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Perceived teaching efficacy and coeducational vs. single-sex grouping in physical education teachers

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ABSTRACT

In many countries, sex equality is an essential aim of physical education (PE) curricula, while the PE grouping practices are widely hetero-normative. As far as there is a discrepancy between the curricula and practice, equality will not fully take place. This study examined the associations between PE teachers' perceived teaching efficacy (student engagement, instruction, class management) and preferences for single-sex (i.e. juridical sex) vs. coeducational grouping in PE. The analysis, based on a cross-sectional online survey of 175 Finnish PE teachers, showed that higher perceived class management was associated with the stronger preferences for single-sex PE. Associations of teacher's age and teaching experience with the preferences for coeducational vs. single-sex PE showed considerable heterogeneity. PE teachers' teaching efficacy, especially in class management, for teaching diverse groupings of students could be improved through in-service teacher training in accordance with the national curriculum.

KEYWORDS

School; equality; sex segregation; mixed-sex grouping; curriculum

Introduction

The national curricula in several countries promote equity and equality as the expectations for what all students should be taught (ACARA, 2014; SHAPE America, 2013; The Finnish National Board of Education, 2016). Over recent decades, the implementation of single-sex vs. coeducational physical education (PE) and their respective effects on student performance has been a topic of research in the field (Best, Pearson, & Webb, 2010; Slingerland, Haerens, Cardon, & Borghouts, 2014; Wallace, Buchan, & Sculthorpe, 2019). However, some studies have argued in favor of single-sex grouping over coeducation (Derry & Phillips, 2004; Hannon & Ratliffe, 2007; Vargos, Williams, Henninger, Coleman, & Burns, 2021; Wallace et al., 2019) and others for the opposite (Author, 2020; Hill & Clevin, 2005; Lentillon-Kaestner & Roure, 2019). For instance, Derry and Phillips (2004) proposed that while coeducational grouping in PE classes offers both girls and boys the opportunity to develop competence and self-esteem

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through a range of physical activities and sports, coeducational PE classes may not be the most appropriate environment for motor skill development and cognitive learning. Irrespective of how students are grouped, the individual PE teacher's effectiveness as a teacher may be the most significant factor in achieving desirable student outcomes in PE classes (Best et al., 2010). This study examined PE teachers' perceived teaching efficacy behind their preferences for single-sex or coeducational grouping in PE.

The Social Cognitive Theory of Self-Regulation (Bandura, 1991) offers a useful framework for examining PE teachers' teaching efficacy, including self-monitoring, judgement of behavior in relation to personal standards, teaching environment, and self-reaction, which play a central role in teaching. Teaching efficacy reflects teachers' beliefs about their abilities to influence student learning (Dellinger, Bobbet, Olivier, & Ellet, 2008; Zee & Koomen, 2016). According to the widely used Teachers' Sense of Efficacy Scale (Tschannen-Moran & Woolfolk Hoy, 2001), teacher efficacy comprises three elements: student engagement, instructional practices, and class management. First, student engagement includes planning and preparation of classes using clearly defined pedagogies and evaluating student responses while teaching based on the standards of curriculum (ACARA, 2014; SHAPE America, 2013; The Finnish National Board of Education, 2016). Second, effective teachers foster student learning through giving clear and consistent instructions, initiating supportive discussions, enabling active participation, and giving students encouraging feedback on their progress in learning tasks. Finally, effective class management includes student grouping, the use of instructional materials and equipment, student behavior management, and the organization of physical learning spaces.

In practice, teachers with lower teaching efficacy are more likely to give up when facing difficulties, experience more anxiety, and are less effective in using problem-solving strategies (Bandura, 1991), whereas teachers with high teaching efficacy are more committed to teaching, set more challenging goals (Woolfolk Hoy & Burke Spero, 2005) and strongly enhance student engagement (Cheung, 2008). PE teachers' perceived teaching efficacy has been shown to be influenced by teachers' sex (Lesh, 2017; Ozkal, 2014; Schnitzius, Kirch, Spengler, Blaschke, & Mess, 2021; Xiong, Sun, Liu, Wang, & Zheng, 2020) and by their age (Xiong et al., 2020) and teaching experience (Xiong et al., 2020). For instance, Xiong et al. (2020) reported that male PE teachers, teachers with 11 or more years of teaching experience, and PE teachers in the age group 36–45 had significantly higher teaching efficacy than their colleagues in a sample of Chinese middle school PE teachers. These findings of Xiong et al. (2020) were consistent with a study of Ho (2009) comprising PE teachers and a study of Ozkal (2014) conducted among classroom teachers. However, their results partly contradicted with some other findings, for instance Khurshid, Qasmi, and Ashraf (2012) found that female secondary school teachers had higher perceived teaching efficacy than male teachers. This indicates that different school subjects, cultures and teacher education programs may have a specific influence on teacher's perceived teaching efficacy. However, students' positive PE experiences, which are strongly related to classroom settings (Best et al., 2010; Leisterer & Jekauc, 2019; Lewis, 2014) and also in part to PE grouping arrangements (Beni, Fletcher, & Ní, Chróinín, 2017), seem more likely to result in a more positive student learning attitude (Xiong et al., 2020) and commitment to an active lifestyle after leaving school (Hill, Harmon, & Knowles, 2012). It is, therefore, important to study the associations between teachers' teaching efficacy and sex grouping issues in PE.

Single-sex grouping, that is, when girls and boys are segregated in PE classes, has traditionally been justified by reference to the different interests of girls and boys (Johansson, Heikinaro-Johansson, & Palomäki, 2011), more active participation and better skill development, particularly in girls (Hill et al., 2012; Vargos et al., 2021; Wallace et al., 2019), and bodily contact activities and safety issues (Hill et al., 2012). In this study, the term 'sex' is used over 'gender' when referring to 'juridical sex' (Repo, 2019) that serves as basis for PE grouping in Finland. Specifically, based on the national PE curriculum (The Finnish National Board of Education, 2016), the schools are free to determine how to group students in PE classes. Therefore, Finnish students have traditionally been taught in biological single-sex PE groups from the third grade onwards, and girls have typically been instructed by female and boys by male teachers (Berg & Lahelma, 2010; Rintala, Palomäki, & Heikinaro-Johansson, 2013). Single-sex PE has also been commonplace in the United States (Wilson, 2012) and remains prevalent in many Muslim countries (UNESCO, 2020). As referenced above, many possible effects of single-sex PE classes, such as students' physical activity levels (Wallace et al., 2019), fitness test results (Wilson, 2012) and teachers' perceptions of reasons favoring single or coeducational PE teaching (Best et al., 2010; Hill et al., 2012) have been investigated in previous studies. However, the results of previous studies, in which segregation in relation to the efficacy of PE teachers was not examined, have yielded conflicting findings.

In turn, coeducational or mixed-sex PE classes, where all students are educated together, have been recommended to prevent discrimination, exclusion, and sex-based inequity (Hill et al., 2012; Lentillon-Kaestner & Roure, 2019). A few studies have investigated PE teachers' perceptions of disparities in coeducational PE. For instance, in a sample of US secondary school PE teachers, Hill et al. (2012) found that most of the teachers would prefer all activities, with the exceptions of football and basketball, to be offered in a coeducational format. In Spain, female PE teachers have been shown to deliver coeducational teaching in PE slightly more than male PE teachers (Piedra, García-Pérez, Rebollo, & Ries, 2011; Valdivia-Moral, Molero, Díaz-Suarez, Cofre, & Zagalaz-Sánchez, 2018). According to Wilson (2012), coeducational PE courses are increasing in popularity in many Western countries and are more common at the elementary than higher school levels. In contrast, girls are not offered PE as a subject in some Eastern and developing countries (Wilson, 2012). Although both coeducational and single-sex groupings can have positive impacts on student learning, more research is needed to better understand the determinants of both grouping styles as facilitators of an effective learning environment from the perspective of PE teachers (Best et al., 2010).

One of the flaws in the existing PE grouping research has been that studies have largely focused on student performance (Best et al., 2010; Slingerland et al., 2014; Wallace et al., 2019; Wilson, 2012) and that the results have been mixed, some studies finding in favor of single-sex (Derry & Phillips, 2004; Hannon & Ratliffe, 2007) and others of coeducational (Author, 2020; Hill & Cleven, 2005; Lentillon-Kaestner & Roure, 2019) PE settings. Author (2015) concluded that previous studies on grouping in PE have focused heavily on male-dominated ball games (e.g. Slingerland et al., 2014; Smith, Lounsbery, & McKenzie, 2014), while sex-equal PE has been overlooked or ignored. This indicates that regardless of equity and equality stated in the

national PE curriculum, the current PE practices designate rules about what are the ‘normal’ sports for boys and girls (Coll, Enright, & O’Sullivan, 2015). In addition, several previous studies (Cheung, 2008; Martin & Kulinna, 2003; Tournaki, Lyublinskaya, & Carolan, 2009; Zee & Koomen, 2016) have found that perceived teaching efficacy consists, at least partly, of teachers’ teaching philosophies and strategies and that the individual PE teacher thus plays a critical role in successful learning (Best et al., 2010). To put curriculum-initiated sex-equality into practice (The Finnish National Board of Education, 2016), it is important to consider PE teachers’ teaching efficacy along with their sex grouping preferences and the covariate effects of their sex, age, and teaching experience. The present study is the first to investigate these associations in the same model, and thus offers a new insight into the teacher-initiated determinants of single-sex and coeducational grouping styles in school PE settings. These findings can be used in developing pre-service PE teacher education programs and in-service teacher training to provide a safer, inclusive, and equal PE learning environment free of sex-based assumptions to all students.

The aims of this study were to examine 1) the associations between teachers’ self-assessed teaching efficacy, comprising student engagement, instructional practices, and classroom management, and their preferences for single-sex or coeducational PE, and 2) the covariate effects of teachers’ sex, age, and teaching experience on their teaching efficacy and preferences for single-sex or coeducational PE. Based on previous findings, male teachers (Lesha, 2017; Ozkal, 2014; Schnitzius et al., 2021; Xiong et al., 2020), older teachers (Xiong et al., 2020), and teachers with longer teaching experience (Xiong et al., 2020) were expected to report higher PE teaching efficacy scores than their counterparts.

Methods

Participants and procedure

A total of 175 PE teachers (122 females, 53 males) aged between 27 and 62 years from eighteen regions across Finland participated in the study (Table 1). Data were collected anonymously by an online survey with convenience sampling between September and November 2018. A link to the survey was published on the website of the Association of Physical and Health Educators in Finland. It was also sent directly to individual PE teachers and school principals. On the opening page, prospective participants were informed that participation was voluntary and anonymous. They were also informed about the objectives and methodology of the study, potential disadvantages of participating in the study, the data processing methods to be used, and the channels through which the study results would be published. To access the questions, participants had first to consent by ticking a box. They were encouraged to answer honestly and assured that their responses were confidential. After completing the questions, each participant’s responses were automatically saved in the digital database of the local university and processed by the researchers. Approval to conduct the study was obtained from the ethics committee of the principal investigator’s university and a data protection assessment delivered to the university’s data protection officer.

Table 1. Participant demographics (N = 175).

	Quantity	Percentage
Sex		
Female	122	69.7
Male	53	30.3
Age		
<30 years	4	2.3
30–39 years	40	22.9
40–49 years	59	33.7
50–59 years	65	37.1
>60 years	7	4
Region		
Uusimaa	52	29.9
Pirkanmaa	18	10.3
Southwest Finland	17	9.8
Central Finland	16	9.2
North Ostrobothnia	11	6.3
Other	61	34.5
Teaching level		
Elementary 1–6	9	5.1
Middle school 7–9	64	36.6
High school	25	14.3
Vocational school	4	2.3
Higher education	2	1.1
Elementary + Middle school 1–9	15	8.6
Middle school 7–9 + High school	56	32
Tertiary education		
Master of Sport Science (120 credits in PE)	150	85.7
Bachelor of Sport Science (60 credits in PE)	3	1.7
Master of Health Science	2	1.1
Master of Education, specialized in PE (25 credits in PE)	9	5.1
Master of Education, not specialized in PE Other	1	0.6
	10	5.7
Teaching experience		
<5 years	30	17
6–10 years	27	15
11–15 years	38	22
>15 years	80	46

Measures

Perceived teaching efficacy

Teachers' perceived teaching efficacy in PE was assessed with the Finnish version of the 24-item Ohio State Teacher Efficacy Scale (OSTES; Tschannen-Moran & Woolfolk Hoy, 2001) which comprises three eight-item dimensions of teacher efficacy: instructional strategies: *'To what extent can you use a variety of assessment strategies'*, classroom management: *'To what extent can you calm a student who is disruptive or noisy'*, and student engagement: *'To what extent can you help your students value learning'*. All items were prefaced by the words *'To what extent can you?'* and answered on a five-point response scale ranging from *not at all* (1), to *extremely well* (5). The mean scores of the three subscales were taken as the teachers' self-rated teaching efficacy scores. The internal consistency of the scale was confirmed based on composite reliabilities (Table 2).

Preferences for coeducational vs. single-sex PE

Preferences for the coeducational vs. single-sex PE variables were assessed using items created by the principal investigator (second author) of this study. Preferences for

Table 2. Correlation coefficients, composite reliabilities, means, and standard deviations of the study variables (N = 175).

	1	2	3	4	5	6	7	8	CR	M	SD
1 Teaching efficacy – student engagement	–								.83	3.67	.50
2 Teaching efficacy – instructional practices	.75***	–							.85	3.90	.49
3 Teaching efficacy – classroom management	.70***	.68***	–						.89	4.01	.50
4 Coeducational PE grouping	–.14	–.19*	–.15	–					.90	2.88	.93
5 Single-sex PE grouping	.15	.14	.22**	–.87***	–				.89	3.13	.95
6 Teachers' age	.17*	.29***	.24**	–.09	.09	–			–	44.76	9.17
7 Teaching experience	.18*	.24**	.25***	–.20**	.20*	.86***	–		–	16.06	9.11
8 Teachers' sex	.01	.10	.21**	.14	–.10	.07	.11	–	–	–	–

Note.

*** $p < .001$,

** $p < .01$,

* $p < .05$

coeducational PE were assessed with nine items (e.g. ‘Teaching elective PE courses in coeducational groups is justified’, ‘Team spirit is better in coeducational PE groups than in single-sex groups’, and ‘I would prefer to teach PE in coeducational groups’). Preferences for single-sex PE were similarly assessed with nine items (e.g. ‘Teaching elective PE courses in single-sex groups is justified’, ‘Team spirit is better in single-sex PE groups than in coeducational groups’, and ‘I would prefer to teach PE in single-sex groups’). PE teachers responded to the items on a five-point Likert scale from *strongly disagree* (1) to *strongly agree* (5). As the scale was created for the purpose of this study, composite reliabilities (Table 2) were calculated to test the internal consistency of items. The factor structure of the scale was confirmed using a structural equation model. Parameter estimates for PE teachers’ preferences for coeducational and single-sex PE are provided in Figure 1.

Data analysis

Prior to the main analyses, the normality of the data distribution, possible outliers, and missing values were analyzed. Correlation coefficients, composite reliabilities, means and standard deviations were calculated for the study variables. To test the correlational associations of teaching efficacy (student engagement, instructional practices, and classroom management) with preferences for coeducational or single-sex PE and covariates (teachers’ sex, age, and teaching experience), a regression model was implemented. To clarify mean differences between female and male teachers, independent t-tests were conducted.

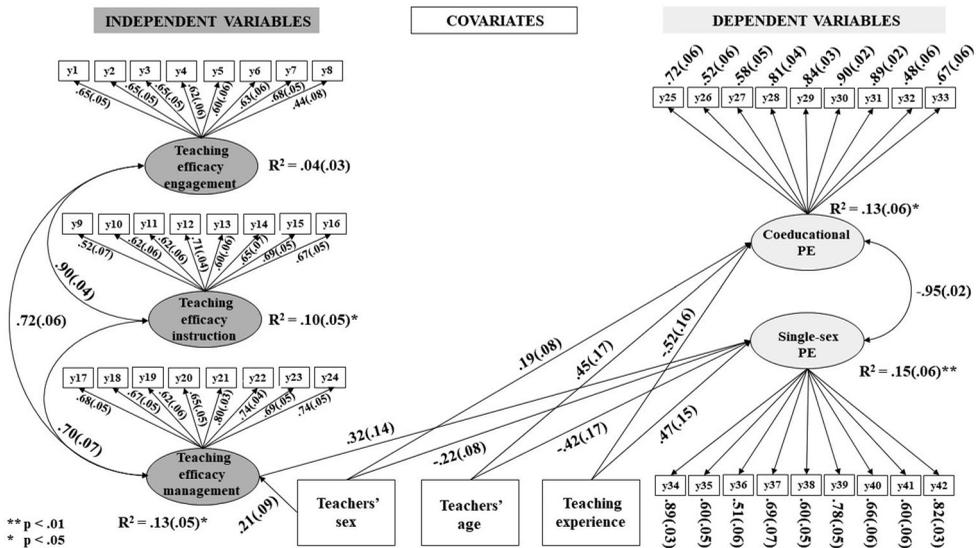


Figure 1. Standardized results of regression analysis for teaching efficacy and coeducational and single-sex grouping in PE, and covariates of teachers’ sex, age, and teaching experience. Note. All paths are significant at $p < .05$ level. For reasons of clarity, residual correlations between items using similar wording (y26 and y35; y33 and y40) are not illustrated (y1-y42 = observed variables).

Chi-square test (χ^2) was used to test the overall model fit. A non-significant difference between the observed distribution and the theoretical distribution demonstrates acceptable fit to the data. The chi-square test has been shown to lack power with small samples, and hence may not discriminate between good – and poor- fitting models (Kenny & McCoach, 2003). To further test the fit of the proposed model, the standardized root mean square residual (SRMR), root mean square error of approximation (RMSEA), comparative fit index (CFI), and Tucker-Lewis index (TLI) were used. A SRMR value of less than .06 and a RMSEA value of .08 or less are generally considered as indicating good model fit. For the CFI and TLI, values greater than .95 indicate excellent model fit and values greater than .90 satisfactory model fit (Kline, 2005). The explanatory power of the regression model was estimated using squared multiple correlations. All preliminary analyses, including missing value analysis and descriptive statistics were performed using SPSS Version 26.0, and the regression model was estimated using Mplus Version 8.3.

Results

Preliminary analyses

A graphical analysis indicated that the data were normally distributed. Based on the standardized values (± 3.0), two significant outliers were removed from the instructional practices dimension of teaching efficacy. The percentage of missing values was 4.3% (320 out of 7 114 values), as 29 teachers did not fully complete the online form. The missing completely at random (MCAR) test ($\chi^2 = 770.79$, $df = 776$, $p = .546$) indicated that the data with and without missing values were similar. Thus, the missing values were considered to be missing completely at random (Little & Rubin, 2002).

Descriptive statistics

Correlation coefficients, composite reliabilities, means, and standard deviations of the study variables were analyzed (Table 2). The correlations between the study variables ranged from strongly positive to strongly negative. The strongest positive correlations were found between student engagement and instructional practices, as well as teacher's age and teaching experience, while the strongest negative association was found between preferences for coeducational and preferences for single-sex PE. Composite reliability values indicated good internal consistency, as the teachers responded the same for each question of the certain scales. The mean values of teaching efficacy were relatively high and preferences for coeducational and single-sex PE were almost at the same level.

The regression model of teaching efficacy and preferences for coeducational and single-sex PE

A regression model was implemented to test the relationships between teaching efficacy (student engagement, instructional practices, and classroom management), preferences for coeducational and single-sex PE, and the covariates of teachers' sex, age, and teaching experience. The theorized model showed unacceptable model fit to the data ($\chi^2(920) = 1288.76$, $p < .001$, $CFI = .89$, $TLI = .88$, $RMSEA = .048$, 90% CI [.04, .05], $SRMR = .063$).

Based on the modification indices, the fixed model including the residual correlations between items using similar wording (y_{26} = 'Teaching elective PE courses in coeducational groups is justified' and y_{35} = 'Teaching elective PE courses in single-sex groups is justified'; y_{33} = 'Team spirit is better in coeducational PE groups than in single-sex groups' and y_{40} = 'Team spirit is better in single-sex PE groups than in coeducational groups') showed acceptable model fit to the data ($\chi^2(918) = 1232.90$, $p < .001$, $CFI = .91$, $TLI = .90$, $RMSEA = .045$, 90% CI [.04, .05], $SRMR = .062$) (Figure 1). Correlated residuals among items using similar wording are both possible and acceptable in some models, although they should be used cautiously (Smolkowski, 2020). In the present data, the items with the same wording covered theoretically significant elements of the PE grouping preferences. The model showed the same fit to the data with or without these items, and therefore the residual correlations were allowed.

The analysis showed that higher perceived classroom management was related to stronger preferences for single-sex PE. Teachers' sex was related to perceived classroom management and to both coeducational and single-sex preferences in teaching PE. Independent t-tests confirmed that teachers' sex had no significant effect on the mean scores of preferences for coeducational PE ($t(169) = -1.83$, $p = .068$). The only significant difference between female and male teachers was in their mean classroom management scores ($t(164) = -2.73$, $p = .007$), with men ($M = 4.16 \pm .52$) scoring higher than women ($M = 3.93 \pm .47$). Older PE teachers scored higher on the preference for coeducational PE, while younger PE teachers reported a higher preference for single-sex PE. Finally, longer-service PE teachers showed a higher preference for single-sex PE and less experienced PE teachers a higher preference for coeducational PE. The latent teaching efficacy variables were positively associated, higher preferences for coeducational PE correlating with lower preferences for single-sex PE and vice versa. Squared multiple correlations (R^2) showed that the model explained 15% of the variability of preferences for single-sex PE and 13% of the variability of preferences for coeducational PE.

Discussion

This study examined the associations between PE teachers' teaching efficacy, comprising student engagement, instructional practices, and classroom management, and their preferences for coeducational vs. single-sex PE, and the covariate effects of teachers' sex, age, and teaching experience. The key findings of the study were: 1) higher perceived classroom management associated with stronger preferences for single-sex PE, 2) older PE teachers preferred coeducational PE, while younger PE teachers preferred single-sex PE, 3) longer-serving PE teachers preferred single-sex PE, while less experienced PE teachers preferred coeducational PE, and 4) male PE teachers scored higher than females on self-reported classroom management.

While the Finnish PE grouping is strongly based on heteronormative tradition, the national curriculum (The National Board of Education, 2016) promotes gender equality regardless of students' sexual identity. This is the first study to investigate the associations between PE teachers' teaching efficacy and sex grouping preferences in the school PE setting. The results showed that higher perceived classroom management related to a stronger preference for single-sex PE. An explanation for this may be that the current sample of PE teachers considered single-sex grouping 'easier' to manage, that is, as

requiring less organizational effort, since the presence of students of different sexes can significantly distract students in the PE context (Best et al., 2010; Hill et al., 2012). The current PE teachers may also have experienced difficulties in managing mixed groups, especially as girls and boys are usually segregated in Finnish PE classes.

However, it must be recognized that many other situation-specific factors, such as the objectives of a particular lesson (social or physical), influence students' performance in PE classes irrespective of the grouping arrangement. The fact that PE teachers have traditionally focused on students' physical performance over other aspects of PE (Wilson, 2012), may impact their preferences for sex grouping. Against this background, it is possible that single-sex and coeducational PE classes require different capabilities in managing both students and equipment, and therefore, PE teachers may feel more comfortable managing single-sex groups, especially with respect to physical learning outcomes. Both groupings have advantages and disadvantages in PE teaching (Hill et al., 2012). Furthermore, single-sex PE classes are typically based on the binary juridical sex, while less attention has been given to diversity comprising transgender and non-binary students (Author, 2020; Gilbert, Pass, Keuroghlian, Greenfield, & Reisner, 2018). This aspect could be better considered in the future PE teacher education programs and in-service teacher training.

The results also revealed that older PE teachers had stronger preferences for coeducational PE while younger PE teachers favored single-sex PE. Interestingly, the longer-serving PE teachers preferred single-sex PE and less experienced PE teachers favored coeducational PE. It is clear that age and length of teaching experience do not always go hand in hand, nevertheless, the inconsistency in these results warrants further investigation. Based on the present data, it is difficult to draw conclusions about the factors underlying this discrepancy. It may be that younger PE teachers, often in the early stages of their teaching career, feel more comfortable teaching traditional single-sex groups. Although the Finnish national PE curriculum is exactly the same for both girls and boys, the delivery of curriculum-based activities is strongly gendered. It has been shown that the sport activities available to girls and boys in Finnish PE classes differ (Palomäki & Heikinaro-Johansson, 2011; Rintala et al., 2013).

It may be that generally Finnish PE teachers feel more familiar with teaching traditional gendered activities based on their own school PE experiences, and perhaps, because they have no versatile experience on teaching coeducational PE. Specifically, the current sex segregation may enhance sex-related prejudices, such as dance and gymnastics for girls and ball games for boys, which in turn, may be reflected in higher preferences for single-sex over coeducational PE classes. In turn, longer-serving PE teachers may also prefer single-sex teaching, as managing students behaviors is a complex process and may be more difficult with diverse groups, i.e. coeducational groups (Krause, Bochner, & Duchesne, 2003). Having said that, PE classes may be easier to manage in single-sex education, for instance, in terms of bodily contacts and safety issues (Hill et al., 2012). Most teachers in the current sample worked in middle schools, where inadequate class management skills may cause more frequent conflicts between students (Egeberg, McConney, & Price, 2020). However, this requires additional evidence, as previous sex grouping research in PE has relied heavily on student performance over behavioral issues.

Finally, in line with previous findings of Lesha (2017), Schnitzius et al. (2021), and Xiong et al. (2020), male PE teachers scored higher on perceived classroom management scores than females. These aforementioned studies have also found significant differences between female and male teachers' self-assessed classroom management skills and competencies indicating that teaching-related self-efficacy may be higher within male than female teachers (Lesha, 2017; Schnitzius et al., 2021; Xiong et al., 2020). This study was the first attempt investigating these relationships in Finnish teachers. Based on past findings (Egeberg et al., 2020; Lewis, 2014), it may be that the teacher-student relationship is the key factor in effective classroom management. For instance, Egeberg et al. (2020) interviewed Australian high school teachers who had been nominated by their students as effective classroom managers. The teachers reported that students find it hard to misbehave when they have a really good communicative relationship with their teacher, although a lack of engagement also plays a key role. Some students may misbehave if they are bored or if they are frustrated because they find school tasks too easy or difficult. Similarly, Lewis (2014) found that PE teachers in the United Kingdom felt that the more relaxed PE environment, compared to that in other school subjects, made it easier to control pupils. Although discipline and controlling behavior was of importance to some PE teachers, others focused more on understanding and building relationships (Lewis, 2014).

A possible explanation for the difference in classroom management between female and male PE teachers in the present study may be that the present sample was collected in Finland, where school PE is sex-segregated. More specifically, girls are typically instructed by female PE teachers and are offered aerobics, gymnastics, circuit training, dance, and relaxation techniques, while boys are usually taught by male PE teachers and more often have ball games, downhill skiing, and ice hockey (Berg, 2010; Palomäki & Heikinaro-Johansson, 2011; Rintala et al., 2013). In addition, Schnitzius et al. (2021) found that male PE teachers possibly have a stricter teaching style, which may explain, at least partly, higher classroom management in male teachers. From this point of view, the classroom management and other competencies required in PE classes may potentially influence PE teachers' student grouping preferences. Effective classroom management requires effective planning, organization and reflection skills as well as teamwork and motivation (Erden, Aytaç, & Erden, 2016). Although pre-service PE teachers gain initial skills in classroom management during their initial teacher education and practical school placements, PE curriculum-initiated training in professional development for in-service teachers may be a useful way of improving their classroom management skills and competencies, especially considering students with diverse sexual identities.

A key strength of this study was the concurrent investigation of teachers' perceived teaching efficacy and preferences for coeducational vs. single-sex student grouping in the PE domain. This study did not try to rank single-sex and coeducational PE, but investigated teacher-initiated determinants of these grouping styles. The results, which showed a strong association between higher class management competencies and single-sex PE, may be of value in future pre-service PE teacher education. In addition, while previous studies have focused on attitudes to sex-based grouping in teaching PE (Best et al., 2010; Hill et al., 2012) and student outcomes (Williams & Hannon, 2018; Wilson, 2012), this study is the first to investigate the contribution of other characteristics

of PE teachers such as perceived teaching efficacy to female and male teachers' preferences for coeducational vs. single-sex grouping in PE teaching.

However, this study has its limitations. First, the anonymous and voluntary-based online data collection procedures used made it impossible to know whether the sample was representative of the group of PE teachers who have most frequently encountered single-sex or coeducational issues in their PE teaching careers. Furthermore, the study was cross-sectional, which limits the drawing of conclusions on the cause-and-effect relationships between teaching efficacy and preferences for single-sex and coeducational PE. Future research could investigate sex grouping and coeducation in different types of teacher samples and schools in both urban and rural contexts. The topic could be also studied across a broader range of student outcomes in PE by including countries with different school cultures and teacher education programs. This would make it easier to identify the specific teaching requirements related to the use of a sex-based or coeducational grouping in PE classes.

Conclusions

This study on cross-sectional data supplied by Finnish PE teachers showed that higher perceived classroom management was associated with a stronger preference for single-sex PE, while the associations of teachers' age and teaching experience with single-sex and coeducational student grouping in PE classes showed considerable differences. These findings indicate that improving PE teachers' teaching efficacy, through teacher education programs and curriculum-based in-service teacher training, for the purpose of teaching diverse (lesbian, gay, bisexual, transsexual, questioning, and intersex students) groups of students could be of great value. This could also challenge proven single-sex and coeducational teaching practices in PE classes by putting the existing PE curriculum into practice. In education systems resembling the Finnish one, where girls are typically instructed by female PE teachers and boys by males, flexible and close cooperation between PE teachers of different sexes and with diverse teaching experience could also be a fruitful way to enhance teaching efficacy, especially class management skills. A possible (and radical) reform in Finnish PE teacher education would be a significantly longer final practical school placement for pre-service PE teachers, lasting, for instance, one or even two semesters, under the supervision of in-service PE teachers. During this longer placement, they would have enough time to experience teaching students regardless of their sexual identity, as the national PE curriculum initially suggests. This would more effectively prepare them to face the requirements and the diversity of PE students in today's schools.

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