

PEDAGOGY

Effects of Teacher-to-Student Relatedness on Adolescent Male Motivation in a Weight Training Class

Zack Beddoes, Keven Prusak, David Barney, Carol Wilkinson

Abstract

The purpose of this study was to determine if the motivational profiles of male junior high weight training students differ across levels of teacher-to-student relatedness. One hundred and sixty six students participated in one of two units of instruction. Contextual motivation was measured using the Sport Motivation Scale II–Physical Education (SMS II–PE). Situational motivation and relatedness measurements were assessed using the Situational Motivation Scale–Physical Education (SIMS–PE), Amotivation Inventory–Physical Education Scale (AI–PE), and the Interpersonal Behavior Scale (IBS). Results revealed that situational motivation was not affected by the intervention in either group. Significant differences were observed in students’ contextual motivation. That is, both within-groups’ contextual motivation increased. Though the intervention did not reveal significant differences in students’ situational motivation, it may confirm the complimentary nature of relatedness and autonomy constructs in fostering student self-determination in a physical education setting.

Zack Beddoes is a PhD student in the Department of Education in Curriculum and Instruction, Physical Education Teacher Education at The University of Texas at Austin. Keven Prusak is a professor in the McKay School of Education at Brigham Young University. David Barney is an associate professor in the McKay School of Education at Brigham Young University. Carol Wilkinson is an associate professor in the McKay School of Education at Brigham Young University. Please send author correspondence to zack.beddoes@gmail.com

Perhaps the most critical element in any educational setting is the teacher who creates the learning environment, designs and delivers the learning activities, interacts with individual students, and hopefully is successful in facilitating greater student achievement. Creating a motivationally sound environment has been shown to increase student motivation toward academic activities as well as student learning outcomes (Ames & Archer, 1988; Standage, Duda, & Ntoumanis, 2005). When capable teachers provide a positive, supportive learning environment and activities, students tend to internalize the value and intent of the academic activities and greater performance, cognition, and affect accompany the experience (Pelletier, Fortier, & Vallerand, 1995). The nature of teacher-to-student support, then, becomes an invaluable tool to effectively create such learning environments and are the central focus of this study. Self-determination theory (SDT) of motivation will provide the framework for this examination of the effects of teacher-support in an academic setting, specifically in physical education (PE).

Self-determination Theory of Motivation

Self-determination theory (Deci & Ryan, 1985) has been used over the past three decades to describe a large variety of motivational phenomena and contexts. In its broadest sense, SDT makes several postulates: (a) humans have innate social needs to seek a sense of competence, autonomy, and relatedness, in a task; (b) motivational indices lie on a continuum of constructs from amotivation (the absence of motivation) through various levels of extrinsic behaviors to intrinsic behaviors; (c) as the social needs of autonomy, competence and relatedness are fulfilled, motivation becomes more internally regulated (self-determined); and (d) as these needs are met and maximized within social contexts, self-determined behavior is fostered and manifested in increased cognition, affect, and behavior (Deci & Ryan, 1985; see Figure 1). In addition, SDT operates within three separate levels of generality. The first level is *situational* which accounts for the current state of being or doing. The second, *contextual*, includes life domains such as education or sports. The third, *global*, encompasses personality or life traits. Global is considered to be the most generalized while situational the most specific (Vallerand, 2007; see Figure 1). Global dispositions are also consid-

ered to be the most stable and enduring life traits or attitudes, which guide adult behavior.

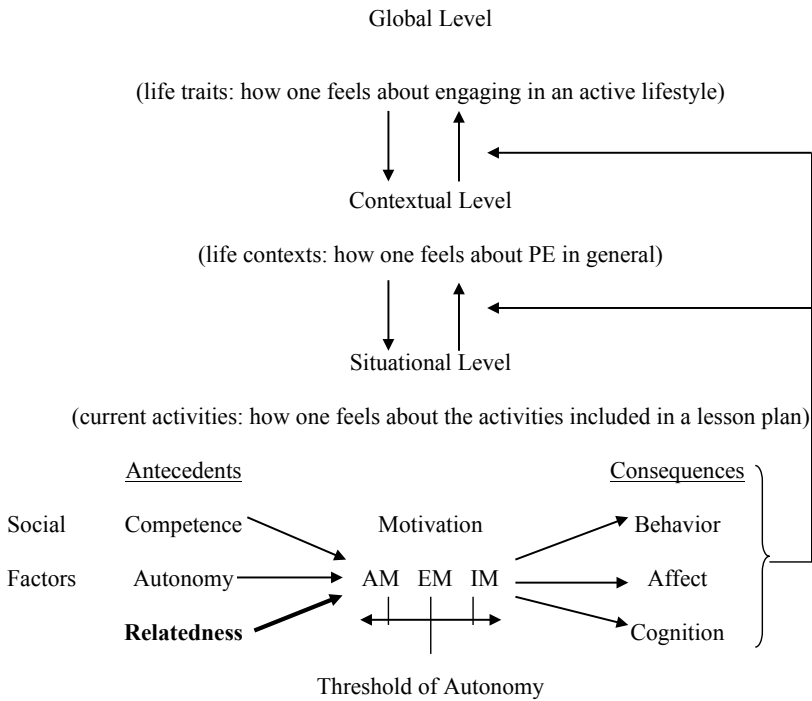


Figure 1. A description of the self-determination theory continuum along with situational, contextual, and global levels of generality. Adapted from “The Effects of Choice on the Motivation of Adolescent Girls in Physical Education,” by K. A. Prusak, D. C. Treasure, P. W. Darst, and R. P. Pangrazi, 2004, *Journal of Teaching in Physical Education*, 23, p. 20.

Contextual dispositions are the next most stable and operate within a particular context such as sports or school domains such as physical education. Situational dispositions are the least stable and therefore most malleable and relate to the activities with which one is currently engaged (e.g., the daily physical education lesson plan). The model further posits top-down as well as bottom-up effects (Guay, Mageau, & Vallerand, 2003), which, when in operation between levels of increasing generality, manifest their effects only after repeated and consistent occurrence. In other words, one’s contextual moti-

vation (such as feelings toward physical education) can be altered either positively or negatively, but only after repeated and consistent situational effects are experienced. Conversely, it can, for good or bad, exert its own top-down effects on the situational motivation of students in daily physical education. Thus Prusak et al. (2004) posit “this hierarchical framework [may allow] for a refined examination of whether daily practices in physical education lesson plans (i.e., situational) do indeed develop favorable attitudes toward physical education (i.e., contextual) and then toward choosing a physically active lifestyle (i.e., global)” (p. 21).

The Multidimensional Nature of Self-Determined Motivation

Amotivation is the least autonomous (self-determined) form of regulation because amotivated individuals either do not engage in the activity or engage without internalizing reasons for participating in the activity. Until recently, amotivation has been viewed as a unitary construct while extrinsic and intrinsic motivation have long been viewed as multidimensional. Extrinsic motivation (EM), for instance, is represented by four constructs including external regulation (the most controlled or least autonomous form of motivation). External regulation is driven primarily by coercion, fear of punishment, or hope for reward. For example, a child is externally regulated when she cleans her room because she fears being punished or perhaps to earn playtime. Next along the continuum is introjected regulation, which involves “taking in but not accepting a regulation as one’s own” (Deci, Vallerand, Pelletier, & Ryan, 1991, p. 329). A student regulated by introjection goes to physical education for the sake of not letting down one’s team or classmates—a form of coercion—or due to pressure-tension resulting from responsibilities beyond self. Next is identified regulation in which the individual values the behavior for himself or herself but only as a means to an end. For example, a person participates in swimming lessons because swimming is perceived as a useful skill at some future time. Integrated regulation is the most autonomous of the four EM constructs and involves fully embracing motives that once were external in origin. If a person is motivated by integrated regulation, he or she may conclude that “this is who I am.” It is adjacent to intrinsic motivation (IM) because both are self-regulated. A major distinction is that “intrinsic motivation is characterized by interest in the activity

itself, whereas integrated regulation is characterized by the activity's being personally important for a valued outcome" (Deci et al., 1991, p. 330). Internally motivated individuals, on the other hand, engage in an activity for the pleasure they derive from the activity itself.

Amotivation in education. Considering the time and monetary investment in the education of children, educators are constantly concerned with how to motivate students (Pintrich, 2003) in order to maximize learning outcomes. For instance, "in their formative first two decades, individuals spend about 15,000 hours in schools. Thus schools represent a primary socializing influence that has enormous impact on the course of people's lives and, in turn, on society" (Deci et al., 1991, p. 325). Not surprisingly, lower school drop-out rates and positive academic performance have been reported when highly self-determined motivational profiles are achieved (Pintrich & de Groot, 1990). Nevertheless, studies reveal an increasing number of high school students lack volition (i.e., students are increasingly amotivated) in educational pursuits (Legault, Green-Demers, & Pelletier, 2006).

Amotivation is the least studied but perhaps the "most concerning form of motivation, due to various negative mental, physical, and affective outcomes" (Perlman, 2010, p. 433). Perlman (2010) suggests that the paucity of studies on amotivation is, in part, due to the reluctant nature of amotivated students toward participation, making it difficult to conduct meaningful examinations and attain enough data from which to draw conclusions that inform practice.

Legault et al. (2006) suggest that understanding the causes and remedies for an increasingly amotivated student population ought to be of paramount importance to educational researchers. To this end, they propose that rather than amotivation being viewed as unidimensional, it should instead be viewed as multidimensional (Legault et al., 2006). Building upon earlier work of Pelletier, Dion, Tuson, and Green-Demers (1999), Legault et al. (2006) pose four subtypes of academic amotivation based upon ability beliefs, effort beliefs, value placed on the task, and characteristics of the task. Ability beliefs describe students who do not believe they are competent at a task and therefore are likely to disengage. Effort beliefs describe students who lack the desire to invest the energy necessary to complete the task, although they may in fact be competent at performing the task. Some students simply do not value the task enough to engage.

Still others find the characteristics of the task unappealing finding little pleasure in their performance.

Social needs support in PE. Competence support is fostered by teachers conveying information in a way that the student feels competent (capable) of completing the class requirements. Autonomy support is fostered “when students feel a sense of choice and personal control in a task” (Prusak et al., 2004, p. 26). Relatedness support is fostered when students develop beneficial relationships with others. As a result, student intrinsic motivation increases (Legault et al., 2006). In addition, all three types of social support are negatively associated with all four subtypes of amotivation. That is, as classroom autonomy, competence, and relatedness support increase, amotivation decreases (Legault et al., 2006). Indeed, competence and relatedness support have recently been negatively associated with amotivation in the PE setting (Shen, Weidong, Sun, & Rukavina, 2010).

While relatedness may be appropriately “[defined] by school climate, quality of teacher-student relationships, feelings of belonging, caring, inclusion, acceptance, importance, and interpersonal support” (Shen, McCaughtry, Martin, Fahlman, & Garn, 2012, p. 231), relatedness studies may be most often conducted in consideration of teacher-to-student relationships (Furrer & Skinner, 2003). In terms of defining relatedness then, this study concentrates specifically on the exploration of the teacher-to-student relationship. Recently, Shen et al. (2012), in a cross-sectional study provided evidence that motivational profiles in high school girls are positively affected by increases in teacher-to-student relatedness. However, despite its proposed importance, teacher-to-student relatedness has yet to be studied in an experimental design as the primary manipulation. To do so presents several distinct challenges including (a) controlling for prior perceptions of student relationships with teachers, (b) manipulating relatedness while retaining appropriate instructional practices, and (c) achieving desired learner outcomes.

Given the paucity of relatedness studies and that relatedness research in PE has been primarily limited to female students (i.e., Shen et al., 2012), the relationship between motivation and relatedness support for males remains unclear. Similar research on male students is warranted and may provide additional insight. The purpose of this study was to assess the effects of levels of teacher-to-student

relatedness support on the motivation of male PE students in weight training classes. It was hypothesized that students in the high-relatedness group would reveal higher levels of situational motivation than those in the self-guided group.

Method

Context

The present study was conducted in three junior high schools in the Intermountain West. The first school serves 1,264 (675 male and 589 female) seventh to ninth grade students with a majority of students being Caucasian and Hispanic from middle to middle-upper-class socioeconomic backgrounds. The second school serves 1,086 (530 male and 556 female) seventh to ninth grade students with a majority of students being Caucasian and Hispanic from middle to middle-upper-class socioeconomic backgrounds. The third school serves 956 (475 male and 481 female) seventh to ninth grade students with a majority of students being Caucasian and Hispanic from middle-class socioeconomic backgrounds.

Participants/Measures

Among the three schools, a total of 180 (School 1 is composed of four classes with $n = 106$ students; School 2 is composed of two classes with $n = 47$ students; School 3 is composed of two classes with $n = 27$ students) seventh, eighth, and ninth grade boys were enrolled in an elective weight training class during the semester. In addition, six girls were enrolled in weight training but were excluded from data collection based on an overrepresentation of boys. Each student received and returned signed letters of consent/assent forms approximately two weeks before the study began. Students who did not return consent/assent documents were excused from participation. Thus the study sample composed of ($N = 166$) participants.

Contextual motivation. A modified (referencing PE instead of sport) version of the 18-item, six-subscale Sport Motivation Scale II (SMS II-PE) was used to measure intrinsic motivation (IM), extrinsic motivation (EM), and amotivation (AM; Pelletier et al., 2013) at the contextual level. The stem states, "Why do I participate in physical education/weight training?" Students responded to 18 statements on a 7-point Likert scale wherein *corresponds not at all* = 1

and *Corresponds exactly* = 7. For example, they responded (a) “because it gives me pleasure to learn more about the activity” or (b) “because I would not feel worthwhile if I did not.” Used in this study to assess any preexisting dispositions toward PE, this scale assesses the motivational dispositions of students toward physical education in general.

Situational intrinsic motivation. A modified version of the 16-item, four-subscale Situational Motivation Scale (SIMS-PE) was used to measure motivation at the situational level (Guay & Vallerand, 2000; Standage, Treasure, Duda, & Prusak, 2003). The stem states, “Why are you currently participating in this body conditioning unit?” Students responded to 16 items on a 7-point Likert scale. For example, they responded that they were participating in the current activities (a) “because I think that this activity is interesting” or (b) “because I don’t have a choice.”

Amotivation. A modified (to include weight training) version of the 16-item, four-subscale Amotivation Inventory (AI-PE) was used to measure amotivation (Shen, Winger, Li, Sun, & Rukavina, 2010). The stem states, “I don’t participate in weight training (WT) activities... Students responded to 16 items on a 7-point Likert scale. For example, they responded that they didn’t participate in the current activities (a) “because, for me, WT holds no interest” or (b) “because I’m not good at WT.”

Relatedness support. A modified (suitable for weight training) version of the 12-item, three-subscale Interpersonal Behavioral Scale (IBS) was used to measure perceptions of competence, autonomy and relatedness support (Shen et al., 2010). Students responded to 12 statements on a 7-point Likert scale wherein *Never* = 1 and *Always* = 7. For example, “I feel that my WT teacher sincerely cares about me” or (b) “My WT teacher does not care if I succeed or fail.”

Data Analysis

Subscale means and standard deviations for each questionnaire (SMS II-PE, SIMS-PE, AI-PE, and IBS) were calculated. Specifically, raw scores from each of the 18 items of the SMS II-PE were reduced to six subscale means by averaging the raw scores from their three corresponding items. Similarly, the 16 items of the SIMS-PE were reduced to four subscales by averaging their four corresponding items. Likewise, the 16 items of the AI-PE were reduced to four subscales

by averaging their four corresponding items. Finally, the 12 items of the IBS were reduced to four subscales by averaging their three corresponding items. All subsequent analyses were conducted using these subscale means. Cohen's *d* is a measure of effect size. Generally, a Cohen's *d* between .15 and .40 represents a small effect, between .40 and .75 a medium effect, and above .75 a large effect (Cohen, 1992).

Procedures

All study procedures received university's Institutional Review Board and district approval as well as approval from the principals of the schools in which the study was conducted. Each participating teacher was male with an average of three years teaching experience. The principal researcher of the present study was one of the participating teachers. All three participating teachers assembled for script training in early August of 2013. The teacher script training was designed to help all participating teachers understand the theoretical framework and purpose of the intervention. The meeting included discussing specifics about the teacher's role in the two treatment groups, the dissemination and collection of data, and the curriculum timeline. Teachers were given printed copies of all scales, assignments, CDs, and DVDs necessary for the intervention. Following the script training, additional follow-up (via phone conversation, e-mail, and text messaging) continued through the entire data collection process. In early September, the principal researcher distributed consent/assent forms to each of the teachers who distributed the forms to each of the students. One week prior to the intervention, the teachers distributed the SMS II-PE survey to students in the class to measure students' preexisting contextual motivation toward PE. The intervention occurred during 2 weeks beginning in the second week of September 2013. Treatment groups were differentiated between distal ends of accepted teaching practices. For example, one group contained high teacher-centered instruction and the other high student-centered (see Mosston, 2002). Each teacher adhered to the predetermined schedule of lesson sequencing and teaching style and frequent (daily or every other day) in-person visits, phone conversations, and/or emails between the principal and coinvestigators were maintained throughout the intervention to maintain fidelity of treatment.

The high teacher-centered instruction (i.e., “command style”) was chosen for the high-relatedness group to get the teachers heavily involved in the instruction process. It was intended that teachers interact with as many students as possible and as frequently as possible through each phase of the lesson plan, thus creating an environment where students were dependent upon the teacher for instruction, feedback, and support. Contrastingly, the self-directed group learned using a modified form of Mosston’s “self-teaching” style that removed the teacher from the learning, causing the students to rely on their own efforts or that of classmates to direct their learning. For example, when a student in the high-relatedness group asked a question, the teacher clearly answered the question. In the self-directed group, students asking similar questions were directed to a poster to discover the answer for themselves. This was a modified version of “self-teaching” as the student was provided the content and direction for what to learn (by the teacher) and did not decide everything about learning something new. The self-teaching form of instruction was chosen to give students the opportunity to guide their own learning while having the least possible interaction with the teacher.

The same 2-week unit of instruction was taught to one of two treatment groups: (a) low-relatedness: self-guided individual instruction and (b) high-relatedness: instruction with high levels of teacher-to-student interaction. For example, during the aerobic kickboxing lesson, the students in the low-relatedness group followed an instructor on a popular instructional DVD. When the high-relatedness group was taught the same lesson, however, the teacher was the instructor. Each participating teacher had previously familiarized himself with the moves, pacing, and instruction of the aerobic kickboxing lesson until he felt comfortable teaching it to his students.

On Day 1 of the intervention, the weight training unit was introduced. A lesson on flexibility was taught, and the AI-PE and IBS surveys were administered. On Day 2, a lesson on kickboxing was taught, and the SIMS-PE survey was administered. On Days 3 through 10, students participated in and completed assignments for various body-conditioning lessons. On Day 9, the SIMS was again administered. On Day 10, the AI-PE and IBS were again administered. One week following the intervention, the SMS II-PE was again administered to all students. Each treatment group consisted of four intact weight training classes. Surveys were administered pre- and

postintervention to all students in both treatment groups. Surveys were recorded by a team of research assistants and rechecked visually for missing data or keystroke errors. The resulting data set, $N = 166$, was used for subsequent analysis. All surveys were proctored using the same set of instructions that were read prior to each survey. Each survey has demonstrated acceptable levels of validity and reliability (Briere, Vallerand, Blais, & Pelletier, 1995; Guay & Vallerand, 2000).

Results

Motivational Responses

Contextual motivation. Group means, standard deviations, and effect sizes for SMS II-PE are shown in Table 1. Unexpectedly, there were significant preexisting differences between groups in contextual motivation (via SMS II-PE), indicating that the self-directed group began the intervention (a) more intrinsically motivated on a contextual level, $F(1,159) = 4.690, p < .05$; (b) had a higher sense of integrated regulation on a contextual level, $F(1,162) = 7.264, p < .05$; (c) felt more externally regulated on a contextual level, $F(1,162) = 6.772, p < .05$. Thus preexisting conditions were statistically controlled in all subsequent analyses. Surprisingly, after preexisting conditions were controlled, and the intervention was implemented, the self-directed group means for the more positive motivational indices (IM, INR, IDR, IR) were higher than the high-relatedness group (Table 1). However, the self-directed group also scored higher in the ER and AM constructs. This indicates that after the intervention, the self-directed group (a) felt more intrinsically motivated, $F(1,158) = 7.017, p < .05$; (b) felt a higher sense of integrated regulation, $F(1,162) = 8.932, p < .05$; (c) felt a higher sense of identified regulation, $F(1,160) = 6.543, p < .05$; felt a higher sense of introjected regulation, $F(1,158) = 8.383, p < .05$; felt more externally regulated, $F(1,162) = 6.986, p < .05$; and felt more amotivated, $F(1,163) = 7.085, p < .05$.

Situational motivation response. Group means, standard deviations, and effect sizes for SIMS-PE are shown in Table 1. Preintervention, the two groups differed significantly with respect to IR, ER, and AM but not IM. However, there were no significant differences between groups or within trials postintervention.

Table 1

Means and Standard Deviations and Effect Sizes for Low- and High-Relatedness Groups on Eight Questionnaires and 16 Subscales

Subscale	Low Relatedness		High Relatedness		ES
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
SMS II-PE 1 IM	4.98**	1.5	4.47	1.5	0.34 †
INR	4.12**	1.4	3.52	1.5	-0.240 †
IDR	4.89	1.3	4.56	1.6	0.225 †
IR	3.25	1.4	3.09	1.4	0.114 †
ER	2.20**	1.5	1.69	.89	0.411 ††
AM	2.13	1.4	1.84	.96	0.240 †
SMS II-PE 2 IM	5.36**	1.5	4.70	1.7	0.411 ††
INR	4.46**	1.6	3.68	1.7	0.472 ††
IDR	5.30**	1.5	4.65	1.7	0.404 ††
IR	4.00**	1.5	3.30	1.5	0.466 ††
ER	2.55**	1.8	1.94	1.2	0.399 †
AM	2.40**	1.7	1.82	1.0	0.417 ††
SIMS-PE 1 IM	5.49	1.3	5.18	1.3	0.238 †
IR	5.70**	1.2	5.23	1.4	0.361 †
ER	2.72**	1.6	2.03	1.1	0.501 ††
AM	2.08**	1.5	1.71	.83	0.30
SIMS-PE 2 IM	5.10	1.5	5.10	1.4	0.00
IR	5.43	1.4	5.26	1.4	0.121
ER	2.52	1.6	2.10	1.3	0.289
AM	2.00	1.2	1.77	1.1	0.200
AI-PE 1 Abl	1.60	.88	1.68	.86	-0.09
Eff	1.61	.88	1.83	.91	-0.245
Val	1.47	.88	1.55	.80	-0.095
Tsk	1.61	.91	1.67	.92	-0.065
AI-PE 2Abl	1.56	.98	1.74	1.0	-0.181
Eff	1.72	1.0	1.83	.94	-0.113
Val	1.48	.79	1.50	.68	-0.027
Tsk	1.76	1.2	1.79	1.0	-0.03
IBS 1 AS	5.11	1.3	5.29	1.0	-0.155
CS	5.47	1.2	5.77	1.0	-0.272
RS	5.44	1.3	5.56	1.0	-0.103
IBS 2 AS	5.24	1.4	5.29	1.3	-0.037
CS	5.54	1.0	5.73	1.2	-0.171
AS	5.3	1.3	5.70	1.2	-0.319

Note. †† Medium Effect Size. † Small Effect Size. $ES = (M_1 - M_2)/SD_{\text{pooled}}$. IM = intrinsic motivation; INR = integrated regulation; IDR = identified regulation; IR = introjected regulation; ER = external regulation; AM = amotivation; Abl = ability beliefs; Eff = effort beliefs; Val = values of a task; Tsk = characteristics of a task; AS = autonomy support; CS = competence support; RS = relatedness support.

**Significant correlations $p < .05$.

Amotivation response. Group means, standard deviations, and effect sizes for AI-PE are shown in Table 1. No significant differences were found between groups or within trials.

Needs support response. Group means, standard deviations and effect sizes for IBS are shown in Table 1. No significant differences were found between groups or within trials.

Reliability and Internal Consistency

Internal consistency of the SMS II-PE, SIMS-PE, AI-PE and IBS scales was assessed using Cronbach's α (Cronbach, 1951). All subscales from all four instruments ranged from .65 to .94. Acceptable reliability scores are generally considered to be $\geq .7$ (Cronbach, 1951; see alphas on diagonals of Tables 2–5).

The subscale correlations generally support the simplex pattern of the SMS II-PE. It is asserted that intrinsic motivation (IM) integrated regulation (INR), identified regulation (IDR), introjected regulation (IR), External Regulation (ER), and amotivation (AM) lie on a continuum. While this relationship pattern is consistent throughout the SMS II-PE (see Table 2, above and below diagonal), the distal relationships never reveal a negative correlation as with the original version of the SMS-PE used in Prusak et al. (2004). The absence of a pronounced simplex pattern, the marginally acceptable alphas (IRA1, a2 and AMA1) and the unexpected preexisting between-group differences in SMS II-PE 1, may lead the readers to question the suitability of the SMS II-PE for this setting and should interpret data with caution.

Table 3 contains the correlations between subscales of both SIMS-PE 1 (below diagonal) and SIMS-PE 2 (above diagonal) depicting the increasingly negative relationship for both trials. However, the simplex pattern is very much more pronounced in the SIMS-PE 2. Correlations in top row in Table 1 indicate that while IM is moderately positively related to IR, it is increasingly negatively related with ER and AM. Note also that the Cronbach alphas indicate that high internal consistency among subscale items across both trials. Thus, we can conclude that the SIMS-PE held up very well for use with this population.

Table 2*SMS II-PE Correlations and Cronbach's Alphas*

Subscales	IM	INR	IDR	IR	ER	AM
IM	.80, .85	.65**	.66**	.51**	.23**	.15
INR	.65**	.76, .85	.74**	.62**	.42**	.37**
IDR	.53**	.64**	.74, .86	.64**	.26**	.19*
IR	.39**	.59**	.47**	.65, .69	.59**	.47**
ER	.23**	.53**	.20*	.65**	.75, .79	.81**
AM	.18*	.42**	.14	.49**	.75**	.69, .76

Note. Correlations for SMS 1 are located below diagonal and for SMS 2 are located above diagonal. Cronbach alphas are located along the diagonal (α_1, α_2).

**Correlation is significant at the 0.01 level. *Correlation is significant at the 0.05 level.

Table 3*SIMS-PE Correlations and Cronbach Alphas*

Subscales	IM	IR	ER	AM
IM	.82, .86	.66**	-.16	-.26**
IR	.73**	.80, .80	-.17	-.21*
ER	-.11	-.06	.81, .85	.70**
AM	.00	-.01	.64**	.80, .78

Note. Correlations for SIMS-PE 1 are located below diagonal and for SIMS-PE 2 are located above diagonal. Cronbach alphas are located along the diagonal (α_1, α_2).

**Correlation is significant at the 0.01 level. *Correlation is significant at the 0.05 level.

Table 4 contains the correlations and alphas for the AI-PE. As expected, the four types of amotivation are moderately correlated with one another. There is no proposed ordering for these subscales. Rather, each subscale provides insight into the nature of student amotivation. The subscale alphas indicate an acceptable level of internal consistency across trials. It appears that this scale is suitable for use with this population.

Table 4*AI-PE Correlations and Cronbach's Alphas*

Subscales	Ability	Effort	Value	Task
Ability	.77, .85	.76**	.60**	.62**
Effort	.74**	.78, .80	.59**	.67**
Value	.68**	.66**	.80, .70	.68**
Task	.64**	.71**	.67**	.86, .87

Note. Correlations for AI-PE 1 are located below diagonal and for AI-PE 2 are located above diagonal. Cronbach alphas are located along the diagonal (α_1, α_2).

**Correlation is significant at the 0.01 level. *Correlation is significant at the 0.05 level.

Table 5 contains the subscale correlations and alphas for the IBS for both trials. As expected, perceptions of support for autonomy, competence and relatedness are moderately and positively correlated with one another. As with the AI-PE, there is no proposed order among these subscales. Notable is the marginally acceptable internal consistency in competence support in both trials (CS_{α_1} and CS_{α_2}). Despite this, the IBS appears to be an appropriate instrument for use in this setting.

Table 5*IBS1 and IBS 2 Correlations and Cronbach's Alphas*

Subscales	AS	CS	RS
AS	.78, .84	.79**	.82**
CS	.73**	.65, .68	.74**
RS	.73**	.69**	.70, .77

Note. Correlations for IBS 1 are located below diagonal and for IBS 2 are located above diagonal. Cronbach alphas are located along the diagonal (α_1, α_2).

**Correlation is significant at the 0.01 level. *Correlation is significant at the 0.05 level.

Discussion

The purpose of this study was to examine the effects of different teacher-to-student relatedness on the motivation of adolescent males in a junior high school weight training class. Using a quasi-experimental design, the researcher sought to create a sufficiently strong manipulation of teacher-to-student relatedness without sacrificing the quality of the learners' educational experience and learning outcomes. Thus, students were subjected to two conditions, high-relatedness, in which teachers maintained high levels of personal interaction with their students, and low-relatedness, in which students engaged in individualized or self-directed learning. Student preexisting contextual motivational perceptions of PE were assessed in order to identify and control for, if found.

Contextual Motivation Findings

The reason for using the SMSII-PE is that the researcher had to have a measure to test whether there were any preexisting conditions between the treatment groups. This was done because it was not possible to randomly assign students to one of two groups. Though intact classes were randomly assigned to either group, it could not be assured that they were drawn from the same population. Therefore the researcher used the SDT contextual motivation instrument (SMS II-PE) to assess any possible preexisting differences. Although none were expected, some were found. This is most likely due to the nature of the instrument rather than any actual preexisting differences. Nonetheless, those items were covaried for which differences were noted. Caution is recommended in placing too much importance on this contextual measure as the short nature of the intervention (10 days) is generally not likely to reveal any pre- or postcontextual motivational differences. Perhaps this instrument ought to undergo further psychometric testing and possibly refinement for use in this population.

Difficulty of Relatedness Interventions

A significant challenge to this study was the difficult nature of *interventional* relatedness studies in general. Compared to studies examining competence and autonomy support in PE, only a few relatedness studies exist in PE (see Shen et al., 2010; Shen et al., 2012) and

those being conducted use a cross-sectional design. Few, if any, PE intervention studies have been conducted in which relatedness was the primary manipulation. This is likely because establishing a control group presents a challenge to the researcher. Within the context of self-determination, relatedness denotes a positive experience between significant others (Shen et al., 2012). Therefore, the opposite of relatedness, by definition, would be to expose students to a negative school climate including negative teacher-to-student relationships. Moreover, of necessity, the environment would discourage feelings of belonging, caring, inclusion and acceptance while simultaneously decreasing student's feelings of importance and interpersonal support. Such ethical issues appear to be insurmountable barriers for a researcher to establish an authentic relatedness control group. For example, it would be both unwise and unsafe to place students in a learning environment where proper training and instruction were omitted, regardless of the duration of the intervention. Likewise purposefully consigning students to a negative instructional environment may exhibit both short-and long-term negative psychological effects.

Possible Autonomy Countereffect

Though not significant, the self-directed group seemed to be trending in increased situational motivation (see means Table 1 SIMS-PE IM, IR). This may be explained by the Hawthorn effect, where otherwise “ignored” students are benefitting from a battery of psychometric tests while having researchers watching and asking them questions. However, it is also possible that in an effort to create a low-relatedness group and remain ethically bound, the researcher designed an intervention which inadvertently elicited a response to the increase in autonomy, creating a countereffect that led students in the self-directed group to feel a greater sense of autonomy than the high-relatedness group. Perhaps the more “hands-off” teaching style was a welcome change for the students. Previous studies have indicated the import of students’ perceived autonomy in developing enhanced intrinsic motivation in the classroom (e.g., Prusak et al., 2004). Additionally, competence and autonomy are considered to be of greater consequence than relatedness with respect to intrinsic motivation (Deci & Ryan, 2000).

Social Needs Support

It may also be revealing to note that although differences were not significant, the high-relatedness group appeared to begin to sense more needs support from their teachers (see Table 1 means, SD, and effect sizes for both groups on IBS 1). This may indicate that within the short duration of the intervention (10 school days) students began to take note of the teacher paying more or less personal attention to them. Nevertheless, the possible perceived change (increase for self-directed and decrease for high-relatedness) in the student's autonomy appeared to have more effect upon the students internally-originated motivation than did teacher-to-student interaction (see Deci & Ryan, 2000).

Several indicators also suggest that the teachers had already established healthy relationships with their students before the intervention. The weight training classes in this study are elective classes, and it is quite possible that preexisting positive feelings toward the teacher led students to enroll. Furthermore, the preintervention mean score of all participants on the IBS scale (measuring perceived competence, autonomy, and relatedness support) was relatively high (5.5 on a 7-point Likert Scale,) suggesting students had already formed positively stable opinions of their teachers.

Since contextual motivation is considered more stable than situational motivation (Vallerand, 2007), previous opinions of students toward their teacher and weight lifting in general would likely change only with repeated and consistently negative situational experiences. Consequently, students may be able to endure 10 days of little to no interaction with their teacher and still maintain positive feelings toward the teacher. While other studies have shown relatively immediate responses to manipulations in situational autonomy (e.g., Prusak et al., 2004; Ward, Wilkinson, Graser, & Prusak, 2008) and competence (e.g., Tao, Solomon, & Xiangli, 2012), this study seems to indicate that perceptions of relatedness may not be as responsive to efforts of manipulation. Similar relatedness studies with longer intervention periods (e.g., semester or full year) may increase our knowledge of the impact of relatedness on both situational and contextual motivation.

Limitations and Conclusion

There are important limitations to this study. First, the participants were all boys. It does not address the female population in single-sex classes or both sexes in coed classes. Furthermore, classes were all elective rather than required. Second, the short duration of the intervention (2 weeks) may not have been long enough to adequately alter relational effects between teachers and students.

Even though the teachers were much more engaging and interactive in the high-relatedness group, ultimately the instruction was still teacher-centered, leaving the students to possibly begin to feel slightly more relatedness with the teacher but perhaps at the expense of their autonomy. When taken in context with the extant literature, the results of this study may indicate that teachers should not only strive to build healthy rapport with their students but must do so without undermining their sense of autonomy (see Mosston, 2002). It may be important for teachers to ensure that teacher-centered instruction (however supportive or entertaining) is delivered sparingly and intermittently within a cushion of student-centered learning activities which allow for more individualized feedback and interaction between students and their teacher. It seems therefore essential that teachers take care in meeting all the social needs of students rather than isolating one or two of those needs apart from the others. Relatedness support alone may be difficult to measure because as Shen et al. (2010) state, “a relatedness-supportive teacher is the one who demonstrates democratic interaction styles [which implies autonomy support], develops expectations for student behaviors in light of individual differences, models a ‘caring’ attitude toward their own work, and provides constructive feedback” (Shen et al., 2010, p. 428).

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