined using various theories, such as achievement goal theory [30,31] and self-determination theory [32]. Social influence is conceptualised in achievement goal theory [30,31] as motivational climates (i.e., social environments that shape individuals' adoptions of achievement motivation). Previous studies of achievement goal theory [33-35] showed that children exhibited higher competence, enjoyment, effort in sport when significant others provided positive reinforcement for children's improvement, effort, and mastery of skills (i.e., a mastery approach climate), than when they were punished or criticised for mistakes or poor normative outcomes (i.e., a performance avoidance climate). Although a few studies of achievement goal theory compared the relative role of teachers/coaches, parents, and classmates/teammates [36-39], the findings were challenged by the inconsistency of the measurement tools of social influences used for different social agents [21,22].

Social influence is conceptualised in self-determination theory [32] as the psychosocial environment in which social agents support and thwart the psychological needs of individuals, affecting the motivation, behaviours, and well-being of individuals in the behavioural context [40-42]. Research findings have shown that children have higher commitment to sport or physical activity when significant others provide them with better support of autonomy, competence, and relatedness [39,40,43-45]. Children's commitment to sport or physical activity is likely to be impaired when significant others exert controlling behaviours (e.g., punishment, intimidation, disregard) on children [44,46].

Although a consistent and validated measure of the psychological need support from PE teachers, peers, and parents has been developed [47], that of con-

trolling behaviour has not been consistent and well validated across different social agents [41]. Similarly, previous studies mainly focused on individual social agents, and they placed very little attention on investigating the relative role of multiple significant others on children's commitments to PE or related behaviours. As far as we know, only two cross-sectional studies examined how psychological need support from multiple social agents are related to students' commitment to physical activity/ physical education [43] and school [48]. In particular, McDavid and colleagues [43] examined how psychological need support from PE teachers and parents on children's autonomous motivation and involvement of leisure-time physical activity; Zhou and colleagues [48] investigated how psychological need support from teachers, peers, and parents were positively linked to students' autonomous motivation and engagement in school. Both studies found that psychological need support from significant others formed positive associations with the commitment outcomes, and the strength of associations as well as the variance explained in the commitment outcomes in McDavid, et al. [43]'s study (i.e., 7% to 36%) and Zhou, et al. [48]'s study (i.e., 37%) were only small to moderate. We argue that the predictive power of social influence could be significantly improved if both positive (i.e., need supportive behaviour) and negative (controlling behaviour) social influence from all significant others (i.e. including classmates/peers) were included in the predictions of commitment outcomes.

Social Influence Conceptualised as Positive Reinforcement and Punishment

Social agents such as teachers, classmates, and parents, shape children's commitments to academic and physical education by exerting positive or negative social influences [4,23,34,46]. However, previous studies have either conceptualised social influences using different theories or perspectives, used inconsistent measurements for assessing social influences, or ignored the importance of considering multiple social agents. To resolve these issues, Chan, et al. [22] developed the Perceived Social Influence [in sport] Scale (PSIS) that aimed to standardise the measurement of positive and negative social influences from significant others on children. It is conceptualised in PSIS that significant others may exert positive reinforcement (for good performance) and punishment (for mistakes or poor performance) on children sport participants. The findings supported the validity and predictive power of PSIS in the measurement of social influence from coach, teammates, and parents on children and adolescents [22]. Studies using PSIS found that positive reinforcement and punishment from significant others respectively formed positive and negative relationships with children's and adolescents' competence, enjoyment, and effort in sport, and moderate to large (25% to 57%) amount of variance of these outcome variables were explained [21,22].

Despite the promising findings of PSIS, previous studies only examined social influence from coaches, teammates, and parents in the contexts of elite youth sport [21,22], but the validity and predictive power PSIS in the context of education have yet to be tested. Also, research has shown that significant others such as parents do not offer the same level of support to children's participation in physical activity as compared to their support to children's academic performance [4-6]. It would, therefore, be interesting to apply PSIS to explore the role of significant others on children commitment to PE, in comparison to their commitment to traditional academic subject such as LE. The results would enrich our understanding of how significant others could optimise their social influences for children's commitment to physical activity, study, and other educational activities in the school setting.

Present Study

In this study, we aim to examine 1) whether social influences from teachers, classmates, and parents are predictive of children's commitment to PE and LE; and 2) whether the predictions are different between PE and LE. We evaluated children's commitments in terms of competence, enjoyment, and effort, which were often used as indicators of students' motivation or the extent to which children engage in the given subject [1,3] or physical activity [22,27,33]. According to the initial findings of PSIS [22], and the literature with regard to positive and negative feedback from significant others [24,34,39,46], we hypothesize that:

H1: Positive reinforcement would be significantly and positively related to commitment outcomes.

H2: Punishment would be significantly and negatively related to commitment outcomes.

H3: The relationships between social influences and commitment outcomes would hold across all social agents in both PE and LE.

Methods

Participants

We obtained ethics approval from the Institutional Review Board of the first author's institution [UW 17-352]. Participants were 614 secondary school students (mean age = 13.05, *SD* = 2.01, range = 9 to 17; 45.38% male) recruited from 30 local secondary schools in the UK. The ethnicity of the participants included 81.13% White, 7.99% Black, 5.63% mixed (e.g., mixed Asian/ Black/White/Others), 4.17% Asian, or 1.09% others, but 96.02% of them regard English (i.e., the official language of the UK) as their first language. They were students of Year 6 (11.83%), 8 (41.67%), 10 (33.83%), 11 (1.17%), and 12 (11.50%).

Procedures

Participants and their parents signed the informed consent prior to the study. In this cross-sectional cohort

study, participants were asked to complete a questionnaire comprising the scales of the study variables (i.e., social influences of teachers, classmates, and parents, and the outcome variables of competence, enjoyment, and effort; see the measurement sub-section below for details). As our study aimed to make comparisons between PE and LE-contexts, two versions of the questionnaire were created by adjusting the items of the study variables into both contexts. The adjustment was made by specifying either "PE" or "English" in the items, which is further described in the sub-section below. We used "English" instead of the term "language education" because "English" is one of the core subjects of UK children, and is more specific and less confusing than "language education". As each version contained 78 items, completing both versions could be demanding for our children participants. In order to reduce response burden, participants were only required to complete either the PE or LE version. We distributed both versions of the questionnaires to the 30 participating schools. At the end of the process, we obtained 490 and 124 questionnaires respectively for PE-version and LE-version.

Measures

Perceived Social Influence: PSIS [22] was used to measure significant others' positive reinforcement and punishment on children. This 12-item scale has received supportive evidence for the factor structure, convergent validity, and criterion validity among children and adolescent athletes in the sport setting [22]. The psychometric properties of the scale were shown to be equally satisfactory for the measurement of social influence from parents, coaches, and peers. The items of the scale for positive reinforcement (e.g., "My *teacher/classmates/father/mother* encourage(s) me to improve") and punishment (e.g., "My *teacher/classmates/father/mother* get(s) angry when I make a mistake") were not contextual specific, so in this study, we adapted the scale into the context of PE and LE by including the terms such as "in PE" or "in English" at the end of the items (see Appendix A for the adapted items). Participant responded to the 12-items in seven-point Likert scales (i.e., "strongly agree" = 7, "strongly disagree" = 1), respectively for the perception of social influence from teachers, classmates, fathers, and mothers on PE and LE, so a total of 72 items (i.e., 12 items x 4 social agents x 2 contexts) were included in this section. The item scores displayed satisfactory internal reliability across all social agents in both PE and LE-context (α = 0.87 to 0.96).

Commitment: We evaluated students' commitment to PE and LE in terms of their competence, enjoyment, and effort in these two contexts. Competence in PE and LE was measured by the Academic Self-Concept Scale [49]. This 6-item scale has been widely used and validated for measuring competence and self-confidence of children in academic setting [50,51], and the items (e.g., "Tasks in *PE/English* are easy for me.") could be adapted to different academic subjects, including PE and LE [49,51]. For enjoyment and effort, we followed the recommendation of the previous study of social influences [22] and adopted the items respectively from the effort subscale (4 items; e.g. "I put a lot of effort into *PE/English")* of the Intrinsic Motivation Inventory [52] and the items of enjoyment (4 items; "I enjoy PE/English") in the study by Duda and Nicholls [53]. To ease the process of questionnaire completion, participants responded to the items of competence, enjoyment, and effort in a seven-point Likert scale similar to that of Perceived Social Influence Scale [22]. The internal reliability of the scores of competence (α_{PE} = 0.87, α_{LE} = 0.87), enjoyment ($_{PE}$ = 0.89, α_{LE} = 0.90), and effort (α = 0.84 to 0.74) were comparable to the previous study [22] across both PE and LE-contexts.

Analyses

Data was analysed by structural equation modeling (SEM) using EQS 6.1 program [54], and the estimation of the fit indices and the paths at structural and measurement levels was employed by robust maximum-likelihood to protect the model against non-normality. The goodness of fit of the models was evaluated by multiple fit indices including the Comparative Fit Index (CFI), Tucker Lewis Index (TLI), standardised root-mean-square residuals (SRMR) and root-mean-square error of approximation (RMSEA). For CFI and TLI, values >= 0.90 and 0.95 reveal acceptable fit and excellent fit of the data respectively [55]. SRMR and RMSEA's value smaller than 0.05 and 0.08 indicate close to fit and reasonable fit to the data, respectively [56,57]. We computed the statistical power of each SEM analysis by algorithm of MacCallum, et al. [58] for the statistical sensitivity of the model.

Following the approach by Chan and colleagues [22], we tested the measurement model of PSIS (independently for PE-version and LE-version), essentially a confirmatory factor analysis, before examining the structural model where each dependent variable (i.e., enjoyment, competence, effort) were regressed on the eight predictor variables (one positive reinforcement and one punishment variable for coaches, fathers, mothers, and peers) of PSIS. In this case, the strength of the parameter estimates in the structural model may determine the predictive values of social influences from one social agent, in relation to the other social agents.

Multi-group SEMs were employed to examine the invariance of the structural model between the groups (i.e., PE-group and LE-group) of participants who completed either the PE-version or the LE-version of the questionnaire. We constrained the factor loadings (for testing the measurement invariance), and then structural paths of the two groups to be equal [59]. We examined the ΔCFI to reveal if the constrains would lead

to an overall reduction of model fit, and a ΔCFI value of 0.01 or greater was considered significant [60]. Measurement invariance was demonstrated when factor loadings were fully invariant, and partial invariance was reflected by having some loadings not-invariant across the groups, and associated constraints were allowed to be relaxed before testing the invariance of the structural paths [61]. Lagrange multiplier test was used to further examine if there were significant differences of the parameter estimates between the PE-group and LE-group, indicated by significant χ^2 values ($p < 0.05$).

Results

Data screening

For examining the factor structure and convergent validity of the study measurements, confirmatory factor analysis on the teacher-, classmate-, father-, and mother-version of PSIS revealed excellent goodness-of-fit from both PE-group (CFI >= 0.972, TLI >= 0.964, SRMR < 0.042, RMSEA < 0.069, statistical power > 0.976) and LE-group (CFI >= 0.974, TLI >= 0.969, SRMR < 0.051, RMSEA < 0.078, statistical power > 0.943). Confirmatory factor analysis of the measurement model comprising the scales of competence, enjoyment, and effort also yielded excellent goodness-of-fit in both PE-group (CFI = 0.947, TLI = 0.935, SRMR = 0.048, RMSEA = 0.063, statistical power = 0.940) and LE-group (CFI = 0.969, TLI = 0.962, SRMR = 0.065, RMSEA = 0.063, statistical power = 0.946). Overall, the data supported the factor structure and convergent validity of the study measurements.

Independent-sample Welch t-tests compared the scores of the study variables between PE-group and LE-group. As compared to the LE group, participants in the PE-group reported higher positive reinforcement ($t(177.05) = 4.72$, $p < 0.01$, Cohen-d = 0.38) and punishment ($t(200.43) = 3.69$, $p < 0.01$, Cohen-d = 0.30) from classmates, lower positive reinforcement from mother ($t(201.77) = 2.46$, $p < 0.05$, Cohen-d = 0.20), and higher competence ($t(181.09) = 2.30$, $p < 0.05$, Cohen-d = 0.19) and enjoyment ($t(161.87) = 8.82$, $p < 0.01$, Cohen-d = 0.71) (Table 1).

Prediction of commitment outcomes

The structural models fitted the data reasonably well for PE-group (CFI >= 0.960, TLI >= 0.941, SRMR < 0.036, RMSEA < 0.069, statistical power > 0.944) and LE-group (CFI >= 0.993, TLI >= 0.990, SRMR < 0.032, RMSEA < 0.078, statistical power > 0.830). In the models, social influences from significant others explained 33% to 58% variance of competence, enjoyment, and effort.

Teacher: Social influences from teachers established significant associations with almost all commitment outcomes for PE-group and LE-group. Positive reinforcement was positively associated with competence ($\beta_{PE} = 0.34$, $p = < 0.01$; $\beta_{LE} = 0.57$, $p = < 0.01$), enjoyment ($\beta_{PE} = 0.45$, $p = < 0.01$; $\beta_{LE} = 0.51$, $p = < 0.01$), and effort ($\beta_{PE} = 0.43$, $p = < 0.01$; $\beta_{LE} = 0.30$, $p = < 0.01$). Punishment established significant negative correlations with competence ($\beta_{PE} = -0.12$, $p = < 0.05$), enjoyment ($\beta_{PE} = -0.21$, $p = < 0.01$), and

Table 1: Descriptive statistics and zero-order correlation of the study variables of the PE-group (N = 490) and LE-group (N = 124).

			1	2	3	4	5	6	7	8	9	10	11
			LE-Group										
1. Teacher's Positive Reinforcement		PE-Group	1	-0.14	0.35**	0.01	0.26**	0.03	0.38**	-0.06	0.59**	0.49**	0.48**
2. Teacher's Punishment			-0.01	1	-0.31**	0.17	0.17	0.40**	0.13	0.39**	-0.05	-0.18	-0.19*
3. Classmates' Positive Reinforcement			0.49**	0.08	1	0.07	0.10	0.09	0.25*	0.07	0.40**	0.51**	0.49**
4. Classmates' Punishment			0.13**	0.50**	0.18**	1	-0.18	0.46**	-0.16	0.48**	-0.16	-0.13	-0.21*
5. Fathers' Positive Reinforcement			0.42**	-0.02	0.37**	0.12*	1	0.20*	0.55**	0.02	0.24*	0.18	0.22*
6. Fathers' Punishment			0.03	0.42**	0.19**	0.46**	0.28**	1	-0.02	0.80**	-0.02	-0.02	-0.11
7. Mothers' Positive Reinforcement			0.45**	-0.04	0.45**	0.12*	0.73**	0.13**	1	0.01	0.37**	0.20*	0.42**
8. Mothers' Punishment			0.02	0.48**	0.17**	0.46**	0.13*	0.76**	0.16**	1	-0.04	-0.09	-0.08
9. Competence			0.43**	-0.05	0.30**	0.07	0.39**	0.14**	0.40**	0.14**	1	0.66**	0.69**
10. Enjoyment			0.48**	-0.08	0.32**	0.11*	0.38**	0.12*	0.39**	0.12*	0.69**	1	0.71**
11. Effort			0.49**	-0.08	0.32**	0.08	0.43**	0.11*	0.50**	0.11*	0.76**	0.76**	1
PE-Group	Mean		5.25	2.93	4.09	3.19	4.73	2.63	4.91	2.60	5.34	5.79	5.45
	SD		1.22	1.54	1.54	1.69	1.90	1.68	1.72	1.73	1.02	1.25	1.32
	α		0.89	0.88	0.93	0.91	0.96	0.91	0.96	0.93	0.87	0.89	0.84
LE-Group	Mean		5.18	2.89	3.31	2.60	4.75	2.45	5.30	2.58	5.09	4.41	5.14
	SD		1.34	1.60	1.66	1.54	1.76	1.50	1.38	1.54	1.09	1.62	1.28
	α		0.91	0.89	0.94	0.91	0.96	0.91	0.92	0.91	0.87	0.90	0.74

Notes: Lower and upper diagonal respectively show the zero-order correlations of the study variables for PE-group and LE-group. *$p < 0.05$, ** $p < 0.01$.

effort (β_{PE} = -0.18, p = < 0.01) in PE-group, but those in LE-group were not significant except the unexpected significant positive correlation with competence in LE-group (β_{LE} = 0.27, p = < 0.01).

Classmates: Social influences from classmates established significant associations with all the commitment outcomes in LE-group only. In the LE-group, competence, enjoyment, and effort were positively associated with positive reinforcement ($\beta_{competence}$ = 0.38, p = < 0.01; $\beta_{enjoyment}$ = 0.44, p = < 0.01; β_{effort} = 0.44, p = < 0.01), and negatively with punishment ($\beta_{competence}$ = -0.20, p = < 0.05; $\beta_{enjoyment}$ = -0.24, p = <0.05; β_{effort} = -0.22, p = < 0.05).

Fathers: Social influence from fathers were significantly associated to all the commitment outcomes, but it was mainly related to punishment in the LE-group. Punishment was found to be negatively correlated with competence (β_{LE} = -0.22, p = < 0.05), enjoyment (β_{LE} = -0.28, p = < 0.05), and effort (β_{LE} = -0.46, p = < 0.05) in LE-group. However, positive reinforcement formed a positive association with competence in the PE-group (β_{PE} = 0.20, p = < 0.05).

Mothers: Social influences from mothers were only related to competence and effort in PE-group. Positive reinforcement was positively associated with effort in the PE-group ($_{PE}$ = 0.34, p = < 0.01), and punishment unexpectedly formed a positive correlation with competence in the PE-group (β_{PE} = 0.29, p = < 0.01).

Comparison between PE and LE

Multi-group SEM of the structural model of competence (CFI = 0.971, TLI = 0.955, SRMR = 0.029, RMSEA = 0.044, statistical power = 0.940), enjoyment (CFI = 0.973, TLI = 0.958, SRMR = 0.028, RMSEA = 0.042, statistical power = 0.965), and effort (CFI = 0.968, TLI = 0.952, SRMR = 0.041, RMSEA = 0.044, statistical power = 0.966) had excellent goodness-of-fit. Constraining the factor loadings and structural paths led to ΔCFI value of <= 0.003, so the measurement and structural models were generally invariant across PE and LE. Results of the Lagrange multiplier test showed a number of significant differences of the parameter estimates between PE-group and LE-group. For teachers, no significant difference was observed apart from the relationship between positive reinforcement and competence. It was found that the positive correlation between positive reinforcement and competence was stronger in the LE-group than in the PE-group (χ^2 = 4.20, p < 0.05). For classmates, the positive predictions of positive reinforcement (competence χ^2 = 8.17, p <.01; enjoyment χ^2 = 11.23, p < 0.01; effort χ^2 = 9.40, p < 0.01) and negative predictions of punishment (competence χ^2 = 3.91, p < 0.05; enjoyment χ^2 = 3.94, p < 0.05; effort χ^2 = 9.93, p < 0.01) on the commitment outcomes were stronger in the LE-group than in the PE-group. For fathers, the negative correlations between punishment and the commitment outcomes were stronger in the LE-group than in the PE-group (competence χ^2 = 4.00, p < 0.05; enjoyment χ^2 = 3.86, p < 0.05; effort χ^2 = 10.95, p < 0.01). For mothers, the positive correlation between punishment and competence (χ^2 = 4.58, p < 0.05) was stronger in the PE-group than in the LE-group. Table 2 displays the parameter estimates of both groups and the full results of the Lagrange multiplier test (Table 2).

Discussion

This study was set out to examine the extent to which social influences from teachers, classmates, and parents were related to children's commitment to PE and LE. We applied the PSIS [22] to evaluate social influences of significant others in terms of positive reinforcement and punishment. The findings were supportive to the validity and the proposed predictive power of PSIS as reported in previous studies [21,22]. Positive reinforcement and punishment from social agents, in general, established positive and negative relationships with the commitment outcomes (i.e., competence, enjoyment, and effort) respectively, which was consis-

Table 2: Parameter estimates in the structural model.

		Competence		Enjoyment		Effort	
		PE	LE	PE	LE	PE	LE
Teacher's	Positive Reinforcement	0.34**	0.57**	0.45**	0.51**	0.43**	0.30**
	Punishment	-0.12*	0.27**	-0.21**	0.12	-0.18**	-0.02
Classmates'	Positive Reinforcement	-0.02	0.38**	0.01	0.44**	-0.05	0.44**
	Punishment	-0.04	-0.20*	0.03	-0.24*	0.02	-0.22*
Fathers'	Positive Reinforcement	0.20*	-0.04	0.13	0.02	-0.09	-0.04
	Punishment	-0.06	-0.22*	0.00	-0.28*	0.19	-0.46*
Mothers'	Positive Reinforcement	0.09	-0.01	0.06	-0.15	0.34**	0.22
	Punishment	0.29*	0.15	0.18	0.21	-0.04	0.32
	R^2	0.33	0.55	0.38	0.49	0.38	0.58

Notes: PE: physical education; LE: language education. Shaded parameter estimates indicate significant differences between PE and LE (p < 0.05) as shown in the Lagrange multiplier test.

*p < 0.05, ** p < 0.01.

tent with our hypotheses (i.e., H1 and H2), and also the findings of previous studies regarding the role of positive and negative social influences from significant others [24,34,39,46]. The amount of variance explained in the commitment outcomes ranged from moderate (33%) to large (58%), which were consistent with the initial application of PSIS within the sport setting [22], and again underscored the importance of measuring social influences from multiple social agents using a standardised measurement tool. Notwithstanding the general consistent pattern of results regarding positive reinforcement and punishment, we observed a number of differences in the predictive values of social influences of the four social agents between PE and LE, thus H3 was rejected. Therefore, teachers, classmates, and parents might exert different roles on children's commitments to education, and their roles might be different across PE and LE.

Social influences from teachers

Among social influences from the three types of social agents we investigated, the social influences from teachers appeared to be the most consistent in predicting the commitment outcomes of children across PE and LE. Teachers' positive reinforcement formed significant positive relationships with all the commitment outcomes in both contexts. In other words, regardless of PE or LE, when children perceived that their teachers recognise and reward their good performances, children are likely to exhibit higher competence, enjoyment, and effort in the subject area. Such findings are consonant with the literature on the role of teacher's support on children's commitment to school [1,3,18,43]. However, the hypothesized negative predictions of punishment from teachers on the commitment outcomes were only present in PE according to the hypotheses and the previous findings of coaches in the sport context [27,28,34,42,46]. However, the corresponding predictions were not observed in LE, and punishment from teachers even formed a positive relationship with children's competence in LE. This interesting result pattern might indicate that children's commitment in PE is likely to be impaired when teachers apply punishment for children's mistakes or poor performance. Indeed, considering the LE-context, the punishment from teachers might not necessarily be maladaptive. It could be due to the possibility that children perceived teachers' punishment in the LE-context as constructive criticisms with the purpose of improving academic performance [21,22], so the effect of punishment on children's competence is still positive. Implementing qualitative studies may help resolve the question why children were more likely to view punishment from teachers as constructive criticism in LE than in PE, and why only children's competence in LE, instead of enjoyment and effort, was positively associated with teachers' punishment.

Social influence from classmates

Similar to teachers, the findings of social influences from classmates were quite robust, but only in the LE-context. Positive reinforcement and punishment respectively formed positive and negative relationships with all the commitment outcomes in the LE-context, but not in the PE-context. Perhaps classmates were not significant social agents of children's commitment to PE as compared to the role of other social agents such as teachers, but this possibility is against the view of the literature about the role of peers in youth sport [3,19,20,37,39]. Yet, it is worthy to note the subtle differences between PE and sport-context. In comparison to classmates in PE, teammates or peers in elite sports are more likely to train and compete with and be compared against each other [15,62]. Children might be more responsive to the positive reinforcement and punishment from their peers in a competitive sport environment, than in PE where the focus might be centered on physical activity and skill acquisition [62].

In contrast, the role of classmates in LE is apparently different from that in PE. Children's perception of how their classmates respond to their performance appeared to be highly important to their commitment to LE. Although it is in agreement with the literature about the role of social support from classmates [1,3,4], it is interesting to observe that punishment from classmates establish negative relationships with all the commitment outcomes in LE. It is because classmates are typically not viewed as authority figures as compared to teachers and parents. Research has documented negative social influences from classmates such as bullying, victimisation, criticism, argument or fights, and disrespect within the school environment [21,46,63]. Our study may supplement the findings of these previous studies about negative social influence from classmates, and explain that classmates may exert negative social influences in the form of punishment to children who do not perform well in school [4,21,22,26].

Social influence from parents

Among the other social agents investigated in this study, the findings of social influences from parents are mixed. Although the literature has largely supported the view that positive social influences (i.e., support) from parents is an important factor of children commitment to school [1,16,18,48] and physical activity [24,38,43], our data only showed that fathers' and mothers' positive reinforcements were positive predictors of children's competence and effort in PE respectively. Positive reinforcement from parents did not form any significant relationship with all commitment outcomes of children in LE. However, it is important to note that in the zero-order correlation matrix, positive reinforcement from fathers and mothers formed

significant positive relationships with almost all the commitment outcomes of children in both the PE and LE contexts (i.e., all apart from enjoyment in LE). Therefore, our findings indeed supported the role of positive reinforcement from parents, but when we took the social influences from other social agents into account in our SEMs, the predictive values of positive social influence from parents impaired or became non-significant. These patterns of results is consonant with the findings of Wentzel [1] and Estell and Perdue [3], and can therefore demonstrate that positive reinforcement from teachers and classmates might be more important than that of parents in fostering children's commitment in school, particularly in LE.

Apart from the inconsistent pattern of results for parents' positive reinforcement, the expected negative role of punishment from parents was only supported among fathers in the LE context, which is consistent with our hypothesis and the literature [4,21,24,43] that punishment from fathers were negatively linked to all commitment outcomes in the LE context. Fathers should be mindful about exerting punishment for children's performance in LE because it is consistently linked positively to impaired competence, enjoyment, and effort in LE. However, it is interesting to observe that mothers' punishment formed a positive relationship with children's competence in PE. This finding deviates from the literature about pressure and negative feedback from parents about children's performance in education [64] and sport [24,43], and, again, underscores the possibility that children consider criticism from mothers as constructive [22]. Future studies should investigate why punishment from mothers is more likely than that of fathers which will potentially lead to adaptive commitment outcomes, and why it only happens to children's competence PE instead of LE, or to other commitment outcomes.

Limitations

Despite the strengths and originality of this study in comparing the role of significant others between the PE and LE contexts, limitations of this study should be discussed in order to highlight the boundaries of the current findings and how future studies could enhance the level of evidence and the generalisability of research about the role of significant others in children's commitment. The first limitation worthy of note is the cross-sectional cohort design of this study. We only compared the parameter estimates between two groups. Although group selection was completely randomized, we were unable to completely exclude the possibility that the comparison between PE and LE was somewhat affected by inherent group differences. Future studies may strengthen the level of evidence by having a between- and within-group design [65]. Also, due to the correlational analysis of our study, no absolute conclusion could be drawn regarding the causal relationship between social influence and commitment outcomes. Future longitudinal studies, or even interventions may examine if social influences from significant others may link to/lead to the change of children's commitment outcomes.

Second, positive reinforcement and punishment only reflect social influences that are conditional to the performance of children, but a growing amount of research has suggested that social agents may exert unconditional social influences, such as emotional support [2], affiliation (e.g., respect, trust, being friendly) and dysfunction (e.g., disrespect, conflict, harm) that are not conditional to children's performance [16,21]. A revised version of PSIS has recently been developed that captures both conditional and unconditional social influences in youth sport context. Future studies may validate the scale in both the PE and LE contexts.

Third, our study did not directly compare the social influence on sport/physical activity against that on school or academic achievement. It is because PE cannot serve as a representative/cannot represent all types of physical activity, particularly leisure-time physical activity. Similarly, social influences in LE were measured in terms of students' perception of English, where English cannot represent all traditional core subjects. More importantly, we did not take other academic subjects or extra-curricular activities (e.g., music, arts), and students' actual academic achievement into account. We should interpret our findings in caution and call for future studies that expand the scope of the investigation on social influences and account for these external factors. Future research should also consider replicating our study in other cultural groups to account for potential cultural difference in the perception of social influences from significant others [45,48].

Conclusion

Despite the evidence regarding the health benefits of physical activity, academic achievement is traditionally viewed as more important than physical activity for the development of children, and the view might affect how significant others exert the social influences on children's commitment to PE, a core subject within the curriculum of UK. This study has compared the relative role of teachers, classmates, and parents on children's commitment to PE and LE. In general, our data shows that positive reinforcement and punishment are respectively positive and negative social influences on children's commitment to PE and LE. However, social influence from teachers and classmates appear to be a stronger and more consistent predictor of children's commitment than that of parents. Our findings may shed light on how children's commitment to school is shaped by multiple social agents, and how social influences from significant others behave differently between the PE and LE contexts.

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Appendix A: Perceived social influence scale.

Physical Education (PE) Version

How true is each of the following statements for you? Remember you should only think about your experiences in Physical Education (**PE**) **this school year**. Please indicate by circling one response for each item.

Dimension	Prefix: My teacher/classmates/father/mother
Positive Reinforcement	1. Encourage(s) me to improve my skills in PE by working on my weaknesses.
	2. Encourage(s) me to improve in PE.
	3. Praise(s) me when I develop new skills in PE.
	4. Praise(s) me when I improve the skills in PE that I don't do well.
	5. Emphasize(s) always trying my best in PE.
	6. Encourage(s) me to try my hardest in PE.
	7. Praise(s) me when I try hard in PE.
	8. Encourage(s) me to keep trying after I make a mistake in PE.
Punishment	9. Criticize(s) me when I do badly in PE.
	10. Make(s) negative comments when I perform poorly in PE.
	11. Make(s) negative comments when I do badly in PE.
	12. Criticize(s) me when I perform poorly in PE.

Language Education (LE) Version

How true is each of the following statements for you? Remember you should only think about your experiences in **English this school year**. Please indicate by circling one response for each item.

Dimension	Prefix: My teacher/classmates/father/mother
Positive Reinforcement	1. Encourage(s) me to improve my skills in English by working on my weaknesses.
	2. Encourage(s) me to improve in English.
	3. Praise(s) me when I develop new skills in English.
	4. Praise(s) me when I improve the skills in English that I don't do well.
	5. Emphasize(s) always trying my best in English.
	6. Encourage(s) me to try my hardest in English.
	7. Praise(s) me when I try hard in English.
	8. Encourage(s) me to keep trying after I make a mistake in English.
Punishment	9. Criticize(s) me when I do badly in English.
	10. Make(s) negative comments when I perform poorly in English.
	11. Make(s) negative comments when I do badly in English.
	12. Criticize(s) me when I perform poorly in English.