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Conceptualizing Applied Exercise Psychology

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Abstract

Exercise psychology has become an emerging field of scholarly research, prolific conference presentations, and of increasing relevance to a world that is experiencing a health paradox. Vastly improved medical care, at least in most of the western world, has been accompanied by a paucity of healthy habits (e.g., a deep propensity to avoid physical activity, intake of large portions of high fat food). The result is decreased health and increased health care costs for all age groups, ethnicities, and genders. While reasons for the negative attitude toward exercise abound, the combination of ubiquitous rates of obesity and the resultant poor health and high health care costs has resulted in a flurry of activity by researchers and practitioners to improve exercise and nutritional habits. Perhaps not surprisingly, then, the field of exercise psychology has become increasingly relevant. Therefore, it is surprising that a companion field of exercise psychology has not been given more prominence in the literature. Defining the conceptual framework for *applied* exercise psychology is overdue. The purpose of this article, then, is to provide a structure for scholars and practitioners in the study and application of applied exercise psychology. The framework is based on the extant literature, which has focused on the factors that contribute to describing, explaining, predicting, and improving exercise behavior in a culture whose sedentary, generally unhealthy lifestyle is resulting in increasingly poorer health. The need for additional research and practice in applied exercise psychology has never been timelier. Guidelines for future directions in the field are also offered.

Keywords: Exercise, exercise psychology, applied, physical activity

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Conceptualizing Applied Exercise Psychology

Introduction

A paradox is defined as “a statement that seems contradictory, but may be true in fact” (*Webster’s New World Dictionary*, 1984, p. 434). It is a paradox, therefore, that on one hand, residents of the U.S. (and other western countries) have the world’s highest standard of living and best healthcare, yet are among the least healthy in the world. This is due to their ubiquitous unhealthy habits that lead to widespread obesity and consequent diseases. One primary determinant of this problem is the lack of regular exercise. While the likely reasons for not exercising have been studied for many years, to date, researchers and practitioners have not found interventions that effectively and permanently change health-related behavior. While the marked increase in obesity and related illnesses among adults is well known, there is now widespread belief that for the first time in U.S. history, children and adolescents will lead shorter, lower quality of life than their parents. This will be due, primarily, to the obesity epidemic and the consequent widespread onset of type-2 diabetes (Critser, 2003). According to the Centers for Disease Control and the U.S. Department of Health and Human Services (USDHHS, 2000), one third of babies born in the year 2000 will become diabetic.

Encouraging people to replace their sedentary lifestyle with additional physical activity has been a major challenge over the years. The late comedian, Milton Berle, was quoted as saying about exercise, “The doctor said it would add 10 years to my life, and he was right. I feel 10 years older already” (*Orlando Sentinel*, March 31, 2002, p. C2). Humor aside, health behavior change is among the most difficult outcomes to achieve (Ockene, 2001). With respect to exercise, the results of related studies on the effectiveness of interventions on promoting exercise behavior have been equivocal at best, and relatively disappointing at worst, particularly with respect to exercise adherence (Buckworth & Dishman, 2002). The purpose of this article, then, is to suggest a conceptual framework to provide the impetus for additional applied research and practice to develop positive attitudes about exercise and promoting long-term exercise habits. This is the primary mission of conceptualizing the emerging field of *applied exercise psychology*.

While the field of exercise psychology has emerged with increased prominence and importance in recent years, field research and practice in applying the exercise psychology literature has received considerably less attention. Testimony to this emerging area of study occurred in 1988 with the *Journal of Sport Psychology*, which experienced a change in the title to the *Journal of Sport and Exercise Psychology* (Gill, 1987). As Gill, the journal's editor at the time, explained, "Given the increasing prominence of exercise in such contexts as corporate fitness, wellness, and preventive and rehabilitative health programs, and the increasing attention to the psychological aspects of such programs, it seems appropriate to include the word exercise in the title rather than assume everyone knows such activities are implied in our definition of sport" (p. 1). In this way, exercise psychology is often categorized as an extension of sport psychology (Hackfort & Birkner, 2005). As the authors contend, "sport psychology has differentiated into specialized areas with sport and exercise psychology now regarded as branches" (p. 351).

Improved understanding of the antecedents and other factors that explain, describe, and predict exercise behavior is needed. Implications for possible areas of effective interventions and future directions for researchers, consultants, and mental health professionals are offered. Specifically, the suggested conceptual framework of applied exercise psychology consists of understanding the motives of exercise participants, generating new, innovative models and theories that explain, describe, or predict exercise behavior, creating dynamic and effective interventions that will lead to more widespread exercise participation and permanent changes in exercise habits, examining health promotion strategies that promote physical activity and reduce the onset of obesity, and addressing the unique needs of special populations in promoting exercise behavior.

Components of this framework include: (1) operationally defining applied exercise psychology; (2) describing, critiquing, and applying relevant theories and models; (3) reviewing the personality traits and dispositions of exercisers and non-exercisers; (4) examining exercise motivation; (5) identifying exercise barriers; (6) the effects of exercise on mental health; (7) factors that affect exercise adherence and non-adherence; (8) the effect of cognitive and behavioral strategies on exercise performance

and other psychological and emotional factors; (9) the use and effectiveness of exercise interventions on exercise performance, adherence, and other psycho-behavioral outcomes; (10) exercise dependence/addiction, and (10) future directions in applied exercise psychology. The conceptual framework of applied exercise psychology is illustrated in Figure 1.

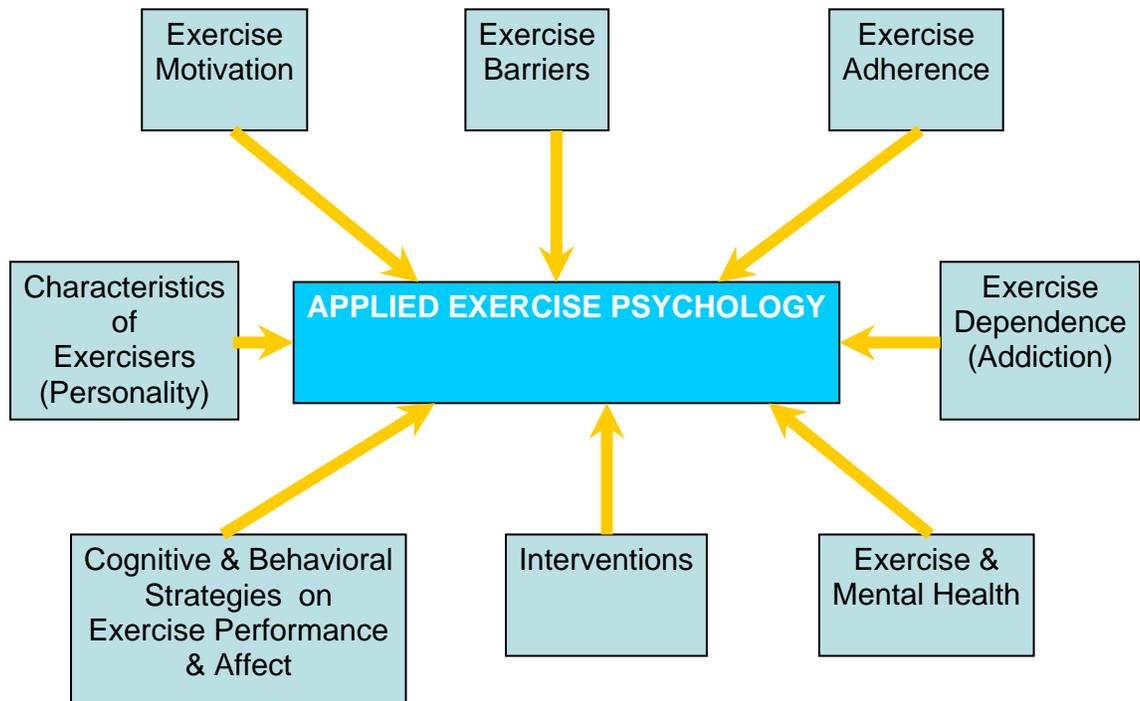


Figure 1. Conceptual Framework of Applied Exercise Psychology

Defining Exercise

One challenge in conceptualizing applied exercise psychology is defining *exercise*. Buckworth and Dishman (2002) recognize the *challenge and importance* on having researchers and practitioners define exercise in a similar manner. For example, some individuals who walk a mile a day will contend that they exercise, while other will categorize themselves as exercisers if they lift weights or engage in flexibility exercises such as yoga or tai chi. One problem with these different interpretations of exercise is that researchers and practitioners need to agree on the criteria for determining cause and effect, that is, to make accurate conclusions about the effects of exercise on desirable

outcomes. For example, established mental and physical health benefits of exercise are minimal unless a person engages in *aerobic* exercise. While both strength training and flexibility exercise are important for improved general health, the same benefits are not accrued for in the absence of aerobic exercise performed at least three times per week for a minimum of 20 to 30 minutes.

Defining Applied Exercise Psychology

Numerous authors have defined exercise psychology differently over the years. Anshel, et al., (1991), in the *Dictionary of the Sport and Exercise Sciences*, describes this field as “the study of psychological factors underlying participation and adherence in physical activity programs” (p. 56). To Berger, Pargman, and Weinberg (2002), who take a more generic perspective in defining this specialization, “exercise psychology includes diverse psychological issues, theories, and general information related to exercise.... This includes the use of exercise for mood alternation, stress management, treatment of mental disorders, enhanced self-concept and self-efficacy, and increased personal fulfillment” (p. 2). Lox, Martin, and Petruzzello (2003) have categorized this field in two dimensions, as “the application of psychological principles to the promotion and maintenance of leisure physical activity (exercise), and the psychological and emotional consequences of leisure physical activity” (p. 5). Similarly, to Hackfort and Birkner (2005), “exercise psychology is concerned with psychological factors coupled with antecedents of participation in exercise such as adoption and maintenance, and the processes involved in organizing and regulating exercise” (p. 352).

Finally, Buckworth and Dishman (2002) claim that this field “includes the study of psychobiological, behavioral, and social cognitive antecedents and consequences of acute and chronic exercise” (p. 17). The authors also include “psychobiological, behavioral, and social cognitive antecedents and consequences of acute and chronic exercise” (p. 17). “Antecedents” consist of factors that predict who will engage in an ongoing habit of exercise and who will quit. The term “consequences” reflects the study of exercise outcomes, that is, the ways in which exercise (both short term, also called acute, and long term, also referred to as chronic) influences mental and emotional processes. The effect of mental skills on exercise performance is also included in this definition. From a more applied perspective, the primary purpose of exercise psychology,

they contend, “is to enhance the adoption and maintenance of regular exercise and its effects on psychological well-being” (p. 1). While there is a growing body of research in exercise psychology, a neglected aspect of this field has been to conceptualize this field by increasing and improving applied research and the applying findings. Table 1 lists the ways in which exercise psychology has been operationally defined in the existing literature.

Table 1: Operationalizing exercise psychology

- Designing specific exercise programs for experiencing psychological benefits;
 - Examining positive addiction and commitment to exercise;
 - Understanding the causes and antecedents of negative addiction to exercise, in which excessive physical activity leads to injury, eating disorders resulting in excessive weight loss, social isolation, exercising when sick, feeling depressed or anxious (worried) if an exercise session is missed;
 - Studying the psychological predictors (dispositions and personality profile) of who will and will not engage in regular exercise;
 - Determining the effects of acute and chronic exercise on changes in mood state;
 - Measuring changes in selected personal dispositions due to exercise, such as various dimensions of self-esteem, confidence, optimism, and anxiety.
 - Identifying the psychological benefits of regular exercise;
 - Exercising to improve quality of life;
 - Prescribing exercise as a tool in psychotherapy (e.g., depression, anxiety, emotional disturbances) for specific populations, such as children, elderly, physically disabled);
 - Using exercise in rehabilitation settings (recovery from injury, cardiac or pulmonary disease);
 - Predisposing factors that explain the exercise high, flow, and peak experience and how to facilitate these feelings;
 - Studying the effectiveness of mental skills that improve exercise performance;
 - Examining the effectiveness of cognitive and behavioral techniques that promote exercise participation and adherence;
 - Predict exercise adherence and dropout; and
 - Prescribing exercise as a stress management strategy.
 - Role of psychopathology in explaining exercise participation and dropout
-

The Increased Relevance of Applied Exercise Psychology

While cultures differ on promoting a physically active lifestyle, the lack of physical activity is a pervasive characteristic of modern civilization. Most individuals struggle with making the time and effort to exercise regularly. Combined with an over-

consumption of high fat food, the rate of obesity is now soaring, not only among adults, but for adolescents and children, as well (Critser, 2003). According to Critser's review of literature, about 63% of U.S. men and women are overweight, and about 33% are classified as obese. The obesity epidemic is not only for adults. In her keynote address at the 2004 Society of Behavioral Medicine Conference in Baltimore, Maryland, Dr. Risa J. Lavizzo-Mourey, President and Chief Executive Officer of the Robert Wood Johnson Foundation, pointed out that for the first time in U.S. history, children today will live a shorter, lower quality of life than their parents. She reported that since 1980, the number of overweight children (ages 6 to 11 yrs) and adolescents (ages 12-17 yrs) has doubled and tripled, respectively. One primary reason for these conditions has been an increasing sedentary lifestyle – not enough physical activity - leading to the widespread onset of type 2 diabetes and hypertension (Nestle & Jacobson, 2000).

The underlying causes of creating negative habits toward exercise stem from many sources. Each of these provides opportunities for future research. For example, in his extensive review of related literature, Critser (2003) indicates that physical education teachers and coaches have *demotivated* students from developing exercise habits by using exercise as a form of punishment (e.g., tardy students are required to perform push-ups, run laps, or engage in some other form of physical activity). Sports coaches often overtrain their athletes, resulting in exercise burnout and promoting negative attitudes toward exercise, especially after the athlete's sports career is over. Similarly and paradoxically, the fitness industry, whose primary mission is to improve the health and well being of the community, instead, market their club toward younger, fitter, thinner members, fail to provide sufficient individual attention to meeting individual needs without additional expense, provide exercise programs and exercise leaders who are insensitive to the less fit, overweight, relatively older participant, and often fail to provide fitness testing and prescription, followed by written materials and other educational opportunities about improving fitness, exercising correctly, and engaging in healthier eating habits.

Additional applied research to authenticate each of these perceptions is warranted, with more effective interventions to improve exercise attitudes and behavior. Research, however, must be conceptually based. In order to understand the basis for examining

exercise behavior and to interpret and generalize the results of studies, it is important to understand the theories and models that exist in exercise and health psychology.

Brief Overview, Critique, and Application of Selected Exercise Psychology

Theories and Models

Developing any conceptual framework in human performance begins with understanding the theories and models that help explain, describe, and predict behavior. Theoretical frameworks help explain the effect of different treatments on desired outcomes, and models help organize vast amount of information to guide our thoughts and actions by separating the most from least important variables in explaining behavior. As Ockene (1998) notes, “theories and models provide a basis for predicting behavior change and maintenance, developing interventions to achieve changes in health-promoting behaviors, and evaluating outcomes of the interventions” (p. 1). The following listed theories and models are not exhaustive, but represent the frameworks that appear most often in the exercise psychology literature. The extent to which theories and models used in exercise psychology translate into effective programs and interventions to promote exercise behavior has been equivocal (Buckworth & Dishman, 2002).

Health Belief Model

The health belief model (HBM; Becker & Maiman, 1975) posits that persons who believe that certain behaviors are healthy, will they more likely engage in those healthy behaviors. Conversely, anticipating undesirable healthy outcomes will lead to behaving in a way that avoids these outcomes or at least reduces their impact. Thus, a person who feels that starting an exercise program will likely prevent or control the experience of poor health, overweight, and other undesirable outcomes will more likely exercise than persons who do not share the same perceptions. In addition, concerns about one’s health, feeling susceptible to or currently experiencing health problems, perceiving they can prevent or control the health problem, believing that exercise will reduce the likelihood of becoming ill or unhealthy, and experiencing cues that raise their awareness about the need to improve health (e.g., genetic predisposition based on health of family members, getting older, exposure to news stories or advertising campaigns, recommendation by a medical professional, positive feelings about attending an exercise facility) will more likely lead to initiating an exercise program.

Future research is needed to examine the extent to which the HBM-based interventions promote exercise behavior in response to: (1) providing educational materials that address the benefits of exercise and the consequences of leading a sedentary lifestyle, (2) modeling proper exercise habits and routines, (3) enhancing the exerciser's perceived competence, (4) improving perceived exercise effectiveness, (5) elevating self-efficacy, (6) developing set exercise routines, and (6) establishing easy access to an exercise facility.

Theories of Reasoned Action and Planned Behavior

These theories are combined in this section because one theory is an extension of the other (Ajzen, 1988; Ajzen & Fishbein, 1974). The theory of reasoned action (TRA) and theory of planned behavior (TPB) is concerned with the factors that influence a person's decisions about his or her behavior in social settings. According to the TRA, proper decisions about one's behaviors are based on information and beliefs about their actions, the outcome they expect from their actions, and the value they place on these outcomes. The most important component of this theory, however, is that an individual's *intentions* form the best predictors of actual behavior. The intention to perform certain actions reflects the person's attitudes about the behavior and about subjective, social norms of that behavior. The attitude toward exercise, for instance, reflects the individual's beliefs about the benefits and consequences – positive and negative evaluations - of engaging or not engaging in regular exercise. One limitation of the model's attitude component, pointed out by Buckworth and Dishman (2002), is that a person may believe that exercise is very healthy, yet conclude that there is a lack of time in the day to exercise regularly.

The second component of TRA reflects the individual's perceptions about the importance that others place on the behavior and the person's incentive to meet others' expectations. Thus, a person who is surrounded by one or more friends or family members who habitually exercise is more likely to exercise regularly than an individual whose friends and family do not. It is understandable, then, that developing social links as part of an exercise program (e.g., hiring a physical trainer, working out with friends, socializing at fitness clubs, training with teammates) often results in better exercise adherence. As Ajzen and Fishbein (1974) conclude, sometimes attitude is the primary

predictor of intentions, while other times it is the social norm within which a person functions.

In his modified follow-up of TRA, Ajzen (1985) added a third component to predicting exercise behavior -- perceived behavioral control, that is, an individual's perception that he or she has the resources (i.e., skill and ability) and the opportunity to perform the behavior or to attain the goal. Thus, an individual with unrealistic expectations (e.g., losing considerable weight; vastly increased musculature; running a marathon) will likely result in low perceived control about the situation, leading to disappointment and helplessness about their apparent inability to meet fitness-related goals. Subsequent low expectations about future success may result in quitting future exercise participation. Implications for supporting TPB through higher perceived behavioral control include establishing realistic exercise goals, and experiencing perceived skill and performance quality early in the exercise program (e.g., perceptions of improvement and using proper technique).

Hausenblas, Carron, and Mack (1997) concluded, based on their meta-analysis of related studies, that "individuals have the greatest commitment to exercise when they hold favorable beliefs about exercise and believe that they can successfully perform the behavior" (p. 45), a concept called perceived competence. It is the lack of perceived competence that is one cause of dropping out of organized exercise programs. In fact, about 50% of individuals who join fitness clubs drop out within six months due to their feelings of no progress or lack of skill in performing the exercise program (Marcus, Bock, Pinto, & Clark, 1996). In addition, this theory might explain the decision by many athletes to discontinue exercise habits when their sport careers ends. Apparently, the combined factors of low perceived control over exercise behavior as an inherent part of their training and the attitude that exercise serves a conditioning purpose for improving sports performance may result in a lack of continued interest when their sport career has ended.

Self-Efficacy Theory

Self-efficacy (SE) is a set of beliefs and expectations about how capable a person feels in performing the necessary behaviors to achieve a desirable outcome (Bandura, 1977). An exerciser may feel high SE about engaging in a weight-training program to

gain strength, yet feel far less SE in performing aerobic exercise. High SE about the activity usually results in a higher likelihood the person will begin and adhere to that activity. SE is specific to a behavior and situation, and is not usually generalized to other types of tasks (e.g., competitive sport versus exercise) or situations (e.g., running competition). SE affects the person's expectations of success and failure, and therefore, influences the person's selection of those activities, the degree of effort expended on the activities, and the extent to which a person will persist at the activities, especially after experiencing failure or not meeting expectations. For instance, exercisers who do not experience rapid success, that is, meet goals quickly, will presume that the task is of insurmountable difficulty and quit exercising, perhaps due to low SE. McAuley and Mihalko (1998), in their review of over 100 studies on the effects of SE on exercise behavior, concluded that SE is higher, which will lead to greater likelihood of exercise participation and maintenance, if the individual: (a) is allowed to select the type of exercise behavior undertaken, a concept called perceived choice, (b) possesses certain thought patterns, such as optimism and feelings of intrinsic motivation (i.e., exercising for pleasure and enjoyment), (c) expends optimal effort and feels capable of redoubling efforts in the face of barriers and challenges, and (d) has reasonably high expectations of successful performance and desirable outcomes. To McAuley and Mihalko, the strongest influence of SE on exercise behavior is performance accomplishments. Mastering tasks perceived by the performer as difficult markedly increase self-efficacy. The ways in which mastery occurs could include observing a model perform the desired task, encouragement from significant others, and observing other persons with similar characteristics to oneself succeed through effort and get rewarded as a result of their success, a process called vicarious experiences. Using performance data that indicates improvements, such as minutes of aerobic work, resistance, repetitions, percent body fat, flexibility, and heart rate (maximal oxygen uptake, or max VO^2) will improve SE and, consequently, exercise adherence. Improving SE as a method to favorably influence exercise behavior has considerable promise, however, it is likely that additional moderating factors must be included to help exercisers maintain this habit.

Information-Motivation-Behavioral Skills Model

The information-motivation-behavioral skills (IMB) model (Fisher, Fisher, & Harmon, 2003) has been applied to numerous health promotion behaviors, with particular attention to adherence in medical therapy settings. The model has considerable relevance to exercise behavior, although apparently it has not received attention in this area by researchers. The model posits that adherence behavior is a function of three components: (1) adherence information (e.g., about the medical regimen, about side effects), (2) adherence motivation (e.g., attitudes and beliefs about outcome of adherent behavior; perceptions of significant others' support for adherence), and (3) adherence behavioral skills (e.g., for minimizing side-effects, for acquiring social support, for self-reinforcement of adherence over time). Moderating factors affecting adherence include psychological health, an unstable living situation, and poor access to medical care. Although not developed to describe, predict, or influence exercise behavior, the IMB has strong implications for enhancing exercise adherence. Perhaps changing behavior from sedentary to active, rather than consisting of one determinant, consists of a series of stages, as suggested in the transtheoretical model (described in the next section), originally applied to addictive behaviors and later modified to exercise by Prochaska and Marcus (1994).

Transtheoretical Model

The *transtheoretical model*, also called the *stages of change model* (Prochaska and DiClemente's, 1982), has probably received the most attention by researchers in recent years. The model reflects the extensive time period, each categorized into separately defined stages, in the process of adopting and maintaining various health behaviors. The model is cyclical, not linear, because the decision to change health behavior is not always permanent. For example, attempts at dieting, smoking cessation, and initiating and maintaining an exercise habit are fraught with repeated failure, or non-adherence. The model's five stages are precontemplation, contemplation, preparation, action, and maintenance.

In *precontemplation*, individuals are inactive with no intention to begin an exercise program, at least not in the next six months, and do not indicate the need to exercise. In *contemplation*, the individual still intends to start exercising within the next

six months. The long-term consequences of living a sedentary lifestyle begins to become more important and closer to reality, while the benefits of exercise, including improved job performance, reduced health care costs, more energy) are increasingly more attractive. Prochaska and Marcus (1994) report that “on the average, individuals stay in this relatively stable stage for at least 2 years, telling themselves that someday they will change but putting off change” (p. 162). The authors refer to individuals who substitute thinking for acting as *chronic contemplators*. The *preparation* stage consists of the intention to take action in the near future, usually within a month. An action planned is formulated, although the plan may not be carried out to obtain the optimal benefits. The individual may not yet be fully committed to the plan because the disadvantages of exercising (e.g., not enough time, cost of a fitness club membership or fitness equipment at home, physical discomfort) still outweigh the advantages. The *action* stage reflects initiating an exercise routine – for less than 6 months. While an extensive amount of activity (e.g., scheduling exercise, thinking about its advantages, working with a partner or personal trainer, even packing the gym bag) is now underway, “it is the least stable stage and tends to correspond with the highest risk for relapse” (Prochaska & Marcus, 1994, p. 163). This stage endures for about 6 months. One uncertainty about this stage concerns the criteria that constitute “action”. Unknown is whether exercising three times per week at a given intensity and duration define “action”, or whether this stage refers to any consistent and enduring change in behavior – in this case, engaging in an exercise routine 3 times a week. As Prochaska and Marcus (1994) conclude, “problems exist in areas for which there is no agreed upon criteria” (p. 163). Finally, the *maintenance* stage occurs after a period of six months; there is now less risk that the person will quit exercising. Similar to the action phase, theorists and practitioners are uncertain about the operational definition of “maintenance.”

Rand and Weeks (1998), for example, have suggested terms such as “partial adherence,” “ideal adherence,” “appropriate adherence,” “erratic adherence,” and “involuntary adherence” to define a person’s decision to maintain a prescribed health behavior pattern. The criteria for using each concept is based on the behavioral change that was originally intended and planned, and would result in the desired (anticipated) outcome. Thus, if a person started on a 3-day per week exercise program, and after a few

weeks exercised only one day per week, the health benefits from exercise would be compromised. Yet, because the person went from no exercise to once per week, this could reflect partial, not full, adherence. Prochaska and Marcus consider 5 years of continuously maintaining an exercise habit as the time interval in which a person will not return to their previous, non-exercise lifestyle.

According to the addiction literature, from where the transtheoretical model was first generated, Reverting to previous habits is always possible, given the presence of selected factors or conditions (e.g., high demands on time, injury, one or more unpleasant exercise-related experience, poor weather, breakage of equipment, other, more tempting, activities that replace exercise) or the absence of others (e.g., lack of social support, failure to meet goals, increased exercise difficulty due to weight gain or aging, lack of financial resources to afford a fitness club membership). This phase of the model is called *termination*. Thus, there is uncertainty about whether a previously sedentary person who has maintained a regular exercise program will ever return to a life of no exercise. In their review of this model, Berger et al. (2002) suggest matching treatment (intervention) strategies to the individual's stage of change, progressing one stage at a time.

The transtheoretical model applied to exercise has received equivocal support according to reviews of related literature. Do people think and behave differently across various time periods related to changing their health behavior? Do we tend to follow similar patterns in the decision-making process in changing our behavior, or do some individuals suddenly change their disposition about exercise, perhaps based on test data or the deteriorating health of a family member or friend? The model awaits further research scrutiny.

The Disconnected Values Model (DVM)

The process of behavior change is a challenging process because habits and routines, in this case, lack of regular exercise, is firmly entrenched in the person's lifestyle (Ockene, 2001). Attempting to increase exercise behavior is particularly difficult because it is accompanied by an array of long-held feelings and attitudes that may reflect negative previous experiences (e.g., the physical education teacher who used exercise as a form of discipline, burnout from too much physical training as a former athlete, injury from previous exercise attempts). Further, vigorous exercise requires effort and some

degree of physical discomfort in order to obtain the well-known benefits. The degree of discomfort, often measured as “ratings of perceived exertion” (Borg, 1998) is directly reflects a person’s body weight, current fitness level, and the person’s sedentary lifestyle.

The DVM (Anshel & Kang, in press) is predicated on two postulates that define self-motivated behavior and have strong implications toward promoting exercise behavior. The first postulate is that self-motivated behavior reflects a person’s deepest values and beliefs about his or her passion, that is, their mission, or passion (Loehr & Schwartz, 2003). An individual’s acknowledged mission reflects their desire to become fully engaged in activities that “really matter” in meeting personal goals and future aspirations. The second postulate is that the primary motivators of normal human behavior consist of three stages: (a) to identify a deeply held set of values, (b) to live a life consistent with those values, and (c) to consistently hold ourselves accountable to them. Ostensibly, then, an individual whose values include health, family, and performance excellent – examples of three common values – should be self-motivated to exercise because it is consistent with these values. The DVM posits that developing an exercise habit rests, at least in part, on recognizing the inconsistency between one’s negative habits (i.e., lack of regular exercise) and their values, and then to institute a new, positive habit of exercise that is strongly connected to one’s values.

Negative Habits and Performance Barriers

The model begins by acknowledging the existence of negative habits, defined as thoughts, emotions, or tasks we experience regularly that are acknowledged by the person as not healthy or in the person’s best interests, yet, remain under our control. Anshel and Kang posit that the primary reason individuals engage in negative habits is because the perceived benefits of maintaining the habit outweigh its costs and long-term consequences. Negative habits (e.g., lack of exercise, poor sleep and nutrition) lead to barriers in performance, such as fatigue, negative mood state, and lack of concentration.

Perceived Benefits, Costs and Long-term Consequences of Negative Habits

There are benefits to every negative habit we have. If there were no benefits to a negative habit, the negative habit would not continue. As discussed earlier, the *benefits* of not exercising, for example, include more time to do other things, not experiencing the discomfort of physical exertion, and having expenses related to purchasing fitness club

memberships and exercise clothing, including shoes. Of course, there are possible *costs* to not exercising. These include reduced fitness, weight gain, and higher stress and anxiety (both of which are reduced due to exercise). The *long-term consequences* of these costs include poorer physical and mental health, reduced quality of life, and, in some cases, shorter lifespan. Are these costs acceptable? If they are, then the negative habit of not exercising and maintaining a sedentary lifestyle will likely continue. However, if the costs are far greater than the benefits, *and* the person concludes that these costs unacceptable, than a change in behavior is far more likely.

Determining One's Deepest Values and Establishing a Disconnect

The DVM then presents individuals with a list of 40 values and asks individuals to designate and rank them. Examples include integrity, happiness, honesty, character, excellence, commitment, and concern for others. To help clients detect an inconsistency between their values and their negative (self-destructive) habits, consultants or mental health professionals might ask non-exercising clients “To what extent are your values consistent with your actions? If you lead a sedentary lifestyle and are not involved in a program of exercise, yet one of your deepest values is to maintain good health, to what extent is your value inconsistent with your behavior? Is there a ‘disconnect’ between your beliefs about good health and your unhealthy behavioral patterns?”

Acceptability of the Disconnect

If a person acknowledges that the negative habit of not engaging in exercise is inconsistent with their deepest values and beliefs about what is really important to them, the follow-up question must be to ascertain if this is acceptable. Is the disconnect between this negative habits - lack of exercise – and the values a person feels passionate about acceptable? If the disconnect *is* acceptable – and for many individuals who feel that changing the negative habit is either undesirable or beyond their control – then no behavior change will likely occur. Only when the disconnect is unacceptable to the individual is the person prepared to commit to behavior change, and then engage in developing and carrying out an action plan.

Developing a Self-Regulation Action Plan

The person’s decision to initiate an exercise program, ostensibly because the disconnect between their negative habit of non-exercise and their deepest values and

beliefs, is followed by developing a self-regulation detailed action plan. The plan consists of determining the details of developing a habit of regular exercise during the week. The DVM remains relatively new, but has received empirical support in two published studies (Anshel & Kang a,b; in press). Additional intervention research is needed to examine the efficacy of this model in exercise settings, and to examine the model's mechanisms for inducing health behavior change.

In summary, research in applied exercise psychology requires conceptual frameworks from which to explain cause and effect, to replicate future studies, and to generalize results to other populations. The theories and models applied to exercise behavior have been only moderately successful in creating permanent change in exercise habits. Further research is needed to improve the efficacy of exercise interventions.

Personal Dispositions of Exercisers and Non-exercisers

All individuals possess a set of psychological characteristics, called dispositions, styles, or orientations, that differ from more permanent, stable personality traits, and that result in certain behavioral tendencies. Because personality traits are, by definition, non-changeable, a conceptual framework for *applied* exercise psychology should include components that may be altered or influenced by some treatment or intervention. Therefore, the focus of this section is on the dispositions that are influenced by exercise participation, how exercisers and non-exercisers differ on these dispositions, and how dispositional research might help us determine the ways in which exercise might be used for therapeutic purposes by favorably influencing desirable dispositions (e.g., confidence, self-esteem, optimism, self-control, anxiety, perfectionism). Traits, such as neuroticism-stability, extraversion-introversion, dominance, and risk-taking, are not amenable to change and, therefore, are not included in the present applied framework.

While a full description of these dispositions goes well beyond the focus of this section, there are certain personal features that predict a person's willingness to begin and adhere to exercise habits. For example, *social physique anxiety* (SPA) is defined as a person's anxiety in response to others' evaluations of his or her physique. It is also concerned with fear of negative evaluation, social self-esteem, self-consciousness, shyness, and loneliness (Crawford & Eklund, 1994; Frost & DiBartolo, 2002). In an exercise context, SPA is negatively associated with favorability of the exercise setting

emphasizing the physique, and positively related to favorability of the setting de-emphasizing the physique (Crawford & Eklund, 1994). In addition, self-presentational reasons to exercise (e.g., body tone, weight control, physical attractiveness) are positively associated with SPA (Eklund & Crawford, 1994). Thus, SPA at least partially explaining the motives for exercise behavior, that is, creating desirable impressions while avoiding undesirable impressions in social settings.

Based on reviews of related literature by Anshel (2006), Lox, Martin, and Petruzzello (2003), Berger et al. (2002), Buckworth and Dishman (2002), other dispositions linked to exercise behavior include self-consciousness (i.e., heightened awareness of how one is being perceived by others), need achievement (i.e., increased motivation in achievement settings), fear of failure (i.e., a motive for behavior based on appraisals of threat to an individual's ability to accomplish one or more personally meaningful goals), perfectionism (i.e., tendency to set extremely high standards and exhibit high self-criticism when these - often unrealistic - standards are not met), hardiness (i.e., a sense of personal control, commitment, and a tendency to perceive life events as challenges rather than as stressors, self-esteem, and type A behavior pattern (i.e., a person's likelihood to exert greater effort, exhibit greater competitiveness and time consciousness, and feel more anger). Type As has lower exercise adherence rates than their Type B counterparts (Oldridge, 1982). Several studies have shown that these dispositions discriminate between exercisers and non-exercise, or may predict exercise participation. Self-esteem, for example, invariably improves in response to initiating an exercise program (Leith, 1998). Exercise has more potent effects on physical self-esteem than on general self-perceptions. Relatively few clinical studies, however, have linked a measure these dispositions with diagnosis and treatment purposes. If, for instance, a person measures a high score for neurotic (maladaptive) perfectionism, they may have abnormally high expectations of their exercise performance and outcome, particularly over a short period of time. Clinical treatment is needed to change this though pattern. More clinical studies examining intervention effectiveness associating dispositions with treatment outcome in exercise settings.

Exercise Motivation

Several studies have indicated that positive attitudes toward a certain behavior (e.g., taking banned drugs, tobacco use, lack of exercise) do not always translate into behavior (Ockene, 2001). Even individuals who chose to lead a sedentary lifestyle know the benefits of exercise, yet, they do not exercise. The reasons some individuals make the choice to exercise while others do not are one major area of study and practice in exercise psychology. Without motivation, starting and maintaining any habit is unlikely.

The term *motivation* comes from the Latin word, *movere*, meaning “to move.” To be motivated means to feel “moved,” or compelled, to initiate action toward a certain goal. More specifically, it is the tendency for the direction and selectivity of behavior to be controlled by its connections to consequences, and the tendency of this behavior to persist until a goal is achieved. Thus, a person’s decision to exercise reflects the importance he or she places on the meeting a certain need and achieving a particular outcome. There are several sources of exercise motivation, including improved fitness, health, physical appearance, weight control, reduced stress, even socializing. One goal of researchers who need to test the effectiveness of exercise interventions and the practitioners who work with clients to promote exercise habits is to discuss the individual’s needs and motives that might facilitate developing an exercise habit.

One of the primary motives for exercising is to maintain or reduce body weight. Sadly, many individuals will quit their exercise habit if weight reduction goals are not quickly met. However, perhaps one of the most convincing reasons to exercise, irrespective of body weight, was the result of a meta-analysis by Blair and Brodney (1999). The authors examined the results of 24 studies that examined links between the effects of aerobic exercise on physiological outcomes and morbidity and mortality. The results of these studies, all conducted on males only, indicated that individuals who were overweight or obese received very similar physiological improvements and health-related benefits in response to aerobic and strength training exercises as compared to their normal weight counterparts. It was important to restrict the reviewed studies to one gender because there are too many biological factors (e.g., hormones, bone density, body type, normal rates of morbidity and mortality) related to gender that might influence the

conclusions of a review of different studies. Clearly, as the authors conclude, a similar review of studies on women only is also warranted.

The authors concluded that: (1) “Overweight and obese individuals who are active and fit have lower rates of disease and death than overweight and obese individuals who are inactive and unfit” (p. S659), (2) “Overweight or obese individuals who are active and fit are less likely to develop obesity-related chronic diseases and have early death than normal weight persons who lead sedentary lives” (p. S659). And (3) “Inactivity and low cardiorespiratory fitness are as important predictors of mortality as being overweight or obese” (p. S660).

The researchers found that a person’s decision to exercise should *not* be associated weight loss. This is because exercise itself, even if not accompanied by a loss in weight or body fat, results in very similar physiological benefits as for persons who are not overweight or obese. Thus, engaging in aerobic forms of exercise, then, is the most important factor to good health and lower rate of disease rather than being consumed with weight control, especially through dieting but not exercising.

Intrinsic Motivation and Exercise

While building IM is not, in itself, a cognitive strategy, however, it is a necessary component of a long-term commitment to exercise and represents a primary area of applied research in exercise psychology. IM, grounded in Deci’s (1975) cognitive evaluation theory, is defined as For promoting exercise, it is important that researchers and practitioners address two main components, self-determination (the exerciser’s perception of high self-control) and information (high perceived competence). Thus, the exerciser should make his or her own decision about the need to exercise, choose his or her preferred type and location of exercise program, feel confident about his or her ability to engage in exercise, and finally, receive positive feedback about their exercise success – a reflection of effort, improvement, outcome, and overall competence. Strategies for improving IM in exercise settings represents a primary area of needed research. One of the more popular means to improve fitness and maintain an exercise habit that reflects the principles and components of IM is walking.

One reason walking programs have become so popular in recent years is because the popularity of more intense aerobic programs that elicited very high (training) heart

rate in the 1970's and 1980's resulted in widespread injuries, overexertion, extreme physical fatigue, and exercise dropouts. The result has been that people are returning to a sedentary lifestyle rather than submitting to an exercise regimen perceived as grueling, difficult, and unpleasant. In order to get more people exercising and overcoming dropout, researchers started examining the benefits of brisk walking and other forms of low-intense physical activity, especially for adults who are older, overweight, have joint problems, or lead a sedentary lifestyle. It was found that a high intense aerobic workout was less necessary than previously thought in order to obtain the benefits of exercise (Marcus et al., 1998). For example, walking at least three miles an hour for at least 20 consecutive minutes can improve cardiovascular fitness (Anshel & Reeves, 1998). The effect of various exercise intensities (e.g., rate of walking or jogging) on improved fitness and exercise adherence forms another area of needed research.

Exercise Barriers

The other side of motivation is demotivation, and the opposite of exercise adherence/maintenance is non-adherence/termination. The primary sources of demotivation and non-adherence - the exercise dropout - are referred to as *exercise barriers*. Berger et al. (2002) refer to this concept as "excuses not to exercise." Based on their review of this research literature, the authors listed (not surprisingly) "lack of time" as the most common reasons for not exercising followed by lack of energy and lack of motivation. These were what they called "major barriers." "Moderate barriers" included excessive cost, illness/injury, lack of close facilities, feelings of discomfort, lack of skill (poor exercise technique), and fear of injury. "Minor barriers" were lack of safe places, lack of childcare, lack of partner, insufficient programs, lack of support, and lack of transportation. This list of exercise barriers is essential in attempting to examine the effectiveness of various cognitive and behavioral strategies on an unfit person's willingness to begin and maintain an exercise habit. While each of these barriers are important determinants of exercise behavior, field research is needed that takes into consideration an individual's own unique exercise barrier(s), and then to develop strategies, routines, and other clinical procedures to overcome each barrier to provide the incentives, skills, motives, and supportive environment to exercise regularly. For example, the frequently cited "lack of time" barrier can be countered by this simple fact:

there are 168 hours in a week, and proper fitness can be attained in only three hours per week. Three hours is only 1% of the hours in a week. Put that way, can the person “sacrifice” a mere three hours of television, causal eating, phone conversations, or internet use over a one-week period? This is where practitioner’s should consider helping clients with effective time management skills, and where researchers can test the efficacy of time management on promoting exercise behavior in response to the excuse of insufficient time. The research questions in this area might be: (1) to ascertain the reasons an individual would begin an exercise program – called *contemplators* in the transtheoretical, or stages of behavior change, model – and then drop out, and (2) what strategies can be enacted that would prevent dropout, and foster long-term exercise adherence. The collective area of research that addresses ways to promote exercise behavior is called *relapse prevention*. Changing the individual’s perceptions of these barriers (i.e., that ways can be found to circumvent every form of exercise barrier) forms a primary area of research.

Exercise and Mental Health: Psychological Benefits of Exercise

While it has been well known for many years that exercise has a strong, favorable affect on physiological processes, similar benefits have been found on mental and emotional factors, including changes in personality. It is important to point out that these benefits are not typically experienced after a brief period of time, but accrue after several weeks or even months (Berger et al., 2002; Buckworth & Dishman, 2002; Leith, 1998; Lox et al., 2003). Reductions in stress and anxiety, and improved mood form the foundation of this research area.

Stress

Buckworth and Dishman (2002), in their review of literature, have concluded that “aerobic exercise programs lasting at least a few months seem best for reducing reports of chronic stress” (p. 79). The mechanisms by which this positive effect occurs seems to be the short-term distraction from unpleasant thoughts and/or increasing feelings of control or commitment that buffers the impact of stressful events (Leith, 1998). Stress-reducing properties are more likely if each exercise session lasts for at least 30 minutes.

Anxiety

While stress reflects a person's sense of immediate danger, anxiety reflects an individual's perceptions of worry and threat about *future* harm. Exercise, particularly *aerobic* in nature, has a favorable influence on both acute and chronic state anxiety, even a single bout of aerobic exercise (Petruzzello et al., 1991). Aerobic exercise has also benefited patients with various anxiety disorders (e.g., panic disorder, post-traumatic stress disorder) and clinical depression. Reasons for the positive effects of exercise on state anxiety include favorable changes in the exerciser's biochemistry, "time-out," or distraction, from the sources or symptoms of anxiety, heightened sense of competence and achievement, improved self-concept, and increased social support.

Mood

Because mood is a state, not trait, measure, research on the effects of exercise on mood have focused on immediate, rather than long-term, effects. Perhaps the most recent and comprehensive review of the research literature related to the effects of exercise on mood, was conducted by Berger and Motl (2000). The authors examined studies over the past 25 years in which mood was measured specifically by the Profile of Mood States (POMS). They concluded that there is unequivocal support for the mood-enhancing effects of exercise, specifically on improved vigor and reduced tension, depression, anger, confusion, and fatigue. The authors attribute changes in mood following exercise to psychological mechanisms, including "enhanced self-concept, feelings of self-efficacy, enjoyment, expectancy of psychological benefits, 'time out' from one's routine and daily hassles, and an increased sense of control" (p. 84). Physiological mechanisms (e.g., cortisol, endorphins, monoamines), reflecting biochemical changes, may also partly explain mood alteration during and after exercise. With respect to exercise intensity, the authors recommend that unless a participant prefers low or high exercise intensity, optimal conditions for mood changes occur at a moderate intensity level. In summary, exercise, in particular moderate intensity and aerobic exercise, reduces negative mood and improves positive mood state. The time period in which these favorable effects endure and the mediating variables that affect these benefits still require future research.

Psychopathology

One area on the mental health and exercise area that has received only scant attention by researchers is the role of psychopathology in creating a barrier to initiating and maintaining an exercise habit. Several edited book have included chapters addressing the links between exercise and mental health (e.g., Sachs & Buffone, 1984; Leith, 1998; Morgan, 1997). Plante (1993) conducted an extensive review of literature on the role of aerobic exercise in preventing and treating psychopathology. Thus, this literature has focused on the psychological and emotional benefits of exercise, and the role of exercise as a form of therapy, particularly in relation to combating clinical depression and chronic anxiety (chapters 2 and 3, respectively, in Leith, 1998). Surprisingly, however, exercise psychology researchers have ignored the role of psychopathology as a barrier to initiating and adhering to exercise programs. Psychopathological issues (e.g., depression, anxiety, disordered eating, irrational thinking) are almost never controlled or considered mediators of treatment outcomes.

In a relatively rare review of this literature, Brewer and Petrie (2002) describe an array of psychopathological issues inherent in clinical sport psychology, with implications for exercise participants. Examples include disordered eating, drug/steroid abuse, panic disorder, bipolar disorder, obsessive-compulsive disorder, and various addictions. Clearly, preexisting conditions often mediate an exerciser's behavioral pattern and decision to engage in an exercise program. Until these issues are resolved, incentives to exercise will be compromised. Descriptive studies on the role of selected psychological conditions as a barrier to exercise initiation and adherence, or examining the effectiveness of clinical interventions on the effect of exercise changes in the client's mental condition are needed.

Exercise Adherence, Compliance, and Relapse

Beginning an exercise habit is challenging, but maintaining it is even more difficult. The tendency of a person to maintain their participation in any behavioral regimen – exercise, in this case – once the individual has agreed to undertake it is called (exercise) adherence. Rand and Weeks (1998) broadly define adherence as “the degree to which patient behaviors coincide with the clinical recommendations of health care providers” (p. 115). Other definitions of adherence include sticking to or faithfully

conforming to a standard of behavior in order to meet some goal, and long-term behavior changes associated with preventing undesirable symptoms or outcomes. *Compliance*, on the other hand, although used interchangeably with adherence, is not the same thing. It refers to behaviors related to following immediate or short-term advice, a direct prescription to improve health or well being, or a sense of coercive obedience to order. In calling for more compliance research in the health care industry, Nancy Miller and her colleagues (1997) define compliance simply as “the extent to which recommendations are followed and defined” (p. 1085). Thus, persons who initiate and maintain an exercise program *on one’s own volition* are adhering rather than complying with their program. However, persons who are given instructions about what exercise to do and how to do it and carry out these instructions are *complying* with the exercise program. Despite differences in how adherence and compliance are operationally defined, most authors in this literature continue to use the terms interchangeably.

Rand and Weeks address a common problem in the adherence literature -- the lack of specific criteria to provide the “gold standard” for determining adherence. What is acceptable adherence in one study or for one exerciser might be non-adherence in another study or for someone else. As indicated earlier, adherence may be classified as “appropriate,” “erratic/partial,” “ideal,” “voluntary,” or “involuntary.” While a complete review of this area goes beyond the purpose of this section, three points are worth noting from an applied perspective in working with exercise clients. First, labeling someone as an exercise dropout (i.e., a non-adherer) has consequences for long term, intrinsic motivation to persist at future attempts at exercising. The person will conclude, as many individuals do, “I once tried that and quit. Why would it work this time?” They will less likely feel secure and motivated to try again. Instead, it might be more motivating to point out limitations in their current exercise habit (i.e., erratic, or partial adherence) and to build on their strengths (e.g., “You are off to a good start; keep trying because exercise gets easier as you get fitter”).

Second, while exercise adherence is usually determined by the extent to which the person is maintaining the original exercise plan, there are often fair reasons for not continuing. One example is the lack of proper instruction, leading to poor exercise technique, higher perceived exertion (i.e., feelings associated with exercise intensity and

effort), and greater difficulty in completing the planned routine. Other reasons include sustaining an injury, self-consciousness about one's appearance in an exercise facility, engaging in an exercise activity that one finds overly strenuous, failure to quickly meet goals (which may be unrealistic), and the lack of social support. Researchers have also determined that the absence of an exercise facility located near home or work, job-related travel, physical and mental fatigue, lack of interest, poor weather, family demands, and perceived lack of time, may all lead to discontinuing an exercise plan.

Third, there is a tendency for researchers to collect data based on formal group exercise programs, as opposed to a person's preference to exercise alone, or perhaps at home instead of at a public facility. In other words, while individuals might decide against continuing to exercise in a structured setting, they could continue to engage in a program of vigorous physical activity in a more private setting. This does not mean they have dropped out, but rather, they have selected another type of venue and structure within which to exercise. To refer to this person as non-adhering to exercise would be incorrect. With a dropout rate of 50% within the first six months of starting a program, one fruitful area of research is to determine ways to maintain a habit of physical activity, especially outside of formal exercise program settings.

Strategies for Enhancing Exercise Adherence and Compliance

There are seven primary guidelines for encouraging individuals who have started exercising to maintain their exercise habit: (1) addressing the exerciser's psychological dispositions that may prompt dropping out, such as chronic anxiety or depression, self-consciousness, perfectionism, need achievement, intrinsic motivation, fear of failure, and even clinical issues (e.g., mood or eating disorders, addictions, secondary effects of medications), (2) promoting a sense of need through initial testing and quantitative data that provides a sense of urgency about the need to exercise – and the consequences of remaining sedentary, (3) fostering the perceptions of optimism, perceived competence, and improvement in both setting and meeting realistic exercise-related goals, (4) providing instruction and feedback – both positive and constructive – that improve exercise skills and techniques, thereby enhancing performance and reducing the unpleasant manifestations of intense physical exertion, (5) providing social support, either through personal coaching or having the person exercise with a friend, (6)

providing educational materials related to proper exercise techniques, exercise benefits, and improved nutrition, and finally, (7) working with the exerciser in creating and maintaining a healthy lifestyle (going beyond exercise behavior) related to nutrition, reduced stress, and other desirable habits. More studies are needed to examine the influence of these factors on attitudes about exercise and long-term exercise behavior.

Cognitive and Behavioral Strategies on Exercise Performance and Affect

Cognitive strategies refer to a mental process that is intended to improve some behavioral outcome, in this case, exercise. Behavioral strategies, on the other hand, consist of any activity that favorably affects a thought process or performance quality (Anshel, 2003; Singer, 1980). One area of applied exercise psychology is concerned with examining the effect of these strategies on exercise performance and affect, or mood state. For example, is it possible that positive self-talk prior to an exercise session will foster confidence and higher expectations? Will performance be favorably affected if a mental skill is conducted during the exercise bout? This section concerns the use of mental skills that favorably influence exercise performance. Most of these have been established in the sport psychology literature and used successfully in sport, yet they also have a direct impact on exercise performance, and form an important concept in applied exercise psychology.

Here are examples of cognitive strategies that may influence physical performance. Further research is needed to test the efficacy of each of the following strategies on various dependent variables, such as affect, attitude toward exercise, performance quality, and exercise adherence. In studying the efficacy of these strategies, researchers are urged to combine reputable research designs and proper exercise protocol recommended by the American College of Sports Medicine (ACSM, 2000) to demonstrate true cause and effect.

Cognitive Strategies

Visualization/imagery. Visualization, also referred to as imagery, consists of thoughts that form mental representations of physical performance. While the use of visualization, or mental imagery, is a common and effective technique in improving sports performance, the exerciser can also use this strategy for numerous reasons to gain confidence, to learn new exercise routines, to reduce tension and anxiety prior to

exercising, to increase excitation and psychological readiness, and to improve motivation. For instance, the exerciser may want to mentally rehearse the exercise activity, performed perfectly, and with positive feelings.

Bizarre imagery. While normal imagery is a mental representation of *real life situations*, bizarre imagery is a mental representation of non-realistic events. For example, cancer patients are sometimes asked to imagine their tumors being shrunk as they receive chemotherapy. Cardiac or pulmonary patients might imagine rapid changes in their circulatory system that are medically impossible during an exercise bout. An overweight person might imagine fat being dissolved or arteries being widened while exercising. The purpose of bizarre imagery is to heighten exercise motivation and to distract the person from the challenges presented from the exercise task.

Association and dissociation. During physical exertion, should the exerciser focus his or her attention on the muscles being used or to ignore bodily sensations and become distracted from the task at hand? Conscious attempts at linking the mind and body is called *association*. An example of properly using association is during strength training. The focus of attention should be on the muscle group being used to lift the weight. *Dissociation*, on the other hand, is used when the exerciser wants to ignore bodily responses. Examples include distance running, or someone undergoing exercise rehabilitation whose therapy requires movements that are uncomfortable.

Thought-stopping. A common dilemma in exercise is engaging in self-statements that reveal unpleasant feelings about the task at hand. Unpleasant feelings, especially if continued during an exercise bout, may lead to demotivation, reduced effort, and even dropping out from further participation. The suggestion here is that in response to negative feelings, exercisers should say to themselves “STOP!” Ongoing negative thinking, often referred to in the psychology literature as rumination, inhibits effort, energy, and distracts the person from the task at hand. Consciously stopping negative thoughts and replacing them with more upbeat self-statements (e.g., “Stay with it,” “keep going,” “just one more rep”) promotes optimism, effort, and performance outcomes.

Positive self-talk (PST). Similar to the thought-stopping strategy, the exercise wants to inhibit negative self-talk (e.g., “This is terrible,” “I feel awful,” or “I can hardly wait until this is over”), and engage in a more uplifting, motivating self-statements. The

result will be more effort and intensity, better concentration, and greater enjoyment of the task. Examples in exercise settings include, “Lets do it,” “I feel good,” and “Stay with it.” The use of single words that influence mood are also effective, such as “Go,” “Focus,” and “Get it!”

Anticipation. The ability to predict a movement before performing it increases momentum, improves pre-performance readiness, and reduces the amount of information the person must process quickly. This strategy is especially important when performing fast-paced, coordinated activity, common in aerobic workouts (Anshel & Reeves, 1998). While research in this area is replete in the motor behavior literature, studies on the effectiveness of using this cognitive strategy on exercise performance and physical fatigue are needed.

Psyching-up. For some activities, in which high arousal and energy are required (e.g., physical exercise), the performer’s thought processes must be upbeat and “active.” Psyching up consists of thinking about the task at hand and having thoughts of excitation, challenge, spirited, engaged, connected, and high energy. Physically, the person can engage in tasks that require increased heightened somatic responses (e.g., heart rate, respiration rate, physical readiness). Mentally, psyching up usually consists of thoughts that increase mental processes (e.g., confidence, motivation, concentration). Examples of psyching up types of thoughts include “lets do it,” and “I’m ready.” Research is needed to examine the effects of negative and positive forms of self-talk on exercise performance and emotional responses. If exercisers can be taught to use PST or psyching up, they will more likely complete a vigorous exercise session, burn more calories, improve fitness level, and develop more favorable attitudes toward physical activity.

Attribution training. An exerciser, particularly a novice, will be physically challenged to engage in vigorous exercise. To maintain optimal effort and persistence in overcoming signs of fatigue and other manifestations of physical training, exercisers should interpret their attempts and outcomes as “successful,” and then to attribute their success as due to high effort (Anshel, 2003). Linking effort to success has very high motivation value and feelings of competence and self-control. Even experiencing fatigue and not meeting performance expectations can be attributed to task difficulty, and sometimes to low effort – if this is an accurate perceived cause. Explaining the outcomes

of exercise should be attributed to the effort and improvement that accrues from exercise maintenance. Learning to make accurate causal attributions that help explain performance success is referred to as attributional training (Anshel, 2003; Biddle, Hanrahan, & Sellars, 2001). One research question in this area would be to examine the extent to which attributional training influences exercise adherence, similar to its favorable affect on preventing or reducing dropout from sport participation (Biddle et al., 2001).

Behavioral Strategies

There has been an emerging body of literature by researchers and practitioners on ways to promote exercise participation and adherence by adopting behavioral techniques. This section will include ways to environmental influences to encourage continued exercise participation based on the recommendations of several references (e.g., Anshel & Reeves, 1998; Leith, 1998; Sallis & Owen, 1999). More research on the effects of these strategies on exercise attitudes and adherence is needed.

Scheduling. We are creatures of routines, not unlike the animal world, to get us through the day. There is a far greater likelihood of exercising if it is planned in advance. The more specific that plan, the better chance it will happen. Choose the time of day that an exercise session is most available and when it feels best – physically and emotionally – to do. However, it is best not to exercise aerobically within 2 hours of bedtime, according to several sleep studies. Aerobic work reduces time spent in deep (dream) sleep, according to the National Sleep Foundation (1522 K Street, NW, Suite 500, Washington, DC 20005, or on see their website: www.sleepfoundation.org/publications). Will scheduling enhance exercise adherence? Research is needed to answer this question.

Goal-setting. Guidelines for setting goals is particularly relevant for the exercise novice. One primary reason for dropping out is the failure to meet goals and expectations, particularly within the first 6 months of starting an exercise program. This is why it is so important to help individuals have realistic expectations about exercise outcomes, and to understand the need to be patient in overcoming years of leading a sedentary lifestyle. The guidelines of having short term, performance-based goals that are minimally challenging will more likely lift confidence and encourage a person to adhere to their program than a person who concludes that they are incapable of meeting the demands of carrying out a proper exercise program. There is no such thing as experiencing perceived

success as soon as possible. Sample goals in exercise settings include, “I will complete 20 minutes non-stop on the treadmill,” “I will complete 3 sets of my upper body resistance routine,” or “I will reach my training heart rate during interval training.” Notice that these goals are performance (process) goals, rather than outcome (product) goals (e.g., “I will lose 3 pounds” or “I will decrease 2% body fat”), which are long-term, not short-term goals and are under less self-control.

One area of goal-setting that has received virtually no attention by researchers is the use of “*mini-goals*.” Building intrinsic motivation to perform any task is strongly linked to building perceptions of competence. This is best accomplished when the exercise detects increments of improvement, however small. The exercise program, then, should contain measures that are somewhat easy to attain and that reinforce the performer’s perception of moving toward achieving their goals. This is why using the relatively small unit of time (minutes, for example) is more likely to reflect competent performance than measuring performance by the relatively larger unit of distance (miles, for instance).

Goal orientation. Is it possible that some individuals do not respond well to goal-setting? It is possible that exercisers with a low goal orientation, in which the person finds goals unsettling, threatening, and demotivating, will actually produce poorer performance outcomes than persons with high goal orientation. Research is needed to address this issue.

Social contacts and interactions. While some exercisers prefer to exercise alone, most novice exercisers prefer social support - feeling connected to others during their routines. The need for social support is especially important in instances when the individual is self-conscious about physical features, and lacks confidence and knowledge about carrying out exercise routines. What conditions or personal dispositions are most compatible with a person’s preference for particular exercise environments? Several studies have shown that social support significantly improves exercise adherence. Studies are needed to determine if primary social support, consisting of a person who is exercising with the subject, affect exercise performance or adherence differently than secondary social support, that is, a supportive person who is not exercising with the subject, but who is lending verbal encouragement.

Rewards. According to positive social reinforcement theory, rewards have information value about competence. A reward, for example, a t-shirt that reflects achieving a certain level of competence (e.g., 500-mile club) or membership with a group (e.g., the YMCA Running Club) enhances a sense of accomplishment and group member identification. Both outcomes markedly improve participation satisfaction and adherence. In order to build intrinsic motivation, the reward should be linked directly to a desirable performance outcome or achievement, rather than as a response that is expected, which loses its value as a reinforcement of competence.

Educational materials. The written word is a powerful tool in helping people to understand the value of what they do, in this case, exercise. While it is best to avoid complicated research journal articles in providing information to the public, other sources such as magazine articles, internet material, and even materials that reflect credible sources of information may be delivered to exercise participants. Findings from recent studies, for instance, has great motivational value.

Clubs, organizations, and programs. Humans have a deep need to belong to a group or attend programs in which groups and friendships flourish. They provide comfort, security, and meets social needs. The greater extent to which individuals feel emotionally attached to an exercise program or facility, the more likely they are to return and maintain their involvement. Running clubs, weekly lecture and reading groups, banquets that recognize exercise achievement, exercise-related events (e.g., Sunday morning jog), company or individual- sponsored contests (e.g., “The John Smith Annual Run”), outdoor activity club, an annual guest speaker’s event, a health-related conference, weekly seminars, and exhibitions by skilled exercisers (e.g., power lifting, aerobic dance) are sample activities that create excitement and motivation to exercise, partly due to group affiliation.

Proper equipment and environment. What is the effect of exercising on different types of equipment on attitudes toward exercise, and fitness outcome and adherence? Will the use of equipment, particularly given the extent of numerical feedback, affect exercise performance, motivation, or adherence differently than the non-use of equipment (e.g., walking, jogging)? Does a clean, properly functioning exercise facility affect exercise participation and adherence rates? While the need to monitor, clean, and fix

broken equipment on a constant basis was discussed in the previous section, it is also important that the facility have equipment available that meets the needs of all members. Resistance training requires different weight machines for the novice as well as the advanced power lifter.

Does the exercise environment influence participant attitude, emotion, and participation rate? Exercise facilities can create an environment that is exciting, intimate and motivating for participants. In addition to the usual colorful walls and pleasant and upbeat music, facilities must ensure that their equipment is clean and functions properly. Broken equipment should be fixed within 24 hours, if at all possible.

Record keeping. The importance of having exercisers keep records is central to promoting intrinsic motivation through the perception of competence. It is important that exercise leaders and physical trainers work with clients to record baseline measures of various dimensions of fitness, then monitor progress through maintaining those records. In this way, exercisers can detect indicators of improvement and achievement, which are important sources of intrinsic motivation. Performance data should be recorded, updated, and monitored in quantitative form, reflecting numbers, rather than general comments, such as “Susan did a good job today” or “Bill is feeling better about his exercise progress.” Examples include minutes and seconds of aerobic activity, weight lifted, number of repetitions, degrees of flexibility (stretching), changes in percent body fat, number of laps or amount of distance jogged, and even frequency of attending the fitness venue or a particular program. Similar to Kirschenbaum’s (1987) work with athletes, detecting quantitative indicators of improving exercise outcomes is a strong source of reinforcement.

Self-monitoring. Developing an exercise habit requires learning a vast array of new skills and initiating many new routines to ensure a successful and pleasant experience. This is the value of an exerciser checklist. The technique, called *self-monitoring* (SM), entails listing the thoughts, emotions, and actions that should be part of the exerciser’s weekly and daily protocol. The SM checklist is not a “test” of knowledge, but rather, a set of guidelines about making exercise as pleasant and performed as efficiently as possible. Thus, answers as close to “5” as possible are always desirable. Items that are answered 1 through 3 require attention about the source(s) of this low

score. *The goal in completing this checklist is to improve (increase) the total score for each segment.* While several studies have shown the benefits of SM in dieting, weight control, and motor performance, more research is needed in applied exercise psychology.

Monitor client attendance. What is the effect of keeping attendance records on exercise attendance and adherence? Absences, after all, signal warning signs of quitting. The effect of monitoring attendance is a form of social support.

Social support. As discussed earlier, the likelihood to adhere to an exercise program increases significantly if a friend or family members accompanies the exerciser, or if the exerciser receives emotional support (e.g., praise, recognition, approval) for their efforts or on the positive outcomes from their exercise participation. Nonverbal social support comes with providing ways to facilitate the exerciser's habit, such as driving a person to the exercise venue, giving a fitness club membership as a gift, supervising or monitoring the exerciser's responsibilities (e.g., babysitting, performing work-related tasks, recording a favorite T.V. program). People are more likely to start and stick with an exercise program if these efforts have the support and encouragement of family and friends.

Perceived choice. It makes no sense to force a person to engage in a certain type of exercise, or to use a certain piece of equipment if they have negative feelings about it. Exercisers need choices about the types of activities they can and feel comfortable performing that will benefit their health and fitness. At first, the novice should develop proper technique before they attempt to be challenged physically. Tasks should be kept relatively easy at first, then slowly increased in task difficulty. People are more likely to stick with the program if it includes exercises that they enjoy doing.

Social engineering. The concept of social engineering comes from the stress management literature, in which persons will experience less stress if locate themselves in a place in which fewer environmental sources of stress are present. If possible, the novice should exercise at a time when equipment is more likely to be available and when the staff can offer more attention and instruction. Even more important for the highly self-conscious exerciser is that fewer people in attendance means less likelihood of being observed by others, at least that may be the exerciser's perception. Social engineering has

been ignored by exercise psychology researchers, yet can produce considerable information about creating the optimal exercise environment that meets individual needs.

Music. It is well known, according to scientific studies (e.g., Anshel & Marisi, 1978; Karageorghis & Terry, 1997) and from empirical observations, that more intense music has an arousal-inducing effect on exercise performance. Exercise facilities acknowledge this, of course, and often have music playing throughout their facility. Some exercisers prefer their own brand of music and wear headsets or “Walkman’s.” Music has the advantage of distracting the exerciser from boredom and the physical manifestations of vigorous physical activity (e.g., fatigue, sweating, high effort). Music also improves the exerciser’s mood state. However, music can also reduce concentration on the task at hand, resulting in lower performance quality. It’s all a matter of personal preference. Unknown are the effects of reading (and other distractions) on exercise intensity, duration, and perceived exertion.

Modeling. Rather than feeling intimidated by highly fit exercisers, one source of motivation is to observe the high level performance of another exerciser (or the instructor). The goal is to emulate their exercise techniques and to use their high performance quality as a source of inspiration and motivation to pursue fitness and health-related goals. The effects of modeling on selected fitness and psychological factors awaits further research.

Time of day. Not surprisingly, each of us differs on the time of day we prefer to exercise. This is due to both personal choice – feeling more like exercising at a certain time – and due to the time that is available to us. Does time of day make a difference in how the body responds to exercise and to exercise outcomes? Not according to a study by O’Connor and Davis (1992), who confirmed the findings of several earlier Swedish studies. While the benefits are similar no matter the time one exercises, it is best not to exercise within 3 hours of going to sleep. Studies also indicate that high intensity aerobic exercise close to bedtime will reduce time spent in deep sleep. The effects of time of day one chooses to exercise on various psychological variables and exercise adherence awaits further research.

Exercise Interventions

Limitations of Intervention Research

The effectiveness of interventions and treatments on exercise behavior (e.g., performance, attitude, emotion, adherence) is at the heart of applied exercise psychology. To date, sadly, the efficacy of many interventions has been low to moderate (Buckworth & Dishman, 2002). The amount of outcome variance explained in studies testing the efficacy of exercise interventions has rarely been above 30% (Baranowski, Anderson, & Carmack, 1998). Dishman and Buckworth (1997) conducted a meta-analysis of 127 studies and 14 dissertations to determine the effectiveness of interventions to enhance exercise adherence in a healthy population. They reported that only about 20% of the studies included a follow-up to the intervention. Typically, increased physical activity or fitness associated with the interventions diminished with time after the end of the intervention. These results persisted as a function of age, gender, and race. Effects were better under conditions of low to moderate intensity compared to strength or aerobic training. A critique of the existing intervention literature is intended to promote and test new treatments, and novel research designs to test the integrity of these treatments.

Selected limitations of the extant exercise intervention literature have been reviewed by Buckworth and Dishman (2002), Dishman and Buckworth (1997), Morgan (1997), and Sallis and Owen (1999), among others. For example, Buckworth and Dishman lament the absence of a theoretical framework or model to examine the efficacy of an intervention intended to promote exercise participation and adherence. The authors correctly conclude, “without a theoretical framework, the choice of variables cannot be well justified and the ability to interpret results is limited” (p. 252). In addition, Dishman (1991) asserts that the majority of early exercise intervention research has relied on one-dimensional techniques and a small sample size of highly selected participants (e.g., clinical populations, individuals already engaged in a specific program). Thus, the generalizability of findings from these studies to the community would not be feasible. Another reason that may explain the paucity of exercise intervention effectiveness is that strategies and programs have often been imposed on the individual: researchers have not controlled for the exerciser’s motives, rationale, and personal commitment to begin and maintain an exercise program.

An additional limitation of existing exercise intervention research is the assumption that the person *desires* a change in behavior (Buckworth & Dishman, 2002; Marcus & Stanton, 1993). Goals for behavior change have been traditionally imposed on the individual by the researcher or clinician rather than self-determined by the exerciser. Along these lines, participants often lack of personal involvement in voluntarily choosing and committing to the type and schedule of exercise involvement, a strategy referred to as perceived choice (Markland, 1999), or perceived behavioral control (Ajzen, 1985). In typical exercise adherence studies, exercisers are required to attend group sessions, often at specific times, performing predetermined exercise routines.

Another limitation is the virtual absence of research on the effects of specific cognitive (e.g., positive self-talk, imagery, cognitive appraisal) and behavioral strategies (e.g., goal setting, music, social support) on selected dependent measures (e.g., cognition, emotion, exercise performance). In addition, previous intervention research has focused on outcomes (e.g., changes in attitude toward exercise and level of exercise adherence) rather than the decision-making mechanisms and thought processes by which changes in exercise-related attitudes and behavior occur. While educational materials, personal coaching, and social support may improve exercise adherence, but researchers are unsure of the reasons (Sallis & Owen, 1999).

In their extensive critique of previous intervention research, Buckworth and Dishman (2002) claim “many interventions have been developed without a theoretical model or with only selected components of a model.” In addition, “interventions are typically not tested to see whether they change the variables they are designed to change, or whether the target variables are actually responsible for changes in the outcome variable” (p. 252). As Glasgow, Klesges, Dzewaltowski, Bull, and Estabrooks (2004) have concluded from their related literature review, “it is well documented that the results of most behavioral and health promotion studies have not been translated into practice” (p. 3). As indicated earlier, unknown to researchers and practitioners are the *mechanisms* that lead to health and exercise behavior change.

One such likely mechanism is what Oldridge (2001) refers to as “regimen factors,” that is, to make exercise habitual, to improve adherence. However, if the strategies are implemented as an integral part of one’s daily routine, adherence is far

more likely. In particular, he suggests “keeping the regimen straightforward, providing clear instructions and periodic checks, promoting good communication with the patient, and reinforcing their accomplishments” (p. 322). Oldridge contends that adherence strategies are seldom very effective on their own. As Ockene (2001) concludes, “...change is a process, not a one-time event, and we can’t expect people to make changes at a level for which they’re not ready. Our interventions need to be directed to where the individual is” (p. 45). What is becoming apparent is that the future of applied research on exercise interventions concerns the development of tailored programs that meet individual needs and overcomes personal perceived barriers to exercise.

Exercise Addiction/Dependence

Just opposite to the problem of promoting an exercise habit is the person who becomes dependent on, or addicted to, exercise. The concept is called exercise addiction or dependence. Originally referred to as positive addiction by Glasser (1976), the terms “exercise dependence” or “compulsion to exercise” have been used more commonly in more recent years.

While researchers and psychologists debate whether any addiction can be positive, most agree that addictions, in general, tend to be unhealthy and undesirable (Cockerill & Riddington, 1996). This is because, by definition, addictions represent behaviors that are beyond the person’s control or that reflect psychopathology, such as low physique self-esteem, an eating disorder, the need for social isolation, or representing some other compensation that requires treatment. For example, the motivation for running or weight training may serve the purpose of improving body image. While it is normal to enhance one’s physical features, the huge amount of time devoted to exercise, at the expense of other normal daily routines and social interactions, borders on abnormal or dysfunctional behavior. Although the exercise dependence may have an anabolic (tissue-building) effect on the body, excessive exercise, whether it is a conscious decision or a behavioral habit driven by routine and a perceived personal need, may have a catabolic (tissue-destroying) effect on the system. Negative consequences may result, such as injury, illness, or exercising while injured or ill (Hausenblas & Symons, 2002). To measure exercise dependence, see Hausenblas and Symons’ (2002) *Exercise Dependence Scale*.

Some individuals who suffer from negative exercise addiction feel compelled to exercise, even at the expense of working, socializing, or being involved in other important activities. Exercise is controlling their life. Thus, a negatively addicted exerciser concludes that they “must” exercise, rather than exercising for improved health, relaxation, or other forms of enjoyment, and that exercise is the center point in their life, even at the expense of their health and life satisfaction. Other manifestations of negative addiction include exercising with a serious injury, when in pain, in poor health, exercising to lose weight when, in fact, the person’s weight is normal or below normal, and exercising at the expense of attending to family responsibilities or developing social relationships. In their review of related literature, Cockerill and Riddington (1996) claim that compulsive exercisers are dissatisfied with their body or with themselves, exercise to have control, but instead, become controlled by the activity, do not enjoy having free time, become dependent on the euphoric and calming benefits of exercise, are avid goal-setters, and become socially withdrawn. More research is needed to understand ways to understand the psychological (perhaps psychopathological) and physiological mechanisms that nurture exercise dependence, and clinical strategies for preventing or overcoming negative forms of exercise dependence.

Conclusion and Future Directions

If exercise is so healthy for us, why are so many of us so unmotivated to engage in it regularly? Why do we refuse to move our body unless absolutely necessary? Why do we maintain habits that we perform every day and that we know are unhealthy, and resist instituting new, healthier habits? Reasons abound, but it is primarily about the cost-benefit tradeoff. The benefits of our inactivity (e.g., more time to do other things than exercise, not enough time or energy, unpleasant side-effects from vigorous physical activity, using our “spare” time more productively), outweigh the costs (e.g., weight gain, less attractive appearance, lower quality of life, negative moods, higher likelihood of undesirable mental and physical conditions and diseases). As a former university President once said, “every time I think about exercising, I lie down until the feeling passes.” We have literally trained our body to be inactive. The result is that physical exertion is unpleasant and the consequent dropout rate for those who initiate a program is

very high. Preventing exercise dropout forms a primary area of future research in applied exercise psychology.

The theoretical and applied literature is replete with research problems and questions in attempting to understand the causes of, and to develop possible solutions to, the problem of a culture that is becoming more overweight and less healthy by the day. Significantly more applied research is needed in the development of new theories and models, and the search for new, increasingly effective strategies that replace unhealthy with new, healthier ones. The challenges of changing health-related behaviors goes far beyond developing an exercise habit, however, instituting regular exercise as a daily ritual will result in extensive advantages to one's health and well being.

There are no shortage of barriers to starting and maintaining an exercise habit, including the need to explore psychopathological explanations (e.g., chronic anxiety and depression, irrational thinking, low self-esteem) for not starting and quitting exercise programs. This issue warrants more attention by researchers. Building intrinsic motivation and developing interventions that are tailored to meet individual needs should provide the focus of future work. The benefits an active lifestyle, including exercise, must outweigh the costs.

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