10-1-2006

Determinants of Physical Activity in an Inclusive Setting

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ADAPTED PHYSICAL ACTIVITY QUARTERLY, 2006, **23**, 390-409

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The purposes of this study included (a) to determine if the Theory of Planned Behavior (TPB) predicted intentions of individuals with and without disabilities to be physically active, (b) to determine if the TPB predicted behaviors of individuals with and without disabilities to be physically active, and (c) to determine if significant differences were present in physical activity opportunities between inclusive and non-inclusive elementary physical education classes taught by the same teacher. Students (N = 114, ages 10-13) completed questionnaires assessing the TPB constructs and had four days of PA evaluated through pedometer measurements. Analyses revealed that subjective norm and perceived behavioral control predicted students' intentions to be active, while behavioral intention was the only significant predictor of activity level by step count accrued in PE classes. Finally, the inclusion of students with autism did not significantly affect overall physical activity.

Numerous theories in psychology act as a foundation from which many health-related behaviors can be predicted. The Theory of Planned Behavior (TPB) is a frequently cited theory appearing in both past and present research. The TPB appears in the literature predicting behaviors including, but not limited to (a) class attendance, (b) exercise behavior, (c) fitness development, and (d) physical activity (Ajzen & Madden, 1986; Dzewaltowski, 1989; Martin et al., 2005). Predicting these types of behaviors, while significant for the adult population, is also important for younger populations in a nation with an obesity epidemic

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(Yin et al., 2005). Understanding the underpinnings of physical activity is essential for eliciting behavior change intended to improve the United States health crisis (Kirk, Scott, & Daniels, 2005).

In this study we used the TPB (Ajzen, 1985, 1991) to predict both physical activity intention and physical activity behavior. Blue (1995), through an in-depth, integrated literature review, concluded that the TPB is a promising framework for the study of exercise-related behaviors because it includes the beliefs about control of factors that would facilitate or inhibit carrying out that exercise.

Theory of Planned Behavior

Three variables predict intention to perform a desired behavior. According to the theory, three conceptually independent determinants of intention (Ajzen, 1991) include attitude toward a desired behavior (ATT), subjective norm (SN), and perceived behavioral control (PBC). These three antecedents create a framework from which behavioral intention (BI) to do something (e.g., be physically active) can be explained (Ajzen & Madden, 1986). Findings from a meta-analysis support the ability of the TPB to predict intention to exercise (Hausenblas, Carron, & Mack, 1997); in addition, Blue (1995) found that the TPB does predict a person's subsequent behavior. In our study, we used physical activity as this specific behavior, measured through pedometer steps and activity time.

The first of these determinants, attitude toward a given behavior, refers, in the current study, to the degree to which youth have a positive or negative appraisal of being physically active (Ajzen, 1991). The more favorable attitudes people have toward physical activity, the more likely they intend to participate in such a behavior. This variable is a function of psychological behavioral beliefs, which refer to the perceived consequences of carrying out a specific action and a personal evaluation of each of these consequences (Carron, Hasenblas, & Estabrooks, 2003). Researchers have reported that in healthy populations, the commonly cited behavioral beliefs regarding physical activity include improvements in psychological health, increases in social interactions, improvements in physical appearance, participation in fun/enjoyable activities, and improvements in fitness or health (Willis & Campbell, 1992).

The second forecaster of intention is subjective norm. This term refers to the perceived social pressure to either perform or not perform the specific behavior. Subjective norm is believed to be a function of normative beliefs, which are determined by the perceived expectations of significant others (e.g., classmates, parents, teachers, principals, youth group leaders) and by the individual's subsequent motivation to comply with these expectations (Carron et al., 2003). Peer pressure, an example of a subjective norm, from classmates and/or a teacher to be physically active in physical education class, can potentially be an immense determinant of whether an individual intends to be active or not.

The third precursor of intention is the degree of perceived behavioral control someone has or the sense of ease or difficulty of being physically active (Ajzen, 1985). This belief represents the perceived presence or absence of required resources and opportunities to do something. In addition, it refers to the perceived magnitude of a particular control factor to facilitate or inhibit performance of the behavior. Lack of time, lack of energy, and lack of motivation are cited as the three most reported inhibitors for individuals to be physically active (Canadian Fitness and Lifestyle Research Institute, 1996). In a physical education setting, these barriers may or may not come into effect, depending on a number of variables including, but not limited to (a) teaching style, (b) curriculum, (c) student nutrition, (d) socioeconomic status, and (e) subjective norm. For example, a teacher who is autocratic when delivering content and who requires complete control of his or her class may reduce the amount of choice allotted to students. In such an instance, students' PBC over being physically active will most likely be reduced, as physical activity opportunity will only be provided upon the teachers' volition.

The central determinant of behavior is intention. This construct is reflective in a person's willingness to carry out the behavior, in addition to how much effort he or she is planning to exert while performing the behavior (Carron et al., 2003). Thus, if a person has a strong intent to participate in physical activities and is motivated to participate fully, he or she is likely to do so.

Benefits of Physical Activity

It is especially important for children to develop strong intentions toward living a physically active lifestyle. Habits begin at an early age and will often transcend into adulthood (Pate, Baranowski, Dowda, & Trost, 1996). Scientists have indicated that nearly 21% of children ages two to five are obese, and by the time they enter adolescence (ages 12-19), this statistic rises to 30% (Crespo & Arbesman, 2003). Additionally, 80% of obese preadolescents grow into obese adults and an alarming 96% of obese teenagers become obese adults (Johnson, Burke, & Mayer, 1956). Physical activity is not only important for children to develop into healthy adolescents and adults, but also to reduce the risk of premature death, heart disease, high blood pressure, colon cancer, and of developing Non-Insulin-Dependent Diabetes Mellitus (NIDDM). Moreover, in youth, adequate physical activity can favorably influence cardiovascular disease risk factors (e.g., blood lipid profile, body mass index, resting blood pressure), improve muscular strength and endurance, build and maintain healthy bones and joints, and decrease feelings of depression and anxiety (Centers for Disease Control and Prevention, CDC, 1997; Tomson, Pangrazi, Friedman, & Hutchinson, 2003; United States Department of Health and Human Services, USDHHS, 1996).

Physical Activity Benefits for Individuals With Disability

Physical activity benefits are especially important for individuals with various physical, mental, and developmental disabilities (Cooper & Quatrano, 1999). Shifflett and colleagues (1994) provide information from their study explaining how physical activity provided many positive benefits for children and adolescents with functional disabilities, both at the individual and societal levels. Generally, persons with such disabilities have low physical fitness profiles that can be attributed to a myriad of factors, one of which being the lack of opportunity to participate in organized physical activity (Cluphf, O'Connor, & Vanin, 2001). Physical education in a school setting can provide an environment that is ideal for individuals to receive high levels of physical activity. In fact, Pangrazi, Corbin, and Welk (1996), along with Pate et al. (1996) brand a school setting as an opportune environment whereby activity levels of individuals with and without disabilities can be studied thoroughly.

Inclusive Physical Education

Within physical education, inclusion-based instruction has received a significant amount of attention in the past decade (e.g., Kozub, 2002) and has been explained as providing a realistic model of everyday life whereby inclusive classrooms simulate the real world where students with and without disabilities will coexist when they graduate (e.g., O'Neil, 1994). The inclusion of students of all ability levels into general physical education (GPE) classes can provide an environment wherein all students are able to receive adequate instruction and substantial physical activity (i.e., being physically active 50% of the class time as recommended by Healthy People 2010) without jeopardizing skills or cognition of classmates (e.g., Block & Zeman, 1996; Obrusnikova, Valkova, & Block, 2003; Vogler, Koranda, & Romance, 2000). It also can, however, result in negative experiences such as teasing and social segregation (Chamberlin, 1999; Place & Hodge, 2001).

Although including students in GPE has many benefits when employed successfully, it also comes with a number of difficulties (Block, 1999). Blinde and McCallister (1998) reported that one student indicated, "I participated in PE once, but I was just a line judge. I just sat there and cheered and did all that. I just sit and watch them and clap and stuff." When individuals with disabilities are included in GPE classes as scorekeepers, timers, or cheerleaders, they are cheated of an opportunity to be physically active and learn. Negative repercussions of such a scenario at an early age have been shown to depressingly affect perceptions of physical activity in individuals as they grow older (Thompson, Humbert, & Mirwald, 2003).

Barriers such as inadequate teacher training, lack of support, and low efficaciousness to teach individuals with disabilities arise when a teacher is attempting to implement an unfamiliar, inclusive environment (e.g., Block, 2003; LaMaster, Gall, Kinchin, & Siedentop, 1998). Such barriers, while difficult, should not excuse teachers' actions that trivialize students' physical education experience by assigning them to only inactive roles. While students may benefit from supportive roles, all children need physical activity.

Studies have revealed that children with and without disabilities can have positive outcomes while in an inclusive setting (e.g., Block, 1995; Block & Zeman, 1996; Obrusinikova et al., 2003; Vogler et al., 2000). Inclusion facilitates improvements in motor engagement, motor performance, and self-concept in children with mild intellectual disabilities (e.g., Block & Vogler, 1994; Houston-Wilson, Dunn, van der Mars, & McCubbin, 1997). Adapted Physical Education teachers (APE) can further help to create positive results in an inclusive setting. In 1996, Block and Zeman demonstrated how a middle school student with severe intellectual disabilities could be successfully integrated into a GPE class with help from an APE teacher. Similarly, DePaepe (1985) and Webster (1987) reported significant improvements in Academic Learning Time-Physical Education (ALT-PE) of students with disabilities using peer tutor help. These two examples show how inclusion experiences can be successful when the GPE teacher is supported.

Support in the form of peer tutors or APE teachers can be an immense help in classrooms, especially when students with severe disabilities are included. However, even slight modifications or adaptations will often suffice to create a positive experience for all students (Kasser & Lieberman, 2003). While some teachers worry that the performance of students without disabilities will decline or be jeopardized due to the burden placed upon the remainder of the class by those students with disabilities, academic and social benefits have been shown in both inclusive general education classrooms and physical education settings (e.g., Shanker, 1994/1995).

Researchers have consistently called for additional studies on inclusion that investigate physical activity opportunities using more diverse samples in a variety of settings (Faison-Hodge & Porretta, 2004; Trost, Pate, Freedson, Sallis, & Taylor, 2001). Furthermore, researchers have recommended that studies are needed investigating the impact of inclusion upon various dimensions of student well-being, such as social determinants of behavior and effects of inclusion upon all students (Block & Malloy, 1998; Houston-Wilson et al., 1997; Obrusnikova et al., 2003; Place & Hodge, 2001). Therefore, determinants of activity and possible effects of inclusion will be examined in the current study.

Findings from a meta-analysis support the ability of the TPB to predict intensions to exercise (Hausenblas et al., 1997). There are very few studies, however, that apply this theory to physical activity with young children (e.g., Martin & Kulinna, 2004; Martin et al., 2005). Examining determinants of youth's intentions to be physically active, along with physical activity behaviors in an inclusive setting of students, will add to the growing body of inclusive physical activity-based literature. This study will also reveal the opportunities for students with and without disabilities to be active in GPE classes. The following research questions guided this study: (a) Does the TPB predict the intentions of children with and without disabilities to be physically active? (b) Does the TPB predict the behaviors of children with and without disabilities to be physically active? and (c) Are there significant differences in physical activity opportunities between inclusive and non-inclusive elementary physical education classes taught by the same teacher?

Method

Participants

The participants in this study were 114 children (60 males, 54 females; *M* age = 11.21, *SD* = .68) from four classes (2 fifth-grade classes, 2 sixth-grade classes) within an elementary school in the Southwestern region of the United States. Class one (C1) and class three (C3) were physical education classes that each had four students with autism included in them ($n = 63$), while class two (C2) and class four (C4) were GPE classes without students with identified disabilities included ($n = 51$). The ethnic composition of the sample was mostly of Caucasian descent (78.4%), followed by a much smaller representation of African-American (3.9%), Hispanic-American (6.9%), Native-American (2.9%), and students who reported being from other ethnic backgrounds (7.8%).

Eight participants with autism participated in this study including seven boys and one girl. Although a number of rating scales exist in assessing the severity of autism (e.g., Autism Behavior Checklist, Autism Diagnostic Interview-Revised, Autism Diagnostic Observation Schedule), the Childhood Autism Rating Scale (CARS; Schopler, Reichler, & Renner, 1998) is a widely used instrument to make a comprehensive clinical assessment and is the scale that we used to assess children in the current study. This scale assigns children into one of three groups: (a) 15-30: non-autistic, (b) 30-36: mildly-moderately autistic, (c) 36-60: severely autistic. The eight children in the study all fell into the category of mildly-moderately autistic (M = 33.0, SD = 2.07), ranging in scores from 31 to 36, as assessed by students' special education teachers. These students were included in GPE classes on a regular basis throughout the school year, but often with a special education aide who would offer assistance to the GPE teacher throughout an entire lesson. In addition, these students were usually only integrated into GPE alone—without the company of any peers from their special education classes. This project built on the inclusion that was already present in physical education at the school by increasing the number of students included at one time. Students in GPE were accustomed to having peers with disabilities included in their class; this integration had been the standard procedure at the school.

In the current study, four students with autism were purposefully included into each of two different classes at the same time—without direct support—to determine the effect on both the teacher and other students. Albeit not ideal, this specific dimension of the design was implemented to create an inclusive environment realistic in schools today (Burgeson, Wechsler, Brener, Young, & Spain, 2001). Because the students with autism were occasionally pulled out of physical education, manipulation of their placement was required to create two inclusive classes. A special education aide was often present during the classes used in this study, in case of any unforeseen emergency that may have arisen, but did not provide any direct support to the teacher. The aide's physical presence alone, however, may still have been a contributing factor in helping to maintain on-task behavior (Block & Zeman, 1996).

One physical education teacher was responsible for teaching all of the classes participating in the study (without assistance or any direct support). She had been teaching K-6 physical education for twelve years and holds a K-12 physical education teaching certificate and a Master's degree in Education. She is not APENS (Adapted Physical Education National Standards) certified. During her teaching tenure, she has consistently used the Dynamic Physical Education (DPE; Pangrazi, 2004) curriculum in all of her classes. This is a district-wide curriculum with high fidelity in curricular use (e.g., teachers are given a weekly schedule and are observed regularly regarding their use of DPE). Participation in the current study was voluntary and permission was obtained at the university, district, school, parental, and student levels prior to data collection. Parental written consent forms and student assent forms were collected from all participants.

Dynamic Physical Education Curriculum

The DPE curriculum acts as a solid framework for successfully integrating all students into a physical education setting. Not only does this curricular model offer comprehensive and vibrant lesson plans developed with the student in mind, it also provides teachers with the opportunity to successfully include all students within each lesson and at each developmental level (e.g., Level 1: grades K-2; Level 2: grades 3-4; Level 3: grades 5-6; Bale, Pangrazi, Corbin, Petersen, & Pangrazi, 1994; Pangrazi, 2004; Rippee et al., 1990). These opportunities arise because the curricular model flexibility allows for changes in lessons, equipment, and activities to accompany students at any skill level.

Houston-Wilson and Lieberman (2003) outline three major points when teaching a student with autism in physical education. Their three recommendations are very compatible with the DPE curriculum and the tactics that are specifically useful when teaching students with autism: (a) organize and structure events into daily routines; (b) organize your teaching space, using boundaries; and (c) use schedules and calendars to structure class time and upcoming events. In the present study, the DPE curriculum contained all three of these recommendations. The DPE curriculum provides all children with the same opportunities to be physically active, a necessity for elementary school children who are only just beginning to reap the benefits of daily activity.

During a half-hour physical education class grounded in the DPE curriculum, the teacher participant adhered to the following breakdown: 2-3 min introductory activity, 7-8 min fitness development, 12-15 min lesson focus, and a 5-7 min closing activity. Classes in this school district meet two times per week, focusing on specific content (e.g., manipulative skills or gymnastic skills) in one or two-week blocks, all progressively building upon one another throughout a school year. Content varies according to the respective developmental level being taught.

This brand of physical education class, wherein inclusion is employed successfully through a combination of both a dynamic curriculum and proactive teaching style (e.g., equipment, instruction, and/or setting modification), brings to light children's strengths and weaknesses that are used to help perpetuate a successful inclusion experience (LaMaster et al., 1998). This experience combines a shared respect of ability level and includes sincere attempts at valuing others' personal uniqueness (Obrusnikova et al., 2003).

Instruments

Data were collected using two different instruments: a questionnaire and an electronic pedometer. The questionnaires were administered to assess TPB constructs in relation to being physically active, while the electronic pedometers were used to measure physical activity during half hour physical education classes.

***Pedometers*.** The MLS-LS2505 (Walk-4-Life, Inc., Plainfield, Illinois) model of pedometer was used in the current study and has the capability to measure steps and activity time concurrently. The accuracy, reliability, and validity of measuring physical activity levels have been achieved in similar populations through the use of electronic pedometers (Bassett et al., 1996; Beets, Patton, & Edwards, 2005). The MLS-LS2505 provides data on number of steps taken, activity time accumulated, and distance traveled (Schneider, Crouter, Lukajic, & Bassett, 2003). The pedometer records vertical movements as steps taken, making it an ideal activity measuring device in large settings (e.g., a school) for children, adolescents, and adults alike (Gretebeck & Montoye, 1992; Wilde, Corbin, & Le Masurier, 2004).

This pedometer has been validated and is considered an adequate device for measuring both steps and activity time (Beets et al., 2005; Schneider et al., 2003). Following Vincent and Sidman's (2003) calibration guidelines, a series of shake-tests were performed before and after the study to ensure that the pedometers were calibrated accurately. In addition, pedometers were sealed prior to data collection to ensure validity of steps taken and activity time accrued during physical education classes. Physical activity was determined by number of steps and amount of activity time accumulated.

TPB Questionnaire. A previously validated questionnaire was used in this study. This instrument has previously been shown to produce reliable scores in a similar population of youth (Martin et al., 2005). The development of this questionnaire was consistent with how numerous researchers have measured variables from this theory over the last 25 years (e.g., Ajzen & Fishbein, 1980; Martin & Kulinna, 2004). Based on this large body of research establishing validity, we are confident of the validity of scores from our present instruments for youth. Internal consistency scores have also been calculated for each instrument for our sample in the data analyses/results sections.

The TPB Questionnaire includes demographic questions and sixteen items related to determinants of students' physical activity using the TPB framework. Scales used a Likert-like scale with answer choices ranging from 1-7. Because the research team was interested in physical activity as an outcome of this model, the phrase "breathe hard or feel tired" was used as a descriptor to elicit accurate responses indicating that children understood what was being investigated. The phrase, "breathe hard or feel tired" has been effectively used in previous research with similarly aged children and has been deemed developmentally appropriate (Sallis et al., 1996).

TPB Questionnaire Scales. The attitude scale (ATT) is a 7 point Likert-like scale specifically designed to assess students' attitudes toward being physically active. Three questions pertaining to this variable were in the instrument, each with opposing affective adjectives as recommended by Ajzen and Madden (1986) and effectively used in previous research (Kimiecik, 1992). The three pairs of adjectives used were *bad/good*, *unenjoyable/enjoyable*, and *unhealthy/healthy*. The question used to assess this domain was, " Participating in physical activity that makes me breathe hard or feel tired is."

The Subjective Norm (SN) scale measures students' perceptions of how important it is to comply with critical individuals' goals within the microcosm of a school (i.e., classroom teachers, parents, physical education teachers, and fellow classmates). As stipulated by the TPB, subjective norm was determined by multiplying students' perceptions of important social groups' beliefs by their motivation to comply with those beliefs. Based on the four groups noted above and previous research studies (e.g., Chester & Beaudin, 1996; Hoover-Dempsey, Bassler, & Brissie 1987; Hoy & Woolfolk, 1993; Martin et al., 2005), eight items were used to measure this variable in our study, such as "My parents believe that it is important that I participate in physical activity that makes me breathe hard or feel tired" and "How important is it to you that your parents believe you should participate in physical activity that makes you breathe hard or feel tired?" Items within this category had opposing answers of *strongly disagree/strongly agree* and *not at all important/very important* on a 7 point Likert-like scale.

The Perceived Behavioral Control (PBC) scale was modeled after similar scales used in previous research studies (e.g., Ajzen & Madden, 1986; Dzewaltowski, Noble, & Shaw, 1990; Yordy & Lent, 1993) and asked participants to answer the following two questions: "It is mostly up to me whether I participate in physical activity that makes me breathe hard or feel tired" and "If I want to, I can participate in physical activity that makes me breathe hard or feel tired." Responses options were ranged from s*trongly disagree* to *strongly disagree* on a 7-point Likert-like scale.

The Behavioral Intention (BI) statements recommended by Ajzen (1991) and Dzewalkowski (1989) for assessing intentions to participate in physical activity or exercise were used in this study. There are three questions on this scale, for example, "I will try to do physical activity that makes me breathe hard or feel tired tomorrow." Response options range from *definitely false/definitely true* to *definitely do not/definitely do* using a 7-point Likert-like scale.

Design and Procedures

Pedometer Orientation. Prior to data collection, each class of students was taught how to wear a pedometer properly during 10-15 min sessions. During these sessions, children were asked to attach the pedometer to his or her waistband and move about the gymnasium; this was an orientation to the measurement device and its step-counting abilities. Pedometers have been regularly worn in physical education classes within this elementary school so students were already familiar with them and did not ask many questions regarding their usage.

Pedometer Data. Over a two-week period, pedometer data were collected in four physical education classes (2 fifth-grade, 2 sixth-grade) taught by the same teacher. Each of the four classes met two times per week and students' steps and activity time were recorded four separate times during this two-week period. Trost et al. (2000) as well as Vincent and Pangrazi (2002) recommend that when using pedometers, four or five days is suitable time to obtain acceptable reliability levels for measuring elementary school children's physical activity.

Students were given the same sealed pedometer during all four data collection days to eliminate inter-instrument error. Each day of data collection, participants were given their respective pedometer prior to entering the gymnasium. Pedometers were sealed with a plastic tie each day during the two weeks of data collection to ensure that students would not reset, tamper, or accidentally leave the pedometer open while moving. In addition, sealing pedometers during data collection reduces reactivity as a confounding variable that could possibly alter the results and jeopardize the validity of the study (Vincent & Pangrazi, 2002). There were no concerns regarding students with or without Autism wearing the pedometers, which may be attributed to their previous experience wearing pedometers.

Participants were instructed to wear the sealed pedometers 2-3 inches to the right of their navel, in line with the midpoint of the right knee, and on the waistband of their pants/shorts. Students wore the pedometers for the duration of each physical education class and then placed them on the stage before exiting the gym.

Total step count and total activity time for each student were recorded at the end of each class.

The physical education specialist was instructed to teach as she did prior to the commencement of the study—without any change to her teaching style. During week one of data collection, throwing/catching was the DPE lesson focus, while week two consisted of a track-and-field focus with classes held outside. Two of the classes (i.e., C1 and C3) each had four students with disabilities purposefully included into them.

Questionnaires. The questionnaires were administered to the students in their regular classroom settings, all at the same time. Classroom teachers were supportive in administering these instruments to their students. Classroom teachers were provided with a thorough oral explanation of the instrument make-up, as well as administration directions. In addition, each classroom teacher was provided a written script of step-by-step directions to adhere to while administering the questionnaires. All students participating in the study completed their respective questionnaires individually and during the week immediately proceeding pedometer data collection. Two students with Autism needed and were provided additional assistance in comprehension of the survey questions. The special education teacher assisted these students, providing further explanations of the questions, to ensure that the students comprehended the questions before answering.

Data Analysis

Students' pedometer data were omitted if they did not participate in at least two of the four recorded physical education classes. If a participant had incomplete pedometer data, but had ≥ 2 days of data complete, an individual-centered method of data replacement was utilized as recommended by Rowe, Mahar, Raedeke, and Lore (2004). Internal consistency reliability was determined for each of the questionnaire's components using Cronbach's alpha (Cronbach, 1951).

Students' Physical Activity Intentions and Behaviors. To determine if the TPB variables predicted students' intentions and behaviors, correlation and regression analyses were conducted. Initially, correlations were run using untransformed variables in a standard multiple regression to produce scatterplots. Overall, negatively skewed shapes were elicited. Because these scores had a moderate to substantial negative skew, the variables were transformed to help reduce skewness, reduce the number of outliers, and improve the normality, linearity, and homoscedasticity of the residuals as recommended by Fox (1991) and Tabachnick and Fidell (2001). A square root transformation was used on the attitude (ATT) and subjective norm (SN) variables, whereas a logarithmic transformation was used on the perceived behavioral control (PBC) and behavioral intention (BI) variables. After transformation, there was no serial correlation present in the residuals; for example, Durbin-Watson scores were 1.99 and 1.83 (Bland & Altman, 1996; Fox, 1991). The transformed variables' correlations are noted in Table 1. Multicollinearity was then checked before running new regression analyses to affirm that the independent variables were not too highly correlated with one another; all sets of variables satisfied this condition ($r < .90$). In addition, VIF values were < 2 and Tolerance values were $> .7$, supporting the absence of multicollinearity (Cohen, Cohen, West, & Aiken, 2003).

Table 1 Correlations among all Transformed Psychological Variables, Pedometer Steps, and Activity Times

	ATT	SN	PBC	BI	ST
ATT					
SN	.49***				
PBC	.39***	.40***			
BI	.37***	.44***	.39***		
ST	.13	.06	.13	.18**	
TI	.09	.05	.08	.17*	.97***

Note. ATT = (square root of) Attitude; SN = (square root of) Subjective Norm; PBC (log of) Perceived Behavioral Control; BI = (log of) Behavioral Intention; ST = Pedometer Steps; TI = Pedometer Activity Time

Note. ***$p < .01$, **$p < .05$, *$p < .10$

Physical Activity in Inclusive and Noninclusive Settings. The third research question was answered using an independent samples *t*-test to investigate possible differences in physical activity behaviors between inclusive and non-inclusive settings. A *t*-test was also used to check for gender differences in physical activity behaviors. In addition, descriptive statistics, including means, standard deviations, and ranges for numerous variables were calculated. Note that separate analyses were not performed on exercise time due to its high correlation with steps (.97).

Results

Internal Reliability

Cronbach alpha values (Cronbach, 1951) shared a high level of inter-item agreement for ATT (.74), SN (.84), and BI (.88) and all were considered adequate based on Nunnally's (1978) minimal criteria of .70. PBC (.64) was just below the .70 cut-off for "adequateness," most likely due to the small number of items (i.e., two) on this scale, thus eliciting a lower internal consistency.

Student Intentions

Descriptive Statistics. Findings show that students' intentions to be physically active were strong ($M = 5.82$, $SD = 1.52$). Students also indicated that they have positive attitudes toward participating in physical activity ($M = 5.54$, $SD = 1.20$), in addition to a strong concern for others' (parents, physical education teacher, classroom teacher, and classmates) opinions regarding their activity levels ($M = 5.27$, *SD* = 1.12). Finally, students reported a strong sense of behavioral control when determining their personal level of physical activity (*M* = 6.19, *SD* = 1.22).

Correlation and Regression Results. A hierarchical regression analysis was conducted to determine how well psychological constructs in the TPB predicted BI. The TPB was evaluated using ATT, SN, and PBC as a block, that is, as IV's predicting BI. Beta weights and multiple regression R^2 values are reported in Table 2.

The TPB constructs entered contributed significantly to the prediction of BI, $F(2, 110) = 12.86$, $p < .001$ and predicted 26% of the variance in BI. Although ATT and BI were correlated at .37, ATT was not a significant predictor in this regression model. This regression analysis showed that the more students felt in control and had expectations placed upon them, the stronger students' intentions to perform physical activity.

Student Behaviors

A second regression analysis was performed to determine if intentions could predict children's behaviors, as well as if attitude, subjective norm, and control could predict behavior when mediated through intention. Because the TPB suggests that intentions directly predict behavior, students' intentions were entered as the first block. ATT, SN, and PBC were then added as the second block (since according to the TPB they only predict behavior through intentions).

This study supports behavioral intention predicting physical activity with regard to number of steps taken, $F(1, 112) = 3.83$, $p = .05$, the greater an individual's intention to be physically active in an inclusive setting, the greater likelihood that they will follow through and perform this behavior. Attitude, subjective norm, and control did not significantly add to the prediction of behavior beyond students' intentions. Beta weights and multiple regression R^2 values are reported in Table 3.

Effects of Inclusion

An independent samples *t*-test was utilized to test for significant differences in activity level between inclusive and noninclusive classes. There was no significant difference between the groups on number of steps, inclusion-based classes (*M* = 1145.42, *SD* = 302.41), and GPE classes (*M* = 1130.85, *SD* = 237.69). Finally, the *t*-test investigating possible gender differences in physical activity was also not significant. A complete breakdown of step and activity time averages by gender is illustrated in Table 4 scaled to represent one class session.

During the 4 days of physical activity data collection, the average total number of steps was *M* = 1138.90, *SD* = 274.28, and average activity time was *M* = 13:07, *SD* = 2:30. The physical activity measures differed by the content taught. On Days 1 and 2, measurements were taken when the content was throwing and catching activities. The number of steps (*M* = 901.28, *SD* = 225.42) and activity time (*M* = 11:12, SD = 2:14) during these lesson were, expectedly, lower. On Days 3 and 4, measurements were taken during track-and-field activities with an average step count (*M* = 1376.53, *SD* = 398.87) and activity time (*M* = 15:02, *SD* = 3:28) that were, without surprise, higher during this outdoor unit.

Table 2 Results of Hierarchical Regression Predicting Behavioral Intention

Step	Variable	*R*	*F*	*df*	*P*<	< ΔR^2	*p* < ΔR^2	*B* at entry	*P*
1	ATT	.26	12.96	110	.001	.26	.001	.10	.14
	SN							.22	.01
	PBC							.24	.02

Note. ATT = attitude, SN = subjective norm, PBC = perceived behavioral control.

Table 3 Results of Hierarchical Regression Predicting Steps

Step	Variable	*R*	*F*	*df*	*P*<	< ΔR^2	*p* < ΔR^2	*B* at entry	*P*
1	INT	.03	3.83	112	.05	.03	.05	.169	.05
2	ATT	.04	.42	109	.74	.01	.74	.043	.43
	SN							–.047	.48
	PBC							.019	.58

Note. INT = intention, ATT = attitude, SN = subjective norm, PBC = perceived behavioral control.

Table 4 Means by Gender for Four Days of Step and Activity Time Pedometer Data

	C1/C2 ST	C1/C2 TI	C3/C4 ST	C3/C4 TI	Total ST	Total TI
Males	928.65	11:29	1435.48	15:22	1182.06	12:28
Females	870.86	10:54	1311.04	14:39	1090.95	12:07
Totals	901.28	11:12	1376.53	15:02	1137.79	13:07

Note. C1/C2 = Throwing & Catching Lesson Focus; C3/C4 = Track & Field Lesson Focus; ST = Pedometer Steps; TI = Pedometer Activity Time

Discussion

Predicting Intentions/Behaviors in an Inclusive Environment

Yielding similar findings to other studies that used the TPB to study individuals' intentions and physical activity behaviors (Martin & Kulinna, 2004; Martin, Hodges-Kulinna, Eklund, & Reed, 2001), we found that subjective norm and perceived behavioral control predicted intention to be active. Regression analyses revealed that the TPB accounted for 26% of the variance in predicting BI and was supportive of the TPB constructs of SN and PBC in predicting intention. In addition, intention predicted behaviors accounting for about 3% of the variance in predicting physical activity behavior (i.e., steps). These findings add to the growing body of literature supporting the TPB in predicting intention and physical activity behavior in youth (Martin & Kulinna, 2004; Martin et al., 2005). Thus, students are more likely to participate in physical activity if they are positively disposed to it, if they receive social influence to do so, and if they believe they will be successful (Armitage, 2005). This model has shown competence in past exercise research and again, has been supported by the current study.

Contrary to a study examining physical activity in a similarly aged population (Mummery, Spence, & Hudec, 2000), attitude was not a significant predictor in our study using the TPB model. Mummery and colleagues found that for their sample of 10-year-old participants ($N = 155$), ATT accounted for the most variance in BI, while SN accounted for the least amount. On the other hand, our findings support the findings of Martin et al. (2005) with subjective norm and perceived behavioral control as critical predictors of students' intentions to be physically active. The Martin et al. (2005) article suggests that the age of participants in a sample may play a role in this finding. The young participants ($M = 11.21$) in our study may have been reliant on the influences and directions of adults, minimizing the effects that individual attitude may have in an inclusive setting.

Inclusive and Noninclusive Environments

Burgeson and colleagues (2001) found that only 23.3% of schools requiring physical education have an adapted physical education specialist to work either independently with students or in unison with the GPE teacher. The GPE teacher is solely responsible for teaching students with disabilities in 83.4% of the public schools in the United States that require both PE for their students and serve learners with disabilities (Burgeson et al., 2001). This is an overwhelming statistic, considering that nationwide, an APE certification is not a prerequisite to teach physical education. Most physical educators want to be the best teacher possible for all of their students; however, many GPE teachers have had very little training and may be insufficiently prepared to successfully and meaningfully integrate children with disabilities into their programs (Block, 2003).

Because physical educators are being increasingly asked to teach in inclusive settings and required to provide the Least Restrictive Environment (LRE) for all students (Burgeson et al., 2001), both teachers and researchers need to provide evidence to support positive inclusion implementation. Based on physical activity levels alone, this study illustrates how the integration of students with disabilities into a GPE class may not detrimentally affect children without disabilities when using a solid curriculum, even when direct support is not provided to the GPE teacher.

Mean step counts and total activity times (shown in Table 4) measured via pedometry indicated there were no differences between classes that had students with autism included in them and those that did not. These are promising findings for teachers that are teaching inclusive classes, giving some hope for teachers that teach in similar situations. Current opponents of this paradigm, however, often argue that including students with disabilities into GPE classes will negatively affect the physical education program for those students' non-disabled counterparts—a valid concern (e.g., Lavay & DePaepe, 1987).

Other scientists in the field have examined this phenomenon—the influence students with disabilities have upon their nondisabled peers—and have used a variety of methodologies and dependent variables. Obrusnikova et al. (2003) examined the impact of including a student who uses a wheelchair and who was given no direct support in a fourth-grade GPE class. The impact this student had upon his classmates without disabilities was the central focus. Obrusnikova et al. found no significant differences in motor skill gains between inclusive and noninclusive classes and that the cognition and skill development of students without disabilities was not comprised. In addition, students had positive attitudes toward inclusion. Physical activity opportunities, however, were not examined.

In terms of inclusion effectiveness, a substantial number of other studies have contributed to the idea that with proper teaching conditions in GPE, the inclusion of students with disabilities will not negatively affect students without disabilities—in terms of motor skill learning (Block & Zeman, 1996; Rarick & Beuter, 1985; Vogler et al., 2000), on-task behavior (Murata & Jansma, 1997; Vogler et al., 2000), and social acceptance (Vogler et al., 2000). Faison-Hodge and Porretta (2004) compared physical education and recess physical activity levels of elementary school children with mild mental retardation (MR) and students without disabilities who had low or high cardiorespiratory fitness. They found students with MR and those with low fitness had similar physical activity patterns in physical education and recess settings.

Finally, our study has some limitations. Although encouraging for proponents of inclusion, conclusions from this study need to be drawn with caution. Participants within this study were not diverse; most of the children were Caucasian-American and from one elementary school. A larger, more representative and randomly selected sample may have elicited different results in questionnaire and pedometer data.

Another limitation is that this study only included students with one type of disability (i.e., autism), all of whom were purposefully placed to simulate an inclusion experience. This simulation is a limiting factor of our study, as completely natural conditions may have elicited different results. Oftentimes in a GPE setting, a teacher instructs students with varying levels of developmental and mental functions—a scenario that may have modified the results of this study. Future researchers should examine students included into GPE classes who have an array of disabilities (e.g., ADHD, cerebral palsy, Fragile X syndrome, etc.). Moreover, future studies on inclusion effectiveness need to also address student attitude, social interaction, cognitive acquisition, and motor skill development in inclusion environments.

Findings from this study are promising for teachers and inclusion proponents alike. The major goal of the study was to test the ability of the TPB to predict intentions to be active and physical activity behavior in an inclusive setting. Based on our regression analyses, we found that the theory is predictive of both of these variables and is an adequate model that can increase the success for practitioners and researchers to predict, understand, explain, and ultimately change physical activity behavior in youth.

In addition, it was found that there were no significant differences between activity levels in classes that had students with autism included into them and in those that did not. While inclusion is, by no means, a panacea to cure all the ills in the current education system, it is a pragmatic paradigm that can be effective when implemented properly.

Many schools, however, do not have access to all of these options (e.g., APE teacher, special education aides, one-on-one teacher assistants), and inclusion without teacher support is often a reality. In such instances, effective classes can still be facilitated, however, with a teacher who is willing to adapt and modify his or her pedagogy and curriculum to accommodate the needs of the students. The TPB continues to predict individual behaviors through intentions.

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