

TYPE OF PHYSICAL ACTIVITY GOAL INFLUENCES PARTICIPATION IN HEALTHY MIDLIFE WOMEN

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Background. Regular physical activity can help to prevent cardiovascular disease in women. Understanding midlife women's exercise goals could offer insight into their motivational facilitators and barriers, and assist in the development of better primary prevention strategies for this population.

Objectives. We sought to investigate the relationship between midlife women's physical activity goals and their physical activity participation over time.

Methods. A random sample of healthy, midlife women (40–60 years of age) was selected to participate in a longitudinal study ($n = 156$). This study fit a linear mixed model to the data to investigate the fixed effects of physical activity goals on physical activity participation, controlling for Body Mass Index (BMI) and Social Support. Mediation analyses were conducted to investigate whether commitment and planning mediated these results.

Results. There were significant differences between participants with distinct types of goals on physical activity participation over time (i.e., baseline, 1 month, and 1 year postbaseline), controlling for the effects of BMI and Social Support. Participants with Weight Loss and Health Benefits goals participated in significantly less physical activity than those with Sense of Well-being and Stress Reduction goals. Commitment and Planning each mediated the relationship between participant goals and their physical activity participation.

Conclusions. These data suggest having physical activity goals that aim to decrease weight or benefit health may not bode well for healthy midlife women who desire to sustain physically active lives. Instead, health care providers and health promotion specialists might better facilitate long-term participation among healthy women if they emphasize physical activity as a means to enhance their quality of life.

Introduction and Background

Physical activity is an important behavior to prevent cardiovascular disease (CVD), the leading cause of death among women (Mosca et al., 2007;

Thom et al., 2006). In addition, women >50 constitute one of the most sedentary populations in the United States (US Department of Health and Human Services, 1996). Targeting increased physical activity participation is not only important for decreasing CVD, but regular participation also prevents other major risk factors such as overweight/obesity and diabetes (National Heart Lung and Blood Institute, 2001). Facilitating sustainable physical activity among women is crucial because it can prevent other costly conditions that occur as women age, such as osteoporosis, cognitive decline, depression, and breast cancer, among many others (McTiernan et al., 2003; US Department

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of Health and Human Services, 1996; Weuve et al., 2004). Unfortunately, increasing physical activity is not easy. Most individuals discontinue exercising within 6 months of initiating a program (Dishman, 1982, 1994). Although it is known that people in general find it difficult to incorporate exercise as a regular part of their lives (Dishman, 2001), the significantly lower exercise rate of women across ages (US Department of Health and Human Services, 1996) indicates different and more extreme barriers to regular exercise than men. To understand how to develop the most effective physical activity interventions for women, it is important to investigate what motivates women to strive toward certain physical activity goals and not others.

Goals energize and direct behavior (Carver & Scheier, 1998; Gebhardt, 1997), and create the frame through which a behavior is perceived and viewed (Kuhl, 2000). Because of that, women's physical activity goals may be helpful for both diagnosing motivational potential (Segar, Eccles, Peck, & Richardson, 2007) and as a point of intervention for enhancing their physical activity motivation, behavioral regulation, and participation (Segar, Jayaratne, Hanlon, & Richardson, 2002). Self-determination theory (SDT) posits that different types of behavioral regulations underlie behavior and can be differentiated by the degree to which they represent autonomous (e.g., self-determined) versus controlled functioning. According to SDT, the specific reasons and goals individuals have for their behavioral pursuits will predict their efforts to sustain and self-regulate a behavior (Deci & Ryan, 1985). According to SDT, social contexts influence the type of goals and motivation one develops. SDT proposes that extrinsic goals—those that derive from external sources, including sociocultural pressures and norms—would be experienced as more controlling and less motivating than autonomous goals originating from the self. Women with extrinsic physical activity goals derived from sociocultural pressures associated with beauty and thinness norms should experience a type of extrinsic motivation and controlled behavioral regulation (i.e., introjected; Ryan & Deci, 2000). In support of this idea, previous research has shown that midlife women who exercised mainly for weight-related reasons reported the highest extrinsic and lowest intrinsic behavioral regulation compared with women who exercised primarily for stress reduction or sense of well-being (Segar et al., 2007). Interestingly, this study also found that midlife women who exercised mainly for health benefits also experienced high extrinsic and low intrinsic behavioral regulation.

If certain physical activity goals lead to more optimal motivation and participation (Frederick-Recascino, 2002; Segar et al., 2007), it is also important to investigate which aspects of physical activity self-

regulation might be inhibited when women experience extrinsic regulation and low intrinsic motivation. *Self-regulation* refers to the actions individuals take to “regulate” or control their behavior. Planning is an important part of self-regulation and successful goal striving (Rovniak, Anderson, & Winett, 2002), and commitment produces sustained goal striving and predicts exercise participation (Corbin, Nielson, Borsdorf, & Laurie, 1987; Deeter, 1988). Because women commonly report that family priorities, care giving duties, and lack of time are barriers to participation (Eyler et al., 2002; King et al., 2000; Stephens & Craig, 1990), planning to be physically active may be an essential self-regulation tool for women to be able to participate in physical activity. In addition, commitment to being physically active might be especially important for women to self-regulate their behavior and participate in physical activity given that they juggle multiple roles and responsibilities (Verhoef & Love, 1994; Verhoef, Love, & Rose, 1992).

The primary objective of this research was to investigate the relationship between midlife women's physical activity goals and their physical activity participation over time. In this prospective study, the purpose was to replicate and extend findings from correlational data showing that women who have weight-related, body shape physical activity goals participate in less physical activity than those having non-weight-related body shape goals (Segar, Spruijt-Metz, & Nolen-Hoeksema, 2006). Because of previous findings suggesting that certain physical activity goals are more extrinsic and others are more autonomous and intrinsic in nature (Segar et al., 2007), it was hypothesized that participants with physical activity goals related to weight-loss, weight maintenance/toning, and health benefits will participate in less physical activity over time, will be less committed, and will plan physical activity less than participants with goals related to sense of well-being and stress reduction. In addition, it was predicted that commitment and planning will mediate the relationship between participants' goals and their participation. Because social support is one of the most consistent correlates of physical activity among women (Eyler et al., 2002), we controlled for it in our analyses. In addition, we controlled for body mass index (BMI) to prevent it from confounding the association between “weight-related” physical activity goals and physical activity participation.

Methods

Sample

Out of the sample population of female university employees, a simple random sample of women (40–60 years old) was selected to participate in a mailed

survey. Inclusion criteria were being between 40 and 60 years old (Keyes & Ryff, 1999), working in clerical jobs, and having Internet access and an e-mail account. This research aimed to understand optimal strategies for primary prevention among midlife women who work full time. Thus, we obtained a sample of women who worked full time, and only included those participants who did not self-report that they had a chronic health condition or illness.

Study Design and Procedure

This longitudinal study included a baseline data collection by mail in addition to 2, brief on-line, follow-up surveys (at 1 month and 1 year postbaseline). We investigated whether participants with distinct goals participated in different levels of physical activity over time by collecting short-term (1 month postbaseline) and long-term (1 year postbaseline) prospective data. We collected these study data in the Midwest where there are great seasonal variations. To prevent having seasonal variation confound our prospective physical activity data, all data collections occurred during the same season. We collected baseline data in early fall, and the second data collection was 1 month later during the same fall season. The third data collection was conducted exactly 1 year from baseline. Human resources provided the principal investigator with contact information of those randomly selected who matched study criteria. The potential participants received a packet of information about the study by mail. Study participants not returning their baseline surveys received e-mail inquiries on days 7, 14, and 21. After that, participants not returning their surveys were considered nonresponders. All data were collected between September 2004 and November 2005. This study was approved by the University of Michigan Institutional Review Board.

Measures

Physical Activity Participation. Physical Activity Participation was assessed using a modified version of the Godin Leisure-Time Exercise Questionnaire (GLTQ; Godin & Shephard, 1985). The GLTQ was selected because it has a low response burden for participants and is easy to understand. Rather than ask participants to estimate how many times they participate in activities “in blocks of 15-minute intervals” as stated in the GLTQ, to give us more detail about their participation, we asked them “how many times per week and minutes per session” they participate. This strategy is very similar to what is asked in the International Physical Activity Questionnaire (Booth, 2000). The reliability and validity of the GLTQ have been described in detail elsewhere (Pereira et al., 1997); nevertheless, the GLTQ is a commonly used, 1-week recall instrument that permits calculation of

the amount of physical activity each person participates in at strenuous, moderate, and light physical activity levels. A physical activity total summary score was obtained for each of the 3 time points by multiplying each of the 3 physical activity levels by the metabolic equivalents that reflected its intensity (mild/light = 3; moderate = 5; strenuous/vigorous = 9), after which all 3 levels were summed. Because the GLTQ scores had to be transformed into their square root to meet statistical assumptions, this paper reports the transformed scores.

Physical Activity Goals. To measure participants' Physical Activity Goals, participants were first asked to select their 3 most important goals from a list of 18 reasons that was compiled from a comprehensive review of the literature: stress reduction, weight maintenance, energy level, tone/shape body, sense of well-being, weight loss, social reasons, overall health benefits, flexibility, competition, disease prevention, family time, enjoyment, cardiovascular fitness, endurance/stamina, strength, fun, and other (Segar et al., 2007). Then they were asked to identify which of the 3 goals was their most important one. Cluster analysis was then used to identify homogeneous groupings of the hierarchically ranked goals using the Sleipner statistical package (version 2.1) for pattern-oriented analyses (Bergman & El-Khoury, 2002). Squared Euclidian distance measure was used to estimate the distance between pairs of participants, and Ward's method was used to assign participants with similar rankings to clusters (Aldenderfer & Blashfield, 1984). A detailed discussion of the survey methods used to identify and validate the goal clusters has been previously described (Segar et al., 2007). Those data showed that out of the total number of possible goals, 99% of the participants could be classified into 5 goal clusters. The 5 goal clusters include: Health Benefits ($n = 63$; 40%); Weight Loss ($n = 33$; 21%); Stress Reduction ($n = 24$; 15%); Sense of Well-being ($n = 19$; 12%); and Weight Maintenance/Toning ($n = 17$; 11%). Because of previously published findings (Segar et al., 2007), Weight Loss, Weight Maintenance/Toning, and Health Benefits goals are considered as representing extrinsic goals, and Stress Reduction and Sense of Well-being goals as reflecting goals that should be more autonomous and intrinsic in nature.

BMI. BMI was calculated from the baseline survey as the ratio of study participants' self-reported weight (kg) to self-reported height squared (m^2 ; Lean, Han, & Seidell, 1999).

Social Support. Social Support was measured using a Likert-type scale. Participants responded to 2 questions about the support from family and friends. They

answered from (1) Not at all to (7) A lot to “to what extent do family members support you being physically active.” An index of Social Support was created from the mean of these 2 items. Inter-item reliability was adequate ($\alpha = 0.82$). The average score was 4.7 (SD = 1.8) and ranged from 1.0 to 7.0. Higher scores indicate greater Social Support.

Commitment. The Commitment scale was measured using an instrument developed to measure individuals' commitment to strive toward their chosen health behavior goal ($\alpha = 0.86$; Maes et al., 2001). To make it more specific for this study, the health behavior was specified as being physical activity. This scale was obtained by taking the mean of 4 items (e.g., “Even if it is difficult to be physically active, I will not give up on it”). Participants responded from Disagree Strongly (1) to Agree Strongly (7). The Commitment scale had adequate internal consistency ($\alpha = 0.93$), and the mean of this scale was 5.3 (SD = 1.4). Scores ranged from 1.0 to 7.0; higher scores indicated greater commitment to being physically active.

Planning. The Planning scale includes items related to planning, prioritizing, and making time for exercise (e.g., “Exercise is generally not a high priority when I plan my schedule”). Participants responded to a 7-point Likert-type scale, from (1) Does not describe me to (7) Completely describes me. Three items were selected from the Exercise Plans Scale (inter-item reliability = 0.87; Rovniak et al., 2002). We used only the 3 items above from this scale because of the redundancy within the 10 items. The Planning scale has an internal consistency that approached the original 10-item scale ($\alpha = 0.84$). The mean of this scale was 3.2 (SD = 1.5). Scores ranged from 1.0 to 6.0. Items were reverse coded so that higher scores indicated greater planning for physical activity.

Statistical Analyses

A linear mixed model (LMM) was fitted to the longitudinal physical activity data to investigate the fixed effects of participants' physical activity goals, BMI, and social support. After fitting the LMM, statistical assumptions were checked, and violations of these assumptions were addressed by transforming the dependent variable (Physical Activity Participation) into the square root of the original measure. Pairwise comparisons were conducted to identify significant differences in physical activity between participants with different goals. Because of small cell sizes in the analyses, the least significant difference procedure was selected. Standardized effect sizes (Δ) for the paired comparisons were calculated according to recommendations (Cohen, 1988; Kirk, 1982; Raudenbush, 1997). Analysis of variance and pairwise comparisons were conducted to investigate the mean differences

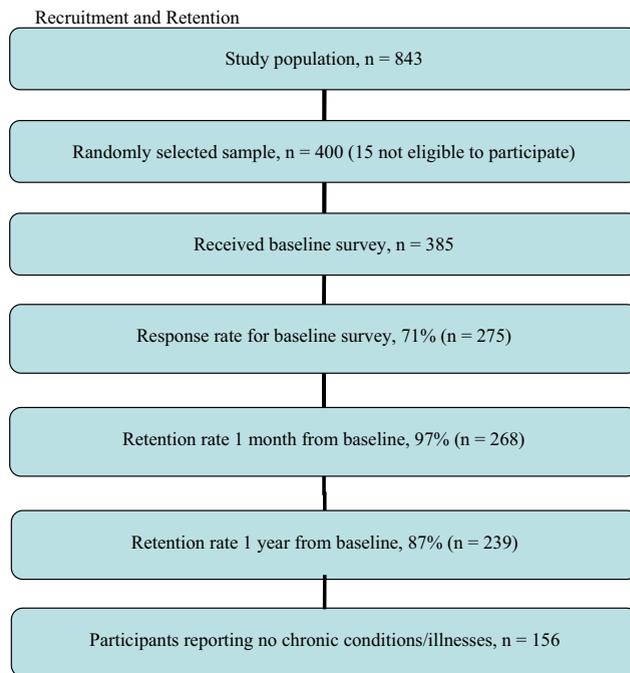


Figure 1. Recruitment and retention.

between participants' Physical Activity Goals in Commitment and Planning. Standardized effect sizes (η^2) for the paired comparisons were calculated in Statistical Analysis Software, Predictive Analysis, Predictive Analytics, Decision Support Systems (SPSS) (Chicago, IL; version 13.0 released 9/14/04). To test for the mediation of Commitment and Planning, each scale was individually entered into the same LMM to investigate their unique effects on the relationship between participants' physical activity goals and their participation (Baron & Kenny, 1986). Tests of significance $\leq .05$ were considered statistically significant.

Results

This study had a high baseline response (71%) and notable retention rates at the 2 study follow-ups (1 month: 97%; 1 year: 87%; Figure 1). The study participants were mostly European American and married, and had a mean age of 49.3 years old (Table 1). Physical Activity Participation was lowest among individuals with Weight Loss and Health Benefits goals and highest among individuals with Sense of Well-being and Stress Reduction goals. Participants with Weight Maintenance/Toning goals reported activity levels closest to those with Stress Reduction and Sense of Well-being goals. Participants with different types of goals differed significantly in BMI ($p = .02$), but not Social Support ($p = .90$; Table 2).

Table 1. Baseline Sample Demographics ($n = 156$)

Factors	Mean (SD)
Age	49.3 (5.3)
BMI	27.2 (5.3)
	Percent (Frequency)
Education	
Some college	36.7 (58)
High school or GED	12.0 (19)
Technical COLLEGE	5.1 (8)
College degree	38.6 (61)
Grad/prof degree	7.0 (11)
Missing	0.006 (1)
Marital status	
Married	65.2 (103)
Living with partner	1.3 (2)
Separated	0 (0)
Divorced	22.8 (36)
Widowed	2.5 (4)
Single	8.2 (13)
Household income (\$)	
<20,000	0.006 (1)
20,000–60,000	38.0 (60)
60,001–100,000	41.8 (66)
100,001–124,999	10.8 (17)
≥125,000	5.7 (9)
Missing	3.2 (5)
Ethnicity	
African American	5.7 (9)
Asian	1.3 (2)
European American	88.0 (139)
Latina	1.9 (3)
Mixed ethnicities	1.9 (3)
Missing	1.3 (2)

Relationship Between Participants' Physical Activity Goals and Their Participation

Participants' Physical Activity Goals [$F(4, 147.5) = 3.0$; $p = .02$], BMI [$F(1, 146.3) = 6.4$; $p = .02$], and Social Support [$F(1, 146.6) = 10.9$; $p = .001$] had statistically significant main effects on Physical Activity Participation. There was no effect of time on participation ($p = .58$), or a time-by-goal cluster interaction ($p = .40$). Figure 2 shows the average Physical Activity Participation score for participants with each type of goal at all 3 time points. These data indicate that there were significantly different levels of Physical Activity Participation over time by type of goal, and the participation trends of each goal type remained constant between groups across time.

Table 2. BMI and Social Support by Participant Goals

Variables	Participant Goals					
	All Participants ($n = 156$)	Weight Loss ($n = 33$)	Health Benefits ($n = 63$)	Weight Maintenance/Toning ($n = 17$)	Stress Reduction ($n = 24$)	Sense of Well-being ($n = 19$)
BMI	27.2 (0.4)	28.9 (0.8)	27.9 (0.7)	24.8 (0.9)	25.2 (1.2)	26.9 (0.9)
Social Support	4.8 (0.4)	4.8 (0.8)	4.7 (0.6)	5.0 (1.2)	5.0 (1.0)	4.5 (1.0)

Data are presented as mean values (standard error of the mean).

Pairwise comparisons were conducted to identify differences on participation between participants with distinct physical activity goals. As predicted, participants with Weight Loss goals reported participating in significantly less Physical Activity Participation than those with Sense of Well-being ($p < .05$; $\Delta = 0.61$) and Stress Reduction ($p < .01$; $\Delta = 0.50$) goals. Also, as predicted, participants with Health Benefits goals participated in significantly less physical activity than those with Sense of Well-being ($p < .05$, $\Delta = 0.37$) and Stress Reduction ($p < .01$, $\Delta = .48$) goals. Contrary to predictions, there was a nonsignificant trend showing that the participants with Weight Maintenance/Toning goals reported greater participation than participants with Weight Loss ($p < .10$; $\Delta = 0.45$) and Health Benefits ($p < .10$; $\Delta = 0.43$) goals. Having a lower BMI and higher Social Support was associated with greater Physical Activity Participation. See Table 3 for a summary of the paired comparisons between participants with distinct goals. Standard effect sizes for paired comparisons in LMMs between 0.50 and 0.80 are considered large (Raudenbush, 1997). These findings indicate robust effects on participation over time from having different types of physical activity goals, after taking the effects of BMI and Social Support into account.

Mediation

Commitment and Planning each fully mediated the relationship between Participants' Goals and their physical activity level (Baron & Kenny, 1986). To fulfill Precondition A, the predictor variable (Participant Physical Activity Goals) was related to the outcome variable (Physical Activity Participation). For Precondition B, the predictor variable (Participant Physical Activity Goals) was related to the mediators (Commitment and Planning). Participants' Goals showed statistically significant main effects on Commitment [$F(4, 153) = 6.7$; $p < .01$ ($\eta^2 = .10$)] and Planning [$F(4, 154) = 4.8$; $p = .03$ ($\eta^2 = .07$)], with medium effect sizes (Cohen, 1988). The mediator variables (Commitment and Planning) had a significant and positive relationship with the outcome variable (Physical Activity Participation; $p < .001$). To meet Precondition C, adding Commitment and Planning, independently, to the model decreased the main effect between Partici-

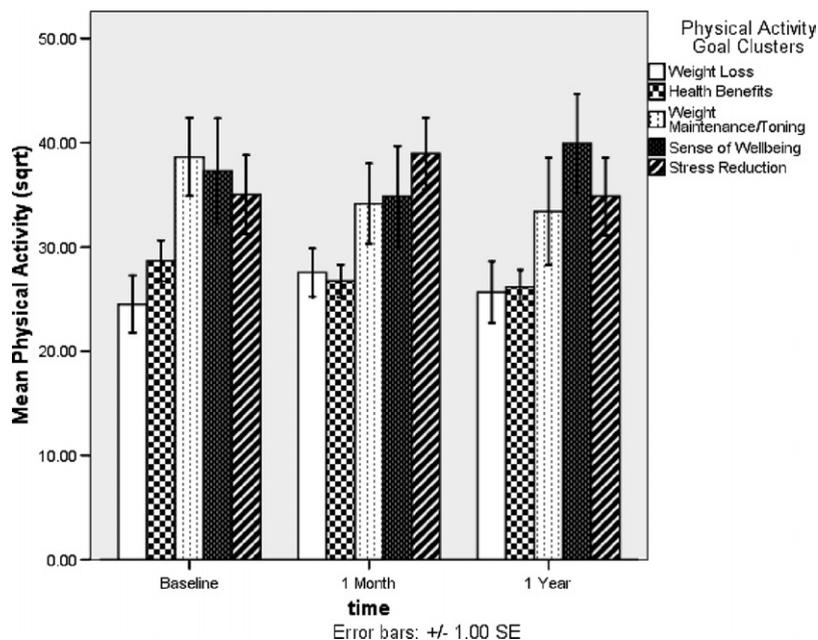


Figure 2. Mean physical activity level across time by participant goals controlling for BMI and Social Support.

pant Physical Activity Goals and Physical Activity Participation from $p = .02$ to $p = .17$, and from $p = .02$ to $p = .10$, respectively, signifying full mediation, with medium effect sizes ($\Delta = 0.22$; $\Delta = 0.27$). In the Commitment model, Social Support was a marginally significant predictor ($p < .10$) and BMI was significant ($p < .05$). In the Planning model, Social Support and BMI were nonsignificant predictors ($p < .20$). See Table 3 for a summary of the paired comparisons between Participant Physical Activity Goals and both mediators.

Discussion

Women's Physical Activity Goals Predict Participation
 These data showed that participants with the most frequently endorsed goals, Weight Loss and Health Benefits, reported participating in the least amount of physical activity over time. Pursuing physical activity to lose weight may be less motivationally compelling

than other types of physical activity goals because of the reasons why women adopt this particular physical activity goal (Wilson & Rodgers, 2002). Many women may have weight loss physical activity goals because they have partially internalized the cultural expectations about what women's bodies should look like (e.g., thin and toned) and the normative reasons for being physically active (e.g., to lose weight, to be healthy; Bagozzi & Edwards, 1998; Leventhal, Brissette, & Leventhal, 2003; Theberge, 1997; Williams, 2002). It may be that weight-loss goals represent conforming to social pressures (Segar et al., 2007). If so, then these goals may not promote self-worth (Wilson & Rodgers, 2002), might have high psychological costs (Eccles & Wigfield, 2002), and result in decreased motivational states (Deci & Ryan, 1985; Fredrickson & Roberts, 1997). This finding supports other research showing that exercising for an extrinsic reason, such as weight loss or appearance, is not optimal for sustaining physical activity participation

Table 3. Relationship Between Participant Goals and Physical Activity and Mediation Variables, Controlling for BMI and Social Support

Measures	Weight Loss (a)	Health Benefits (b)	Weight Maintenance/Toning (c)	Stress Reduction (d)	Sense of Well-being (e)
Physical Activity Participation	27.4 (2.4) ^{d***}	27.7 (1.7) ^{d***}	34.2 (3.3)	35.0 (2.8) ^{a**b*}	<u>36.7 (3.1)^{a**b**}</u>
Commitment	4.6 (1.3)^{bcd}	5.2 (1.5) ^{ae}	5.8 (1.3)	5.8 (1.4)	<u>5.9 (1.3)</u>
Planning	2.4 (1.3)^{bcd}	3.1 (1.4) ^a	<u>3.9 (1.4)</u>	3.6 (1.7)	3.6 (1.4)

Data are presented as mean values (standard error of the mean). Underlined numbers represent the highest mean for each measure. Bolded numbers represent the smallest mean for each measure.

For each measure, superscripts within each row of the table indicate which goal clusters differ significantly ($p > 0.05$).

*Indicates medium effect size.

**Indicates large effect size.

(Ingledeu, Markland, & Medley, 1998; Ryan, Frederick, Lepes, Rubio, & Sheldon, 1997).

Previously published data showed that participants with physical activity goals related to obtaining health benefits exhibited among the highest introjected (e.g., controlled/extrinsic) and the lowest intrinsic regulation levels among the sample (Segar et al., 2007). Thus, participants with physical activity goals related to health benefits were more likely to feel that they should pursue their physical activity goal rather than enjoy pursuing it, compared with participants with goals that are more autonomous (e.g., Stress Reduction or Sense of Well-being). In accordance with these data and our predictions in this study, participants with goals related to achieving health benefits from physical activity also participated in low levels of physical activity. Although a physical activity goal to achieve health benefits might appear to be a more autonomous and intrinsically motivated type of goal, these and other data (Segar et al., 2007) suggest the opposite. Having a health-related physical activity goal may represent a woman's attempt to adhere to her health care practitioner's recommendation that she exercise (American College of Sports Medicine, 2008) or the normative cultural expectation that it is important to practice health behaviors such as physical activity (Theberge, 1997; Williams, Rodin, Ryan, Grolnick, & Deci, 1998) and may lead to feelings of pressure and a nonoptimal behavioral regulation such as introjected regulation (Williams, 2002).

Introjected regulation is controlling and characterized by an internal sense of pressure to participate and the sense that "I should" do it (Deci & Ryan, 1985). Research suggests that women need leisure time experiences to reflect freedom of choice, lack of constraint, enjoyment, and intrinsic motivation (Henderson, Bialeschki, Shaw, & Freysinger, 1996). Given this, women with physical activity goals that are experienced as controlling may not select physical activity as a leisure time activity. Moreover, if a health threat is not imminent, taking time for physical activity aiming to achieve health benefits might not be a priority for women who are healthy. This is especially important to consider given that women often sacrifice their own physical activity and self-care behavior to care for others (Clark, Janz, Dodge, & Garrity, 1994; Verhoef et al., 1992). This idea is supported by data showing that participants with goals related to achieving health benefits reported lower commitment to being physically active. However, it might be that once women retire and have more leisure time available, exercising for health reasons might become more important, especially with age.

Participants with Weight Maintenance/Toning goals reported physical activity levels comparable with the participants who had autonomous goals (e.g., Sense of Well-being) rather than those with more

extrinsic, controlling types of goals (e.g., Weight Loss). These data suggest that being physically active to maintain weight has different effects than being physically active to lose weight, even after controlling for BMI. Research on framing may help to explain this finding. Although counterintuitive, a weight loss physical activity goal can be considered a gain-framed goal. Individuals with gain-framed goals move toward a desired outcome, such as "losing a certain amount of weight" or "weighing what I did 2 years ago." In contrast, loss-framed goals aim to move away from or avoid an undesired state or outcome, such as "avoiding gaining any weight" or "not getting fat" (Emmons, 2000). Research on the framing of messages suggests that individuals respond differently to the same information if it is perceived as a gain or as a loss. Prospect Theory has shown strong support for the idea that "a good is worth more when it is considered as something that could be lost or given up than when it is evaluated as a potential gain" (Kahneman, 2003). It may be that the positive effects from having Weight Maintenance/Toning goals reflect a strong desire to not lose the privileges that accompany being a normal weight, and avoid the discrimination that overweight and obese individuals face (Burgard & Lyons, 1994; Darlin, 2006; Grover, Keel, & Mitchell, 2003).

In addition, research shows that physical activity participation is not very effective for losing weight (Bagozzi & Edwards, 2000; Blair, 1993; Hill, 2005). In contrast, physical activity is known to be an effective strategy for weight maintenance (Fogelholm & Kukkonen-Harjula, 2000; Hill, 2005). Thus, midlife women with weight loss goals might discontinue exercising if they do not have evidence that they are attaining their goal (Carver, 1996). In contrast, women who are exercising to maintain their weight would see that they are achieving their goal and stay motivated to continue exercising. Data from recent research on outcomes expectations and women's exercise adherence supports this interpretation (Wilcox, Castro, & King, 2006). This study found that women who attained their outcomes expectations for exercising, or their reasons/goals for doing it, were more likely to adhere to physical activity over time than women who did not attain their desired exercise goals.

Mediators of Participation: Commitment and Planning

These data suggest that participants with Weight Loss goals, and to a lesser extent Health Benefits goals, are less inclined to overcome their daily challenges to being physically active, and plan physical activity less than those with Sense of Well-being, Stress Reduction and Weight Maintenance/Toning goals. Both Commitment and Planning mediated the relationship between the participants' Physical Activity Goals and their Physical Activity Participation. Given the com-

plexity of women's roles and responsibilities and that they report greater barriers and less leisure time than men (Marcus & Forsyth, 1998; Verhoef et al., 1992), physical activity goals that are associated with greater commitment and planning should be more likely to help women sustain their participation.

There is some evidence that changing women's physical activity goal content facilitates increased physical activity participation. The Fitting in Fitness for Life! intervention (FIF) was developed to facilitate a shift in perceptions about and goals for physical activity among midlife women (Segar et al., 2002). This theoretically derived program (Bandura, 1982; Fredrickson & Roberts, 1997; Freire, 1970; Ryan & Deci, 2000) addresses the sociocultural pressures and expectations as they relate to physical activity participation among women. Participants are encouraged to identify personally meaningful physical activity goals and to identify pleasure-based physical activities. Contrary to most physical activity intervention follow-up data (Baranowski, Anderson, & Carmack, 1998), follow-up data showed that FIF participants increased their physical activity participation from baseline to follow-up (6 weeks), which was maintained 10-months postprogram (Segar et al., 2002).

Health At Every Size (HAES) is another intervention that posits the importance of divorcing physical activity participation and eating from weight-loss motives (Association for Size Diversity and Health, 2007). A recent study compared the HAES intervention with a diet program on anthropometry, metabolic fitness, energy expenditure, eating behavior, and psychology (Bacon, Stern, Van Loan, & Keim, 2005). Although the diet group had lost weight and showed improvements at 1 year, they regained their weight and lost most of their improvements at year 2. In contrast, the HAES participants maintained their weight the whole time (no cycling as the diet group demonstrated), improved in all outcome variables, and sustained their improvements at year 2. The HAES and FIF interventions offer support for the idea that women can change their motives for adopting healthy lifestyles, and that this can facilitate increased physical activity participation in ways that are sustainable.

We contend that for sustainable behavior changes to occur, it is important to help women shift their physical activity goals away from the culturally mandated goals to "lose weight and be thin" or "exercise as medicine" to goals that are more individually meaningful, more intrinsically based, and immediately experienced (e.g., enhanced sense of well-being). Moreover, facilitating the adoption of intrinsic exercise motives might even benefit weight loss in the long run. Among midlife women who participated in a weight reduction program, the strongest predictor for long-term weight loss was increased intrinsic motivation for exercise (Teixeira et al., 2006). Given these

data, the importance of achieving one's outcome expectations (Wilcox, Dowda, & Griffin, 2006), and the apparent negative motivational effects from having weight loss exercise goals, interventionists and health care practitioners might better facilitate increased physical activity participation among overweight women, or those who perceive themselves as overweight, by encouraging them to change their exercise goal from weight loss to weight maintenance (Gaesser, 2004; Polivy & Herman, 1992, 2000). This is especially important because being physically active improves health and well-being regardless of weight (Blair, 1994; Gaesser, 2004).

Limitations

The use of self-reported physical activity data is an important limitation of this study (Durante & Ainsworth, 1996). Despite this, research has shown that self-reported activity levels have a low response burden, are frequently reported in the literature, and have predictive validity (Brownson, Jones, Pratt, Blanton, & Health, 2000; Karoly et al., 2005; Segar et al., 2002). Self-reported weight is another limitation. If underreporting of weight did occur, however, there is no reason to expect that it would not be equally distributed across women with different types of goals. It is important to note that these findings are relevant for primary prevention and only to midlife women without chronic health problems or conditions. These findings need to be replicated with a larger sample, and cannot be generalized outside of this sample of healthy, mostly European American, midlife, women who work full time.

Study Strengths

Collecting prospective physical activity data over a 12-month period and targeting a specific life stage are important study strengths. In addition, the benefit of having used a person-centered strategy such as cluster analysis is that the findings can be translated into recommendations for specific subgroups and thus improve external validity (Eccles, 2005; Magnusson, 2003), something that has been lacking in the field of behavioral medicine (Glasgow et al., 2006). In addition, physical activity goals are common and concrete. They may be optimal to both diagnose motivational potential or deficiency and for targeting motivational/behavioral interventions to women (Segar et al., 2002). It is important to keep in mind, however, that women of different ages and ethnicities may value distinct types of physical activity goals.

Conclusions

These study findings suggest that the way a woman has been socialized to think about being physically

active, especially “why” she would do it, influences how much she participates in physical activity. These data and other research (Segar et al., 2007) support the notion that distinct physical activity goals may have different psychological meaning for women, and as a result, differentially impact their motivation, commitment, planning and participation. Specifically, having physical activity goals that aim to decrease weight or benefit health may not bode well for healthy midlife women who desire to sustain physically active lives. Although counterintuitive, these robust findings suggest that emphasizing weight loss and health-related reasons and goals for exercising might undermine efforts to increase physical activity participation among healthy midlife women. This in turn might limit the effectiveness of physical activity interventions to prevent chronic diseases such as diabetes and CVD. Because behavior can be better understood by identifying the goals to which that behavior is attached (Carver & Scheier, 2000), health care providers, social marketers, and health promotion specialists may be more likely to facilitate long-term participation among midlife women by inquiring about the type of physical activity goal they have (Segar et al., 2002), and endorsing that they use physical activity as a means to maintain weight, reduce stress and improve their sense of well-being. This research supports our contention that gender norms and cultural pressures need to be taken into account to more deeply understand women’s complex barriers to participation and to optimally facilitate increased physical activity participation (Brittle & Bird, 2007; Jacobs Institute of Women’s Health, 1998; Marcus & Forsyth, 1998; Segar et al., 2002).

References

- Aldenderfer, M. S., & Blashfield, R. K. (1984). *Cluster analysis*. Newbury Park, CA: Sage University Papers.
- American College of Sports Medicine. (2008). *Exercise is medicine*. Available: www.exerciseismedicine.org/contact.htm. Accessed January 22, 2008.
- Association for Size Diversity and Health. (2007). Available: www.bgsu.edu/offices/sa/counseling/page13300.html. Accessed February 13, 2007.
- Bacon, L., Stern, J. S., Van Loan, M. D., & Keim, N. L. (2005). Size acceptance and intuitive eating improve health for obese female chronic dieters. *Journal of the American Dietetic Association*, 105(6), 929–936.
- Bagozzi, R. P., & Edwards, E. A. (1998). Goal setting and goal pursuit in the regulation of body weight. *Psychology & Health*, 13, 593–621.
- Bagozzi, R. P., & Edwards, E. A. (2000). Goal-striving and the implementation of goal intentions in the regulation of body weight. *Psychology & Health*, 15(2), 255–270.
- Bandura, A. (1982). Self-efficacy in human agency. *American Psychologist*, 37, 122–147.
- Baranowski, T., Anderson, C., & Carmack, C. (1998). Mediating variable framework in physical activity interventions: How are we doing? How might we do better? *American Journal of Preventive Medicine*, 15, 266–297.
- Baron, R., & Kenny, D. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 173–182.
- Bergman, L. R., & El-Khoury, B. M. (2002). *SLEIPNER: A statistical package for pattern-oriented analyses. Version 2.1*. Stockholm: Stockholm University.
- Blair, S. (1994). Physical activity, fitness, and coronary heart disease. In C. Bouchard R. J. Shephard & T. Stephens (Eds.), *Physical activity, fitness, and health: International proceedings and consensus statement* (pp. 579–590). Champaign, IL: Human Kinetics.
- Blair, S. N. (1993). Evidence for success of exercise in weight loss and control. *Annals of Internal Medicine*, 119, 702–706.
- Booth, M. L. (2000). Assessment of physical activity: An international perspective. *Research Quarterly in Sports and Exercise*, 71, s114–s120.
- Brittle, C., & Bird, C. E. (2007). *Literature review on effective sex- and gender-based systems/models of care* (No. HHSP233200600978P). Washington DC: Office on Women’s Health.
- Brownson, R. C., Jones, D. A., Pratt, M., Blanton, C., & Health, G. W. (2000). Measuring physical activity with the behavioral risk factor surveillance system. *Medicine & Science in Sports & Exercise*, 32, 1913–1918.
- Burgard, D., & Lyons, P. (1994). Alternatives in obesity treatment: Focusing on health for fat women. In P. Fallon (Ed.), *Feminist perspectives on eating disorders* (pp. 212–230). New York: The Guilford Press.
- Carver, C. (1996). Some ways in which goals differ and some implications of those differences. In P. Gollwitzer & J. Bargh (Eds.), *The psychology of action: Linking cognition and motivation to behavior* (pp. 645–672). New York: The Guilford Press.
- Carver, C., & Scheier, M. (1998). *On the self-regulation of behavior*. Cambridge: Cambridge University Press.
- Carver, C., & Scheier, M. (2000). Autonomy and self-regulation. *American Psychologist*, 55, 284–294.
- Clark, N., Janz, N., Dodge, J., & Garrity, C. (1994). Managing heart disease: A study of the experiences of older women. *Journal of the American Women’s Medical Association*, 49, 202–206.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Corbin, C. B., Nielson, A. B., Borsdorf, L. L., & Laurie, D. R. (1987). Commitment to physical activity. *International Journal of Sport Psychology*, 78, 98–104.
- Darlin, D. (2006). Extra weight and higher costs. Available: www.nytimes.com. Accessed December 2, 2006.
- Deci, E., & Ryan, M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Deeter, T. (1988). Does attitudinal commitment predict physical activity participation? *Journal of Sport Behavior*, 11, 177–192.
- Dishman, R. (1982). Compliance/adherence in health-related exercise. *Health Psychology*, 1, 237–267.
- Dishman, R. (1994). *Advances in exercise adherence*. Champaign, IL: Human Kinetics.
- Dishman, R. (2001). Adherence to exercise and physical activity. *QUEST*, 53, 277–278.
- Durante, R., & Ainsworth, B. E. (1996). The recall of physical activity: Using a cognitive model of the question-answering process. *Medicine & Science in Sports & Exercise*, 28, 1282–1291.
- Eccles, J. S. (2005). Subjective task value and the Eccles et al. model of achievement-related choices. In A. Elliot & C. Dweck (Eds.), *Handbook of competence and motivation* (pp. 105–121). New York: Guilford.
- Eccles, J. S., & Wigfield, A. (2002). Motivational beliefs, values and goals. *Annual Review of Psychology*, 53, 109–132.
- Emmons, R. A. (2000). Personal Striving Coding Manual. *Unpublished manuscript*, A1–A25.

- Eyler, A. E., Wilcox, S., Matson-Koffman, D., Evenson, K. R., Sanderson, B., Thompson, J., et al. (2002). Correlates of physical activity among women from diverse racial/ethnic groups. *Journal of Women's Health & Gender-based Medicine*, 11, 239–236.
- Fogelholm, M., & Kukkonen-Harjula, K. (2000). Does physical activity prevent weight gain: A systematic review. *Obesity Reviews*, 1, 95–112.
- Frederick-Recascino, C. M. (2002). Self-determination theory and participation motivation research in the sport and exercise domain. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-regulation research* (pp. 277–294). Rochester, NY: The University of Rochester Press.
- Fredrickson, B. L., & Roberts, T. A. (1997). Objectification theory. *Psychology of Women Quarterly*, 21, 173–206.
- Freire, P. (1970). *Pedagogy of the oppressed*. New York: Continuum.
- Gaesser, G. A. (2004). Weight loss for the obese: Panacea or pound-foolish? *QUEST*, 56, 12–27.
- Gebhardt, W. A. (1997). *Health behaviour goal model: Towards a theoretical framework for health behaviour change*. Leiden: Leiden University.
- Glasgow, R. E., Green, L. W., Klesges, L. M., Abrams, D. B., Fisher, E. B., Goldstein, M. G., et al. (2006). External validity: We need to do more. *Annals of Behavioral Medicine*, 31, 105–108.
- Godin, G., & Shephard, R. J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sports*, 10, 141–146.
- Grover, V. P., Keel, P. K., & Mitchell, J. P. (2003). Gender differences in implicit weight identity. *International Journal of Eating Disorders*, 34, 125–135.
- Henderson, K. A., Bialeschki, M. D., Shaw, S. M., & Freysinger, V. J. (1996). *Both gains and gaps: Feminist perspectives on women's leisure*. State College, PA: Venture Publishing Inc.
- Hill, J. O. (2005). Role of physical activity in preventing and treating obesity. *Journal of Applied Physiology*, 99, 765–770.
- Ingledeu, D., Markland, D., & Medley, A. (1998). Exercise motives and stages of change. *Journal of Health Psychology*, 3, 477–489.
- Jacobs Institute of Women's Health. (1998). National leadership conference on physical activity and women's health. *Women's Health Issues*, 8, 69–88.
- Kahneman, D. (2003). A perspective on judgement and choice. *American Psychologist*, 58, 697–720.
- Karoly, P., Ruehlman, L. S., Okun, M. A., Lutz, R., Newton, C., & Fairholme, C. (2005). Perceived self-regulation and exercise goals and interfering goals among regular and irregular exercisers: A life space analysis. *Psychology of Sport and Exercise*, 6, 427–442.
- Keyes, C. L., & Ryff, C. (1999). Psychological well-being in midlife. In S. L. Willis & J. D. Reid (Eds.), *Life in the middle: Psychological and social development in middle age* (pp. 161–178). San Diego: Academic Press.
- King, A., Castro, C., Wilcox, S., Eyler, A. E., Sallis, J., & Brownson, R. C. (2000). Personal and environmental factors associated with physical inactivity among different racial/ethnic groups of U.S. middle- and older-aged women. *Health Psychology*, 19, 354–364.
- Kirk, R. E. (1982). *Experimental design: Procedures for the behavioral sciences* (2nd ed.). Belmont, CA: Brooks/Cole.
- Kuhl, J. (2000). A functional-design approach to motivation and self-regulation: The dynamics of personality systems and interactions. In M. Boekaerts P. Pintrich & M. Zeidner (Eds.), *Handbook on self-regulation* (pp. 111–169). San Diego: Academic Press.
- Lean, M. E., Han, T. S., & Seidell, J. C. (1999). Impairment of health and quality of life using new US federal guidelines for the identification of obesity. *Archives of Internal Medicine*, 159, 837–843.
- Leventhal, H., Brissette, I., & Leventhal, E. (2003). The common-sense model of self-regulation of health and illness. In L. Cameron & H. Leventhal (Eds.), *The self-regulation of health and illness behaviour* (pp. 43–65). London: Routledge.
- Maes, S., Pomaki, G., Joeke, K., Boersma, S., Gebhardt, W., & Huisman, S. (2001). *The Goals and Processes Inventory (GAPI)*. Leiden, The Netherlands: Leiden University, Health Psychology.
- Magnusson, D. (2003). The person approach: Concepts, measurement models, and research strategy. In S. C. Peck & R. W. Roeser (Eds.), *New directions for child and adolescent development: Vol. 101. Person-centered approaches to studying human development in context* (pp. 3–23). San Francisco: Jossey-Bass.
- Marcus, B., & Forsyth, L. (1998). Tailoring interventions to promote physically active lifestyles in women. *Women's Health Issues*, 8, 104–111.
- McTiernan, A., Kooperberg, C., White, E., Wilcox, S., Coates, R., Adams-Campbell, L. L., et al. (2003). Recreational physical activity and the risk of breast cancer in postmenopausal women: The Women's Health Initiative Cohort Study. *Journal of the American Medical Association*, 290, 1331–1336.
- Mosca, L., Banka, C. L., Benjamin, E. J., Berra, K., Bushnell, C., & Dolor, R. J. (2007). Evidence-based guidelines for cardiovascular disease prevention in women: 2007 update. *Circulation*, 115, 1481–1501.
- National Heart Lung and Blood Institute. (2001). *Women's heart health: Developing a national health education action plan* (No. 01-2963). Silver Spring, MD: Office of Prevention, Education, and Control.
- Pereira, M. A., FitzerGerald, S. J., Gregg, E. W., Joswiak, M. L., Ryan, W. J., Suminski, R., et al. (1997). A collection of physical activity questionnaires for health-related research. *Medicine & Science in Sports & Exercise*, 29, S36–S38.
- Polivy, J., & Herman, P. (1992). Undieting: A program to help people stop dieting. *International Journal of Eating Disorders*, 11, 261–268.
- Polivy, J., & Herman, P. (2000). The false-hope syndrome: Unfulfilled expectations of self-change. *Current Directions in Psychological Science*, 9, 128–131.
- Raudenbush, S. W. (1997). Statistical analysis and optimal design for cluster randomized trials. *Psychological Methods*, 2, 173–185.
- Rovniak, L. S., Anderson, E. S., & Winnett, R. A. (2002). Social cognitive determinants of physical activity in young adults: A prospective structural equation analysis. *Annals of Behavioral Medicine*, 24, 149–156.
- Ryan, R. M., & Deci, E. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55, 68–78.
- Ryan, R. M., Frederick, C. M., Lepes, D., Rubio, N., & Sheldon, K. M. (1997). Intrinsic motivation and exercise adherence. *International Journal of Sport Psychology*, 28, 335–354.
- Segar, M. L., Eccles, J. S., Peck, S. C., & Richardson, C. (2007). Midlife women's physical activity goals: Sociocultural influences and effects on behavioral regulation. *Sex Roles*, 57, 837–850.
- Segar, M. L., Jayaratne, T., Hanlon, J., & Richardson, C. (2002). Fitting fitness into women's lives: Effects of a gender-tailored physical activity intervention. *Women's Health Issues*, 12, 338–349.
- Segar, M. L., Spruijt-Metz, D., & Nolen-Hoeksema, S. (2006). Go figure? Body-shaping motives are associated with decreased physical activity participation among midlife women. *Sex Roles*, 54, 175–187.
- Stephens, C., & Craig, C. (1990). *Wellbeing of Canadians: Highlights of the 1988 Campbell's Survey*. Ottawa: Canadian Fitness and Lifestyle Research Institute.
- Teixeira, P. J., Going, S. B., Houtkooper, L. B., Cussler, E. C., Metcalfe, L. L., Blew, R. M., et al. (2006). Exercise motivation, eating, and body image variables as predictors of weight control. *Medicine & Science in Sports & Exercise*, 38, 179–188.
- Theberge, N. (1997). Sociological perspectives on physical activity. In J. Curtis & S. Russell (Eds.), *Physical activity in human experience: Interdisciplinary perspectives* (pp. 129–159). Champaign, IL: Human Kinetics.

- Thom, T., Haase, N., Rosamond, W., Howard, V. J., Rumsfeld, J., Manolio, T., et al. (2006). Heart disease and stroke statistics: 2006 update: A report from the American Heart Association statistics committee and stroke statistics subcommittee. *Circulation*, 113, e85–e151.
- US Department of Health and Human Services. (1996). *Physical activity and health: A report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention.
- Verhoef, M. J., & Love, E. J. (1994). Women and exercise participation: The mixed blessings of motherhood. *Health Care in Women International*, 15, 297–306.
- Verhoef, M. J., Love, E. J., & Rose, M. S. (1992). Women's social roles and their exercise participation. *Women & Health*, 19, 15–29.
- Weuve, J., Kang, J. H., Manson, J. E., Breteler, M. B., Ware, J. H., & Grodstein, F. (2004). Physical activity, including walking, and cognitive function in older women. *Journal of the American Medical Association*, 292, 1454–1461.
- Wilcox, S., Castro, C. M., & King, A. C. (2006). Outcome expectations and physical activity participation in two samples of older women. *Journal of Health Psychology*, 11, 65–76.
- Wilcox, S., Dowda, M., & Griffin, S. F. (2006). Results of the first year of Active for Life: Translation of 2 evidence-based physical activity programs for older adults into community settings. *American Journal of Public Health*, 96, 1201–1209.
- Williams, G., Rodin, G., Ryan, R., Grolnick, W., & Deci, E. (1998). Autonomous regulation and long-term medication adherence in adult outpatients. *Health Psychology*, 17, 269–276.
- Williams, G. C. (2002). Improving patients' health through supporting the autonomy of patients and providers. In E. L. Deci & R. M. Ryan (Eds.), *Handbook of self-determination research* (pp. 233–254). Rochester, NY: The University of Rochester Press.
- Wilson, P. M., & Rodgers, W. M. (2002). The relationship between exercise motives and physical self-esteem in female exercise participants: An application of self-determination theory. *Journal of Applied Biobehavioral Research*, 7, 30–43.

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