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## Individual Progress Toward Self-Selected Goals Among Older Adults Enrolled in a Physical Activity Counseling Intervention

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### Abstract

The purpose of this study was to examine what happens to goals over the course of a physical activity counseling trial in older veterans. At baseline, participants ( $N = 313$ ) identified 1 health-related goal and 1 walking goal for their participation in the study and rated where they perceived themselves to be relative to that goal at the current time. They rated their current status on these same goals again at 6 and 12 mo. Growth-curve analyses were used to examine longitudinal change in perceived goal status. Although both the intervention and control groups demonstrated improvement in their perceived proximity to their health-related and walking goals ( $L = 1.19, p < .001$ ), the rates of change were significantly greater in the intervention group ( $\beta = -.30, p < .05$ ). Our results demonstrate that this physical activity counseling intervention had a positive impact on self-selected goals over the course of the intervention.

### Keywords

goal setting; longitudinal; function; exercise behavior

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Goal setting was first identified as a strategy for behavior change in goal theory (Locke, Shaw, Saari, & Latham, 1981) and has since become a central component of physical activity counseling and rehabilitation programs. Goal setting is purported to operate as a self-monitoring strategy that increases activity behavior by enhancing motivation. Although goal setting is a key component of social cognitive theory (Bandura, 1986, 1997), the most often cited theoretical framework for examining physical activity determinants, very few studies have systematically examined goal setting in older adults (Shilts, Horowitz, & Townsend, 2004). Consequently, we know very little about the process of goal setting. That is, what happens with these goals over time, independent of behavior?

There is a broad literature demonstrating the beneficial effects of goals on behavior in organizational (Locke et al., 1981) and academic (Rosswork, 1977; Wyer, 1968) settings, as well as on health behaviors such as physical activity and nutrition (Kelley & Abraham, 2004; Nothwehr & Yang, 2007). Although these findings are encouraging, those studies largely treated behavior change as synonymous with goal attainment; few studies have

tracked goals over time (Shilts et al., 2004). Thus, the effectiveness of behavioral interventions to promote goal-setting processes remains to be evaluated (Levack, Dean, Siegert, & McPherson, 2006).

In a recent review, Shilts et al. (2004) examined the literature on goal setting and physical activity and nutrition. Of the 13 studies that assessed goal setting in adults, only one, conducted among college students in a dietary-change intervention, reported tracking goal progress (Schnoll & Zimmerman, 2001). Such information is important in light of previous research that suggests that goal progression serves as a reinforcement of successful self-management (Bandura, 1997; Locke & Latham, 2002). Indeed, in the context of behavior, often the most important outcomes to the patient are the self-reported outcomes (Randall & McEwen, 2000). Assessing progress on individually meaningful milestones (i.e., self-selected goals) has long been recognized as an important indicator of patient satisfaction in the physical therapy arena, the underlying assumption being that patients who do not improve their ability to perform valued activities will cease participation. In fact, the standard of care for any physical therapy treatment plan has evolved to include both therapist-derived goals to improve functional impairments and patient-selected goals often related to functional limitations and disabilities. However, to predict long-term adherence, it is necessary to periodically assess individual perceptions of progress toward these self-selected goals within the timeframe of the intervention (Acquadro et al., 2003; Wiklund, 2001).

Among older adults participating in physical activity research, there may be a disconnect between the stated objectives of the research protocol and the personal objectives of the study participants. In fact, personal objectives or goals may be more important to the individual than those posed by the research team. In response to this potential disconnect, Bearon, Crowley, Chandler, Robbins, and Studenski (2000) developed the Personal Functional Goals Interview Protocol (PFG). The PFG was designed to assess and track personal functional goals in older adults in the context of an exercise intervention. Bearon et al. conducted pilot testing of the PFG with 39 older adults (22 experimental participants, 17 controls) enrolled in three different exercise interventions. They reported improvements in goal status in the experimental groups relative to controls. Although these preliminary results provided by Bearon et al. suggest positive changes in goal status pre- to postintervention, the pattern of this change in the context of a single intervention remains to be examined. Moreover, an understanding of the factors that predict whether an individual progresses toward his or her goal is lacking (Levack et al., 2006).

The purposes of the current study were to examine changes in perceived proximity to self-selected health and walking goals among older veterans enrolled in a physical activity counseling study and to conduct a series of exploratory analyses to examine the impact of age, race, education, treatment group, number of comorbidities, and physical function on progression toward these goals over the course of a 1-year intervention.

## Methods

Data for this study are from the Veterans LIFE Study, a complete description of which has been reported elsewhere (Morey et al., 2009). In brief, the study was a randomized controlled trial comparing a 12-month multicomponent physical activity counseling (PAC) program with usual care. The physical activity objectives for the PAC group were to walk or perform lower extremity physical activity for 30 min or more on 5 or more days of the week and perform 15 min of lower extremity strength training on 3 days each week. Usual care consisted of usual care received in the context of visits to primary-care providers in the same time frame.

The PAC component was designed using principles from social cognitive theory (Bandura, 1997) and the transtheoretical model of behavior change (Prochaska & DiClemente, 1992). Individuals randomized to the PAC group met with the health counselor at baseline to develop realistic physical activity goals and a structured plan of progression for engaging in physical activity. At this appointment, all participants received a workbook that included the National Institute on Aging's exercise workbook (*Exercise: A Guide From the NIA*), elastic bands of different resistances with instructions for use, an exercise poster detailing six lower body strength exercises, and a pedometer.

To encourage adherence and promote individual efficacy and motivation, each participant in the PAC group received three follow-up telephone calls in the first 2 months and one every month thereafter from the health counselor. The content of these phone calls was consistent across all calls, which consisted of assessing physical activity goals and quantifying the physical activity completed in terms of stated goals, offering support and reinforcement, discussing barriers and potential solutions, and setting new physical activity goals. The counselor also incorporated elements of social cognitive theory that are designed to enhance self-efficacy by reinforcing the importance of continued activity, solving barrier problems, and identifying feasible physical activities for the individual.

Another element of the PAC was endorsement of the study by the patient's primary-care provider during a usual-care clinic visit and monthly automated telephone encouragement from the primary-care provider. Finally, each participant in the PAC group received personalized progress reports quarterly. These reports included a tailored message specific to whether the individual had progressed toward the two overarching study aims: endurance- and strength-exercise participation. Eight structured messages were created to address the possible scenarios and included improvement in both endurance and strength, improvement in one but not the other, achievement of maintenance for either aim, failure to improve, or a decrease from the previous record. A graphic display of quarterly changes in endurance- and strength-exercise participation was also included. The Durham Veterans Affairs institutional review board reviewed and approved the research protocol, and written consent was obtained from all participants.

## Participants

The medical records of all patients age 70 and older who were followed at the Durham VA Medical Center were first reviewed to identify any exclusion criteria, which included a terminal diagnosis, unstable angina, history of ventricular tachycardia, chronic obstructive disease requiring two hospitalizations within the previous 12 months, uncontrolled hypertension, stroke with moderate to severe aphasia, diagnosis of chronic pain, active substance abuse, diagnosis of mental or behavioral disorders, dementia, severe hearing loss, or severe visual loss. In addition, patients were required to be able to walk 30 ft (9 m) without human assistance and be sedentary, defined here as engaging in less than 150 min of physical activity per week. The primary-care provider was asked to determine the final eligibility using the same exclusion criteria.

Of the 398 male veterans initially enrolled in the Veterans LIFE Study, 43 withdrew from the study (see Morey et al., 2009), and 42 did not identify a health goal or walking goal at baseline. The 85 participants excluded from these analyses did not significantly differ from those retained with respect to age, race, education, number of comorbidities, physical function, or group to which they were randomized. Study participants examined were male veterans (76% were White) ranging in age from 70 to 92 years. Before randomization, 313 participants (intervention group = 156 and control group = 157) completed the health-goal and walking-goal assessments at baseline and were subsequently retained for these analyses.

## Measures

**Goals**—Goals were assessed by interview using the open-ended questions from the PFG protocol (Bearon et al., 2000). The importance of the PFG was that it helped create a link between personally stated goals and our ultimate physical activity objectives for the study. At baseline, participants were asked to create one health-related goal and one walking goal for their participation in this study. These goals were self-selected by the participants, without any guidance from the research staff regarding content or principles of goal setting (e.g., feasibility, specificity). An example of a health-related goal was “to get into shape so that I can take care of myself.” An example of a walking goal was “to walk 2 miles every morning with my wife.” Next, participants were given a picture of a ladder, and instructed, “Suppose the top rung of the ladder (10) represents the best that your goal of (getting into better shape) could become, and the bottom rung (0) represents the worst it could be.” The interviewer then asked, “Thinking about your health-related goal, which is to get into better shape, where would you say you are on the ladder at the present time?” Thus, the values recorded represent perceived status relative to the self-selected goals. Both the goal content and rating were logged into the study database. These procedures were repeated for the walking goal.

At 6 months, participants were provided with a printout of the health-related goal they had set for themselves at the baseline interview. They were then instructed, “Please look at your goal and the score you gave it in our first interview. Taking into account where you were before, where are you on the ladder today?” Participants were then instructed to rate their current status on this same goal, again using the ladder as a reference. These procedures were repeated for the walking goal. Using Month 6 scores as a reference, these procedures were repeated at Month 12. Interviews at all three time points were conducted by a neutral member of the research team who was blinded to intervention. Other than during the assessment points, participants were not reminded of their goals during the program; goals that the PAC participants created with the health counselor were distinct from these goals.

**Demographic and Health Information**—Basic demographic information including age, race, and education was collected at baseline. Number of comorbidities was assessed using a modified version of the Older Americans Resources and Services comorbidity index (Fillenbaum, 1988). Participants were instructed to indicate whether they currently had any of the 35 specific diseases or conditions included in this questionnaire. Self-rated physical function was assessed using the Physical Function subscale of the Medical Outcomes Study 36-item Short-Form Health Survey (SF-36; Ware & Sherbourne, 1992). This scale was scored by normalizing raw data, resulting in scores that range from 0 to 100, with higher scores indicating better function.

## Data Analysis

Our analyses followed a series of stages. First, we conducted latent growth-curve analyses to examine the patterns of change in proximity to health goals and walking goals across three time points: baseline, 6 months, and 12 months. Growth-curve models were run for health goals and walking goals (see Figure 1). Mplus statistical modeling software v. 5.1 (Muthén & Muthén, 2007) was used to conduct these analyses.

The next series of analyses was exploratory in nature and estimated the previous models with demographics (i.e., age, race, and education), number of comorbidities, physical function, and treatment group as covariates. This analysis was used to determine their relative influence on initial health- and walking-goal status and the rate of improvement in goal status.

The extent of missing data was <1% health goals and 3% walking goals at 6 months and <1% health goals and 3% walking goals at 12 months. The preferred approach to treating missing data in structural equation modeling is to use the full-information maximum likelihood estimator (Arbuckle, 1996; Enders, 2001; Enders & Bandalos, 2001), which we therefore used in these analyses.

## Results

Demographic characteristics and health status of the sample are shown in Table 1. As can be seen, this is a diverse sample of older men; 45% reported some college or more advanced education, and 21% did not graduate from high school. At baseline, participants reported an average of five medical conditions, with arthritis (67%), circulation problems (40%), diabetes (34%), heart conditions (46%), hypertension (74%), and diagnoses related to vision problems (40%) being the most prevalent. Reported physical function was moderate, with a mean score of 65.4.

The mean scores and standard deviations for the selected health-related goal and walking goal across the three time points are provided in Table 2. Participants reported doing moderately well relative to both the health-related goal ( $5.25 \pm 2.25$ ) and the walking goal ( $4.71 \pm 2.30$ ) at baseline. Examples of health-related goals identified by study participants include reducing pain, improving strength, maintaining or improving health, and losing weight. Examples of walking goals identified by study participants include increasing walking distance, increasing days per week of walking, walking with less pain, and maintaining current walking ability.

### Estimating Changes in Health-Related-Goal Status

The results of this model demonstrated a significant ( $L = 1.19, p < .001$ ) increase in health-related-goal progression over the 1 year. The mean scores provided in Table 2 illustrate that there was a large initial increase in goal progression at the Month 6 measurement, followed by a smaller increase in goal status at the 12-month assessment. This model provided an excellent fit for the data (see Table 3 for model-fit indices).

### Estimating Changes in Walking-Goal Status

Similar to the model of health-related-goal status, this model demonstrated a significant ( $L = 1.55, p < .001$ ) increase in walking-goal progression over the 1 year. The mean scores provided in Table 2 illustrate that there was a large initial increase in goal progression at the Month 6 measurement, followed by a smaller increase in goal status at the 12-month assessment. This model provided an excellent fit for the data (see Table 3 for model-fit indices).

### Exploratory Analyses: Demographic Factors, Comorbidity, Physical Function, and Treatment Group Effects on Changes in Health-Related-Goal Status

Next, we tested the extent to which covariates such as age, race, education, number of comorbidities, and treatment group contributed to the variance in baseline status (intercept) and change over time (slope) for health-related-goal status. This model provided an excellent fit for the data (see Table 3 for model-fit indices). As can be seen in Table 3, the model fit did not change dramatically from the previous model. Education ( $\beta = -.20, p < .05$ ), number of comorbidities ( $\beta = -.32, p < .05$ ), and physical function ( $\beta = .46, p < .01$ ) were associated with baseline health-related-goal status. Age ( $\beta = -.14, p = .05$ ) and treatment group ( $\beta = -.26, p < .001$ ) were significantly associated with changes in goal status. Being younger and being randomized to the PAC group were associated with

significantly greater increases in health-related-goal status. All parameter estimates are shown in Table 4.

### Exploratory Analyses: Demographic Factors, Comorbidity, Physical Function, and Treatment Group Effects on Changes in Walking-Goal Status

The extent to which covariates such as age, race, education, number of comorbidities, and treatment group contributed to the variance in baseline status (intercept) and change over time (slope) of walking-goal status was assessed. This model provided an excellent fit for the data; the model fit did not change dramatically from the previous model (see Table 3). Education ( $\beta = -.19, p < .05$ ), age ( $\beta = .12, p = .045$ ), number of comorbidities ( $\beta = -.31, p < .05$ ), and physical function ( $\beta = .46, p < .01$ ) were associated with baseline walking-goal status. Age ( $\beta = -.17, p < .05$ ) and treatment group ( $\beta = -.30, p < .05$ ) were significantly associated with changes in goal status. Being younger and being randomized to the PAC group were each associated with significantly greater increases in walking-goal status. All parameter estimates are shown in Table 4.

## Discussion

This study examined perceived progress toward self-selected health and walking goals over the course of a 12-month PAC intervention. Both the PAC and control groups demonstrated significant and positive changes in health-related-goal status and walking-goal status. However, results of subsequent growth-curve analyses indicated that progression toward these goals was significantly greater among those in the PAC group, suggesting that characteristics of the intervention itself may have been responsible for the change. Indeed, this multicomponent intervention, which incorporated social cognitive principles such as modeling, self-monitoring, goal setting, reinforcement, and cognitive reframing to enhance self-efficacy for exercise, appears to have had a significant effect on individual perceptions of progress toward self-selected goals. As stated previously, having a positive impact on self-reported outcomes plays a critical role in whether individuals look back on the intervention favorably and will influence whether they stick with the behavior moving forward.

To examine the extent to which perceived progress on self-selected goals corresponded to actual improvements across the intervention, we assessed the changes in physical activity, physical performance, and motivation across the same time intervals in the PAC group (data reported previously in Morey et al., 2009). Consistent with goal theory, we observed similar trends across all of these measures, such that the bigger increases observed in goal progression from baseline to Month 6 were accompanied by bigger increases in physical activity, physical performance, and motivation. Similarly, the smaller increases from Month 6 to Month 12 observed here for goal progression were also seen in physical activity, physical performance, and motivation.

These results suggest that not only was the Veterans LIFE Study intervention successful at improving important study-related outcomes such as gait speed and physical activity participation, but also these performance-based improvements were associated with significant, positive effects on self-selected goals for participating in the program. To our knowledge, this study is one of the first to demonstrate that an intervention focused on improving physical activity levels is also effective at facilitating self-selected goals in older adults. Our results suggest that goal setting, when integrated in a physical activity intervention and treated as a truly iterative process, is associated with commensurate changes in behavior and motivational outcomes.



In an effort to understand individual-level impediments and facilitators of goal attainment, we conducted exploratory analyses using demographics, number of comorbidities, physical function, and treatment group as predictors. The results of these analyses suggest that changes in perceived proximity to goal attainment are largely independent of these factors. However, it is important to recognize that such factors may act as important sources of information for the types of goals that are set and the degree to which these goals are met (Cheavens & Cum, 2000; Locke et al., 1981). We note that although age, education level, number of comorbidities, and physical function were associated with baseline goal status, increases in perceived proximity to goal attainment across time appear to only be affected by age and treatment group. Younger individuals and those randomized to the intervention group reported greater improvements in goal status than did older individuals and those randomized to the control group. The fact that younger age was associated with larger improvements in self-selected goals over time may be attributable to potentially greater improvements in physical activity and higher functional performance in the younger-old adults than in the older-old adults. Our ability to provide a meaningful interpretation of these associations between changes in goal status and demographic and health-status variables is significantly limited, however, by the variation in the types of goals identified and the characteristics of these goals. Indeed, some goals targeted specific behaviors (e.g., walking), whereas others targeted performance outcomes (e.g., exercise for 20 min), and some goals were set for the short term (e.g., next 2 weeks), whereas others were more long term (e.g., over the 12 months of the intervention). Given the paucity of literature exploring these associations (Levack et al., 2006; Shilts et al., 2004), this is clearly an area that warrants further investigation.

The results of our study suggest that assessments of baseline goal status and goal progression over time are both feasible and informative, providing researchers with important qualitative and quantitative data. However, there are some limitations. First, previous research has demonstrated that examining specific qualities of the goal is important for predicting behavior (Locke & Latham, 2002). Our results demonstrate individual progression on self-selected goals even in the absence of structured goal counseling, suggesting a robustness of goal-setting properties. However, future research that examines the influence that the presence (or absence) of these characteristics has on rates of goal attainment and behavior change is warranted.

Second, the methodology specified by the developers of the PFG relative to assessing goal status (Bearon et al., 2000) deserves consideration. As noted in our description of the measure, before rating their current status on the health-related goal and walking goal (at Month 6 and Month 12), participants were reminded of the rating they had selected at the previous time point. It is conceivable that such prompting encouraged participants to shift their responses to please the researcher, choosing a rating that reflected progression on those goals. In an effort to minimize rating distortion, future studies might consider the use of computer-assisted data-collection techniques (Estabrooks et al., 2005; Richman, Kiesler, Weisband, & Drasgow, 1999), having the interview conducted by a neutral person as was done in this study, or asking participants to rate their current status on a coded form without seeing their previous ratings.

Our findings further previous work by demonstrating that self-identified health and walking goals can be assessed and perceived progression toward these goals can be tracked in older adults enrolled in an exercise intervention. Previous research has examined the influence of goal setting on various health behaviors (Estabrooks et al., 2005; Shilts et al., 2004); however, this is the first study to our knowledge to systematically assess goals over the course of an intervention and to test the influence of individual-level variables on baseline status and changes over time. To truly understand the impact of an intervention on

individual participants, goals, similar to other clinical outcomes, must be assessed periodically over the course of the intervention (Revicki, Hays, Cella, & Sloan, 2008). The study's findings have implications for future health-behavior research in which self-monitoring strategies such as goal setting are included in the study design.

One benefit of using self-selected goals rather than assigned ones is that the former are associated with greater commitment and often are more valued by the individual (Locke & Latham, 1990, 2002). Thus, perceiving individual progression toward the attainment of a desired goal is a motivating phenomenon, often accompanied by increased adherence and participation (Bandura, 1997; Locke & Latham, 2002). Conversely, failure to observe progress toward one's goals is associated with declines in motivation and satisfaction (Lapierre, Bouffard, Dube, Labelle, & Bastin, 2001; Rapkin & Fischer, 1992). From a researcher's perspective, then, identifying individuals who are struggling to progress on self-selected goals—who are consequently at risk for program withdrawal—and intervening with additional resources and supports may prove beneficial to enhancing motivation and lessening attrition. This pattern of associations and the utility of perceived proximity to goal attainment as a marker of risk for attrition from physical activity intervention remain to be examined. However, our results do suggest that individuals who demonstrated significant increases in goal status over time also became more motivated to exercise.

Our results demonstrate that this PAC intervention was efficacious in enhancing perceived proximity to self-selected health and walking goals in older adults. Asking individuals to self-identify meaningful goals is a form of engagement with some power to inform, motivate, and personalize the behavior-change process. Health care providers may want to consider working with patients to identify goals and monitor both subjective and performance-based progression toward those goals as part of a treatment regimen. Indeed, our results suggest that doing so may provide patients with a psychologically richer experience by cuing them to reflect on achievement and satisfaction as measured by changes in goal status.

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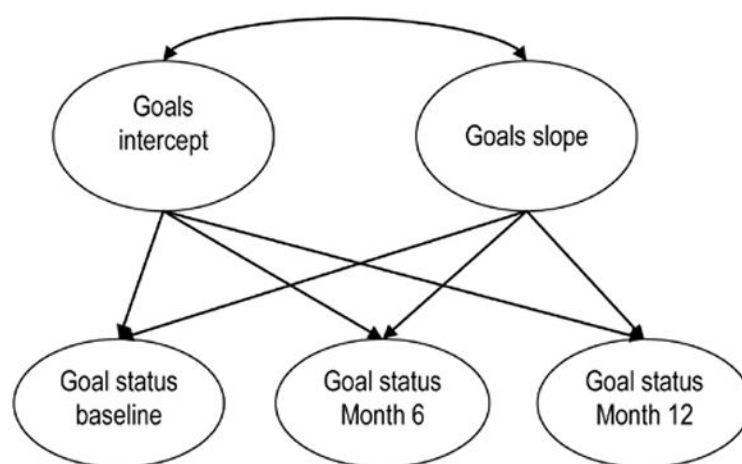
## References

- Acquadro C, Berzon R, Dubois D, Leidy NK, Marquis P, Revicki D. for the PRO Harmonization Group. Incorporating the patient's perspective into drug development and communication: An ad hoc task force report of the Patient-Reported Outcomes (PRO) Harmonization Group Meeting at the Food and Drug Administration, February 16, 2001. *Value in Health*. 2003; 6(5):522–531. [PubMed: 14627058]
- Arbuckle, JL. Full information estimation in the presence of incomplete data. In: Marcoulides, GA.; Schumacker, RE., editors. *Advanced structural equation modeling: Issues and techniques*. Mahwah, NJ: Lawrence Erlbaum; 1996. p. 243-278.
- Bandura, A. *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice Hall; 1986.
- Bandura, A. *Self-efficacy: The exercise of control*. New York: W.H. Freeman; 1997.
- Bearon LB, Crowley GM, Chandler J, Robbins MS, Studenski S. Personal Functional Goals: A new approach to assessing patient-centered outcomes. *Journal of Applied Gerontology*. 2000; 19(3):326–344.



- Cheavens, J.; Cum, A. Gray power: Hope and older adults. In: Snyder, CR., editor. The handbook of hope: Theory, measures, and application. San Diego, CA: Academic Press; 2000. p. 201-222.
- Enders CK. The impact of nonnormality on full information maximum-likelihood estimation for structural equation models with missing data. *Psychological Methods*. 2001; 6:352–370. [PubMed: 11778677]
- Enders CK, Bandalos DL. The relative performance of full information maximum likelihood estimation for missing data in structural equation models. *Structural Equation Modeling*. 2001; 8:430–457.
- Estabrooks PA, Nelson CC, Xu S, King D, Bayliss EA, Gaglio B, Glasgow RE. The frequency and behavioral outcomes of goal choices in the self-management of diabetes. *The Diabetes Educator*. 2005; 31(3):391–400. [PubMed: 15919639]
- Fillenbaum, G. Multidimensional functional assessment of older adults. Hillsdale, NJ: Lawrence Erlbaum; 1988.
- Kelley K, Abraham C. RCT of a theory-based intervention promoting healthy eating and physical activity amongst out-patients older than 65 years. *Social Science & Medicine*. 2004; 59:787–797. [PubMed: 15177835]
- Lapierre, S.; Bouffard, L.; Dube, M.; Labelle, R.; Bastin, E. Aspirations and well-being in old age. In: Schmuck, P.; Sheldon, KM., editors. Life goals and well-being: Towards a positive psychology of human striving. Ashland, OH: Hogrefe & Huber; 2001. p. 102-115.
- Levack WM, Dean SG, Siegert RJ, McPherson KM. Purposes and mechanisms of goal planning in rehabilitation: The need for a critical distinction. *Disability and Rehabilitation*. 2006; 28(12):741–749. [PubMed: 16754571]
- Locke, EA.; Latham, GP. A theory of goal setting and task performance. Engle-wood Cliffs, NJ: Prentice Hall; 1990.
- Locke EA, Latham GP. Building a practically useful theory of goal setting and task motivation. *The American Psychologist*. 2002; 57(9):705–717. [PubMed: 12237980]
- Locke EA, Shaw KN, Saari LM, Latham GP. Goal setting and task performance: 1969–1980. *Psychological Bulletin*. 1981; 90(1):125–152.
- Morey MC, Peterson MJ, Pieper CF, Sloane R, Crowley GM, Cowper PA, Pearson MP. The Veterans Learning to Improve Fitness and Function in Elders Study: A randomized trial of primary care-based physical activity counseling for older men. *Journal of the American Geriatrics Society*. 2009; 57(7):1166–1174. [PubMed: 19467149]
- Muthén, LK.; Muthén, BO. Mplus user's guide. Los Angeles, CA: Muthén & Muthén; 2007.
- Nothwehr F, Yang J. Goal setting frequency and the use of behavioral strategies related to diet and physical activity. *Health Education Research*. 2007; 22(4):532–538. [PubMed: 17032703]
- Prochaska JO, DiClemente CC. Stages of changes in the modification of problem behaviors. *Progress in Behavior Modification*. 1992; 28:183–218. [PubMed: 1620663]
- Randall KE, McEwen IR. Writing patient-centered functional goals. *Physical Therapy*. 2000; 80(12): 1197–1203. [PubMed: 11087306]
- Rapkin BD, Fischer K. Framing the construct of life satisfaction in terms of older adults' personal goals. *Psychology and Aging*. 1992; 7(1):138–149. [PubMed: 1558698]
- Revicki D, Hays RD, Cella D, Sloan J. Recommended methods for determining responsiveness and minimally important differences for patient-reported outcomes. *Journal of Clinical Epidemiology*. 2008; 61:102–109. [PubMed: 18177782]
- Richman WL, Kiesler S, Weisband S, Drasgow F. A meta-analytic study of social desirability distortion in computer-administered questionnaires, traditional questionnaires, and interviews. *The Journal of Applied Psychology*. 1999; 84(5):754–775.
- Rosswork SG. Goal setting: The effects on an academic task with varying magnitudes of incentive. *Journal of Educational Psychology*. 1977; 69(6):710–715.
- Schnoll R, Zimmerman BJ. Self-regulation training enhances dietary self-efficacy and dietary fiber consumption. *Journal of the American Dietetic Association*. 2001; 101:1006–1011. [PubMed: 11573751]

- Shilts MK, Horowitz M, Townsend MS. Goal setting as a strategy for dietary and physical activity behavior change: A review of the literature. *American Journal of Health Promotion*. 2004; 19(2): 81–93. [PubMed: 15559708]
- Ware JE, Sherbourne CD. The MOS 36-item Short-Form Health Survey (SF-36). *Medical Care*. 1992; 30:473–483. [PubMed: 1593914]
- Wiklund I. Assessment of patient-reported outcomes in clinical trials: The example of health-related quality of life. *Fundamental & Clinical Pharmacology*. 2001; 18:351–363. [PubMed: 15147288]
- Wyer RS Jr. Behavioral correlates of academic achievement: Pursuit of individual versus group goals in a decision-making task. *Journal of Educational Psychology*. 1968; 59(2):74–81. [PubMed: 5649620]



**Figure 1.** Representation of the growth-curve model tested in both health and walking goals. *Note.* These models were run separately for health-related goals and walking goals. Intercept = baseline values; slope = change over time.

**Table 1**

## Demographic and Health-Status Characteristics of the Study Sample

	<b>Total sample, <i>N</i> = 313</b>	<b>Intervention group, <i>n</i> = 156</b>	<b>Control group, <i>n</i> = 157</b>
Age, <i>M</i> ( <i>SD</i> )	77.59 (4.88)	77.51 (4.82)	77.68 (4.95)
High school graduates	79%	77%	80%
Number of comorbidities, <i>M</i> ( <i>SD</i> ); range 0–35	5.38 (2.61)	5.15 (2.53)	5.60 (2.69)
White	76%	74%	78%
Physical function, <i>M</i> ( <i>SD</i> ); range 0–100	65.40 (22.43)	69.27 (20.95)	61.56 (23.24)

**Table 2**Health-Goal and Walking-Goal Status for the Whole Sample Across All Time Points, *M* (*SD*)

Variable	Total sample	Intervention group	Control group
Health goals, baseline	5.25 (2.25)	5.37 (2.16)	5.13 (2.34)
Health goals, 6 months	6.39 (2.30)	6.93 (2.22)	5.85 (2.25)
Health goals, 12 months	6.72 (2.47)	7.25 (2.38)	6.19 (2.44)
Walking goals, baseline	4.71 (2.30)	4.75 (2.32)	4.66 (2.29)
Walking goals, 6 months	6.25 (2.58)	6.91 (2.48)	5.61 (2.53)
Walking goals, 12 months	6.46 (2.70)	7.07 (2.62)	5.87 (2.64)

**Table 3**

## Model-Fit Indices for all Tested Models

	$\chi^2$ (df)	RMSEA (90% CI)	SRMR	CFI
Model 1: Changes in health-related goal status	3.62 (2)	0.05 (0.00–0.13)	0.01	0.99
Model 2: Changes in walking goal status	0.07 (2)	0.00 (0.00–0.00)	0.01	1.00
Model 3: Effects of demographics, comorbidities, and physical function on changes in health-related goal status	7.92 (8)	0.00 (0.00–0.07)	0.02	1.00
Model 4: Effects of demographics, comorbidities, and physical function on changes in walking goal status	5.75 (8)	0.00 (0.00–0.05)	0.01	1.00

*Note.* RMSEA = root-mean-square error of approximation (values  $\leq .05$  suggest good model fit); CI = confidence interval; SRMR = standardized root-mean-square residual (values  $\leq .08$  suggest good model fit); CFI = comparative fit index (values  $\geq .95$  suggest good model fit).



**Table 4**

Parameter Estimates for Structural Models Predicting Health Goals' and Walking Goals' Growth With Demographic and Health Conditions as Predictors

	<b>Health goals</b>		<b>Walking goals</b>	
	<b>Intercept <math>\beta</math></b>	<b>Slope <math>\beta</math></b>	<b>Intercept <math>\beta</math></b>	<b>Slope <math>\beta</math></b>
Age	.11	-.14 *	.12 *	-.17 *
Education	-.20 *	.09	-.19 *	.05
Race	.04	.04	-.02	.09
Comorbidities	-.32 *	.11	-.31 *	.09
Physical function	.46	-.51	.46	-.08
Treatment group	-.03	-.26 **	.01	-.30 **

*Note.* Intercept = baseline values; Slope = change over time.

\*  
 $p < .05$ .

\*\*  
 $p < .001$ .