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Evaluation of the Effectiveness of Autogenic Training in Gerontopsychology

Its Role in Developmental Intervention and Its Effects on Development-Related Cognitions and Emotions as well as Psychosomatic Complaints in the Elderly

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This paper presents the results of two studies on the promotion of personal self-regulation of development, personal control over development and development-related emotions as well as generalized locus of control and psychosomatic well-being in the elderly using autogenic training (AT), a psychophysiological self-control method using self-inductions of physical and mental relaxation. Subjects were 120 adults aged 66–80 years. Study I had a randomized cross-over design with a waiting list group; Study II had a randomized cross-over design comparing the effects of introductory courses on autogenic training and of a general health education program. Each program phase continued for 8 weeks, with one small group meeting per week. Tests were conducted in both studies before program start, during mid-program, after total program, and 6 months after the end of the program. Data were gathered on development-related emotions, personal control over development, personal self-regulation of development, psychosomatic complaints, and generalized locus of control. The results point towards short-term as well as long-term effects of autogenic training on these variables. Possible applications of autogenic training in gerontopsychology are discussed as well as its role in developmental intervention and its references to the action-theory oriented perspective in developmental psychology.

Keywords: Autogenic training, Treatment effectiveness evaluation, Developmental intervention, Internal external locus of control, Gerontopsychology.

To date, most empirical work on the effectiveness of autogenic training as well as on its theoretical foundations in psychophysiology, learning theory, and behavior modification has been done with reference to its applications in clinical and medical psychology (e.g., Krampen, 1992a; Luthe, 1969–1973). Only a few studies have included applications in educational psychology and industrial psychology, focusing for the most part on clinically relevant aspects in these domains (i.e., the reduction of test anxiety or stress reactions, or the promotion of coping behavior; e.g., Krampen, 1992a; Snider & Oetting, 1966). However, while the treatment effectiveness of autogenic training is confirmed by those studies (at least as an effective additional treatment technique accompanying other methods), most of them remain purely pragmatic and symptom-oriented, i.e., without differentiated reference to a psychological theory (Gorton, 1959; Pikoff, 1984). Even worse, up until now, there are no conceptually sound nor empirically well-founded applications of autogenic training in applied devel-

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opmental psychology: Its utility as a developmental intervention has rarely been tested, either conceptually nor empirically. This is astonishing in view of the clear and differentiated relationships of autogenic training to the concept of developmental intervention and the action-theory oriented approach to human development in adulthood as well.

Three historical merits of Johannes H. Schultz, the founder of autogenic training, must be considered when speaking of the development of modern psychological treatment methods. (1) Very early on — in the 1920s — he dismissed the heterosuggestive (directive) treatment strategy in favor of an approach focusing on the individual's competencies and capabilities to actively regulate his/her own development, behavior, and experience (Schultz, 1926, 1970). Therefore, autogenic training has since been termed an autosuggestive self-help technique. (2) From the beginning Schultz was engaged in empirical studies (for the most part single-case reports, but also some group studies), which analyzed the applicability and the effects of autogenic training not only in clinical samples, but in healthy persons, too — together with preventive treatment indications. (3) This early research was conducted in group settings. Thus, autogenic training is historically one of the first — if not the first — psychological group treatment approach that aimed at preventive outcomes concerning the improvement of personal self-regulation competencies.

Autogenic training is defined as a psychophysiological self-control technique aiming at physical and mental relaxation (see e.g., Pikoff, 1984; Schultz & Luthe, 1969). It uses auto-suggestions by which individuals learn to alter certain psychophysiological functions with, initially, minimal intervention by another person and, after the technique is learned, with no intervention by another person. The individual learns postural and cognitive skills. In a relaxed sitting position (for technical details see below: Study I — Procedure) the training uses seven short verbal standard formulas, emphasizing feelings of (1) general peace, (2) heaviness in the limbs, (3) peripheral warmth, (4) respiratory regularity, (5) cardiac regularity, (6) abdominal warmth, and (7) coolness of the forehead. The formulas are introduced in this sequence, each one being practiced in the introductory course group and alone at home until the intended effect is observed. Mastery of all formulas requires daily training for several weeks (at least 2 months). Once learned, autogenic exercises provide not only relief from psychosomatic complaints and disorders, but should also become part of a daily relaxation routine. Individuals use the exercises as a coping device in anticipation of and during stress as well as a self-management technique for relaxation and recuperation: "In its most complete form, then, autogenic training represents the fusion of physiological, cognitive, and behavioral elements into what for some becomes a lifelong method of emotional and physical self-control" (Pikoff, 1984, p. 622). The specific treatment objectives of autogenic training refer to (1) the promotion of the person's capabilities to relax and to rest, (2) the reduction of overwhelming negative affects, (3) the reduction of nervousness, (4) the promotion of performance (e.g., selective attention and memory recall), (5) the self-regulation of autonomous nervous system processes (like heart rate and body temperature), and (6) the promotion of self-control and self-actualization through enhanced self-perception and self-regulation (see, e.g., Krampen, 1992a; Schultz & Luthe, 1969; Pikoff, 1984).

With its focus on primary prevention and competence development, autogenic training shows *a priori* marked common features with the concept and methods of developmental intervention (e.g., Danish, 1981; Danish, Smyer, & Nowak, 1980). Whenever autogenic training takes into account the developmental status and possibilities of the participants, and whenever it is conceptualized with reference to a theory of human development, it effectively becomes developmental intervention. Up until now, most existing, empirically evaluated developmental intervention programs in gerontopsychology have focused on the enhancement of competence in specific behavioral domains (e.g., cognitive skills: Baltes & Willis, 1982; self-assertiveness: Hudson, 1983; coping behavior: Danish, D'Augelli, & Hauer, 1981). These programs are based on theories of human development which refer to the specific behavior and attitude domain found in the program. In contrast to existing programs, the development-related treatment objectives of autogenic training refer to the promotion of more general self-regulatory competencies and self-efficacy as well as development-related emotions, cognitions, and efforts.

These variables — development-related emotions, cognitions, and efforts — are central concepts of action-theory-oriented, constructivistic approaches to human development (e.g., Brandtstädter, 1984, 1989; Brandtstädter, Krampen, & Heil, 1986; Lerner & Busch-Rossnagel, 1981). This theoretical orientation is based on the premise that the individual is not simply a passive subject of developmental changes, but rather actively tries to influence and to gain control of development and aging. Therefore, the action perspective on life-span development focuses on (1) the development-related emotions of the person (his/her affective future outlook and autobiographical retrospect) and (2) the person's efforts actively to regulate his/her own development. In accordance with action theory, both variables are conceptualized within this approach as dependent on both subjective evaluations of developmental goals and subjective self-efficacy beliefs (e.g., Bandura, 1981, 1989). Of central relevance is the concept of personal control over development, which is defined as the expectancy of the person with regard to his/her possibilities to control and to regulate his/her own development (Brandtstädter et al., 1986). Implications of this theoretical perspective for developmental interventions include the objectives of enhancing the self-regulation competencies of the individual, strengthening his/her personal control over development, optimizing his/her development-related emotions, and promoting his/her personal

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self-regulation of development. These developmental objectives correspond to the treatment objectives of autogenic training: the promotion of a person's capabilities of self-regulation and self-help.

Thus, autogenic training can be considered a form of developmental intervention. Moreover, as an interventional method, it preceded the action and self-efficacy perspective in life-span developmental psychology by at least five decades. Yet, there is little empirical research regarding the relevance of autogenic training in developmental interventions. At most, some results point towards the impact of autogenic training on the enhancement of generalized internal locus of control and self-concept as well as the indicative relevance of these variables for the effectiveness of autogenic training (e. g., Johnson, 1976; Krampen, 1991 a; Krampen & Ohm, 1985). But these results refer directly neither to development-related emotions, personal control over development, and self-regulation of development nor to gerontopsychology. Therefore, the two studies presented below empirically test the conceptual compatibility of autogenic training as a developmental intervention within the action-theory approach to human development. It is hypothesized that autogenic training improves prospective development-related emotions by decreasing a person's depressive-resignative outlook and increasing his/her optimistic-active outlook toward own personal future. As well, personal control over development and self-regulation of development are improved. With reference to the specific treatment objectives of autogenic training, it is expected that psychosomatic complaints as well as externality in generalized locus of control beliefs will be reduced and internality in generalized locus of control improved upon learning autogenic training.

Study I: Effectiveness of Autogenic Training in the Elderly

Method

Subjects. The participants of Study I were 60 German adults (M = 73.6, SD = 5.3 years; age range: 67–80 years; 39 females and 21 males) who were receiving no psychiatric or psychotherapeutic treatment and who lived in their own houses or apartments. Regarding former occupational status and level of education, subjects belonged to the middle-class. They were recruited by the announcement of introductory courses on "autogenic training" within a community service program. The courses were announced with preventive treatment objectives for the healthy elderly in an institution for open adult education.

Measures. Data were collected before program start, at midpoint, and at the end of the program as well as 6 months after the program was over. The measures used included (1) the "Scales for the Measurement of Prospective Development-Related Emotions" (EM-P; Brandtstädter et al., 1986), a German adjective list measuring personal depressive-resignative and optimistic-active future outlook via ratings of 13 different facets of positive or negative emotional attitudes towards personal development over the next two years of life (e. g., "When I think of the coming two years in my life, I feel discouraged; ... I feel depressed; ... I feel venturesome; ... I feel hopeful"; internal consistency $r_{tt} > .81$). (2) The "Scales for the Measurement of Personal Developmental Control" (P-CON; Brandtstädter et al., 1986), a German questionnaire measuring subjective evaluation of 20 developmental goals and the expectancies about one's personal impact on the attainment of these goals. Goal evaluations and control expectancies are aggregated into an indicator of (weighted) internal developmental control beliefs (see Brandtstädter et al., 1986; internal consistency in the present sample: $r_{tt} > .79$). (3) The German version of "IPC Scales" (Krampen, 1981) of Levenson (1974) measuring generalized internality (I), powerful others' control (P), and chance control (C) in locus of control of reinforcement; internal consistency $r_{tt} > .75$. (4) The "Symptom Checklist for Autogenic Training" (AT-SYM; Krampen, 1991 b), a German symptom checklist including four-point rating scales of 48 mainly psychosomatic complaints with indicative relevance for autogenic training; internal consistency $r_{tt} > .91$. Test-retest reliability and validity of all scales used were confirmed in test-construction studies (see Brandtstädter et al., 1986; Krampen, 1981, 1991 b).

Procedure. After randomization and pretest, the subjects of Group 1 (n = 30) participated in two separate introductory courses on autogenic training (15 participants per course, one group-meeting per week for 8 weeks); the subjects of Group 2 (n = 30) were the waiting control group. After 8 weeks Group 2 became the treatment group (in two separate AT-courses), and group sessions in Group 1 stopped.

Autogenic training was imparted to the participants of all (four) courses in the same way, using standard procedure and formulas (see Schultz & Luthe, 1969): After exercise of the "simple sitting posture" (which was

preferred to the horizontal training posture and the reclining chair posture because of its higher practical value), closure of eyes, and passive concentration (implying a casual and functional passivity toward the intended functional changes), and the technique of coming back to normal (flexing arms vigorously, breathing deeply, opening eyes), the standard exercises of autogenic training were introduced and trained. Two formulas were introduced in each group meeting after an introductory discussion with the participants. The mental standard exercises refer to auto-suggestions of the standard formulas (a) "I am at peace" – "Peace," (b) "My right/left arm is heavy" – "Heaviness" (the dominant arm was selected), (c) "My right/left arm is warm" – "Warmth," (d) "Breathing calm and regular" – "It breathes me," (e) "Heartbeat calm and regular," (f) "My solar plexus is warm," and (g) "My forehead is cool." Participants were trained to practice passive concentration and "mental contact with the part of the body indicated by the formula (e. g., the right arm), and maintenance of a steady flow of a film-like (verbal, acoustic or visual) representation of the autogenic formula in the mind" (Schultz & Luthe, 1969, p. 15). Thus, from a psychophysiological point of view, the stage is set for relaxation and self-regulation during autogenic exercises by the reduction of extero- and proprioceptive stimulation, and by the verbal content of the formula implying that the relevant psychophysiological system works automatically. Participants practiced the learned autogenic exercises alone at least twice daily.

Data were collected in both groups on all variables before (pretest) and after (first posttest) the program start in Group 1. After the first 8 weeks, Group 2 became the treatment group, and Group 1 did not receive further treatment. Following the treatment of Group 2, a second posttest was performed in both groups on all variables. In addition, a follow-up was carried out on all evaluative variables 6 months after the end of the entire program for both groups. Furthermore, the "Follow-up Inventory for Autogenic Training" (AT-KATAM; Krampen, 1991 b) was included in the follow-up, measuring attitudes towards autogenic training, general well-being, the frequency of autogenic exercises in everyday life, and the subjective effectiveness of the different autogenic formulas.

Results

Mean comparisons for all pretest variables indicated that the randomization procedure resulted in comparable groups ($t(58) < 1.43$). There were four dropouts in Group 1 and three dropouts in Group 2 during the training program. All dropouts were due to acute physical disorders and the need for hospitalization. Thus, the evaluative results presented here are based on a total of 53 participants. Means and standard deviations for pretest, posttests, and follow-up measures are summarized for both experimental groups in Table 1.

A multivariate analysis of variance (MANOVA) with the factor Groups (1, 2) and the repeated measurement factor Time (1, 4) was computed, including all seven measures. Single mean comparisons between groups and times of measurement were computed by univariate analyses of variance (resulting in estimates of effect size *d*; Cohen, 1977) and validated by *a posteriori* tests (Duncan procedure). Significant results are presented graphically in terms of standardized T-scores (see Figures 1–6).

MANOVA yielded significant main effects for the grouping factor ($F(7, 45) = 5.06$, $p < .01$), the repeated measurement factor ($F(21, 31) = 7.69$, $p < .01$), and a significant interaction between Group and Time ($F(21, 31) = 8.05$, $p < .01$). Single mean comparisons between groups (treatment versus control group) for the first posttest showed (1) significantly higher scores in active-optimistic future outlook ($p < .01$, effect size $d = .82$) and significantly lower scores in depressive development-

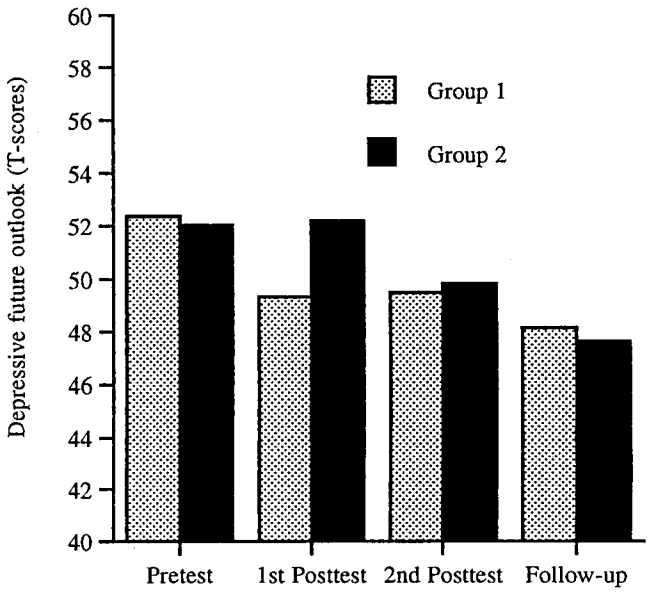

Figure 1
Depressive future outlook at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study I).

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Table 1
Means and standard deviations of dependent variables in Experimental Group 1 (n = 26) and Experimental Group 2 (n = 27) in Study I.

Variable	Pretest		First posttest		Second posttest		Follow-up	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Depressive future outlook								
Group 1	8.2	5.3	6.4	5.4	6.5	4.9	5.7	5.0
Group 2	8.0	5.8	8.1	5.7	6.7	4.7	5.4	5.4
Optimistic-active future outlook								
Group 1	22.0	5.1	26.1	4.9	26.3	5.0	28.1	5.1
Group 2	21.8	4.9	22.0	5.1	27.2	4.9	27.9	5.1
Personal control over development								
Group 1	154.1	44.2	173.5	43.0	175.6	45.2	189.4	44.3
Group 2	150.4	46.0	149.7	47.3	178.1	46.5	188.3	45.2
Internality (IPC-I)								
Group 1	29.2	4.8	33.8	4.9	33.9	4.4	34.5	4.1
Group 2	30.0	4.1	29.8	4.2	34.0	4.3	34.2	4.3
Powerful others control (IPC-P)								
Group 1	27.3	3.9	28.1	4.1	27.7	4.0	26.9	4.0
Group 2	26.9	4.1	27.4	4.1	27.9	4.0	27.4	4.1
Chance control (IPC-C)								
Group 1	30.5	4.9	25.7	4.9	25.2	5.0	24.9	4.8
Group 2	30.3	4.7	29.9	4.6	24.1	4.8	24.7	4.9
Psychosomatic complaints (AT-SYM)								
Group 1	56.3	18.4	35.8	17.9	35.2	17.8	32.1	17.6
Group 2	57.2	19.2	57.3	19.0	35.4	18.5	33.3	17.8

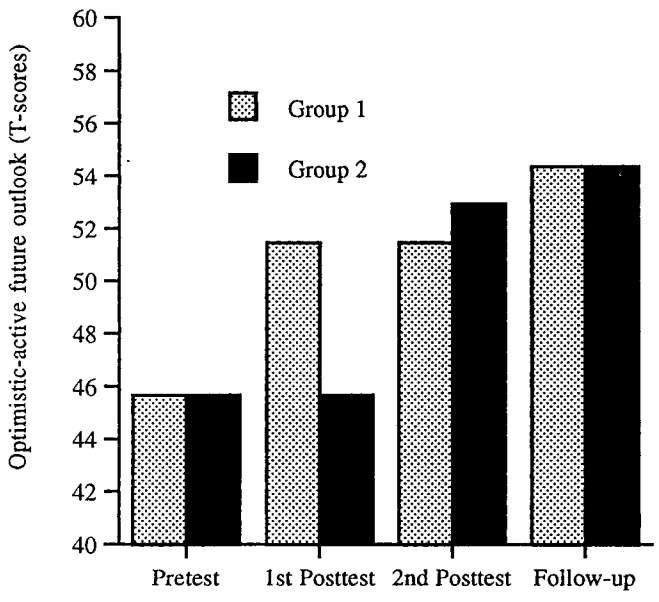

Figure 2
Optimistic-active future outlook at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study I).

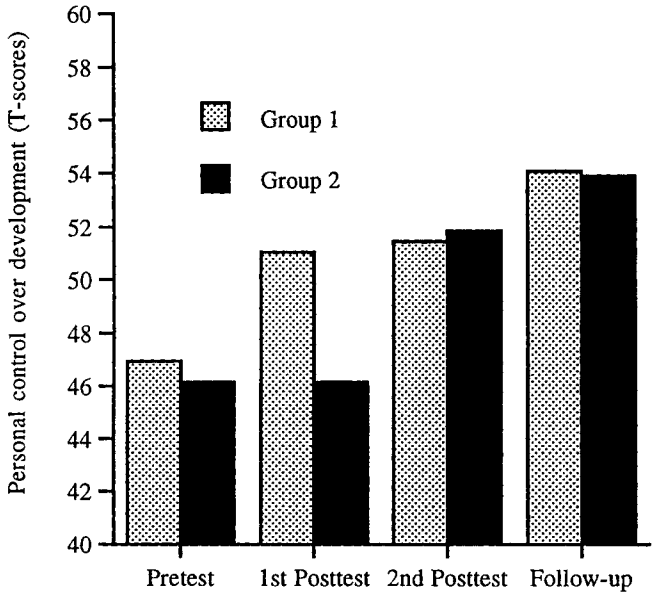

Figure 3
Personal control over development at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study I).

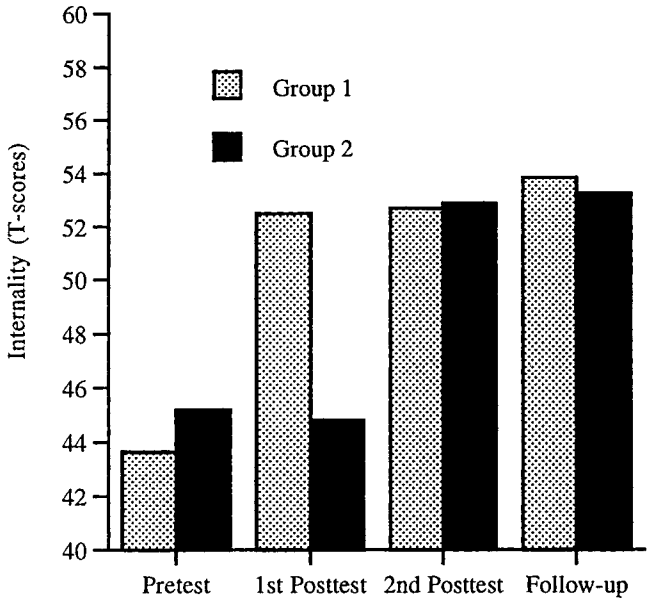

Figure 4
Internality at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study I).

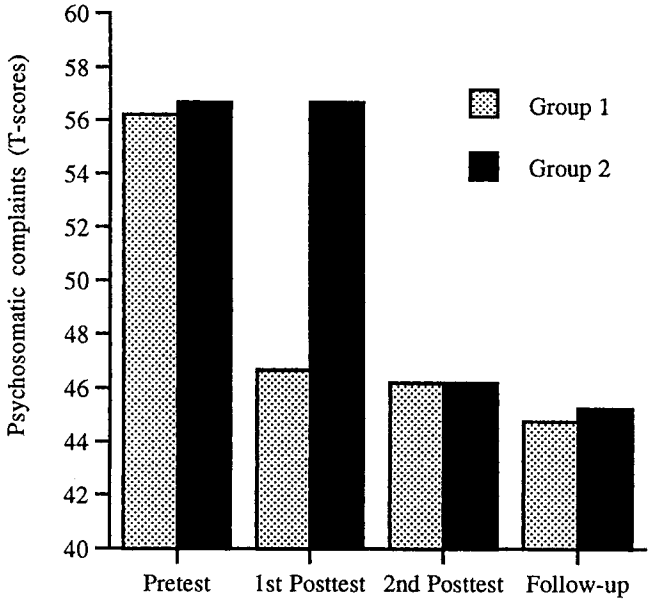

Figure 6
Psychosomatic complaints at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study I).

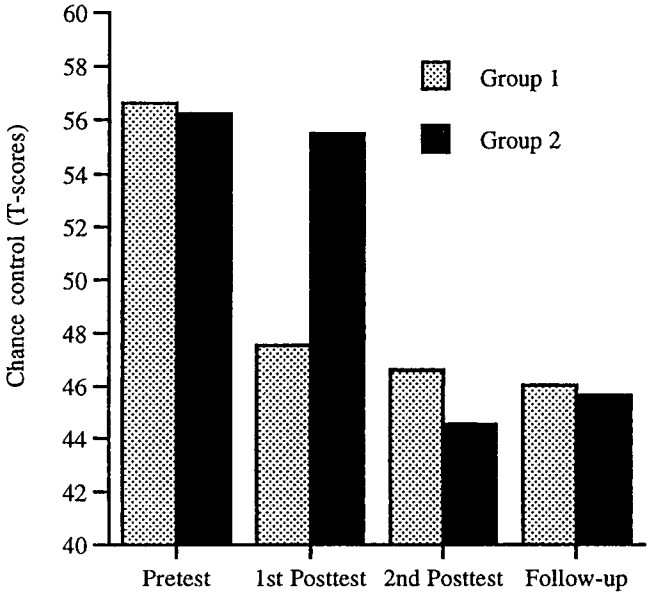

Figure 5
Chance control at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study I).

related emotions in Group 1 ($p < .05$, $d = .31$); (2) significantly higher personal control over development in Group 1 ($p < .01$, $d = .53$); (3) a significantly lower score in chance control ($p < .01$, $d = .88$) and a significantly higher score in internality (generalized locus of control; $p < .01$, $d = .88$) in Group 1; (4) no significant group differences in powerful others' control ($p > .10$); (5) a significantly lower AT-SYM total score in Group 1, indicating a reduction in psychosomatic complaints ($p < .01$, $d = 1.16$).

The results of time comparisons confirmed between-group results (see Table 1 and Figures 1–6). Intra-individual comparisons for pretest and (both) posttest data point towards significant increases of positive development-related emotions, personal control over development and generalized internality as well as towards a significant decrease in psychosomatic complaints, generalized chance control, and in the indicator of negative development-related emotions ($p < .01$; $.33 < d < 1.14$). Follow-up data gathered 6 months after training confirm these short-term effects of autogenic training and point towards lasting and increasing effects. Comparisons of the pretest and follow-up data show

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that all positive changes last for at least 6 months ($p < .01$). Comparisons of the (second) posttest and follow-up data indicate further positive trends in the reduction of psychosomatic complaints ($p < .10$, $d = .16$) and in the increase of personal control over development ($p < .10$, $d = .26$).

At follow-up, 41 of the 53 participants reported that they practiced autogenic exercises "at least one or two times a week" (or more frequently), with six participants reporting exercising "at least one or two times per month." Six former participants reported that they had stopped autogenic exercises entirely (shortly after the end of the course).

Conclusions

Autogenic training was shown to be an effective treatment for the modification of development-related emotions and personal control over development in a sample of elderly. Moreover, reductions of psychosomatic complaints as well as changes in generalized locus of control were observed. Between-group as well as time comparisons confirm these results. However, only the results from the first experimental phase (in which Group 1 was the treatment and Group 2 the control group) met the requirements of a true experimental design. But even here, nonspecific treatment factors (i.e., one group meeting per week, related social activities, and the possibility of seeing other people) may have influenced the results. Therefore, in the second empirical evaluation, the waiting control group condition switched to another group treatment condition. This resulted in a randomized cross-over design comparing two treatments.

Study II: Effectiveness of Autogenic Training Compared with Another Group Treatment

Methods

Subjects. Participants of Study II were 60 German adults ($M = 74.2$, $SD = 4.9$ years; age range: 66–79 years; 36 females and 24 males) recruited from a home for the elderly (without nursing facilities). Regarding past occupational status and level of education, all subjects belonged to the middle-class. The course title was changed to "Health Education and Autogenic Training." All participants had been living in the institution for at least one year, none was in psychiatric or psychotherapeutic treatment, and none was in need of care.

Measures. Again, data were gathered with the EM-P-Scales (internal consistency $r_{tt} > .83$), the IPC Scales ($r_{tt} > .73$), and the AT-SYM ($r_{tt} > .88$). The very extensive P-CON-Scales were dropped in favor of the more economical German research questionnaire "Questionnaire for the Measurement of Development-Related Action Efforts" (E-REGU; Krampen, 1992b), which assesses ten life and behavior domains in which subjects have changed actively over the last 6 months (e.g., "In the last 6 months of my life I have actively changed something for the better in the life domain of social relations"; "... of family relations"; "... of mass media consumption"; "... of eating habits"; $r_{tt} > .64$).

Procedure. After randomization and pretest, the subjects of Group 1 ($n = 30$) participated in two separate introductory courses on autogenic training (15 participants each, one group-meeting per week for 8 weeks), and subjects of Group 2 ($n = 30$) participated in two separate courses of a General Health Education Program. The latter program lasted for eight weeks with one group-meeting per week. It was implemented to control for nonspecific treatment factors resulting from group-meetings and related social activities (see above). It therefore included only simple group discussions of general health topics (i.e., diets, sleep disorders, and physical exercise) and — after short lectures — was realized in a nondirective group leadership style. After the first posttest, Group 1 changed to the Health Education Program and Group 2 to the introductory AT-courses. Following the entire program, a second posttest was introduced as well as a follow-up 6 months later, including all variables and, again, the follow-up inventory AT-KATAM.

Results

Mean comparisons in all pretest-variables confirmed that the randomization procedure resulted in comparable groups ($t(58) < 0.91$). There were four dropouts in each group during the course program and in the follow-up. Six participants dropped because of acute physical disorders and hospitalization, and two died. Thus, evaluative results are based on a total of 52 subjects. Means and standard deviations of all variables for all pretest, posttest, and follow-up-measures are summarized for both experimental groups in Table 2.

Table 2
Means and standard deviations of dependent variables in Experimental Group 1 (n = 26) and Experimental Group 2 (n = 26) in Study II.

Variable	Pretest		First posttest		Second posttest		Follow-up	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Depressive future outlook								
Group 1	8.6	5.8	6.9	5.2	6.0	5.2	5.8	5.0
Group 2	8.8	5.7	8.3	5.7	7.1	5.6	6.3	4.9
Optimistic-active future outlook								
Group 1	20.2	5.1	25.3	4.9	26.3	5.1	28.5	5.1
Group 2	20.6	5.0	24.9	4.9	25.4	4.8	27.6	5.7
Personal self-regulation of development								
Group 1	0.4	0.9	2.3	0.7	2.7	0.8	4.8	0.9
Group 2	0.5	1.0	2.2	0.9	2.5	0.9	4.2	1.0
Internality (IPC-I)								
Group 1	28.6	4.1	31.8	4.3	33.9	4.7	33.7	4.3
Group 2	29.7	4.2	29.4	4.7	31.7	4.1	32.9	4.2
Powerful others control (IPC-P)								
Group 1	29.1	4.0	28.2	4.1	28.3	4.5	29.3	4.1
Group 2	28.9	3.9	28.4	4.0	27.9	4.1	28.9	4.0
Chance control (IPC-C)								
Group 1	31.6	4.9	31.1	5.0	32.0	4.9	31.4	5.0
Group 2	31.2	5.0	30.6	4.8	31.5	4.9	30.9	4.7
Psychosomatic complaints (AT-SYM)								
Group 1	57.0	17.8	38.5	18.1	36.7	16.5	37.2	17.9
Group 2	56.9	18.9	53.0	19.5	39.4	17.8	38.0	18.4

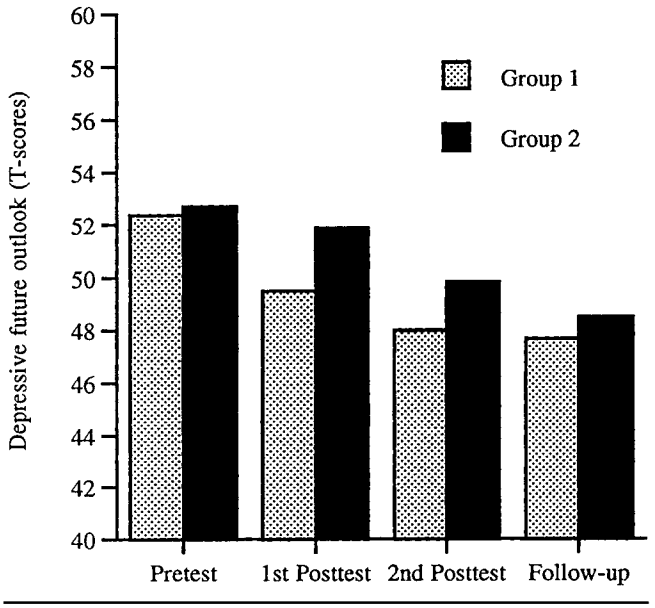

Figure 7
Depressive future outlook at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study II).

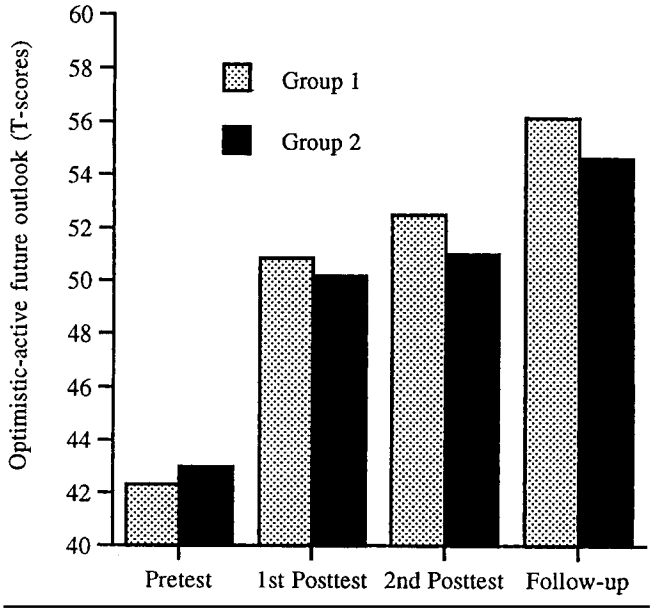

Figure 8
Optimistic-active outlook at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study II).

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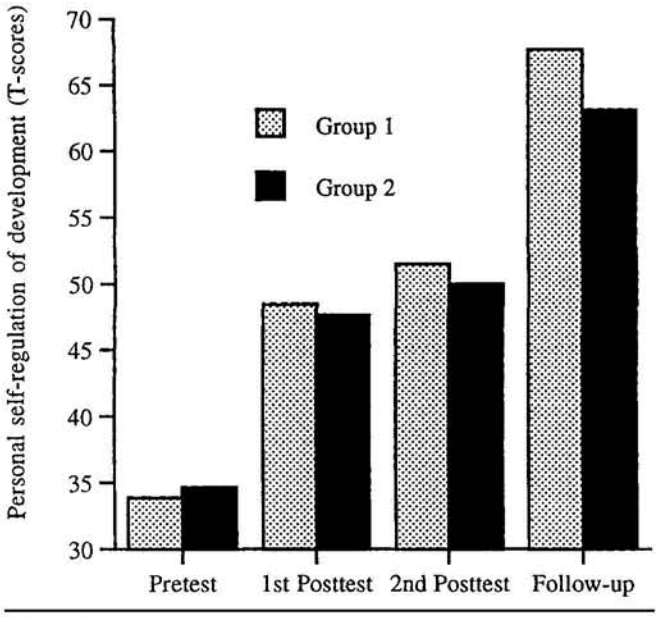

Figure 9
Personal self-regulation of development at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study II).

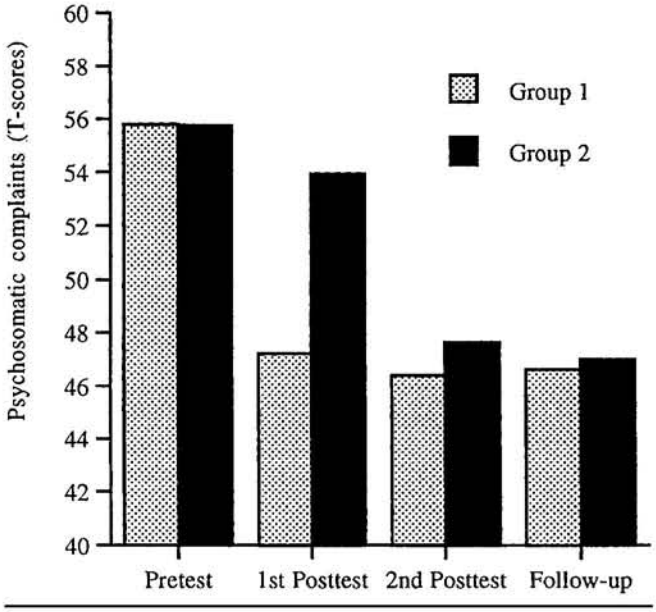

Figure 11
Psychosomatic complaints at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study II).

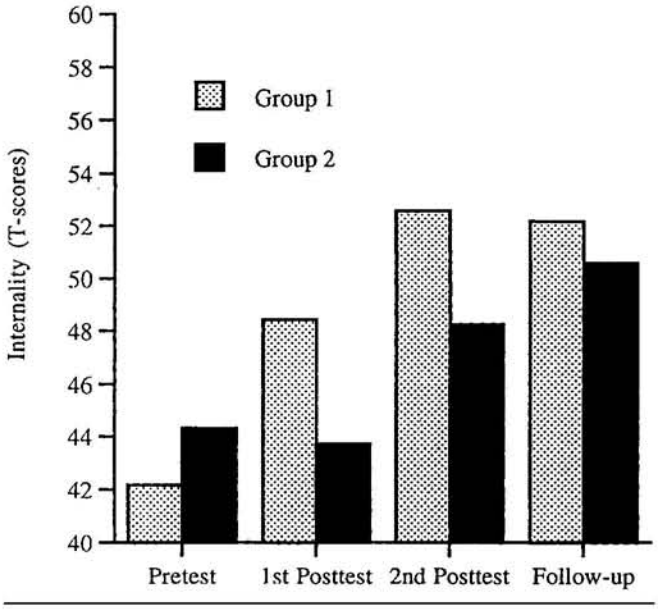

Figure 10
Internality at pretest, posttests and follow-up in Experimental Group 1 and Experimental Group 2 (Study II).

A multivariate analysis of variance (MANOVA) with the factor Groups (1, 2) and the repeated measurement factor Time (1, 4) was computed including all seven measures. Again, single mean comparisons between groups and times of measurement were computed by univariate analyses of variance (resulting in estimates of effect size *d*; Cohen, 1977) and validated by *a posteriori* tests (Duncan procedure). Significant results are presented graphically in terms of standardized T-scores (see Figures 7–11).

MANOVA yielded significant main effects for the grouping factor ($F(7, 44) = 4.19$, $p < .01$), the repeated measurement factor ($F(21, 30) = 5.45$, $p < .01$), and a significant interaction between Group and Time ($F(21, 30) = 5.64$, $p < .01$). Single mean comparisons for time and between groups for the first treatment part (i.e., AT introduction versus Health Education Program participation) showed the following results (see Table 2 and Figures 7–11):

1) Positive effects of both treatments (AT and Health Education Program) leading to an increase of optimistic-active future outlook (Group 1: $p < .01$, $d = 1.02$; Group 2: $p < .01$, $d = .86$; between groups: $p > .10$) and of

personal self-regulation of development (Group 1: $p < .01, d = 2.37$; Group 2: $p < .01, d = 1.79$; between groups: $p > .10$). As indicated, these effects proved to be significant in time comparisons for both treatment groups, but not to be significant in between-group comparisons. Thus, with reference to these two variables, both treatments show similar effects for two central variables of the action-theory approach to development.

2) Specific positive effects of the autogenic training in the reduction of psychosomatic complaints (between groups: $p < .01$, $d = .77$; within group 1: $p < .01$, $d = 1.03$), in the reduction of depressive future outlook (between groups: $p < .01$; within group 1: $p < .05$, $d = .31$), and in the increase of generalized internality in locus of control (between groups: $p < .01, d = .53$; within group 1: $p < .01, d = .77$)). As indicated, these specific effects of autogenic training are significant with reference to pretest–first posttest comparisons for Group 1 as well as with reference to between-group comparisons for the first posttest data.
3) There were no specific positive effects of the Health Education Program implemented in Group 2 (between groups: $p > .10$; within group 2: $p > .10$).
4) There were no treatment effects — neither in the between- ($p > .10$) nor in the within-group comparisons ($p > .10$) — for powerful other's control and chance control in generalized locus of control beliefs.

The results found for the (second) posttest data (collected after the total program) indicate cumulative effects of the two treatment elements, an increasing tendency being observed for all described positive changes (see Table 2 and Figures 7–11). The results show some advantages for Group 1, which participated first in the AT-introduction and then in the Health Education Program (pretest–second posttest comparisons for Group 1: $p < .01$, mean effect size $d = .1.32$; Group 2: $p < .05$, mean effect size $d = .93$). Powerful other's control and chance control were neglected in these pretest–second posttest comparisons, because there were, again, no significant within- and/or between-group differences (see Table 2).

Follow-up data showed (1) that 41 of the 52 subjects, who participated in the entire program, practice AT-exercises "at least once or twice weekly" or more frequently, (2) that personal self-regulation of development (E-REGU) increases further in comparison with the second-posttest data in both groups (Group 1: $p < .01$, $d = 2.47$; Group 2: $p < .01$, $d = 1.79$), and (3) that the same holds for improvements in optimistic-active as well as depressive-resignative future outlook ($p < .05$). There are no significant differences between the two groups, both of which had participated in the entire program at follow-up ($p > .10$).

Conclusions

In the experimental comparison, autogenic training proved to be an effective treatment for positive changes in development-related prospective emotions, personal self-regulation of development, psychosomatic complaints, and generalized internality in the elderly. Between-group comparisons as well as time comparisons confirm the specific effects of AT on psychosomatic complaints, generalized internality, and depressive future outlook as well as some common effects of both treatments (on optimistic-active future outlook and personal self-regulation of development). No significant treatment effects were found in the two aspects of external locus of control of reinforcement. Thus, the reduction of generalized chance control found in Study I to be an effect of autogenic training could not be replicated in Study II. However, second-posttest and follow-up data point towards cumulative effects of both treatments on the other (treatment sensitive) variables. These effects remain stable or even increase within 6 months following program participation.

General Discussion

The results of both experimental studies indicate significant short-term as well as long-term effects of autogenic training on development-related emotions, personal control over development, personal self-regulation of development, psychosomatic complaints, and generalized internal locus of control beliefs in the elderly. Therefore, the conceptual compatibility of autogenic training with the action-theory-founded approach to development in adulthood was confirmed. Positive effects of autogenic training for all central variables of this approach were observed. Effect sizes reach medium to large values (Cohen, 1977).

Of special importance are, first, the results concerning covariations of changes in development-related emotions, cognitions, and efforts, and second the more intervention-specific measures of psychosomatic complaints and of frequency of autogenic exercise at follow-up. These results point towards the role of autogenic training as a developmental intervention that can be in-

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tegrated into action-theory-oriented, constructivistic approaches (Brandtstädter, 1989; Brandtstädter et al., 1986; Lerner & Busch-Rossnagel, 1981) as well as to control and self-efficacy-oriented approaches (e.g., Bandura, 1981, 1989) to human development.

It must be mentioned, however, that all reported effects of autogenic training were measured in both studies at the subjective level of questionnaire data. Verbal data were obtained on emotional attitudes towards personal development in the past and future, personal evaluations of developmental goals, subjectively perceived potentials of personal control of development, psychosomatic complaints, and generalized locus of control of reinforcement. These data need to be validated in future research against external criteria, e.g., expert ratings of individuals' autogenic competencies and/or development, psychophysiological indicators of relaxation, medical data on health and well-being, etc. However, one must not forget that central concepts of action-theory as well as self-efficacy approaches to human development are defined as variables referring to the individual's *subjective* perceptions and evaluations of his/her own personal development. Such subjective perceptions and evaluations of one's own development have been found to be affected positively by autogenic training. This is a relevant basis for behavioral changes, which must be analyzed in future research.

The high proportion of participants still using autogenic exercises with good effects 6 months after the course demonstrates the special appropriateness of this method for the elderly. Of course, subjects in both studies were self-selected, which limits the generalizability of the findings to those who elect to participate in introductory courses on autogenic training. However, this is true for all developmental intervention programs that focus on primary prevention and competence development. Hirsch (1987) presented findings on age differences in the acquisition of autogenic training which point towards more positive attitudes and exercise habits among older compared to younger adults: Old persons were more involved in the autogenic exercises, exercised more frequently, and rated the significance of autogenic training for their life much more positively than younger ones. Thus, in its autosuggestive and contemplative approach autogenic training may be especially appropriate in gerontopsychology. The results presented confirm this, and the view of autogenic training as a developmental intervention with reference to action-theory- and self-efficacy-oriented approaches in developmental psychology should promote its application in gerontopsychology.

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