

Self-Determination Theory and teacher instruction: A positive partnership for student performance and involvement

Dana J. Perlman*

University of Wollongong, Australia

The purpose of this study was to examine the influence of distinct motivationally-based instructional approaches on student's game performance and involvement. 78 secondary physical education students were taught a unit of volleyball using one in either an autonomy-supportive, controlling or balanced instructional style. Using a pretest and posttest design, students were measured on their game performance and involvement during 20-minute game of volleyball. Data analysis indicated that students engaged in the autonomy-supportive context illustrated significantly higher levels of performance and involvement when compared with the other groups.

Keywords: Game Performance; Self-Determination Theory; Motivation

Introduction

Educational bodies that govern physical education indicate that student learning should focus on the ability to perform in a manner that demonstrates appropriate movement skills and tactical understanding (NASPE, 2004; NSW Board of Studies, 2009). Research in the area of physical education has been continuously focused on providing insight into the understanding of pedagogical approaches that lead to enhanced student learning. An area of inquiry that has been strongly correlated with student learning and a quality physical education experiences is the concept of student motivation (Standage, Duda & Ntoumanis, 2003; Alderman, Beighle & Pangrazi, 2006). Therefore, the overall aim of this study was to examine the influence of motivationally grounded instructional approaches on physical education students learning (i.e. game play performance and involvement).

Motivational instructional approaches

The concept of motivation within this study was grounded in Self-Determination Theory (SDT) whereby individual motivation is influenced in a linear manner as illustrated in Table 1 (Deci & Ryan, 1985; Deci & Ryan, 2000).

On the left side of Table 1 and of major focus within this study is the social context. Perlman and Webster (2011) stated that the social context can be influenced by a person in a leadership position (e.g. teacher) and is the main driver that facilitates support for student's psychological needs, individual motivation and experiences. Deci and Ryan

* Email: dperlman@uow.edu.au

(2004) proposed two styles of social context: autonomy-supportive and controlling. An autonomy-supportive and controlling context provide very diverse experiences for students and are taught in very different ways. Reeve, Jang, Carrell, Jeon and Barch (2004) reported that an autonomy-supportive teacher will support students at more of an individual level, be more concerned about student welfare and allow students to voice their opinions. In addition, an autonomy-supportive teacher will be patient with their students, allow more time for the completion of tasks and use flexibility when communicating teacher intent with students (Perlman and Webster, 2011). In contrast, a controlling teacher will influence student behavior through teacher imposed criteria, deadlines and statements that place pressure on students. Perlman and Webster (2011) indicated that a controlling teacher will use the aforementioned concepts, as well as demonstrate a lack of caring. While autonomy support and controlling behaviors are diverse, it should be noted that each setting does possess a degree or level of both (Guay, Ratelle & Chanal, 2008).

Table 1. Linear Progression of Self-Determined Motivation

Social Context	Psychological Needs	Motivation	Outcomes / Experiences
Autonomy-Supportive	Autonomy Competence	Intrinsic Extrinsic	Engagement Physical Activity
Controlling	Relatedness	Amotivation	Levels

The creation and implementation of a social context does illicit support for student's psychological needs (Vallerand, 2001). SDT posits three psychological needs of autonomy, competence and relatedness that are supported at diverse level depending of the social context (Deci & Ryan, 2004). Deci and Ryan (2000) indicated that a quality educational environment should provide instruction that supports all three needs. Ryan and Deci (2000) suggest that each psychological need works to facilitate a student's overall level of self-determined motivation. Student motivation is broadly defined as into three overarching categories or levels: intrinsic, extrinsic and motivation (Deci & Ryan, 1985, 2000). From a motivational perspective, it is ideal if a student is more intrinsic or self-determined within their motivational level as this lends itself to increased levels of in-class physical activity (Lonsdale, Sabiston, Raedeke, Ha & Sum, 2009; Perlman, 2012) and engagement (Ntoumanis, 2001; 2005).

Literature on the Social Context

Research on the self-determined learning contexts has been strongly based within a general classroom or psychological laboratory setting (Black & Deci, 2000; Deci & Ryan, 2004; Reeve, 2009; Reeve et al., 2006). A review of these studies has illustrated that student's benefit from being taught in a highly autonomy-supportive setting. For instance, students indicated higher levels of learning when engaged in a course taught in an autonomy-supportive manner (Black and Deci 2000). In physical education research there has been more of a focus on psychological outcomes associated with autonomy support (Ward, Wilkinson, Graser & Prusak, 2008; Murcia, Lacarcel & Alvarez, 2010). The aforementioned physical education studies were limited by the fact that they did not take into account the diverse ends of the social context spectrum. Specifically, each study viewed the social context with a more holistic perspective. The only study to date that used a more experimental design whereby the social context was manipulated to provide both a highly supportive and controlling context was the Perlman (in press) study, whereby

students in the autonomy-supportive context were engaged in a significantly higher level of health-enhancing physical activity. Perlman (in press) identified a need to examine the influence of the social context on other relevant learning outcomes, such as game performance. Therefore, the purpose of this study was to examine the influence of the self-determined learning environment on student's motivational responses, game performance and involvement. Specifically, this study was guided by the following questions:

1. What is the influence of the self-determined context (i.e. Autonomy-Supportive, Controlling and Balanced) on student's motivational responses (i.e. need support and individual motivation)?
2. What is the influence of the self-determined context (i.e. Autonomy-Supportive, Controlling and Balanced) on student learning (i.e. game performance and involvement)?

Method

Participants and Setting

A total of 78 secondary physical education students were randomly and equally assigned to one of three treatment groups: Autonomy-Supportive (AS; Male=14; Female=12), Controlling (C; Male=13; Female=13) and Balanced (B; Male=12; Female=14). Each treatment group was taught a 10-lesson unit of volleyball using an instructional model called the skill-drill-game (SDG) approach. The rationale for using the SDG approach was due to the school districts adoption of this approach as the mode of instruction for all secondary physical education students. In addition, the teacher was most comfortable and competent to deliver the SDG form of teaching.

Intervention

Design, development, implementation and evaluation of the intervention was conducted using a three phase approach of (a) unit and lesson development, (b) teacher training and (c) pilot testing:

- (a) Unit and lesson development.

The researcher and physical education teacher engaged in a workshop lasting five days. During the workshop, the teacher and researcher developed a 10-lesson unit to ensure that all students received similar content, learning activities and learning objectives within each treatment group.

- (b) Teacher training.

The physical education teacher was taught the underlying principles of SDT (Deci & Ryan, 1985), how SDT can be applied within a teaching and learning setting (Perlman & Webster, 2011; Reeve 2009; Sarrazin, Tessier, Pelletier, Trouilloud & Chanal, 2006;) and engaged in teacher development strategies to demonstrate his abilities to teach each diverse social contexts (Perlman, 2011b). Specifically, the teacher was engaged in a module that identified the instructional themes used by both an autonomy-supportive and controlling teacher. For example, the autonomy-supportive teacher would use terms such as *could* or *would*, while a controlling

teacher would use the term *must* when providing instruction. The next step of the module required the teacher to script lessons that would be implemented within all three treatment groups. The scripted lessons were practiced with a small group of secondary physical education students unaffiliated with the study. Analysis of each lesson was conducted by the researcher and used as a reflective tool for discussion with the teacher. Once the teacher and researcher felt comfortable that lessons could be implemented in a manner that represented AS, C and B, the teacher created all scripted lessons for each treatment group.

(c) Pilot Testing.

Three classes were used as pilot classes, whereby the teacher implemented the 10-lesson unit of volleyball. Each class was taught using either the AS, C or B approach. Each lesson was video and audio recorded for later analysis using a specific systematic observation protocol, as well as a mechanism for the teacher and researcher to reflect on each lesson. In addition, students were asked to measure their perceptions of the social context using the Learning Climate Questionnaire (LCQ; Williams & Deci, 1996). More detail of the systematic observation protocol and LCQ are provided later within this paper.

Fidelity of Implementation

Implementation fidelity was established through (a) systematic observation of each lesson and (b) students assessment of the learning context. Using an observation grid designed by Sarrazin, et al. (2006), each teacher and student interaction was coded as frequencies of autonomy-supportive, controlling or neutral. A summation of codes per category (e.g. total number of statements that were controlling) was calculated for each lesson. For the purpose of this study, per lesson benchmark was created and illustrated in Table 2. It is important to note that this systematic observation tool has been identified as valid and reliable for use within secondary physical education research (Perlman, 2012).

Table 2. Percentage Benchmarks of Statements for each Social Context

Treatment	Benchmark
Controlling	90% of statements per lesson should be controlling
Balanced	Between 40-60% of statements should be controlling and autonomy-supportive
Autonomy-Supportive	90% of statements per lesson should be autonomy-supportive

Students were asked to complete a self-report measure on their perceptions of the level of autonomy-support. Each student was asked to complete the LCQ at the beginning and end of the unit. The LCQ is a valid and reliable tool for use within secondary physical education (Williams & Deci, 1996) that asks students to rate their level of agreement on 15-items using a 7-point Likert scale (1=strongly disagree; 4=neutral and 7=strongly agree). Scores from all items are averaged and provide an overall perception of the social context.

Measures of Dependent Variables

Psychosocial Needs Support. The Basic Psychological Needs Scale in Physical Education (BPNS-PE; Ntoumanis, 2005) was used to assess students perceived level of support for autonomy, competence and relatedness. Students responded to 21-items using a 7-point Likert scale (1= “not true at all” to 7= “very true”). Responses were averaged and provided an overall score for autonomy, competence and relatedness (e.g. 7-items per psychological need). The BPNS-PE has been identified as a valid and reliable tool for use with PE students (Ntoumanis, 2005).

Self-Determined Motivation. Student motivation was assessed using the 16-item Sport Motivation Scale (SMS; Pelletier, Fortier, Vallerand, Tuson, Brière & Blais, 1995). The SMS requires students to rate their level of agreement on each item (1= ‘strongly disagree’ and 7= ‘strongly agree’) that provide each student with 4 motivational scores (i.e. intrinsic motivation, identified regulation, external regulation and amotivation). The 4 motivational scores are further utilized within a calculation that provides an overall score or self-determination index (SDI) using the following calculation ((2* intrinsic motivation) + identified regulation)-(external regulation + (2* amotivation)). Adequate validity and reliability of this short form SMS has been established by Ward, Wilkinson, Vincent and Prusak (2008) for use with secondary physical education students.

Student Learning - Game Performance and Involvement. Student learning was measured using the Game Performance Assessment Instrument (GPAI; Oslin, Mitchell & Griffin, 1998). The GPAI is a systematic observation tool used to code a student’s game play behaviors in the areas of (a) skill execution, (b) decision-making and (c) adjust. Each game play behavior can be categorized as appropriate or inappropriate. For example, an appropriate skill execution tally would be given when a student demonstrated bent knees, flat forearms and follow through when completing a forearm pass. On the contrary, an inappropriate skill execution tally would be given when a student would smack the ball with one hand when attempting an overhead set. As such each student would be provided frequencies in six areas (e.g. skill execution – appropriate, skill execution – inappropriate, etc.). The six frequencies are used within the following calculation that provide students with a game performance and involvement score as illustrated below:

- Game Performance = (Summation of all appropriate tallies) / (Summation of all inappropriate tallies)
 - Game Involvement = (Summation of all inappropriate and appropriate tallies for Decision Making and Skill Execution) + (Appropriate Adjust).
- The GPAI has been used as a valid and reliable tool for a variety of sports within physical education including volleyball (Oslin, Mitchell & Griffin, 1998).

Data Collection

Before beginning this study University Ethics approval was granted, as well as participant/guardian consent. Data were collected using a pretest/posttest design. Each student was asked to complete the LCQ, SMS and BPNS-PE at the beginning of class on day one of the study and upon completion of the last day of the unit. All surveys were completed in a classroom setting that lasted between 15 and 20 minutes. In addition to completing the surveys, students were also engaged in a 20-minute game of six a side volleyball. Each game of volleyball, as well as all lessons were audio and videotaped from

an area of gymnasium that could capture all students game play behaviors and teacher instruction.

Data Analysis

Initial Analysis and Video Coding

Initial analysis began with entry of survey data from the LCQ, SMS and BPNS-PE that was double checked for accuracy. Video and audio taped lessons and game play sessions were downloaded into iDVD for analysis in the University Pedagogy Lab. In order to determine the level of analysis (individual or group), intra-class coefficients (ICCs) were calculated on all pretest and posttest dependent variables. Results of the ICCs indicated that the individual should be used as the level of analysis, based on the guidelines suggested by Kenny and Lavoie (1985).

Fidelity of Implementation

Two unaffiliated experts coded data from the systematic observation of each lesson independently. Each coder was a member of the Pedagogical Laboratory for Physical Education and Sport and trained to systematically code lessons using the aforementioned tool. Training modules followed the recommendations and protocols of previous studies using the Sarrazin et al . (2006) observation tool (Perlman, 2012). Upon completion of independent coding, both coders met to conduct inter-rater reliabilities with all coded lessons (AS=80%; C=89%; B=82%). In addition, intra-rater reliabilities were conducted (AS=92%; C=95%; B=92%). Analysis of each lesson was conducted using the following calculation for autonomy-supportive and controlling statements to determine the percentage of statements per lesson:

- $\text{Autonomy-Supportive} = (\# \text{ of Autonomy-Supportive Statements} / \text{Total \# of Statements}) * 100$
- $\text{Controlling} = (\# \text{ of Controlling Statements} / \text{Total \# of Statements}) * 100$
- Analysis of the LCQ data was conducted through a (3 X 2) (Group X Time) repeated measures ANOVA and plotted to demonstrate where significant differences were located.

Assessment of Student Learning

As with the coding of teacher instruction, game play was coded by two independent coders. Each coder was trained to use the GPAI and completed coding independently. Intra and inter rater reliabilities were calculated and deemed acceptable (Intra=95%; Inter=89%). To examine the effectiveness of the intervention a (3 X 2) (Group X Time) repeated measures ANOVA was calculated for both performance and involvement with an adjusted level of significance at or below .025. Any significant ANOVA calculations were plotted in a chart to identify and illustrate where the significant differences were located.

Results

Descriptive statistics (Mean and Standard Deviation) for pretest and posttest dependent variables are displayed in Table 3. Examination of fidelity measures indicated that all lessons meet the prescribed instructional benchmarks (e.g. a minimum of 90% of the

teacher instruction was autonomy-supportive within the AS group). In addition, the (3 X 2) (Group X Time) repeated measures ANOVA for perceptions of the social context revealed a significant main $F(1, 75) = 6.262, p=.015, \eta^2=.077$ and interaction effect $F(2,75)=3.115, p=.050, \eta^2=.077$ whereby the AS group was significantly higher compared with the B and C group demonstrates a level support that the social context was taught in a manner that is aligned with the study purpose (See Figure 1).

Table 3. Descriptive statistics (mean and standard deviations)

	AS		C		B	
	M	SD	M	SD	M	SD
SDI-Pretest	4.57	3.23	4.53	3.08	4.56	3.56
SDI- Posttest	7.14	3.60	3.58	3.31	3.55	3.15
Autonomy-Pre	3.34	0.55	3.35	0.55	3.34	0.58
Autonomy-Post	3.17	0.65	3.25	0.61	3.29	0.68
Competence – Pre	2.52	0.64	2.53	0.50	2.51	0.66
Competence – Posttest	2.38	0.78	2.49	0.67	2.16	0.73
Relatedness – Pre	3.11	0.78	3.09	0.76	3.10	1.01
Relatedness - Posttest	3.79	0.76	3.17	0.88	3.35	0.92
Performance – Pre	3.41	0.62	3.43	0.44	3.42	0.57
Performance – Post	3.80	0.44	3.40	0.55	3.46	0.65
Involve – Pre	20.07	4.48	19.81	3.57	20.46	6.00
Involve - Post	25.31	5.77	17.65	3.92	18.38	5.58
LCQ _ Pre	3.94	0.73	3.96	0.78	3.95	0.79
LCQ – Post	4.46	1.04	3.99	1.37	4.05	1.14

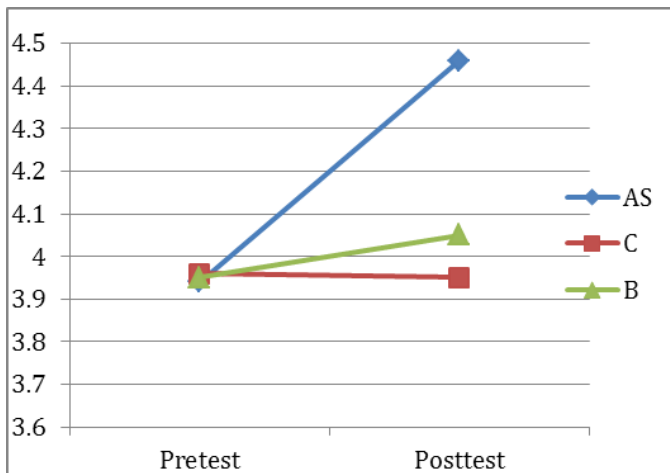


Figure 1. Mean student score by treatment on student perceptions of social context

Results of the repeated measures ANOVA indicated significant interaction effects for student motivation $F(2,75)=7.148, p=.001, \eta^2=.160$, support for relatedness $F(2,75)= 3.96, p=.023, \eta^2=.096$, game performance $F(2,75)=5.113, p=.008, \eta^2=.120$ and involvement $F(2,75)= 11.046, p=.000, \eta^2=.228$, while the calculations for competence $F(2,75)=1.366, p=.261, \eta^2=.035$ and autonomy $F(2, 75)=0.289, p=.750, \eta^2=.008$ were deemed insignificant. Significant ANOVA calculations are displayed in Figures 2 - 5.

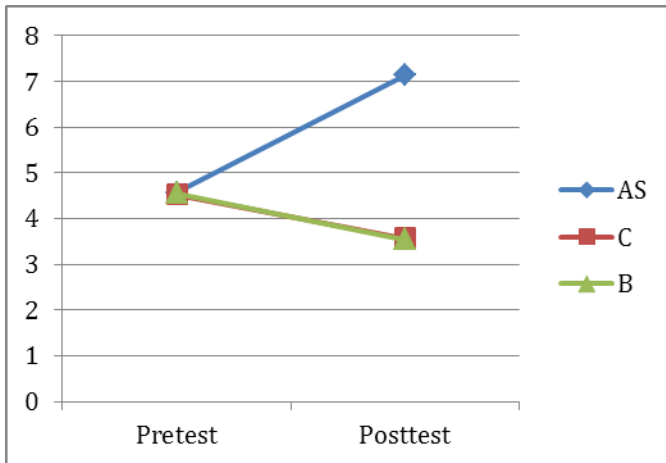


Figure 2. Mean student score by treatment on Self-Determined Motivation

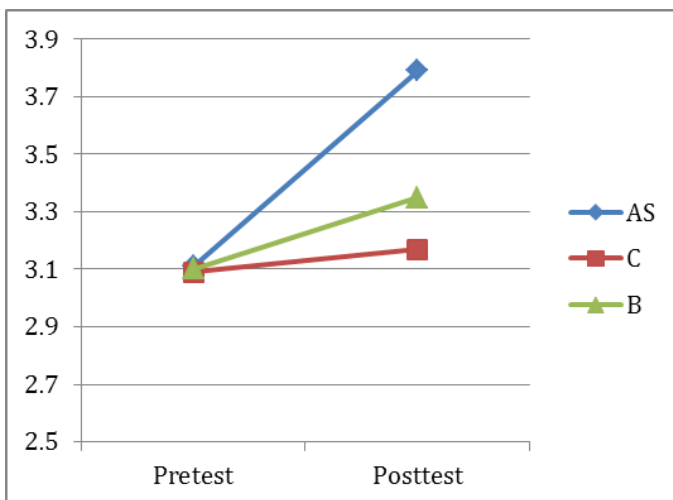


Figure 3. Mean student score by treatment for relatedness

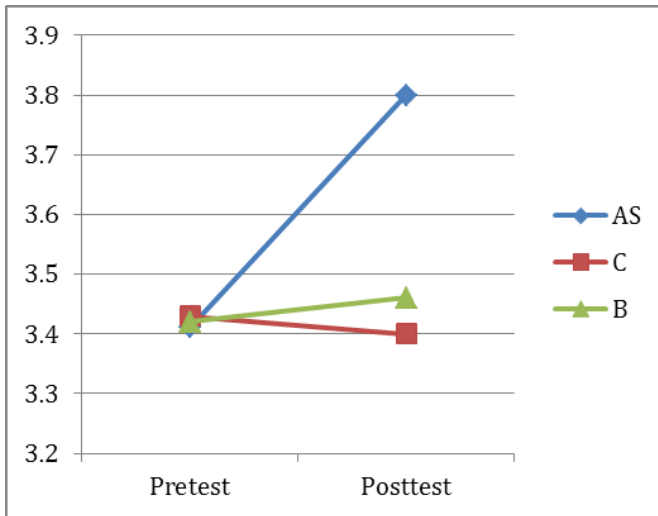


Figure 4. Mean student score by treatment on Game Performance

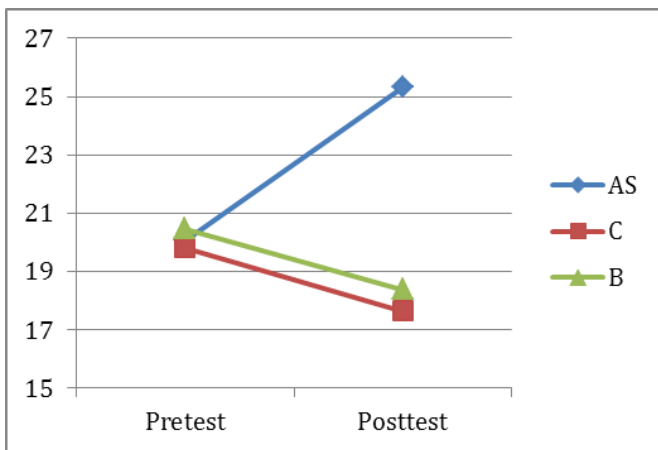


Figure 5. Mean student score by treatment on Game Involvement

Discussion and conclusion

Findings from this study support the applied benefits of teaching and learning within an autonomy-supportive context. Previous studies have found that students taught in an autonomy-supportive context are more engaged, physically active and motivated (Edmunds, Ntoumanis & Duda, 2006; Perlman & Goc Karp, 2010; Perlman, 2011a; Perlman, 2011b; Hagggar, Chatzisarantis, Culverhouse & Biddle, 2003; Lim & Wang, 2009). This study supports and extends previous research by supporting the notion that students demonstrated an increased level of motivation, as well as game performance and involvement.

Students engaged in an autonomy-supportive context brought upon significant changes in student's motivational responses, overall game performance and involvement. This supports previous studies that have manipulated or examined the learning environment based on SDT and the positive student benefits (Murcia, Lacarcel & Alvarez, 2010; Mouratidis, Vansteenkiste, Lens & Sideridis, 2008; Mandigo, Holt, Anderson & Sheppard, 2008; Ward, Wilkinson, Graser & Prusak, 2008).

Change to student motivation tends to be a key aspect of this paper. Perlman and Webster (2011) suggest that the teacher is a powerful facilitator or influence on the motivational process. As such, the teacher when using more autonomy-supportive statements while delivering the same content and lesson formats supported the motivational construct of students. In addition, Deci and Ryan (1985) posit that supporting the psychological needs is a powerful influence on student motivation. Within this study the concept of relatedness was deemed significantly changed. As such, it could be viewed that students perceived a higher level of caring and empathy that in turn assisted with the growth in motivation. It is important to note that the psychological needs of autonomy and competence were not changed. This could be attributed to the fact that (a) students may not have been provided time or opportunities to be in a level of control and (b) the demonstration of success was similar throughout all the units. The findings associated with psychological needs could be viewed as supporting the need for further inquiry into what constitutes an autonomy-supportive teacher. Current viewpoints suggest that autonomy-supportive teaching as a broadly defined construct, yet why might one form of a supportive context influence relatedness without autonomy and competence.

Influence of the autonomy-supportive context brought upon significant changes to both game performance and involvement. Plausible reasons for these changes could have been attributed to the enhanced motivation of the student, perceptions of relatedness support that could have a knock-on effect of the instructional lessons. As illustrated within this paper, students were more motivated and supported through the need of relatedness. As such, it could be suggested that each student was more willing and possessed an increased desire to engage in the content or lesson. Each lesson was specifically designed to assist and/or provide students with educational experiences that focused on the underlying movement skills and tactical problems that could occur in a game of volleyball. As a result it would tend to align with the notion that a more motivated student is more engaged (involved) and will learn and be able to execute better (performance).

These findings suggest and support the notion that a teacher can influence the motivation and learning of their students. Results indicated that students, no matter the underlying content or instructional model (SDG), influence the affective, psychomotor or cognitive outcomes of their students. Teachers and teacher-education professionals may benefit from adopting or infusing a more self-determined approach within their specific settings. While positive results of this study are positive, they are not without limitations. This study utilized a single unit of study. As such, research may want to infuse the instructional principles of autonomy support within different unit and for longer periods of time to alleviate the potential novel effect.

References

- Alderman, A., Beighle, A., and Pangrazi, R. (2006). Enhancing motivation in physical education: promoting intrinsic motivation, enhancing perceived physical competence, and creating a mastery-oriented environment will increase students'

- enjoyment of physical activity. *The Journal of Physical Education, Recreation & Dance*, 77(2), 41.
- Black, A. E., & Deci, E. L. (2000). The effects of instructors' autonomy support and students' autonomous motivation on learning organic chemistry: A self-determination theory perspective. *Science Education*, 84, 740-756.
- Deci, E.L., & Ryan, R.M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- 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.
- Deci, E.L., & Ryan, R.M. (2004). *Handbook of self-determination research*. Rochester, NY: The University of Rochester Press.
- Edmunds, J., Ntoumanis, N., & Duda, J.L. (2006). A test of self-determination theory in the exercise domain. *Journal of Applied Social Psychology*, 36, 2240-2265.
- Guay, F., Ratelle, C. F., & Chanal, J. (2008). Optimal learning in optimal contexts: The role of self-determination in education. *Canadian Psychology*, 49(3), 233-240.
- Hagger, M.S., Chatzisarantis, N., Culverhouse, T., & Biddle, S.J.H. (2003). The processes by which perceived autonomy support in physical education promotes leisure-time physical activity intentions and behaviour: A trans-contextual model. *Journal of Educational Psychology*, 95, 787 - 795.
- Kenny, D.A., & La Voie, L. (1985). Separating individual and group effects. *Journal of Personality and Social Psychology*, 48, 339-348.
- Lim, B.S., & Wang, C.K. (2009). Perceived autonomy support, behavioural regulations in physical education and physical activity intention. *Psychology of Sport and Exercise*, 10, 52 – 60.
- Lonsdale, C, Sabiston, C. M., Raedeke, T. D., Ha, A. S. C., Sum, R. K. W. (2009). Self-determined motivation and students' physical activity during structured physical education lessons and free choice periods. *Preventive Medicine*, 48, 69-73.
- Mandigo, J., Holt, N., Anderson, A., & Sheppard, J. (2008). Children's motivational experiences following autonomy-supportive games lessons. *European Physical Education Review*, 14, 407-25.
- Mouratidis, A., Vansteenkiste, M., Lens, W., & Sideridis, G. (2008). The motivating role of positive feedback in sport and physical education: Evidence for a motivational model. *Journal of Sport & Exercise Psychology*, 30, 240-68.
- Murcia, J.A.M., Lacarcel, J.A.V., & Alvarez, F.D. (2010). Search for autonomy in motor task learning in physical education university students. *European Journal of Psychology of Education*, 25, 37-47.
- National Association for Sport and Physical Education. (2004). *Moving into the future: National standards for physical education*. Reston, VA.
- NSW Board of Studies. (2003). *Personal Development, Health and Physical Education 7-10*. Sydney: NSW Board of Studies.
- Ntoumanis, N. (2001). A self-determination approach to the understanding of motivation in physical education. *British Journal of Educational Psychology*, 71, 225-242.
- 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.
- Oslin, J., Mitchell, S., Griffin, L. (1998). The Game Performance Assessment Instrument (GPAI): Development and preliminary validation. *Journal of Teaching in Physical Education*, 17, 231-243.

- Pelletier, L.G., Fortier, M.S., Vallerand, R.J., Tuson, K.M., Briere, N.M., & Blais, M.R. (1995). Toward a new measure of intrinsic motivation, extrinsic motivation, and amotivation in sports: The sport motivation scale (SMS). *Journal of Sport and Exercise Psychology, 17*, 35–53
- Perlman, D.J. (2013). Manipulation of the social context on needs support, motivation and affect. *Physical Educator, 70*(4), 413 – 428.
- Perlman, D.J. (2012). The influence of the sport education model on developing autonomous instruction. *Physical Education and Sport Pedagogy, 17*(5), 493 – 505.
- Perlman, D.J. (2011a). Examination of self-determined motivation within the sport education model. *Asia-Pacific Journal of Health, Sport and Physical Education, 2*, 79-96.
- Perlman, D.J. (2011b). The influence of an autonomy-supportive intervention on preservice teacher instruction: A self-determined perspective. *Australian Journal of Teaching Education, 36*(11), Article 6.
- Perlman, D.J., & Goc Karp, G. (2010). A self-determined perspective of the sport education model. *Physical Education and Sport Pedagogy, 15*(4), 401-418.
- Perlman, D.J., & Webster, C.A. (2011). Supporting student autonomy in physical education. *Journal of Physical Education, Recreation and Dance, 82*(5), 46-49.
- Reeve, J. (2006). Teachers as facilitators: What autonomy-supportive teachers do and why their students benefit. *The Elementary School Journal, 106*(3), 225-236.
- Reeve, J. (2009). Why teachers adopt a controlling motivational style toward students and how they can become more autonomy supportive. *Educational Psychologist, 44*(3), 159-175.
- 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.
- Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist, 55*, 68-78.
- Sarrazin, P.G., Tessier, D.P., Pelletier, L.G., Trouilloud, D.O., & Chanal, J.P. (2006). The effects of teachers' expectations about students' motivation on teachers' autonomy-supportive and controlling behaviors. *International Journal of Sport and Exercise Psychology, 4*, 283-301.
- Standage, M., Duda, J.L., & Ntoumanis, N. (2005). A test of self-determination theory in school physical education. *British Journal of Educational Psychology, 75*(3), 411-433.
- Vallerand, R.J. (2001). A hierarchical model of intrinsic and motivation in sport and exercise. In G. C. Roberts (Ed.), *Advances in motivation in sport and exercise* (pp. 263-320). Champaign, IL: Human Kinetics.
- Ward, J., Wilkinson, C., Graser, S.V., & Prusak, K.A. (2008). Effects of choice on student motivation and physical activity behavior in physical education. *Journal of Teaching in Physical Education, 27*, 385-98.
- Williams, G. C., & Deci, E. L. (1996). Internalization of biopsychosocial values by medical students: A test of self-determination theory. *Journal of Personality and Social Psychology, 70*, 767-779.