

Nonspecialist, Preservice Primary-School Teachers: Predicting Intentions to Teach Physical Education

Guy Faulkner

University of Toronto, Canada

Colin Reeves

University of Greenwich, UK

Sue Chedzoy

University of Exeter, UK

The purpose of this study was to establish the utility of the theory of planned behavior in predicting nonspecialist, preservice primary-school teachers' intentions to teach physical education for 2 hr per week. A questionnaire was developed according to the recommended procedures and was administered to 128 final-year teacher trainees in two primary-teacher training courses in England. A variety of predictors were identified including: beliefs of significant others, such as parents; a positive assessment of control over difficult barriers; and experiences of past (teaching) behavior. The most significant predictor in discriminating between intenders and nonintenders, however, was personal exercise behavior. Helping preservice primary-school teachers become more physically active themselves might positively influence their intentions to teach physical education 2 hr per week more than alleviating barriers to teaching physical education.

Key Words: theory of planned behavior, attitudes, exercise

Physical education is a critical setting for promoting health-related physical activity (McKenzie, Marshall, Sallis, & Conway, 2000) and physical education experiences could have important implications for the health, future exercise participation, and well-being of children (Malina, 1996). Concerns about the quality of physical education that children receive now and in the future, however, are readily apparent (Hardman & Marshall, 2000). In England there is a National Curriculum for pupils age 5 to 16 years. It is presented in four key stages: Key Stage 1

Faulkner is with the University of Toronto, Faculty of Physical Education and Health, 55 Harbord Street, Toronto ON, M5S 2W6, Canada. Reeves is with the University of Greenwich, School of Education and Training, Bexley Road, Eltham SE9 2PQ, UK. Chedzoy is with the University of Exeter, School of Education and Lifelong Learning, Heavitree Road, Exeter EX1 2LU, UK.

for pupils age 5 to 7 years, Key Stage 2 for pupils age 7 to 11 years (the primary phase), Key Stage 3 for pupils from 11 to 14 years, and Key Stage 4 for pupils from 14 to 16 years (the secondary phase). Traditionally Key Stages 1 and 2 are taught by primary-school teachers. These teachers are responsible for delivering the entire National Curriculum even though they might have a subject specialization other than physical education.

Many primary-school teachers are required to teach the core subjects of English, math, and science and the foundation subjects of art, design and technology, geography, history, information and communication technology, music, physical education, and religious education. The programs in the national physical education curriculum that are to be delivered in the primary phase include dance, gymnastics activities, and games activities at both Key Stages 1 and 2. Swimming must be taught at either Key Stage in the primary curriculum, and at some point in the 4 years of the Key Stage 2 program, the pupils must be taught athletics activities (track and field) or outdoor and adventurous activities (Department for Education and Employment & Qualifications and Curriculum Authority, 1999).

The limited time allocated to initial teacher training (ITT) in physical education has been an ongoing concern of the professional associations in England. Research (Carney & Armstrong, 1996; Office for Standards in Education [OFSTED], 1998) has revealed that few trainees experienced the minimum 60 hr training that has been recommended since the 1970s by the Physical Education Association of the United Kingdom and the British Association of Advisers and Lecturers in Physical Education. In their inspection of 20 ITT providers, OFSTED (1998) praised the teaching in the general physical education courses as good or very good, but they expressed concern about the trainees' subsequent experience in school-based work in their training. In ITT one-year postgraduate courses (PGCE), which include 24 weeks in school-based training, the majority of trainees did not have the opportunity to teach at least ten lessons. Other research into the experiences of trainee teachers during their school-based training during a PGCE course (Chedzoy, 2000; Rolfe & Chedzoy, 1997) found that preservice teachers had variable experiences in their school placements, with few feeling that they had worked with a teacher who was both confident and competent enough in supporting them to allow them to develop their subject knowledge of physical education or a sense of how to teach the subject.

In their latest report on physical education in primary schools, OFSTED (2003) inspectors pointed out that physical education teaching effectiveness is reduced by weaknesses in teachers' subject knowledge of the full range of the programs of study. As in previous reports, this inspection revealed that pupils in primary schools rarely experience the full range of activity areas in physical education. This is exacerbated by broader government initiatives that, since 1997, have sought to address raising the standard of primary-school pupils' achievements in numeracy and literacy; the result has been to marginalize the foundation subjects, including physical education. Several surveys conducted since the introduction of these initiatives have identified a reduction in time allocated to primary physical education because of other academic pressures (see Central Council of Physical Recreation, 2001, for an overview).

The Government has recently turned its attention to investing in high-quality physical education and school sport. In October 2002 the British Prime Minister launched the Physical Education, School Sport, and Club Links (PESSCL)

strategy, which is aimed particularly at the 5-16 age group. A key goal is to increase the percentage of school children in England who spend a minimum of 2 hr per week engaged in high-quality physical education and school sport both in and beyond the curriculum; the target is for 75% of school-age children to reach this goal by 2006. Currently, approximately one quarter of the schools provide this at Key Stage 1 and about one third at Key Stage 2 (Department for Education and Skills & Department for Culture, Media and Sport, 2003). Much of this physical education is taught by nonspecialist physical education teachers.

Research has continued to identify important differences in physical education lessons delivered by specialist and nonspecialist teachers (e.g., McKenzie, Feldman, Woods, et al., 1995). In a descriptive analysis of nonspecialist elementary physical education teachers' curricular choices and class organization in southern California, Faucette, McKenzie, and Patterson (1990) found that children "enjoyed few opportunities to either develop physical skills or improve their fitness levels during class time" (p. 291). Furthermore, teachers frequently permitted children to engage in free play or dropped physical education classes from the day's schedule altogether. This study suggests that the nonspecialist teachers are a major determinant of whether children engage in 2 hr per week of physical education, and it is unlikely that all English primary schools will hire specialist physical education teachers (Warburton, 2000).

Because intentions are major determinants of behavior (Fishbein & Ajzen, 1975), understanding the determinants of nonspecialist teachers' intentions to teach physical education is an important first step towards realizing the goal of 2 hr per week of physical education in primary schools. Little is known about teachers' intentions, however, or the determinants of those intentions (Martin, Kulinna, Eklund, & Reed, 2001). Therefore the theories of reasoned action and planned behavior might be informative in identifying these.

Theoretical Framework

The theory of reasoned action (TRA) of Fishbein & Ajzen (1975) details the determinants of an individual's decision to enact a particular behavior. The theory proposes that the central determinant of behavior is an individual's intention to perform that behavior. Intention is influenced by two psychosocial determinants: attitude and subjective norms. Attitude is a positive or negative evaluation of performing the behavior. Subjective norms reflect the perceived social pressure to perform or not perform the behavior. Because not all behaviors are under volitional control, a third determinant, perceived behavioral control (PBC), was added to the model to form the theory of planned behavior (TPB) (Ajzen, 1991). Perceived behavioral control refers to the degree to which an individual feels that performance is under his or her control. Overall, the TPB suggests that individuals form intentions based on attitudes, subjective norms, and perceptions of behavioral control. In addition, the latter determinant can also directly determine behavior when PBC can be considered to function as "a partial substitute for" (Ajzen & Madden, 1986, p. 459) actual control over factors that could interfere with performance of the behavior.

Findings from a number of meta-analyses and narrative reviews of the TPB (Sutton, 1998) suggest that the prediction of behavioral intention from attitude, subjective norms, and PBC is reasonably consistent, explaining between 40% and 50% of variance. Sutton (1998) concluded that the TPB performs well in comparison

with typical effect sizes in the behavioral sciences. Armitage and Connor (2000) suggest that the TPB is a superior predictor of intentions and behavior in comparison with other common social-cognition models.

Most important, in the present context the TPB model might be an appropriate framework for understanding the work-related behaviors of professionals (e.g., Faulkner & Biddle, 2001). Using the TPB model, a recent study examined the determinants of specialist physical education teachers' intentions to teach physically active classes. In a cross-sectional study of 187 U.S. physical education teachers, Martin and colleagues (2001) found support for the TPB: 65% of the variance in intention to teach physically active classes was found to be a result of attitudes, subjective norms, and their interaction effects.

The TPB is continually evolving as additions are made to the model that increase its predictive validity; three additions are considered in this study. The role of past behavior has been found to be an independent predictor of both intention and behavior (e.g., Rutter, 2000) while attenuating other TPB relationships (Hagger, Chatzisarantis, & Biddle, 2002). Past behavior does not cause subsequent behavior, but it might inform the intention to act, in addition to attitudes and subjective norms, or it might reflect an individual's assessment of the extent of PBC.

A second refinement to the model is the inclusion of self-efficacy. Self-efficacy, independent of perceived behavioral control, has been found to have a significant influence on intentions, which supports its inclusion in the TPB (Hagger, Chatzisarantis, & Biddle, 2002). This might reflect internal and external aspects of control in operation (Terry & O'Leary, 1995). That is, self-efficacy might reflect internal aspects of control, such as perceived ability, whereas perceived behavioral control reflects external aspects of control, such as the influence of external barriers on behavior. Martin et al. (2001) adopted a microanalytic, hierarchical-task approach to assessing behavioral self-efficacy and assessed the strength of self-efficacy for seven levels of increasing difficulty for providing physical activity during class time. In contrast to this assessment of general perceptions of self-efficacy, Bandura & Cervone (1983) measured self-efficacy by eliciting salient barriers and constructing a self-efficacy variable using items derived from the responses. Hagger, Chatzisarantis, and Biddle (2001) suggest that this conceptualization of self-efficacy provides a more explicit means of eliciting an individual's overall judgment of self-efficacy.

A final refinement to the model was added by the inclusion of self-identity. Self-identity can be defined as "the salient part of an actor's self which relates to a particular behavior" (Connor & Armitage, 1998, p. 1444). For example, a teacher might regard herself as someone who is concerned about the physical health of her students. For Charng, Piliavin, and Callero (1988), intentions are likely to be based on central or salient role identities, which encapsulate individuals' wider social context by linking a particular behavior to an identifiable social characteristic, such as being health conscious. Evidence supports the role of self-identity in predicting intentions (e.g., Terry, Hogg, & White, 1999). This self-identity could, in part, reflect personal exercise behavior. For example, in a US study (McKenzie, LaMaster, Sallis, & Marshall, 1999), teachers who were more physically active were found to provide more time for physical fitness and spent more time promoting physical fitness in their classes.

The purpose of this study, therefore, was to establish the utility of the TPB in predicting the intentions of nonspecialist, preservice primary-school teachers to teach physical education for 2 hr per week. The role of past behavior, self-efficacy,

and self-identity in augmenting the predictions of the theory was also addressed. Finally, the role of personal exercise behavior and barriers to teaching physical education were explored as predictors of intentions. Understanding the determinants of intentions to teach physical education in the primary-school setting might offer insight into how teacher training institutions can structure learning experiences for nonspecialist preservice teachers in a grounded theoretical framework that encourages a commitment to teaching physical education for the statutory requirement of 2 hr per week.

Method

Participants and Procedures

The 128 participants were primary-school teachers-to-be in their final year at two universities in the south of England. The teacher-training programs at these two universities provide preservice primary-school teachers with curriculum experiences in gymnastics, dance, and games. The experiences include both theory and practice, and both programs follow the expectations laid down in the National Curriculum for Physical Education (Qualifications and Curriculum Authority, 1999). A preliminary set of analyses (predicting behavioral intentions, intenders, and nonintenders) was conducted to identify the necessity of examining the data separately for each of these university programs. The only difference between the two samples on all variables consisted of higher scores on two TPB variables. Participants from one program reported significantly higher Perceived Behavioral Control and Self-Identity scores. Controlling for the effects of program location, however, did not change any of the results of the analyses. Therefore, all analyses were performed on the collapsed sample from both universities. Most participants were female ($n = 117$), had a mean age of 26.44 years (± 5.95), and were predominantly White (97%). Course directors for each program gave consent for the inventories to be administered during scheduled cohort course meetings: Questionnaires were completed anonymously and returned. Normal informed consent and ethical procedures were followed and conformed to the guidelines of the British Psychological Society.

Measures

For this cross-sectional survey, a questionnaire was developed that initially asked participants to report their gender, age, and ethnicity. The second section used questions derived from the TPB and was based on the recommendations of Ajzen and Fishbein (1980). The category of intention was measured by participants responding to two separate statements: "During the next school year, I will be teaching physical education for two hours a week" and "I intend teaching physical education for two hours a week during the next school year". These items were scored on a 7-point semantic differential scale anchored by the word pair *likely/unlikely*. Responses to the two items were merged to provide a measure of behavioral intention that was internally consistent (Cronbach alpha = 0.84).

Modal salient beliefs about the consequences of teaching physical education for 2 hr per week and relevant referent groups were identified using a small pilot study of 41 preservice primary-school teachers using the procedures outlined by

Ajzen and Fishbein (1980). This produced a total of 11 behavioral beliefs and six referent groups. Belief strength was measured by means of unipolar scales from 1 (*very unlikely*) to 7 (*very likely*) and outcome evaluation was measured by means of bipolar scales from +3 (*very good*) to -3 (*very bad*). Responses to the eleven product items were merged to provide an internally consistent measure for the category attitude (Cronbach alpha = 0.83).

Normative beliefs were measured on 7-point scales from 1 (*very unlikely*) to 7 (*very likely*). The referent groups were parents, head teacher, physical education subject leader, other teaching colleagues, other core-subject leaders, and school governors. Traditional motivation-to-comply questions were not used because they might attenuate the correlation between subjective norm and intention (Ajzen, 1991). Responses to the six items were merged to form the measure for the category subjective norms (Cronbach alpha = 0.89).

Perceived behavioral control was obtained by taking the mean of the responses to four items assessing participants' perceptions of their control in teaching physical education for 2 hr per week (e.g., "How much opportunity do you have over your working program to teach physical education for two hours a week during the next school year?") These items were found to be internally consistent (Cronbach alpha = 0.70) and were merged to form the direct measure of perceived behavioral control. These items were scored on a 7-point semantic differential scale anchored by the word pair *likely/unlikely*.

In addition to this direct measure of control, participants indicated their confidence in their ability to overcome barriers that might arise to inhibit physical education teaching behavior (the category self-efficacy). Seven control beliefs were elicited in the aforementioned pilot study: lack of space, lack of equipment, lack of time, bad weather, lack of confidence, lack of student interest, and lack of training. Participants were asked how much each barrier would be likely to interfere with their ability to teach physical education for 2 hr per week and measured on a 5-point Likert scale (1 = *not at all limiting effect*, 5 = *very limiting effect*). Items to measure self-efficacy were included that asked participants to rate how confident they were in overcoming each barrier. Responses were given on a 5-point scale representing 0-100%. The internal consistency of this scale was satisfactory (Cronbach alpha = 0.83)

To assess self-identity, respondents were presented with the sentence "I think of myself . . .," for example, "as a sort of person who teaches physical education" or "as a health conscious person." Four items were presented and scored on a 7-point semantic differential scale anchored by the word pair *likely/unlikely*. Responses to the four items were merged to form the direct measure of identity (Cronbach alpha = 0.85).

Past teaching behavior was assessed by a single question: "In a typical week on your last teaching practice, how many minutes of physical education did you usually teach in a week." The final section of the questionnaire included a stage algorithm assessing participants' personal stage of physical activity (McKenna, Naylor, & McDowell, 1998).

Analysis

The sample was initially divided into two groups: those who responded *very likely* or *likely* to the statement "I intend to teach physical education for two hours a week over the next school year" (77), and those who responded *very unlikely*,

unlikely, or not sure (51). *T* tests were conducted on the component scales of the model to identify variables discriminating intenders and nonintenders. Pearson product moment correlation coefficients were calculated to establish associations among components of the TPB. To accompany this, a hierarchical multiple-regression analysis was conducted to test the sufficiency of this model. Attitude, subjective norm, and perceived behavioral control were entered into the analysis simultaneously on the first step. Past behavior, self-efficacy, and self-identity were entered on the second step. The dependent variable was behavioral intention. Initial analyses revealed no collinearity in the data and that residuals were independent and assumptions of homoscedasticity and linearity were met (Field, 2000).

A logistic regression using barrier responses and stage of personal physical activity behavior was then conducted in order to explore the relative influence of these barriers on intention to teach physical education. Odds ratio analysis quantifies the relative odds of being in one outcome category—intenders or nonintenders—when the predictor (the scale measuring the limiting effects of each barrier) increases by one unit. The relative influence of personal physical activity stage of change was also explored as a potential barrier. Personal physical activity stage of change was entered first in the logistic regression followed by the barriers identified in the initial pilot study. Initial analyses revealed no substantive concerns regarding multicollinearity (Myers, 1990).

Results

Descriptive Statistics

Table 1 demonstrates that intenders were significantly more positive on all measures except attitude and self-efficacy. That is, intenders (a) were more likely to be aware of and influenced by social pressure to teach physical education for 2 hr per week, (b) were more likely to feel capable of controlling their physical education teaching behavior, and (c) reported higher levels of self-identity and previous physical education teaching experience. The greatest difference between intenders and nonintenders was in perceived behavioral control. It is important to note that both groups had favorable attitudes toward teaching physical education for 2 hr per week. The relationships among components of the TPB are presented in Table 2. Intentions to teach physical education for 2 hr per week were positively correlated with all included TPB variables. The strongest correlation was between intentions and perceived behavioral control ($r = 0.60, p < .01$), which has been reported in research examining work-related behaviors (e.g., Bunce & Birdi, 1998; Faulkner & Biddle, 2001). Individuals who self-identified as being concerned about the physical health of students also reported higher perceptions of behavioral control ($r = 0.52, p < .01$).

Hierarchical Regression Analyses

Using hierarchical multiple regression, the next step in the analysis was to examine the sufficiency of the TPB in predicting participants' intentions to teach physical education for 2 hr per week and to assess whether the addition of past behavior, self-efficacy, and self-identity increased the predictive power of the model. Table 3 shows that the TPB components explained 41% of the variance in intention. When past behavior, self-efficacy, and self-identity were added on the second step,

Table 1 Differences Between Intenders and Non-Intenders on Theory of Planned Behavior Variables

Variables	Total sample (N = 128)		Intenders (n = 77)		Nonintenders (n = 51)		t (126 df)
	Mean	SD	Mean	SD	Mean	SD	
Intention	5.03	1.43	5.99	.84	3.58	.76	-16.83***
Attitude	8.38	3.90	8.73	4.03	7.86	3.68	1.27
Subjective norms	4.83	.92	5.08	.96	4.46	.72	-4.18***
Perceived behavioral control	4.39	1.08	4.79	.98	3.79	.94	-5.76***
Self-efficacy	3.30	.54	3.37	.54	3.20	.53	-1.76
Identity	5.60	1.01	5.94	.88	5.09	.98	-4.98***
Past behavior	74.77	33.79	82.81	35.57	62.54	26.89	-3.67***

Note. SD = Standard Deviation. Attitude: belief strength (1 = *very unlikely*, 7 = *very likely*) multiplied by outcome evaluation (+ 3 = *very good*, - 3 = *very bad*). Intention, Subjective Norms, Perceived Behavioral Control, and Identity: (1 = *very likely/much*, 7 = *very unlikely/little*). Self-Efficacy: likelihood (1 = *not at all limiting effect*, 5 = *very limiting effect*) multiplied by confidence to overcome (1 = *0% confidence*, 5 = *100% confidence*). Past behavior: minutes. ****p* < .001.

Table 2 Correlations Among Variables in Theory of Planned Behavior Model

Variables	Intentions	Past behavior	Attitude	Subjective norm	Perceived behavioral control	Self-efficacy
Past behavior	.27**					
Attitude	.27**	.12*				
Subjective norm	.49**	.10	.39**			
Perceived behavioral control	.60**	.17	.46**	.43**		
Self-efficacy	.18*	.14	.21*	.24**	.34**	
Self-identity	.42**	.09	.39**	.33**	.52**	.27**

**p* < .05. ** *p* < .01.

Table 3 Results of Hierarchical Regression Analysis on the Prediction of Intention to Teach Physical Education (N = 128)

Step	Variable	Adjusted R ²	F	ΔR ²	Beta in final equation
1	Attitude	.41	30.82***	.43	.11
	Subject norm				.30***
	Perceived behavioral control				.44***
2	Past behavior	.45	18.10***	.05	.18*
	Self-efficacy				-.08
	Identity				.14

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

it made a statistically significant contribution in increasing the variance explained (to 45%). Subjective norms, perceived behavioral control, and past behavior were all significant independent predictors.

Barrier Analysis

Descriptive analyses of barriers to teaching physical education demonstrate that a lack of time was the most common limiting barrier (see Table 4). Nonintenders generally reported all barriers as being more limiting. A lack of training and confidence to teach physical education were significantly more limiting to the nonintenders ($p < .01$) in addition to a lack of time and bad weather ($p < .05$). Intenders were more confident in overcoming all barriers. Intenders were significantly more confident in overcoming those barriers involving lack of training and confidence ($p < .01$) and lack of time ($p < .05$).

Logistic regression using barrier responses and personal stage of physical activity behavior was then conducted in order to explore the relative influence of these barriers on intention to teach physical education. Complete data were analyzed for 128 participants. A test of the full model with eight predictors against a constant-only model successfully distinguished between intenders and nonintenders ($N = 128$, Chi-square [8], = 19.82; $p < .02$). Prediction success was 41.67% for the nonintenders and 77.92% for intenders. This produced an overall success rate of 64% (see Table 5).

Table 5 shows regression coefficients (B), Wald statistics (z), odds ratios (OR), and 95% confidence intervals (95% CI) for every predictor. Using the Wald criterion, personal activity stage of change accurately predicted intention to teach physical education for 2 hr per week (OR = 1.49, 95% CI 1.07 to 2.08). The Wald statistic should be used cautiously when the regression coefficient (B) is large (Menard, 1995). Although the regression coefficients are not large in this case, it

Table 4 Barriers to Teaching Physical Education

Barriers	Intenders		Nonintenders		Limiting <i>t</i> (126 df)	Confidence <i>t</i> (126 df)
	Limiting effect mean (<i>SD</i>)	Confidence to overcome (<i>SD</i>)	Limiting effect mean (<i>SD</i>)	Confidence to overcome (<i>SD</i>)		
Lack of space	3.43 (1.03)	3.44 (1.01)	3.40 (1.00)	3.14 (.81)	-.180	-1.88
Lack of equipment	3.20 (.93)	3.54 (.87)	3.29 (.91)	3.36 (.87)	.504	-1.11
Lack of time	3.61 (.94)	3.42 (.98)	3.92 (.75)	3.02 (.80)	2.07*	-2.50*
Bad weather	3.16 (1.12)	3.51 (1.11)	3.57 (.71)	3.38 (.94)	2.59*	-0.70
Lack of confidence	2.11 (1.09)	4.18 (.81)	2.65 (1.04)	3.75 (.91)	2.85**	-2.76**
Lack of student interest	2.73 (.96)	3.75 (.81)	2.94 (.75)	3.35 (.74)	1.33	-2.85**
Lack of training	2.58 (1.14)	3.83 (.84)	3.06 (.95)	3.49 (.88)	2.62**	-2.20*

Note. *SD* = Standard Deviation (in parentheses). Limiting scale 1–5: 1 = not at all limiting effect, 5 = very limiting effect. Confidence Scale 1–5: 1 = 0% confidence, 5 = 100% confidence.

p* < .05. *p* < .01.

Table 5 Logistic Regression Results to Predict Intenders from Nonintenders using Barrier Variables and Personal Physical Activity Stage of Change ($N = 128$)

Variable	B	Wald (z)	Significance	Odds ratio	95% CI
Personal activity stage of change	.40	5.44	.02	1.49	1.07 to 2.08
Lack of space	-.08	.14	.71	.92	.59 to 1.43
Lack of equipment	.18	.46	.50	1.19	.72 to 1.98
Lack of time	-.34	1.60	.21	.71	.42 to 1.21
Bad weather	-.26	1.29	.26	.77	.49 to 1.21
Lack of confidence	-.32	2.31	.13	.73	.48 to 1.10
Lack of pupil interest	-.07	.09	.77	.93	.57 to 1.52
Lack of training	-.15	.48	.49	.86	.56 to 1.32

Note. B = regression coefficient. $N = 128$, Chi-square (8) = 19.82; $p < .02$

has been suggested that an examination of the likelihood ratio statistics is more accurate (Field, 2000). Reviewing Table 5, it is the confidence interval values for physical activity stage that are both greater than one (95% CI 1.07 to 2.08). This indicates a significant and positive relationship for this variable only. Specifically, participants were more likely to intend to teach physical education if they were more physically active themselves. Using this statistical procedure, individual barriers did not significantly predict intentions.

Discussion

The purpose of this study was to establish the utility of the TPB in predicting intentions of nonspecialist primary teachers to teach physical education for 2 hr per week. Subjective norms and perceived behavioral control accounted for 41% of the variance in intentions to teach physical education. Attitudes were not a significant predictor. A further 4% was explained by the addition of past teaching behavior, although self-efficacy and self-identity were not unique predictors. Given that this study used the TPB with a new population and a novel behavior, it is encouraging that the amount of variance in intention explained by the TPB variables was comparable to that reported in other studies (Sutton, 1998). Nonspecialist teachers who perceived that their teaching colleagues, parents, and governors wanted them to teach physical education for 2 hr per week; had a positive assessment of their control over difficult barriers to teaching physical education; and had taught physical education during school practices were likely to report strong intentions to teach physical education for 2 hr per week in the next school year.

It was surprising that attitudes were not as significant a predictor of intentions as the TPB purports because this relationship is overwhelmingly supported

in meta-analyses (e.g., Armitage & Connor, 2001). As the descriptive results comparing intenders with nonintenders demonstrate, attitudes were positive and similar between the two groups. This is promising in that beliefs regarding the teaching of physical education were favorable for both individuals intending to or not intending to teach physical education for 2 hr per week. Perhaps, as Martin et al (2001) suggested in their study investigating the determinants of teachers' intentions to teach physically active classes, it might be because participants in this sample had consistently positive attitudes toward physical education that these cognitions exerted little influence on intentions to teach physical education. It is more likely, however, that attitudes did not predict intentions because of a perceived lack of volitional control over teaching physical education.

Self-efficacy reflects more internal aspects of control in the face of barriers. This was not a significant factor and is similar to the findings of Martin and colleagues (2001). As student teachers, the participants might have been unable to form realistic appraisals of their own capabilities (Bandura, 1997). In contrast, perceived behavioral control, which reflects the potential of external barriers to interfere with teaching intentions, was the strongest predictor of intentions to teach physical education for 2 hr per week. This is in line with research that highlights the primacy of control in understanding the intentional behavior of health professionals (e.g., Faulkner & Biddle, 2001). Because a personal assessment of external factors is likely to facilitate or inhibit the teaching of physical education for 2 hr per week, it is of overwhelming importance to promote perceptions of control over physical education teaching behavior given the motivational implications for the formation of intentions. At present, ITT might be more concerned about promoting subject knowledge of physical education without equipping preservice teachers with the skills necessary to consistently incorporate 2 hr of physical education per week into the busy schedule of a teaching week.

During ITT, time should be spent identifying common potential barriers to teaching physical education, as exemplified in Table 4, and discussing strategies for overcoming them. For example, a lack of time was the most limiting barrier to teaching physical education and probably reflects the current emphasis on National numeracy and literacy strategies in the UK and the need for teachers to teach across a full range of subjects (Warburton, 2000). Physical education should be contextualized explicitly in the broader curricula by discussing how physical education can contribute to the development of numeracy and literacy through cross-curricula links (see Bailey, 2001). In terms of lack of confidence, a common concern (Chedzoy, 2000), reducing the importance preservice teachers place on physical competence for teaching physical education effectively might reduce the salience of this barrier (Faulkner & Reeves, 2000). Overall, we have to move beyond merely equipping preservice teachers with the knowledge and skills to teach physical education to showing them how they can teach physical education in the context of a school environment.

One way this attitude is communicated is through subjective norms. In this study, intenders subscribed more strongly to beliefs that teaching colleagues, pupils' parents, and school governors thought they should be teaching physical education for 2 hr per week. Mawer (1996) has highlighted the school context as being important for allowing preservice teachers to receive a meaningful and progressive learning experience and the need for teacher training institutions and schools to collaborate closely in the provision of teaching experiences in physical education.

Continuing education of key stakeholders, such as head teachers, regarding the importance of physical education must be provided. For example, we might emphasize that devoting substantially more school time to health-related physical education does not have detrimental effects on students' academic performance while, at the same time, conferring significant health benefits (Sallis et al., 1999). Although we could start by developing preservice teachers who are themselves advocates for physical education, poor quality mentoring in schools whereby subtle negative value judgments of physical education are passed on to preservice teachers must be alleviated (Faulkner & Reeves, 2000). Logically, it is certain that a level of school support will be necessary in legitimizing the teaching of physical education for 2 hr per week and reinforcing this behavior.

Such institutional support will also have an impact on how many opportunities preservice teachers have to experience physical education instruction. In our study, although the amount of additional variance explained by the addition of past behavior was small, results indicate that behavioral intentions are influenced by evaluations about teaching physical education in the past in addition to possible situation-specific evaluations regarding the behavior. Any significant effects found, including variables of intentions, can be interpreted as a meaningful influence if past behavior is held constant (Bagozzi & Kimmel, 1995). There is an empirical case to support past behavior as a predictor of unique variance in intentions (Connor & Armitage, 1998; Hagger et al., 2002). As Chedzoy (2000) has suggested, ITT institutions need to communicate to schools the expectation that students have opportunities to teach physical education on a regular basis during their school placements. Two lessons per week of physical education on all school visits during training should be mandatory (Warburton, 2000). Opportunities to teach physical education are important in enabling preservice teachers to feel more competent (Chedzoy). Past behavior, in terms of teaching physical education, might act as a source of information that enhances perceptions of behavioral control and self-efficacy to teach physical education in the future. The inclusion of past behavior in future studies utilizing the TPB deserves consideration.

In contrast, self-identity did not augment the prediction of intentions to teach physical education, although intenders did report higher means in terms of self-identity in teaching physical education. This could be because self-identity, as measured in this study, was too broad to encapsulate a specific behavior such as teaching physical education, which all nonspecialist teachers are required to teach. Relationships between self-identity and intention have not been reported to be particularly large and the relationship might be more important for certain behaviors (Connor & Armitage, 1998). Personal exercise behavior, however, which we consider to reflect this self-identity in part, was important. A range of barriers was reported as being potentially limiting (see Table 4), but the role of personal exercise behavior in discriminating between intenders and nonintenders was of greater significance. Despite the presence of these barriers, personal exercise behavior was the only significant predictor of intentions to teach physical education.

Personal exercise behavior has been found to be significantly more influential than other common barriers in explaining physical activity promotional behavior of primary-care staff (McKenna et al., 1998), and it has been related to positive attitudes toward teaching physical education (Katene, Faulkner, & Reeves, 2000). As McKenna and colleagues suggested, in the context of general practitioners and practice nurses, this raises the dilemma of whether helping primary

preservice teachers to become more physically active themselves will be more influential than alleviating barriers to teaching physical education. As a consequence, the relationship between personal health behaviors and professional behavior deserves further exploration. If teacher physical activity is related to the quantity or quality of physical education provided, then, as McKenzie et al. (1999) suggest, "teachers should be encouraged to lead active lifestyles so that they are effective role models of the goals of physical education" (p. 131). The role of ITT in encouraging such lifestyles remains speculative.

In summary, results support the finding of Martin and colleagues (2001) that the TPB, a validated theoretical framework, can clarify the determinants of intentions for teaching behaviors. In predicting intentions to teach physical education for 2 hr per week, the beliefs of significant others, having a positive assessment of control over difficult barriers, and experiences of similar, prior behavior are likely to be important considerations for nonspecialist preservice teachers. Given the cross-sectional nature of the study in an English setting, however, the generalizability of these results must be treated with caution. We did not test the link between intention and behavior, and no inferences about the quality of physical education delivered by the participants in the past or in the future can be made. In addition, although the theory has performed well in explaining variance in intention and behavior across studies, it does not provide a complete account (Armitage & Conner, 2001). This could be because of the omission of other, unmeasured factors.

Although there are a range of strategies for promoting health-enhancing physical activity in schools other than through formal physical education lessons (see Fox & Harris, 2003), the TPB might be a useful tool in underpinning theoretically derived interventions to increase the involvement of nonspecialist teachers in physical education instruction. Future research should explore the causative relationships hypothesized in the TPB and examine whether interventions that manipulate perceptions of behavioral control, for example, can change intentions and, ultimately, behavior.

References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, **50**, 179-211.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Englewood Cliffs, NJ: Prentice-Hall.
- Ajzen, I., & Madden, T.J. (1986). Predicting goal directed behavior: Attitudes, intentions and perceived behavioral control. *Journal of Experimental Social Psychology*, **22**, 453-474.
- Armitage, C.J., & Connor, M. (2000). Social cognition models and health behaviour: A structured review. *Psychology and Health*, **15**, 173-189.
- Armitage, C. J., & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology*, **40**, 471-499.
- Bagozzi, R.P., & Kimmel, S.K. (1995). A comparison of leading theories for the prediction of goal-directed behaviors. *British Journal of Social Psychology*, **34**, 437-461.
- Bailey, R. (2001). *Teaching physical education: A handbook for primary and secondary school teachers*. London: Kogan Page.
- Bandura, A. (1997). *Self-efficacy: The exercise of control*. New York: Freeman & Co.

- Bandura, A., & Cervone, D. (1983). Self-evaluative and self-efficacy mechanisms governing the motivational effects of goal systems. *Journal of Personality and Social Psychology*, **45**, 1017-1028.
- Bunce, D., & Birdi, K.S. (1998). The theory of reasoned action and theory of planned behaviour as a function of job control. *British Journal of Health Psychology*, **3**, 265-275.
- Carney, C., & Armstrong, N. (1996). The provision of physical education in primary initial training courses in England and Wales. *European Physical Education Review*, **2**, 64-74.
- Central Council of Physical Recreation. (2001). *Charter for physical education and school sport*. London: Central Council of Physical Recreation.
- Charnig, H.W., Piliavin, J.A., & Callero, P.L. (1988). Role identity and reasoned action in the prediction of repeated behavior. *Social Psychology Quarterly*, **51**, 303-317.
- Chedzoy, S. (2000). Students' perceived competence to teach physical education to children aged 7 to 11 years in England. *European Journal of Physical Education*, **5**, 104-127.
- Connor, M., & Armitage, C.J. (1998). Extending the theory of planned behavior: A review and avenues for further research. *Journal of Applied Social Psychology*, **28**, 1429-1464.
- Department for Education and Employment & Qualifications and Curriculum Authority. (1999). *Physical education: The National Curriculum for England*. London. Her Majesty's Stationary Office (HMSO) and Qualifications and Curriculum Authority.
- Department for Education and Skills & and Department for Culture, Media and Sport. (2003). *Learning through PE and Sport*. London: HMSO.
- Faucette, N., McKenzie, T.L., & Patterson, P. (1990). Descriptive analysis of nonspecialist elementary physical education teachers' curricular choices and class organization. *Journal of Teaching in Physical Education*, **9**, 284-293.
- Faulkner, G., & Biddle, S.J.H. (2001). Predicting physical activity promotion in health care settings. *American Journal of Health Promotion*, **16**, 98-106.
- Faulkner, G., & Reeves, C. (2000). Primary school student teachers' physical self-perceptions and attitudes toward teaching physical education. *Journal of Teaching in Physical Education*, **19**, 311-324.
- Field, A. (2000). *Discovering Statistics using SPSS® for Windows*. London: Sage.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. Reading, MA: Addison-Wesley.
- Fox, K.R., & Harris, J. (2003). Promoting physical activity through schools. In J. McKenna & C. Riddoch (Eds.), *Perspectives on health and exercise* (pp. 181-201). London: McMillan.
- Hagger, M.S., Chatzisarantis, N., & Biddle, S.J.H. (2001). The influence of self-efficacy and past behaviour on the physical activity intentions of young people. *Journal of Sports Sciences*, **19**, 711-725.
- Hagger, M.S., Chatzisarantis, N., & Biddle, S.J.H. (2002). A meta-analytic review of the theories of reasoned action and planned behavior in physical activity: Predictive validity and the contribution of additional variables. *Journal of Sport and Exercise Psychology*, **24**, 3-32.
- Hardman, K., & Marshall, J. (2000). The state and status of physical education in schools in international context. *European Physical Education Review*, **6**, 203-229.
- Katene, W., Faulkner, G., & Reeves, C. (2000). The relationship between primary student teachers' exercise behavior and their attitude to teaching physical education. *British Journal of Teaching Physical Education*, **31**, 44-46.
- Malina, R.M. (1996). Tracking of physical activity and physical fitness across the lifespan. *Research Quarterly for Exercise and Sport*, **67**, S49-S57.
- Martin, J.L., Kulinna, P.H., Eklund, R.C., & Reed, B. (2001). Determinants of teachers' intentions to teach physically active physical education classes. *Journal of Teaching in Physical Education*, **20**, 129-143.

- Mawer, M. (1996). Learning to teach physical education in the primary school. In M. Mawer (Ed.), *Mentoring in physical education* (pp. 89-107). London: Falmer Press.
- McKenna, J., Naylor, P.-J., & McDowell, N. (1998). Barriers to physical activity promotion by GPs and practice nurses. *British Journal of Sports Medicine*, **32**, 242-247.
- McKenzie, T.L., Feldman, H., Woods, S.E., et al. (1995). Student activity levels and lesson context during third-grade physical education. *Research Quarterly for Exercise and Sport*, **66**, 184-193.
- McKenzie, T.L., LaMaster, K.L., Sallis, J.F., & Marshall, S.J. (1999). Classroom teachers' leisure physical activity and their conduct of physical education. *Journal of Teaching in Physical Education*, **19**, 126-132.
- McKenzie, T.L., Marshall, S.J., Sallis, J.F., & Conway, T.L. (2000). Student activity levels, lesson context, and teacher behavior during middle school physical education. *Research Quarterly for Exercise and Sport*, **71**, 249-253.
- Menard, S. (1995). *Applied logistic regression analysis*. Sage University paper series on quantitative applications in the social sciences, 07-106. Thousand Oaks, CA: Sage.
- Myers, R. (1990). *Classical and modern regression with applications* (2nd ed.). Boston, MA: Duxbury.
- Office for Standards in Education (OFSTED). (1998). *Teaching physical education in the primary school: The initial training of teachers. A report from the office of Her Majesty's Chief Inspector of Schools*. London: OFSTED.
- Office for Standards in Education (OFSTED). (2003). *Physical education in primary schools: OFSTED subject reports series 2001/02*. London: OFSTED
- Qualifications and Curriculum Authority & Department for Education and Employment. (1999). *Physical education: The national curriculum for England (Key stages 1-4)*. London: Department for Education and Employment.
- Rolfe, L., & Chedzoy, S. (1997). Student teachers' perceptions of teaching dance in primary schools. *European Journal of Physical Education*, **2**, 218-227.
- Rutter, D.R. (2000). Attendance and reattendance for breast cancer screening: A prospective 3-year test of the theory of planned behavior. *British Journal of Health Psychology*, **5**, 1-13.
- Sallis, J. F., McKenzie, T. L., Kolody, B., Lewis, M., Marshall, S., Rosengard, P. (1999). Effects of health-related physical education on academic achievement: Project SPARK. *Research Quarterly for Exercise and Sport*, **70**, 127-134.
- Sutton, S. (1998). Predicting and explaining intentions and behavior: How well are we doing? *Journal of Applied Social Psychology*, **28**, 1317-1338.
- Terry, D.J., & O'Leary, J.E. (1995). The theory of planned behaviour: The effects of perceived behavioral control and self-efficacy. *British Journal of Social Psychology*, **34**, 199-220.
- Terry, D.J., Hogg, M.A., & White, K.M. (1999). The theory of planned behaviour: Self-identity, social identity and group norms. *British Journal of Social Psychology*, **38**, 225-244.
- Warburton, P. (2000). Initial teaching training: The preparation of primary teachers in physical education. *British Journal of Teaching Physical Education*, **31**, 6-9.

Acknowledgments

We would like to thank Will Katene (University of Exeter) for helping us develop this research and the two anonymous reviewers for their insightful comments on earlier versions of the paper.