Published in final edited form as:
Psychol Aging. 2009 September ; 24(3): 586–594. doi:10.1037/a0016951.

The Relative Success of a Self-Help and a Group-Based Memory Training Program for Older Adults

Erin C. Hastings and **Robin L. West**
Department of Psychology, University of Florida.

Abstract

This study evaluates self-help and group-based memory training programs to test for their differential impact on memory beliefs and performance. Self-help participants used a manual that presented strategies for name, story, and list recall and practice exercises. Matched content from that same manual was presented by the trainer in 2-hr weekly group sessions for the group-based trainees. Relative to a wait-list control group, most memory measures showed significant gains for both self-help and group-based training, with no significant training condition differences, and these gains were maintained at follow-up. Belief measures showed that locus of control was significantly higher for the self-help and group-based training than the control group; memory self-efficacy significantly declined for controls, increased for group-trained participants, and remained constant in the self-help group. Self-efficacy change in a self-help group may require more opportunities for interacting with peers and/or an instructor emphasizing one's potential for memory change.

Keywords

self-help; self-efficacy; memory training; older adults

The beneficial effects associated with training on mnemonic strategies have been documented repeatedly. In a meta-analysis of 33 studies, training on mnemonic strategies significantly improved memory performance over both control and placebo groups (Verhaeghen, Marcoen, & Goossens, 1992). Most of the studies in the meta-analysis were based on group training programs rather than self-guided interventions. Because group training has had considerable success, it seems reasonable to expect that self-guided training programs teaching mnemonic strategies will also improve memory performance. In fact, it has been speculated that any memory-stimulating activity may lead to memory improvement (Park, Gutchess, Meade, & Stine-Morrow, 2007; Rasmusson, Rebok, Bylsma, & Brandt, 1999). On the other hand, group training may owe some of its success to variables separate from the actual strategies that are learned. In particular, researchers have proposed that the social aspects of group training, the ability to share coping strategies, and the ability to observe others modeling adaptive strategy use may contribute to improvement gains in a group setting (Rebok, Rasmusson, & Brandt, 1997). The purpose of this research is to compare a self-guided training approach with a group class, where both conditions were exposed to the same training content.

Correspondence concerning this article should be addressed to Erin C. Hastings, Department of Psychology, P.O. Box 112250 – Psychology, University of Florida, Gainesville, FL 32611. clh1230@ufl.edu.

The potential value of an effective self-guided training program makes its development an important research issue. If a self-help approach can produce memory improvements similar to group interventions, memory training becomes more accessible to older adults who may not be able to attend group workshops (Rebok, Carlson, & Langbaum, 2007). Self-help approaches also are much less expensive to administer than comprehensive group training programs that require participants to travel to multiple sessions. Reserving a training location and paying an instructor add to the financial burden of group training. Older adults may not live near a clinic that offers such training. Compromised health or an inability to drive may prevent some from traveling to a class location. In addition, self-guided training may be more amenable to individualization. Participants have more freedom to select which strategies to practice, according to their personal needs and abilities. Further, the strategies may be used more in everyday life if they are practiced in the home rather than in a class setting (Baldi, Plude, & Schwartz, 1996).

Past research on self-guided intervention has shown mixed results for performance gains. Scogin and colleagues (Scogin, Storandt, & Lott, 1985; Woolverton, Scogin, Shackelford, Black, & Duke, 2001) found that memory scores improved significantly after self-guided manualized training in mnemonic techniques. Likewise, participants using a handbook to learn memory strategies were able to significantly improve their name recall and strategy knowledge in comparison with a placebo group (Andrewes, Kinsella, & Murphy, 1996). Computer and video-based training, which individuals completed on their own, also resulted in significant changes on posttest scores (Baldi et al., 1996; Finkel & Yesavage, 1990; Plude & Schwartz, 1996; West & Crook, 1992). Finally, in a comparative study of group-based, self-paced, and computer-based training, no single intervention exceeded the others; all participants improved on a behavioral memory test (Rasmusson et al., 1999). Despite these encouraging results, other studies have failed to find significant improvements in memory after self-guided training (Flynn & Storandt, 1990; Rebok, Rasmusson, Bylsma, & Brandt, 1997). Few of these investigations have examined maintenance of training effects over time (e.g., Baldi et al., 1996; West & Crook, 1992; Woolverton et al., 2001).

To encourage maintenance of training benefits, it may be necessary to address the memory beliefs of older adults (Lachman, Weaver, Bandura, Elliott, & Lewkowitz, 1992). Performance change alone may not be sufficient to generate long-term memory success in everyday life. Memory performance and memory beliefs do not necessarily coincide, as evidenced by the fact that most programs have been able to improve one without any change in the other (West, Welch, & Yassuda, 2000). Negative beliefs about memory competence can undermine performance gains, leading to increased dependence on others, avoidance of difficult memory tasks, and a decrease in motivation (Welch & West, 1995). For long-term gain, many authors have emphasized the value of training programs targeting self-evaluative beliefs, due to their importance for future memory persistence and success (Lachman et al., 1992; Rebok & Balcerak, 1989; West et al., 2000).

Many investigators have examined the effects of traditional group training on self-evaluation. A previous meta-analysis of existing training studies reported that group training programs have been able to help participants improve on measures of self-evaluative beliefs (Floyd & Scogin, 1997). For example, participants in a condition including memory training and cognitive restructuring improved on a measure of memory control beliefs (Lachman et al., 1992). In more recent studies, as well, group-trained participants reported feelings of memory stability and were less likely to report feelings of memory stress following an intervention (Valentijn et al., 2005). However, others have failed to find significant changes across memory self-evaluation measures, even when beliefs were targeted by the intervention (Best, Hamlett, & Davis, 1992; Schmidt, Zwart, Berg, & Deelman, 1999). Another important issue is whether changes in self-evaluation mirror changes in

performance. To our knowledge, only one study with a control group has shown significant increases in memory self-evaluation along with significant performance change on most objective measures (West, Bagwell, & Dark-Freudeman, 2008), although many show partial success (Lachman et al., 1992; Rebok & Balcerak, 1989; Valentijn et al., 2005; Zarit, Cole, & Guider, 1981).

Only a few studies have also suggested that memory self-evaluation may be improved using a self-help intervention approach. Scogin, Prohaska, and Weeks (1998) found that both group- and self-guided training were able to improve memory performance and subjective memory assessment (although there was no control group comparison). In a self-guided study using two different audiotape programs, participants did not significantly improve memory, but there was a significant change in the belief that memory loss can be prevented through effort; the tapes appeared to impact sense of control but not performance (Rebok, Rasmusson, Bylsma, & Brandt, 1997). However, other investigations were not able to significantly change memory beliefs through self-guided training (Scogin & Bienias, 1988; Scogin et al., 1985; Valentijn et al., 2005; Woolverton et al., 2001).

Clearly, past research on self-help training has shown mixed results with respect to both memory change and change in self-evaluative beliefs. Although self-help programs have not shown consistent success, we feel that more investigation of self-help approaches is important, given their significant potential benefit for seniors. With a memory intervention, a poor sense of one's potential (low self-efficacy, external locus of control) during or after training may hinder trainees' motivation to take part in memory activities and subsequently reduce long-term performance gains (Valentijn et al., 2006). Therefore, the current study developed a self-help version of a group-based training program that was previously shown to lead to successful change in memory, locus of control, and memory self-efficacy (West et al., 2008). The results of this new self-help program were compared to those of the previously tested group-based training program and a wait-list control group.

Social learning theory addresses the factors that influence positive changes in beliefs (Bandura, 1997), including mastery experiences, verbal persuasion, vicarious experiences (such as observation of peer models), and physiological states (e.g., reduced anxiety). Both the group-based (West et al., 2008) and the self-help version of the training program in this study were designed to encourage positive change for all of these factors. The practice exercises for both training conditions were organized from simplest to most difficult, to provide participants with early mastery experiences. Both self-help and group-trained participants received encouragement to adopt positive memory beliefs (for example, the reading emphasized that memory is controllable and not necessarily destined for devastating failure with age). In addition, those in the group-based training condition met regularly with instructors and other participants, during which time they shared their experiences and practiced memory strategies together. Positive feedback was provided regularly in group sessions. Finally, training was set at a fairly slow pace to reduce performance-based stress. Although all of these elements were present in the group-based training condition, only some were consistently present in the self-guided condition—for example, the self-guided group had relatively little opportunity to observe others modeling correct strategy usage or to receive positive feedback from the instructor.

The primary research questions of this study are as follows: (a) Does self-help memory training result in memory performance improvement for list, name, and story recall, relative to untrained controls? (b) Does self-help memory training result in changes in memory self-evaluation, relative to untrained controls? (c) Does a self-help training program produce similar performance and self-evaluation outcomes to the content-matched group-based training program previously examined by West et al. (2008)? First, we expect to show that

self-help training would raise memory scores due to the strategy training and extensive practice provided by the manual. In addition, all trained participants obtained mastery experiences and received written encouragement emphasizing their memory potential in a slow-paced or self-paced program, which should lead to an increased sense of control and higher memory self-efficacy, in contrast to controls, who were expected to remain at the same level or decline (Dittmann-Kohli, Lachman, Kliegl, & Baltes, 1991; West & Thorn, 2001; West, Thorn, & Bagwell, 2003).

The final question of interest was the relative value of self-help and group training. Given the mixed results from past literature and the fact that past studies have not often used a manual to ensure comparable content in both conditions, it was not clear whether the self-help group would show gains in performance and beliefs as high as those that would be achieved with group-based training. Here, a comprehensive, multifactorial training program (Stigsdotter Neely, 2000) was provided in a written manual for the self-help groups, and the same training was presented didactically for the group-based condition by a class instructor who followed the written manual. That suggests that gains would be similar for the two groups. On the other hand, Valentijn et al. (2005) noted that the participatory nature of the group setting may improve feelings related to self-efficacy that may, in turn, lead to greater memory performance gains than self-guided study. Here, the group-trained participants experienced benefits such as social support, peer models, and positive feedback that were not as frequently present for the self-help group, and these aspects may result in greater gains for the group-trained participants.

Method

Participants

Participants consisted of 185 older adults, ages 54 to 92 (M = 70.9 years, SD = 7.7). Most were recruited at lifelong learning programs, but others were recruited through newspaper ads or a research pool. Participants were eliminated when there was evidence of potential cognitive problems (e.g., stroke, use of anticholinergic medications, or difficulty following instructions). The final sample consisted mostly of women (136 female, 49 male) who were well educated (M = 15.1 years of education, SD = 2.9) and healthy (M = 3.2, SD = 1.8 on a self-rated health scale of 1–10, 1 = *excellent health*).

Training Materials and Procedure

Training manual—A training manual was used both in the self-help condition and in instructor-led workshops. In the manual, each of six weekly lessons included written strategy instruction, practice exercises, and homework. The first lesson in the manual introduced the goals of the training program and discussed basic memory processes. The second, third, and fourth lessons provided specific strategy training, along with readings about memory, aging, and everyday memory strategies. The fifth lesson emphasized control over memory, and the sixth lesson discussed methods for continued use of effective strategies at home. (See Table 1 for the target strategies and skills that were emphasized in each week's lesson.) Each lesson in the manual included homework of at least 1 hr per week (readings, questions, additional practice exercises).

For the self-help participants, the manual was used at home as a training guide for six weekly lessons. Participants in the group-based training condition did not receive a copy of the book. Instead, the groups met each week and the strategy instruction from the manual was taught didactically by a trained instructor, followed by completion of the weekly practice exercises from the manual. The group-based training participants also completed

the homework assignments from the manual. These were taken home in individual packets to complete each week.

Training procedure—Six different training sites were used within 100 miles of campus, including clinic offices, public libraries, and community centers in four cities. Participants were randomly assigned within each training site to serve as wait-list controls (n = 41), attend group training sessions (n = 99),[1] or receive the self-help manual (n = 45). Classes ranged in size from eight to 20 participants, with an average of 14 participants per class. The wait-list control group was offered self-help training after the final assessment session.

Group-trained participants attended four strategy-focused sessions of approximately 2 hr each over a period of 6 weeks, for a total of 8 hr of strategy-focused group training. Each of the four strategy sessions (Weeks 2, 3, 4, and 6) began with participants reviewing the past week's homework in small group discussions. Then the instructor taught a new strategy (following the script in the self-help training manual) and led practice exercises that were completed in small groups or individually (depending on the task). Participants asked questions and participated in general discussion throughout the session. Table 1 describes the basic content of each group-based training session, which was the same as the training offered in a previous study (see West et al., 2008).

The self-help manual contained the same strategy-training material and the same homework assignments as that of the group-training program. Completed homework was submitted at the assessment sessions or mailed to the office. Participants who received the training manual to use as a self-help tool were encouraged to ask questions and voice concerns at any point during the study by contacting the instructor via phone or e-mail. However, very few participants contacted the instructor. After the posttest, one group session of 1.5 hr was scheduled for the self-help participants at Week 6 to answer their questions, review what they had learned, and ensure completion of the assignments. With the exception of the small-group discussion of homework (this activity began every group-trained session), which was not carried out in the self-help condition, the general content of the Week 6 session was similar for the two conditions (review of trained strategies, response to questions, and highlighting of gains already achieved; discussion of how to continue to use strategies in the home by applying the "DASH method"—*decide* what you want to remember, *attend* to it, plan a *strategy* to remember it, and *hold* or rehearse that plan in your mind). The focus of the session depended on the specific questions of the participants in each particular class. Overall, the group-based participants received 8 hr of interactive training, compared with 1.5 hr for the self-help group.

Both in the manual (provided to self-help participants) and in the group-based sessions (where the trainer followed the scripted material in the manual), the possibility of memory change was emphasized, and participants were encouraged to practice every strategy they had learned, starting with the simplest exercises and working up to more challenging exercises. Participants in both conditions were encouraged to talk with friends or family about what they were learning. All training was either self-paced or moderately slow and focused on facilitating learning and mastery by older trainees.

[1]For the group-trained participants, there were slight variations between training sites in the supplemental materials given to participants following Week 6. Because no significant differences in performance at Week 9 were evident as a function of the type of supplemental material received, all training group participants were pooled for the analyses in this article. Further details are available upon request.

Assessment Materials and Procedure

Participants were assessed prior to training (pretest), at 5 weeks (posttest), and at 9 weeks (follow-up test). The dependent measures included assessments of memory performance and memory beliefs. The group assessment sessions did not function as group meetings because no instruction or discussion occurred. All participants worked alone, without talking to others, during the assessment sessions.

Assessment of beliefs—Memory self-evaluation was assessed with the four-scale version of the Memory Self-Efficacy Questionnaire (MSEQ-4; Berry, West, & Dennehy, 1989; West, Bagwell, & Dark-Freudeman, 2005) and three subscales of the Metamemory in Adulthood Questionnaire (MIA; Dixon, Hultsch, & Hertzog, 1988). The partial MIA included 39 items rated on a 5-point Likert scale (1 = *agree strongly*,5 = *disagree strongly*). These items assessed perceived memory achievement (e.g., "I think a good memory is something of which to be proud"; $\alpha = .74$), locus of control (e.g., "I know if I keep using my memory, I will never lose it"; $\alpha = .91$), and anxiety (e.g., "I find it harder to remember things when I am upset"; $\alpha = .73$). A score for each subscale was obtained by averaging responses across all pertinent items (range = 1 to 5).

The MSEQ-4 (West et al., 2005) included items related to participants' perceived efficacy for four memory tasks, with five items for each scale. Participants first read a statement, such as "If someone showed me the photographs of 10 people and told me their names once, I could identify 10 persons by name if I saw the pictures again a few minutes later," then rated how certain they were that they could do this memory task (on a scale of 0–100; 0 = *I cannot do it*, 100 = *100% sure I could do it*). Other statements that followed described the identical task with fewer items recalled. In addition to name recall, the MSEQ-4 also measured confidence in ability to remember object locations, a shopping list, and the main points of a story. Responses were averaged to obtain an overall score for memory self-efficacy strength ($\alpha = .94$), which represents how capable participants feel of succeeding at memory tasks, ranging from 0 to 100.

Assessment of performance—Name, shopping list, and story recall tasks were used to assess everyday memory performance. Four matched versions of these tasks were randomly assigned to groups, across the three assessment sessions (pretest, posttest, and follow-up). At each session, name, list, and story recall tasks were assessed at two levels. Level 1 tasks consisted of fewer items to remember and less time for encoding (1 min study time and 5 min for retrieval for all tasks). Level 2 tasks included more items to remember, and participants had more time to study the information (self-paced study with up to 5 min study time on all tasks). Participants were allowed to take notes during Level 2 study time, but the notes were removed during the recall period. The Level 2 tasks always had the Level 1 items embedded within them, so that participants would see their scores improve over the testing session.

The name recall task involved studying names that were matched with color photographs; each face was shown in a 2.5 × 3 in. (6.35 × 7.62 cm) rectangle, with four faces on a page. The faces were balanced for age, gender, and ethnicity. At retrieval, the participants had to look at the images in the test booklet, presented in a new random order, and write the name of each person beneath the picture. Level 1 contained 12 names and faces (score range = 0 to 12), and Level 2 contained 24 names and faces (score range = 0 to 24); the number of correctly recalled names was the dependent measure. List recall was measured by requiring participants to study a shopping list and then write as many items as possible in the test booklet. All lists were partially categorizable, using one-(e.g., *socks*) and two-word (e.g., *green beans*) names for items that can be found in a store (see West, Welch, & Thorn, 2001,

for list categorization details). Number correct was scored as the dependent measure for the Level 1 list, containing 15 items (score range = 0 to 15), and the Level 2 list containing 35 items (score range = 0 to 35). For story recall, participants studied a story and then wrote down all the details they could remember. Stories were selected from 25 structurally equivalent stories (Dixon, Hultsch, & Hertzog, 1989); they were chosen by a multiethnic group of adults as stories that represented common experiences across ethnic groups. The stories were scored using a propositional analysis (Dixon et al., 1989).[2] The Level 1 story contained eight sentences, and the Level 2 story contained 24 sentences. Due to minor variations in the number of possible propositions to recall from each story, percentage correct was used as the dependent measure (score range = 0 to 100).

Assessment procedure—All assessments were administered during group interviews lasting 1.5 to 2 hr. The Level 1 assessment of each of the performance outcomes was given first, followed by questionnaires. Level 2 assessments were administered after the questionnaires. All to-be-remembered items were presented in a notebook, using bimodal presentation, with individuals reading printed instructions as the experimenter read them aloud. Participants wrote their responses in a test booklet. All assessments were overseen by research assistants to ensure adherence to instructions and time limits for encoding and retrieval. Due to the length of time required, assessments for beliefs were administered only at Weeks 1 and 9 and not at the Week 5 posttest (additional details concerning assessment procedures can be found in West et al., 2008).

Results

Preliminary analyses examined possible baseline differences between participants assigned randomly to the three conditions. In all subsequent analyses, education was included as a covariate because the self-help participants reported significantly less education, $M = 14.22$, $SD = 2.58$, than both the control participants, $M = 15.43$, $SD = 2.74$, $t(79) = 2.04$, $p < .05$, and the group-trained participants, M = 15.29, $SD = 3.10$, $t(134) = –1.98$, $p = .05$. There were no other significant differences between conditions at baseline in gender, age, health status, self-efficacy, MIA scales, or memory test scores (list, name, and story recall).

All post hoc tests reported are Bonferroni adjusted, using simple main effects tests to follow up the significant interactions. In these analyses, main effects for level or occasion reflected overall improvements due to some combination of practice and training. Main effects for condition represented overall group differences. Training effects were demonstrated by significant interactions of condition with test occasion and/or level.

Attrition

Discontinuing the study was defined by missing both the post-test and the follow-up test. An analysis of attrition revealed that significantly more trained participants withdrew from the study than controls, $\chi^2(1, N = 185) = 6.66$, $p < .05$. However, there was no significant difference in attrition based on training condition, $\chi^2(1, N = 144) = 2.1$, $p = .15$. The wait-list control participants completed all assessments (87%) and participated in a self-help training condition after the follow-up assessment. Those who completed the study differed from those who discontinued the study by marital status, $\chi^2(3, N = 174) = 8.25$, $p < .05$. More

[2]Story data were analyzed using SPSS Text Analysis for Surveys 2.0. Propositions were entered into the program for semantic recognition based on a propositional analysis of the stories (Dixon, Hultsch, & Hertzog, 1989). Due to slight variations in the number of propositions available to score for each story (e.g., 145 in one story, 138 in another), the participant's score consisted of the number of propositions recalled divided by the total number of propositions in the story. Initially, a subset of the stories ($N = 67$) was scored by trained readers showing high interrater reliability (see West et al., 2008). The reported SPSS scores on these same 67 stories showed a high correlation between the SPSS scores and scores calculated by those trained readers ($r = .91$). All remaining stories were then scored using the SPSS software.

single participants dropped out (44.4%), compared with those who were married (16.3%), divorced (0%), or widowed (17.8%). However, marital status was not related to memory performance or beliefs. Gender, age, education, health status, baseline self-efficacy, MIA scales, and ability variables were not found to be significantly related to attrition. To partially control for attrition differences between trained and untrained individuals, all analyses were conducted using an intent-to-treat approach with imputation, such that missing scores were replaced with randomly assigned group scores (see Ball et al., 2002).

Performance

A repeated measures multivariate analysis of variance (MANOVA) examined name, list, and story recall with a between-subjects factor of training condition (group-trained, self-help, control) and within-subjects factors of test occasion (pretest, posttest, and follow-up) and level (1 and 2). The MANOVA showed a significant two-way interaction of occasion and training condition, $F(12, 312) = 2.85$, $p < .01$, $\eta_p^2 = .10$, and a three-way interaction of occasion, training condition, and level, $F(12, 312) = 2.01$, $p < .05$, $\eta_p^2 = .07$.

Univariate follow-ups for name recall revealed a significant three-way interaction of Occasion × Training Condition × Level, $F(4, 324) = 2.52$, $p < .05$, $\eta_p^2 = .03$. For Level 1, follow-up tests indicated a trend toward a main effect of occasion, $F(2, 161) = 2.75$, $p = .07$, $\eta_p^2 = .03$. At Level 1, both group-trained and self-help participants significantly improved between pretest and posttest, $p < .05$, and these gains were maintained, with no significant change from posttest to follow-up. For name recall Level 2, a significant interaction of occasion and condition was found, $F(4, 338) = 3.28$, $p < .05$, $\eta_p^2 = .04$. Post hoc tests showed that participants significantly improved between pretest and post-test in both training conditions, $p < .05$. Level 2 gains for both training conditions were maintained, with no significant change from posttest to follow-up. There were no significant name recall gains for the control group at either level (see Table 2).

Univariate follow-ups for list recall revealed a significant main effect of occasion, $F(2, 168) = 3.20$, $p < .05$, $\eta_p^2 = .04$. Additionally, there was a trend toward a three-way interaction of Occasion × Training Condition × Level, $F(4, 338) = 2.29$, $p = .06$, $\eta_p^2 = .03$. For list recall Level 1, post hoc tests revealed no significant main effects or interactions. No groups significantly improved between Weeks 1 and 5, but all showed significant cumulative gain from pretest to follow-up, $p < .05$. For list recall Level 2, follow-up tests indicated a significant main effect of test occasion, $F(2, 168) = 3.51$, $p < .05$, $\eta_p^2 = .04$. There was also a significant trend toward interaction between occasion and training condition, $F(4, 338) = 2.03$, $p = .089$, $\eta_p^2 = .02$. Post hoc tests revealed that all groups showed significant list recall improvement for Level 2 between pretest and posttest, $p < .05$, and maintained these gains at follow-up (see Table 2). These results indicated that list recall gains can be made without training (see West et al., 2008).

Univariate follow-ups for story recall revealed a significant interaction of Occasion × Training Condition, $F(4, 334) = 6.16$, $p = .001$, $\eta_p^2 = .07$. For story recall Level 1, follow-up tests revealed a significant interaction of occasion and training condition, $F(4, 336) = 7.39$, $p < .001$, $\eta_p^2 = .08$, and a significant main effect of occasion, $F(2, 167) = 8.53$, $p < .001$, $\eta_p^2 = .09$. Both training groups improved from pretest to posttest ($p < .05$). The self-help group maintained this improvement at follow-up, and the group-trained continued to improve, showing a significant improvement between posttest and follow-up. For story recall Level 2,

follow-up tests also indicated a significant interaction of Occasion × Training Condition, $F(4, 336) = 2.73$, $p < .05$, $\eta_p^2 = .03$, and a significant main effect of occasion, $F(2, 167) = 8.56$, $p < .001$, $\eta_p^2 = .09$. Both training groups improved from pretest to posttest and maintained their gains at follow-up ($p < .05$) as shown in Table 2. There were no significant improvements for the control group at either level.

Beliefs

To analyze self-efficacy, independent variables included a between-subjects factor of training condition (group-trained, self-help, control) and a within-subjects factor of test occasion (pretest and follow-up). Analysis of variance (ANOVA) results revealed a significant Test Occasion × Training Condition interaction, $F(2, 170) = 9.55$, $p < .001$, $\eta_p^2 = .10$. Post hoc tests indicated that the control group participants significantly decreased in memory self-efficacy between pretest and follow-up, $t(40) = 2.13$, $p < .05$. In contrast, group-trained participants significantly increased in memory self-efficacy between pretest and follow-up, $t(98) = 4.92$, $p < .001$, and self-help participants showed a nonsignificant gain in self-efficacy scores from pretest to follow-up (see Table 3).

For the MIA measures, we conducted a MANOVA for self-evaluation of memory-related anxiety, locus of control, and achievement, also with a between-subjects factor of training condition and a within-subjects factor of test occasion. The multivariate analysis showed a significant main effect for occasion, $F(3, 170) = 12.2$, $p < .001$, $\eta_p^2 = .18$, and a significant training effect, as indicated by the interaction of occasion and condition, $F(6, 342) = 3.4$, $p < .005$, $\eta_p^2 = .09$. Follow-up univariate analyses indicated that these results were due to significant changes across testing occasion for locus of control, $F(1, 172) = 36.9$, $p < .001$, $\eta_p^2 = .18$, which were superseded by the interaction, $F(2, 172) = 8.4$, $p < .001$, $\eta_p^2 = .09$, showing training gains for locus of control for both the self-help and the group-trained participants and no change for the control group, as seen in Table 3. There were no significant changes for anxiety or achievement (all ps > .20).

Discussion

Over the last two decades, considerable success has occurred with comprehensive group training programs (Ball et al., 2002; Rebok et al., 2007; Stigsdotter Neely, 2000; West et al., 2008). Such programs offer systematic strategy training over a period of 10 to 20 hr and typically include multifactorial coverage of related issues such as aging, attention, relaxation, or exercise (West et al., 2008). The success of such programs is important, but many older adults are not able to attend regular weekly meetings to participate in extended group training. The true benefits of training will not be realized until we can identify training programs that are widely accessible to older adults, such as self-help approaches. The self-guided training program presented here shows definite performance benefits and some concomitant changes in beliefs for individuals who worked with the training manual on their own and attended only one discussion meeting. The observed training effects were, for the most part, comparable to those obtained in the multifactorial group training program, reinforcing the notion that comprehensive self-help approaches can be highly effective.

This study provides evidence that both self-help and group-based memory training can yield performance gains. Name and story recall were significantly improved through training, with no significant gains for either task in the control group. Even more important, these gains occurred at two different levels of task difficulty and were maintained over 1 month after strategy training was completed on two very different types of tasks—name and story

recall. However, for the shopping list recall tests, all groups showed improvement. Because shopping list categories are well known (e.g., meats, fruits), and most people know how to group items for memory using such simple categories, training was not needed for participants to improve their scores on the lists. The gains in name and story recall achieved by the self-help group give hope to older individuals who may have difficulty attending group workshops due to decreased driving ability, busy days, or health concerns. People who learned the strategies on their own were able to maintain motivation and do well on the memory tasks, showing significant gains after training on most of the memory tasks, and maintaining these gains over time.

The group training program offered to participants clearly emphasized adaptive memory beliefs and resulted in significant changes in beliefs, suggesting an increased likelihood of maintaining gains over the long-term (Lachman et al., 1992; West et al., 2000, 2008). The findings for the self-help group, however, were mixed. On the one hand, this group did not experience the declines in self-efficacy observed in the control group (a finding that is consistent with other studies showing self-efficacy declines from repeated testing without intervening training or motivational conditions; see West et al., 2003). More important, the self-help group did show significant improvements in control, feeling that they were responsible for their own memory skill—a message that was frequently emphasized in the readings. On the other hand, the self-help group did not show the significant increases in self-efficacy observed in the group training condition. The fact that the memory training manual contained readings identical to the lessons taught didactically in the group sessions suggests that an element outside of the actual training content contributed to higher self-efficacy change among group-trained participants.

Social learning theory highlights the power of four factors to influence belief change, as discussed earlier. Two of these influences—mastery experiences and physiological states—may have exerted a similar influence on both training groups. When people have many successful (mastery) experiences, whether in an individual or group setting, their feelings of self-efficacy with regard to that task are enhanced, and the practice exercises completed by both training group were structured to provide these mastery experiences. Likewise, factors such as mood, anxiety, fatigue, or illness were equally likely to influence both types of trainees because the training program, in both conditions, was self-paced or slow paced (unlikely to create anxiety) and included many statements of positive encouragement (e.g., emphasizing that change was possible regardless of one's age). However, the remaining two influences proposed by Bandura (1997)—vicarious experience and verbal persuasion—might have been more prevalent in the group-trained approach. In the group training condition, participants worked alongside others of a similar age. They had the opportunity to experience vicarious successes on the part of their peers, thereby communicating the idea that “if he can do it, I can do it, too.” Participants in a group training situation were also more likely to hear persuasive statements supporting the value of the program, both from the instructor and from others in the group who reported personal success with a new strategy. In one sense, verbal persuasion makes people more likely to persist and continue working in the face of challenges. In another sense, verbal affirmation can increase confidence when it provides positive feedback. These elements were weaker in the self-help group because of minimal social interaction. Valentijn et al. (2005) also noted that the social stimulation provided by a group environment may contribute to more feelings of well-being, sharing of experiences, confidence, and cognitive challenge.

The self-help participants met for only 1.5 hr at Week 6. Although the questions asked during this single meeting were similar to those asked throughout group-training, such as questions about aging, memory, and how to apply strategies, the self-help participants had considerably less opportunity for interaction with the instructor and other trainees than the

group-based participants who had 8 hr of interactive group meetings. It is important to note that the self-help group showed significant performance gains in name and story recall at both levels at the posttest before this group meeting occurred. This demonstrates that self-help performance gains were due to the manual alone and that written strategy instructions and practice exercises are sufficient to create memory change. With respect to beliefs, however, there was a slight advantage for the group-based training; the self-help participants did not show significant memory self-efficacy improvement at Week 9. At the same time, these self-help trainees did not show significant decline as the control group did. That is, the self-help approach worked to the extent that it prevented the expected efficacy decline that typically accompanies repeated memory testing (West et al., 2003). Their ability to maintain efficacy may have been due to the training program's emphasis on enhancing memory self-efficacy, their participation in one group session, and/or their sharing of learning experiences with friends and family.

One possible limitation of this study is that the control group began the study with a higher level of education than both training groups. This may have occurred because participants were randomly assigned to conditions not as individuals but according to specific training sites; group membership existed as a function of location and ability to attend a common group training site. This introduced some group differences, which we controlled for statistically by using education (the only variable found to be uniquely related to group membership and performance) as a covariate in our analyses.

Another potential limitation to this study was difficulty in monitoring the timing of homework completion in the self-help condition, because the program encouraged self-pacing and we were not meeting with participants each week. The participants completed the homework, but their papers were not always dated, so there was no mechanism in place to ensure that the recommended week-by-week schedule was followed. Thus, variations in homework completion dates may have contributed to the absence of self-efficacy improvement. Perhaps if participants completed many sessions at once, not enough time existed between sessions to effectively restructure their beliefs. There is also the possibility that if self-help participants “crammed” and did the entire program just before the assessment, they may have felt overwhelmed or anxious, which could affect self-efficacy. It is also possible that some self-help participants did not spend enough time with the last two assignments, which were designed specifically to increase self-efficacy and control; these lessons covered the controllability of memory and how to maintain higher levels of memory ability at home. Although we considered the use of self-pacing to be an advantage in this project, investigators may want to maintain control over the pacing of the work to investigate this issue in future studies of efficacy and self-help training.

We hope that this study will encourage more self-help memory training. The training program evaluated in this study was able to improve memory performance on most measures in both training conditions, with maintenance of memory self-efficacy and significant increases in feelings of control in the self-help participants. Because self-help training is done by individuals in their own homes with no need for a paid instructor or reserved training site, self-guided training clearly is cost effective compared to comprehensive group training. Future research should focus on the identification of ways to improve memory self-efficacy in a self-help training program, to increase feelings of competence, and to encourage continued engagement in mentally stimulating activities (West et al., 2000). It is possible that weekly phone calls to self-help participants, giving them encouragement and positive feedback, could help to improve self-efficacy in future studies. Or perhaps self-help trainees could be paired with a spouse or friend. Margrett and Willis (2006) investigated collaborative training for inductive reasoning and found that those who were trained with a collaborator did not benefit more than those who worked alone.

However, similar studies of collaborative *memory* training in which participants are then tested individually are lacking. It may be that spouses or close friends could work together, and the manual could include training on how to model strategies for each other and how to use supportive encouragement to enhance positive beliefs. The development of a successful, empirically tested, self-help memory program that improves performance and beliefs would be an innovation that would improve the lives of older adults by helping them maintain independence longer. The program evaluated in this study is another important step toward that goal.

Acknowledgments

This research was supported by a grant from the Retirement Research Foundation and the University of Florida Research Foundation. We are grateful for their support. Special thanks go to the Villages Lifelong Learning Program, the Shepherd Center, Oak Hammock, the Jacksonville JCC Senior program, and the SHARE program for permitting us to offer programs in their facilities.

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Table 1

Training and Assessment Plan

Schedule	Group-trained	Self-help	Target skill
Week 1	Assessment	(same)	
	Homework: Introduction to memory	(same)	
Week 2	Group meeting	Manual	
	Organization; association	(content same)	List recall
	Homework: Age and memory; practice	(same)	
Week 3	Group meeting	Manual	
	Imagery; image-name-match method	(content same)	Name recall
	Homework: How to remember names; practice exercises	(same)	
Week 4	Group meeting	Manual	
	PQRST text strategy; attention	(content same)	Story recall
	Homework: Other strategies; practice	(same)	Attention
Week 5	Assessment	(same)	
	Homework: Controlling memory	(same)	
Week 6	Group meeting	Group meeting	
	Review; strategy use at home	Review; strategy use at home	Maintenance
	Homework: DASH strategy (Decide, Attend, Strategize, Hold)	(same)	
Week 7	No contact	(same)	
Week 8	No contact	(same)	
Week 9	Assessment	(same)	

Table 2

Mean Scores for Recall Across Test Occasions and Levels

Measure and condition	Level 1			Level 2		
	Test week			Test week		
	1	5	9	1	5	9
Name recall						
Control	5.22	5.39	5.82	12.13	12.60	12.44
Self-help	4.56	5.54[a]	5.70[b]	9.80	13.83[a]	13.07[b]
Group-trained	4.90	5.48[a]	5.52[b]	9.84	12.69[a]	12.18[b]
List recall						
Control	9.35	9.50	10.17[b]	18.38	20.49[a]	20.93[b]
Self-help	9.28	9.68	10.04[b]	18.31	20.20[a]	21.24[b]
Group-trained	9.24	9.56	9.91[b]	18.80	19.92[a]	19.75
Story recall						
Control	54	51	51	44	47	45
Self-help	47	57[a]	53[b]	38	48[a]	46[b]
Group-trained	51	54[a]	57[a,b]	40	46[a]	48[b]

[a] Significant difference from previous assessment.

[b] Significant difference from Week 1 pretest (all $p < .05$).

Table 3

Mean Scores for Memory Beliefs Across Test Occasions

Measure and condition	Week 1	Week 9
Self-efficacy		
Control	49.39	45.44[a]
Self-help	44.33	46.68
Group-trained	45.79	52.44[a]
Locus of control		
Control	3.84	3.86
Self-help	3.61	4.02[a]
Group-trained	3.78	3.99[a]

[a]Significantly different from Week 1 pretest ($p < .05$).