Original Communication

Systematic Self-Monitoring and Reflection of Health Behavior in Widely Differing Preventive Settings

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Effects of a group health promotion program were tested in widely differing preventive settings. The objectives of the SySeRe program are systematic self-monitoring and reflection on everyday life health behavior as well as the promotion of health- and development-related cognitions and personal well-being. Randomized group designs were employed to evaluate effects on health locus of control, health value, personal developmental control, personal self-regulation of development, well-being, and psychosomatic complaints. Program effects were confirmed with reference to outcome measures administered at the end of the treatment and at 2-month follow-ups in samples of 56 aged individuals (Study 1), 50 adolescents (Study 2), and 53 inpatients on a psychosomatic rehabilitation hospital program (Study 3). Results demonstrate effectiveness and usability of the SySeRe program as an economical health promotion treatment in different primary and tertiary preventive settings.

Keywords: health promotion, health attitudes, health behavior, self monitoring, treatment effectiveness evaluation

The *Program for Systematic Self-Monitoring and Reflection of Health Behavior and Health Attitudes (SySeRe program;* Krampen, 1996a) aims at the systematic self-monitoring of and reflection on participants' current everyday life behavior and experience as well as their self-determined and self-regulated search for options to improve their own behaviors and attitudes in the following six behavior and life domains: (a) eating and drinking habits (including alcohol consumption), (b) drug and tobacco consumption (including both non-prescribed and prescribed drugs), (c) physical exercise and fitness, (d) mass media consumption habits, (e) social contact and interpersonal relations, and (f) stress reactions and coping with stress.

The selection of these six behavior and life domains was driven by existing conceptual and empirical taxonomies of health-related behavior domains (e.g., Becker, 1982; Gochman, 1988; Schmidt, 1990) as well as by empirical results concerning their significance in everyday life (e.g., Krampen, Fähse, & Groß, 1993; Wahl & Schmidt-Furstoss, 1988; Ziegler & Reid, 1983). A guiding principle was the syndrome-similar constellation of dysthymic mood, reduced social activities and contact frequencies (up to the point of social isolation), reduced physical activities, frequent and excessive (passive-receptive) mass media consumption patterns (for the most part television viewing) as

well as resignative and perseverating cognitions (e.g., in withdrawn living, elderly persons). This addresses the corrective task of health education. The preventive task of the SySeRe program refers to the prevention of such development, of a chronification of latent existing developmental trends, and of related dangers and risks.

Each of the six behaviors and life domains is sampled in the SySeRe program in the following manner:

1. *Systematic self-observation and description of the behavior:* Each participant constructs his/her own diary (much like a school exercise book) and keeps it during the whole course of the program. Diary keeping is trained by the systematic (retrospective) copying of relevant behaviors into the diary for each day of the previous week and, much more generally, by construction of a personal biography (roughly structured into early childhood, late childhood, adolescence, early adulthood, etc.). Following this training, participants keep the diary for the subsequent weeks of the program. After each group meeting, one more behavioral domain is added to the diary keeping.

2. *Behavior analysis and reflection in the group:* First of all, gaps in the diary of each participant are identified during the group meetings. After this, the concept of stimulus-organism-response-consequences analysis (S-

O-R-C analysis) is explained, demonstrated and trained. Each participant conducts at least one such analysis for his/her diary content and for each behavior domain.

3. *(Self-)Diagnosis and goal-definition in the group:* The necessity of behavioral and attitudinal changes is discussed for each participant and for each behavior domain in the group. If there is any negative or problematic behavior or attitude, the goals of change are defined in a behavior-proximate (operationalized) form. In this way, the objective and subjectively perceived barriers and resources of the individual participant are considered and discussed.

4. *Ongoing self-monitoring and evaluation of efforts to change behaviors:* The diary is kept for the critical behaviors during the whole course of the program but diary recording for other, non-problematic, behavior domains is omitted after two or three weeks. At group meetings, each participant reports his/her (critical and changed) behaviors over the last week. These reports are discussed, and this leads, in addition to self-evaluations of one's own progress, to group evaluations of the success versus failure of each participant.

Group size should not exceed 15 participants, the group meeting once or twice weekly for 90 to (maximally) 120 min in an open (round) seating plan including the group leader. The whole group program is oriented around the principles of the client-centered (non-directive) approach, focusing the stimulation of group discussion and group dynamics as well as the empathic understanding and reflection of the participants' behaviors, statements, and reports. Exceptions from this refer to (a) explanation and training of self-perception and diary keeping; (b) illustrative demonstration of the behavior-modification S-O-R-C analysis; and (c) cases of reported negative and risky behaviors (such as excessive alcohol or tobacco consumption) and statements (such as positive statements on unbalanced diets), if corrections (which are positively reinforced) are not forthcoming from other participants. All three exceptions result in a more directive leadership style, which returns again after explanations and illustrative demonstrations to a client-centered interaction style.

The first evaluation of the efficacy of the SySeRe program (see Krampen, 1996a) involved an empirical test of its impact on health- and development-related cognitions and on well-being in the elderly. A randomized group design was employed. Program effectiveness was evaluated with reference to variables deduced from action and self-efficacy perspectives in life-span developmental psychology (i.e., personal control of development, hopelessness, and personal self-regulation of development; Brandtstädter, 2001; Brandtstädter, Krampen, & Heil, 1986; Lerner & Busch-Rossnagel, 1981) and from social-cognitive models of health attitudes and behavior (i.e., multidimensional health locus of control and health value; Schwarzer, 2001; Sniehotta & Schwarzer, 2003; Wallston & Wallston, 1984). In addition, current health status was measured by indica-

tors of psychosomatic complaints and subjective well-being.

The results confirmed significant short-term as well as longer-term (two-month) effects of the SySeRe program in the elderly. Effect sizes were large (following Cohen, 1977) for the promotion of personal self-regulation of development, subjective well-being, and internality in health locus of control as well as for reduction of psychosomatic complaints. Medium effect sizes were achieved in reducing the perceived role of chance in health locus of control and in reducing hopelessness as well as in an increase of personal control over development. No program effects were observed for health value or on powerful others' health locus of control.

For health value, this was explained by a ceiling effect resulting from an a priori very positive valuation of health in the sample, which did not leave sufficient range for any significant increase. This is in accordance with existing results indicating a general tendency for individuals to rate health very highly and reflects related problems in the development of a health value scales with sufficient score variances and sensitivity to change (e.g., Kaplan & Cowles, 1978; Nentwig & Windemuth, 1992; Seeman & Seeman, 1983). In addition, it should be recognised that all participants in the study were self-selected and motivated to participate in a course on health education. The stability of powerful others' health locus of control hypothetically was explained by the somewhat ambiguous normative status of this concept. On the one hand, it implies delegation of responsibility for one's own health to others; on the other hand, it is associated with treatment compliance and participation in preventive medical check-ups (see, e.g., Greve & Krampen, 1991; Lohaus & Schmitt, 1989; Wallston, Wallston, & DeVellis, 1978). Thus, for this measure it may be postulated that very low as well as very high scores are non-optimal and that treatments should aim to move scores towards a medium level. However, pretest data point, with reference to the German standardization sample, toward such a medium level in both groups right from the start.

Initial empirical results have been encouraging concerning the efficacy of the SySeRe program in promoting favorable health attitudes and health behavior, as well as in subjective well-being and personal control over development (Krampen, 1996a). The evaluation did meet the requirements of an experimental randomized control group design. But even here, non-treatment specific factors (i.e., one small group meeting per week and the related social activities in the experimental group) may have influenced the findings. Therefore, a study with a randomized crossover design was carried out (Study 1) in which the effects of the SySeRe program were tested in a sample of the aged in comparison to another group treatment, specifically a group introduction course on autogenic training. Two further studies involved other age groups (adolescents in Study 2, middle aged adults in Study 3), in one of which the application context was changed from primary prevention (the context for Studies 1 and 2) to a rehabilitation hospital set-

ting focusing on tertiary prevention in a sample of inpatients with psychosomatic disorders (Study 3).

The principal question underlying the research was whether the favorable results gained in the first SySeRe program efficacy evaluation with a sample of older people (see above; Krampen, 1996a) could be replicated in independent samples differing in age and taking part in the health promotion program in widely differing preventive settings. Up to now, the hypothesis that the training is effective with different age groups at risk for suboptimal health behavior has not been tested. It is hypothesized that the SySeRe program effects can be replicated not only in samples of the aged but also in samples of middle aged and young adults as well as adolescents, because the intervention methods applied, relating to self-management in life-long learning and personal development concerning one's own health attitudes and health behavior, are suitable for all age groups beyond childhood.

To examine program efficacy as well as its effectiveness and usability across this range of primary and tertiary prevention settings, most methodological details were retained from the original study (Krampen, 1996a) and held constant across the three new studies. These details include the randomized group designs and the outcome measures applied at pretests, posttests, and follow-ups. Therefore, the measures applied in all three of the studies presented will be described next.

Methods

Outcome Measures in Studies 1, 2 and 3

Measures were administered at baseline (before the start of the program), at the end of the SySeRe program, and at 2-months follow-up. Outcome measures included:

1. A German symptom checklist (Krampen, 1991) including 4-point ratings of 48 psychosomatic and behavioral complaints (e.g., frequency from 0 *[never]* to 3 *[very often/strong]* of "sleep disorders", "nervousness", "respiration problems", "digestive troubles", "attention problems", "headache", etc.).
2. Two graphical 7-point rating scales on "My current personal physical fitness" and "My current personal mental well-being" illustrated with faces from 1 *(very sad)* to 7 *(very happy)* were combined, $r > .70$, $p < .01$, to form the variable "subjective well-being".
3. The Scale for the Assessment of Health Value from Nentwig and Windemuth (1992; developed following Kaplan & Cowles, 1978; Seeman & Seeman, 1983) which includes a 10-point rating of the item "How important to you is your health?" and 6-point ratings of three other items (e.g., "Better to be poor and healthy than rich and sick").
4. The Disease and Health Locus of Control Scales (KKG; Lohaus & Schmitt, 1989) measuring (a) internality in health locus of control (e.g., "When I take care of my-

self, I never have complaints"), (b) powerful others' externality in health locus of control (e.g., "If I have complaints, I ask others for help"), and (c) role of chance in health locus of control (e.g., "Whether I feel good or not can not be influenced"), similar to Wallston et al. (1978).
5. The Scales for the Measurement of Personal Control over Development (P-CON; Brandtstädter et al., 1986), a German questionnaire measuring subjective evaluations of 20 developmental goals and expectancies about one's personal impact on goal attainment (goal evaluations and control expectancies were aggregated to form an indicator of internality in personal control over development; see Brandtstädter et al., 1986).
6. The Questionnaire for the Measurement of Development-Related Action Efforts (E-REGU; Krampen, 1992) assessing for 10 life and behavior domains the individual's efforts to change something actively in the last two months as well as behavioral changes (e.g., "In the last two months of my life, I have actively changed something for the best in the life domain ... of social relations"; "...of family relations"; "...of mass media consumption"; "...of eating habits"; "...of physical exercise").
7. The German version of the Hopelessness Scale (HScale; Beck, Weissman, Lester, & Trexler, 1974; Krampen, 1979, 1994) measuring generalized negative expectancies concerning one's own person and personal future life (e.g., "I never get what I want so it's foolish to want anything").

Test reliability and validity data for all scales employed are available for German samples (see Brandtstädter et al., 1986; Krampen, 1991, 1992, 1994; Lohaus & Schmitt, 1989; Nentwig & Windemuth, 1992). With one exception, Cronbach's alpha for all scales in each of the studies presented is above $\alpha = .67$. The exception is the KKG-Subscale "Powerful others' externality in health locus of control" ($.54 > \alpha > .44$), which therefore was eliminated from all the following data analyses.

Study 1

Method

Participants

Participants were 60 German adults ($M = 67.8$, $SD = 7.4$ years; age range: 58–79 years; 36 females and 24 males) receiving no psychiatric or psychotherapeutic treatment, who lived in their own apartments or houses (18 of them lived alone, 42 with a partner or with their larger family). In terms of former occupational status and level of education, the majority of the participants were middle class. Participants were recruited via a community advertisement for courses on health education, announced with preventive treatment objectives for the healthy elderly in a communi-

ty service for open adult education. Participants had no severe acute disorders, but some chronic diseases under medical outpatient treatment were noted ($n = 8$ diabetes, $n = 2$ myocardial infarctions after remission, $n = 6$ hypertension, $n = 3$ arrhythmias).

Procedure

A randomized crossover design was employed. After pretest and randomization (controlling for age, gender, and chronic disease), those in Group I ($n = 30$) participated in SySeRe program courses in two small groups ($n = 15$), which met weekly for 8 weeks. Participants in Group II ($n = 30$) took part in introductory courses on autogenic training (AT) in two small groups ($n = 15$) following the standard procedure (see, e.g., Krampen, 1998) including a weekly group meeting over a period of 8 weeks. After these first 8 weeks a treatment crossover was applied, that is, Group I participated in AT courses, and Group II participated in the SySeRe program, both again for a period of 8 weeks. Measures were administered to Group I and Group II at baseline (pretest), at the end of the first 8-week treatment (posttest after SySeRe for Group I and AT for Group II), at the end of the second 8-week treatment (posttest after AT for Group I and SySeRe for Group II), and in a 2-months follow-up after the total 2-step-treatment program.

Mean comparisons for all pretest measures confirmed that the randomization procedure resulted in comparable groups, $t(58) < 1.44$ (see Table 1). During treatment and the follow-up interval, two participants from Group I and one from Group II dropped out because of acute physical illness and hospitalization; one participant in Group I died. Thus, evaluative results are based on a total sample of 56 participants.

Results

Means and standard deviations of pretest, (first) posttest and follow-up measures are summarized for both groups in Table 1. Data from the second posttest are omitted because of their high correspondence to the follow-up data, $r > .86$, $p < .01$; $t(55) = 0.83$. A multivariate analysis of variance (MANOVA with unequal cell sizes) with the grouping factor Groups (1, 2) and the repeated measurement factor Time (1, 3) was computed including all measures. Single mean comparisons between groups and times of measurement were computed by univariate analyses of variance (ANOVAs with unequal cell sizes; see Table 1). In addition, certain results are presented graphically to illustrate the medium- and long-term-effects of the SySeRe program. Figures 1 and 2 illustrate the results from Study 1 for psychosomatic complaints and internal health locus of control. Because of the similarity of

Table 1
Means and Standard Deviations of Measures in Group I ($n = 27$) and Group II ($n = 29$) in Study 1 With Aged in a Preventive Community Service Setting for Open Adult Education and ANOVA Results

Measure	Pretest M	Pretest SD	Posttest M	Posttest SD	Follow-up M	Follow-up SD	Group $F(1/54)$	Time $F(2/108)$	Group × Time $F(2/108)$
Psychosomatic complaints									
Group I	58.3	20.2	42.6	18.4	35.9	19.1			
Group II	57.8	21.7	35.8	16.9	36.2	17.6	0.67	7.02**	4.98*
Subjective well-being									
Group I	7.1	3.0	11.0	2.5	10.2	2.8			
Group II	7.4	2.9	12.1	2.4	10.8	2.4	1.29	8.44**	1.73
Health value									
Group I	26.5	3.1	26.9	2.8	26.4	2.1			
Group II	27.1	2.7	26.4	2.4	27.2	1.9	0.98	1.53	0.36
Internal health locus of control									
Group I	24.2	4.3	28.3	4.7	27.8	4.9			
Group II	23.9	4.4	26.4	5.2	29.3	4.3	0.70	6.91**	5.30*
Chance health locus of control									
Group I	20.2	5.6	13.9	5.2	14.0	5.4			
Group II	19.6	4.4	17.8	4.9	13.5	4.1	0.82	10.04**	6.43*
Personal control over development									
Group I	147.7	39.0	172.3	42.9	181.3	44.1			
Group II	151.6	40.4	159.8	43.7	189.2	38.3	1.27	9.30**	4.74*
Personal self-regulation of development									
Group I	0.4	0.3	2.9	0.6	4.7	1.1			
Group II	0.6	0.5	3.1	0.4	5.3	1.4	0.88	11.06**	1.63
Hopelessness									
Group I	7.1	4.4	4.0	4.0	3.8	3.8			
Group II	7.3	3.7	3.8	3.3	3.5	4.0	0.53	8.40**	0.69

** $p < .01$; * $p < .05$

results between Studies 1, 2, and 3, results for the other dependent variables under investigation are illustrated only with reference to Studies 2 and 3.

MANOVA yielded no significant overall main effect for Group, $F(1,54) = 3.02$, but statistically significant overall effects for Time, $F(2, 108) = 14.22$, $p < .01$, and for the Group × Time interaction, $F(7,378) = 3.79$, $p < .01$. The results of the ANOVAs computed are presented in Table 1. Whereas there is no significant main effect of the grouping factor, there are significant main time effects for seven of the eight outcome measures considered. Thus, both groups gain from the total (i.e., 2-step) health promotion program
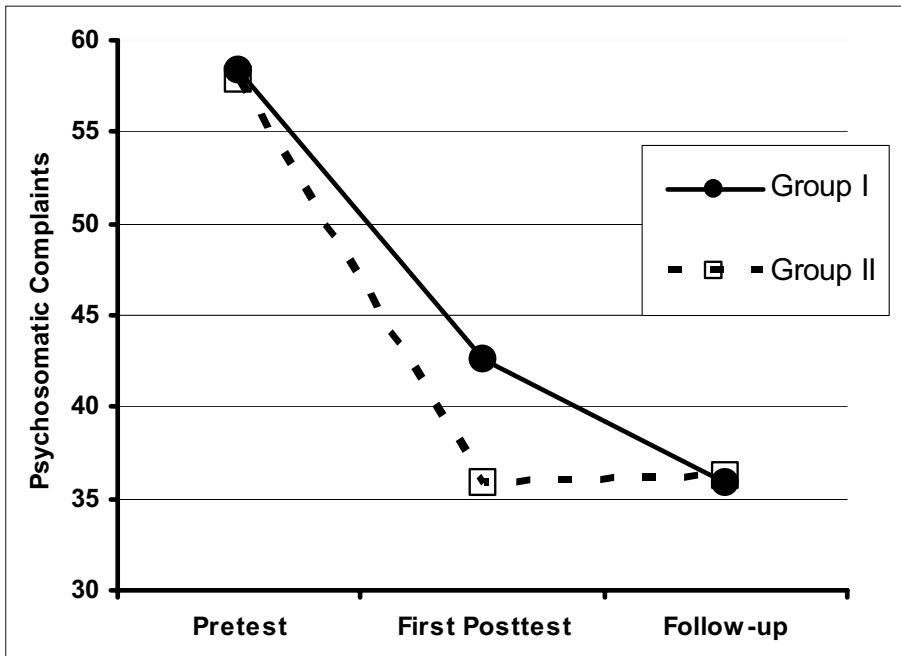

Figure 1. Psychosomatic complaints in Group I (SySeRe first, AT second) versus Group II (AT first, SySeRe second) at pretest, first posttest and follow-up (Study 1).
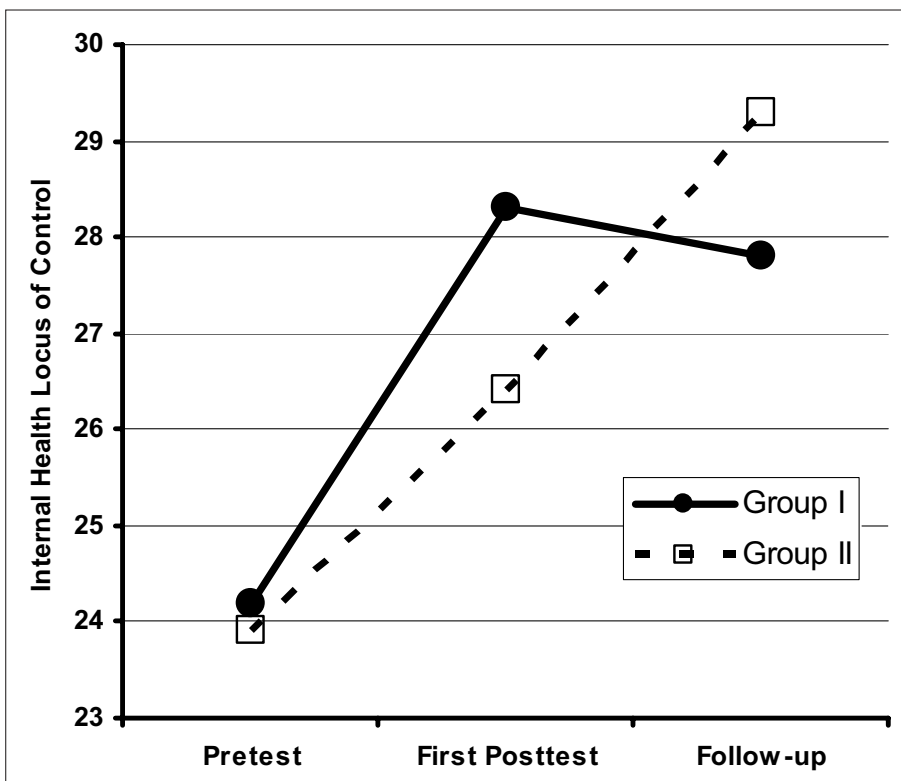

Figure 2. Internal health locus of control in Group I (SySeRe first, AT second) versus Group II (AT first, SySeRe second) at pretest, first posttest and follow-up (Study 1).

(including SySeRe and AT) in terms of significant reductions in psychosomatic complaints, hopelessness, and perceived role of chance in health locus of control as well as in the form of significant increases in well-being, internal health locus of control, personal control over development, and personal self-regulation of development. Effect sizes are medium to large in terms of Cohen's (1977) guidelines. Only for health value, there is no significant effect, neither of time or of any other factor, which confirms the earlier results (Krampen, 1996a) and which again can be attributed to a ceiling effect resulting from very high health value scores already present at the pretest stage in the self-selected samples under study. With reference to the two different treatment methods under investigation, however, the interaction term Group × Time is even more interesting. In univariate ANOVAs (see Table 1), four of these are significant and differentiate a posteriori the significant MANOVA interaction effect (see above).

Results show, firstly, that Group II (i.e., the group with AT first) improves in the reduction of psychosomatic complaints much more at the posttest than Group I (i.e., the group with SySeRe at first). However, this group difference in favor of AT effects evens out at follow-up (and at the second posttest too), when Group I had learned the AT systematic relaxation technique as well. This pattern of result is presented graphically in Figure 1.

Secondly, three more significant interaction terms for Group × Time (see Table 1) are in favor of treatment-specific effects of the SySeRe program: Group I (i.e., the group with SySeRe at first) shows at posttest increases in internal health locus of control and personal control over development as well as a decrease in "chance" health locus of control, which are significantly different to these in Group II (i.e., the group with AT first). Again, these group differences in SySeRe-specific effects on health- and development-related control orientations (or self-efficacy beliefs) even out at follow-up, by when Group II had also participated in the SySeRe program. This result is illustrated in Figure 2 graphically for the outcome measure of internal health locus of control. In addition, it must be noted that all of the four significant interactions pointing to medium-term differential effects of AT versus SySeRe have only small effect sizes in terms of Cohen (1977).

Discussion

Consistent with earlier results gained in a randomized waiting-list control group design (Krampen, 1996a), the SySeRe program has proven to be an effective and efficient health promotion group treatment in a primary prevention community setting for the aged and elderly. Participants of the whole intervention program (including SySeRe and AT) improved significantly, particularly with respect to outcomes measures on health locus of control, personal control over development, personal self-regulation of development, and behavioral change as well as subjective well-being.

In addition to medium- and long-term effects common to both treatments (SySeRe and AT) with respect to self-regulation of development and behavioral change, well-being and hopelessness, the randomized crossover design also provided empirical proof of treatment-specific effects. The SySeRe program is more efficient in medium-term modifications of unfavorable health- and development-related beliefs concerning self-efficacy. Autogenic training is more efficient in medium-term reductions of subjective psychosomatic complaints. This is one of the main treatment goals of this psycho-physiological self-control technique for physical and mental relaxation focusing on self-regulation of autonomous nervous system processes (like heart rate), the reduction of overwhelming negative effects and of nervousness, the promotion of relaxation and resting skills as well as the promotion of performance, self-control, and self-actualization (see Krampen, 1998). Taking both health promotion methods together, favorable effects are gained in the application context of a preventive community service setting for elderly adults and the aged.

Follow-up data suggest a slight advantage in effectiveness of a treatment sequence with AT first and SySeRe second as compared to the reverse sequence. However, it must be noted that a combination of both methods is time- and resource-expensive and also requires a high level of treatment motivation and compliance in the participants. The first was assured in the present study by research funding, the second was achieved through self-selection of treatment-motivated elderly adults in a well-known and regionally respected community service as well as by the motivating "go-with-the-group" effects of the treatments themselves (Krampen, 1996a), again resulting in a very low dropout rate.

In combination with the results of other evaluation studies on SySeRe and AT, it can be said in conclusion, with reference to the differential indication of both treatments, that (a) autogenic training is somewhat more effective for medium-term reductions of psychosomatic complaints and symptoms of mental and somatoform disorders (Krampen, 1996b, 1999) whereas (b) the SySeRe program is somewhat more effective for medium-term optimizations of health- and development-related self-efficacy (Krampen, 1996a). In addition to these treatment-specific effects, it should be remembered that common positive effects of both treatments in their separate application have been gained for indicators of subjective well-being as well as personal self-regulation of development and behavioral change (see, e.g., Krampen, 1996a, 1996b).

Study 2

Method

Participants

Participants were 60 German adolescents ($M = 14.3$, $SD = 2.1$ years; age range: 13–16 years; 38 females and 22 males) in a general community service setting that has special regular offerings for adolescents in the domains of leisure-time activities and peer-tutoring of school homework (after-school educational program). In terms of parents' occupational status and level of education, the adolescents were from lower and middle class backgrounds. All were enrolled in secondary education, most of them in the German "Hauptschule" ($n = 27$) and "Realschule" ($n = 25$), with only a few in the "Gymnasium" type high school ($n = 8$). Participants were recruited within the regular program of the community service setting by obligation. No adolescent had a severe chronic or acute disorder.

Procedure

A randomized waiting-list control group design was employed. After pretest and randomization (controlling for age, gender, and type of secondary school), participants in

Group I ($n = 30$) participated in SySeRe program courses in two small groups ($n = 15$), which met weekly for 8 weeks. Participants in Group II ($n = 30$) were the waiting-list group who received the SySeRe program 6 months after Group I (following the summer break). Measures were administered to Groups I and II at baseline (pretest), at the end of the 8-week treatment (posttest), and at 2-months follow-up.

Mean comparisons for all pretest measures confirmed that the randomization procedure resulted in comparable groups, $t(58) < 1.16$ (see Table 1). During treatment and the follow-up interval, four participants from Group I dropped out because of acute physical illness. Two more participants from Group I and four from Group II dropped out because they had completed their period of community service and following parental permission. Thus, evaluative results are based on a total sample of 50.

Results

Means and standard deviations of pretest, posttest, and follow-up measures are summarized for both groups in Table 2. As in Study 1, first, an overall multivariate analysis of variance (MANOVA with unequal cell sizes) with the grouping factor Groups (1, 2) and the repeated measurement factor Time (1, 3) including all measures was computed. Second, univariate analyses of variance (ANOVAs with unequal cell sizes; see Table 2) were computed for sin-

Table 2

Means and Standard Deviations of Measures in Group I (n = 24) and Group II (n = 26) in Study 2 With Adolescents in a Preventive Community Service Setting and ANOVA Results

Measure	Pretest M	Pretest SD	Posttest M	Posttest SD	Follow-up M	Follow-up SD	Group F(1/48)	Time F(2/96)	Group × Time F(2/96)
Psychosomatic complaints									
Group I	44.3	14.2	39.5	13.9	32.1	12.4			
Group II	45.5	13.4	44.9	12.5	44.0	11.9	5.08*	4.72*	8.94**
Subjective well-being									
Group I	8.2	2.6	10.4	1.8	11.5	2.2			
Group II	7.9	3.1	8.4	2.1	8.1	2.5	6.11*	4.70*	9.28**
Health value									
Group I	24.9	2.3	25.8	3.0	26.1	2.7			
Group II	25.2	2.6	26.2	2.7	25.5	3.2	1.01	2.42	0.28
Internal health locus of control									
Group I	26.3	5.2	32.6	6.1	31.4	4.3			
Group II	27.1	4.6	28.2	5.7	26.6	5.9	8.01**	5.82*	10.32**
Chance health locus of control									
Group I	22.5	4.3	14.7	4.7	14.3	5.2			
Group II	23.3	3.7	20.1	5.4	21.4	4.4	4.35*	6.03*	7.88**
Personal control over development									
Group I	173.1	29.4	194.3	33.9	192.0	37.7			
Group II	169.5	31.7	175.3	34.6	172.4	29.1	3.63*	6.32*	9.44**
Personal self-regulation of development									
Group I	1.1	0.8	3.2	0.6	6.3	1.4			
Group II	1.5	1.1	2.0	1.4	3.2	1.6	5.12*	7.18**	4.69*
Hopelessness									
Group I	5.8	3.7	3.8	2.1	3.8	2.2			
Group II	6.1	4.0	5.9	3.5	6.0	3.5	7.63**	8.41**	8.05**

** $p < .01$; * $p < .05$

gle mean comparisons between groups and times of measurement.

MANOVA yielded statistically significant overall main effects for Group, $F(1,48) = 7.03$, $p < .05$, and Time, $F(2, 96) = 8.41$, $p < .01$, as well as a significant overall Group × Time interaction effect, $F(7, 336) = 5.28$, $p < .01$, this latter pointing to the necessity for differential interpretation of the main effects. This is confirmed by the results of the a posteriori ANOVAs (see Table 2). Significant interaction terms show that Group I improves medium-term as well as long-term, following participation in the SySeRe program, in terms of reductions in psychosomatic complaints, hopelessness, and chance health locus of control as well as in increases in well-being, internal health locus of control, personal control over development, and self-regulation of development. Effect sizes are medium to large (Cohen, 1977). The results are illustrated in Figure 3 for subjective well-being and in Figure 4 for chance health locus of control.

As in Study 1 with the elderly and aged, there are no significant effects for health value in this sample of adolescents. Admittedly, in comparison to samples of elderly adults and the aged (see, e.g., Table 1), means for health value in the adolescents under study are somewhat lower – however, means at pretest (see Table 2) are high enough that the failure to gain significant improves in health value can again be attributed to a ceiling effect.

Some other obvious pretest mean differences between the samples of Study 1 (elderly and aged; Table 1) and Study 2 (adolescents; Table 2) should at least be mentioned: Adolescents have lower scores for psychosomatic complaints and hopelessness as well as higher scores for well-being, personal control over development, and personal self-regulation of development. Internal health locus of control is somewhat higher too but the same is true for chance health locus of control, pointing to some personal risk factors in the domain of health-related cognitions and health attitudes as well as the indication of primary preventive treatments. These obvious differences between the age groups are not statistically tested, because they are gained cross-sectional, thus describing potentially not only age differences but also cohort differences, differences in educational level, occupational experience, and so forth.

Discussion

Results from Study 2 demonstrate the efficacy and usability of the SySeRe program with adolescents, at least those up to age 13. In contrast to a waiting-list control group, there were positive significant medium- and long-term effects of SySeRe participation on adolescents' health- and development-related self-efficacy beliefs, health behavioral changes, and well-being. Again, effect sizes were medium to large.

However, the characteristics of the application setting must be considered. Admittedly, the sample was not self-selected for the specific preventive treatment applied, but it
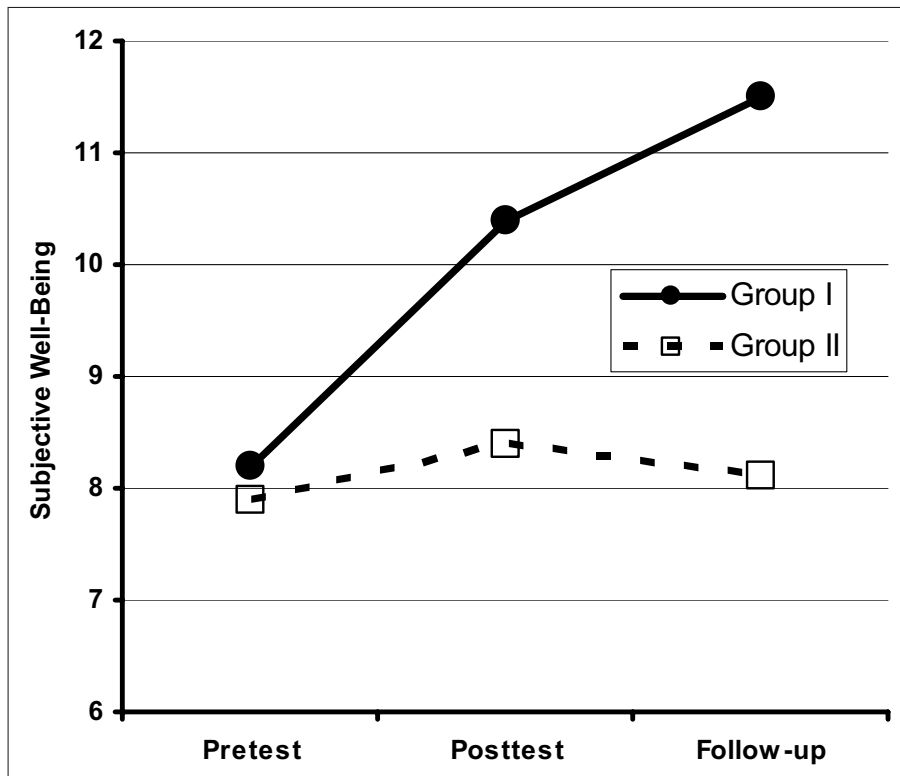

Figure 3. Subjective well-being in experimental Group I versus control Group II at pretest, posttest and follow-up (Study 2).
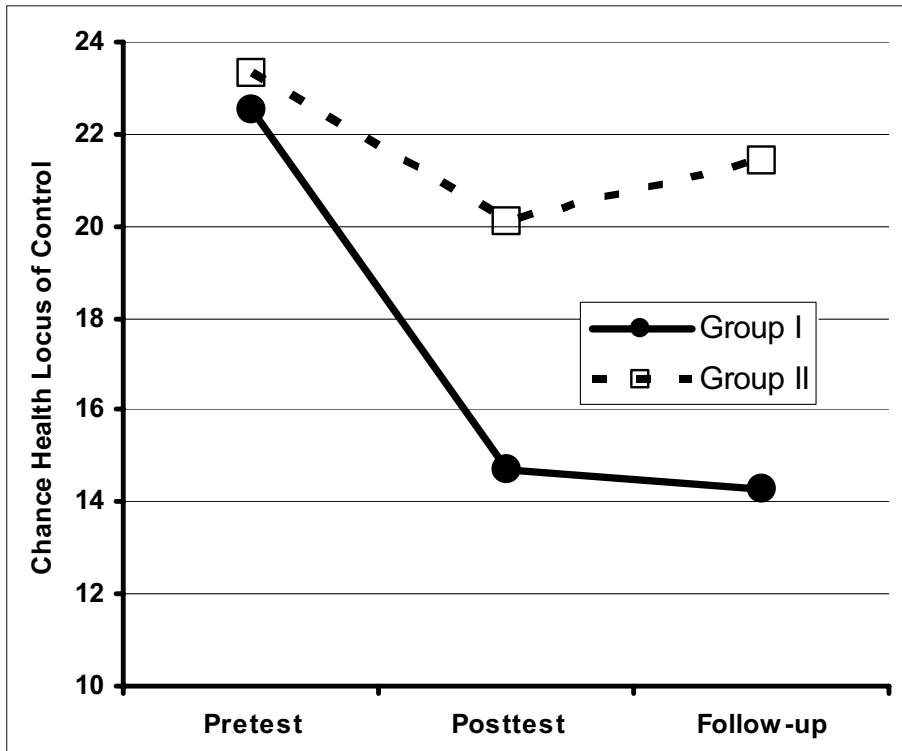
Figure 4. Chance health locus of control in experimental Group I versus control Group II at pretest, posttest and follow-up (Study 2).

was self-selected or, more precisely, parental-selected for regularly visiting a community service making special provision for adolescents in the domains of leisure-time activities and peer-tutoring of school homework. Within this program adolescents were recruited for SySeRe participation by obligation resulting in a low dropout rate and rather low treatment compliance problems. Other, purely optional preventive treatment offers may lead, in adolescents and young adults as well (see, e.g., Krampen, 2003), to many more dropouts and to compliance problems. A strong institutional integration of preventive treatments promotes low dropout rates and treatment compliance as well as the resulting possibilities of such positive effects as those gained in Study 2. However, it should be mentioned that posttest questions on "fun", "interest", "group atmosphere", etc. in SySeRe were very positively answered by the adolescents and that there were no protests or other forms of resistance during SySeRe application in the small groups.

Study 3

Method

Participants

Participants were 60 German adult inpatients of a psychosomatic rehabilitation hospital ($M = 49.4$, $SD = 8.8$ years; age range: 39–56 years; 18 females and 42 males). All patients suffered from coronary heart diseases and were receiving, following acute medical treatment, a psychosomatic rehabilitation inpatient treatment with a duration of 4–8 weeks. Patients had had myocardial infarctions (n = 44) and bypass-surgeries ($n = 16$) indicating the desirability of medical post-treatments as well as lifestyle and behavioral changes to reduce risk factors and relapses. In terms of occupational status and level of education, all patients were middle class. Individuals were recruited within the regular standard hospital program, which includes many different treatments (general medical treatment and drug treatment, relaxation therapy, health education in the domains of diets, physical exercises, group counseling, etc.) in response to differential indications.

Procedure

A randomized control group design was employed. After pretest and randomization (controlling for age, gender, and coronary heart disease), those in Group I ($n = 30$) participated in SySeRe program courses in two small groups ($n = 15$), which met in addition to the standard hospital program two times weekly for 4 weeks. Participants in Group II ($n = 30$) were the control group who only received the hospital's standard rehabilitation program. Measures were administered to Groups I and II at baseline (pretest), at the end of the 4-week treatment (posttest), and at 2-month follow-up after hospital discharge.

Mean comparisons for all pretest measures confirmed

that the randomization procedure resulted in comparable groups, $t(58) < 1.47$ (see Table 1). During treatment and the follow-up interval, one individual from each group dropped out because of early hospital discharge. Three more of those in Group I and two in Group II did not respond to the 2-months follow-up, which concerned the total rehabilitation program. Thus, evaluative results are based on a total sample of 53.

Results

Means and standard deviations of pretest, posttest, and follow-up measures are summarized for both groups in Table 3. Again, first of all an overall multivariate analysis of variance (MANOVA with unequal cell sizes) was computed with the grouping factor Groups (1, 2) and the repeated measurement factor Time (1, 3) including all measures. Second, univariate analyses of variance (ANOVAs with unequal cell sizes; see Table 3) were computed for single mean comparisons between groups and times of measurement.

MANOVA yielded no significant overall main effect for Group, $F(1,51) = 1.21$, but significant overall effects for Time, $F(2, 102) = 19.03$, $p < .01$, and for the Group × Time interaction, $F(7, 357) = 12.07$, $p < .01$, the latter pointing to the need for a differentiated interpretation of the main effect. This is confirmed by the results of the a posteriori ANOVAs (see Table 3), which point for both groups to gen-

eral positive rehabilitation program outcomes in terms of significant decreases in psychosomatic complaints, hopelessness, and chance health locus of control as well as increases in well-being, internal health locus of control, personal control over development, self-regulation of development, and behavioral change. Effect sizes were medium to large (Cohen, 1977).

Significant interaction terms show that Group I (participating in the SySeRe program), in comparison to Group II (receiving the standard rehabilitation program only), improves medium-term as well as long-term in terms of reductions in psychosomatic complaints, hopelessness, and chance health locus of control as well as in increases of well-being, internal health locus of control, personal control over development, and self-regulation of development. Effect sizes for these interaction effects are small to medium (Cohen, 1977). The results for personal regulation of development and behavioral changes are illustrated graphically in Figure 5, those for hopelessness in Figure 6. The figures show impressively that the SySeRe group in particular gains significantly over the follow-up interval after hospital discharge, living at home and working again. In Group II (without SySeRe), there are stagnations or even deteriorations in the positive outcomes gained during rehabilitation at the time of hospital discharge.

Again, as in Study 1 and Study 2, there are no significant effects for health value, for which once again scores are very high at pretest and are comparable to the means in

Table 3
Means and Standard Deviations of Measures in Group I (n = 26) and Group II (n = 27) in Study 3 With Psychosomatic Rehabilitation Hospital Inpatients and ANOVA Results

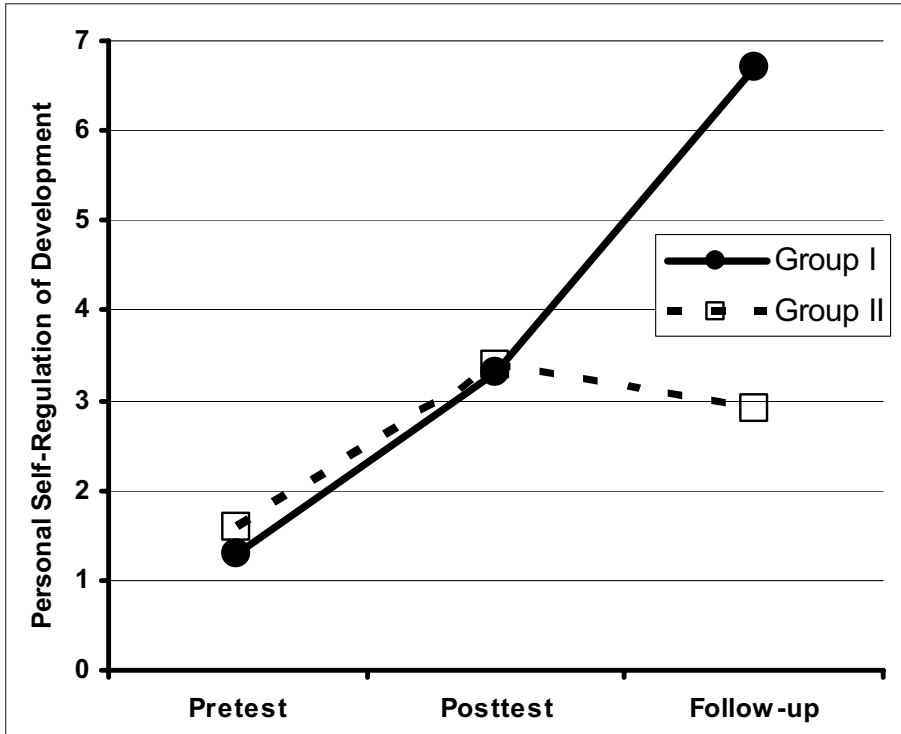| Measure	Pretest		Posttest		Follow-up		Group	Time	Group × Time
	M	SD	M	SD	M	SD	F(1/51)	F(2/102)	F(2/102)
Psychosomatic complaints									
Group I	69.3	19.5	57.7	20.1	44.4	18.3			
Group II	70.1	21.6	63.4	17.5	55.9	19.6	0.52	10.93**	4.19*
Subjective well-being									
Group I	5.5	2.0	8.6	2.5	11.9	2.8			
Group II	5.1	2.4	7.1	3.2	8.7	3.2	0.38	11.27**	5.53*
Health value									
Group I	26.7	1.9	27.0	2.1	26.4	2.8			
Group II	27.1	2.2	26.9	3.3	25.1	3.0	1.24	2.74	1.51
Internal health locus of control									
Group I	22.3	5.1	29.3	5.4	30.0	4.7			
Group II	21.6	4.2	23.5	4.7	25.2	5.4	3.36	9.53**	6.02*
Chance health locus of control									
Group I	24.8	3.2	15.9	3.0	14.7	3.6			
Group II	25.4	4.3	19.4	4.1	16.8	3.5	2.72	8.04**	4.55*
Personal control over development									
Group I	117.2	22.3	153.0	30.8	177.3	42.1			
Group II	110.8	26.2	151.5	41.3	149.7	45.6	2.01	10.64**	5.82*
Personal self-regulation of development									
Group I	1.3	0.5	3.3	1.1	6.7	1.4			
Group II	1.6	0.9	3.4	1.3	2.9	1.8	1.88	5.79*	9.94**
Hopelessness									
Group I	9.8	3.2	6.3	3.8	4.2	2.7			
Group II	10.6	4.1	8.2	4.0	7.9	3.4	2.91	8.36**	5.14*

$** p < .01$; $* p < .05$

Figure 5. Personal self-regulation of development in experimental Group I and control Group II at pretest, posttest and follow-up (Study 3).
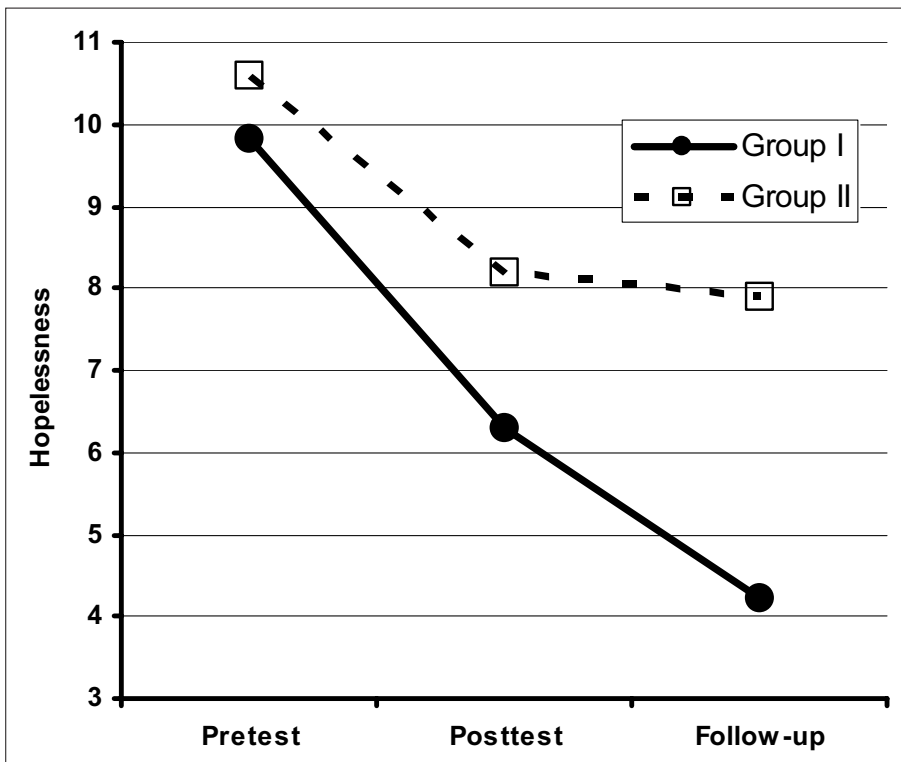

Figure 6. Hopelessness in experimental Group I and control Group II at pretest, posttest and follow-up (Study 3).

the sample of elderly and aged in Study 1. Unsurprisingly, means for most of the other pretest measures are very different in this clinical sample in comparison to those in Study 1 with the healthy elderly and aged. For example, these in-patients score higher in psychosomatic complaints, hopelessness, and chance health locus of control, and they score lower in subjective well-being, internal health locus of control, and personal control over development. The observa-

tion that inpatients score somewhat higher in personal self-regulation of development and behavioral changes than the elderly and aged can be attributed to their coronary heart disease and hospital admission, which require these efforts and change by themselves.

Discussion

The results from Study 3 point to the efficacy and usability of the SySeRe program as an additional treatment measured for inpatients with coronary heart diseases and already involved in a multimodal rehabilitation hospital program. In addition to general positive rehabilitation program outcomes, which were confirmed for nearly all outcome measures concerning health- and development-related self-efficacy, well-being, and behavioral changes, some specific effects of the SySeRe program on these variables were demonstrated. Of special significance is here the result that long-term outcomes (at follow-up) are much more positive among former SySeRe participants. This is not only true for the indicators of self-efficacy, well-being, and hopelessness under study, but also for behavioral changes after hospital discharge pointing at considerable lifestyle changes in everyday life at home and at work. Last, but not least, it should be mentioned that there were no problems with treatment compliance and dropout rate was low in this sample of hospitalized patients with a high strain imposed by suffering and a strong motivation to recover knowing the risks of relapse with reference to their own coronary heart disease.

General Discussion

The results from three new empirical studies with randomized group designs confirm significant and essential medium-term as well as at least two-month long-term effects of the SySeRe program for different age groups and in different treatment settings. The encouraging results gained in an earlier study of elderly and aged within a primary prevention community service setting (Krampen, 1996a) were replicated in a crossover design (Study 1). They point to positive outcomes of the SySeRe program, some of which SySeRe has in common with introductory courses to autogenic training (in the domains of well-being, personal self-regulation of development, and behavioral change), some other being specific to SySeRe (in the domain of health- and development-related self-efficacy). The efficacy and usability of SySeRe in primary prevention was, additionally, confirmed in a sample of adolescents in an after-school educational community service (Study 2). The quality and size of effects in the adolescent sample are very similar to those gained in the samples of elderly adults and the aged. The application context was then extended to a rehabilitation hospital program with treatment objectives in the domain of tertiary rehabilitation, that is, lifestyle changes and

the reduction of risk factors in patients with coronary heart diseases to reduce chances of relapse. In addition to general rehabilitation outcome effects, the results point to SySeRe-specific effects in terms of medium-term and even long-term lifestyle behavioral changes as well as changes in health- and development-related self-efficacy beliefs and indicators of well-being. Thus, ten years after presentation of the first evaluation of the SySeRe program, its efficacy, effectiveness, and usability in different age groups – adolescents, middle-aged and elderly adults, and the aged – is empirically and clearly supported with respect to primary and tertiary prevention.

Effect sizes of the SySeRe program are medium to large (following Cohen, 1977) in the promotion of personal self-regulation of development and favorable behavioral changes, subjective well-being, and internality in health locus of control as well as in the reduction of psychosomatic complaints. Somewhat lower, which is to say small to medium effect sizes are observed in reductions of chance health locus of control and hopelessness as well as in increases of personal control over development. Thus, variables are affected by the SySeRe program that are both deduced from its theoretical foundations, that is, the action and self-efficacy perspective in life-span developmental psychology (Brandtstädter, 2001; Brandtstädter et al., 1986; Lerner & Busch-Rossnagel, 1981), and indicated by social-cognitive models of health attitude and behavior (Schwarzer, 2001; Sniehotta & Schwarzer, 2003; Wallston & Wallston, 1984).

No program effects were observed in health value, which is attributed to a ceiling effect resulting from an a priori very positive valuation of health in the samples under study. This does not leave sufficient range for significant increase. Because this cannot entirely be explained by a self-selection of the samples under study (this only holds for Study 1, but not for Study 2 and Study 3), the psychometric quality of the 4-item-scale (Nentwig & Windemuth, 1992) applied to measure health value is in doubt. Future research should employ measures of health value for which more variance between subjects has been found empirically (for an overview, see Renner & Weber, 2003).

Of course, the efficacy and effectiveness of the SySeRe program, as with most measures in primary prevention, stand or fall with treatment motivation, treatment compliance and, ideally, adherence of participants to treatment objectives and methods. Thus, self-selection of participants (like Study 1) is a good precondition for positive outcomes. An alternative good precondition is the strong and clear integration of SySeRe within a regular institutional program with personal commitment or even obligation on the part of those involved, that is, differential indication of treatment in clinical settings or aptitude-treatment allocation in educational or community service settings. This was achieved in Study 2 and Study 3, resulting not only in positive treatment outcomes, but also in low dropout rates. In this way, by institutional integration and/or obligation, high levels of participation are achieved in the first group meetings, initially perhaps with very little or no personal involvement or

treatment motivation among some of the participants. However, it is of interest to note that the SySeRe program produces something like an infectious trend towards self-enhancement among group members. This motivating go-with-the-group effect of the treatment itself was apparent in the earlier study (Krampen, 1996a). This effect cannot be attributed only to those participants who were highly motivated at the outset of the program, but also to the self-determined exercises in diary keeping introduced at the beginning. In addition, positive effects on motivation stem from the concrete, behavior-relevant homework given to the participants as well as from the direct feedback on their performance in the group. Participants in SySeRe know very well and very quickly what should be done and how it should be done, and, moreover, they have fun doing it. This is a good prerequisite for SySeRe program applications and is encouraging with reference to existing problems in reaching potential participants and in acceptance of a health promotion program, especially in primary prevention settings aimed at adolescents or at young and middle-aged adults without psychological gain and, at least subjectively, a narrow time budget (Krampen, 2003).

If there is no self-selection by treatment-interested participants and no institutional integration of SySeRe within a more or less obligatory clinical, educational or organizational program, the risk of dropouts just after the start of the program – right after the first group meeting – increases. Own experiences have shown that applications of SySeRe with young and middle-aged adults in open adult education settings can result, just after the first group meeting, in dropout rates of up to 46%; applications in open community services for adolescents resulted in dropout rates of up to 60%. So many dropouts just at the start are in danger of producing another, but negative, go-with effect quickly resulting soon in groups too small to be effective, because group interactions, modelling, social learning, and so forth suffer too much. It is assumed that such early dropouts can be explained mainly by a sheer curiosity motivation (subjectively "have seen it all, know it all") and lack of willingness to invest personal or time resources. In consequence, the effectiveness of such prevention settings is low, resulting neither in treatment satisfaction for the participants and psychologists nor in sound or sufficiently representative empirical data for the systematic evaluation of the treatment. Primary prevention treatment requires, as does secondary and tertiary prevention, at least moderately motivated participants. In primary prevention for adolescents as well as young and middle-aged adults, this can be assured best by an institutional integration of the treatment; among elderly adults and the aged self-selection may provide this. Secondary and tertiary prevention measures are mostly integrated into broader multimodal treatment programs and can draw directly upon the strain imposed by suffering and/or by the risk of relapse.

To sum up, the SySeRe program is a theoretically based, economical health promotion program employing homogeneous treatment techniques. Its parts are more homogeneous than those of eclectic health education programs, which aim at holistic, but in the main not precisely defined lifestyle changes. SySeRe is theoretically well founded with reference to modern action and self-efficacy approaches in life-span developmental psychology, health psychology, and cognitive behavior modification. These theoretical foundations allow specific predictions about treatment outcomes, which were for the most part confirmed in the domain of development- and health-related cognitions by the program effectiveness evaluations. Additionally, conceptual compatibility and empirical findings show that developmental intervention and health education go hand-in-hand. Thus, using cognitive-behavioral modification techniques, the SySeRe program brings together the concepts of developmental intervention (founded of theories on human development) and health promotion (founded on theories of health behavior).

Finally, the SySeRe program can easily be adapted to the special conditions of treatment settings and target groups, that is, one or more life domains can be omitted (if not necessary in the target group), one or more life domains can be focused upon (if highly relevant in the target group), new life domains can be added (if desirable, e.g., the domain of ecological behavior or that of socio-political behavior). Also the number of group meetings and/or the duration of SySeRe can be shortened (see in this regard Study 3) or indeed extended. Thus, SySeRe is a very flexible treatment heuristic for health promotion and health attitude as well as health behavior changes in primary and tertiary prevention. It requires no treatment manual or other expensive aids (either for the group leader or for the participants), because all is "hand-made" by the participants themselves in the motivating and involving group setting, thereby saving financial resources. SySeRe requires only personal resources, that is, at least minimum levels of capability and willingness on the part of the participants to monitor, to reflect on, and to change one's own behaviors (for more details see Krampen, 1996a) , together with, for the group leader, a sound and broad education in psychology including theories and methods of self-management and cognitive-behavioral treatments, theories of health behavior and human development as well as skills in person-centered group counseling.

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