Understanding Older Adults’ Physical Activity Behavior: A Multi-Theoretical Approach

Janene M. Grodesky, Maria Kosma, and Melinda A. Solmon

Physical inactivity is a health issue with serious consequences for older adults. Investigating physical activity promotion within a multi-theoretical approach may increase the predictive strength of physical activity determinants and facilitate the development and implementation of effective interventions for older adults. This article examines constructs from the Transtheoretical Model, Theory of Planned Behavior, and Self-Determination Theory and their integration with the Stages of Change Model in order to understand physical activity behavior change among older adults. In addition, barriers and facilitators of physical activity are identified. The need for a comprehensive multi-theoretical approach in physical activity behavior change for older adults is reinforced and implications and research areas to be addressed are discussed.

Regular physical activity is essential for quality of life and health. It decreases the risk for coronary heart disease, the nation’s leading cause of death, and decreases the risk for stroke, colon cancer, diabetes, and high blood pressure. It is associated with fewer hospitalizations, physician visits, and medications. Empirical evidence shows that physical activity helps to reduce or prevent “age-related” physical declines such as decreases in endurance and functional capacity, sarcopenia (loss of muscle mass), and bone density loss (Taylor et al., 2004).

Physical activity also positively affects psychological and cognitive aspects among older adults. Specifically, moderate levels of physical activity decrease the incidence or severity of depression, and increase a sense of well-being (Taylor et al., 2004). For cognitive functioning, evidence shows that fit older adults have faster reaction time, better memory and fluid intelligence than their unfit counterparts (Boutcher, 2000; Chodzko-Zajko & Moore, 1994).

The Centers for Disease Control and Prevention (CDC, 2002) recommend that older adults accumulate at least 30 min of moderate-intensity physical activity (e.g., brisk walking and yard work) on most, and preferably all, days of the week. In this article, “physical activity” is a broad term encompassing any activity that requires body movement and increased energy expenditure. “Exercise,” a subcomponent of...
physical activity, is planned, structured, and repetitious body movement to increase physical fitness (Plonczynski, 2003).

Despite the well-documented benefits of physical activity, few individuals participate in physical activity on a regular basis. Inactivity is common in all age groups, with older adults (age 65 years and older) being one of the most inactive populations (United States Department of Health and Human Services [USDHHS], 2000). Only 10–30% of older adults report engaging in regular exercise. Twenty-eight to 34% of adults age 65–74, and 35–44% of adults age 75 or older do not engage in regular moderate-intensity physical activity as recommended (Centers for Disease Control & Prevention, 2002; Schutzer & Graves, 2004).

About 25% of adults age 55–64 report “not being active in the last month” (Behavior Risk Factor Surveillance System [BRFSS], 2005). This age group needs to be acknowledged because it represents the next generation of older adults. Considering these statistics, the report that by the year 2030 the estimated number of persons age 65 and older will reach 70 million in the United States, and the fact that persons ≥ 85 years old represent the fastest growing population segment (ACSM, 1998), it is imperative to understand the reasons for the low participation in regular physical activity among both the current older adult and upcoming older adult populations (Michael, Colditz, Coakley, & Kawachi, 1999; Orsega-Smith, Payne, & Godbey, 2003; Taylor et al., 2004; USDHHS, 2000).

Given the plethora of atheoretical studies in physical activity promotion (Biddle & Nigg, 2000), it is important to understand physical activity behavior change from a theoretical perspective (McAuley, Jerome, Elavsky, Marquez, & Ramsey, 2003). More specifically, integrating constructs from several theories (multi-theoretical approach) may facilitate the development and implementation of effective physical activity motivational programs (Kosma, Gardner, Cardinal, Bauer, & McCubbin, 2006a). However, there are few theoretically driven studies that identify physical activity determinants among older adults (McAuley et al., 2003).

Therefore, the purpose of this review article is to integrate constructs from the Transtheoretical Model (TTM), Theory of Planned Behavior (TPB), and Self-Determination Theory (SDT) with the stages of change (SOC) to understand the psychosocial determinants of physical activity behavior change among older adults. Given the limited empirical evidence of theory-based physical activity determinants among older adults, the reported studies are not limited to a specific age group. However, research with older adults will be highlighted. Physical activity barriers and facilitators among older adults will also be examined. Lastly, practical implications and research areas to be addressed will be discussed.

### Transtheoretical Model of Behavior Change

A theoretical framework that has shown promise in the exercise domain over the past decade is the Transtheoretical Model of Behavior Change (Marcus & Simkin, 1993; Marshall & Biddle, 2001; Prochaska & Marcus, 1994; Prochaska & Velicer, 1997). The TTM originated from a comparative analysis of change systems used in the psychotherapy domain to treat addictive behaviors (e.g., smoking; Prochaska & DiClemente, 1983). The model contends that behavior change is not an
all-or-none phenomenon. Individuals may make several attempts to initiate an activity, or may restart an activity several times after terminating it. The TTM incorporates four constructs: (a) SOC (physical activity intention and behavior), (b) processes of change (POC; cognitive and behavioral strategies to be active), (c) decisional balance (perceived pros and cons of physical activity), and (d) self-efficacy (perceived ability to be active; Prochaska & Velicer, 1997).

Stages of Change

The temporal dimension along which behavior change unfolds is the stages of change (SOC). The five most commonly studied SOC in the physical activity domain are: precontemplation, contemplation, preparation, action, and maintenance (Cardinal, 1997; Marcus & Simkin, 1993). The original SOC model also includes the termination stage whereby negative behaviors (e.g., smoking) are hypothesized to cease for a lifetime (Prochaska & DiClemente, 1983). Although Courneya and Bobick (2000) suggest the termination stage is not relevant in the exercise domain, current findings suggest substituting the transformed stage for the termination stage to reflect lifetime acquisition of a positive behavior like physical activity (Cardinal, 2000; Cardinal & Levy, 2000; Fallon & Hausenblas, 2004). In precontemplation, the individual is not active and does not intend to become active in the future. In contemplation, the individual is not active, but is thinking of becoming active in the next six months. In preparation, the individual is not regularly active but intends to be regularly active within the immediate future (i.e., within one month). The action stage is where the individual regularly engages in the new behavior, but has been engaging in it for less than six months. In the maintenance stage, the individual sustains the physical activity behavior over six months. In general, the higher the SOC an individual is in, (e.g., action and maintenance) the higher the physical activity level (Cardinal, 1995; Cardinal, 1997; Dannecker, Hausenblaus, Connaughton, & Lovins, 2003; Marcus & Simkin, 1994).

Decisional Balance

Based on the model set forth by Janis and Mann (1977), decisional balance reflects the way perceived pros (benefits) and cons (barriers) of a behavior can affect adoption of a new behavior. Perceived pros and cons can vary systematically across the exercise SOC (Prochaska & Marcus, 1994). Individuals in the higher SOC (e.g., action and maintenance) perceive more benefits of physical activity than individuals in the lower SOC (e.g., precontemplation and contemplation) (Plotnikoff, Blanchard, Hotz & Rhodes, 2001). The pros and cons are shown to “cross-over” during the preparation stage with pros outweighing cons of physical activity thereafter (Jordan, Nigg, Norman, Rossi, & Benisovich, 2002; Lee, 1993; Marcus, Rossi, Selby, Niaura, & Abrams, 1992; Marcus, Banspach et al., 1992; Nigg & Courneya, 1998; Prochaska & Velicer, 1997).

Older adults in precontemplation tend to focus on the negative aspects of exercise, such as the time involved or unpleasant physical sensations. Conversely, those in the maintenance stage emphasize the positive aspects of exercise (e.g., feeling better or better appearance) (Gorely & Gordon, 1995). In a qualitative study by O’Brien Cousins (2003), older adults in the early SOC (i.e., precontemplation
and contemplation) reported negative past experiences, dislike of physical activity, and “lack of value” in physical activity. Those in the later SOC enjoyed the social atmosphere of a physical activity class, and a general sense of well-being.

Self-Efficacy

Self-efficacy, as defined in the TTM, is the situation-specific confidence individuals have that they can cope with high risk situations without relapsing to their unhealthy behaviors (Prochaska & Velicer, 1997). It is the perceived confidence to overcome barriers to initiating and maintaining behavior change. This construct was integrated into the TTM from Bandura’s self-efficacy theory (Bandura, 1997).

Self-efficacy increases across the SOC in a positive, almost linear fashion, and has been shown to be an important predictor of progress through the exercise SOC (Cardinal, 1997; Marcus, Eaton, Rossi, & Harlow, 1994). These findings have also been supported across various populations such as individuals with physical disabilities (Cardinal, Kosma, & McCubbin, 2004), ethnic minorities (Laffrey, 2000), women (Fahrenwald & Walker, 2003), obese populations (Dallow & Anderson, 2003), and older adults (Gorely & Gordon, 1995). McAuley, Jerome, Marquez, Elavsky, and Blissmer (2003) suggested that previous exercise behavior is a strong source of self-efficacy information and future exercise behavior, especially in older adults.

Processes of Change

Physical activity behavior change is a complex “process” of both covert and overt activities in which the individual modifies her or his experiences and environments in order to adopt or maintain the behavior (Prochaska & Marcus, 1994; Prochaska & Velicer, 1997). The 10 POC in the TTM reflect certain strategies and techniques individuals may employ as they progress through the different SOC. Utilization of the POC depends strongly on the individual’s SOC (Prochaska & DiClemente, 1983). The POC are organized into two higher-order constructs of five behavioral processes and five cognitive processes. Theoretically, the processes are derived from a variety of therapy systems including behavioral, cognitive, existential, experiential, gestalt, humanistic, interpersonal, and psychodynamic (Marcus & Simkin, 1994). Thus, “behavioral” conveys personal action, and “cognitive” conveys perceptions in relation to behavior and setting.

Behavioral POC include reinforcement management, counterconditioning, helping relationships, self-liberation, and stimulus control. Reinforcement management provides consequences for taking steps in a particular direction. Counterconditioning promotes the learning of healthy behaviors that can substitute for unhealthy behaviors. Helping relationships combine caring, trust, openness, and acceptance as well as support for healthy behavior change. Self-liberation is both the belief that one can change and the commitment and recommitment to act on that belief. Lastly, stimulus control removes cues for unhealthy habits and prompts for healthy alternatives (Prochaska & Velicer, 1997).

Cognitive POC include consciousness-raising, dramatic relief, environmental reevaluation, self-reevaluation, and social liberation. Consciousness-raising involves increased awareness about the causes, consequences, and solutions for
a particular problem behavior. *Dramatic relief* initially produces increased emotional experiences followed by reduced affect if appropriate action can be taken. *Environmental reevaluation* combines both affective and cognitive assessments of how the presence or absence of a personal habit affects one’s social environment. *Self-reevaluation* combines both cognitive and affective assessments of one’s self-image such as one’s image as an inactive and an active person. *Social liberation* requires an increase in social opportunities or alternatives especially for individuals who are relatively deprived or oppressed (Prochaska & Velicer, 1997).

In regard to the use of each POC across the stages of change, there is a lack of conclusive evidence of various health behaviors (e.g., smoking, nutrition, health screenings, etc.) (Nigg, 2005; Rosen, 2000b). Within the physical activity domain, the use of both the cognitive and behavioral processes tends to increase across the stages of change among different populations (e.g., Cardinal & Kosma, 2004; Kosma, Cardinal, & McCubbin, 2004; Marcus & Simkin, 1994; Tseng, Jaw, Lin, & Ho, 2003). Recent research for physical activity behavior change among adults with physical disabilities reinforces the important role of the POC to positive SOC behavior change. In this way, the development and implementation of effective stage-matched physical activity motivational interventions may be facilitated among understudied populations (Kosma et al., 2004). However, only one study has examined the relationship between the POC and the SOC in older adults (Tseng et al., 2003).

### SOC Determinants in the TTM

Although the importance of applying the full TTM (i.e., *all* model constructs) to physical activity behavior change has been recognized (Prochaska & Marcus, 1994), few studies have tested the full model among older adults to identify the most important exercise SOC determinants. In particular, Gorely and Gordon (1995) investigated the relationship between the SOC and the rest of the TTM constructs in a population of Australian older adults. They found that self-efficacy, POC (e.g., self-revaluation, consciousness raising, counterconditioning, self-liberation, and stimulus control), and decisional balance all significantly and independently contributed to the discrimination of the SOC. A post hoc analysis revealed that self-efficacy had the highest significant increase from precontemplation to maintenance.

Hellman (1997) examined the relationship among SOC, decisional balance, self-efficacy, and physical activity among older adults with a cardiac diagnosis. She reported that self-efficacy was the most powerful predictor of SOC followed by decisional balance. The predictive strength of self-efficacy on the SOC has also been supported among adult women with obesity (Dallow & Anderson, 2003), adults with diabetes (Plotnikoff, Brez, & Hotz, 2000), adult women with fibromyalgia (Oliver & Cronan, 2005), and older adult cardiac patients (Allison & Keller, 2000).

Recent studies support the importance of the POC in relation to the SOC and physical activity. For example, Cardinal et al. (2004) examined self-efficacy, processes of change, and decisional balance in relation to stages of exercise behavioral change among mainly *active* adults with physical disabilities. All constructs were significantly associated with SOC for exercise behavior. The behavioral POC were the most important predictors of the SOC followed by self-efficacy, cognitive POC, perceived pros, and perceived cons. Similar findings have been reported for SOC for muscular fitness promoting behaviors among mainly active college
students (Cardinal & Kosma, 2004). Within mainly inactive adults with physical
disabilities, the most important SOC predictors were the behavioral and cognitive
POC, followed by self-efficacy and decisional balance (Kosma et al., 2004). In a
recent study by Kosma et al. (2006a), the behavioral and cognitive POC mostly
distinguished the SOC. These two constructs and self-efficacy mostly predicted
physical activity among both active and inactive adults with physical disabilities.

**Integrating the SOC with Parallel Theoretical Constructs**

Recent studies have combined constructs of the TTM (e.g., SOC) with con-
structs from different theoretical frameworks (e.g., TPB and SDT) in order to
improve the predictive strength of physical activity determinants. In light of the
complexity of physical activity behavior change, it seems unlikely that a single
theory can truly capture an individual’s motivations and behavioral patterns (Pin-
trich, 2003). Thus, multiple perspectives from parallel theories can be combined
to better understand physical activity behavior change.

**Theory of Planned Behavior**

A conceptual framework of behavior change often compared with the SOC is
TPB, an extension of the Theory of Reasoned Action, (Azjen & Fishbein, 1980;
Fishbein & Azjen, 1975), the central determinant of volitional behavior is one’s
intention to engage in that behavior. Intentions are conceptualized to capture the
motivational factors that influence a behavior (Azjen, 1991). In turn, intention is
determined by three conceptually independent variables: attitude, subjective norm
and perceived behavioral control. Attitude reflects the perceived positive or nega-
tive consequences of performing the behavior and the value of these consequences.
Subjective norm reflects the perceived social pressure to perform or not perform
the behavior from significant others. Perceived behavioral control is the perceived
ease or difficulty (self-efficacy) and control of the behavior.

Attitude and perceived behavioral control have been described as similar
to decisional balance and self-efficacy of the TTM, respectively (Azjen, 1991;
Courneya, Nigg, & Estabrooks, 1998). Perceived behavioral control may also be
an immediate determinant of behavior if the behavior is not completely volitional
(Azjen, 1991). Therefore, the basic hypotheses of the TPB are that people will intend
to perform a behavior when they possess favorable attitudes, subjective norm, and
strong perceived behavioral control, and they will perform the behavior when they
possess strong intentions and perceived behavioral control (Azjen, 1991).

Although the TPB has been used extensively as a framework to design stud-
ies examining physical activity behavior, and a large body of evidence has been
generated (e.g., Courneya, 1995; Godin, 1993; Jordan et al., 2002), a thorough
review of the literature is beyond the scope of this article, and only cursory research
examining the important predictors in relation to physical activity SOC will be
examined. Attention is focused on those constructs important for older adults.
Then, studies that integrate the TPB with the SOC will be reviewed (Courneya,

In two recent meta-analyses (Downs & Hausenblas, 2005; Hagger, Chatzisarantis, & Biddle, 2002), the most important predictor of physical activity was intention and the most important predictors of intention were attitude and perceived behavioral control. The importance of intention to exercise behavior has also been supported among older adults (Michels & Kugler, 1998; Wankel & Mummery, 1993). Wankel, Mummery, Stephens, and Craig (1994) reported that as age increased, perceived behavioral control and subjective norm were more important predictors of physical activity intention than attitude. The predictive strength of social influences may increase when social support substitutes for subjective norm (Courneya, Plotnikoff, Hotz, & Birkett, 2000).

In relation to the SOC, evidence shows that the TPB constructs are useful for differentiating the SOC in the exercise domain (Courneya, 1995; Courneya et al., 1998; Jordan et al., 2002; Lee, 1993; Rosen, 2000b) and also for predicting future behavior (Courneya, Plotnikoff, Hotz, & Birkett, 2001; Michels & Kugler, 1998); however, these findings are not in complete agreement. For example, perceived behavioral control was a strong determinant of the SOC with a cohort of men age 30 to 60 years (Nguyen, Potvin, & Otis, 1997). In other studies, intention appears to be essential in differentiating the early SOC and predicting transition through the later SOC (Courneya, 1995; Rosen, 2000b). For older adults, Courneya (1995) reported that intention, followed by attitude, and perceived behavioral control predicted SOC. Precontemplators had more negative attitudes and lower control beliefs than contemplators. They also had lower scores on intention, attitude, subjective norm, and perceived behavioral control than members of all other stages.

Within a three-year prospective design Courneya et al. (1997) examined progression across the SOC in relation to the TPB constructs. They found that participants who adopted exercise in those three years had higher perceived behavioral control at baseline than those who resisted exercise. Also, participants who maintained activity over the three years had more positive attitudes, higher perceptions of control, and stronger intentions. In another study with older adults, Courneya et al. (1998) examined the mediating role of intention and SOC in baseline and future (three year) exercise behavior using attitude, subjective norm, and perceived behavioral control as the independent variables. The study findings revealed that both intention and SOC predicted baseline exercise. However, intention was a stronger predictor of future exercise behavior than SOC (beta weight was not reported).

In the latter study by Courneya et al. (1998), both intention and SOC were used as mediators between the TPB independent variables (attitude, subjective norm, and perceived behavioral control) and current as well as future (three year) exercise behavior. Using both SOC (intention and behavior) and intention as mediators of physical activity may lead to inaccurate parameter estimates (e.g., attenuation or increase of predictive strength; Kline, 1998). In addition, in their study multiple regression analyses were used to analyze the study data. In multiple regression analyses, mediator and outcome effects cannot be tested simultaneously (Kline, 1998).

In a recent study (Kosma, Gardner, Cardinal, Bauer, & McCubbin, 2006b), the mediating role of intention and SOC in physical activity over a six-month period
was tested using two models (TPB and TPB/SOC) among adults with physical disabilities. In the second model (TPB/SOC), SOC served as the sole mediator of future physical activity. Based on path analyses (simultaneous examination of outcome and mediator effects), attitude had the highest effect on intention and SOC followed by perceived behavioral control within both well-fit models. The SOC exhibited a stronger mediator effect on physical activity than intention. A similar finding was reported in the prospective study (one to three months) of Rosen (2000a) whereby baseline early SOC (precontemplation–contemplation vs. preparation–semi-preparation) accounted for more variance in future exercise behavior than intention. The strong mediator effects of the SOC have also been supported within the TTM (Kosma, Cardinal, & McCubbin, 2005; Marcus et al., 1994).

In summary, the studies reviewed suggest that the integration of the SOC with constructs of the TPB may provide a comprehensive framework for understanding the psychosocial factors that predict exercise initiation and maintenance. Of particular importance is the notion that such an integrative framework may facilitate the understanding of exercise behavior change in the older adult population.

**Self-Determination Theory**

Another framework that provides valuable insight into the choices that individuals make with regard to their health, such as engaging in physical activity, is Self-Determination Theory (SDT) (Deci & Ryan, 1985). The SDT is based on three assumptions concerning the nature of individuals: (a) proactive in nature, (b) they are naturally prone toward growth and improvement, and (c) they have basic psychological needs that are innate, universal, and essential for health and well-being. Autonomy, competence, and relatedness are identified as fundamental psychological needs and they are the driving force for an individual’s endeavor to internalize or integrate actions and experiences onto self within a social environment (Deci, Eghrari, Patrick, & Leone, 1994). Autonomy is the degree to which individuals choose actions at the highest level of consideration and initiate the actions with a full sense of choice (Strauss & Ryan, 1987). Markland (1999) defines competence as the perception of ability in negotiating the social context. Relatedness is an individual’s feelings of closeness to others (Ryan & Deci, 2000).

Thus, SDT focuses on internalization and personality orientations within a social context (Deci & Ryan, 1985; Rose, Markland, & Parfitt, 2001). According to the model, the social context or climate mediates the amount and quality of internalization. Internalization is the process in which motivation for a behavior moves from external regulation to internal regulation (Deci et al., 1994). Internalization of autonomy can be facilitated by an individual’s social context, culture, or climate. If supportive, it allows for choices that would aid in autonomous motivation. If non-supportive, then autonomous motivation would not be facilitated (Deci & Ryan, 1985; Landry & Solmon, 2002; Mullan & Markland, 1997). Motivation, as defined by Roberts (2001) is the energization, direction, and regulation of behavior. In the SDT, motivation for behavior is viewed on a continuum. The continuum ranges from amotivation (lack of motivation), through extrinsic motivation (externally controlled motivation), to intrinsic motivation (for the activity itself) (Deci & Ryan, 1985; Landry & Solmon, 2002; Ryan, 1995).
Central to SDT is the notion that extrinsic motives are multidimensional and vary considerably in their level of personal integration and autonomy (Deci & Ryan, 1985; Ryan, 1995). Extrinsic motives may include compliance with external pressures or attainment of rewards (Mullan & Markland, 1997). There are four levels of extrinsic motivation along the continuum. Each type possesses a varying degree of internalization as the continuum moves toward intrinsic motivation (external regulation, introjected regulation, identified regulation, and integrated regulation, respectively). Internalization is the process by which the individual assumes the new behavior as a part of self (Ryan & Deci, 2000).

External regulation is the lowest form of extrinsic motivation, placing it immediately to the left of amotivation on the self-determination continuum. At this level, individuals participate in an activity or task merely to obtain a desired outcome, such as recognition, or to avoid a negative consequence, such as punishment (Deci & Ryan, 2000). It is well documented that individuals who begin an exercise program often do so for extrinsically motivated reasons. The individual is likely to progress to exercising for more intrinsically motivated reasons if they maintain the activity long enough (Ingledew, Markland, & Medley, 1998). The next level of extrinsic motivation is introjected regulation, where the individual has yet to integrate the regulation into self. Individuals at this level tend to participate out of guilt, coercion, or a sense of obligation (Ryan & Deci, 2000). Identified regulation is when an individual perceives the behavior as relevant to her or his goals, and believes there is value in performing the behavior. Behaviors that are initiated at this level are more likely to be maintained than behaviors initiated at a lower level (Deci & Ryan, 2000). Identified regulation is directly linked to physical activity outcomes and is related to future plans (Biddle, 1999).

The most self-determined level of extrinsic motivation is integrated regulation, where the behavior becomes fully integrated into one’s identity and is important to the attainment of personal goals (Biddle, 1999). Individuals at this level act completely of their own volition, but they are driven by the usefulness of the behavior in relation to personal goals rather than by the behavior as an end unto itself (Deci & Ryan, 2000).

The highest level on the continuum of behavioral regulation is intrinsic motivation, when the individual participates in the action for enjoyment and for the action itself (Ryan, 1995). As an individual moves closer to intrinsic motivation, he or she tends to possess stronger feelings of personal investment, autonomy, and self-identity. Intrinsic motivation occurs when the activity (e.g., exercise) is valued as an end unto itself, and is operationalized in three forms: (a) to know, (b) to accomplish, and (c) to experience stimulation (Biddle, 1999).

The SDT for physical activity has facilitated a deeper understanding of how one can simultaneously be extrinsically motivated (do it for appearance or maintain fitness), yet feel quite self-determined in the regulation of physical activity behavior (Mullan & Markland, 1997). It also produces a better understanding of how initial levels of motivation predict exercise adherence (Landry & Solmon, 2002). This continuum view of motivation in which intrinsic motivation is the highest and most desirable form is consistent with current social cognitive theories that view perceptions of control as the thread that binds theories of motivation (Biddle, 1999). Thus, studies integrating multiple theories are warranted.
The integration of the SOC with the SDT in the exercise domain has only recently been studied (Biddle & Nigg, 2000). Mullan and Markland (1997) integrated the SOC with SDT and found that in the initial SOC for exercise behavior, the focus is on making the decision to start exercising. Here, individuals showed less self-determined forms of regulation as they began the process of internalizing the regulation of behavior that might be initially uninteresting or unwanted. As individuals progressed from occasionally participating (preparation) to habitually participating (action and maintenance), he or she became more self-determined in the regulation of their exercise behavior. Individuals with more self-determined reasons for exercising were characterized as being in the later stages of change (action and maintenance) in comparison with those in the earlier stages (precontemplation and contemplation).

Thus, the process of behavior regulation from initiation, or precontemplation stage to maintenance stage seems to be linked to an individual’s level of internalization on the SDT continuum. Ingledew et al. (1998) reported that shifts from inactive to active stages of exercise behavior were associated with more autonomous exercise motives (e.g., participating in an activity for enjoyment of the activity). To date, the only study that examines the SDT across the exercise SOC in adults age 50–79 found that increased enjoyment (intrinsic motivation), and higher expectations of health, fitness, stress management, and social-emotional benefits (self-determined extrinsic motivation) discriminated activity levels than motives related to more externally determined extrinsic motives such as weight management and appearance (Dacey, 2004).

While discussing the general movement along the continuum, it is important to note gender differences along the regulatory continuum in exercise motivation. Specifically, as self-determination in the regulation of exercise behavior increased across SOC, females were more self-determined at all SOC, and reported higher levels of intrinsic and identified regulation and lower levels of external regulation, than males (Mullan & Markland, 1997).

Landry and Solmon (2004) examined self-determination in the regulation of exercise behavior across the SOC in African American women. They found that behavior regulation became more self-determined as an individual moved across the stages of exercise change. Their study showed that introjection and identified regulation, and intrinsic motivation discriminated across the exercise SOC. Specifically, introjected regulation made a negative contribution. Extrinsic regulation, reported in the study as coercion from significant others, was not a significant influence in motivational constructs differentiating SOC, suggesting that coercion by significant others did not have an impact on physical readiness.

Mullan and Markland (1997) cautioned that due to their cross-sectional design it may be difficult to determine whether individuals in the later SOC became more self-determined in the regulation of exercise over time as they increased their SOC, or whether they reached the later SOC because they were more self-determined from the onset. Ingledew et al. (1998) found that extrinsic motives dominated the early SOC (contemplation, preparation), whereas intrinsic (specifically enjoyment) motives were mostly associated with physical activity progression and maintenance among British government employees.
Barriers and Facilitators to Physical Activity Among Older Adults

Across the literature, various researchers posit slightly different conceptualizations of barriers and facilitators to physical activity among older adults. Some researchers consider broad categorical distinctions of barriers such as physiological, psychological, and environmental. Other researchers consider whether the barrier is internal or external to the individual. There is general consensus that identifying physical activity barriers and facilitators may be important to determine effective and individualized physical activity intervention programs (Wallace & Lahti, 2005). The next section will briefly discuss categorical distinctions of barriers, and report commonly identified barriers and facilitators to physical activity.

Barriers

Barriers to physical activity can be real or perceived (Booth, Bauman, & Owen, 2002) and identified by three broad categories including physiological, psychological, and environmental (Wallace & Lahti, 2005). Physiological barriers are those that relate to one’s physical body and its needs (Wallace & Lahti, 2005). Poor health (e.g., vision problems, balance disorders, cardiovascular disease, osteoporosis, decreased strength, etc.) is the most commonly reported barrier to physical activity (Melillo, Williamson, Futrell, & Chamberlain, 1997).

Psychological barriers correspond to mental or behavioral characteristics that inhibit activity (Wallace & Lahti, 2005). The perception of self was reported as a common barrier. Some older adults reported that they perceived themselves as too old or frail for physical activity (Schutzer & Graves, 2004), while others reported that they were already active enough (Wallace & Lahti, 2005). Misconceptions about physical activity, or lack of knowledge and understanding about the health benefits of regular moderate physical activity were also cited (Brawley, Rejeski, & King 2003; Lee, 1993). Some older adults exhibited a lack of will power, lack of interest, or perceived lack of time for exercise (Schutzer & Graves, 2004). In other words, attitude towards physical activity reflected the value placed on the behavior. A noted psychological barrier to consider is negative past physical activity experiences (Satiriano & McAuley, 2003). Past behavior experiences tend to determine future behavior (Rhodes et al., 1999). Environmental barriers include factors within one’s physical or economic context (Wallace & Lahti, 2005). Examples include inclement weather, crime, facility upkeep, presence or quality of sidewalks, lack of transportation to facilities for physical activity, and no place to rest or sit down during activity (Booth et al., 2002; Dergance et al., 2003; Schutzer & Graves, 2004). Furthermore, negative societal and cultural influences, low socioeconomic status, and lack of exercise prescription by physicians are also reported as common environmental barriers (Schutzer & Graves, 2004).

Facilitators

Because of the complex interactions among the large number of potential variables associated with behavioral change, many of the barriers to exercise for older adults can also serve as facilitators to exercise activity (Schutzer & Graves, 2004).
For example, deteriorating health, a commonly reported barrier, was frequently cited as a facilitator (Cohen-Mansfield, Marx, & Guralnik, 2003). Knowledge of and belief in the health benefits of exercise were important factors toward initiating an exercise program (Schutzer & Graves, 2004). African American women who exercise viewed being active as a means of mediating their health problems and combating the aging process, while those who did not exercise viewed aging and health problems as limiting factors that prohibited them from being active (Landry, 2003). Also, perceived feelings of enjoyment and satisfaction better predicted higher levels of adherence (Dishman, 1994a). Social support, more so among older women than older men, facilitated exercise adherence because it contributed to enjoyment of physical activity (Estabrooks & Carron, 1999).

**Implications for Practice**

Psychosocial factors for physical activity motivation considered from a multi-theoretical perspective can reveal a number of important implications for practitioners. The practitioner may be well equipped to develop and implement individualized physical activity interventions (Wallace & Lahti, 2005). This can be achieved by integrating the SOC with constructs from the TTM, TPB, and SDT for older adults. Based on the TTM, health promotion practitioners may use such cognitive POC as education, increasing awareness of the benefits of physical activity, and encouraging positive reflections of active lifestyles. Additionally, practitioners may focus on behavioral POC, like goal-setting, rewarding positive behavior change, and using activity reminders in the home or workplace (Wallace & Lahti, 2005).

To encourage increased self-efficacy, the practitioner may emphasize that most people do engage in activity of some level (i.e., housework, shopping, caring for another, etc.). This may decrease the gap between an individual’s perceived ability for physical activity and actual activity level, thus assisting movement through the early SOC (Laffrey, 2000).

Decisional balance is important when determining which aspects of physical activity to emphasize within the intervention, and when to emphasize those (Wallace & Lahti, 2005). In the early stages, the benefits such as increased energy and weight control might be attractive to some individuals, whereas in the later SOC the focus may be on the negative consequences of inactivity (e.g., decreased strength and balance). For the practitioner using the SOC within the TPB, Courneya (1995) suggested focusing on attitudes and control beliefs to move individuals from the early stages of precontemplation and contemplation to the later SOC. Important TPB factors for transition into the maintenance stage included intention, attitude, and perceived behavioral control (Courneya, 1995).

Recognizing the important mediating role of the SOC in current and future physical activity behavior reinforces the focus on stage-matched physical activity intervention programs. Practitioners working with older adults need also to recognize that physical activity behavior change is a dynamic process and the factors associated with it may evolve over time and context (Wallace & Lahti, 2005). Strategies that reinforce a motivation continuum model and focus on the movement from the lower to the higher levels of self-regulation may lead to long-term physical activity adherence (Landry & Solmon, 2004). Using the SOC in relation to
the SDT becomes an important part of intervention. In the early stages of physical activity adoption, the practitioner can emphasize both the extrinsic (physical) and the intrinsic (enjoyment) benefits of exercising (Ingledew et al., 1998). Intrinsic benefits may aid in maintenance of actual activity later, however, extrinsic benefits are still important for individuals in the action stages. Individuals about to undertake an exercise program should understand that anticipated enjoyment benefits may not materialize in the short-term, and meanwhile, a reliance on the more extrinsic benefits is appropriate (Ingledew et al., 1998).

With regard to physical activity barriers and facilitators, Gorely and Gordon (1995) suggest emphasizing proper physical activity facilitators and overcoming barriers of physical activity based on the individual’s SOC. For example, an older adult female may need assurance for consistent social support before initiating an activity program. An older adult male, who has started a program and wants to maintain an active lifestyle but has lost his personal transportation, might be guided to a facility that has a shuttle service.

**Research Issues to Address**

Due to the complex nature of physical activity behavior change, reinforcing a multi-theoretical approach that addresses psychosocial factors is warranted. Recent studies that have focused on physical activity with the older adult population have yielded important information and have begun to produce a body of knowledge that can facilitate researchers’ efforts to promote active lifestyles. There remain, however, notable gaps in the literature that need to be addressed for future research.

Though not addressed in this review, the first area consistently mentioned in the literature deserving mention is measurement of physical activity. Specifically, do self-report assessment instruments accurately gauge very low or low intensity activities, which is usually the predominant form of activity engaged in by the older adult population? Also, instruments have been primarily validated in homogenous populations, and need to capture a diverse older adult population (Cardinal & Cardinal, 2000; Washburn, 2000).

Another acknowledged research area to address is research design. Most theory-based studies of physical activity behavior change employ a cross-sectional or retrospective design. When studying the SOC, prospective studies are warranted so as to capture the temporal strength of physical activity determinants among older adults. In addition, experimental designs are needed to understand cause-and-effect relationships between different theoretical constructs and physical activity (Dishman, 1994b).

Many studies also cite the need to examine the full TTM (Burbank et al., 2002; Marcus & Simkin, 1994; Marshall & Biddle, 2001). This allows for a deeper understanding of how to use the constructs in guiding older adults from initiation to maintenance of physical activity. Yet, within the full model itself, there is also a call for further understanding of the POC, or “how” older adults move through the SOC. Understanding the POC might be even more important than key demographic variables (i.e., gender, age, and education) in designing effective interventions (Marcus et al., 1992).
There is also the call to integrate a motivation continuum model with the SOC. This integration can be viewed as the “next generation” of understanding behavior change in older adults because exercise motivation theories are grounded in the ultimate decision-making capacity of the individual, and emergent research recognizes this capacity as dynamic and occurring along a continuum. To date, only four studies examine the SOC with SDT. One is with African American women (Landry & Solmon, 2004), one with healthy adults (Mullan & Markland, 1997), the third with British government employees (Ingledew et al., 1998), and the fourth focuses on adults between the ages of 50-79 (Dacey, 2004). Therefore, the need to integrate the SOC with frameworks such as the SDT in diverse populations, particularly the older adult population, can lead to the development and implementation of motivational strategies toward physical activity engagement (Kosma et al., 2006b).

Studies incorporating qualitative methods are encouraged as well (Dishman, 1994b). Interviews and case studies might provide a deeper insight into the psychosocial factors that impact and shape an older adult’s decision-making about physical activity. When older adults tell their stories about physical activity experiences, one may get a varying sense of reality than usually found in the extant research literature on aging and exercise (Grant & O’Brien Cousins, 2001).

**Conclusion**

It is well established that physical activity has many physical, psychological, and social benefits for the older adult population. Yet, an overwhelming percentage of that population is sedentary. This is particularly alarming in view of the projected growth of that segment, and the potential costs, both personal and societal, associated with inactivity in later life. Traditional measures for encouraging the adoption and maintenance of exercise have been relatively ineffective, most likely due to the complexity of physical activity behavior and the myriad of issues facing the older adult (Burbank et al., 2002). If a comprehensive approach is not employed by researchers and practitioners, we are likely to allow a growing portion of our population to “slip through the cracks.”

Evidence has been presented throughout this article that an individual’s level of physical activity can be predicted by knowing their stage of readiness for exercise, their perceptions of the costs and benefits (cons and pros, respectively), their processes of change, and their self-efficacy for exercise (Marcus et al., 1994). Evidence has also been presented that constructs from several theories can lead to a comprehensive understanding of the psychosocial factors of physical activity behavior change. Thus, this paves the way for the development of intervention strategies. Based on the literature, intervention strategies need to match the older adult’s stage of readiness for change (Cardinal, 1997; Oldenburg et al., 1999). Individualized interventions that match an individual’s SOC, and also consider various psychosocial characteristics, are imperative for effective initiation and maintenance of physical activity (Wallace & Lahti, 2005). The efficacy of those interventions needs to be tested in carefully controlled studies.


