

A SELF-DETERMINATION THEORETICAL ANALYSIS OF THE MOTIVATIONAL
SEQUENCE IN PHYSICAL EDUCATION

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ABSTRACT

Motivation drives human behavior and is, therefore, of utmost concern in fields where individuals occupy roles that involve facilitating the actions of others. Physical education is one such field, as teacher-educators attempt to mold the behaviors of preservice teachers and inservice teachers attempt to mold the behaviors of their students. Couched within self-determination theory, this dissertation tested various aspects of the motivational sequence whereby teachers' psychological need satisfaction ultimately predicts a host of desirable in-class and leisure time student outcomes.

In study one, a structural equation model generated from survey data completed by inservice physical education teachers ($N = 477$) revealed perceived mattering and role stress as two antecedents to physical education teachers' psychological need satisfaction. Teachers' perceived mattering predicted perceptions of autonomy, competence, and relatedness satisfaction directly as well as indirectly by attenuating perceptions of role stress.

Based on the notion that teachers' motivating styles are socially developed, the second examined the sociological development of physical education teachers' motivating. Participants were purposefully selected from the sample of teachers involved in study one ($N = 29$). Qualitative data indicated that teachers' motivating styles were influenced by the nature of the contexts in which they enjoyed psychological need satisfaction during previous life involvements, their professional identity, and the extent to which they perceived experiencing psychological need satisfaction at work.

Study three investigated the effects of an intervention in bringing about a change in one preservice teacher's provision of need supportive instruction within sport education and any accompanying changes in learning demonstrated by the students in his fifth grade class ($N = 58$). The preservice teacher taught one season of floor hockey, during which his need-supportive teaching behaviors were quantified. The students were administered cognitive (pre, post, retention) and contextualized and decontextualized skill (pre, post) assessments. Post-intervention, the preservice teacher then taught a season of pickleball to the same students. The intervention was successful in bringing about an increase in the preservice teacher's provision of need-supportive instruction. Moreover, with respect to those observed pre-intervention, significantly larger gains in student learning were observed post-intervention.

DEDICATION

I dedicate my dissertation to my loving wife, Aléna, for her unwavering support on a daily basis throughout my graduate work; to my mother, Denise, who raised me to approach appreciable challenges with the “make it happen” mentality; to my older brother, Paul, whose template for life to date, which has been to set high goals and work hard until they are attained, has served as an invaluable guide for me; to my step-father, Jack, whose support can be summed up in the following quote from a conversation as I was preparing to commence doctoral study, “Someone is going to go out there and get it. Why not you?”; to my father, Neil, who, since the days of reminding me to make sure my tie was straight and the buttons on my shirt lined up with my belt buckle, has taught me the vital importance of paying attention to detail; and I owe a great deal of gratitude to my parents-in-law, Jeff and Faye, for their interest in my work and perpetual backing.

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CHAPTER I

PERCEIVED MATTERING AND ROLE STRESS AS ANTECEDENTS TO PHYSICAL EDUCATION TEACHERS' PSYCHOLOGICAL NEED SATISFACTION

Abstract

From a self-determination theoretical perspective, satisfaction of the psychological needs for autonomy, competence, and relatedness facilitate more autonomous forms of motivation. Within the context of physical education (PE), teachers' psychological need satisfaction has been linked with more self-determined motivations for teaching, need-supportive instruction, and a host of desirable student outcomes. Through structural equation modeling, the purpose of the present study was to examine the effects of two potential antecedents to PE teachers' perceived satisfaction of autonomy, competence, and relatedness. Physical education teachers ($N = 477$) with an average of 19.48 years of service completed an electronic survey containing measures for both dimensions of perceived mattering (PE matters and teacher matters), all three role stressors (overload, conflict, and ambiguity), and satisfaction of all three psychological needs. The regression coefficients of a structural model demonstrating good fit revealed that role conflict and role ambiguity negatively predicted autonomy satisfaction, and role overload and role ambiguity negatively predicted competence satisfaction. Perceived mattering predicted satisfaction of all three psychological needs directly and indirectly through reducing role stress. These results lend credence to the importance of elevating PE teachers' perceptions of mattering in pursuit of psychological need satisfaction.

Introduction

Defined by Reeve (2009) as any force that energizes and directs behavior, motivation is of central importance for any context concerned with shaping the behavior of individuals. School-based physical education (PE) is one such context, particularly seeking to instill in students a desire to be physically active (Society of Health and Physical Educators; SHAPE, 2014). By virtue of the authority vested in their position, PE teachers can, to a large extent, influence student motivation (Sinelnikov & Hastie, 2010; Taylor & Ntoumanis, 2007). While research on student motivation and associated outcomes in PE is plentiful (Cox & Williams, 2008; Jaakkola, Washington, & Yli-Piipari, 2013), comparatively little is known about the development and maintenance of PE teacher motivation (Van den Berghe, Vansteenkiste, Cardon, Kirk, & Haerens, 2014). As such, this investigation contributes to a limited but growing body of knowledge concerned with identifying antecedents to PE teachers' motivation for their work by investigating the impact of perceived mattering and role stress and psychological need satisfaction (PNS). Prior to reviewing relevant research on this topic, it is necessary to provide a brief overview of the theory through which the construct of motivation will be interpreted.

Self-Determination Theory

Self-determination theory (Deci & Ryan, 1985; Ryan & Deci, 2000) delineates five qualities of motivation according to the extent to which the source of behavioral initiation and regulation is internalized. Purely *intrinsic* behavioral initiation and regulation constitutes motivation in its highest quality and most autonomous form. Intrinsically-regulated behavior is fueled by interest and enjoyment. Behavior becomes increasingly governed by external agents as the source of motivation emanates from locations that are further from the core. When acting out of *integrated* regulation, the most autonomous form of extrinsic motivation, engagement is

congruent with other core values insofar as it reflects personal identity. A slightly less autonomous form of motivation is *identified* regulation, present when the behavior is considered personally valuable in its own right, such as exercising to improve health. Behavior that is initiated and sustained through internally-induced pressure, such as the avoidance of guilt or preservation of esteem, qualifies as motivation through *introjection*. When the catalyzing and governing source of behavioral engagement moves beyond the self, for instance to obtain a reward or avoid public ridicule, motivation is considered to be *extrinsically* regulated. Finally, the complete absence of motivation is known as *amotivation*. Rather than being resolute, Ryan and Deci (2000) posit that the quality of motivation to engage in any particular behavior shifts proportionately with perceived satisfaction of the innate psychological needs for *autonomy* (personal volition), *competence* (efficacy), and *relatedness* (belonging). Specifically, greater satisfaction of these needs facilitates increasingly self-determined forms of motivation whereas greater frustration leads to more externally-regulated motivations or amotivation (Vansteenkiste & Ryan, 2013).

Self-determination theory has been widely recruited as a means for better understanding motivational processes in the field of PE (Aelterman, Vansteenkiste, Van den Berghe, De Meyer, & Haerens, 2014; Reeve & Cheon, 2016; Taylor & Ntoumanis, 2007). Based on a review of research using SDT in PE, Van den Berghe and colleagues (2014) identified a sequence of motivational variables. The sequence begins with the relationship between various antecedents and PE teachers' PNS and motivation (relationship A). The second relationship (relationship B) is concerned with teachers' motivation for teaching and their provision of instruction that supports rather than thwarts their students' psychological needs. The next relationship in the sequence exists between teachers' provision of instruction and the students' perceptions of PNS

and frustration (relationship C). The sequence's fourth relationship examines the connection between student PNS and motivational quality (relationship D). The final relationship is concerned with the impact of student motivation on various in-class and leisure time outcomes (relationship E). Though teachers' PNS serves as a necessary first step, setting in motion a string of positive motivational outcomes in PE, this phenomenon has received little attention in the literature (Moreira, Fox, & Sparkes, 2002). The vast majority of the studies reviewed by Van den Berghe and colleagues (2014) focused on the latter portion of the motivational sequence, specifically: (a) the impact of class climate on students' PNS (Cox & Williams, 2008), (b) the impact of students' PNS on their motivation in PE (Mandigo, Holt, Anderson, & Sheppard, 2008), and (c) the resultant outcomes from that motivation (Chatzisarantis & M.S., 2009). Responding to Moreira and colleagues' (2002) call for "a more comprehensive view of the motivation of physical educators in the context of their work and their career development" (p. 846), this study sought to contribute to a currently limited body of knowledge on the antecedents to PE teachers' PNS. In particular, the purpose of this study was to identify predictive relationships between the multi-faceted constructs of role stress and perceived mattering and satisfaction of the psychological needs for autonomy, competence, and relatedness among inservice PE teachers.

Development of a Conceptual Model

Considering the marginal status occupied by teachers of PE (Lawson, 1989; Lux & McCullick, 2011) coupled with the breadth of their job responsibilities (Richards, Templin, & Graber, 2014), two additional constructs that may influence PE teachers' PNS are perceived mattering (Marshall, 2001) and role stress (Conley & You, 2009). Couched within self-determination theory, Figure 1 serves as a conceptual model specifying hypothesized

relationships between perceived mattering, role stress, and the three psychological needs. It was expected that role stress would reduce PNS, with perceived mattering positively predicting PNS directly and indirectly through attenuating role stress. The more PE teachers perceive that they matter to other stakeholders in the school context, the lower their feelings of role stress will be and, subsequently, the greater the extent to which they will perceive PNS.

Physical Education Teacher Psychological Need Satisfaction

While a number of studies have examined PE teachers' motivation for entering the profession (Dewar & Lawson, 1984; Hutchinson, 1993; Lawson, 1983) and its relationship to various forms of motivation (Spittle, Jackson, & Casey, 2009), little work has focused on factors that serve to nurture and sustain as well as thwart and suppress higher quality forms of PE teacher motivation throughout their careers. Studies conducted in general education (Leroy, Bressoux, Sarrazin, & Trouilloud, 2007; Pelletier, Seguin-Levesque, & Legault, 2002) and PE (Taylor & Ntoumanis, 2007; Taylor, Ntoumanis, & Smith, 2009) suggest that certain personal and contextual variables influence teachers' construction of the motivational climate. Pelletier and colleagues (2002) constructed a structural model in which pressure from *above* (e.g., compliance with a curriculum, colleagues, and performance standards) and *below* (e.g., perceiving student apathy) negatively predicted more self-determined forms of motivation for teaching which, in turn, predicted the use of autonomy-supportive instruction. Working with self-report data from 336 fifth grade teachers in France, Leroy and colleagues (2007) discovered that teachers' implicit theories of intelligence, seniority, and perceived pressures at work predicted their development of an autonomy-supportive climate. In particular, possessing an entity theory of intelligence (i.e., the perspective that student abilities are fixed) and perceiving

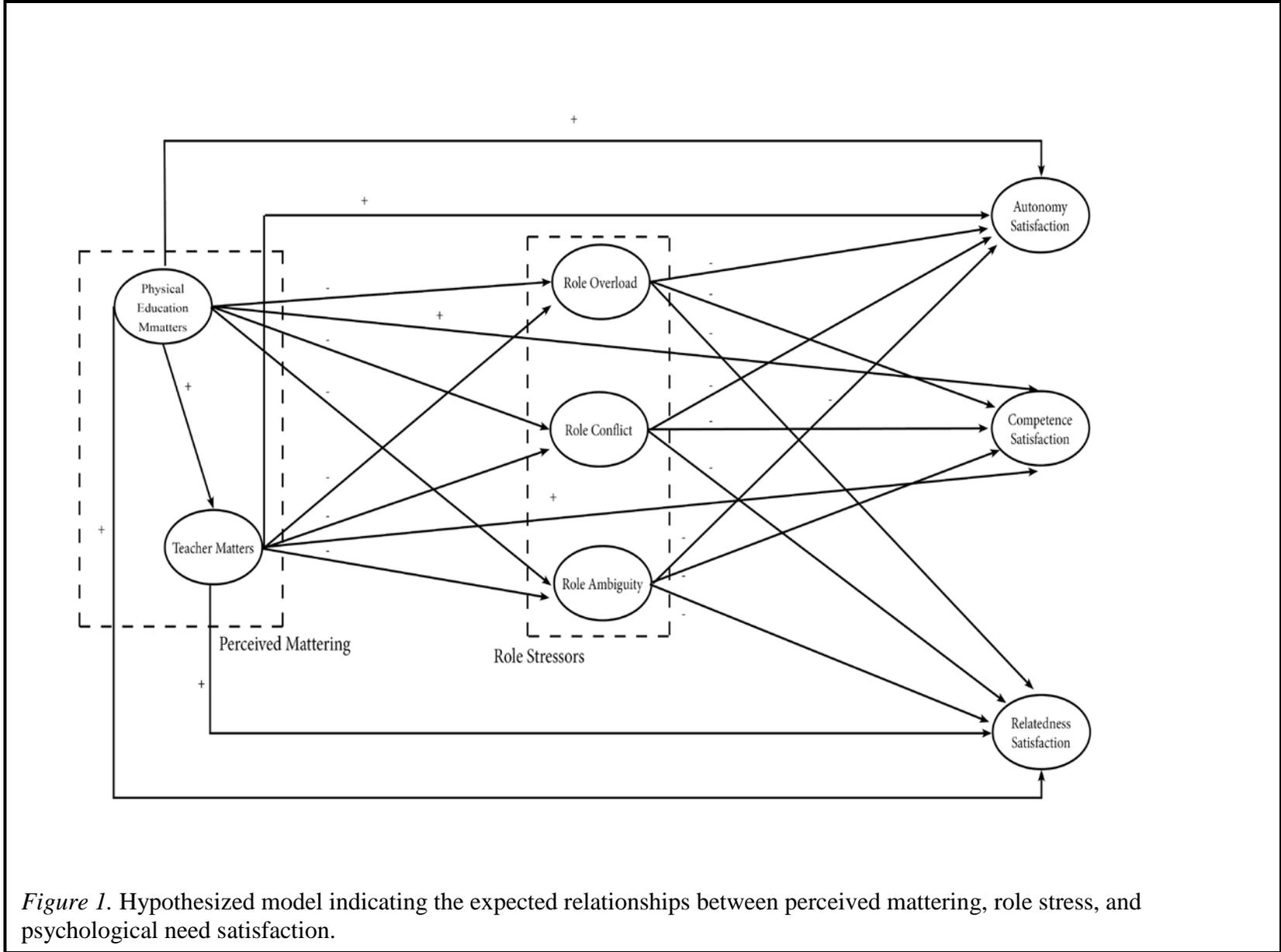


Figure 1. Hypothesized model indicating the expected relationships between perceived mattering, role stress, and psychological need satisfaction.

pressure at work (from colleagues, students, and parents) directly thwarted teachers' development of an autonomy supportive climate, with teachers' self-efficacy mediating the pressure-at-work and autonomy-support relationship. Contrarily, possessing an incremental theory of intelligence (i.e., the perspective that student abilities are malleable) and having more seniority positively predicted the development of an autonomy-supportive climate indirectly through self-efficacy, with seniority also having a direct effect. Taylor and Ntoumanis (2007) used survey research with 51 PE teachers and their 787 students in England to uncover the mediating role of teacher motivation between teachers' perceptions of student motivation and their use of need-supportive teaching behaviors (i.e., behaviors that specifically support the psychological needs for autonomy, competence, and relatedness). The more the teachers perceived that their students were autonomously motivated in class, the more autonomously motivated they were to teach. In turn, more autonomous motivation for teaching predicted teachers' use of autonomy support, structure, and relatedness support, comprising the need-supportive instructional strategies that support students' needs for autonomy, competence, and relatedness, respectively. Taylor and colleagues (2008) identified yet another factor contributing to autonomous teacher motivation in the possession of an *autonomy orientation* (Deci & Ryan, 1985), or a general inclination to organize one's actions around interest and goals as opposed to controls and constraints. Perhaps even more importantly is that the authors revealed PNS as a mediating variable in the antecedents-teacher motivation relationship. This was a paramount discovery in that now, rather than simply knowing *that* various factors impact teachers' motivation, researchers are able to explain *how* these factors influence teachers' motivation through PNS. The only research specifically investigating predictors of PE teachers' psychological needs for autonomy, competence, and relatedness was conducted by Carson and

Chase (2009). Among 247 PE teachers from the state of Ohio, findings revealed that attending conferences and having quality equipment significantly predicted autonomy satisfaction, having quality equipment and reading professional journals predicted competence satisfaction, and reading professional journals and perceptions of administrative support predicted relatedness satisfaction. The multidimensionality and magnitude of PE teachers' responsibilities in schools (Curtner-Smith, 2001) coupled with the documented marginality of PE in schools (Lux & McCullick, 2011) brings to light the potential for perceived mattering and role stress to act as antecedents to PE teachers' PNS.

Role Stress

Resting on the assumption that people behave predictably and contextually, role theory seeks to describe how people act in certain social positions and how they expect others to act in their respective positions (Hindin, 2007). Essentially, individuals occupy specific roles within an organization that are accompanied by various privileges and obligations (Katz & Kahn, 1966). The organization establishes a state of consensus when individuals at the same, as well as differing, levels of the organizational hierarchy agree on the expectations of a particular role (Biddle, 1986). This consensus prevents an imbalance between work-related stressors and resources, an occurrence referred to by Aldrup, Klusmann, and Lüdtkke (2016) as *stress exposure*. Three forms of role stress that have been of particular interest in the literature are role conflict, role overload, and role ambiguity (Conley & You, 2009; Dhurup & Mahomed, 2011). According to Biddle (1986), *role conflict* is present in situations where different groups have diverse and incompatible expectations for role performance. A PE teacher experiencing role conflict may perceive the purpose of her subject to develop competency in a variety of motor skills and movement patterns, whereas her administration may view PE as little more than an additional

recess period. This difference in perception may limit the resources she is afforded, in turn adversely impacting her content selection (autonomy), ability to teach at her full potential (competence), and relationship with her principal (relatedness). *Role overload* describes situations in which individuals feel the expectations accompanied by their role exceed available resources (Hindin, 2007; Richards, Templin, Levesque-Bristol, & Blankenship, 2014). Examples of role overload might include one PE teacher burdened with the responsibility of providing developmentally appropriate instruction to students of quite different ages with minimal time to prepare between classes. For reasons similar to those previously mentioned, role overload could conceivably frustrate all three psychological needs. Lastly, *role ambiguity* characterizes conditions in which the expectations for a given role are vague to the point where they are unable to guide behavior. Teachers experiencing role ambiguity may lack a clear understanding of their purpose within the school environment. Amidst imprecise criteria for success, teachers may be reluctant to innovate (autonomy), question their performance (competence), and struggle to develop meaningful relationships with students and other teachers (relatedness).

While inquiry into the relationship between these particular role stressors and basic PNS is currently uncharted, recent findings from the occupational well-being research offers relevant insight. Aldrup and colleagues (2016) asked 152 beginning teachers to record daily stress exposure, competence and relatedness satisfaction, and occupational well-being (i.e., enthusiasm and emotional exhaustion) at the end of 14 consecutive workdays. Results indicated that, on high-stress days, teachers felt more emotionally exhausted and less enthused with their work. Competence satisfaction and relatedness with students mediated the stress-enthusiasm relationship and competence mediated the stress-emotional exhaustion relationship, speaking to the importance of teachers' perceptions of self-efficacy and relationships at work. Previous

research has, however, demonstrated the predictive relationship between the aforementioned role stressors and variables that plausibly relate to PNS. For example, higher levels of all three role stressors have predicted higher levels of professional disengagement and exhaustion (Dasgupta, 2012) and intention to leave (Conley & You, 2009) and lower levels of job satisfaction and commitment (Conley & You, 2009; Dhurup & Mahomed, 2011). Conceivably, teachers experiencing higher levels of job satisfaction and commitment would also perceive PNS, given that PNS facilitates more self-determined forms of motivation for teaching (Taylor et al., 2008).

H1: Therefore, it is expected that all three role stressors will negatively predict satisfaction of all three psychological needs. The more PE teachers perceive (a) they have too much to do and not enough time to do it, (b) conflicting expectations of how to be successful in their role, and (c) unclear expectations, the less they will perceive satisfaction of all three psychological needs.

Perceived Mattering

Marshall (2001) conceptualized perceived mattering as the “psychological tendency to evaluate the self as significant to specific other people” (p. 474). Rosenberg and McCullough (1981) theorized mattering as including the four dimensions of *attention* (evoking interest from others), *importance* (a belief that others care about our thoughts, actions, and fate), *dependence* (feeling needed), and *ego-extension* (the feeling that others will be proud of our accomplishments and saddened by our failures). Physical education has a long history of being considered peripheral and subsidiary to the true focus of learning more academic content (Henninger & Carlson, 2011; Lynn & Woods, 2010; Sparks, Templin, & Schempp, 1993). As such, PE teachers’ perceptions of mattering has become a recent topic of interest (Gaudreault, Richards, & Woods, 2016; Richards, Gaudreault, & Woods, 2017). Based on previous work (Rosenberg &

McCullough, 1981; Schiemen & Taylor, 2001), Richards and colleagues (2017) forwarded that, within PE, the construct of perceived mattering has two facets: PE matters and teacher matters. The former refers to the extent that PE teachers perceive that their subject is important to those around them whereas the latter refers to the extent that PE teachers perceive that they matter as people to those around them. Interestingly, their participants indicated lower levels of PE matters than teacher matters, communicating that PE teachers can maintain a personal sense of mattering in the midst of feeling as if their subject matter does not. Using a mixed methods design to examine PE teacher's perceived mattering, Gaudreault and colleagues (2016) noted conflicting quantitative and qualitative results. Participants reported only moderate perceptions of mattering via survey, yet when being interviewed, they communicated higher levels of mattering. The authors suggested the use of impression management (Richman, Keisler, Weisband, & Drasgow, 1999) as a potential explanation for this discrepancy.

In their validation study, Richards and colleagues (2017) established significant correlations between teacher matters and role conflict ($r = -.17$) and role ambiguity ($r = -.36$) and between PE matters and role conflict ($r = -.25$) and role ambiguity ($r = -.29$). While significant correlations were not detected between either dimension of perceived mattering and role overload ($r = -.09$), the relationship was still negative. Extending this correlational finding, Furthermore, Richards (in press) documented a predictive relationship from PE matters to teacher matters, indicating that the extent to which PE teachers perceive that their discipline matters to others in the school predicts the extent to which they perceive that they matter as teachers to others in the school. Plausibly, administrators and teachers who value PE and those who teach it would be sensitive to their workloads (role overload), allow them to focus on their

primary duty of instructing children (role conflict), and ensure that criteria for success are made clear (role ambiguity).

H2: Hence, higher levels of PE matters should predict lower levels of role overload, role conflict, and role ambiguity indirectly through the enhancement of teacher matters.

Considering the hypothesis that higher levels of perceived mattering would predict lower levels of role stress, which may negatively predict PNS, the positive effect of perceived mattering on PNS was hypothesized to be both direct and indirect through its mitigating effect on role stressors.

H3: It is hypothesized that both facets of perceived mattering will positively predict satisfaction of all three psychological needs. The more PE teachers perceive that they, as people, and that their subject matters to other stakeholders within the school, the greater the extent to which they will perceive PNS.

Method

Participants and Setting

This study included 477 inservice PE teachers (234 males, 243 females) from the Northeast, Southeast, and Midwest regions of the United States. Table 1 provides a detailed description of participant demographic information. The average age of the participants was 46.44 years ($SD = 11.32$) and the average length of service was 19.48 years ($SD = 10.54$). At the time of data collection, approximately one third of the participants were teaching at the elementary level ($n = 152$; 31.90%) and two thirds were teaching at the secondary level ($n = 325$; 68.10%), which was inclusive of junior and senior high. Importantly, these teachers worked in urban ($n = 108$; 22.70%), suburban ($n = 194$; 40.80%), and rural ($n = 174$; 36.50%) environments.

Research Design and Instrumentation

Upon receiving approval from the institutional review board, PE teachers employed in selected public schools from Alabama, Connecticut, Illinois, Indiana, and Pennsylvania were sent an email inviting them to participate in an online survey using Qualtrics. Interested teachers were instructed to follow a URL link, directing them to the survey.

Table 1.

Demographic information for all participants

<i>Category</i>	<i>Subcategory</i>	<i>Total Sample (n = 477)</i>	
		<i>Participants</i>	<i>Mean (SD)</i>
Gender	Female	243 (50.94%)	
	Male	234 (49.06%)	
Age (Years)			46.44 (11.32)
Years Teaching			19.48 (10.53)
Race/Ethnicity	Caucasian	434 (91.00%)	
	African American	27 (5.70%)	
	Multiple Races	6 (1.30%)	
	Hispanic	4 (.80%)	
	Other	4 (.80%)	
	Native American	1 (.20%)	
	Indian		
Education	Asian American	1 (.20%)	
	Bachelor's	132 (27.70%)	
Teaching Level	Advanced Degree	345 (72.30%)	
	Elementary	152 (31.90%)	
School Context	Secondary	325 (68.10%)	
	Urban	108 (22.70%)	
	Suburban	194 (40.80%)	
US Region	Rural	174 (36.50%)	
	Northeast	230 (48.20%)	
	Midwest	137 (28.70%)	
Coach Status	Southeast	110 (23.10%)	
	Currently Coaching	255 (53.50)	
	Not Currently Coaching	222 (46.50)	
Students/Class			31.88 (16.77)
Hours/Week			36.94 (4.97)

Note: Years Teaching = years of teaching experience, Coach Status = with respect to extracurricular sport at the time of survey completion, Students/Class = average number of students in each class, Hours/Week = total number of hours spent teaching PE classes per week.

The survey contained 17 demographic questions, the eight-item Perceived Mattering Questionnaire-Physical Education (PMQ-PE; Richards, Gaudreault, & Woods, 2016), the nine-item Teacher Role Stressors Survey (TRSS; Conley & You, 2009), and the 24-item Basic Psychological Needs Satisfaction and Frustration Scale (BPNSNFS; Chen et al., 2015). Prior to data collection, the survey was pilot tested with 25 PE teachers in the interest of identifying potential logistical and comprehension problems and to estimate the time required for completion. The pilot resulted in minor changes to item wording, survey structure, and an estimated 20-25 minutes to complete.

Perceived mattering. The extent to which PE teachers perceive that they and their subject matter was assessed using the PMQ-PE (Richards et al., 2016). The instrument contains two four-item subscales. One subscale (teacher matters) relates to teachers' perceptions that they matter and the other (PE matters) gauges their perceptions of how much their subject matters to other stakeholders within the school. Example items included "How much attention do you feel other people pay to you at school? (teacher matters), and "How much do you feel others at school would miss PE if it went away? (PE matters). The responses to each item fall along a Likert-type scale ranging from one (not at all) to four (a lot). Internal consistency reliability for the teacher matters and PE matters subscales reached .83 and .89, respectively.

Role stress. Role stress was assessed using the nine-item TRSS(Conley & You, 2009). The TRSS specifically measures role overload (two items), role conflict (three items), and role ambiguity (four items). Participants indicate the extent to which each statement reflects their personal experiences at work using a Likert scale, ranging from one (very inaccurate) to seven (very accurate). Example questions include: "I am rushed in doing my job" (role overload), "I often buck a rule or policy to carry out my work" (role conflict), and "I know exactly what is

expected of me” (role ambiguity, reverse scored). Internal consistency reliability for role overload (.89), role conflict (.78), and role ambiguity (.74) was acceptable.

Basic psychological needs. Satisfaction of the psychological needs for autonomy, competence, and relatedness was measured using the BPNSNFS (Chen et al., 2015). The instrument contains six four-item subscales, one subscale for the satisfaction and one subscale for the frustration of each psychological need. For the purposes of this investigation, only the three satisfaction subscales were used. Using a Likert scale ranging from one (not true at all) to seven (completely true), participants indicate the extent to which each statement is true for them. As items have been slightly modified in prior research (van der Kaap-Deeder et al., 2015), the words “at work” were added to each item to make the scale applicable to participants’ working situation. Example items included “I feel a sense of choice and freedom in the things I undertake at work (autonomy satisfaction), “I feel confident that I can do things well at work” (competence satisfaction), and “I experience a warm feeling with the people I spend time with at work” (relatedness satisfaction). Internal consistency reliability for autonomy support was .83, for competence support was .75, and for relatedness support was .83.

Data Analysis

Data were analyzed in three phases. Subsequent to exporting the Qualtrics survey responses into IBM SPSS 23, Phase I consisted of cleaning and screening the data according to procedures set forth by Tabachnick and Fidell (2013) as well as producing descriptive statistics and bivariate correlations for all.

In Phase II, heeding Hair, Black, Babin, Anderson, and Tatham’s (2006) observation that Cronbach’s α tends to understate reliability, confirmatory factor analysis (CFA) using LISREL 9.1 (Jöreskog & Sörbom, 2013) was used to assess construct reliability and examine latent

correlations. Reliability of the measurement model was determined through convergent and discriminant validity (Teo, Lee, Chai, & Wong, 2009). Convergent validity at the item level was determined by ensuring that all λ loadings exceeded the .50 threshold deemed appropriate (Hair et al., 2006). At the latent variable level, composite reliability (ρ_c) values above .70 indicated strong internal consistency (Nunnally & Bernstein, 1994). The last measure of convergent validity was the average variance extracted (AVE). This value reflects the variance attributable to each particular construct in relation to the variance attributable to measurement error and should exceed .50 (Fornell & Larcker, 1981). Whereas convergent validity scrutinizes construct similarity, discriminant validity inspects construct uniqueness. Constructs should not be so similar as to become redundant. Teo and colleagues (2009) note that variance shared by two constructs is obtained by squaring their correlation. For a construct to be independent and demonstrate adequate discriminant validity, then, the square root of its individual variance (AVE) should exceed its correlation with every other construct in the model (Teo et al., 2009). In Phase III, a structural model was constructed to test the hypothesized relationships between perceived mattering, role stress, and PNS. This technique evaluates the relationships among latent constructs and manifest indicators that are supported by logic or theory (Schreiber, Stage, King, Nora, & Barlow, 2006), and is based on variance/covariance estimation whereby all variables in a model are evaluated simultaneously (Byrne, 1998). After specifying a SEM, significance tests for the regression coefficients of the relationships among latent variables are examined, and non-significant pathways should be removed prior to re-specifying the model (Hatcher, 1994). The direct and indirect effects of perceived mattering and role stress on autonomy, competence, and relatedness satisfaction were examined using LISREL 9.1 (Jöreskog & Sörbom, 2013).

Results and Discussion

Preliminary Analysis

Descriptive statistics for all indicators entered into the SEM analysis as well as the composite scores are included in the top panel of Table 2. Considering the range of the separate scales, the teachers in this study experienced high levels of competence satisfaction ($M = 6.37$, $SD = .83$) and teacher matters ($M = 3.02$, $SD = .65$), modest levels of autonomy satisfaction ($M = 5.87$, $SD = 1.32$), relatedness satisfaction ($M = 5.84$, $SD = 1.16$), PE matters ($M = 2.68$, $SD = .94$), and role overload ($M = 3.65$, $SD = 1.90$), and low levels of role ambiguity ($M = 2.07$, $SD = .97$), and role conflict ($M = 3.04$, $SD = 1.66$). With the exception of competence satisfaction, which had a kurtosis value of 12.22, all manifest indicators satisfied Kline's (2005) guidelines of skewness $< |3.00|$ and kurtosis $< |10.00|$ for inclusion in SEM analyses. This was particularly important considering that maximum likelihood estimation was used to gauge model fit and such a method of estimation assumes that observed data are from a normally distributed sample. The correlations between latent constructs (bottom of Table 2) confirmed expected relationships. The dimensions of perceived mattering correlated positively with one another and with all three facets of need satisfaction. All three facets of role stress were positively correlated and related negatively with perceived mattering and autonomy, competence, and relatedness satisfaction. The strongest correlations existed between autonomy satisfaction and competence satisfaction ($r = .70$, $p < .001$), autonomy satisfaction and relatedness satisfaction ($r = .67$, $p < .001$), and teacher matters and relatedness satisfaction ($r = .62$, $p < .001$).

Confirmatory Factor Analysis

In light of the purpose of a structural equation model (i.e., to investigate the plausibility of a hypothesized model), it is necessary to examine the discrepancy between the observed

Table 2

Descriptive statistics, factor loadings, composite reliability values, and latent correlations for all study variables

	<i>M</i>	<i>SD</i>	<i>Skewness</i>	<i>Kurtosis</i>	<i>λ Loadings</i>	<i>ρ_c</i>	<i>AVE</i>
Physical Education Matters	2.68	.94	-.18	-.80		.90	.69
PEM1	2.68	.93	-.12	-.89	.84		
PEM2	2.42	.86	.13	-.61	.87		
PEM3	3.05	1.08	-.67	-.96	.71		
PEM4	2.57	.90	-.06	-.75	.88		
Teacher Matters	3.02	.77	-.41	-.27		.86	.60
TM1	3.13	.75	-.57	-.01	.83		
TM2	2.94	.74	-.15	-.59	.74		
TM3	2.99	.87	-.54	-.42	.76		
TM4	3.03	.72	-.38	-.06	.76		
Role Overload	3.65	1.90	.15	-1.23		.88	.72
RO1	3.84	1.97	.10	-1.26	.88		
RO2	3.47	1.82	.20	-1.19	.92		
Role Conflict	3.04	1.66	.50	-.83		.79	.56
RC1	3.47	1.83	.26	-1.13	.68		
RC2	2.84	1.59	.63	-.64	.77		
RC3	2.80	1.56	.62	-.71	.78		
Role Ambiguity	2.07	.97	1.39	3.36		.80	.51
RA1	2.57	1.33	1.12	.90	.53		
RA2	2.28	.98	1.32	2.62	.51		
RA3	1.62	.70	1.41	4.42	.87		
RA4	1.81	.87	1.69	5.50	.86		
Autonomy Satisfaction	5.87	1.32	-1.38	1.88		.84	.57
AS1	5.64	1.45	-1.42	1.59	.67		
AS2	5.48	1.33	-1.23	1.20	.74		
AS3	6.65	1.22	-1.32	1.94	.79		
AS4	5.71	1.28	-1.56	2.77	.81		
Competence Satisfaction	6.37	.83	-2.62	12.22		.76	.44
CS1	6.52	.81	-3.10	14.74	.64		
CS2	6.58	.71	-3.18	18.02	.62		
CS3	6.21	.94	-2.18	7.73	.71		
CS4	6.18	.84	-2.01	8.39	.67		
Relatedness Satisfaction	5.84	1.16	-1.44	2.70		.83	.56
RS1	6.12	1.04	-1.80	4.52	.68		
RS2	5.99	1.10	-1.57	3.00	.81		
RS3	5.78	1.21	-1.40	2.28	.76		
RS4	5.45	1.29	-.99	.98	.73		

	TM	PEM	AS	CS	RS	RO	RC	RA
TM	(.77)							
PEM	.54**	(.83)						
AS	.43**	.37**	(.75)					
CS	.33**	.19**	.70**	(.66)				
RS	.62**	.35**	.67**	.49**	(.75)			
RO	-.15*	-.18**	-.29**	-.23**	-.13*	(.85)		
RC	-.25**	-.23**	-.47**	-.31**	-.20**	.57**	(.75)	
RA	-.40**	-.22**	-.42**	-.55**	-.32**	.21**	.30**	(.71)

Note. AVE = average variance extracted; ρ_c = composite reliability; physical education matters and teacher matters ranged from 1-4; role ambiguity, role conflict, role overload, autonomy satisfaction, competence satisfaction, and relatedness satisfaction ranged from 1-7; all factor loadings were significant at $p < .01$, diagonal of the correlation matrix replaced with \sqrt{AVE} , * $p < .05$, ** $p < .01$

values and those expected using the model of interest through measures of goodness of fit. In the present study, a good fitting model was defined by the following criteria: (a) a ratio of the χ^2 statistic to degrees of freedom of < 3 , (b) a root mean square error of approximation (RMSEA) value of $< .06$, (c) a standardized root mean residual (SRMR) value $< .08$, and (D) non-normalized fit index (NNFI) and comparative fit index (CFI) values $\geq .90$ (Byrne, 1998; Hu & Bentler, 1999). According to this criteria, the model demonstrated good fit, $\chi^2(349) = 657.83, p < .001$; RMSEA = .043 (90% CI = [.038, .048], $p = .989$); SRMR = .049; NNFI = .946; CFI = .954. Factor loadings and ρ_c and AVE values (convergent validity) for each construct are presented in the top panel of Table 2. All of the λ loadings were strong (i.e., $\geq .50$), and were significant at the $\alpha = .01$ level (i.e., t -values > 3.21). All of the ρ_c values were $> .70$, and all of the AVE values, with the exception of competence satisfaction ($AVE = .44$), were $> .50$ as recommended, indicating adequate construct reliability (Diamantopoulos & Sigauw, 2000; Fornell & Larcker, 1981). The diagonal elements of the correlation matrix located at the bottom of Table 2 have been replaced with \sqrt{AVE} to display the quality of discriminant validity. In line with prior recommendations (Teo et al., 2009), all of the \sqrt{AVE} values were greater than the correlations between the constructs and other constructs in the model with the exception of the \sqrt{AVE} for competence satisfaction and its correlation with autonomy satisfaction. The questionable AVE and \sqrt{AVE} values for competence satisfaction are worthy of consideration as the former indicates the construct's inability to capture a reputable amount of variance in relation to that which is due to measurement error while the latter indicates the potential redundancy between it and autonomy satisfaction. These minor issues notwithstanding, these analyses maintain strong evidence in support of psychometric quality of the measurement model.

Evaluation of the Conceptual Model

It was generally expected that perceived mattering would reduce role stress, and that role stress would reduce satisfaction of the psychological needs for autonomy, competence, and relatedness. Additionally, it was posited that perceived mattering would directly enhance autonomy, competence, and relatedness satisfaction. Therefore, both direct and indirect relationships were hypothesized in the framework. Given the expected correlation among the role stressors and their position on the endogenous side of the model, their error terms were allowed to covary in the model. The test of the hypothesized model indicated good model fit, $\chi^2(358) = 669.38, p < .001$, RMSEA = .043 (90% CI = [.038, .048], $p = .993$), SRMR = .055, NNFI = .947, CFI = .953.

While the conceptual model was a good fit for the data, the β weights for several pathways in the structural model were not significant (i.e., $t < 1.96$). These included the paths from PE matters to role ambiguity, competence, and relatedness satisfaction; teacher matters to role overload and role conflict; role overload to relatedness and autonomy satisfaction; and role conflict to competence and relatedness satisfaction. The model maintained its goodness of fit after removing these pathways, $\chi^2(359) = 672.67, p < .001$, RMSEA = .043 (90% CI = [.039, .048], $p = .992$), SRMR = .058, NNFI = .947, CFI = .953. A chi-square difference test indicated that removing the non-significant pathways did not result in a significantly worse fitting model. Figure 2 displays the final model with completely standardized regression coefficients. Next, the completely standardized direct and indirect effects were examined in the final model. As illustrated in Figure 2, PE matters predicted teacher matters ($\beta = .54, p < .01$). Teacher matters had the strongest direct effect on relatedness satisfaction ($\beta = .63, p < .01$) and role ambiguity ($\beta = -.39, p < .01$). Role overload only predicted competence satisfaction ($\beta = -.10, p <$

.01), role conflict only predicted autonomy satisfaction ($\beta = -.29, p < .01$), and role ambiguity had the largest direct effect on competence satisfaction ($\beta = -.46, p < .01$). Thus, perceived mattering and role stress had significant direct and indirect effects that influence PE teachers' perceptions of PNS.

Discussion

The purpose of the current study was to examine the impact of two potential antecedents, perceived mattering and role stress, on PE teachers' perceived satisfaction of the psychological needs for autonomy, competence, and relatedness. In general, the findings supported the hypotheses that role stress would negatively predict PNS (H1), perceived mattering would negatively predict role stress (H2), and that perceived mattering would positively predict PNS in both direct and indirect pathways (H3).

The most notable observation from this study was the particularly strong effect of PE matters on relatedness satisfaction, which was fully mediated by teacher matters. The extent to which these teachers perceived that others in the school valued their discipline greatly impacted their perceptions of how much they, themselves, were valued as teachers. This predictive relationship is consistent with that which was found recently by Richards (in press). Considering the integral role played by relatedness satisfaction in nurturing autonomous forms of motivation (Baumeister & Leary, 1995), steps taken by key stakeholders in the educational realm to impress upon PE teachers the value held by their discipline and their capacities as teachers may be steps in the right direction (Gaudreault et al., 2016; Lux & McCullick, 2011).

In addition to predicting relatedness satisfaction, PE matters predicted autonomy satisfaction directly and indirectly through teacher matters. Increased perceptions that their discipline matters and that they matter as teachers positively predicted these PE teachers'

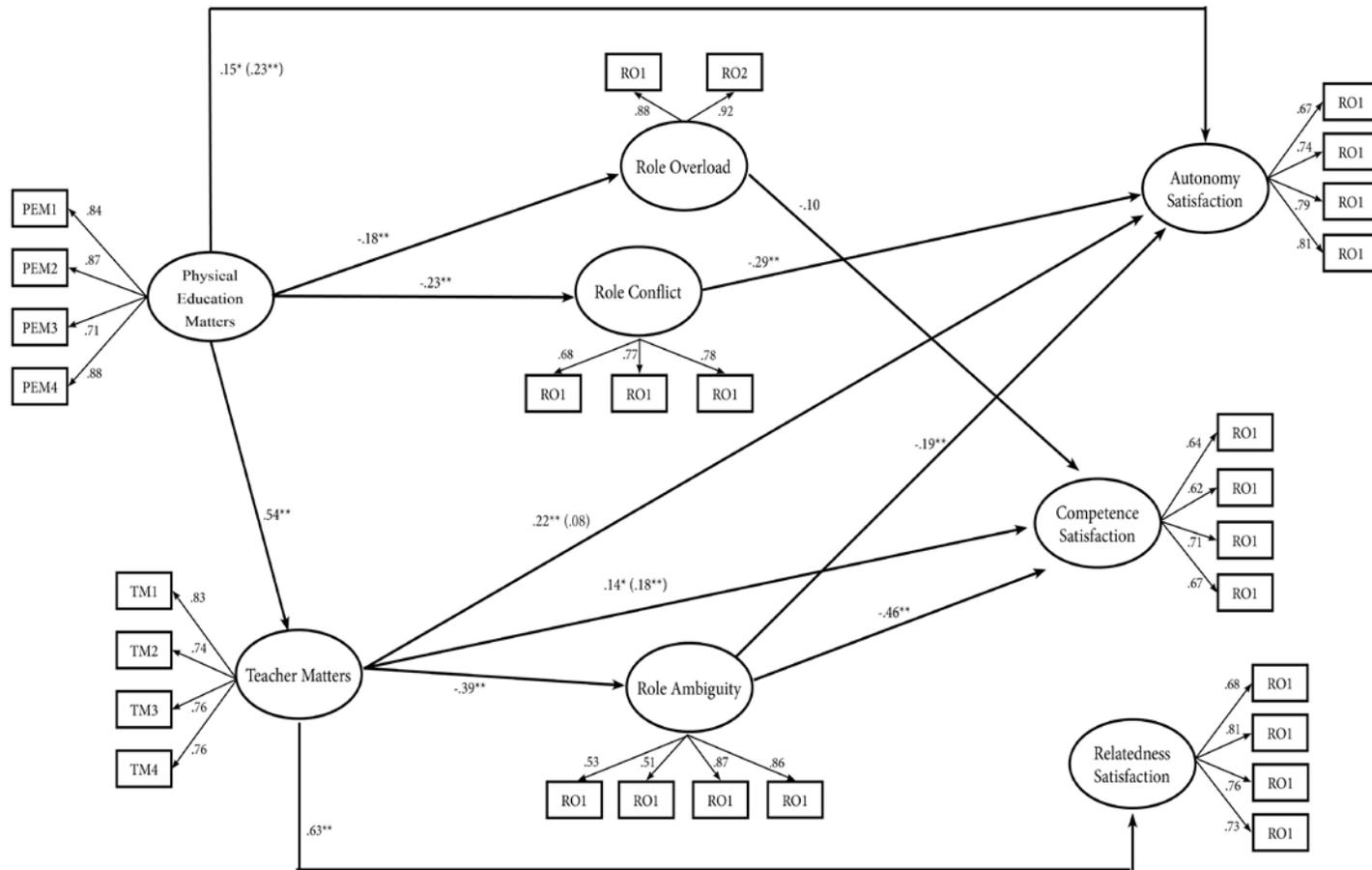


Figure 2. Final structural model with completely standardized regression path coefficients, $\chi^2(359) = 672.67, p < .001, RMSEA = .043$ (90% CI = [.039, .048], $p = .992$), SRMR = .058, NNFI = .947, CFI = .953.

Note. Coefficients in parentheses are the values of indirect effects,

satisfaction of the need for autonomy. Role conflict decreased respondents' perceptions of autonomy satisfaction, while PE matters negatively predicted role conflict. This result speaks to the need-thwarting effect of role conflict, which can be attenuated by heightened perspectives of PE matters. Identification of these antecedents and their impact on autonomy satisfaction is important because increased teacher autonomy has been connected with decreased on-the-job stress, empowerment, and professionalism (Pearson & Moomaw, 2005).

Role overload, role conflict, and role ambiguity are products of a turbulent social system (Richards, Templin, Levesque-Bristol, et al., 2014). The current model illustrates the importance in PE teachers' perceptions that their discipline matters, as this very perception appears enhance their perceived value as a teacher, reduce feelings of all three role stressors, and enhance PNS through direct and indirect pathways.

Teacher matters predicted competence satisfaction directly and indirectly through role ambiguity. The more they felt valued as teachers, the less stress these teachers encountered in the form of unclear expectations for performance. In turn, this led to enhanced feelings of competence. These findings only further support the necessity to elevate PE teachers' perceptions of mattering and decrease those of role stress as the needs for autonomy and competence have been touted as the alpha nutrients for intrinsic motivation (Ryan & Deci, 2000).

Conclusion

This study extends the line of inquiry concerned with uncovering antecedents to PE teachers' PNS by identifying the constructs of perceived mattering and role stress as two related and multidimensional factors that impact the extent to which PE teachers experience need satisfaction at work. Prominently, these results hold practical significance. Within teacher

education programs, faculty can dedicate concentrated effort to not only instilling in preservice teachers a belief that PE is valuable, but also equipping them with strategies for instilling similar beliefs in the administrators and teachers under and with whom they will be working when they acquire employment. Moreover, these findings support and extend those of Carson and Chase (2009) in that attending conferences and reading professional journals may support teachers' psychological needs through the enhancement of perceived mattering. Raising awareness of the benefit to teachers through engaging in these practices in both teacher education programs and within schools is appropriate.

The results of the present study should be interpreted with some caution as a result of a potentially skewed sample. Though teachers from three regions of the country participated in this study, it is plausible that only the most intrinsically motivated PE teachers completed the survey (Carson & Chase, 2009). Additionally, similar to Carson and Chase's (2009) sample, the sample in the present study consisted of mostly Caucasian teachers teaching in the U.S., bringing into question the generalizability of these results for teachers of other races and ethnicities. Future studies might target specific demographic characteristics to generate a more holistic portrait. In conclusion, this study lends credence to the motivational sequence proposed by Van den Berghe and colleagues (2014) by establishing the existence of certain antecedents that influence PE teachers' PNS.

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CHAPTER II

THE DEVELOPMENT OF PHYSICAL EDUCATION TEACHERS' MOTIVATING STYLES: A SOCIALIZATION PERSPECTIVE

Abstract

Physical education teachers' interpersonal sentiments and behaviors toward students during class define their motivating styles. These motivating styles range from those that support student autonomy to those that pressure students to think and behave in certain ways. One factor that influences motivating style is one's general causality orientation. Theoretically, these orientations develop throughout socialization. Drawing from the theories of self-determination and occupational socialization, this study examined the impact of autonomy, competence, and relatedness satisfaction and frustration throughout the socialization process on physical teachers' motivating styles. Participants included purposefully selected physical education teachers ($N = 29$) based on motivating style (11 autonomy-supportive, 12 neutral, seven controlling). Data were collected through semi-structured interviews and analyzed using open, axial, and selective coding. Efforts to ensure trustworthiness included member checking, participant anonymity, and peer debriefing. Six analyst-constructed typologies emerged from the data: (a) humanitarians, (b) concrete roses, (c) stage managers, (d) referees, (e) coasters, and (f) jaded shepherds. Factors affecting motivating styles included the inductive or deductive nature of the contexts in which participants derived psychological need satisfaction during their acculturation and professional socialization, their professional identity, and the extent to which they experienced psychological need satisfaction and frustration at work. In general, the results of this study suggest that

individuals are more supportive of student autonomy (a) tend to have experienced psychological need satisfaction in inductive contexts growing up, (b) identify chiefly as teachers of physical education, and (c) enjoy psychological need satisfaction at work.

Introduction

Physical education (PE) is a profession predicated on the belief that physical activity is crucial to a healthy lifestyle (McKenzie & Lounsbery, 2014). The extent to which students engage in PE content during class and during their leisure time, however, appears contingent on their motivation do to so (Ntoumanis, 2005). Considering the teacher to be a determinant of student motivation (Sinelnikov, Hastie, & Prusak, 2007; Perlman; 2012; Van den Berghe et al., 2013), it appears that teachers' motivating styles influence the extent to which their students value and routinely engage in physical activity, or exude the characteristics of what Hastie (2016) referred to as the *personally identified mover*. Guided by self-determination theory (SDT; Ryan & Deci, 2008) and occupational socialization theory (OST; Lawson, 1983a, 1983b), this study aimed to better understand how PE teachers come to possess certain motivating styles during instruction.

Self-Determination Theory

Self-determination theory identifies various forms of motivation, distinguishable by the extent to which the source of behavioral initiation and regulation is proximal to the self (Deci & Ryan, 2000). Sources of behavioral initiation and regulation that are internal reflect more self-determined forms of motivation (e.g., action to experience joy or out of interest). As these sources move distally, motivation becomes increasingly extrinsic (e.g., action out of perceived importance or action to avoid shame). Theoretically, satisfaction of the innate psychological needs for *autonomy* (personal volition), *competence* (efficacy), and *relatedness* (belonging) fosters more self-determined forms of motivation whereas psychological need frustration (PNF)

results in more extrinsic forms of motivation (Deci & Ryan, 2002). Largely, the PE literature supports the tenets of SDT, linking teachers' psychological need satisfaction (PNS) with more self-determined reasons for teaching (Carson & Chase, 2009; Taylor, Ntoumanis, & Standage, 2008), thus enabling them to utilize autonomy-supportive motivating styles (Reeve, 2009) that increasingly support their students' psychological needs (Haerens et al., 2015; Taylor & Ntoumanis, 2007). Inversely, teachers experiencing PNF tend to teach for less self-determined reasons and rely on controlling motivating styles in which they pressure students to think and behave in prescribed ways (Pelletier, Seguin-Levesque, & Legault, 2002).

Students (De Meyer et al., 2016) and teachers alike (Cheon, Reeve, Yu, & Jang, 2014) reap strong benefits from autonomy-supportive motivating styles. De Meyer and colleagues (2016) randomly assigned 320 secondary students to watch PE-based video vignettes involving teachers employing either an autonomy-supportive or a controlling motivating style. After watching the vignettes, all students completed questionnaires on PNS, PNF, engagement, and oppositional defiance. The students in the autonomy-supportive, relative to the controlling, condition reported more engagement and less oppositional defiance. These effects were mediated by PNS and PNF. Additionally, Cheon and colleagues (2014) randomly assigned 27 PE teachers to either a treatment group in which they received an intervention on being more autonomy-supportive or a control group that taught as they normally would. The teachers having received the intervention reported greater teaching motivation, teaching skill, and well-being.

In light of the influence teachers' motivating styles have on the instructional process, research has identified numerous factors explaining why teachers assume particular motivating styles, including personal beliefs (Reeve et al., 2014) and the social context (Taylor, Ntoumanis, & Smith, 2009; Pelletier et al., 2002), among others. Perhaps none, however, do so to the extent

of personality disposition (Van den Berghe et al., 2013). Extrapolating from findings relative to other life contexts (e.g., Olesen, Thomsen, Schnieber, & Tonnesvang, 2010), Van den Berghe and colleagues (2013) established a connection between PE teachers' causality orientations (i.e., their overall alignment with reference to behavioral initiation and regulation) and motivating styles. After coding lessons taught by 79 secondary PE teachers who had completed a Dutch version (Soenens, et al., 2005) of the short General Causality Orientations Scale (Deci & Ryan, 1985), the authors concluded that autonomy-oriented teachers (i.e., those who are chiefly inclined to act out of interest and challenge) were more supportive of their students' needs. Contrarily, control-oriented teachers (i.e., those who act out of extrinsically imposed deadlines and pressures) were more inhibitive of their students' needs. These and other findings (Taylor et al., 2008) corroborate Vallerand's (2000) position that motivational disposition at the personality level affects behavior at the contextual level. This connection makes conceptualizing the development of teachers' causality orientations pertinent. Given that causality orientations are personality dispositions that develop, in part, through socialization experiences (Vansteenkiste et al., 2010), it is necessary to discuss PE teachers' socialization. One widely accepted theoretical platform for doing so is OST.

Occupational Socialization Theory

Occupational socialization theory (Lawson, 1983a, 1983b; Richards, Templin, & Graber, 2014) seeks to explain individuals' decisions to enter the teaching profession and their perceptions and actions in practice. Toward this end, the PE socialization literature has largely accepted a three-phase, temporally-bound model consisting of acculturation, professional socialization, and organizational socialization.

Acculturation begins at birth and lasts until entrance into a formal teacher education program. This is, perhaps, the most potent phase of socialization (Curtner-Smith et al., 2008). As students in school observing the actions and views of their teachers, a period identified by Lortie (1975) as the *apprenticeship of observation*, individuals considering a career in PE begin to compare what they believe to be the requirements and expectations of a PE teacher with their own skill sets. In turn, they formulate sturdy assumptions regarding their fitness for the position (i.e., a *subjective warrant*; Lortie, 1975). One of the primary attractors to the teaching profession identified by Lortie (1975), namely a desire to remain involved in a familiar context, is evident in many recruits' decisions to enter the profession in order to coach interschool athletics (Lawson, 1983a). Recruits of this nature have generally viewed teaching as a career-contingency and identified chiefly as coaches (i.e., possessed a coaching orientation; Curtner-Smith, 1997).

Professional socialization spans the duration of a teacher education program. This period serves as the primary channel for formal training in the professional knowledge, skills, and dispositions deemed important by teacher education faculty (Lawson, 1983b). Unfortunately, research suggests this phase may be the weakest of the three (Stran & Curtner-Smith, 2009). The sturdily constructed *subjective warrant* (i.e., an appraisal of a field's requirements in relation to personal aptitudes) that many preservice teachers develop during their acculturation and bring with them to their teacher education programs constitute one highly plausible explanation for professional socialization's limited impact on preservice teachers' beliefs and practices (Lortie, 1975). These naïve perceptions may function as filtering mechanisms, prompting future teachers to accept only those teachings that parallel their perceived realities, while rejecting those in conflict or manipulating them to conformity. Individuals' capacity to proactively filter, accept, and dismiss their PETE program's influence highlights the dialectical nature of socialization

when viewed through OST, whereby there is a mutual, albeit likely unequal, impact on both parties (Schempp & Graber, 1992).

The third stage of socialization, covering the entirety of a teacher's career, is *organizational socialization* (Lynn & Woods, 2010). Van Maanen and Schein (1979) defined this phase as “the process by which one is taught and learns the ropes of a particular organizational role” (p. 211). The “ropes” to which Van Maanen and Schein refer symbolize the school's hegemonic culture to which neophyte teachers are exposed during induction (Lawson, 1983b) through a process identified by Zeichner and Tabachnick (1983) as the “institutional press.” This quite powerful, and often custodial, socializing machine asserts itself to newly hired teachers in their interactions with students, veteran faculty, administrators, and parents (Curtner-Smith, 2001; Richards et al., 2014). Though not ubiquitous, as evidence suggests that pedagogical innovation is encouraged in some school cultures (Hebert & Worthy, 2001), the institutional press often limits teachers' perceptions and possibilities through *technocratic rationality* (Althusser, 1971). In pursuit of institutional benefit, this ideology promotes questions of *what* and *how* over *why* and prioritizes objectivity over sentiment, resulting in a sort of dehumanization (Fernández-Balboa & Muros, 2006).

Rationale and Purpose

The above theories assume different yet potentially complimentary perspectives with regard to explaining teachers' behaviors. Where OST explains the nature of the particular context, SDT explains the impact of the context on an individual's motivation and personality disposition through PNS. A particular context may support the needs of one person and thwart those of another. Occupational socialization theory has contextually considered professional behavior. Professional behavior, though, may stem from personality disposition (Van den Berghe

et al., 2013) which, theoretically, stems from need satisfaction or frustration during socializing experiences in multiple contexts and at different life stages (Vallerand, 2000). Therefore, the purpose of this study was to establish connections between PE teachers' socialization experiences as they relate to PNS and PNF and their current teaching motivational styles.

Method

Research Design

This cross-sectional, qualitative study is an extension of a larger study seeking to understand the antecedents to PE teachers' PNS. Upon receiving Institutional Review Board approval, and per the recommendations of Taylor and colleagues (2008), 492 PE teachers from the American Midwest, Northeast, and Southeast completed a survey containing the Problems in Schools questionnaire (PIS; Deci, Schwartz, Sheinman, & Ryan, 1981), an instrument designed to assess teachers' contextual motivating styles. Essentially, the PIS assesses whether teachers orient toward supporting the autonomy versus controlling the behavior of children (Deci et al., 1981). The scale yields a score ranging from 11 (highly autonomy-supportive) to -19 (highly controlling). Scoring procedures were modified according to the recommendations of Reeve and colleagues (1999).

Of the 492 PE teachers who completed the survey, 94 were willing to participate in a phone interview. Maximum variation sampling (Patton, 2015) identified a sample of teachers with relatively autonomy-supportive, controlling, and neutral motivating styles. Autonomy-supportive teachers' PIS scores fell at least three quarters of one standard deviation above the mean. Controlling teachers' PIS scores were lesser than three quarters of one standard deviation below the sample's mean. Lastly, neutral teachers' PIS scores fell within three quarters of one standard deviation from the mean. This procedure accounted for a percentage of teachers in all

three groups who were no longer interested in taking part in an interview. To prevent any potential bias during the interviews, this sampling procedure was completed by the third author, who then supplied the lead author with a three-page blinded excel spreadsheet containing the names and contact information for all teachers in each of the three groups.

Participants

The aforementioned sampling process identified 29 PE teachers (17 males, 12 females), between 29 and 66 years of age ($M = 47.77$, $SD = 11.50$), with between four and 43 years of teaching experience ($M = 20.37$, $SD = 11.09$). This primarily Caucasian sample ($n = 28$, 96.5%) included teachers from the elementary ($n = 6$), middle ($n = 8$), and high ($n = 15$) school levels.

Data Collection

Data were collected through semi-structured interviews (Patton, 2015). The lead author developed the interview script in consult with an expert in the theories of self-determination and occupational socialization and conducted all interviews. Predicated on the logic that teachers' PNS may influence their motivating styles (Taylor & Ntoumanis, 2007) and that motivating styles are developed through socialization (Vansteenkiste et al., 2010), the interviews focused on the teachers' experiences in various contexts throughout the three phases of their socialization. For example, interviews included questions pertaining to family lives and participation in community activities during acculturation, work experiences and social lives during professional socialization, and professional satisfaction and enjoyment during leisure time during organizational socialization. All interviews lasted between 31 and 77 minutes ($M = 47.9$, $SD = 9.0$), were audio-recorded, and transcribed verbatim.

Data Analysis and Trustworthiness

Analysis of interviews with teachers recruiting autonomy-supportive, neutral, and controlling motivating styles took place separately and included a combination of inductive and deductive processes. Inductive analysis through open, axial, and selective coding revealed emergent themes (Strauss & Corbin, 1990). Specifically, the codes from the first three interviews within each group led to the development of a codebook. This codebook served as a guide for coding the remaining interviews in each group. The codes identified for each teacher generated a brief life summary. Finally, and deductively, the lenses of SDT and OST framed the process of generating analyst-constructed typologies (Patton, 2015) according to similar trends of PNS satisfaction throughout their socialization. It is crucial to note that during this final process of analysis, teachers' PIS scores (a proxy for the motivating styles) were blinded. This allowed for tabulation based on need satisfaction throughout socialization without the influence of motivating style.

Multiple techniques for enhancing the credibility findings were utilized (Lincoln & Guba, 1985). First, all teachers were emailed their interview transcripts. Through this method of member checking, participants were able to confirm or amend their responses. In the rare instance of incongruence, responses were modified accordingly. Second, to promote candid responses, all interviewees were informed that their participation was voluntary and that their anonymity would be preserved using pseudonyms. Finally, experts in the field of SDT and OST not involved in the coding of the data served to peer debrief the final coding structure by assessing the appropriateness and extent to which the typologies assigned to each group of teachers described their socialization.

Results and Discussion

Analysis revealed a tri-level classification scheme. The top level delineated teachers as having primarily experienced PNS in inductive or deductive contexts throughout their socialization. With regard to logic, inductive, or “risky,” arguments operate upon the premise that an absolute truth is unreachable (Hacking, 2001, p.10). In life, these contexts support individuality and self-expression. There is no absolute way to think, feel, or act. Contrariwise, akin to how deduction is the process of arriving at valid, or absolute, conclusions (Johnson-Laird, 1999), deductive contexts foster conformity through the acknowledgement of absolute ways of thinking and acting. The second level further delineated teachers according to whether they predominantly identified professionally as a PE teacher or some other role within the school. The third level of classification specified those teachers who experience PNS versus PNF at work. Ultimately, six analyst-constructed typologies emerged from this scheme: (a) *Humanitarians*, (b) *Concrete Roses*, (c) *Stage Managers*, (d) *Referees*, (e) *Coasters*, and (f) *Jaded Shepherds*. Table 3 identifies PE teachers’ typologies, PIS scores, and background information.

Need Satisfaction in Inductive Contexts

Physical education as a primary focus.

Humanitarians. Laura, Chloe, Scott, and Lilly were categorized as Humanitarians. As individuals seeking to promote human welfare, these teachers were supported lovers of all children who possessed devotion for inclusion. When his students walked through the gym doors, Scott wanted them all “to feel loved and accepted.” Lilly maintained, “all children, regardless of intellectual ability, can be successful. I’m very involved with including all students.” The Humanitarians identified themselves as teachers of PE over other roles they may have assumed within the school. Scott proclaimed that his job as a PE teacher “has so far

exceeded [his] expectations and dreams.” In the interest of including the *people* whom they teach, humanitarians recruited autonomy-supportive motivational styles during their instruction. With all four members of this group reporting motivating styles above zero, they were, on average, the most autonomy-supportive group of teachers (\bar{x} PIS score = 3.97). Laura explained:

I really enjoy my job because I like the kids. They are such interesting personalities.

When I was first here, the hard-nose yelling when they were acting up, I used to do that.

They were students. They were troublemakers. I was trying to control. For me, they

weren't real people. They were the students. I think now they are real. They are people.

Humanitarians largely experienced PNS throughout their socialization in inductive contexts.

Though research suggests that many PE teachers create deductive climates in their gymnasias (Sarrazin et al., 2006), Lilly appears to have enjoyed the autonomy-support provided in her high school PE program: “each nine weeks we were given choices of activities that we wanted to participate in...I really liked that. I carry that over into my teaching today because you are going to get better participation.” In college, Scott deviated from organized sport in pursuit of a more inductive activity, allowing for more self-expression and exploration:

...this doesn't sound like a physical education teacher, but I got involved in theatre. I

started performing in community theatres. I did running on my own but I stopped

organized sports so that I could pursue this other area of enjoyment.

During her organizational socialization, Laura claimed to be an avid hiker, which influenced her interaction with students in an inductive (i.e. open-ended) manner. “I travel quite frequently to New Hampshire and I go hiking,” she explained. “the kids know it and when we get back they ask, ‘Where did you hike this weekend?’ I ask them, ‘Who was active this weekend?’”

The third characteristic of Humanitarians was their perception of PNS at work. All four

Table 3

Typologies of PE teachers and their background information

Name	PIS	Age	Gender	Race	Level	TE	Name	PIS	Age	Gender	Race	Level	TE
Humanitarians							Concrete Roses						
Laura	7.13	66	F	C	HS	27	Cadence	6.13	57	F	C	ES	35
Chloe	4.13	58	F	C	ES	17	Megan	3.63	53	F	C	MS	26
Scott	2.5	60	M	C	MS	38	Kelly	3	41	F	C	ES	19
Lilly	2.13	57	F	C	HS	20	Mark	1.63	59	M	C	MS	35
							Sylvia	.38	64	F	C	HS	43
							Diane	-.25	35	F	C	MS	12
Average PIS	3.97						Average PIS	2.42					
Stage Managers							Referees						
Austin	3.75	39	M	C	HS	9	Daniel	1.75	29	M	C	HS	5
Sam	.13	66	M	C	MS	39	Stan	-.88	42	M	C	HS	18
Sage	-1.13	51	M	C	MS	29	Dot	-1.25	58	F	C	ES	15
Rodrick	-3.88	38	M	C	ES	13	Keith	-1.88	41	M	Other	HS	16
Cynthia	-4.38	37	F	C	HS	11	Jeremy	-2.25	36	M	C	HS	11
							Patricia	-3.38	49	F	C	MS	27
Average PIS	-1.10						Average PIS	-1.32					
Coasters							Jaded Shepherds						
Patrick	-3	36	M	C	HS	12	Reese	-1.25	48	M	C	ES	19
Corrine	-3.63	32	F	C	HS	4	Kris	-1.38	59	M	C	HS	34
Stuart	-4.38	38	M	C	HS	14	Cody	-2.38	49	M	C	HS	24
							Simon	-2.5	32	M	C	MS	4
							Matthew	-3.5	31	M	C	HS	8
Average PIS	-3.67						Average PIS	-2.20					

Note. Average PIS indicates the average PIS score for that group of teachers. PIS = Problems in Schools Questionnaire Score; TE = Teaching Experience; C = Caucasian; ES = Elementary School; MS = Middle School; HS = High School.

teachers reported having complete autonomy over what they teach and how they teach it. Also, these teachers were quite competent pedagogically. Lilly was “flattered that someone just nominated [her] to be [state] teacher of the year last year.” Laura attributes her nurturing style to her increasing competence as a teacher, “I have become more comfortable in my teaching and in my class control. I’ve become more confident in myself to be able to then enjoy them as people instead of controlling them as students.” Finally, Lilly’s support from her administration and colleagues speaks to the strong sense of relatedness these teachers felt at work: “I have an excellent relationship with [the administration]. I feel very confident that if I went to my building principal with a new initiative that I wanted to put in place, I would get full backing.”

Concrete Roses. Cadence, Magen, Kelly, Mark, Sylvia, and Diane exuded the characteristics of a Concrete Rose. A Concrete Rose refers to the growth and development of something positive in the midst of adverse conditions. These teachers, similar to the Humanitarians, experienced PNS in inductive contexts. A shining example of this was Diane’s fond recollection of a particular teacher’s indirect teaching style during her acculturation. She said her art teacher “...was more open to suggestions. He wanted you to figure out your own style. Our projects weren’t as structured. I thrived because you could put your own stamp on it and you weren’t placed inside of a box.” During their professional socialization, Sylvia and the other Concrete Roses gained experience outside of their PETE programs that served to further their inductive perspectives.

I did therapeutic recreation 17½ hours a week working with severe profound handicapped kids [*sic*]...that laid the foundation. Whether we were bowling or taking a walk around the grounds, I was really having to think ahead to be able to help them out. That helped me tremendously once I got out into the work world.

Concrete Roses also prioritized their role as a PE teacher over any other. Mark, who started his career as both a teacher and an athletic trainer, eventually discontinued athletic training for a more family-friendly schedule, a decision he believes to have been a good one: “once I gave up athletic training I became more of an educator. I became involved in moving our school from just playing games to using heart rate monitors.” These teachers took their role as a PE teacher quite seriously and expressed a value for taking responsibility as it pertains to remaining active in professional organizations and contributing to the advancement of the profession. Kerry explained, “I know what’s going on in PE. I keep up to date in journals, in workshops, and in conferences to ensure sure it’s best practice.” Sylvia indicated that she tries “...to be in the forefront with our profession and providing workshops for other physical education teachers around the state. I worked on the state curriculum as well.”

Though they did express feelings of pedagogical autonomy, this group of teachers experienced frustration of their needs for competence and relatedness at work. An innovator who prides herself on trying new pedagogies and refining her craft, the following comment made by Diane suggested her unmotivated colleagues adversely impact her need for competence as a teacher:

I feel like I am constantly taking two steps forward and one-step back. I’m constantly trying to figure out what [the students] are interested in. You constantly have to rely on your [teaching partner], who has their own class. If they aren’t as motivated then they will stand back and, if you are sharing a gym, you end up teaching both classes.

In stating that, “I do think people look upon us as the dumping ground,” Megan appeared to sense other professionals’ lack of value for her position in the school, likely frustrating her need for relatedness. While it may be possible for people to feel that they matter to others but their

subject matter does not (Richards et al., 2014), Cadence' observation of the segregation of the faculty in her building due to age indicated that she, as a person, felt devalued, "There is a big age gap in the teaching staff. When I first started teaching, that age gap didn't really matter...It's a big cliquey." In spite of experiencing PNF at work, however, these teachers continued to utilize autonomy-supportive motivating styles, as evidence by five of the six members reporting positive PIS scores (\bar{x} PIS score = 2.42).

Need Satisfaction in Deductive Contexts

Physical education as a primary focus.

Stage managers. The Stage Managers were Austin, Sam, Sage, Rodrick, and Cynthia. By ensuring that props are in their place and the actors are ready, stage managers keep productions moving smoothly. In their preoccupation with maintaining a smooth process, however, stage managers may not concern themselves with the interests or feelings of the actors with whom they work. In this study, Stage Managers came off as competent, technical teachers who instruct in more controlling ways. They experienced PNS largely in deductive contexts throughout their socialization. They tended to appreciate and thrive in arenas that set parameters and provided little autonomy. Sage, for instance, was heavily involved in organized sport: "When I was a kid I played organized sports in virtually everything, whether it be football, baseball, basketball, soccer, all of your traditional team sports." In addition to playing organized sports, Austin remembered his parents as "...being definitely more authoritarian. You'd get the 'Why do I need to do that? Because I said so.' Old school Italian for the most part, but you learned a lot of respect, hard work, and a lot of values and things that are missing a lot today." During her professional socialization, these teachers also assumed somewhat regulatory positions of employment. Cynthia mentioned "I worked at the local gun club as a scorekeeper starting when I

was 14. Then I was a lifeguard when I was old enough at 16 until I was 22 and out of college.”

Rodrick “was a store clerk at the corner store... dealing with drunks a couple nights a week.”

Austin was a competitive bodybuilder for years who considered a career in law enforcement before ultimately going into PE. Outside of work during his leisure time, Sage continued to dwell in deductive contexts. In addition to coaching many of his kids’ club teams, he plays in an adult soccer league.

Similar to the Humanitarians and Concrete Roses, the Stage Managers considered teaching PE to be their primary responsibility. What brought Rodrick the most joy at work was “seeing the kids have fun, number one, and seeing the kids that don’t necessarily like sports or don’t excel in them do something great in the class that everybody else notices.” Not all of these teachers emphasized teaching PE over other roles from the start, nevertheless they ultimately did. For Sage, “going into college I knew I wanted to teach PE, but my big focus was on coaching. Once I blew out my knee, it became more about PE and the instruction and less about the coaching.” Though Stage Managers still considered teaching PE to be their primary responsibility, they viewed that responsibility slightly differently than the Humanitarians and Concrete Roses. Stage Managers tended to provide more regimented, less autonomy-supportive instruction (\bar{x} PIS score = -1.10). Table 3 shows that three of five Stage Managers responded as having negative PIS scores. A lesson described by Sage illustrates a typical stage manager’s lesson:

We never do anything more than six classes. Volleyball is a six-class unit. Basketball is a six-class unit. I’ll take the first three classes to develop skills. The last few classes will be using those skills in game situations.

In the event that students avoided participation, stage managers' responses suggested more coercive than autonomy-supportive courses of action. Cynthia, for instance, maintained the position that "when a student doesn't dress for class, they still need to be active. If we're playing basketball in the gym, I have that student walk. When we're in the cardio room, [they] are still on the bikes."

Much like the stage manager of a musical receives recognition in gratitude for their efforts from the performers and the audience after a show, teachers in this group experience feelings of autonomy, relatedness, and competence at work. Cynthia stated, "I have 100% control over what I teach and how I teach it. I helped re-write the curriculum. I could teach whatever I want on any day of the week. I have 100% freedom." Along with feeling as though they have control over what they teach, stage managers had positive relationships with their colleagues and did not experience marginalization. Rodrick stated, "I get along with most teachers here because...they are motivated to teach. They have the same philosophy as me...they continually want to improve as a teacher. I think that's why our faculty usually gets along so well." These teachers perceived themselves as quite competent in the work they perform and proud of the service they provide. Cynthia's response to a question about her level of perceived professional accomplishment supports this view, "I've been very successful. I've written countless letters of recommendation for students. I believe they wouldn't have asked me if I wasn't a part of their lives in a way that could speak to their success in the future."

Referees. Daniel, Stan, Dot, Keith, Jeremy, and Patricia were the Referees. Referees enforce the rules of the game in the midst of withstanding criticism from players, coaches, and fans. They are rarely, if ever, recognized for their efforts in calling a contest objectively, yet they

persist in faithfully executing their regulatory positions. Teachers classified as Referees share all of the characteristics of stage managers, except they appear to face PNF at work.

Referees have been quite successful in deductive contexts. Daniel, for example, made the varsity basketball team as a freshman and is currently the all-time leading receiver for his high school's football team. With regard to athletics, he said "that's what I've done my whole life. I started playing organized sports when I was four or five." Athletics were also a major part of Stan's acculturation. When the time came to decide on a career path, sport guided the needle of his compass:

I just really liked sports. I could not see myself really doing anything else. Nobody in my family had had a college education, so I thought I'd go and try it. When it came time to decide a major, I thought, 'Well, let's just do PE.' I was an athletic guy.

Though she did not compete in intercollegiate athletics, Cynthia was highly involved in intramural sports: "I did a lot of intramural sports. I did IM flag football, basketball, racquetball, and swimming." Outside of his work as a teacher, Jeremy invested his time serving his community in minimally autonomous capacities: "I'm an assistant chief in the fire department and a first responder. We run both medical and fire calls. I also handle a lot of the rescue side of our department."

Collectively, Referees' motivational styles tended to be slightly more controlling than the aforementioned typologies. Five of six Referees responded with negative PIS scores ($\bar{x} = -1.32$). Patricia described herself by saying "I'm very structured so we have a set schedule. I think the kids should have fun but everything can't always be fun. They have to understand that hard work pays off. You have to work hard at everything." Nonetheless, akin to the Humanitarians,

Concrete Roses, and Stage Managers, the Referees also seemed to identify primarily with their role as a PE teacher. Dot's comments lend credence to this notion:

I know in other schools that the PE teachers were the coaches who tended to favor the athletes but I tend to be more of the opposite. I tend to attract to the kids who need me, like the obese or the kids who don't feel athletic.

Further expressing this group's professional identity as teachers first was Keith's declaration that "as a discipline, there are people that are not pulling their weight and not giving a great experience for kids."

The line of demarcation between the Stage Managers and the Referees exists in the extent of their PNS at work. Far from feeling supported, the Referees seemed to face a chronic professional struggle. The chief area of PNF for these teachers appeared to be relatedness. Dot commented, "I really don't think [the administration] cares about us. We're left out of everything. When we have meetings, they have nothing to do with PE. They are just unrelated to anything we teach and nobody seems to care." Perhaps no teacher's comments illustrate the frustration in this group more than Patricia's does. Her involuntary transfer to the middle school to create a spot for the basketball coach who had poor teaching evaluations may just have been the tipping point for her:

They moved me to get the program more structured. I got punished for doing a good job and he got rewarded for doing a bad job. The political bullshit is the part I can't handle. That's why I'm going to retire at 55. I love teaching but I cannot handle all this favoritism. When I was in the elementary, I felt like somebody appreciated me.

Physical education as a contingency.

Coasters. Patrick, Corrine, and Stuart were identified as the Coasters. As a coasting vehicle remains in motion without expending energy, teachers characterized as Coasters seemed to coast through their PE classes without much effort and reflection. They were preoccupied with excelling in other aspects of their employment. Corrine's comments reflected her interest in teaching a subject other than PE, "I really enjoy the health side of things a little bit more than the PE side. I'm always looking to do better over there. I think our health program could be stronger. I'm always looking to make that better." For Patrick, his role as a coach defined his professional identity.

I think people would tag me as being a coach first and a teacher second. It's not Mr. Brunner, its Coach Brunner. You get asked, 'Would you do one without the other?' I don't know if I can. If you took the coaching element away, I'm not sure it would keep me motivated for the teaching aspect.

Supporting the notion that the Coasters tended to possess apathetic and controlling perspectives to instruction in PE, all three members in this group reported negative PIS scores ($\bar{x} = -3.67$). The following blasé description provided by Corrine typifies a PE lesson taught by a Coaster: "We warmed up. Then we played this game called 'Chicanery.' We made teams, got our goals set up, and played our little game. When it was over, we closed a little bit and then headed in to change." For Patrick, PE functioned as "an outlet for students during the day to go waste some energy, be with their friends, and compete or lift some weights and make themselves better." Despite his relatively cavalier philosophy of PE, Patrick and the other Coasters placed a great deal of import on discipline. "I want them to be respectful of the process, and be respectful of me and listen and do what they are supposed to be doing," he says.

Similar to the Stage Managers and Referees, the Coasters also experienced PNS primarily in deductive contexts. Stuart, for instance, indicated that his upbringing in a military family involved clearly set rules that were “a mainstay.” This focused upbringing guided him in becoming what he described as “...a person who searches for rules. ‘What do you need me to do? I will do it and I will get it done and then you’re going to tell me something else to do.’” During his field experiences, Patrick experienced senses of competence and relatedness working under hardcore coaching-oriented cooperating teachers. In his words:

I always lucked out and got in with somebody that was a coach. My first [student teaching placement] was with a coach who had won state championships in basketball. My next one was a female basketball coach who threw me in the mix right away. I remember her being out and having a sub and having me run the class instead of the sub.

During their organizational socialization, these teachers also engaged in deductive contexts. Corrine and her husband were, at the time, experiencing senses of competence and relatedness in training their dog to become a search and rescue dog. “We’ve really been putting a lot of effort into her training. Every day when I get home we have to do stuff with her to keep her training fresh and that kind of thing.”

While at work, Coasters experienced PNS. Patrick’s administration gave him and his colleagues the liberty to redesign the curriculum at his school to become more fitness-based. Stuart considered himself to be in the right place, professionally: “my career as a PE teacher has been very good so far. I have been in the same place for 14 years. I think I’m well-suited for what I do.” Along with feeling accepted by her colleagues, Corrine felt a sense of relatedness with her building principal: “he’s really awesome. He comes from a big athletic background, so I knew him before I started teaching. Obviously, I knew he bought into me.” Having their needs

satisfied at work allowed the coasters to remain content in their positions. Corrine's statements that, "I haven't thought about leaving teaching at all. I figure I'll be doing this until I'm done working entirely" supported this view.

Jaded Shepherds. Reese, Kris, Cody, Simon, and Matthew comprised the final group, the Jaded Shepherds. Not unlike how a shepherd corrals sheep, teachers in this study identified as Jaded Shepherds essentially viewed their PE classes as pastures in which to house students while dedicating their efforts elsewhere. The following response provided by Kris with regard to how he ran his PE classes reflects this perspective: "if you came out and started playing four on four at one basket and another group started playing football, I would never start class. I would just let that go until it was time to get dressed." The jaded shepherds identified primarily with their roles as an athletics coach. For these teachers, PE was a contingency to acquire a career in coaching. Cody candidly explained,

I got into this to be able to do football. That's why PE. I did it all so I could be around the game of football. That's why I did it. I work from 7:30 to 3:05 to get to the second part of my job, which is sport. That's what I love.

Interestingly, the Jaded Shepherds viewed the athletes on their teams in the same way the Humanitarians viewed their students in PE class: as humans. As a case in point, Matthew loved coaching because, for him, "You get to see kids in a different light. In a classroom you see kids one way but once you get on a field you get to see kids more as people." In class, however, these teachers tended to view their students in a more negative light. When asked about his primary frustration at work, Reese responded, "Right now, it's the lack of respect that they give an adult, a teacher, or anyone. It's 'What about me?' They fail to see the greater picture." The Jaded Shepherds' passion for coaching and mentality in athletics manifested itself in their relatively

controlling motivational styles (\bar{x} PIS score = -2.20). In fact, all five Jaded Shepherds' PIS scores were negative. As Simon documented, "I think that my coaching reputation blends into the classroom as well. I'm pretty firm."

Consistent with the Stage Managers, Referees, and Coasters, the Jaded Shepherds also experienced PNS in deductive contexts. The positive experiences Kris had with his with his PE teacher/coach have influenced his current teaching practice: "Coach Byron, the head football coach, was one of my heroes growing up. I reflect on what he would do. We did mountain climbers and burpees and, guess what? I still do those things in junior high PE." Many of the Jaded Shepherds competed in collegiate athletics, often under dictatorial coaches. Simon explained how his baseball coach "was a tremendous athlete who spent time in the Red Sox organization with Fred Lynn, Jim Rice, and that group. Playing for him was very traditional and very old school." At the time of data collection, Matthew was preparing to attend a summer training to become a Lieutenant in the state army national guard. Jaded shepherds reportedly rely on relatively controlling motivating styles. Taking after his college football coach, who was also one of his methods professors, Kris tells his students at the start of each year, "I love you like you're my nieces and nephews, but if you get out of line I'm going to discipline you. I'm telling you that up front."

Jaded Shepherds experienced PNF at work, rendering them jaded or burned out (Richards & Templin, 2012). Despite feeling a sense of autonomy in their teaching, the Jaded Shepherds struggle with feelings of competence and relatedness in their jobs. When asked how accomplished he felt as a PE teacher, Cody's response highlighted his perceived lack of competence and a desire to be able to improve:

[I don't feel very confident] because I fail every day from what I was taught in college.

I'm not doing what I was taught and what I want to be doing, but I think that, given a better situation, I could go back to doing it the way that I want to do versus what I have to do to survive.

In the midst of feeling frustrated as a teacher trying to implement the practices espoused by his PETE program, Cody made the decision to “go with what worked and keeps the fuss down. I say, ‘We are playing football over there, we are playing basketball over there, and we are playing four-square here. There’s your options. Let’s play.’” In addition to feeling as though they weren’t able to do their best pedagogically, the Jaded Shepherds clearly felt isolated and devalued. Simon noted a lack of respect from other faculty leading to “invisible walls” being constructed. Reese also voiced his perceived lack of respect from other stakeholders, “I am most definitely at the bottom of the totem pole...there is a lot of taking for granted. I think to myself ‘I have a degree...I get evaluated the same as all of you.’ Sometimes they forget that.”

Discussion

Dovetailing the theories of self-determination and occupational socialization, this study established connections between PE teachers’ motivating styles and their experiences of PNS throughout their socialization. Table 4 functions to summarize the results of this study, hypothesizing the impact PNS in inductive or deductive contexts, professional identity, and PNS at work on motivating style. These results contain several topics for discussion.

The two most autonomy-supportive typologies experienced PNS primarily in inductive contexts throughout their socialization and the more controlling typologies experienced PNS mostly in deductive contexts. This suggests a connection between contextual PNS and motivational style. Specifically, chronic PNS in arenas that support the pursuit of self-interest

Table 4

Influence of PNS in inductive and deductive context, professional identity, and PNS at work on motivating style

PNS in Deductive/Inductive Contexts	Professional Identity (PE-focused or PE-contingency)	PNS at Work	Motivational Style
Inductive	PE	Yes	Autonomy-supportive
Inductive	PE	No	Autonomy-supportive
Deductive	PE	Yes	Neutral
Deductive	PE	No	Neutral
Deductive	Contingency	Yes	Controlling
Deductive	Contingency	No	Controlling

Note. Adapted from Curtner-Smith, M. D., Hastie, P. A., & Kinchin, G. D. (2008). Influence of occupational socialization on beginning teachers' interpretation and delivery of sport education. *Sport, Education, and Society*, 13(1), 97-117.

and expression may incline one to motivate others with similar methods. Likewise, chronic PNS in arenas that endorse conformity, quantify performance, and provide recognition accordingly may lead one to believe that such motivating tactics are superior. Theoretically, greater PNS leads to more need-supportive instruction (Van den Berghe et al., 2014). Teachers who had all three needs satisfied over their socialization (i.e., those dwelling in inductive contexts) tended to support all three of their students' needs, particularly that for autonomy. On the other hand, teachers who lacked autonomy support during their socialization (i.e., dwelling in deductive contexts), while supportive of their students' needs for competence and relatedness, were not as concerned with supporting the autonomy of their students. Contexts such as traditional team sports (Fraser-Thomas & Côté, 2009) and the military (Brunger, Serrato, & Ogden, 2013) typically do not afford much autonomy. However, they plausibly do provide opportunities to experience great senses of competence and relatedness. Conceivably, the joy experienced in these contexts predisposes these teachers to perceive that their students will experience a similar emotional response from competence and relatedness only, in the absence of autonomy. This

may partially explain why teachers develop controlling motivating styles. This finding also speaks to the socializing power of the apprenticeship of observation (Lortie, 1975). The means by which these teachers were motivated during their acculturation appeared to set them on a motivational trajectory moving forward. The relatively weak impact of professional socialization (Curtner-Smith et al., 2008) is noteworthy, as most all teachers expanded on areas of their lives outside of their PETE courses during this portion of the interview.

A second noteworthy finding from this study was the ubiquity of PNF at work. Concrete Roses, Referees, and Jaded Shepherds all reportedly struggled for feelings of competence and relatedness satisfaction at work. This discovery lends credence to the long-standing identification of PE as a marginalized subject in American schools (Lux & McCullick, 2011; Sparkes, Templin, & Schempp, 1993). In teaching a subject considered peripheral to their school's mission, PE teachers may struggle for meaningful interaction and acceptance from colleagues and administrators, thus leaving them questioning the extent to which they matter as a professional (Richards et al., 2016). Not only is PE considered peripheral, but also gymnasias are often physically located on the school's periphery or stand alone as separate structures altogether, exacerbating PE teachers' feelings of isolation (Lynn & Woods, 2010; Stroot and Ko, 2006). This PNF was associated with more controlling motivating styles for the teaching-focused typologies. Conceivably, with greater PNS at work, the Concrete Rose could achieve Humanitarian status and the Referees could achieve Stage Manager status. For the Coasters and Jaded Shepherds, however, PNS at work appeared to be a nonfactor as the latter were more autonomy-supportive than the former. Nonetheless, interpretation of this observation warrants caution. It could be that the Coasters' PNS at work reinforced their relatively controlling motivating styles, almost reinforcing what they know to be best practice. The Jaded Shepherds'

preoccupation with coaching coupled with their PNF at work may incline them to become more reclusive in their teaching which could possibly inflate a PIS score and present a sort of pseudo-autonomy-supportive motivating style.

Thirdly, there were teachers within all typologies who loved their jobs. Motivating style may not be indicative of professional motivation. A teacher can orient toward supporting students' autonomy or controlling their behavior and possess a passion for what they do just the same. The notion that teachers with controlling pedagogies can be "lifers" (Henninger, 2007) just the same as autonomy-supportive teachers only further accents the need to promote more autonomy-supportive teaching methods during PETE.

Finally, analysis of Table 2 shows that among the neutral and controlling typologies, all of whom experienced PNS in deductive contexts growing up, two prioritized teaching PE and two viewed teaching as a career contingency in order to teach a separate subject or coach sport teams (Lawson, 1983b). If PNS in inductive contexts is a predictor of a more autonomy-supportive motivating baseline and a teaching orientation (Curtner-Smith, 2001) PETE programs might be well served to consider a number of strategies to improve practice in schools aiming at all three phases of occupational socialization. One strategy could include collaborating with schools to provide inductive experiences for students in PE in the interest of purifying their subjective warrants through cerebrally molding their apprenticeship of observation (Lortie, 1975). As they are nearing graduation, PETE faculty might attempt to recruit future teachers reporting PNS in inductive contexts and use this as a gatekeeping mechanism for entrance into PETE programs (Curtner-Smith, 2009). During PETE, faculty could infuse into their own curricula inductive experiences that allow for self-growth and individuality. Upon receipt of their first teaching position, PETE programs could provide recent graduates with sustained,

immediate, and situated support (Sinelnikov, 2011) to help new teachers maintain autonomy-supportive motivating styles in what can be troubling work environments.

While this study contributes to the OST and SDT literatures, interpretation of these findings warrants consideration of its limitations. First, the only gauges for assessing the teachers' motivating styles were the PIS questionnaire and phone interviews, presenting the possibility of a response bias. Though not an option with this sample size due to practical reasons, actual observation of their teaching would likely have yielded a more accurate representation of their motivating styles (Van den Berghe et al., 2013). Second, by virtue of the study's cross-sectional design, data revealing teachers' motivating styles over time were not available; such data would be useful in targeting for intervention those teachers who are in career phases making them more prone to recruit controlling pedagogies (Lynn, 2002). Finally, the vast majority of the sample (97%) being Caucasian indicates the possibility of a skewed sample. It is possible that different races experience different levels of marginality and experiences at work similar to teachers of different subjects, genders, and sexual orientations (Sparkes, Templin, & Schempp, 1993). In light of these limitations, we recommend future research using longitudinal designs that observes teachers' actual teaching and includes a more diverse sample.

Conclusion

In closing, the significance of this study is found in the connection observed between PE teachers' PNS during their socialization and their motivating styles in practice. Future investigations might consider applying this classification structure to larger, more diverse populations of teachers to confirm its generalizability. Upon necessary modification, the typologies constructed in this study can be a useful tool for identifying teachers who may benefit from autonomy-supportive intervention programs.

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CHAPTER III

ENHANCING STUDENT LEARNING IN SPORT EDUCATION THROUGH THE MANIPULATION OF NEED-SUPPORTIVE INSTRUCTION

Abstract

Self-determination theory research in physical education has linked more autonomous forms of motivation to many teacher and student benefits. This area of inquiry has largely neglected the impact of motivation on learning. This study examined the efficacy of an intervention in increasing one preservice teacher's provision of need-supportive instruction and the associated impact on learning in Sport Education. Participants include one preservice teacher, Jason, and the students in his fifth grade class ($N = 58$). Jason taught one season of floor hockey season, during which the frequencies of his use of need-supportive behaviors were quantified and his students were tested in the cognitive (pre, post, retention) and psychomotor (pre and post) domains. Following a workshop seeking to increase his provision of need-support, Jason then taught a season of pickleball to the same class with identical data collection procedures. Paired samples t -tests revealed a significant increase in Jason's provision of provision of autonomy support ($p = .006$), structure ($p < .001$), and relatedness support ($p = .004$) from pre- to post-intervention. Analysis conducted within the general linear model revealed significant improvements in cognitive scores during both seasons from pre- to post-test, however only during pickleball were scores significantly higher from post-test to retention $t(53) = 2.20, p = .033, d = .22$. Moreover, while contextual skill performance improvement was significant in both seasons, t -test results using change scores indicated that significantly more progress was made during the post-

intervention season. Significant improvement in decontextualized skill performance was comparable across seasons.

Introduction

The construct of motivation has received significant consideration in the physical education (PE) literature over the past decade (Lirgg, 2006; Reeve & Cheon, 2016). Among others (e.g., Ames, 1992), self-determination theory (SDT; Ryan & Deci, 2000) is one theory of human motivation that has been commonly recruited to better understand the contextual role of motivation in PE (Van den Berghe, Vansteenkiste, Cardon, Kirk, & Haerens, 2014). This research has highlighted many benefits associated with contextually autonomous teacher motivation (Cheon & Reeve, 2013) and student motivation (Owen, Smith, Lubans, Ng, & Lonsdale, 2014). Moreover, it has shown that inservice PE teachers are capable of adopting forms of instruction that are more supportive of their students' autonomous motivation (Reeve & Cheon, 2016). Interestingly, however, the extent to which instruction that nourishes students' motivational capacities impacts learning quality is one line of inquiry that has received comparatively little attention. Sport Education (SE; Siedentop, Hastie, & van der Mars, 2011) is one pedagogical model that has demonstrated a particularly strong capacity to enhance student motivation (Perlman, 2011; Sinelnikov, Hastie, & Prusak, 2007). Accordingly, through SDT, the present study sought to determine the efficacy of an intervention in bringing about a change in one preservice PE teacher's provision of motivationally supportive instruction within SE and the associated impact of this form of instruction on student learning.

Self-determination Theory

Self-determination theory postulates a spectrum of motivation delineated by the extent to which the locus of causality is regulated internally (de Charms, 1968; Ryan & Deci, 2000). In

descending order of self-regulation, intrinsic forms of motivation include intrinsic, integrated, and identified regulation, and those forms that are extrinsic include introjected, external, and non-regulations (Ryan & Deci, 2000). According to Deci and Ryan (2008), individuals' motivation to engage in any given behavior appears to shift along this spectrum commensurate with satisfaction of the innate psychological needs for *autonomy* (personal volition), *competence* (self-efficacy), and *relatedness* (connectedness in social settings). Conceptualizing learning as a self-regulated process (Levesque, Sell, & Zimmerman, 2006), and noting that psychological need satisfaction (PNS) precedes autonomous motivation (Deci & Ryan, 2008), the responsibility of the teacher then becomes that of creating the most need-supportive climate for fostering students' self-determination (De Naeghel et al., 2014).

Need-supportive Instruction

Teachers can support students' psychological needs through the provision of need-supportive instruction (Haerens, Aelterman, Vansteenkiste, Soenens, & Van Petegem, 2015). Specifically, NSI supports autonomy through *autonomy-support*, competence through *structure*, and relatedness through *interpersonal involvement*. For example, need-supportive teachers promote their students' interests (autonomy-support), delivering information and assistance adequate for students to feel a sense of self-efficacy (structure), and dedicating significant resources to student growth in warm, friendly, and affectionate ways (relatedness-support; Haerens et al., 2013). Previous research has linked teachers' provision of NSI to numerous student outcomes, including PNS, self-determined motivation, engagement, motor skill development, and intent to engage in leisure time physical activity (Jaakkola, Washington, & Yli-Piipari, 2013; Tessier, Sarrazin, & Ntoumanis, 2010). In spite of this evidence indicating the

benefits of NSI, many PE teachers continue to rely on more controlling strategies (Sarrazin, Tessier, Pelletier, Trouilloud, & Chanal, 2006).

Fortunately, initial evidence suggests that PE teachers can be trained to be more need-supportive (Aelterman et al., 2013; Reeve & Cheon, 2016; Tessier et al., 2010). Consistent with previous recommendations (Su & Reeve, 2011), Aelterman and colleagues (2013) constructed a three-part need-supportive workshop that was viewed by the 35 in-service secondary PE teachers who took part as being quite successful. Their workshop began with a theoretical overview of SDT, continued with instruction of the various strategies characteristic of need-supportive teachers, and concluded with a practical microteaching session in which opportunities to practice the various strategies were offered. Based on data obtained from objective coders, Tessier and colleagues (2010) were able to document an appreciable increase in three novice PE teachers' provision of need-supportive instruction from pre- to post-intervention. Their workshop closely resembled that of Aelterman and colleagues' (2013), with the addition of allotted time for planning more need-supportive post-intervention lessons. In their successful attempt at increasing the level of autonomy-support provided by 42 in-service PE teachers over the course of a 17-week semester, Reeve and Cheon (2016) concluded that, in order for teachers to modify their motivational style, they must first perceive that it is "easy to do" (p. 178). Specifically, these authors' three-part autonomy-supportive intervention program (ASIP) began with a PowerPoint presentation on the nature of student motivation, an introduction to the autonomy-supportive motivational style, and the impact it has on student motivation. In part two, teachers were introduced to the specific autonomy-supportive behaviors, were given opportunities to see them enacted on film and practice them with peers, and discussed how and when to enact such behaviors in practice. The final portion of the ASIP consisted of peer-to-peer discussions in

which the teachers shared their experiences with autonomy-supportive teaching to date in the semester, resulting in tips, suggestions, and clarifications for all. Ultimately, modifications in the teachers' beliefs about autonomy support and increases in their provision of such were attributed to intervention-induced changes in beliefs about the simplicity of becoming more autonomy-supportive.

Need-Support in Models-Based Instruction

In addition to empirically-based interventions, the pedagogical model being implemented may impact need-support in PE (Ennis et al., 1999). Though not directly measuring student motivational responses, Ennis and colleagues demonstrated how the structures of the Sport for Peace model contributed to a sense of family (akin to the need for relatedness) among urban students taught by teachers usually using a traditional teaching approach. Now a well-established pedagogical model in PE, SE has shown the potential to facilitate teachers' provision of NSI (Perlman, 2012) and nurture students' intrinsic motivational capacities (Perlman, 2011; Perlman & Goc Karp, 2010; Sinelnikov et al., 2007). Congruent with the tenets of SDT, SE appears to promote a variety of positive student outcomes, including enjoyment (MacPhail, Gorely, Kirk, & Kinchin, 2008), engagement (Hastie & Sinelnikov, 2006) and, perhaps most importantly, learning (Hastie, Calderón, Rolim, & Guarino, 2013; Hastie & Trost, 2002; Pereira et al., 2015). This potential appears to be attributable to the model's goals and structure (Hastie, Sinelnikov, & Guarino, 2009).

In pursuit of developing *competent* (skillful and strategic), *literate* (informed of and values good sporting practice), and *enthusiastic* (honorable) sportspersons, SE gradually shifts the decision-making process from teacher to student, allowing students to take ownership of their learning (Sinelnikov et al., 2007). Structurally, SE is intended to closely resemble the

progression of an authentic sport season and includes six distinguishable features: (a) a season format; (b) team affiliation for the season's duration; (c) formal competition; (d) public record keeping; (e) a culminating event; and (f) festivity throughout (Siedentop et al., 2011).

Notwithstanding its mandated features, SE still affords the teacher a level of space for variation (Kirk, 2013). From a motivational perspective, this means that the teacher can still manipulate the class climate within SE's need-supportive structure (Sinelnikov & Hastie, 2010). Drawing on previous work (Ko, Wallhead, & Ward, 2006; Sinelnikov, 2009), examples of specific need-supportive and need-thwarting pedagogical behaviors within each feature of SE are listed in Table 5.

To this point, findings suggesting the benefits of NSI, the malleability of PE teachers' motivational styles, and the need-supportive potential of the SE model have been presented. Taken together, these propositions raise two pertinent questions: (1) Can teachers be trained to be even more need-supportive within an already need-supportive instructional model?; and if so, (2) What effect does this change in NSI have on the student learning? To date, only one study in PE has sought to answer these questions. Following Aelterman et al.'s (2013) guidelines, (Perlman, 2015) compared the autonomy-supportive practices of preservice teachers (PTs) having completed an online autonomy-supportive workshop to those in a control group using the hybrid SE-Tactical Games model (Pritchard & Mc-Collum, 2009). Results obtained from objective coders observing all PTs' instruction revealed a significant increase in the treatment group's post-intervention provision of autonomy-support. Moreover, the students of the PTs in the treatment group detected an increase in autonomy-support as well.

Rationale and Purpose

The optimistic findings of Perlman's (2015) initial work warrants additional inquiry into the efficacy of workshops seeking to enhance PE teachers' provision of NSI (i.e. autonomy-support, structure, and interpersonal involvement). Furthermore, the effects of possible change in teachers' NSI on learning need to be investigated. Therefore, the purpose of this study was to (1) determine the efficacy of a NSI intervention in changing one PE student teacher's provision of NSI in SE, and (2) examine the impact of that change on student learning in SE. Specifically, we hypothesized: (H1) there to be an increase in the provision of NSI instruction following the intervention; (H2) greater student learning in the cognitive domain to occur as a result of increased need-support; and (H3) greater student learning in the psychomotor domain to occur as a result of increased need-support.

Methods

The University Institutional Review Board approved the study protocols and school district, school, and participants provided appropriate consent and assent.

Participants and Setting

The participants for this study included one male PT, Jason, and the students in his intact fifth grade PE class ($N = 58$). Jason is Caucasian and was 22 years old during data collection. He was purposefully recruited for participation for two reasons. First, with the exception of his student teaching, he had successfully completed what Curtner-Smith, Hastie, and Kinchin (2008) referred to as "high-quality" SE physical education teacher education program (SE-PETE), during which he received "plenty of exposure to and supervised practice of the model during [early field experiences] and teaching practices" (p. 111). In particular, Jason has used SE in his teaching, having previously taught four complete SE seasons (two of soccer, one of ultimate, and

one of volleyball). Second, in light of Stran and Curtner-Smith's (2009) finding that teaching-oriented PTs were most influenced to teach the full version of the model learned through high-quality SE-PETE, a teaching-oriented PT was desired for this study to maximize the potential for SE to be delivered in its full version (Curtner-Smith et al. 2008). As a proxy for determining Jason's professional orientation, he was administered the General Causality Orientations Scale (GCOS; Deci and Ryan 1985). The GCOS quantifies autonomous, controlling, and impersonal orientations at the personality or global (Vallerand, 2001) level. Autonomy-oriented individuals, not unlike teaching-oriented individuals, tend to act out of interest and the desire to master challenges (e.g., enrolling in a PETE program out interest in developing skills as an educator). Control-oriented individuals, similar to those with coaching orientations, tend to thrive in controlling situations in which their behavior is externally regulated (e.g., enrolling in a PETE program because teaching provides a career with significant structure). Lastly, impersonally-oriented people tend to perceive the outcome of their behavior as being beyond their control and tend to believe they are incompetent. The scale assumes that individuals harbor each orientation to varying degrees. Respondents are presented with 12 vignettes. Following each vignette is an autonomous, controlling, and impersonal way of reacting. Using a seven-point Likert-type scale (1 = very unlikely, 7 = very likely), respondents indicate how likely each reaction reflects their feelings. The 12 responses for each orientation are separately summed, generating a numerical value reflecting the magnitude of that particular orientation within the respondent. Jason scored highest on the autonomy subscale (74), followed by the control subscale (51), and lowest on the impersonal subscale (41). His possession of an autonomy-orientation further suggested his intent to both deliver the full version of SE and his receptivity to the messages espoused in the workshop (Su & Reeve, 2011).

Data collection took place at a public elementary school located in the southeastern United States serving students in grades one through five selected from other schools in the district for their academic achievement. Thirty-nine percent of the school's students are eligible for the free or reduced lunch program. The student population is 50% African American, 42% White, 5% Asian, 2% Hispanic, and 2% of other ethnicities. Physical education facilities include a large gymnasium with a stage, a large field surrounded by a walking/running track, and a concrete basketball court. It is crucial to note that SE was the primary pedagogical model in place in the school's PE program. Students participate in five SE seasons during each of their fourth, fifth, and sixth grade PE courses. As such, students in this study had experienced a minimum of seven and a maximum of fifteen seasons of SE prior to data collection. This familiarity with the model likely attenuated one of the contextual barriers to successful professional development identified by Ko et al. (2006).

Research Design

This study followed a quasi-experimental design. Initially, Jason taught one 15-lesson SE season of floor hockey. Two digital video cameras were used to record all lessons, which were later coded, for both SE seasons. Lessons were 50 minutes in length and occurred three times per week (Monday, Wednesday, and Friday). To assess gains in learning, all students were administered a floor hockey-focused cognitive exam, a battery of decontextualized skill tests, and a contextualized skills assessment at the beginning and end of the season. Additionally, per the recommendations of Mesquita, Farias, and Hastie (2012), a third iteration of the cognitive exam was administered to the students approximately one month after the conclusion of the floor hockey season to investigate retention over time. Following the season, Jason participated in a SDT-based workshop designed to increase his provision of NSI. Subsequent to the workshop,

Table 5

Examples of need-supportive and -thwarting pedagogical behaviors according to the features of SE.

Model Feature	Psychological Need	NSI Category	Need-Supportive	Need-Thwarting
Season	Competence	Structure	The teacher clearly outlines the season format for the students	The teacher dictates tasks as they are encountered “now we will do this...”
Team Affiliation	Autonomy	Autonomy-Support	The teacher helps the students select their own teams in a fairly	The teacher selects teams
Formal Competition	Autonomy	Autonomy-Support	The teacher informs the students of various formats, allowing for a class vote	Teacher-dictated competition format
Public Record keeping	Competence	Structure	The teacher often references public records, briefing the class on the season status	The teacher often neglects public records
Culminating Event	Relatedness	Interpersonal Involvement	The teacher displays enthusiasm, valuing the culminating event and promoting student investment	The teacher sets the guidelines for the culminating event and remains distant from the students
Festivity	Competence	Structure	The teacher regularly recognizes individual and team accomplishments publicly	The teacher neglects to acknowledge student successes

Adapted from Sinelnikov, O. A. (2009). Sport education for teachers: Professional development when introducing a novel curriculum model. *European Physical Education Review*, 15(1), 91-114.

Jason then taught a 15-lesson SE season of pickleball to the same class. Again, all of Jason's lessons were either coded live or from video recording. To assess learning gains, all students were pre- and post-tested using pickleball-focused cognitive, decontextualized, and contextualized skills assessments. A third iteration of the cognitive exam was administered approximately one month after the conclusion of the pickleball season.

Model Fidelity

Considering this study's focus (i.e., increasing NSI in SE) and the possible misalignment between teachers' planning and implementation in SE and other models (Kloepfel, Kulinna, Stylianou, & Van der Mars, 2013; Ko et al., 2006), it was crucial to ensure that Jason was, in fact, implementing SE as it was intended to be implemented. Commensurate with expectations previously set forth for reporting studies using models-based practice (Hastie & Casey, 2014), we provide (a) a description of curricular elements of the unit, (b) detailed validation of model implementation, and (c) description of the program context. Jason's and his students' prior experiences with SE have been described previously. Table 6 displays the content as well as Jason's and his students' roles throughout the duration of both SE seasons (Hastie, 2012). To ensure implementation validation, Jason's instruction was routinely compared to the checklist of Sport Education Specific Pedagogical Behaviors (Ko et al., 2006; Sinelnikov, 2009). Two researchers who are experts in model-based instruction completed validation of both SE seasons. Of the 23 behaviors comprising the SE model, Jason demonstrated 20 (87%) during the floor hockey season and 21 (91%) during the pickleball season, indicating high fidelity to the model. Specifically, during the floor hockey season Jason failed to (1) establish a level of accountability for student performance in nonplaying roles; (2) provide the team captains with task sheets during practices; and (3) promote clear team identification (while each team did have a name,

they were not easily recognizable as they did not wear common t-shirts or colors). During the pickleball season, he satisfied the same 20 criteria as he did in the floor hockey season and also

Table 6

Content and teacher and student roles for the floor hockey and pickleball seasons.

Floor Hockey Season			
<u>Lesson</u>	<u>Content</u>	<u>Teacher Role</u>	<u>Student Role</u>
1	Team selection/skills testing	✓	Skill development
2	Training camp/skills testing	✓	Skill development
3	Training camp/skills testing	✓	Skill development
4	Team practice/posters	Assisted coaches	Coach-led practice
5	Team practice/non-player roles	Non-player role instruction	Practice
6	Scrimmage	Assisted coaches	Playing & nonplaying
7	Regular season	Monitored/assisted duty teams	Playing & nonplaying
8	Regular season	Monitored/assisted duty teams	Playing & nonplaying
9	Regular season	Monitored/assisted duty teams	Playing & nonplaying
10	Playoffs	Announced teams/assisted duty teams	Playing & nonplaying
11	Playoffs	Announced teams/assisted duty teams	Playing & nonplaying
12	Playoffs	(Jason absent)	Playing & nonplaying
13	Championship/awards/post testing	(Jason absent)	Playing & nonplaying
14	Post-testing	✓	Performer
15	Post-testing	✓	Performer
Pickleball Season			
1	Team selection/skills testing	✓	Skill development
2	Training camp/skills testing	✓	Skill development
3	Team practice/posters	Assisted coaches	Coach-led practice
4	Team practice/role instruction	Non-player role instruction	Coach-led practice
5	Scrimmage	Monitored/assisted duty teams	Playing & nonplaying
6	Regular season	Monitored/assisted duty teams	Playing & nonplaying
7	Regular season	Monitored/assisted duty teams	Playing & nonplaying
8	Regular Season	(Jason absent)	Playing & nonplaying
9	Regular Season	Announced teams/assisted duty teams	Playing & nonplaying
10	Post Season	Monitored/assisted duty teams	Playing & nonplaying
11	Post Season	Monitored/assisted duty teams	Playing & nonplaying
12	Playoffs	Monitored/assisted duty teams	Playing & nonplaying
13	Playoffs/championship/awards	Monitored/assisted duty teams	Playing & nonplaying
14	Post-testing	✓	Performer
15	Post-testing	✓	Performer

Note. Adapted from Hastie, P. (1996). Student role involvement during a unit of Sport Education. *Journal of Teaching in Physical Education*, 16(1), 88-103.

provided team captains with task sheets. Lastly, Jason's and his students' prior exposure to and experience working with the SE model further facilitated its authentic implementation.

The Workshop

The workshop followed Su and Reeve's (2011) recommendations and was structured according to Sinelnikov, Kim, Ward, Curtner-Smith, & Li's (2016) design of effective workshops. Specifically, the three-phase workshop, led by an expert on SDT and NSI, served as an intervention after the conclusion of the first and prior to beginning of the second SE seasons. In the first phase, Jason received an overview of the workshop, including its objectives (examples of which are provided in Table 7). Next, the expert delivered to Jason a PowerPoint lecture on the basic tenets of SDT, the various types of student motivation, need-supportive and -thwarting teaching styles, and specific behaviors he can exhibit that have been empirically shown to nurture students' motivational capacities. During the second phase, Jason watched video of his own teaching from the first SE season (floor hockey), identifying and engaging in discussion about specific situations in which he demonstrated both need-supportive and need-thwarting behaviors. After observing the video, Jason and the expert engaged in role play, giving him the opportunity to practice implementing various need-supportive behaviors in common scenarios (e.g., responding to a students' demonstration of negative affect, incorporating the student perspective into the lesson). Upon completion of the role play, Jason answered a set of questions designed to assess his level of comprehension with respect to NSI. When Jason scored at or above 95% on the assessment, the workshop was complete (Sinelnikov et al., 2016). Finally, to maximize the workshop's possible effectiveness, the first author provided Jason with sustained, immediate, and situated support throughout the post-intervention SE season (pickleball) in the form of observations and briefing and debriefing sessions (Sinelnikov, 2012).

Data Collection

Need-supportive instruction. The first author quantified Jason's need-supportive teaching behaviors exhibited in every lesson using the Need-Supportive Teaching Behaviors in PE observation instrument (NSTB-PE; Haerens et al., 2013). Specifically, the instrument identifies 21 need-supportive behaviors reflecting the three need-supportive dimensions (autonomy-support, structure, and interpersonal involvement). The researcher observed the frequency of each of these behaviors exhibited by Jason during a five-minute interval. At the end of the interval, the researcher assessed the frequency of that behavior during that interval using a 4-point scale, ranging from 0 (never observed) to 3 (observed all the time). Interval scores were then summed for each behavior to create a behavioral sum score for the entire lesson. Behavioral sum scores for all behaviors within each dimension of need-support were summed to create an overall score for each need-supportive dimension (i.e., autonomy support, structure, and relatedness support) each lesson. Prior to analysis, an external coder randomly selected and individually coded one-third of Jason's lessons from video recording. Also, the lead researcher recoded an additional randomly selected third of Jason's lessons. Consequently, inter- and intra-rater reliability percentages reached 94 and 97 percent, respectively, exceeding the recommended 80% threshold for behavioral sciences (van der Mars, 1989).

Student learning. Student learning was measured cognitively through pencil-and-paper exams, and in the psychomotor domain through decontextualized and contextualized skill assessments.

Cognitive assessments. Due to the inability to locate validated cognitive exams for 5th grade students in both content areas, Jason created two 12-question multiple-choice exams comprised of components of common content knowledge, namely rules, etiquette, techniques and tactics

Table 7

Sample objectives, processes, and evaluations of the needs-supportive workshop.

Objective	Process	Evaluation
Autonomy Support		
The teacher will be able to identify situations in class when it is possible to offer choice to students	When viewing the video and engaging in discussion, situations when choice can be offered to students will be reviewed (e.g., order of exercises, grouping students)	At the end of the workshop, Jason will be expected to answer questions specific to this objective with 95% criterion
The teacher will recognize opportunities to refrain from intervening, allowing students to experiment first	Various situations in which the students can work through problems without initial instruction from the teacher will be examined (e.g., experimenting with the most effective body position for a forehand shot in pickleball)	At the end of the workshop, Jason will be expected to answer questions specific to this objective with 95% criterion
Structure		
The teacher will understand the concept of asking more questions as opposed to giving more directives	Throughout the workshop, Jason will be informed of times during class when questioning can support students need for competence (e.g., checking for understanding, inquiring about the level of difficulty)	At the end of the workshop, Jason will be expected to answer questions specific to this objective with 95% criterion
The teacher will recognize different ways in which he can provide students with an overview and flow of the lesson	An emphasis will be placed on explaining the objectives of the lesson at the start of class and clearly communicating the status of the lesson to the students (e.g., the objective for today's lesson is..., we are almost ready to...")	At the end of the workshop, Jason will be expected to answer questions specific to this objective with 95% criterion
Interpersonal Involvement		
The teacher will develop strategies for responding empathetically to students' perspectives	When viewing the video of his own teaching and during role play, situations in which student problems arise and possible empathetic responses will be addressed (acknowledging negative affect, assuming students' perspective)	At the end of the workshop, Jason will be expected to answer questions specific to this objective with 95% criterion
The teacher will identify ways in which he can develop a meaningful connection with students	During the workshop, Jason will be informed of strategies he can use to connect with students, such as asking individual students questions not directly related to PE or encouraging persistence	At the end of the workshop, Jason will be expected to answer questions specific to this objective with 95% criterion

(Ward, 2009). Face and content validity of each exam was verified by experts in PE, resulting in minor modifications before administration.

Decontextualized skills assessment. Based on the work of Hastie and Trost (2002), six isolated tests were used to assess decontextualized hockey skills: (1) dribble and shoot, (2) speed dribble, (3) agility dribble, (4) shot accuracy, (5) rapid fire, and (6) flicking the ball. A seventh test, assessing slap shot speed using a radar gun was used since puck velocity is influenced by skill level (Wu et al., 2003). Wasem's (1994) service, forehand, and backhand tests were used to assess decontextualized skills in pickleball.

Contextualized skills assessments. The previously validated floor hockey and pickleball assessments from the South Carolina Physical Education Assessment Program (2010) were used to document student gains in a more authentic environment. The floor hockey assessment was carried out for a 2v1 (offense-to-defense) game played on a 24'x24' playing area. Trained observers coded one member on offense for 60-seconds and assigned the student a score of 0-4 for three offensive components, namely (1) movement without the ball (i.e., support), (2) passing, and (3) receiving. The aggregate of these three scores was used to quantify contextualized skill performance. The pickleball assessment included two students playing a 3-minute cooperative game of pickleball, switching sides half way through. Using the same scoring scale as with the floor hockey assessment, the observers evaluated performances based on ability to (1) execute forehand and backhand shots, (2) return to the center of the court during a rally (i.e., positioning), and (3) maintain a rally. Inter-rater reliability for floor hockey and pickleball was 94% and 93%, respectively (van der Mars, 1989).

Data Analysis

Data analysis began with standard screening and cleaning procedures (Tabachnick & Fidell, 2013). Paired samples *t*-tests were used to detect changes in Jason's provision of each

need-supportive dimension between corresponding lessons pre- to post-intervention. A 3x2 (Time x Sport) factorial ANOVA with Bonferroni post-hoc analysis was run to compare changes in cognitive performance from the beginning of each season through approximately one month after each season's conclusion. A 2x2 (Time x Sport) factorial ANOVA was run to examine changes in contextualized skill performance between pre- and post-tests in both seasons. An independent samples t-test was used to detect significance in the magnitude of learning growth between floor hockey and pickleball. Given that the decontextualized skills assessments administered during floor hockey and pickleball differed in number and unit of measurement, the ability to compare decontextualized skill performance across seasons was not appropriate. Changes in performance on each decontextualized skill test were, however, assessed within each season using paired samples *t*-tests. Partial- η^2 was used as a measure of effect size in the factorial ANOVA models (Warner, 2012), and Cohen's *d* was used to estimate effect size for *t*-tests (Cohen, 1992).

Results and Discussion

Effectiveness of the Workshop

To test the hypothesis that the workshop would have an impact on Jason's provision of NSI, three paired samples *t*-tests were performed for autonomy support, structure, and relatedness support, respectively. Table 8 displays the results of these tests. Within the structure of SE,

NSI Category	Sport		<i>t</i> -test Statistics		
	FH <i>M(SD)</i>	PB <i>M(SD)</i>	<i>t</i>	<i>P</i>	<i>d</i>
AS	21.44(9.77)	38.78(11.29)	3.74	.006*	1.64
Structure	48.67(9.91)	95.11(25.84)	5.89	<.001**	2.37
RS	67.00(12.35)	87.89(9.96)	3.98	.004*	1.86

Note. FH = Floor Hockey, PB = Pickleball, AS = Autonomy Support, RS = Relatedness Support, **p*<.05, ***p*<.001

Jason increased his provision of all three dimensions of need-support from pre- to post-workshop. His average provision of need-support, by dimension, is graphically compared across seasons in Figure 3. These results support the hypothesis that there would be a significant increase in Jason’s provision of NSI during the pickleball season (post-workshop) relative to the floor hockey season (pre-workshop), indicating the efficacy of the workshop.

Differences in Student Learning

Given the workshop’s effectiveness in increasing Jason’s provision of NSI, it was ANOVA results examining differences in cognitive and contextualized skill learning pre- and post-workshop. Results of the cognitive and contextualized assessments will be presented first, followed by those for the decontextualized assessments.

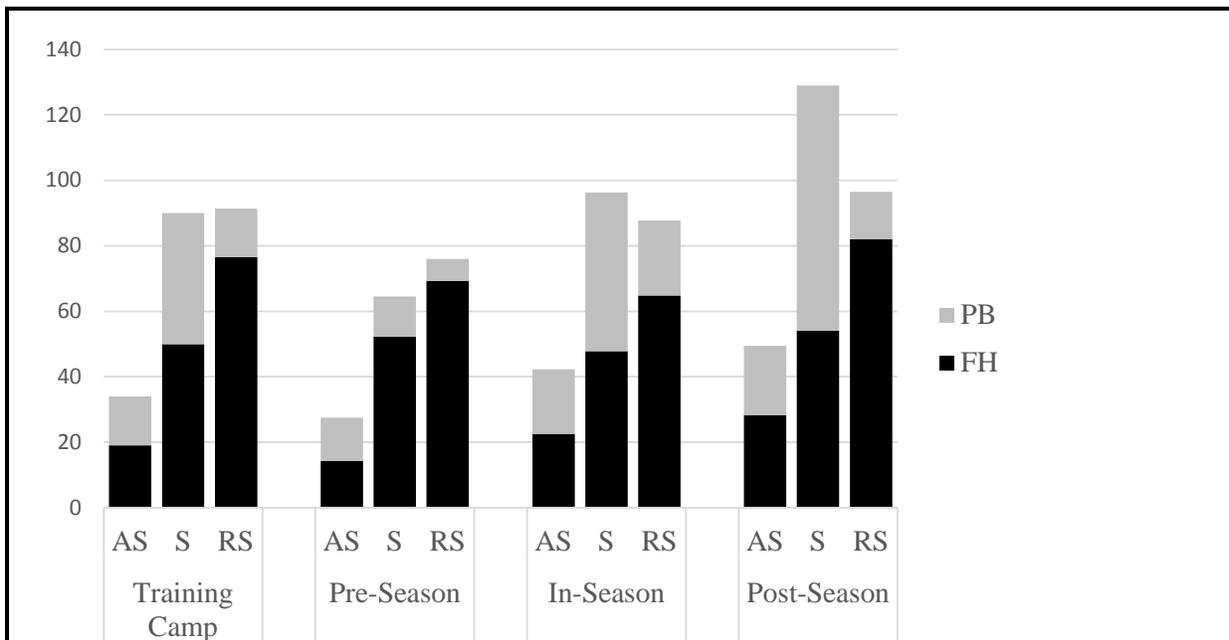


Figure 3. Average frequencies of Jason’s autonomy-supportive (AS), structure (S) and relatedness-supportive (RS) instructional behaviors by season phase from pre- to post-workshop.

Note. PB values are in addition to FH values.

Differences in Student Learning

Given the workshop's effectiveness in increasing Jason's provision of NSI, it was ANOVA results examining differences in cognitive and contextualized skill learning pre- and post-workshop. Results of the cognitive and contextualized assessments will be presented first, followed by those for the decontextualized assessments.

Cognitive and contextualized skill learning. Table 9 contains descriptive and ANOVA results for the cognitive and contextualized skill assessments. Additionally, means plots for cognitive and contextualized data is provided in Figure 4. With regard to cognitive performance, significant main effects were observed for Sport, $F(1,53) = 61.14, p < .001, \text{partial-}\eta^2 = .536$ and Time, $F(2,106) = 109.94, p < .001, \text{partial-}\eta^2 = .675$. Scores for floor hockey were generally higher than those for pickleball, and significant growth from pre- to retention test was observed in both seasons. While students' cognitive scores significantly increased from pre- to posttest in

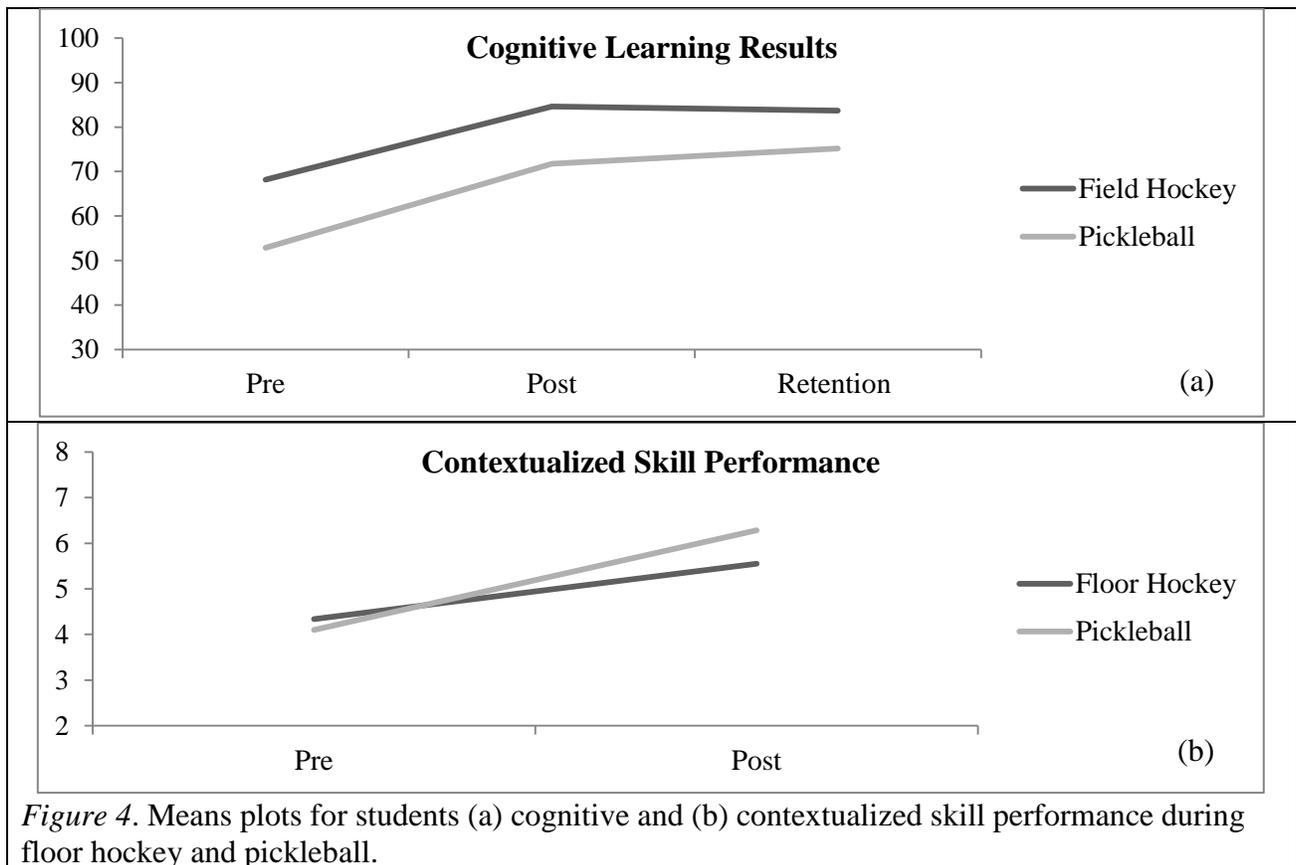
Variable Iteration	Sport		Factor	ANOVA Statistics		
	FH <i>M(SD)</i>	PB <i>M(SD)</i>		<i>F</i>	<i>P</i>	Partial- η^2
Contextualized			Time**	113.15	<.001	.665
Pre	4.34(1.98)	4.10(1.36)	Sport	1.66	.202	.028
Post	5.55(1.73)	6.28(1.99)	Interaction**	11.25	.001	.165
Cognitive			Time**	109.94	<.001	.675
Pre	68.15(12.19)	52.87(13.14)	Sport**	61.135	<.001	.536
Post	84.59(10.71)	71.74(14.53)	Interaction*	3.29	.047	.058
Retention	83.69(11.99)	75.17(15.42)				

Note: SP = Skill Performance, Cog Score = Cognitive Score, * $p < .05$, ** $p < .001$

both seasons, post hoc analysis revealed differences across seasons from posttest to retention test. Only during pickleball did students' scores increase significantly from post to retention tests $t(53) = 2.20, p = .033, d = .22$. Contextualized skill data revealed a significant main effect for

Time $F(1,57) = 113.15, p < .001$, $\text{partial-}\eta^2 = .665$, and a significant Time x Sport interaction effect $F(1,57) = 11.25, p = .001$, $\text{partial-}\eta^2 = .165$. Students contextualized skill performance increased significantly during floor hockey and pickleball. Independent samples t -test results between floor hockey and pickleball change scores indicated significantly more improvement during the pickleball season than the floor hockey season $t(114) = 3.19, p = .002, d = .59$.

Decontextualized skill learning. Paired samples t -test results comparing students' scores on the individual components of the contextualized skill assessment and decontextualized skill assessments from beginning to end in each season are displayed in Table 10. While students' overall scores for the contextualized skills assessment significantly improved during both



seasons, when examining the individual components of the assessment, results suggest that students experienced more holistic improvement during pickleball than during floor hockey.

Students' scores improved significantly from pre- to post- test for all three components of the pickleball contextualized skills assessments (forehand/backhand use, positioning, and rally length), whereas significant improvements were discovered for one of the three components in the floor hockey contextualized skills assessment (support). With reference to the decontextualized skills assessments, scores significantly improved in five of seven floor hockey decontextualized skills, namely speed dribble, agility dribble, shot accuracy, shot speed, and rapid fire. Post-intervention, students significantly improved from pre- to post-test in serving and backhands.

Discussion

While interventions with a similar objective have proven successful internationally (Aelterman et al., 2013; Reeve & Cheon, 2016; Tessier et al., 2010), it seems inappropriate to generalize the applicability of findings from other countries as PE perspectives and practices may differ between cultures (Curtner-Smith et al., 2008). In the only study of this nature working with PTs Perlman (2015) reported the success of an online intervention in bringing about an increase in 31 preservice teachers' provision of autonomy-supportive instruction in the US. Nonetheless, in order for teachers to fully nurture their students' motivational capacities, their instructional styles should, theoretically, also nurture their students' needs for competence and relatedness through the provision of structure and relatedness support, respectively. In concert with previous findings (Ko et al., 2006; Sinelnikov et al., 2016) reporting on effective workshops within PE, the findings from this study provide empirical support for determining the efficacy of a NSI intervention in changing one PT's provision of autonomy support, structure, and relatedness support within the SE model. After the floor hockey season, instructional observation data indicated that Jason's instruction was already appreciably need-supportive. This was not

surprising in light of his familiarity with SE, a model that is inherently motivational for students (Perlman, 2012; Perlman & Goc Karp, 2010; Sinelnikov & Hastie, 2010), and his documented

Table 10

Descriptive Statistics and paired samples t-test results for contextualized and decontextualized skills assessments

Floor Hockey	<i>M</i>	(<i>SD</i>) Pre	<i>M</i>	(<i>SD</i>) Post	<i>t</i>	<i>df</i>	<i>p</i>	<i>d</i>
Decontextual Assessment								
Dribble and Shoot	3.88	(1.14)	4.18	(1.02)	1.61	56	.114	.28
Speed Dribble**	7.63	(1.72)	6.62	(1.62)	8.54	50	<.001	.60
Agility Dribble**	12.56	(3.24)	11.40	(2.43)	5.22	50	<.001	.41
Shot Accuracy**	7.07	(3.67)	9.23	(4.19)	3.63	55	.001	.55
Rapid Fire**	6.25	(2.45)	8.10	(2.28)	4.29	57	<.001	.54
Shot Speed**	31.23	(7.00)	40.26	(9.83)	7.45	57	<.001	1.06
Flicking	11.17	(6.13)	12.57	(4.26)	1.69	57	.096	.27
Contextual Assessment**								
Support*	1.74	(.67)	2.46	(.73)	7.24	56	.001	1.03
Passing	1.62	(.80)	1.80	(.68)	1.46	54	.090	.24
Receiving	1.47	(.77)	1.65	(.75)	1.40	54	.159	.24
Pickleball								
Decontextual Assessment								
Serve*	9.56	(6.57)	11.95	(6.96)	2.33	56	.024	.35
Forehand	5.91	(3.92)	7.04	(4.49)	.88	56	.381	.27
Backhand**	3.65	(3.00)	6.07	(4.34)	3.76	56	<.001	.65
Contextual Assessment**								
Forehand/Backhand**	1.33	(.57)	1.95	(.76)	8.49	57	<.001	.92
Positioning**	1.60	(.65)	2.41	(.80)	8.98	57	<.001	1.11
Rally Length**	1.17	(.38)	1.91	(.76)	8.19	57	.001	1.23

* $p < .05$, ** $p < .001$

autonomy orientation (Deci & Ryan, 1985). However, as a result of the workshop described in this study, Jason provided significantly more autonomy support, structure, and relatedness

support to his students in the pickleball season post-intervention than in the floor hockey season pre-intervention. Despite Pajares' (1992) contention that PTs' beliefs are relatively resistant to change, Jason's autonomy orientation appears to have facilitated his perception of the workshop's messages as being informational in nature (Deci & Ryan, 1985a). This is an important finding, especially considering the notion that preservice teachers tend to be more concerned with student control (Fuller & Brown, 1975). Having established the increase of teacher's NSI post-intervention, the second aim of this study was, then, to examine the impact of the increase in Jason's NSI on student learning in the subsequent SE season. As previously noted, student learning in this study was measured through paper and pencil exam score (pre, post, and retention) and contextual (game play) and decontextual skill performance (skill tests), both pre and post.

Cognitively, student performance increased significantly from pre- to post-iterations of the cognitive assessment. While cognitive scores on the floor hockey test decreased from the post- to the retention iteration, they increased significantly between the same two iterations following the pickleball season. This finding supports previous research (Mesquita et al., 2012) and suggests that instruction that is need-supportive fosters learning on a deeper level that is capable of attenuating a time effect. This significant finding is compounded by previous research demonstrating students' deeper understanding accrued in models-based practice lasting years beyond contact with SE (Sinelnikov & Hastie, 2010; Wahl-Alexander, Sinelnikov, & Curtner-Smith, 2017).

A large body of literature on student learning within SE approach confirms that students can achieve significant gains in learning (cognitive and psychomotor) by participating in quality SE seasons (Araújo, Mesquita, & Hastie, 2014; Hastie, de Ojeda, & Luquin, 2011). While our

study supports previous findings, this is the first study that empirically demonstrates important avenues by which teachers can have a greater impact on student learning within SE seasons. In other words, we knew that students learn over time with SE but our findings demonstrate that the learning can be greater if the teacher uses NSI within SE. This is a particularly significant finding, one that needs to be further examined, perhaps with other pedagogical models such as Teaching Games for Understanding (Oslin & Mitchell, 2006), Cooperative Learning (Casey & Dyson, 2012), Personal and Social Responsibility (Hellison, 2011) or others.

With respect to contextualized skill performance, significant improvements in both seasons were observed. This finding is congruent with a significant body of research on student learning in SE (Hastie et al., 2013; Hastie et al., 2009), demonstrating the ability of the model to foster learning. After the intervention workshop in this study, however, contextualized skill performance not only significantly improved as well, but *t*-test analysis indicated improvement to an even greater degree. We can partially attribute this finding to students' satisfaction of autonomy, competence, and relatedness by Jason providing more autonomy-support, structure, and interpersonal involvement.

Finally, decontextualized skill performance increased significantly in approximately the same percentage of assessments between both seasons. Students significantly improved in five of seven floor hockey decontextual assessments (71%) and in two of three pickleball assessments (66%). Though comparisons across the seasons were not possible given the incompatibility of the decontextualized assessments, these results indicate that a teacher can, essentially, do no harm to students' learning skills by being more need-supportive. Moreover, using the other two measures of learning as a frame of reference, student learning appears to occur more holistically and on a deeper level when the teacher provides more need-support in class.

Conclusion

One of the important findings of this study was that, while students experienced gains in both seasons, a greater increase was observed in the pickleball season (post-intervention). This suggests that, with respect to authentic performance in physically active settings, student learning may increase with the instructor's provision of NSI. The exact nature of this relationship, however, remains unclear and warrants additional investigation. Perhaps NSI aids student learning to a point, before its effects attenuate.

Worthy of mention are the limitations of this study. The inclusion of only one preservice teacher who taught at a middle school in which students were familiar with SE limits the generalizability of the findings. Future research is necessary to determine the impact of a similarly-designed workshop on the NSI of preservice teachers working at elementary and high school levels in schools more unfamiliar with the model for implementation. Also, the preservice teacher in this study possessed a teaching orientation. Added inquiry focused on determining the impact a similar intervention can have on the instruction of more coaching-oriented preservice teacher seems warranted. Finally, in support of previous recommendations (Perlman, 2015), future studies focusing on enhancing NSI in PE should strive to include a qualitative approach to gain a more thorough understanding of the preservice teachers' perceptions of the workshop, its impact on their teaching, and how this process can be improved.

The Society of Health and Physical Educators touts the profession of PE as being predicated on the notion that a physically active lifestyle is preferential to one characterized as being primarily sedentary (2014). Quite simply, the motivation to learn about and engage in physical activity of any kind precedes the volitional decision to engage in such. Physical education serves as a suitable context for fostering this motivation. Within this context, the

teacher is in a position to influence the extent to which this motivation is fostered (Taylor & Ntoumanis, 2007). This logic highlights the need for continued investigation into the most effective means of equipping PTs and teachers alike with the pedagogical strategies necessary for maximizing their students' motivational capacities. It is evident from this study that it is possible for teachers to increase their NSI during teaching using models-based approach and that students experience greater gains in learning when teachers use NSI within the SE pedagogical model.

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APPENDIX A

Office for Research
Institutional Review Board for the
Protection of Human Subjects

THE UNIVERSITY OF
ALABAMA
R E S E A R C H

September 9, 2015

Kevin Richards, Ph.D.
Dept of Kinesiology
College of Education
Box 870312

Re: IRB # 15-OR-270, "Studying Physical Education Teachers' Perceptions of their Supervisors"

Dear Dr. Richards:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. You have also been granted the requested waiver of written documentation of informed consent. Approval has been given under expedited review category 7 as outlined below:

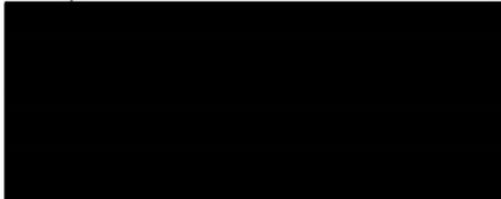
(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing survey, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your application will expire on September 8, 2016. If your research will continue beyond this date, please complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, please complete the Modification of an Approved Protocol form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, please complete the Request for Study Closure form.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,



358 Rose Administration Building
Box 870127
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TOLL FREE (877) 820-3066

APPENDIX B



Office of the Vice President for
Research & Economic Development
Institutional Review Board for the Protection of Human Subjects

April 4, 2016

Nicholas Washburn
Department of Kinesiology
College of Education
The University of Alabama
Box 870312

Re: IRB # 16-OR-032 (Revision) "Enhancing Need-Supportive Instruction in Sport Education: An Experimental Study"

Dear Mr. Washburn:

The University of Alabama Institutional Review Board has reviewed the revision to your previously approved expedited protocol. The board has approved the change in your protocol.

Please remember that your approval period expires one year from the date of your original approval, January 26, 2016, not the date of this revision approval.

Should you need to submit any further correspondence regarding this proposal, please include the assigned IRB application number. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants.

Good luck with your research.

Sincerely,

