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Understanding physical educators' perceptions of mattering: Validation of the Perceived Mattering Questionnaire – Physical Education

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Abstract

Previous research has illustrated that physical educators feel their subject is valued less than others in the context of schools. However, to date, no instruments have been developed to measure physical education teachers' perceptions of mattering. This study sought to propose and validate the Perceived Mattering Questionnaire – Physical Education (PMQ-PE). In total, 460 physical educators completed an online survey that measured perceived mattering, role stress, and resilience. Data analysis began with exploratory factor analysis to identify a stable two-factor structure that measured physical educators' perceptions that they matter and that the discipline of physical education matters. Next, confirmatory factor analysis was used to affirm the factor structure and to examine convergent, discriminant, and divergent validity. The model was a good fit for the data and the PMQ-PE correlated positively with resilience and negatively with role stress. These analyses support initial validation of the PMQ-PE.

Keywords

Exploratory factor analysis, confirmatory factor analysis, role socialization theory, sociopolitics, marginalization

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Introduction and background

International research on the socialization of physical education (PE) teachers has consistently indicated that PE is a marginalized subject and that PE teachers feel the effects of this marginalization in their daily work-lives (Henninger, 2007; Macdonald, 1995; Whipp et al., 2007). Marginalization, as it relates to school subjects, acknowledges that some subjects are more closely related to the socially constructed mission of school than others. Subjects such as PE, which are viewed as less important, are afforded less status and rewards and are thus marginalized (Kougioumtzis et al., 2011; Lux and McCullick, 2011). In the 21st century, the centrality of subjects to the mission of schooling has been further defined by government initiatives. In the USA, No Child Left Behind (US Department of Education, 2002) omitted PE from the definition of core academic subjects. As a governmental policy, this limits the ways schools can use federal monies to support PE programs (Richards et al., 2013).

The hierarchy of subjects in school contexts reinforces marginalization and creates an unequal status structure in which some teachers are viewed as performing a central educational function, whereas the work of others is viewed as peripheral or dispensable (Armour and Jones, 1998; Richards et al., 2014b). Subject status is not interchangeable with teacher status, as some teachers are relevant to the environments in which they work despite teaching a traditionally marginal subject (Lux and McCullick, 2011; O'Sullivan, 1989; Richards and Templin, 2012). However, prestige associated with the subjects one teaches appears to impact teachers' sense of mattering as an educator, with physical educators feeling as if they matter less because they teach a marginalized subject (Kougioumtzis et al., 2011). Research has documented the effects of marginality on PE teachers' sense of worth and motivation to teach effectively (Mäkelä and Whipp, 2015; Whipp et al., 2007). Generally, this work has illustrated that marginalization impacts the way teachers perceive that they and the subject they teach matters to the overall functioning of education. Perceived mattering, as defined by Marshall (2001), is the 'psychological tendency to evaluate the self as significant to specific other people' (p. 474).

When considering teachers' feelings of marginalization or perceptions of mattering, it is important to consider the sociopolitical dynamics present in school environments. By drawing upon the tenets of occupational socialization theory (Richards et al., 2014b) and role theory (Parsons, 1951), role socialization theory (RST; Richards, 2015) addresses how expectations for performance of the PE teacher role are socially constructed and contextually bound to a school setting. Drawing from occupational socialization theory, RST examines the recruitment, training, and ongoing socialization of PE teachers in the context of the schools in which they work (Richards et al., 2014b; Woods and Lynn, 2014). Across these three phases of socialization, individuals learn the skills required for performing a given social role as well as social expectations for that performance. In contrast to functionalist models of socialization, RST adopts a dialectical perspective on socialization (Schempp and Graber, 1992) by recognizing that individuals have the capacity to resist the influence of socializing agents.

RST proposes that interactions within the work environment are central for understanding how individuals navigate and derive meaning from their work-lives. Integral to this understanding is the extent to which physical educators' perspectives of their work align with those held by other members of the school community, such as colleagues, administrators, parents, and children (Kougioumtzis et al., 2011; Richards et al., 2013). When there is a high degree of congruence, stress is typically reduced and the role can be performed without social barriers (Biddle, 1986). In these situations, everyone in the school environment shares relative agreement on the way in which

the role should be enacted, which has been referred to as role consensus (Hindin, 2007). Differences in perspectives are common, however, as members of the school community are likely to have had diverse socialization experiences (Richards et al., 2013). When prior socialization experiences lead members of the school community to view PE as a lower status subject, marginalization can ensue as PE teachers are forced to defend their subject and negotiate social role definitions with those around them (Kougioumtzis et al., 2011). This process of negotiation is context-specific and depends heavily on the views held by others in a particular school context (Richards, 2015).

In a context such as Finland, where it has been noted that physical educators' status is relatively high (Mäkelä et al., 2014), marginalization may not be a pervasive issue. Where the effects of marginalization are felt, however, physical educators may believe that they do not matter to those around them (Richards, 2015; Woods and Lynn, 2001). While *marginality* represents a particular position within a group relative to what is considered central or most important, *mattering* refers to how occupying a position within a group translates into feelings of significance or value by others within that group. Perceived mattering is described as the conception that others are concerned with us, or the tendency to believe we are significant to other people (Marshall, 2001). Scholars posit that mattering is comprised of four dimensions: (a) attention; (b) importance; (c) dependence; and (d) ego-extension (e.g. Rosenberg and McCullough, 1981; Schieman and Taylor, 2001). *Attention* relates to feeling we are of interest to another person or group. *Importance* refers to the concept that others value our contributions to the group. *Dependence* implies the perception that the success of others is dependent upon us, and *ego-extension* refers to the notion that others are interested in our successes or failures.

The ability to perceive oneself as valuable to others can reduce marginality (Baumeister and Leary, 1995), which seems noteworthy given the lower status occupied by many physical educators across countries (Kougioumtzis et al., 2011; Macdonald, 1995; Woods and Lynn, 2001). Individuals who hold a strong sense of mattering perceive that their actions are acknowledged and relevant in the lives of other people (Schieman and Taylor, 2001). Investigations of mattering in work contexts show that work experiences provide opportunities for relationships that can enhance mattering and that work conditions affect attitudes, values, and perceptions of the self (Kohn, 1976; Rosenberg, 1957; Schieman and Taylor, 2001). When physical educators occupy a marginal position in schools, the enhancement of mattering may reduce the effects of this marginality and possibly allow physical educators to elevate their status positions. Such was the case with Grace, the teacher studied by Lux and McCullick (2011), who was able to convince others in her school of the value of the PE program.

When the social role negotiation that results from marginalization and relates to feelings of mattering becomes intense, social role stress can occur (Conley and You, 2009). Forms of role stress include the following: role conflict; role overload; and role ambiguity. *Role conflict* occurs when expectations for role performance held by the role incumbent do not align with the expectations of others in the occupational setting (Hindin, 2007). Teachers experience stress because they are seldom able to meet all the varying expectations others hold for their work. *Role overload* results when the responsibilities associated with a particular social role are overwhelming, and individuals do not feel that they have adequate time to complete all assigned tasks (Chan, 2003). Finally, *role ambiguity* results from situations in which expectations for role performance are vague or unclear (Conley and Woosley, 2000), and can be intensely stressful when teachers feel unaware of evaluation procedures, yet are held accountable for their work. In the current study, role conflict, role overload, and role ambiguity were expected to correlate negatively with perceived

mattering as we hypothesized that teachers who perceived higher levels of role stress would likely believe that they matter less to those around them.

Related to the constructs of role stress and perceived mattering is resilience. Resilience relates to an individual's capacity to bounce back or recover strength in the face of stressful life circumstances (Gu and Day, 2007). Resilient teachers are those who are able to cope with the stressors of their work while balancing their needs and the needs of their students (Gloria et al., 2013). Researchers interested in the study of resilience seek to understand how teachers adapt to stressful life circumstances (Luthar and Cicchetti, 2000) as a way to reduce prolonged stress or prevent early career exit (Yonezawa et al., 2011). Because resilience helps teachers to manage stress, it has been cited as an important variable in preventing teacher burnout (Richards, 2015), which is positively related to marginalization (Fejgin et al., 2005; Koustelios and Tsigilis, 2005) and has been cited as a challenge for physical educators (Bartholomew et al., 2014). Supportive environments in which teachers believe that they matter can foster resilience and aid teachers in working through stressors (Pearce and Morrison, 2011). In the current study, a positive correlation between perceived mattering and resilience was expected as we hypothesized that teachers who perceive higher levels of mattering should also espouse more resilience.

Perceiving a strong sense of mattering helps individuals to feel more central to their member organizations and has the potential to combat the effects of marginalization (Baumeister and Leary, 1995). While valid and reliable instruments for measuring perceived mattering exist in the adolescent health (Marshall, 2001) and general sociological (Schieman and Taylor, 2001) literatures, no such instrumentation exists in PE. The availability of such an instrument is of great importance for the PE community, as it represents the first step in understanding how PE teachers derive a sense of mattering from their work, and the factors that can facilitate or inhibit this development. The purpose of this investigation was to propose and validate the Perceived Mattering Questionnaire – Physical Education (PMQ-PE) as an instrument for measuring PE teachers' perceived mattering. Research aims included the following: (1) developing the PMQ-PE; (2) identifying a factor structure for the PMQ-PE using exploratory factor analysis (EFA); (3) confirming the factor structure through confirmatory factor analysis (CFA) using a separate sample; and (4) examining the extent to which the PMQ-PE correlates with conceptually similar (i.e. resilience) and dissimilar (i.e. role stressors) constructs.

Method

Instrument development

All research activities were approved by the research ethics board at the lead investigator's university prior to initiation of the study. In order to ensure content validity, items considered for the PMQ-PE were selected through a four-step process similar to that followed by Weiss et al. (2014). This process included the following: (1) reviewing previous literature; (2) interviewing physical educators; (3) creating a pool of items; and (4) conducting a pilot test.

Reviewing previous literature. Our review of literature focused on the construct of mattering in the general organizational literature (e.g. Rosenberg, 1957; Rosenberg and McCullough, 1981; Schieman and Taylor, 2001), as well as research that has captured the ways in which PE teachers perceive their work and how they believe it is perceived by others (e.g. Kougioumtzis et al., 2011; Lux and McCullick, 2011; Mäkelä et al., 2014; Mäkelä and Whipp, 2015; Napper-Owen

and Phillips, 1995; O'Sullivan, 1989; Whipp et al., 2007; Woods and Lynn, 2014), including the literature examining teacher job satisfaction and burnout (e.g. Bartholomew et al., 2014; Koustelios and Tsigilis, 2005). The perceived mattering literature provided us with a framework for conceptualizing mattering around the four dimensions of attention, importance, dependence, and ego-extension (Rosenberg and McCullough, 1981), as well as a valid and reliable instrument for measuring perceived mattering (Schieman and Taylor, 2001). The PE literature related to teacher perceptions of their work was consulted to garner an understanding of how teachers described their feelings of mattering. Finally, we consulted resources for instrument development generally (e.g. Brown, 2006; Loehlin, 2004; Tabachnick and Fidell, 2013), as well as those in the PE literature more specifically (e.g. Kyrgiridis et al., 2014; Richards et al., 2014a; Weiss et al., 2014) to inform our process.

Interviews with physical educators. Based on the review of literature in the previous step, we developed an interview guide focused on perceptions of mattering in the four domains of attention, importance, dependence, and ego-extension, and interviewed 30 in-service teachers. The purpose of these interviews was to develop an understanding of PE teachers' perspectives on mattering and to ascertain whether or not all four dimensions discussed in the extant literature and included in Schieman and Taylor's (2001) instrument were relevant to PE teachers. These interviews revealed that the four dimensions of mattering did apply to the work of PE teachers; however, it was also clear that PE teachers felt as if they could matter to those around them while also feeling that PE as a discipline did not matter. This expanded our understanding of perceived mattering in PE and led us to conceptualize two interrelated domains focused on PE teachers' perceptions that they matter (teacher matters) and that PE as a discipline matters (PE matters). The two domains align with previous research illustrating that individuals within schools can appreciate PE teachers for behavior management skills (O'Sullivan, 1989; Schempp et al., 1993), coaching school sport (Richards and Templin, 2012), and giving children breaks from classroom subjects (Lux and McCullick, 2011), while still holding negative impressions of PE as a subject.

Identifying a pool of items. Following a review of the literature and interviews with PE teachers, we identified items that reflected Rosenburg and McCullough's (1981) four dimensions of mattering (i.e. attention, importance, dependence, and ego-extension) across the two domains of PE matters and teacher matters. A total of eight items were created: four related to the teacher matters domain and four related to PE matters. The four teacher matters items were adapted from Schieman and Taylor's (2001) items and worded to specifically reference teaching school-based PE (e.g. How important do you feel you are to other people at school? [Importance]). The four PE matters items with also created to mirror questions on Schieman and Taylor's (2001) instrument, but the focus of each item was on the extent to which PE matters as a discipline (e.g. How interested are people, generally, in PE at your school? [Ego-extension]).

Prior to finalizing the survey, items were shared with PE researchers ($N = 5$) whose scholarship focuses on teacher socialization and the sociopolitics of schooling. These experts were asked to review the items and recommend changes to the wording and structure of items. The experts agreed that the items were worded clearly and accurately reflected the perceived mattering construct as conceptualized by Rosenberg and McCullough (1981). They also concurred with the theoretical and conceptual underpinnings of the two perceived mattering domains (i.e. PE matters and teacher matters). In concert with Schieman and Taylor's (2001) instrument, items were set to a four-point,

Table 1. Items included on the two factors of the Perceived Mattering Questionnaire – Physical Education (PMQ-PE).

Domain	Items
Physical education matters	How interested are people, generally, in physical education at your school? (Ego-extension)
	How much attention do you feel other people pay to physical education at your school? (Attention)
	How important do you feel physical education is to other people at school? (Importance)
	How much do you feel others at school would miss physical education if it went away? (Dependence)
Teacher matters	How important do you feel you are to other people at school? (Importance)
	How interested are people, generally, in what you have to say at school? (Ego-extension)
	How much do you feel others at school would miss you if you went away? (Dependence)
	How much attention do you feel other people pay to you at school? (Attention)

Likert-type scale that included one (not at all), two (a little), three (somewhat), and four (a lot) as response options.

Conducting a pilot study. An initial pilot study was conducted using the items created for inclusion on the PMQ-PE. A total of 35 in-service PE teachers completed the pilot study, which sought to check the survey structure, identify potential item wording problems, and determine the approximate time to complete the survey (the piloted survey included the PMQ-PE in addition to other items described below). Participants were also asked to comment on items they did not understand in an open response question that followed the survey. As a result of pilot testing, minor structural changes were made to improve survey flow, and survey completion time was deemed to be approximately 20–25 minutes. No substantive issues related to the wording of PMQ-PE items were noted. Thus, we decided to retain the two-factor structure that reflected multiple domains of mattering and included eight items (see Table 1 for a list of items). While the two domains are theoretically distinct, a positive correlation was anticipated as we expected teachers who perceive that PE matters to be more likely to believe that they matter.

Procedures and instrumentation

Following the development of the PMQ-PE, an email including an overview of the study and link to an online survey was sent to 1267 PE teachers in the American Midwest and Mountain West. The survey pool was drawn from databases of physical educators maintained by state agencies in Illinois, Indiana, and Wyoming. The survey was developed and administered using Qualtrics Survey Software (Qualtrics, 2015). A total of 460 teachers (36.60%) agreed to participate (see Table 2 for demographic information) and completed the survey packet, which contained the following 44 questions: a 17-item demographic questionnaire; the nine items on the teacher role stressors survey (TRSS; Conley and You, 2009); the 10-item version of the Connor-Davidson

Table 2. Demographic information for the participants in aggregate as well as for the divided samples.

		Total sample ($n = 460$)		EFA subsample ($n = 200$)		CFA subsample ($n = 260$)	
Category	Subcategory	Participants	Mean (SD)	Participants	Mean (SD)	Participants	Mean (SD)
Gender	Male	238 (51.70%)		107 (53.50%)		131 (50.40%)	
	Female	222 (48.30%)		93 (46.50%)		129 (49.60%)	
Age (years)			43.99 (11.48)		45.13 (10.78)		43.12 (11.94)
Years teaching			18.54 (11.38)		19.66 (11.15)		17.68 (11.50)
Race/ethnicity	Caucasian	433 (94.10%)		189 (94.50%)		244 (93.80%)	
	African American	8 (1.70%)		6 (3.00%)		2 (.80%)	
	Hispanic	8 (1.70%)		1 (.50%)		7 (2.70%)	
	Asian American	1 (.20%)		0 (0%)		1 (.40%)	
	Native American	1 (.20%)		0 (0%)		1 (.40%)	
	Multiple races	9 (1.90%)		4 (2.00%)		5 (1.90%)	
Education	Bachelor's	187 (40.60%)		79 (39.50%)		108 (41.50%)	
	Advanced degree	273 (59.40%)		121 (60.50%)		152 (58.50%)	
Teaching level	Elementary	173 (37.40%)		77 (38.50%)		95 (36.50%)	
	Secondary	288 (62.60%)		123 (61.50%)		165 (63.50%)	
School context	Urban	143 (31.10%)		57 (28.50%)		86 (33.10%)	
	Rural	174 (37.80%)		83 (41.50%)		91 (35.00%)	
	Suburban	143 (31.10%)		60 (30.00%)		83 (31.90%)	
Coach status	Teacher/coach	269 (58.50%)		110 (55.00%)		159 (61.20%)	
	Non-coaching	191 (41.50%)		90 (45.00%)		101 (38.80%)	
Students/class			27.91 (7.24)		27.84 (7.31)		27.98 (1.25)
Hours/day			5.01 (1.21)		5.03 (1.14)		4.99 (1.25)
Prep time			.87 (.31)		.87 (.33)		.87 (.28)
Total prepare			1.60 (.79)		1.52 (.71)		1.66 (.83)

EFA: exploratory factor analysis; CFA: confirmatory factor analysis; Years teaching: years of teaching experience; Coach status: whether or not the participant coached extracurricular sport in addition to teaching responsibilities; Students/class: average number of students in each class; Prep time: time (in hours) allocated by the school for lesson preparation; Total prepare: time (in hours) spent by the teacher inside and outside of school for lesson preparation (includes time allocated by the school).

Resilience Scale (CD-RISC 10; Campbell-Sills and Stein, 2007); and the eight items from the PMQ-PE.

Teacher role stressors. Conley and You (2009) developed the TRSS to examine the role stressors of role conflict, role ambiguity, and role overload among members of the teaching profession. Participants were asked to respond to the nine survey items by rating the accuracy of each item relative to their personal experience. Responses were set to a seven-point, Likert-type scale anchored by one (very inaccurate) and seven (very accurate). Example questions include: 'I feel certain about how much authority I have' (role ambiguity; reverse coded) and 'I often work under incompatible policies and procedures' (role conflict). Internal consistency reliability for the TRSS as indicated by Cronbach's $\alpha > .70$ (Tabachnick and Fidell, 2013) has been demonstrated through previous research (Conley and You, 2009), and was adequate in the current investigation (Cronbach's α ranged from .78 to .87).

Resilience. Connor and Davidson (2003) developed the 25-item CD-RISC to measure resilience. Campbell-Sillis and Stein (2007) reduced the CD-RISC to create the CD-RISC 10, which included 10 items that loaded on a single, unidimensional factor. While the factor structure of the CD-RISC has been unstable across studies (e.g. Lamond et al., 2008), the CD-RISC 10 has consistently demonstrated a stable structure (Campbell-Sills and Stein, 2007). The RD-RISC 10 was administered as a unidimensional measure of resilience in this study. Participants were asked to respond to the 10 resilience items by indicating the extent to which the items related to their experiences in the past month. Responses were set to a five-point, Likert-type scale ranging from zero (not true at all) to four (true nearly all the time). Example items include: 'I am able to adapt when changes occur,' and 'I tend to bounce back after illness, injury, or other hardships.' Internal consistency reliability for the CD-RISC 10 has been demonstrated previously (Campbell-Sills and Stein, 2007), and was good in the current investigation (Cronbach's $\alpha = .87$).

Instrument validation

The 460 respondents were randomly divided into two subsamples so that separate analyses could be conducted as part of the validation process. Firstly, we conducted an EFA to identify the underlying factor structure of the PMQ-PE with a subsample of 200 PE teachers (see Table 2 for demographic information). In the second study, we conducted a CFA to confirm the factor structure and to examine the factorials, convergent, divergent, and discriminant validity of the PMQ-PE with a second sample of 260 PE teachers (see Table 2 for demographic information). Data cleaning, descriptive statistics, and the EFA were conducted using IBM SPSS 21.0 software (IBM Corporation, 2014), and CFA was conducted using LISREL 9.1 software (Jöreskog and Sörbom, 2013).

Exploratory factor analysis. EFA seeks to explore the relationships among variables, and group together those that are highly correlated with one another (Tabachnick and Fidell, 2013). During the instrument development process, it is usually used to identify the number of factors described by a group of variables (Brown, 2006). In the current study, EFA was conducted using maximum likelihood extraction. A direct oblimin (i.e. non-orthogonal rotation) was selected to reflect the hypothesized correlation between the PE matters and teacher matters domains of perceived mattering (Tabachnick and Fidell, 2013). The eight-item model was run and factors with eigenvalues

over one were extracted. If necessary, item and factor reduction would be conducted by removing individual items that did not load significantly, loaded on a theoretically unjustifiable factor, or had a significant cross-loading (i.e. factor loading > .32; Brown, 2006).

Confirmatory factor analysis. CFA examines the loadings of manifest indicators on latent constructs (Brown, 2006). As a confirmatory technique, it tests a hypothesized model of factor loadings against a dataset (Hatcher, 1994). In the instrument validation process, CFA is often used to confirm a factor structure suggested through EFA (Loehlin, 2004). In the current study, we used CFA to confirm the two-factor structure for the PMQ-PE identified through EFA. In CFA, fit statistics indicate the degree to which the hypothesized model fits the data (Hatcher, 1994). As recommended by Brown (2006), multiple goodness-of-fit indicators were used to evaluate model fit in the CFA model. These included the χ^2, the non-normed fit index (NNFI), the comparative fit index (CFI), the standardized root mean square residual (SRMR), and the root mean square error of approximation (RMSEA). The ratio of χ^2 to its degrees of freedom (χ^2 / *df*) was used, with a ratio of $\leq$3.00 indicating good fit (Schreiber et al., 2006). NNFI and CFI values $\geq$.95 and SRMR and RMSEA $\leq$.08 are also indicative of good fit (Brown, 2006).

We also used CFA to examine convergent, discriminant, and divergent validity. Convergent validity is ascertained through the strength of factor loadings, composite reliability values (ρ_c), and average variance extracted (AVE) scores. Factor loadings above .50 and associated with *t*-values >1.96 are significant and considered good indicators (Brown, 2006). The ρ_c values should be .70 or higher (Diamantopoulos and Siguaw, 2000) and AVE scores should be .50 or higher to ensure model reliability (Fornell and Larcker, 1981). Discriminant validity was evaluated by comparing $\sqrt{AVE}$ for a construct to the correlation between that construct and others in the model. Should $\sqrt{AVE}$ be greater than the correlations between the constructs, the constructs can be considered independent of one another, which is evidence of discriminant validity (Teo et al., 2009).

Correlational analysis. As a final step in the instrument validation process, we conducted a correlational analysis to examine the extent to which the PMQ-PE subscales relate to other variables that are conceptually similar or dissimilar. It was hypothesized that resilience would be positively correlated with the teacher matters and PE matters subscales. Conversely, it was hypothesized that role conflict, role ambiguity, and role overload would negatively correlate with the teacher matters and PE matters subscales.

Results

Exploratory factor analysis

We began the instrument validation process by running an EFA on a subsample of 200 PE teachers to identify the underlying factor structure of the PMQ-PE. The initial EFA extracted two factors that explained a cumulative 64.34% of the variance. The χ^2 goodness-of-fit statistic was significant, $\chi^2(13) = 29.51$, $p = .006$, but a significant χ^2 test is expected in most EFA models because the procedure is highly dependent upon sample size (Brown, 2006). The first factor included the four items hypothesized to measure PE matters (53.83% of the variance), and the second factor included the four teacher matters items (10.51% of the variance). All factor loadings were above .60, and there were no significant cross-loadings. Given that the items loaded in a theoretically justifiable manner without significant cross-loadings, item reduction was not necessary.

Table 3. Factor loadings for the two-factor solution for the Perceived Mattering Questionnaire – Physical Education (PMQ-PE).

	Factors		Descriptive statistics	
PMQ-PE Items	PE matters ($\alpha = .86$)	Teacher matters ($\alpha = .87$)	*M*	*SD*
How interested are people, generally, in physical education at your school?	.96		2.31	.83
How much attention do you feel other people pay to physical education at your school?	.84		2.10	.80
How important do you feel physical education is to other people at school?	.75		2.44	.95
How much do you feel others at school would miss physical education if it went away?	.64		2.78	1.11
How important do you feel you are to other people at school?		.87	2.76	.86
How interested are people, generally, in what you have to say at school?		.80	2.62	.92
How much attention do you feel other people pay to you at school?		.72	2.53	.83
How much do you feel others at school would miss you if you went away?		.71	2.64	.99

PMQ-PE: Perceived Mattering Questionnaire – Physical Education, PE: physical education.
Note: only factor loadings of .30 or greater are presented.

An alternative model was examined to test the extent to which the eight items could represent one underlying perceived mattering construct. While all of the items loaded significantly in the single-factor model, it explained less variance (52.46%). The χ^2 goodness-of-fit statistic was significant, $\chi^2(20) = 196.96$, $p < .001$. Given that the two models are nested, a χ^2 difference test was used to determine whether the increase in χ^2 reflected in the single-factor model resulted in deteriorated fit. The χ^2 difference test was significant, $\chi^2_{\text{Diff}}(7) = 167.45$, $p < .001$, indicating that the two-factor model was preferable. Since the two-factor model was theoretically justified and extracted through the initial EFA, coupled with the large increase in the χ^2 values for the single-factor model, we elected to adopt the two-factor model reflecting the hypothesized PE matters and teacher matters subscales. The factor loadings for the two-factor model are included in Table 3. Internal consistency was adequate for both the teacher matters (Cronbach's $\alpha = .87$) and PE matters (Cronbach's $\alpha = .86$).

Confirmatory factor analysis

Using a second subsample of 260 PE teachers, we conducted a CFA to examine the factorial, convergent and discriminant validity of the hypothesized two-factor structure of the PMQ-PE. Results indicated that the hypothesized model was a good fit for the data, $\chi^2(19) = 47.52$, $p < .001$, NNFI = .97, CFI = .98, SRMR = .03, RMSEA = .07 (90% CI [.04, .10], $p = .055$). The goodness of model fit was supported by NNFI and CFI values above .95, and SRMR and RMSEA values below .08. Further, the ratio of χ^2/df was < 3.00 (47.52 / 19 = 2.50). Model modification indices

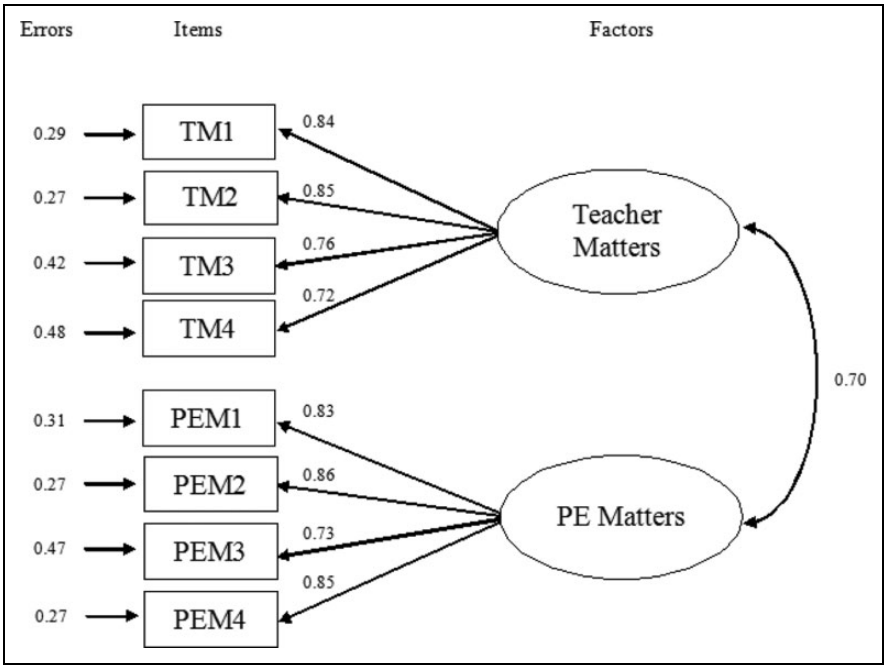

Figure 1. Latent factor solution for the Perceived Mattering Questionnaire – Physical Education (PMQ-PE) with completely standardized λ loadings, $\chi^2(19) = 47.52$, $p < .001$, non-normed fit index (NNFI) = .97, comparative fit index (CFI) = .98, root mean square error of approximation (RMSEA) = .07, standardized root mean square residual (SRMR) = .03. TM: teacher matters; PEM: physical education matters; PE: physical education.

did not recommend any conceptually justifiable changes to the model. The final model with standardized factor loadings is depicted in Figure 1, and the variance/covariance matrix for all items is included in Table 4. Factor λ loadings, ρ_c, and AVE values for each factor, and the latent factor correlation matrix, are presented in Table 5. All factor loadings were significant ($t > 1.96$) and strong (>.65), indicating that the items were good indicators of the underlying factors. The ρ_c and AVE values for each factor were above the respective .70 and .50 cut-off points. As expected, the correlation between the teacher matters and PE matters subscales was strong ($r = .70, p < .001$), but not so strong as to be a violation of discriminant validity. This is substantiated by the $\sqrt{AVE}$ values inserted in the diagonal of the latent correlation matrix in the bottom panel of Table 5, which were larger than the correlation between the constructs.

Descriptive statistics and correlational analyses

Using the same subsample used to conduct CFA ($n = 260$ PE teachers), we examined descriptive statistics for bivariate correlations among the study constructs. The top panel of Table 6 provides descriptive statistics for the subscales of the PMQ-PE and TRSS, as well as the unidimensional resilience construct. In reference to the scale underlying each measure, participants perceived low levels of role ambiguity; moderate levels of role conflict, role overload, PE matters, and teacher matters; and high levels of resilience. The correlation matrix in the bottom panel of Table 6

Table 4. Variance/covariance for all items included on the PMQ-PE.

Items	TM1	TM2	TM3	TM4	PEM1	PEM2	PEM3	PEM4
TM1	.67							
TM2	.49	.67						
TM3	.40	.44	.64					
TM4	.48	.45	.43	.92				
PEM1	.40	.35	.34	.43	.92			
PEM2	.38	.39	.35	.42	.60	.76		
PEM3	.34	.33	.31	.46	.67	.54	1.18	
PEM4	.34	.32	.30	.33	.55	.53	.64	.69

TM: teacher matters; PEM: physical education matters.

Table 5. Convergent and discriminant validity for all constructs included in the model.

	λ Loading	*t*-values	*M*	*SD*	ρ_c	*AVE*
Teacher matters					.87	.63
TM1	.84[a]	—	2.91	.82		
TM2	.85	15.90	2.67	.81		
TM3	.73	13.74	2.74	.95		
TM4	.72	12.77	2.73	.80		
PE matters					.89	.67
PEM1	.83[a]	—	2.51	.96		
PEM2	.86	16.31	2.22	.87		
PEM3	.73	13.12	2.83	1.09		
PEM4	.85	16.23	2.39	.83		
		Teacher matters		Physical education matters		
Teacher matters		(.82)				
PE matters		.70*		(.82)		

ρ_c: composite reliability; *AVE*: average variance extracted; TM: teacher matters; PEM: PE matters; PE: physical education.
Note: diagonal elements of the correlation matrix have been replaced with $\sqrt{AVE}$, all factor loadings were significant ($t > 1.96$).
[a] Factor loading fixed to 1.00.

provides support for convergent and divergent validity. As expected, teacher matters correlated positively with resilience ($r = .32$, $p < .001$) and negatively with role conflict ($r = –.17$, $p = .005$) and role ambiguity ($r = –.36$, $p < .001$). However, it did not correlate significantly with role overload ($r = –.09$, $p = .161$). PE matters correlated positively with resilience ($r = .22$, $p < .001$), and negatively with role conflict ($r = –.25$, $p < .001$) and role ambiguity ($r = –.29$, $p < .001$). Similarly to teacher matters, it did not correlate significantly with role overload ($r = –.09$, $p = .150$). Taken together, these analyses support the factorial, convergent, and discriminant validity of the PMQ-PE.

Discussion

The purpose of this study was to develop and provide evidence of initial validity and reliability for the PMQ-PE, an instrument for measuring the perceived mattering of PE teachers.

Table 6. Descriptive statistics and bivariate correlations for the Perceived Mattering Questionnaire – Physical Education (PMQ-PE), teacher role stressors survey (TRSS), and Connor-Davidson Resilience Scale (CD-RISC).

Scale	TM	PEM	RA	RC	RO	RES
TM	1.00					
PEM	.62**	1.00				
RA	–.36**	–.29**	1.00			
RC	–.17**	–.25**	.17**	1.00		
RO	–.09^{NS}	–.09^{NS}	.14*	.48**	1.00	
RES	.32**	.22**	–.38**	–.03^{NS}	–.08^{NS}	1.00
Mean	2.76	2.49	2.36	3.35	4.01	3.27
Standard deviation	.72	.81	.91	1.40	1.75	.53
Skewness	–.36	–.06	1.43	.21	.01	–.51
Kurtosis	–.23	–.96	3.67	–.85	-1.10	–.20
Minimum	1.00	1.00	1.00	1.00	1.00	1.60
Maximum	4.00	4.00	7.00	7.00	7.00	4.00

Note: $N = 260$ teachers, teacher matters and physical education matters were set to a four-point, Likert-type scale ranging 1–4, role stressors (role ambiguity, role conflict, and role overload) were set to a seven-point, Likert-type scale ranging 1–7, resilience was set to a five-point, Likert-type scale ranging 0–4.

TM: teacher matters; PEM: physical education matters; RA: role ambiguity; RC: role conflict; RO: role overload; RES: resilience.

^{NS}Not significant; *$p < .05$; **$p < .001$.

Following a four-step approach to ensure content validity, survey items were created after examining both the perceived mattering (e.g. Rosenberg, 1957; Rosenberg and McCullough, 1981; Schieman and Taylor, 2001) and PE teacher socialization (e.g. Kougioumtzis et al., 2011; Lux and McCullick, 2011; Mäkelä and Whipp, 2015; Woods and Lynn, 2014) literatures and interviewing PE teachers. The PMQ-PE was then validated with both EFA and CFA procedures. Taken together, these analyses support the validity and reliability of the PMQ-PE for measuring the perceived mattering of teachers across the dimensions of teacher matters and PE matters.

Participants in this study perceived moderate levels of both PE matters and teacher matters. This finding illustrates that, despite the marginal status of PE teachers in many school contexts (Kougioumtzis et al., 2011; Richards et al., 2013), PE teachers believe that they and their subject hold some degree of importance to those around them. While the levels of both perceived mattering constructs were moderate, the respondents believed that they mattered to those around them slightly more than the discipline of PE mattered. This reinforces the distinction between the PE matters and teacher matters domains by demonstrating that PE teachers can feel as if they matter, despite the fact that their discipline has a lower status (Lux and McCullick, 2011; Richards and Templin, 2012). Correlational analyses indicated that there was a positive relationship between PE teachers' perceptions of mattering and resilience. This reinforces previous research indicating that supportive environments in which teachers feel valued can help to foster resilience (Pearce and Morrison, 2011). There was a negative correlation between perceived mattering and the role stressors of role ambiguity and role conflict, which complements previous research illustrating the negative impact of role stress on teacher satisfaction (Conley and You, 2009). Neither of the

subscales correlated significantly with role overload, indicating perceived mattering may not relate to perceptions of workload.

The availability of a valid and reliable instrument for measuring PE teachers' perceptions of mattering provides the field with numerous theoretical and empirical advantages. Prior research across countries has documented that PE can be characterized as a marginalized discipline in the context of schools, with PE teachers often feeling like second-class citizens (Kougioumtzis et al., 2011; Mäkelä et al., 2014; Woods and Lynn, 2014). As an adaptation of role theory and occupational socialization theory, RST (Richards, 2015) asserts that marginality is a function of expectations for performance in the PE role that are learned through socialization. Individuals who have negative experiences in PE as students grow up to hold lower expectations for the discipline (Woods et al., 2016). When those individuals occupy social roles that interact often with PE teachers (e.g. administrator, colleague, parent), they may deemphasize the importance of PE within the schools' social environment. This marginality can influence the extent to which PE teachers feel as if they and their subject matters in the occupational environment (Baumeister and Leary, 1995; Schieman and Taylor, 2001).

Physical educators who work in environments where others value the contributions of PE, as well as those they make as PE teachers, may experience lower perceptions of marginalization and higher perceptions of mattering. Drawing from previous research in cognate areas such as school counseling and social work (Rosenberg and McCullough, 1981; Schieman and Taylor, 2001), increases in PE teachers' perceptions of mattering may correspond with enhanced feelings of belonging, relevance, and overall job satisfaction and wellbeing. Thus, individuals who perceive a high level of mattering are more likely to feel as if they are a part of the organizational milieu. This state of belonging is important when considering the work of PE teachers, as those who believe that they matter in their work environments are less likely to feel marginalized and more likely to recognize the contributions they make to students' education. This may have implications for teachers' feelings of burnout, as evidence indicates a relationship between teacher satisfaction and burnout, with teachers who are more satisfied and that feel better supported tending to feel less burned out (Fejgin et al., 2005; Koustelios and Tsigilis, 2005).

While the construct of perceived mattering fits conceptually within predictions forwarded by RST, until this point, the field has lacked a validated instrument through which to measure the construct. Through this study, we have conceptualized perceived mattering in PE along two interrelated domains that capture the four dimensions proposed by Rosenberg and McCullough (1981). The PMQ-PE will allow scholars to examine the ways in which PE teachers' work experiences impact their sense of mattering. This study found that perceived mattering correlates positively with resilience and negatively with role stress. Future researchers may extend these findings by developing regression or structural equation models to examine antecedents and outcomes of perceived mattering. RST can be used as a framework to hypothesize and test these relationships. Scholars will also be able to examine whether teachers who perceive that they matter teach more effectively, as measured through systematic observation of their teaching.

The newly developed PMQ-PE can also assist researchers to more completely understand factors that enhance or inhibit PE teachers' feelings of mattering, as well as whether or not group differences related to constructs such as gender, race/ethnicity, years of teaching experience, teaching level (e.g. elementary, middle, high school), and teaching context (e.g. suburban, urban, rural) exist relative to perceived mattering. Further, the wording of PMQ-PE items could be adjusted for use with teachers of other fields. Likewise, the ways in which PE teachers' perceptions

of mattering relate to those held by classroom teachers could be examined. An assumption reported in the literature is that PE teachers perceive greater marginalization and lower mattering than colleagues in other subjects (Richards et al., 2014b), but such an assertion has never been tested empirically. The instrument also has practical implications for individuals who work with PE teachers. Researchers and practitioners can use the PMQ-PE to quantify teachers' feelings of mattering and identify instances in which low perceived mattering could pose problems for teacher satisfaction and wellbeing. When such instances are identified, steps can be taken to enhance how teachers view themselves and their subject, as well as the way in which other members of the school community view both. In this way, the PMQ-PE can act as a proxy measure for the effects of marginality on PE teachers.

While this study makes an important contribution to the literature, there are several limitations. Firstly, the teachers were recruited from schools in the American Midwest and Mountain West, leaving teachers in other geographic locations unexamined. While we anticipate that the PMQ-PE will be relevant for teachers across geographical and cultural boundaries, further work would be necessary to extend validation to other countries. Secondly, the cross-sectional nature of the survey merits mention. Invariance of survey items over time cannot be ascertained with only one implementation of a survey; consequently, it was not possible to comment on the temporal stability of the perceived mattering construct. Further, the relatively low response rate is acknowledged. While response rates between 30% and 40% are fairly standard in survey research, and a lower response rate does not necessarily mean lower response representativeness (Lambert and Miller, 2014), a higher response rate is preferred and the representativeness of the data cannot be assured. Given the online nature of the survey, self-selection bias is possible. Finally, while perceived mattering is assumed to be inversely related to marginalization, the PE literature lacks a valid and reliable instrument to measure perceived marginality. The development of such an instrument is an important direction for future research.

In conclusion, the validation of a psychometric instrument to measure perceived mattering in PE represents an important step in the advancement of research related to the lives and careers of PE teachers. As evidence for the validity and reliability of the PMQ-PE continues to accumulate, researchers will be able to use it to evaluate some of the assumptions and tenets of RST. This work will have implications for those who collaborate with in-service teachers, as it will illustrate how the social construction and contextualized nature of the PE teaching role impacts the way in which teachers experience their work (Richards, 2015). Further, pre-service teacher education programs can use what is learned about the lived experiences of in-service teachers to better prepare recruits for the reality of life in school. As asserted by Richards and colleagues (2013), preparation for life in schools should be of paramount concern to teacher educators. Increased understanding of perceived mattering should aid PE teacher educators in preparing recruits for teaching environments that promote as well as challenge perceptions of mattering, and the ways in which to best navigate such environments.

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