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PEDAGOGY

A Content Analysis of Teacher Autonomy Support During a High School Volleyball Unit

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Abstract

Reviews of the literature have confirmed the influence of autonomy-supportive teaching on student self-determined motivation and enhancement of skill in various educational contexts influencing students to be more engaged in their learning in addition to having higher levels of perceived skill improvement. Unfortunately, not much of the literature directly examines the autonomy-supportive language that teachers naturally use in physical education. Therefore, this study determined how and when teachers use autonomy-supportive behaviors within the context of a regular physical education (PE) class. Four high school PE teachers (2 male, 2 female, all Caucasian, M_{age} = 41.25, SD = 11.84) and 140 high school students (M_{age} = 14.90, SD = 1.01) in compulsory co-educational classes participated in the study. Teachers' verbal behaviors were audio recorded during four 90-min classes for three of the teachers and eight 45-min classes for the remaining teacher. Audio data were transcribed verbatim. Class observations and field notes also contributed to the analysis and helped the researchers to contextualize data collected via recordings. Findings indicate that teachers used a variety of autonomy-supportive behaviors, some more

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often than others. Some behaviors were underrepresented and, in some cases, were observed in an interconnected nature. The low use of some behaviors suggests room for improvement, with the benefits of such behaviors more directly influencing student motivation and enhancing skill learning.

Within physical education (PE), there has been considerable focus on how teachers communicate with students to influence motivation for physical activity. Martinek (1997) spoke of teachers who tend to address motivation by "drawing on conventional wisdom and using simplistic techniques" (p. 32). He argued that using oversimplified techniques such as high expectations for all and general praise does little to support student motivation. More recently, literature in PE has focused on more complex explanations of motivation from the perspective of self-determination theory (SDT), which posits that when students' basic psychological needs (autonomy, competence, and relatedness) are satisfied, motivation moves from a more controlled form to a more autonomous form (Deci & Ryan, 2000). In essence, the way that teachers communicate with students can influence students' perceptions of choice, ability level, and relationships with others, which in turn influences motivation. This communication style, autonomy support, is more specifically defined as a collection of "behaviors by a person in position of authority that show respect, allow freedom of expression and action, and encourage subordinates to attend to, accept, and value their inner states, preferences, and desires" (Tessier, Sarrazin, & Ntoumanis, 2010).

Reviews of the literature have confirmed the influence of autonomy-supportive teaching on student self-determined motivation and enhancement of skill in various educational contexts (Wang, Ng, Liu, & Ryan, 2016). Further, a well-established line of research has addressed the positive influence of autonomy-supportive teaching in motivating students to be more engaged in their learning, in addition to increasing students' perceptions of skill improvement (Cheon & Reeve, 2013, 2015). In addition, the use of rating scales in PE has led to the identification of autonomy-supportive teaching behaviors that have been shown to influence student motivational processes and consequences (Haerens et al., 2013; Tessier et al., 2010). While the use of rating scales and the systematic observation of autonomy support have yielded a wealth of knowledge, the list of

behaviors and characteristics of those behaviors in PE is underdeveloped, in the sense that no context has been provided with given examples. Through a more in-depth investigation of language used by teachers in this context, more concrete information could be given, thereby allowing teachers to rely less on conventional wisdom and underdeveloped techniques. This study aims to qualitatively examine autonomy-supportive communication patterns among high school PE teachers, to give a better sense of what teachers say and do to enhance student motivation.

Self-Determination Theory and Autonomy-Supportive Teaching

Within the SDT subtheory of basic psychological needs (Deci & Ryan, 2000), self-determined motivation is enhanced when individuals' basic needs for autonomy, competence, and relatedness are satisfied. Thus, in learning environments, the more control over learning a student perceives (autonomy), the more competent the student feels in performing skills (competence), and the more connected the student feels to others in the learning environment (relatedness), the more self-determined the student's motivation to act will be. Studies using the theory have observed a strong focus on teacher autonomy support over the last 15 years. Consistent with expected associations between key variables in SDT (Vallerand, 1997), models have shown causal links between students' perceptions of autonomy support, need satisfaction, motivation, and success in acquisition of movement skills, sport knowledge, and attitudes toward PE (Langdon, Webster, Hall, & Monsma, 2014; Ntoumanis, 2005; Vierling, Standage, & Treasure, 2007). Further, a series of intervention studies highlight that teachers can learn to be autonomy supportive and maintain such training for up to a year beyond (Reeve & Cheon, 2014).

Studies of autonomy support clearly outline the benefits students experience in PE. With this in mind, interest in defining the role of teachers in supporting autonomy, specifically with what teachers say that may contribute to student satisfaction, has been rising (Haerens et al., 2013; Tessier et al., 2010). Rating scales by Tessier et al. (2010) and Haerens et al. (2013) are based on the original work of Reeve and colleagues (Reeve, 2009; Reeve, Jang, Carrell, Jeon, & Barch, 2004).

Although the types of instruments for classifying autonomy support in PE have differences, collectively they represent a variety of behavior classes that can inform what teachers typically do to support students' basic needs. The first behavior Reeve et al. (2004) identify is nurturing students' internal sources of motivation, whereby teachers provide choices within a structured environment, encourage students to set and reach their own goals, and design tasks that align with students' interest or sense of personal challenge. Haerens et al. (2013) describe this behavior class as providing "variation between or within exercises," asking students "questions about their interests, problems, values, or wishes," in addition to providing differentiated instruction (p. 8). The second behavior, using noncontrolling and informational language, involves using positively or neutrally charged language specific to the learning task, suggesting rather than commanding, and responding positively to student-generated questions. From Haerens et al.'s (2013) behavior descriptions, PE teachers exemplify this behavior class by giving clear instructions. Tessier et al. (2010) also describe this behavior class as providing contingent feedback "in an informational way" (p. 246). The third behavior, providing explanatory rationales, involves explaining why class content (knowledge, skills, and strategy) is important for students to learn. According to some literature, this can include explaining rules and limitations for gameplay (Haerens et al., 2013; Tessier et al., 2010), in addition to connecting individual activities to future participation in exercise and physical activity (Chatzisarantis & Hagger, 2009; Edmunds, Ntoumanis, & Duda, 2007). Finally, the fourth behavior is acknowledging negative affect, which involves recognizing students' negative feelings toward particular tasks and allowing students to voice their opinions without passing judgment. Tessier et al. (2010) also refer to this behavior as showing warmth, sympathy, or humor. Haerens et al. (2013) refer to this behavior in descriptions of relatedness support, whereby teachers "[take] the perspective of the pupils into account" and "[pay] attention to what the pupils are saying" (p. 8).

While not part of the original behavior classes described by Reeve et al. (2004), patience has been regarded as an important component of autonomy-supportive teaching. As such, Reeve (2009) added patience as an autonomy-supportive behavior, describing it

as waiting for students to discover answers on their own, offering hints without disclosing answers, and using phrases such as "almost," "you're close," and "keep trying." Among the 21 behaviors identified by Haerens et al. (2013), patience in PE includes "offering help, new guidelines, tips and advice during exercises"; providing positive feedback; and "allowing students the opportunity to practice independently and solve problems without interference" (p. 8).

Overall, the literature base of SDT as applied to teaching in PE has addressed teacher antecedents for providing autonomy support (Taylor, Ntoumanis, & Standage, 2008), the influence of teacher perceptions of student motivation on teachers' ability to provide autonomy support (Taylor & Ntoumanis, 2007), students' perceptions of autonomy support (Hagger, Chatzisarantis, Barkoukis, Wang, & Baranowski, 2005), observer ratings of autonomy support in PE (Haerens et al., 2013), and the effects autonomy-supportive training programs for teachers to improve student motivation and need satisfaction (Langdon et al., 2014; Tessier et al., 2010). While this information is invaluable to the improved understanding of SDT and its effect on various outcomes in PE, such research could be enhanced by eliciting more descriptive examples of autonomy-supportive behaviors teachers use in a typical PE environment. A better understanding of what teachers say in context could better help teacher educators cultivate such behaviors in preservice teachers. Such a contextual analysis could also be helpful to teachers already in the field who are looking to improve student motivation and achievement. Therefore, this study used content analysis to determine how and when teachers use autonomy-supportive behaviors within the context of a regular PE class.

Method

Participants and Setting

Four high school PE teachers (2 male, 2 female, all Caucasian, M_{age} = 41.25, SD = 11.84) and 140 high school students (M_{age} = 14.90, SD = 1.01) in compulsory co-educational classes participated in the study. Teaching experience ranged from 4 to 30 years ($M_{experience}$ = 12.5, SD = 11.93). Teacher 1 (female) had 6 years of teaching experience and a national board certification. Teacher 2 (male) had 10 years of teaching experience and a national board certification. Teacher 3

(male) had 30 years of teaching experience. Teacher 4 (female) had 4 years of teaching experience. The students in the study included 66 males, 67 females, and 7 who did not indicate gender. Race/ethnicity included 54.8% Black, 18.7% Caucasian, 11.5% other, 3.2% Hispanic, and 0.6% Asian. The students demographics reflected that of the school, with the sample representing 9% of the schools' total population. Class sizes ranged from 37 to 42.

Volleyball, with imbedded fitness activities, was chosen as the principal activity for this study because all four teachers indicated that they felt comfortable teaching volleyball and were planning to teach it as part of the curriculum for the semester. The fitness component of the unit included daily active warm-ups (short runs around the gymnasium, static stretching, curl-ups, and push-ups) and a 1-mile run once a week. Teachers followed a standard delivery of instruction throughout the unit; individual skills were taught first, followed by tournament-style gameplay.

Procedures

Throughout the unit, teachers' verbal behaviors were audio recorded during four 90-min classes for three of the teachers and eight 45-min classes for the remaining teacher. Classes were randomly chosen throughout the unit for recording, with recordings occurring on nonconsecutive days. The number of classes represented 20% of the time spent within this unit of instruction. Audio was recorded during different phases of the unit including individual skill learning, simulated gameplay, and fitness-related activities. For the content analysis, the audio data were transcribed verbatim and class observations and field notes allowed for the data collected via recordings to be contextualized and triangulated.

Data Analysis

Transcribed data were analyzed via deductive content analysis. In preparing the data, the researchers continuously read through the transcripts to get a sense of what teachers said during instruction (Stemler, 2001). As coding continued, a multilevel categorization matrix was designed, which included dividing the transcripts into more meaningful sampling units. Using the notion of task systems (e.g., Rink, 1979; Jones, 1992), the researchers considered several characteristics of a typical PE lesson to define such units. Within task

statements, examples of autonomy-supportive statements were identified through the aforementioned conceptual framework (Reeve, 2009; Reeve et al., 2004): (1) nurturing students' inner motivational resources; (2) using noncontrolling, informational language; (3) providing explanatory rationales; (4) acceptance of expressions of negative affect; and (5) patience. To ensure credibility and trustworthiness of the coding procedures, four researchers conducted several rounds of review. They were familiar with the conceptual framework for autonomy-supportive teaching and provided face validity for sampling units and identification of autonomy-supportive behaviors. Interrater reliability of the coding procedure was tested via Pearson correlations, with agreement of .93 among the researchers for sampling units and .83 for autonomy support. Any disagreements were discussed and consensus reached.

After coding the statements for autonomy support, the primary researcher further identified them by autonomy-supportive behavior class, which was verified by another research team member who was not directly involved in the sampling unit identification process. In this way, all identified statements were classified into one of the five classes outlined by Reeve et al. (2004) and Reeve (2009). Via the content analysis procedures outlined by Stemler (2001), 1,008 sampling units were identified across all four teachers. Three hundred thirty-three (33%) of these statements were coded as autonomy supportive, with each statement represented in only one behavior class for clarity of interpretation. For instances when more than one behavior class was identified, the task statement was labeled with the most prevalent behavior class. In the final portion of the organization process, statements from each behavior class were further examined for how and when such behaviors were used in the PE context. In sum, four research team members analyzed the data across an extended time. Further, they took care to observe teachers in their normal teaching environment and made no effort to change or modify lesson content for the purposes of the study.

Results

As Table 1shows, each teacher exhibited some use of at least four out of the five behavior classes, including nurturing inner motivational resources, using noncontrolling and informational language, providing explanatory rationales, and demonstrating patience. One

of the four teachers minimally acknowledged students' negative affect (less than 1% of total autonomy-supportive statements). This section highlights examples of each behavior class.

Table 1
Percentage of Use of Autonomy-Supportive Behavior Classes Among Teachers

	Overall		Teacher							
			1		2		3		4	
Behavior class	*f*	%	*f*	%	*f*	%	*f*	%	*f*	%
Nurturing Inner Motivational Resources	39	12	14	24	2	2	20	15	3	13
Language	181	54	31	53	105	88	34	26	11	46
Rationales	40	12	2	3	4	3	31	24	3	13
Acceptance of Students' Negative Affect	2	1	1	2	0	0	1	1	0	0
Patience	71	21	11	19	9	8	44	34	7	29
Total	**333**	**100**	**59**	**100**	**120**	**100**	**130**	**100**	**24**	**100**

Nurturing Inner Motivational Resources

Within this behavior class, teachers demonstrated verbal behaviors that relate to students' choice, internal interests, simplistic goal setting, sense of challenge, and internal initiative. These represent a movement from simplistic to more complex application of the behavior.

Choice. Teachers generally provided students with choices in a structured environment, ranging from skills to practice to tournament format selection. During skill practice, Teacher 1 allowed for choice by having students decide which skill they would work on. Teacher 1 gave specific instructions to the students depending on what they chose:

> I want you to choose, those of you who want to work on spiking will stay on the end and practice that. The rest of your group that is not currently working on spiking will continue practicing bump and sets.

Teacher 3 best used choice when teaching serving to his students. Although this choice was confounded by ability level, he still considered motivation, allowing students to decide which serve they were more comfortable with:

> Which way would you like to serve? Overhand or underhand? And I said, because the bleachers are out, you are allowed to step in here, but all I wanted you to do, you normally have to serve from way back here. Anywhere back in here, wherever you are comfortable . . . So anyplace in here, you find where you're comfortable.

In this case, Teacher 3 allowed students to choose not only whether they wanted to use an underhand or overhand serve, but also from where on the court they would like to serve. Some of this was due to structures being in the way (bleachers set out for a pep rally), but in cases when these structures were not in the way, students could still choose to stand in a spot that would ensure a successful serve.

Teacher 2 offered choice by allowing students to decide how they would set up gameplay during one class. Teacher 2 gave this choice later in the unit, after the students had several skill-related lessons and modified gameplay:

> . . . I want to give you the chance to vote right now . . . If you would like to do single gender volleyball league, that would be females playing females and males playing males. Single gender, you get a chance to vote right now. Raise your right hand if that's what you prefer. Okay. Alright. So we got one vote. Now if you want co-ed, raise your right hand. Co-ed, that would mean 3 to 4 girls and 3 to 4 boys on each team.

Internal interests. Teachers supported internal interests of students in various ways, including recognizing students' positive comments toward the game. For example, when discussing student interest in the game, Teacher 2 said, "You're starting to like it, that's what I want to hear." Teacher 3 spent time informing students that they did not have to play at very high levels to be successful in volleyball:

> Like I said, if you don't have the ambitions of playing in the Olympics for volleyball, that's fine. I want you to enjoy the game. I want you to enjoy the camaraderie with your teammates. Enjoy helping each other out.

In another class period, Teacher 3 also discussed where students can engage in volleyball activities outside of school:

> We learned some skills, we can [use] the skills outside, take them home. I know if you remember from church you have church volleyball going on. Tuesday nights I'm over there playing racquetball at the rec center, there's usually two or three teams rotating around playing volleyball.

As Teacher 3 mentions being able to play in the Olympics and getting scholarships, it is clear that many of these students may not have those aspirations or opportunities. In this case, the teacher was describing all possibilities, although the main focus of the discussion was recreational play.

Goal setting. Teacher 2 spent a vast amount of teaching time instructing students how to analyze their peers' success in gameplay and determine why they might have been more successful. Through this process, students came up with their own team goals. Teacher 2 said,

> I want you today to figure out so you can tell me tomorrow why you think your team is not being successful . . . And if you're not playing in a game, what I need for you to do today is to watch how the other teams are playing. And if you can see they're being successful because they are scoring a lot of points, I'd like you to figure out what they are doing right, or correctly, that's allowing them to be so successful.

The formulation of team goals reflects a more complex application of the behavior by Teacher 2. Such an example shows the progression of how teachers can nurture inner motivational resources of students.

Individual sense of challenge. Students' sense of challenge was supported when they were allowed to experiment with different ways of serving the volleyball. Among the four teachers, Teacher 3 was the most expressive with this behavior. He stated, "Alright, which way do

you like to serve the best?"; "Which one do you think you'll be the best at?"; "Which one do you think is easiest?"; and "Try overhand and see what happens." As most of the unit time was spent in skill development, Teacher 3 focused mainly on allowing students to try underhand and overhand serves:

> What happened on your toss? . . . Which way did your body move to get to it? It kind of went backwards. So throw it out in front of you so you can get to it. Try it again . . . Now let's try the underhand serve to see if you can get the ball over with the underhand serve. Then you'll have two ways to choose when you get ready to play the game. Try that again, but this time was pretty good.

Further specific feedback was given to another group on the same day, showing the consistency that Teacher 3 provided a sense of challenge among all students:

> Look here, if I hold the ball over here and I'm going to hit it with this hand, I want this hand to go this way like a pendulum. Is this ball in the way? No, but if I move my hands over here, guess which way it's going to go? If I bring it too far this way, where do you think it would go? Now you gotta try and find a happy medium where you can find contact with the ball in between the two poles. Or in this case, in between the gray lines. See what happens. There you go, much better.

Internal initiative. Teachers supported internal initiative by giving the students the responsibility of analyzing their peers' skill development. During practice and gameplay, they asked students to provide constructive feedback to their teammates to increase success. Students who acted as team "coach" were also responsible for organizing team practices during tournament play and for designing the team lineup. During skill development, Teacher 2 instructed students to make sure they were providing teammates with good starting tosses to practice setting and providing helpful feedback: "Give them a good high toss so they can experience success. And you're able to help give them constructive criticism on what they are and aren't doing well." Teacher 3 also encouraged individual initiative to help others during skill development: "You can be helping

each other, if you see something with the overhand, you can figure out what he's doing and say, this is what you're not doing."

Using Noncontrolling and Informational Language

Using noncontrolling and informational language was the most prevalent use of autonomy support across all teachers. This behavior was exemplified through the use of encouraging language and positive or neutral feedback relevant to the task.

Use of encouraging language. Use of encouraging language was mostly limited to using the word *good* for describing serving skills, working together as a team, setting up a successful rally, and being complimentary to teammates/other students. Some examples of these statements include "A compliment, very good"; "Mike, see somebody could have played that, that was an awesome good job. I want to see that again"; "I like how you guys are working together, good job"; and "Those forearm passes are getting a lot better." Most of these statements were given by Teacher 2, although all four teachers seemed to use this strategy to some degree. In addition, many of these statements were given during gameplay.

Positive or neutral feedback relevant to the task. Teachers also used language that was positive or neutral and relevant to the task. This included complimenting students on the correct technique for individual skills. More specifically, Teacher 1 commented, "Very nice platform that time" and "Jerry you have very nice follow-through with your fingers." Teacher 3 also provided positive and relevant feedback on particular aspects of form during skill practice:

> So far we've got a good job of being on the balls of your feet, one group did a good job of that flat surface. The other group said they had a hard time of staying on the balls of their feet.

Teacher 1 also commented about decision making during gameplay: "I heard one team in particular utilizing calling the ball very nicely. That was the team over on this court." Teacher 3 followed a similar pattern, stating, "One team has very good communication, that is a very good strategy" and "Austin, I like how you started here and you realized it was high and you went here. Good job."

Statements in this behavior class were shorter and given with more frequency. For example, Teacher 1 made several direct comments about several aspects of acquiring the skill of setting:

> Nice flick. Very nice. I want to see those wings when you take off. See you snap it down. Nice jump. Use your wings. Let me see. Those are all the right steps. You got it. In time it will become very smooth . . . Good job. You didn't send it all crazy across the gym, okay.

Teacher 2 also gave such feedback to students while they practiced spiking: "There it is, one more. Is that three, Alissa? Just remember to swing that pendulum going back. A little bit more force behind the ball and you'll be fine. You got this right here. There you go, good." In the same way he initiated internal interest in students, Teacher 3 used several lines of questioning to provide positive feedback to students:

> Trey, instead of catching it, hit it back to us. Good job . . . See if you can get it up there, get underneath it, but good try. Oh my goodness, what do you think you need to do now? [pause for student response] . . . Hit it a little bit harder to get it off the front line and into the back line and into play. Okay, go ahead. Much better, much better, see.

Giving Explanatory Rationales

Only 12% of the autonomy-supportive statements were characteristic of giving explanatory rationales. Specific rationales given related to concepts of success, classroom management, personal relevance, reaching personal goals, skill/rule importance, and gameplay strategy.

Conceptions of success. Teachers collectively made statements or asked questions that focused students on what they felt their own success looked like. Teacher 3, when discussing serve technique with a student, said, "Was that a good serve or a bad serve? How would she do it to do it right? Okay, were you comfortable throwing it up there like that?" This behavior was highly exemplified by two of the four teachers and was discussed throughout individual lessons and during gameplay. To allow for different levels of success, teachers

could modify rules and explain rule changes in modified games. Teacher 3 commented about modifications to rules as students were learning: "It's okay if you hit it twice now. It's okay now because we're just practicing our skills." Similarly, he stated during another lesson about serving, "Move out as you get more comfortable" and "Think about where you need to be so you can cover your space" when discussing with students where to move on the court during gameplay. Teacher 2 also gave students a conception of success during gameplay, stating "It's not going to go over every single time. You work at it, you work at it." He also said, "For the most part, team rotation, it takes a little time to get that down and the rally scoring."

Classroom management. Relative to the other rationales given, those related to classroom management were few, with only five coded autonomy-supportive statements. These included explanations of why students should not talk while the teacher is talking (to hear instructions), proper protocol for returning a volleyball (under the net for safety reasons), watching a demonstration (so that students knew what to do), and why it is improper to cross the line under the net (for safety reasons).

Communicating personal relevance. Similar to classroom management, a small percentage of the rationales were coded as communicating personal relevance. This encompassed statements that keyed into why a student might want to focus on sportsmanship and skill development. Teacher 4 stated,

> We're going to have some playtime, but what I am trying to focus on today is sportsmanship. It's been one of the weakest things in this class. Because, remember, you are not graded on those points on that scoreboard, but you are graded on sportsmanship.

The teacher focused on making the sportsmanship idea relevant by explaining its importance to how students would be evaluated. Although the idea of grading is an extrinsic reward, the rationale provided taps into what the students found to be important.

Reaching personal goals. Rationales related to reaching personal goals accounted for a modest proportion of overall use of this

behavior. Most of these statements were related to explaining how students can communicate with each other for personal improvement, including Teacher 2, stating, "If you didn't hear Taylor, she said we need to do a better job of giving her a toss. Because right now, guys, we want all of you to experience success." Other explanations of why certain groups of individuals might be better skilled than others were given. This came up in a class with Teacher 3, after the students watched a "teachers vs. varsity volleyball players" game during a pep rally. Comparing the performance of students and faculty to varsity volleyball players, Teacher 3 said, "You have to remember something else . . . you guys don't get to practice in here for two hours every night either." Another said, "They [the varsity volleyball players] did a better job setting than we [teachers] did as the faculty because they do it [practice the game] every day."

Overall, these statements were used to explain why students should not perceive their skill level as low and encouraged them to understand that learning the game was a work in progress.

Skill/rule importance and gameplay strategy. Explanations of why skills or rules in gameplay were important represented a larger portion of the coded data than reaching personal goals and classroom management. Teachers explained how timing the proper spike would allow students to hit the ball over the net without touching the net, as would utilizing the ready position before making contact with the ball. Teacher 3 used this strategy to combine skills, by explaining why it is important to pass the ball with height: "That's why we're working on both the bump and the set at the same time. So you can be setting it. Your set may be too low to you, so then you can bump it back to her."

Along with providing rationales of skill/rule importance, teachers explained strategy in terms of what was needed for successful gameplay. Most of the rationales provided in this category included why it is important to maintain control of the ball, placing serves in proper areas of the court, and predicting where the opposing team will hit the ball. For example, Teacher 3 showed an example of space limitations as strategy use among three experienced volleyball players in his class:

> Alright, these three ladies right here kept their game pretty much contained in this area. Okay, so playing volleyball is not a game that the ball should be going wildly all over the gym floor . . . You're limited to your space. That's why you're practicing those skills, to know that your space is contained.

Teacher 3 also used rationales to explain why the serve is important in the game:

> In order to score a point in volleyball, the serve has to be in. And it means it has to be inside the gray lines on the other side of the net that you're standing on. So when you're practicing your serving, you're practicing keeping the ball inside the gray box. Because in order to have a good competitive game of volleyball, you have to be able to put all the skills together.

Acknowledgment and Acceptance of Negative Affect

The smallest representation of autonomy-supportive teaching came through acceptance of students' negative affect. In fact, only one statement supported this behavior class. Teacher 3 provided some support to a student who did not understand why, when executing a spike, the ball could not be thrown down. He responded, "I know, but that's just part of the game," which helped communicate to the student that the teacher had heard his complaint.

Patience

Behaviors displaying patience were the second highest coded autonomy-supportive behavior class. Specific behaviors included general encouragement and questioning. As expected, teachers used general encouragement throughout the unit. This included words such as "good job," "nice work," and "excellent job."

Along with general encouragement, teachers used questioning to reinforce concepts. These questions related to all aspects of skill execution and gameplay, including demonstrating good sportsmanship, deciding which skill execution was most favorable, and how to be successful as a team. The most important aspect of the questioning process was the teacher's ability to wait for student responses, as indicated by Teacher 1: "Well, for someone who is trying to show sportsmanship, what could you do if you had one net? . . . [waits for

student response] . . . You could share, very good." Teacher 3 also showed high levels of patience through questioning while teaching serving:

> Did you watch them do it? [waits for student response] . . . Okay, what did they do? Was it a good serve you think? [waits for student response] . . . Analyze him and see if you can figure out what he's doing. [waits for student response] . . . Right. Now, you do what he did.

Teacher 4 also exhibited this behavior while teaching gameplay strategy to students:

> Where do you think he's going to hit it again? [waits for student response] . . . Yeah, he's going to hit it right in here because he's found somebody that's afraid of the ball.

Teacher 3 exhibited another good example of patience while discussing chemistry of a team:

> What else is there for you to be successful and put six bodies together to make one team? [waits for student response] . . . Chemistry. Unselfishness. There's a good one right there. [waits for student response] . . . Knowing where your position is. So you have to work together, have chemistry, communication. Knowing where you are supposed to be on the floor. All those things work together to make it what? [waits for student response] . . . A team. So I suggest while you are watching these other teams play, you watch to see if there's chemistry. Communication, teamwork, knowing your positions. Seeing maybe that's why your team is not successful.

Discussion

This study used content analysis to determine how and when teachers use autonomy-supportive behaviors within the context of a regular PE class. Generally, the PE teachers in this sample used some of the behaviors more frequently than others. This was especially the case when they gave feedback using noncontrolling and informational language and using nurturing inner motivational resources.

The data suggest that teachers used some of the behaviors in more complex ways than other behaviors, specifically nurturing inner motivational resources and patience. Rationales were provided less frequently than other behaviors, but when used, represented explanations about classroom management and skill development. Few examples of accepting negative affect were observed in the data.

Autonomy Support: How and When

With regard to nurturing inner motivational resources, Sun and Chen (2010) suggest that finding places where choice can be implemented in a controlling environment may be difficult. However, more recent meta-analyses studying interventions indicate that providing autonomy support is possible within controlling environments (Van den Berghe, Vansteenkiste, Cardon, Kirk, & Haerens, 2012). Within the data analyzed for this study, the examples observed are characteristic of simplistic choices, such as what skill will be practiced or how teams will be distributed. The recent literature includes little to no information that suggests that this is an issue, with one study suggesting that autonomy can still be enhanced with these types of simplistic choices (How, Whipp, Dimmock, & Jackson, 2013). As the research into autonomy-supportive teaching advances, however, it would be interesting for researchers to discover if providing more meaningful choice to students can further enhance satisfaction of basic needs in a more profound way.

Internal interests, including relating content to students' interests, were also supported by the PE teachers in this study. It is important for teachers to consistently support students' interests, even when students may not be inherently motivated to complete the task. In this study, teacher were observed encouraging students to apply skills outside of PE and encouraging positive affect. More specifically, teachers encouraged their students by highlighting some of the positive aspects of playing the game, including fun, enjoyment, and camaraderie. Along with internal interests and choice, there was also a brief example of simplified goal setting, with one coach asking students to come back the next day and tell her how they might be more successful. The lack of further evidence and the simplicity with which the goal setting was applied suggest that teachers may not be aware of effective goal-setting practices. Although it is possible that the researchers did not observe this in the days chosen to record,

further investigation into goal-setting practices and their relationship to autonomy-supportive teaching is warranted.

An individual sense of challenge, which is said to nurture inner motivational resources, was also seen, although not by every PE teacher. Teacher 3, in particular, used several student-centered learning techniques to help students challenge themselves. One study conducted in a teacher education program supports this notion, showing that need support can be further enhanced through a gradually introduced student-centered approach (Baeten, Dochy, & Struyven, 2013). Essentially, PE teachers could begin with a more direct approach to teaching basic skills and then move to more student-centered techniques when introducing complex skills, strategy, and full gameplay. This could enhance an individual's sense of challenge and engage internal interests. Connected to this idea, internal initiative was also fostered by the teachers, but not to a great extent. When observed, these statements of internal initiative tended to be shorter than other explanations. The examples provided also hint to a greater sense of responsibility for students, because the teacher asks them to find internal motivation to help other students, which would most likely enhance the experience for all students.

Behaviors associated with using noncontrolling and informational language fell within two distinct categories: encouraging language and positive or neutral feedback related to the task. Within this behavior, many of the statements reflected what was learned in teacher education programs. Most of the encouraging language was used during gameplay and consisted of short, direct, and positively worded statements. For the researchers, this was an interesting finding because currently no literature discusses the provision of autonomy support during gameplay. It is possible that the shortness of the encouragement given is a product of the context, as students would not readily comprehend long-winded explanations while focused on playing the game. The positive or neutral feedback that was relative to the task is also characteristic of what is currently taught in teacher education programs. Three of the teachers had defined strategies for giving feedback that was positive and descriptive enough that students could use the information. This type of feedback also occurred during various times in the lessons, not just during skill acquisition or gameplay.

Low Representation of Specific Behaviors

Although the PE teachers gave many types of explanatory rationales, these represented a very small percentage of the total number of autonomy-supportive statements coded. This is not uncharacteristic of other related studies on autonomy-supportive teaching. Langdon, Schlote, Melton, and Tessier (2017) conducted an intervention with university physical activity instructors and found that the initial use of explanatory rationales was low. Within this behavior, rationales were sometimes for classroom management, which brings to the light the idea that autonomy support could be an effective way of managing students when the educator explains why order is needed in the classroom. In addition, teachers can use explanatory rationales to explain how a game is played so that students not only understand the rules, but also why the rules exist. Gameplay strategy is related to this in that it requires an understanding of cause and effect, where rationales play a large role in helping students understand the game.

An even smaller percentage of statements supported acknowledgment and acceptance of negative affect. With only one statement that supported this behavior, this suggests that it is either not easy for PE teachers to implement or not a focus of PE teachers. Indeed, researchers investigating the implementation of autonomy-supportive teaching suggest that adoption of such behaviors could be influenced by the teacher's conception of what is effective, by the ease of implementation, and by the normativeness of such behaviors in the school context (Reeve et al., 2013). From this perspective, the lack of acknowledgment and acceptance of negative affect could be explained by these reasons. Teachers at this school did not have previous experience in autonomy-supportive teaching, nor were they aware of the importance of accepting negative affect. From a behavior management standpoint, accepting negative affect is not normally recommended. Considering these explanations by Reeve et al. (2013), it may be important for researchers to highlight effectiveness, ease of implementation, and school norms for teachers to enhance their use of this behavior.

Interconnectedness of Behaviors

The results of this study show the existence of the interconnected nature of the autonomy-supportive behaviors. Although the coded

statements highlighted one behavior at a time, some evidence suggests that autonomy-supportive behaviors do not exist in a vacuum. In essence, teachers can use the behaviors simultaneously to provide support to students. For example, the teachers provided explanatory rationales to help students acquire volleyball skills. When connected to the internal interest and sense of challenge aspects of nurturing inner motivational resources, teachers could help students reach their goals, by explaining how communication and skill development lead to success. This was also seen when the teachers provided patience through questioning. Teacher 3 used questioning frequently to engage students in learning, but did so with a great deal of pause between asking the question and getting an answer. From the researchers' point of view, this teacher was more interested in the students' answers than using questioning in a superficial manner.

Limitations

Although the researchers paid careful attention to ensure validity and reliability of the study, generalizability to other teaching contexts is limited. This is mostly due to the low sample size. The results are specific to volleyball instruction in a high school setting and thus may not apply to applications of motivational behaviors in other settings. The data collected represent several time points in the unit of instruction, but more data could also have been helpful and ensured further consistency of the behaviors. Future work in this area should include more observations of teachers in a variety of movement forms and activities among different age groups.

Conclusions

Autonomy-supportive teaching behaviors allow teachers to move past what Martinek (1997) describes as "conventional wisdom and simplistic techniques" (p. 32). Based on evidence from this study, teachers in a high school environment tended to use some of these behaviors more often than others. The use of informational feedback and patience reinforce the idea of a connection between autonomy-supportive teaching and best practices. The lack of evidence of certain autonomy-supportive strategies used in the PE context implies room for improvement. Many of the benefits to students in this context cannot be fully realized unless a wider range of strategies are used. In addition, deeper levels of strategy use could

improve motivation among students. Future studies could address this by training teachers to use a more sophisticated method of goal setting, to better acknowledge negative affect, and to provide more detailed rationales. It would also be pertinent for research to determine the ways that choice enhances feelings of need satisfaction from a student perspective.

References

Baeten, M., Dochy, F., & Struyven, K. (2013). The effects of different learning environments on students' motivation for learning and their achievement. *British Journal of Educational Psychology*, *83*, 484–501. https://doi.org/10.1111/j.2044-8279.2012.02076.x

Chatzisarantis, N. L. D., & Hagger, M. S. (2009). Effects of an intervention based on self-determination theory on self-reported leisure-time physical activity participation. *Psychology & Health*, *24*(1), 29–48. https://doi.org/10.1080/08870440701809533

Cheon, S. H., & Reeve, J. (2013). Do the benefits from autonomy-supportive PE teacher training programs endure? A one-year follow-up investigation. *Psychology of Sport & Exercise*, *14*, 508–518. https://doi.org/10.1016/j.psychsport.2013.02.002

Cheon, S. H., & Reeve, J. (2015). A classroom-based intervention to help teachers decrease students' amotivation. *Contemporary Educational Psychology*, *40*, 99–111. https://doi.org/10.1016/j.cedpsych.2014.06.004

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*, 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Edmunds, J., Ntoumanis, N., & Duda, J. L. (2007). Adherence and well-being in overweight and obese patients referred to an exercise on prescription scheme: A self-determination theory perspective. *Psychology of Sport & Exercise*, *8*(5), 722–740. https://doi.org/10.1016/j.psychsport.2006.07.006

Haerens, L., Aelterman, N., Van den Berghe, L., De Meyer, J., Soenens, B., & Vansteenkiste, M. (2013). Observing physical education teachers' need-supportive interactions in classroom settings. *Journal of Sport and Exercise Psychology*, *35*(1), 3–17. https://doi.org/10.1123/jsep.35.1.3

Hagger, M. S., Chatzisarantis, N. L. D., Barkoukis, V., Wang, C. K. J., & Baranowski, J. (2005). Perceived autonomy support in physical education and leisure-time physical activity: A cross-cultural evaluation of the trans-contextual model. *Journal of Educational Psychology*, *97*, 376–390. http://doi.org/10.1037/0022-0663.97.3.376

How, Y. M., Whipp, P., Dimmock, J., & Jackson, B. (2013). The effects of choice on autonomous motivation, perceived autonomy support, and physical activity levels in high school physical education. *Journal of Teaching in Physical Education*, *32*, 131–148. https://doi.org/10.1123/jtpe.32.2.131

Jones, D. L. (1992). Analysis of task systems in elementary physical education classes. *Journal of Teaching in Physical Education, 11*, 411–425. https://doi.org/10.1123/jtpe.11.4.411

Langdon, J., Webster, C., Hall, T., & Monsma, E. (2014). A self-determination theory perspective of student performance at the end of a volleyball unit in compulsory high school physical education. *Sport Scientific and Practical Aspects, 11*(1), 5–16.

Langdon, J. L., Schlote, R., Melton, B., & Tessier, D. (2017). Effectiveness of a need supportive teaching training program on the developmental change process of graduate teaching assistants' created motivational climate. *Psychology of Sport and Exercise, 28,* 11–23.

Martinek, T. J. (1997). Myths and realities of motivating students. *Strategies, 10*(4), 32–35. https://doi.org/10.1080/08924562.1997.10591267

Ntoumanis, N. (2005). A prospective study of participation in optional school physical education using a self-determination theory framework. *Journal of Educational Psychology*, *97*, 444–453. https://doi.org/10.1037/0022-0663.97.3.444

Reeve, J. (2009). Why teachers adopt a controlling motivating style toward students and how they can become more autonomy supportive. *Educational Psychologist*, *44*(3), 159–175. https://doi.org/10.1080/00461520903028990

Reeve, J., & Cheon, S. H. (2014). An intervention-based program of research on teachers' motivating styles. In S. Karabenick & T. Urdan (Series Eds.), *Advances in Motivation and Achievement: Vol. 18. Motivational interventions* (pp. 293–339). Bingley, United Kingdom: Emerald Publishing.

Reeve, J., Jang, H., Carrell, D., Jeon, S., & Barch, J. (2004). Enhancing students' engagement by increasing teachers' autonomy support. *Motivation and Emotion*, *28*(2), 147–169. https://doi.org/10.1023/B:MOEM.0000032312.95499.6f

Reeve, J., Vansteenkiste, M., Assor, A., Ahmad, I., Cheon, S. H., Jang, H., . . . Wang, C. K. J. (2013). The beliefs that underlie autonomy-supportive and controlling teaching: A multinational investigation. *Motivation and Emotion*, *38*, 93–110. https://doi.org/10.1007/s11031-013-9367-0

Rink, J. E. (1979). *Development of a system for the observation of task structures in physical education* (Unpublished doctoral dissertation). Ohio State University, Columbus, OH.

Stemler, S. (2001). An overview of content analysis. *Practical Assessment, Research, & Evaluation, 7*(17). Retrieved December 2, 2016, from http://PAREonline.net/getvn.asp?v=7&n=17

Sun, H., & Chen, A. (2010). An examination of sixth graders' self-determined motivation and learning in physical education. *Journal of Teaching in Physical Education*, *29*, 262–277. https://doi.org/10.1123/jtpe.29.3.262

Taylor, I. M., & Ntoumanis, N. (2007). Teacher motivational strategies and student self-determination in physical education. *Journal of Educational Psychology*, *99*(4), 747–760. https://doi.org/10.1037/0022-0663.99.4.747

Taylor, I. M., Ntoumanis, N., & Standage, M. (2008). A self-determination theory approach to understanding the antecedents of teachers' motivational strategies in physical education. *Journal of Sport and Exercise Psychology*, *30*, 75–94. https://doi.org/10.1123/jsep.30.1.75

Tessier, D., Sarrazin, P. G., & Ntoumanis, N. (2010). The effect of an intervention to improve newly qualified teachers' interpersonal style, students' motivation, and psychological need satisfaction in sport-based physical education. *Contemporary Educational Psychology*, *35*, 242–253. https://doi.org/10.1016/j.cedpsych.2010.05.005

Vallerand, R. J. (1997). Toward a hierarchical model of intrinsic and extrinsic motivation. *Advances in Experimental Social Psychology, 29,* 271–360. https://doi.org/10.1016/S0065-2601(08)60019-2

Van den Berghe, L., Vansteenkiste, M., Cardon, G., Kirk, D., & Haerens, L. (2012). Research on self-determination in physical education: Key findings and proposals for future research. *Physical Education & Sport Pedagogy*, *17*(1), 1–25.

Vierling, K. K., Standage, M., & Treasure, D. C. (2007). Predicting attitudes and physical activity in an "at-risk" minority youth sample: A test of self-determination theory. *Psychology of Sport & Exercise*, *8*, 795–817. https://doi.org/10.1016/j.psychsport.2006.12.006

Wang, J. C. K., Ng, B. L. L., Liu, W. C., & Ryan, R. M. (2016). Can being autonomy-supportive in teaching improve students' self-regulation and performance? In W. C. Liu, J. C. K. Wang, & R. M. Ryan (Eds.), *Building autonomous learners: Perspectives from research and practice using self-determination theory* (pp. 227–243). Singapore: Springer. https://doi.org/10.1007/978-981-287-630-0_12