Exercise Promotion in Physical Education: 
Application of the Transtheoretical Model

Michael J. O'Connor

Student display of regular physical activity has been presented as a principal component of the definition of a physically educated student (National Association for Sport and Physical Education, 1991). What strategies can a physical educator employ to facilitate the adoption and maintenance of physical activity? The transtheoretical model offers an explanation of the structure of change that occurs when adults attempt to change behavior. Although the model was derived from the modification of addictive and problem behaviors, the transtheoretical model shows promise for providing a theoretical foundation for the acquisition of positive behaviors such as physical activity. This paper explains the basic constructs of the transtheoretical model and discusses application of strategies that a physical educator in postsecondary and community settings may employ to facilitate the adoption and maintenance of physical activity.

The Outcomes Project (National Association for Sport and Physical Education [NASPE], 1991) is a recent undertaking by NASPE that supports increased emphasis on the regular participation in physical activity. The project defines the physically educated student in a five-part definition, which is supplemented with outcome statements that distinguish appropriately designed and conducted school physical education programs. One characteristic included in the definition of a physically educated individual pertains to regular physical activity. The NASPE definition emphasizes the importance of regular participation in physical activity by all students (NASPE, 1991, p. 4).

According to a recent U.S. Department of Health and Human Services (1990) survey, only 46% of the population who are 18 to 35 years of age continue active lifestyles beyond their school years. The overall estimate of the rate of sedentary living in the United States is as high as 60% (Centers for Disease Control, 1990). Medical research suggests that modest increases in the level of physical activity by the sedentary population may be the single most effective method to improve health and prevent disease (Leon, Connett, Jacobs, & Rauramaa, 1987; Paffenbarger, Hyde, Wing, & Hsieh, 1986).

Physical educators have the opportunity to proactively challenge the exercise adherence problem. The application of effective intervention strategies across the scope of a physical education curriculum that promotes the habit of individual physical activity has the potential to favorably affect the overall quality of life.

Michael J. O'Connor is with the Department of Health and Physical Education at Augusta College, Augusta, GA 30904.
of the nation. One strategy that provides promise for assisting physical educators in the promotion of increased levels of physical activity is the transtheoretical model (Prochaska & DiClemente, 1982).

The purposes of this paper are to explain the constructs of the transtheoretical model and to propose strategies for applying the model in postsecondary and community physical education settings. Hopefully, further research of this model may identify specific strategies for secondary physical education curricula. The transtheoretical model is an integrative perspective that explains the structure that results when individuals attempt to change behavior. This perspective has significant implications for the promotion of physical activity by physical educators.

**Background**

Exercise behavior change interventions, such as written agreements, behavior contracts, goal setting, and decision making, have been associated with a 10% to 25% increase in the frequency of physical activity (Dishman, 1991). However, Dishman suggests there are reasons to question the research design of these studies. One reason is that cited increases in the frequency of physical activity is questionable due to the preexperimental and quasi-experimental designs used in exercise studies. A second reason is that past exercise studies have not based interventions on theoretical models of behavior change that include current knowledge from behavior science, exercise science, and public health.

The transtheoretical model illustrates the structure that underlies behavior change (Prochaska, 1979). This model, which has been applied and analyzed in a variety of settings, was generated from a comparative analysis of leading psychotherapy theories that recommended behavior change techniques (Prochaska, DiClemente, & Norcross, 1992).

Early research focused on the extinction of addictive behaviors such as alcohol abuse, smoking, obesity, and drug addiction (Prochaska & DiClemente, 1983, 1985, 1986). Recently, the core constructs have been applied to the study of the acquisition and maintenance of positive health behaviors, such as exercise (Marcus, Selby, Niaura, & Rossi, 1992; Marcus & Owen, 1992). Despite the newness of the model’s application to the acquisition of positive behaviors, the model has demonstrated the potential to provide a broad theoretical orientation from which to promote physical activity and maintenance. Evidence for generalizing the underlying constructs of the transtheoretical model to the study of exercise behavior were validated in a recent study by Marcus, Rossi, Selby, Niaura, and Abrams (1992). This study is discussed in detail in the Application to Exercise section of this paper.

**Transtheoretical Model**

The transtheoretical model has two major dimensions: stages of change and processes of change. The model proposes that people make behavior change in stages and that they move sequentially through the stages while experiencing different processes of change (Prochaska, 1979). Stages of change represent a temporal dimension during which change may occur. Processes of change are strategies individuals use as they progress through the stages of change. Concisely this can be stated as “doing the right things [processes] at the right time [stages]” (Prochaska et al., 1992, p. 1110).
Early research by Prochaska and DiClemente (1983) identified behavior change occurring along a linear pattern of four stages comprised of precontemplation, contemplation, action, and maintenance. More recent research has supported a spiral pattern of change attributed to the commonality of relapse to behavior change (Marlett & Gordon, 1985). Additionally, a fifth stage of change (preparation) was added between contemplation and action to correct a misinterpretation of data made in original research studies (DiClemente et al., 1991). The following provides a brief explanation of each of the five stages (Prochaska et al., 1992):

- **Precontemplation**: The stage in which there is no intention to change behavior in the foreseeable future.
- **Contemplation**: The stage in which people are aware that a problem exists and are seriously thinking about overcoming it but have not yet made a commitment to take action.
- **Preparation**: The stage in which individuals are intending to take action in the next month and have unsuccessfully taken action in the past year.
- **Action**: The stage in which individuals modify their behavior, experiences, or environment to overcome their problems.
- **Maintenance**: The stage in which people work to prevent relapse and consolidate the gains attained during action.


- **Consciousness raising**: Efforts by the individual to seek new information and to gain understanding and feedback about the problem.
- **Dramatic relief**: Affective aspects of change, often involving intense emotional experiences related to the problem behavior.
- **Environmental reevaluation**: Consideration and assessment by the individual of how the problem affects the physical and social environment.
- **Self-reevaluation**: Emotional and cognitive reappraisal of values by the individual with respect to the problem behavior.
- **Social liberation**: Awareness, availability and acceptance by the individual of alternative, problem-free life-styles in society.
- **Counterconditioning**: Substitution of alternative behaviors for the problem behavior.
- **Helping relationships**: Trusting, accepting, and utilizing the support of caring others during attempts to change the problem behavior.
- **Reinforcement management**: Changing the contingencies that control or maintain the problem behavior.
- **Self-liberation**: The individual's choice and commitment to change the problem behavior, including the belief that one can change.
- **Stimulus control**: Control of situations and other causes that trigger the problem behavior.
Prochaska and DiClemente (1985) propose that the application of strategies is conditional to the individual's stage of change. This suggests that exercise interventions that engage processes of change relevant to the individual's stage of change will enhance the effectiveness of intervention. Based on cross-sectional research, Prochaska et al., (1992) propose that physical educators emphasize specific processes during specific stages of change. Figure 1 depicts the stages of change in which particular processes of change have been empirically verified as effective (DiClemente et al., 1991).

Exercise researchers have recommended a dynamic model approach to improve the understanding of behavior change in the adoption and maintenance of exercise (Dishman, 1982; Sonstroem, 1988). A dynamic model approach focuses on different progressions in the adoption and maintenance of exercise. The transtheoretical model is considered dynamic for two reasons. First, the model proposes that individuals at different stages respond to different processes. Second, the model acknowledges the commonality of relapse by people attempting to change a behavior.

Most behavior change research and behavior change interventions have been designed for individuals who are prepared for action (Prochaska & Marcus, in press). The dynamic focus of the transtheoretical model matches the needs of the individual with an appropriate process to help facilitate change. Additionally, the model suggests that exercise adoption is not an all-or-nothing proposition because most individuals follow a spiral pattern of change due to the commonality of relapse (Marlatt & Gordon, 1985; Prochaska & DiClemente, 1986).

**Application to Exercise**

Marcus, Selby, Niaura, and Rossi (1992) examined the application of the transtheoretical model to exercise behavior. Instruments to measure stage of change
and exercise self-efficacy were developed, refined, and validated using adult participants in a work site study. Efficacy expectations are beliefs about how capable one is of performing a behavior that leads to a specific outcome (Strecher, DeVellis, Becker, & Rosenstock, 1986). Results indicated that scores on the self-efficacy measure were significantly related to the stage of change. This finding supports the proposition that individuals in different stages would benefit from interventions that differ in their focus on enhancing efficacy expectations.

Marcus, Rossi, Selby, Ni aura, and Abrams (1992) have applied the transtheoretical model directly to exercise behavior. A stage and process of change questionnaire was developed and administered to participants \(N = 1,172\) in a work site health promotion venture. The responses of the participants were divided randomly into two samples. Exploratory dimensional analyses (LISREL VI structural modeling computer program) were conducted on one half of the sample, and confirmatory analyses (cross-validation of the model determined through exploratory procedures) were conducted on the other half of the sample. The purposes of the analysis were to identify the change processes for exercise adoption and to produce a reliable questionnaire that measures these processes of change. Lastly, the samples were combined to analyze the relationship between the processes and stages of change. Results of the study support the use of all 10 processes of change proposed by the transtheoretical model for exercise adoption. The study appears to validate the proposal that the transtheoretical model may be applied to the study of exercise adoption and maintenance.

Marcus, Banspach, Lefebure, Rossi, and Carleton (1992), in the only intervention study to date, used the transtheoretical model to design an intervention to increase the physical activity of community participants \(N = 610\). Results revealed that the intervention significantly increased the stage of change of the participants. Marcus et al. concluded that the increase in stage of exercise adoption implied an increase in activity level. Unfortunately control groups were not utilized in this study, and maintenance of increased activity levels over time were not assessed (Prochaska & Marcus, in press).

Pender, Sallis, Long, and Calfas (in press) are involved in a Centers for Disease Control–funded research study called Project PACE (physician-based assessment and counseling for exercise). Project PACE is a counseling program designed for doctors to promote increasing levels of physical activity. The transtheoretical model is the basis for assessment and intervention in the PACE program. The program is designed to increase the percentage of primary care providers who routinely assess and counsel their patients about physical activity. The principal PACE objective is to promote healthy lifestyles through population increases in physical activity.

### Application for Physical Education

Two curriculum studies (O’Connor, 1993; Rehor, 1991) applied constructs of the transtheoretical model in college physical education classes. Rehor (1991) \(N = 44\) designed a personal meaning fitness education curriculum model that focused on the development of the habit of regular exercise. The model was implemented in two Fitness For Life classes. In addition to the normal Fitness For Life course requirements, the intervention group was exposed to behavioral change intervention, which included processes of change appropriate to each
subject’s stage of readiness and the development of behavioral modification skills. A frequency distribution of exercise stages across time indicated that the proportion of intervention group members in the maintenance stage at the conclusion of the study was significantly greater than that of the control group.

The O'Connor (1993) study (N = 71) involved two behavior interventions to increase physical activity as part of a regular university coed activity course (racquetball). One intervention was based on the transtheoretical model (stage group), and the other was patterned on the relapse prevention model (decision-balance group). The stage group treatment consisted of stage-specific exercise counseling adapted from the counseling protocols devised for Project PACE (Pender et al., in press). The decision-balance group received a decision balance-sheet technique to increase exercise commitment. A control group received a traditional teaching approach for the activity course. At the conclusion of the study, racquetball skill for all groups had improved at the same rate. The stage of change of male intervention group members changed differentially across time from the control group. The stage of change of female intervention group members did not change differentially from the female control group. Activity level did not significantly increase for either the male or female intervention groups. The limited success of this study may have resulted from time constraints and sample characteristics.

The two studies cited above demonstrate that the transtheoretical model can be practically employed in a postsecondary physical education class. To increase the effectiveness of the intervention, the strategy should be implemented across a school’s physical education curriculum. The purpose of the following section is to suggest strategies to effectively employ the model in a postsecondary physical education class. Additional information on strategies and instruments to assess exercise behavioral change can be found in a NASPE curriculum and instruction publication entitled *Self-Assessment Strategies for Exercise Behavioral Change* (Rehor, Feldkamp, O’Connor, & Smith, 1992).

**Strategies for Physical Education**

First, as part of a postsecondary physical education class, each student’s stage of change should be assessed at the beginning and conclusion of selected courses throughout the physical education curriculum. An overall program goal should be to consistently expose each student to exercise behavior change strategies. A recommended physical activity stage questionnaire is shown in Figure 2. This questionnaire is recommended because it is easily understood by the students, can be quickly administered and evaluated, and provides precise information for selecting instructional strategies. The second application of the instrument will provide the teacher an evaluation of the effectiveness of instruction. This information should be entered on a student’s permanent physical education record so that succeeding physical education teachers can provide synchronized instruction and a supportive environment.

The following strategies are suggestions for employing appropriate behavior change interventions in class. Teachers with classes that are already constrained for time might simply provide individual students with oral feedback that corresponds to the student’s stage of change. A better technique would be to provide individual students with written protocols in which the content is tailored to their
This form will help your instructor understand your level of physical activity. Please read the entire form and then choose the number that best describes your current level of physical activity or your interest in physical activity. Do not include activities that you do as part of a class or a job.

Vigorous physical activity includes activities like jogging, running, fast cycling, aerobics classes, swimming laps, singles tennis, and racquetball. Any activity that makes you work as hard as jogging and that lasts 20 minutes at a time should be counted. These types of activities usually make you sweat, get out of breath, and feel your heart beat. (Do not count weight lifting.)

Moderate physical activity includes activities like brisk walking, gardening, slow cycling, dancing, doubles tennis, or hard work around the house. Any activity that makes you work as hard as brisk walking and that lasts at least 30 minutes at a time should be counted.

Current Physical Activity Status

1. I currently am not physically active, and I do not intend to start being physically active in the next 6 months.
2. I currently am not physically active, but I am thinking about becoming physically active in the next 6 months.
3. I currently am physically active some, but not regularly.
4. I currently am physically active regularly, but I have only begun doing so within the last 6 months.
5. I currently am physically active regularly, and have done so for longer than 6 months.

[Numbers selected correspond to the following stage of change: 1 = precontemplation, 2 = contemplation, 3 = preparation, 4 = action, and 5 = maintenance.]


current stage of change. An individualized protocol may be distributed to each student as a handout or discussed on an individual basis with each student. Separate protocols should be prepared for the precontemplator, contemplator, preparation, and action/maintenance stages. Examples of stage-specific protocols from Pender et al., (in press) are available in the O’Connor (1993) study. The following explains specific strategies to employ at each stage of behavioral change.

Precontemplators need to be asked why they are not currently active. The next approach is to ask precontemplators to think of how they might personally benefit from increases in physical activity. This should give the teacher an opportunity to suggest benefits derived from physical activity that the student
Instructions: This balance sheet is designed to help you think through the possible consequences of regularly participating in an exercise program. By considering the potential costs (cons) and benefits (pros) you will make a better informed decision and be more likely to stick to that decision. In addition, by formulating strategies for facilitating positive outcomes and for minimizing or effectively dealing with negative outcomes, you will be better able to persist in your exercise behavior. Complete the various categories of the balance sheet as completely as you can.

<table>
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<th>Cons</th>
<th>Pros</th>
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Figure 3 — Decision balance sheet (adapted from Wankel, 1984).

may not have previously considered. The object at this stage is to facilitate student thinking about both the health risks associated with being sedentary and the health benefits derived from being physically active (consciousness raising).

Another effective technique with precontemplators is to have each student complete a decision balance sheet (Wankel, 1984) on the pros and cons of physical activity. Figure 3 provides an example of a decision balance-sheet. At this stage of readiness, the form should be adapted to exclude the strategy section. Completion of the decision balance sheet is followed by individual or group discussion of the pros and cons of physical activity. The strategy of the discussion is to minimize the effect of cons and to facilitate knowledge of positive effects (pros) derived from physical activity. This method facilitates the student’s thinking of positive outcomes of physical activity.

Contemplators have already been thinking about physical activity and need assistance to initiate an activity program. This could be accomplished by requiring the student to design a realistic (moderate) activity program (self-reevaluation). Each student should carefully consider potential barriers to the plan (self-reevaluation). By taking time to think through the negative implications of a plan, students
will have a deeper commitment to stick with a decision when barriers present themselves. A handout of potential moderate physical activities for the student to consider would be helpful at this stage.

The decision balance sheet (Figure 3) can also be used effectively with contemplators. Emphasis at this stage is getting the student to think of individual strategies to overcome the cons. This is an elementary form of relapse prevention training (Marlett & Gordon, 1985). Relapse prevention training is a critical component of transtheoretical treatment due to the commonality of relapse. The objective is to promote student coping skills. Coping skills are abilities to effectively deal with situations that could disrupt planned physical activity.

Preparation students are ready to make a commitment to physical activity (self-liberation). This can be accomplished with a written contract that summarizes the activity plan the student has decided to attempt. A contract demonstrates a student's commitment to carry out a specific goal. Suggestions on both moderate and vigorous activities would be appropriate at this stage, as would a handout that encourages students to record completed activity.

Relapse prevention training is also meaningful at this stage because relapse is the most common barrier for individuals attempting to change behavior (Marlett & Gordon, 1985). It is important for the student to view relapse as a necessary step in changing one's behavior (Brownell, Marlett, Lichtenstein, & Wilson, 1986). Appropriate coping responses to temptations to relapse will increase exercise self-efficacy (Bandura, 1977). Self-efficacy receives the strongest support of all cognitive determinants now known in exercise adherence research (Dishman & Sallis, 1993). Increased exercise self-efficacy is associated with an increased effort to continue in the face of barriers (Brownell et al., 1986).

Action and maintenance students warrant praise (reinforcement management) for the physical activity programs in which they are currently involved. Additionally, action stage students can benefit from the support of family, friends, and school (helping relationships). Another consideration for both action and maintenance students is to prepare them to deal effectively with interruptions or relapses in their activity routines such as injury or life changes (counterconditioning and stimulus control). Students trained to expect and deal with interruptions will be better prepared to resume physical activity.

Research Implications

The transtheoretical model has only recently been applied to the study of exercise behavior (Marcus & Owen, 1992; Marcus, Selby, Niaura, & Rossi, 1992). Only one study has attempted to validate the model for exercise applications (Marcus, Rossi, Selby, Niaura, & Abrams, 1992). Research studies are needed, particularly at the secondary level, to examine the application of this model for exercise adoption and maintenance so that physical educators can evaluate the long-term effectiveness of the model. Research questions that should be addressed are (a) Does the model facilitate engagement in physical activity? (b) Does the model sustain adopters in maintaining physical activity over time? (c) Can the model be adapted for use in elementary and secondary physical education classes? and (d) Can the model be empirically evaluated to verify self-reported activity level and fitness gain/loss?
Conclusion

The health benefits, particularly for the prevention of cardiovascular disease, that result from adopting increased levels of physical activity are tremendous (Powell, Thompson, Caspersen, & Kendrick, 1987). The potential of the transtheoretical model to assist physical educators in creating and enhancing the acquisition of regular physical activity is significant. The model may provide the physical educator with a dynamic description of the cognitive processes employed by individuals attempting to change behavior. This knowledge permits the use of appropriate strategies that facilitate the acquisition and maintenance of the behavior of physical activity. By so doing, physical educators may contribute significantly to improving our nation’s health and quality of life.

References


