INTERNATIONAL JOURNAL OF BEHAVIORAL DEVELOPMENT, 1987, *10* (1) 99–120

Personal Control over Development: Effects on the Perception and Emotional Evaluation of Personal Development in Adulthood

Jochen Brandtstädter, Günter Krampen, and Werner Greve
University of Trier, Federal Republic of Germany

Proceeding from an action perspective on development, this article addresses the impact of perceived control over personal development on the perception and emotional evaluation of developmental achievements and prospects in adulthood. Findings from a research project on personal control and emotional experience of development in adulthood reveal that low subjective control over development is related: (1) to a depressive outlook on personal development; (2) to an unfavorable appraisal of personal development in terms of perceived distances from personally valued developmental goals as well as in terms of personal resources for developmental progress. The findings further indicate that unsatisfying prospects of personal development may instigate self-corrective tendencies. The analyses reported (path analysis, analyses of variance) are based on questionnaire data obtained on a sample of over 630 married couples in the age range of 30 to 60 years. The results are specified with regard to different dimensions of personal development as well as to age and sex of respondents.

INTRODUCTION

Central to an action perspective on development (see Brandtstädter, 1984a, 1984b) is the notion of personal control over development, which implies that individuals on the basis of certain development-related expectancies, values, and control beliefs actively influence and try to control their development. Up to now developmental psychology has paid surprisingly little attention to such development-related control activities, which are an important aspect of human activity over the life span (see also Von Cranach, Mächler & Steiner, 1983). The recent emergence (or renaissance) of action-theoretical approaches in psychology, however, has given

Requests for reprints should be sent to Jochen Brandtstädter, Universität Trier, Fachbereich I–Psychologie, Postfach 3825, D-5500 Trier (West Germany).

This article is based on findings from a larger project supported by a research grant (Br 834/1–2) from the Deutsche Forschungsgemeinschaft (DFG).

a fresh impetus to empirical and theoretical work on issues of personal control over development (see Baltes & Baltes, 1985; Bandura, 1981; Brandtstädter, 1981, 1984a, 1984b; Chapman, 1984; Lerner & Busch-Rossnagel, 1981).

As is well known, various paradigms in developmental psychology have centered on the individual's interactions with his social and natural environment (e.g. Reese & Overton, 1970). The concept of personal control over development differs from this general notion in that it focuses on intentional or planned control activities by which the individual attempts to induce or to forestall certain developmental outcomes in order to reach a favorable balance of developmental gains and losses. The values, expectancies, and control beliefs that guide such regulatory actions are themselves subject to ontogenetic change. It may be assumed that belief-value systems related to personal development, as well as the corresponding time perspectives and action plans, emerge and become more articulate during adolescence and early adulthood, when themes of individual responsibility, autonomy, and personal identity gain importance. Thus the notion of personal control over development has special significance for developmental psychology of adulthood and aging. It offers an explanatory account for the observed contextual specifity of developmental patterns (see Baltes, Reese, & Lipsitt, 1980; Lerner, 1984) and a promising vantage point for research on issues such as development and mastery of personal crises and conflicts, emotional experience of developmental transitions, and reciprocal control of development in partnership relations (Brandtstädter, 1984b, 1986; Brandtstädter, Krampen & Heil, 1986).

Individuals differ in the degree to which they consider processes of development and aging as open to change, and also in the degree to which they consider themselves as capable of effecting such changes. Extending theoretical notions of action, control, and self-efficacy to the developmental domain, we may assume that such interindividual differences have an important impact on development-related control activities as well as on the appraisal and emotional evaluation of personal development in adulthood. This article presents findings from a larger research project on personal control and emotional evaluation in partnership relations that pertain to this issue. It focuses on correlates and consequences of development-related control beliefs with respect to emotional evaluation of developmental prospects, development-related control activities, and subjective appraisal of personal development as well as of marital codevelopment. The data were gathered in the first, cross-sectional phase of a projected longitudinal cohort sequence. The general research approach is described in the following (see also Brandtstädter et al., 1986; Brandtstädter, Krampen, & Warndorf, 1985).

RESEARCH APPROACH

Sample

The analyses reported below are based on questionnaire data obtained in the first wave of a longitudinal cohort sequence on a sample of 634 married couples. The couples were grouped according to their mean age into five age cohorts: (1) 30–35 years (129 couples); (2) 36–41 years (123 couples); (3) 42–47 years (133 couples); (4) 48–53 years (115 couples); (5) 54–59 years (134 couples). According to occupational status, income, and level of education, the majority of subjects belong to the middle class. Respondents were remunerated for participation.

Variables

The construction of the questionnaire reflects the theoretical notions exposed above: Personal development is conceived as a change toward or away from personally valued developmental goals, a process over which the subject may exert control to a greater or lesser degree. Correspondingly, the main part of the questionnaire referred to subjective perception and emotional evaluation of this process. More specifically, the following areas were covered (out of a larger set of variables, we list only a subset of variables involved in the analyses reported here):

1. Personal Evaluation of Developmental Goals. Seventeen different goals or dimensions of development were rated according to personal importance. The selection of goals combines elements from different taxonomies of values (see Rokeach, 1973; Bühler & Marschak, 1969). The complete list of goals will be given together with the presentation of results (e.g., see Fig. 2, p. 111).

2. Perceived Distance From and Approach Toward Developmental Goals. For each goal dimension, subjects were asked to rate: (a) actual subjective distance from goal; (b) retrospectively perceived change toward or away from goals (looking back on the past three years of life); (c) anticipated change toward or away from the goal (looking forward to the coming three years of life). Here, we asked for initial expectations (supposing no major change in the subject's actual way of living) as well as for revised expectations (supposing determined efforts to strive toward the developmental goal).

3. Subjectively Perceived Resources of Developmental Control and Supports. For each goal dimension, subjects were asked to rate: (a) the

extent to which developmental progress on that dimension depends on personal effort; (b) the extent to which it is influenced by factors outside personal control; (c) the extent to which goal attainment is supported or impeded by the spouse.

4. Emotional Evaluation of Personal Development. Subjects were also asked to describe their feelings with regard to personal development, again: (a) looking back on the past three years of life; (b) looking forward to the coming three years of life. For the retrospective and prospective modes, two lists of adjective scales were used, each comprising 13 different emotional attributes.

5. Behavioral Preferences and Tendencies. For 16 different areas of behavior, each represented by three more specific behavioral aspects, subjects were asked to rate: (a) the actual strength or salience of each behavioral aspect; (b) intended behavioral changes toward that aspect; (c) desired changes of partner's behavior toward that aspect. The selection of behavioral areas partly covers the behavioral domains of the 16 Personality Factors Test (Schneewind, Schröder, & Cattell, 1983).

The ratings were effected on bipolar (for variables mentioned in 2(b), 2(c), 3(c)) or unipolar Likert-type scales.

Aggregation of Variables

From the questionnaire data (items 1–5 previously discussed), several aggregated index variables relating to different aspects of the subject's perceived developmental situation were derived. Besides yielding more global and condensed parameters of personal development, the aggregational approach has statistical advantages with regard to reliability and distributional quality of measurements. The analyses reported here involve the following aggregate indicators (the conceptual denotation of these indicators is determined by the structure of the corresponding aggregational calculus and the meaning of the basic variables involved).

1. Index Variable SDA (Subjective Developmental Attainment). SDA is defined as a function of the subjectively perceived distance (sd_g) from developmental goal g ($g = 1, 2, \ldots, 17$) and the personal importance of g(pi_g):

$$\text{SDA} = \text{Max} \sum_g pi_g sd_g - \sum_g pi_g sd_g,$$

where the first term is a constant denoting the maximum of the product sum that can be realised within the given scaling format. Correlations of SDA with external reference variables are conceptually consistent and confirm the interpretation of this indicator. In our sample, SDA is

significantly correlated with reported life satisfaction (0.35, $p < 0.001$), with marital adjustment as measured by the Dyadic Adjustment Scale (DAS) (Spanier, 1976), and—negatively (-0.31, $P < 0.001$)—with emotional lability as measured by the Freiburger Persönlichkeitsinventar (FPI), short version (Fahrenberg, Hampel, & Selg, 1973).

2. Index Variable SDR (Subjective Developmental Reserve). SDR is defined as a function of the personal importance of goal g and of the subjective potential for progress toward g, pp_g (pp_g refers to "revised" expectations of change, as defined above):

$$\text{SDR} = \sum_g pi_g pp_g.$$

SDR is significantly correlated to FPI-Extraversion (0.20, $p < 0.001$) as well as to a "hopeful" (0.28, $p < 0.001$), "assured" (0.26, $p < 0.001$), and "venturesome" (0.33, $p < 0.001$) outlook on personal development. SDR is furthermore related (0.22, $p < 0.001$) to an internal control orientation as measured by the IPC-Fragebogen (Krampen, 1981).

3. Index Variable PCD (Personal Control Over Development). PCD is defined as a function (a) of the extent to which the subject sees development on goal dimension g as dependent on his or her own control efforts (perceived internal control over g, ic_g); (b) of the degree to which development on dimension g is seen as influenced by factors outside personal control (external control over g, ec_g); and (c) of the personal importance of g,

$$\text{PCD} = \sum_g (ic_g - ec_g)pi_g,$$

where the weighting factor pi_g accounts for the possibility that the experience of personal control over development may be more affected by subjective control potentials or deficits on dimensions of higher personal importance. PCD is moderately correlated with generalised control beliefs: with IPC, I (Internality) 0.33, $p < 0.001$; with IPC, P (Externality/powerful others) -0.31, $p < 0.001$; with IPC, C (Chance control) -0.26, $p < 0.001$.

4. Index Variable PMS (Perceived Marital Support). PMS is defined as a function of the personal importance of goal g and the subjectively perceived support from the partner in the attainment of $g(sp_g)$:

$$\text{PMS} = \sum_g pi_g sp_g.$$

As expected, PMS is substantially correlated to dyadic adjustment as measured by the DAS total score (0.54, $p < 0.001$). Furthermore, PMS

predicts life satisfaction (0.32, $p < 0.001$) and a "hopeful" (0.30, $p < 0.001$), "calm" (0.27, $p < 0.001$), and "confident" (0.28, $p < 0.001$) outlook on personal development.

5. *Index Variable SCT (Self-Corrective Tendency)*[2]. SCT is defined as a function of the subject's intention to change his or her own behavior (ic_b) with regard to behavioral aspect b ($b = 1, 2, \ldots, 48$):

$$\text{SCT} = \sum_b ic_b.$$

6. *Index Variable DEP (Depressive Outlook on Personal Development).* DEP is a sum variable comprising six adjective scales from our questionnaire that indicate a depressive outlook on past development ("depressed", "powerless", "resigned") or future development ("discouraged", "depressed", "being at a loss"). The mean intercorrelation of these scales is reasonably high (0.59). DEP is substantially correlated to FPI "depression" (0.46, $p < 0.001$) and (negatively) to life satisfaction (-0.66, $p < 0.001$). To obviate misunderstandings, it should be noted that DEP pertains to emotional evaluation of personal development and, thus, should not be considered as an *ad hoc* substitute for standardised psychometric measures of clinical depression.

Analyses of Data

The effects of development-related control beliefs on the perception and evaluation of personal development were explored within two separate analytical schemes. In a first study, a path analysis was performed to gauge correlates and effects of personal control over development (PCD) within the context of the aggregate indicators mentioned above. In a second study, two ANOVAs were performed to scrutinise the effects of personal control more closely with regard to perceived distance from developmental goals and subjective potential for developmental progress, taking into account possible interactions with age and gender of respondents. Methodological details and results of these analyses will be described in the following sections.

STUDY 1: PATH ANALYSIS

Method

The index variables PCD (personal control over development), PMS (perceived marital support), SDA (subjective developmental attainment),

[2]Elsewhere (Brandtstädter, Krampen & Heil, 1986), this variable has been termed "inclination toward behavioral change".

SDR (subjective developmental reserve), DEP (depression), SCT (self-corrective tendency) were arranged together with the age variable in a recursive causal model. The model structure is given by the following structural equations (where Z_1 = PCD, Z_2 = age, Z_3 = PMS, Z_4 = SDA, Z_5 = SDR, Z_6 = DEP, Z_7 = SCT; $R_1 - R_7$ = residual variables):

$$Z_4 = p_{41}Z_1 + p_{42}Z_2 + p_{43}Z_3 + p_{4R}R_4,$$
$$Z_5 = p_{51}Z_1 + p_{52}Z_2 + p_{53}Z_3 + p_{54}Z_4 + p_{5R}R_5,$$
$$Z_6 = p_{61}Z_1 + p_{62}Z_2 + p_{63}Z_3 + p_{64}Z_4 + p_{65}Z_5 + p_{6R}R_6,$$
$$Z_7 \text{ i} p_{71}Z_1 + p_{72}Z_2 + p_{73}Z_3 + p_{74}Z_4 + p_{75}Z_5 + p_{76}Z_6 + p_{7R}R_7.$$

The ordering of variables in the path model (see also Fig. 1, p. 107) reflects theoretical assumptions about the relation between control beliefs and depression (see e.g. Peterson & Seligman, 1984) and between corrective tendencies and subjective developmental prospects (see Brandtstädter, 1984b); it is further determined by more trivial restrictions (e.g. because age does not causally depend on any other model variable, it has to be treated as an exogenous variable). The path coefficients were determined by multivariate regression analyses (see e.g. Brandtstädter & Bernitzke, 1976). Instead of excluding certain path effects a priori (over-identified model), we preferred to proceed from a full-scale recursive model allowing for all possible effects and to evaluate a posteriori the strength and significance of any effect.

Results

Table 1 presents the correlational data on which the path-analytic solution is based. Some of these preliminary correlational findings already seem

TABLE 1
Intercorrelations[a] of Aggregate Variables

Variable	*PMS*	*SDA*	*SDR*	*DEP*	*SCT*	*Age*
Personal control over development (PCD)	0.30	0.29	0.36	−0.38	−0.01	−0.19
Perceived marital support (PMS)	—	0.15	0.37	−0.27	0.18	0.18
Subjective development attainment (SDA)		—	−0.09	−0.42	−0.23	−0.10
Subjective developmental reserve (SDR)			—	−0.16	0.37	−0.09
Depression (DEP)				—	0.16	0.13
Self-corrective tendency (SCT)					—	0.07

[a]Coefficients ≧0.07 (0.10) are significant on the 5% (1%) level (n = 872. Listwise deletion of missing data).

noteworthy: For example, personal control over development is significantly correlated with subjective developmental attainment, subjective developmental reserve, and (negatively) with depression. Furthermore, we observe that self-corrective tendency is positively related to subjective developmental reserve, but negatively to subjective developmental attainment.

For the path-analytic solution, the following multiple correlations were obtained:

1. For the multiple prediction of SDA from PCD, age, and PMS: $R = 0.30$.
2. For the multiple prediction of SDR from SDA, PCD, age, and PMS: $R = 0.52$.
3. For the multiple prediction of DEP from SDR, SDA, PCD, age, and PMS: $R = 0.52$.
4. For the multiple prediction of SCT from the remaining model variables: $R = 0.47$ (all coefficients significant at the 0.001 level).

Figure 1 presents the fully identified recursive path model. With only a few exceptions, the path coefficients (i.e. beta coefficients yielded by the multivariate regression procedure) are significant or highly significant.

For a detailed analysis of the results given in Fig. 1, we may first consider the findings concerning the variable DEP (depression). The observed negative correlation between depression and personal control over development (PCD) is reflected in direct and indirect negative path effects of PCD on DEP. This pattern of effects is fairly consistent with theoretical formulations emphasising the centrality of control beliefs in the etiology of depression (see Abramson, Seligman & Teasdale, 1978; Bandura, 1981, 1982). The present study extends these notions to the domain of personal development. Our correlational and path-analytic findings suggest that self-percepts of low control in this domain are an important risk factor in the development of depressive problems. They further indicate that perceived control deficits—and, correspondingly, depressive tendencies—increase with age in the observed age range (the age variable correlates with PCD -0.19, $p < 0.001$ and with DEP 0.13, $p < 0.001$, [see Table 1]).

It should be noted at this juncture that theories of control and learned helplessness stipulate a rather direct causal effect of perceived control on the development of depressive influence in stressful situations (see e.g. Peterson & Seligman, 1984). In contrast, our results hint at a more complex and, from a developmental point of view, perhaps more differentiated causal sequence. The path-analytic findings indicate that the strongest direct causal effect on depression (DEP) does not originate from personal control over development (PCD), but rather from subjective

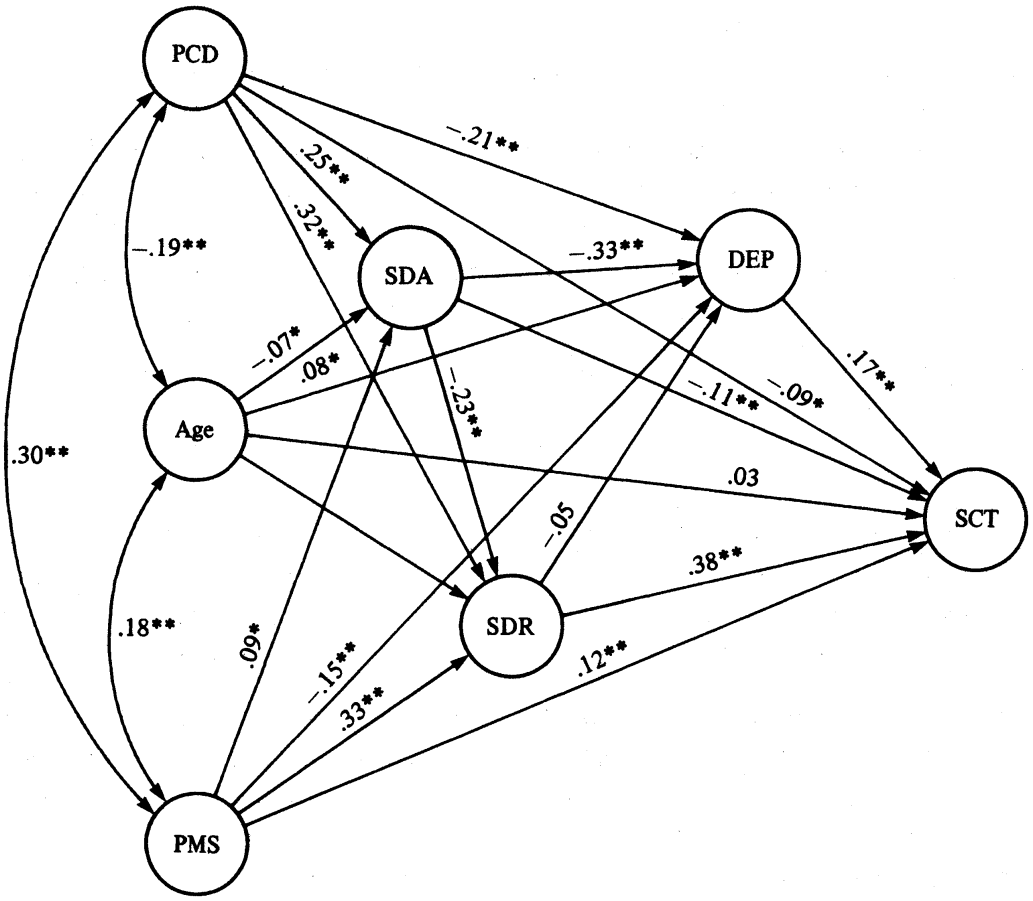

FIG. 1 Path model for aggregate variables PCD (personal control over development), PMS (perceived marital support), SDR (subjective developmental reserve), DEP (depression), SCT (self-corrective tendency), and age.

developmental attainment (SDA). Thus the observed correlation between PCD and DEP (see Table 1) is mediated in part by SDA. To theoretically account for this finding, we may assume that low personal control over development, by impeding the realisation of personal developmental options, leads to cumulative developmental deficits and, correspondingly, to low subjective developmental attainment. This developmental sequence, which eventually ends up in depression, may be precipitated by specific self-debilitating effects of self percepts of low control over development (avoidance of challenging new situations and opportunities to cultivate personal potentialities, lower persistence of coping efforts, despondency to failure experiences, etc.; see also Bandura, 1981). The etiological impact of self-percepts of low control over development on depression, thus, could well be mediated or at least amplified by long-term effects of control beliefs on subjective developmental prospects. In addition, our findings indicate that a supportive marital relationship has a protective function in this respect. Thus, the observed increase of perceived marital support with age

or duration of partnership (correlation of PMS with age: 0.18, $p < 0.001$) may alleviate or compensate for perceived control deficits in the higher age groups (see also Brandtstädter, Krampen & Heil, 1985).

Additional findings of interest involve the aggregate variable of self-corrective tendency (SCT). Self-monitoring activities undoubtedly constitute an important facet of development-related control. Our correlational and path-analytic findings indicate that such activities are instigated by personal crises and conflicts. The intention to change onself or to revise one's habitual behavior patterns is inversely related to subjective developmental attainment (SDA) and more pronounced among subjects with higher scores in depression (DEP) (SCT is correlated to SDA -0.23, $p < 0.001$, and to DEP 0.16, $p < 0.001$ [see Table 1]). In the path-analytic solution, SCT is most strongly determined by subjective developmental reserve (SDR). As previously mentioned, SDR reflects the subject's belief that he or she could (through determined effort) improve on personally valued dimensions of development. SDR, in turn, depends above all on personal control over development (PCD) and perceived marital support (PMS). This pattern of effects also accounts for the almost negligible correlation between personal control over development (PCD) and self-corrective tendency (SCT), which may appear somewhat counter-intuitive at first sight. This result is apparently due to the fact that the positive indirect effect of PCD on SCT, which is mediated by subjective developmental reserve (SDR), is counteracted statistically by the positive effect of PCD on subjective developmental attainment (SDA), which, in turn, should reduce the motive for self-corrective behavioral change. We will return to this finding in the general discussion.

STUDY II: ANALYSES OF VARIANCE

Method

Two ANOVAs were performed to explore more thoroughly the effects of personal control over development on different dimensions of personal development with regard to possible interactions with age and gender. Both analyses involved the following four factors:

1. Personal control over development (C). Factor C comprised two levels that were formed by a paramedian split on the index variable PCD.
2. Age cohort (A) (age groups I to V).
3. Sex (S).
4. Goal dimension (G) (goals 1 to 17).

Dependent variables were: (1) perceived distances from developmental goals (ANOVA 1); (2) subjective potential for progress on goal dimen-

sions (ANOVA 2). Both analyses correspond to a 2 × 5 × 2 × 17 design with repeated measurement on goals (G). To control for unequal cell frequencies or effects of nonorthogonality, results were compared with solutions obtained according to the general linear model (GLM) (see Steyer, 1979; Woodward & Overall, 1976).

ANOVA 1

Table 2 summarises the ANOVA results obtained for the dependent variable of perceived distance from developmental goals (basic variable sd_g, see above [aggregation of variables]).

Effects Related to Goal Dimensions (G). The highly significant main effect of G indicates that perceived distances from developmental goals vary with the goal dimension considered. A posteriori comparisons reveal that perceived distances or developmental deficits are largest on the following dimensions: commitment to ideals; wisdom, major understand-

TABLE 2
Summary of Analysis of Variance: ANOVA 1[a]

Source	*df*	*MS*	*F*	*p*
Between				
Control (C)	1	1582.25	83.40	0.000
Age (A)	4	28.31	1.49	0.202
Sex (S)	1	207.03	10.91	0.001
C × A	4	3.26	0.17	0.953
C × S	1	24.98	1.32	0.251
A × S	4	7.18	0.38	0.824
C × A × S	4	35.56	1.87	0.113
Error (between)	997	18.97		
Within				
Goals (G)	16	235.74	92.45	0.000
G × C	16	8.58	3.37	0.000
G × A	64	6.64	2.60	0.000
G × S	16	16.22	6.36	0.000
G × C × A	64	2.76	1.08	0.307
G × C × S	16	3.46	1.36	0.153
G × A × S	64	3.21	1.26	0.079
G × C × A × S	64	3.16	1.24	0.094
Error (within)	15952	2.55		

[a] Dependent variable: Perceived distance from developmental goal (n = 1017. Listwise deletion of missing data).

ing of life; prosperity, comfortable standard of living; physical fitness. Goal attainment, on the other hand, seems highest with regard to harmonious partnership and family security. The $G \times A$ interaction further reveals that the pattern of goal distances differs between age cohorts. Perceived developmental deficits seem to increase with age on the following dimensions (means are different [$p < 0.05$] by Scheffé's procedure if they have different subscripts): health (I: 2.72_a, II: 3.18_{ab}, III: 3.45_{bc}, IV: 3.91_c, V: 3.88_c); social recognition (I: 3.07_a, II: 3.30_{ab}, III: 3.54_{ab}, IV: 3.77_b, V: 3.45_{ab}); intellectual efficiency (I: 3.02_a, II: 3.34_{ab}, III: 3.50_b, IV: 3.67_b, V: 3.39_{ab}); and satisfying friendship (I: 3.21_a, II: 3.35_{ab}, III: 3.56_{ab}, IV: 3.81_b, V: 3.34_{ab}). These cross-sectional gradients also exhibit a slight turn-around toward more satisfying developmental prospects in the oldest cohort (54–59 years). Only on one goal dimension (commitment to ideals) we observe a tendency for perceived distance from goal to diminish with age. The corresponding contrasts, however, do not reach the conventional level of significance.

Effects Related to Gender (S). The highly significant main effect for S results from the fact that—averaging over goal dimensions—female subjects experience larger developmental deficits (mean distances are *f*: 3.69, *m*: 3.42). The G × S interaction further reveals that this effect is differentially pronounced on the different goal dimensions. It involves above all the dimensions of occupational efficiency (*f*: 3.89, *m*: 3.12; $F = 41.64$, $p < 0.001$), self-development, actualisation of personal potential (*f*: 4.06, *m*: 3.65; $F = 17.56$, $p < 0.001$), intellectual efficiency (*f*: 3.56, *m*: 3.19; $F = 15.98$, $p < 0.001$), physical fitness (*f*: 4.19, *m*: 3.78; $F = 13.70$, $p < 0.001$), assertiveness, self-assurance (*f*: 3.85, *m*: 3.48; $F = 11.90$, $p < 0.001$), emotional stability (*f*: 4.00, *m*: 3.68; $F = 8.73$, $p < 0.001$), and personal independence (*f*: 3.94, *m*: 3.63; $F = 7.06$, $p < 0.001$). A reverse relationship is observed only on the goal dimension of empathy (*f*: 2.72, *m*: 3.18; $F = 18.99$, $p < 0.001$).

Effects Related to Personal Control over Development (C). In the present context, the question how personal control over development relates to perceived distance from developmental goals is of prime interest. The highly significant main effect of C indicates that high scores on the index variable of personal control (PCD $\gtrless$ *Md*) are clearly associated with lower subjective developmental deficits (in terms of perceived goal distances). A posteriori analyses reveal that this effect involves all 17 goal dimensions: Except for commitment to ideals, all contrasts on means are highly significant ($p < 0.001$). The observed G × C interaction indicates, however, that the effect of C on perceived goal distances differs between the various goal dimensions: subjects with self-percepts of low control over

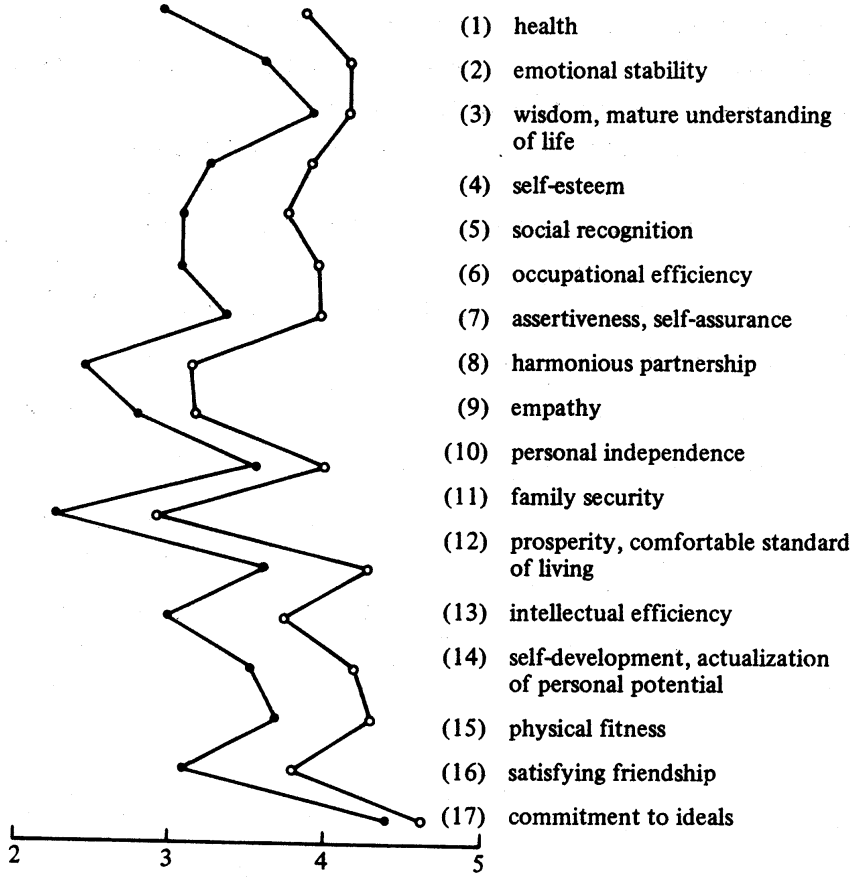

FIG. 2 Perceived distance from developmental goals (1–17) as a function of personal control over development (PCD ≧ *Md* [●] versus PCD < *Md* [○]; profiles of means).

development experience developmental deficits above all on dimensions related to health, occupational efficiency, prosperity of comfortable standard of living, and intellectual efficiency. Figure 2 shows the corresponding pattern of effects.

ANOVA 2

Table 3 summarizes the ANOVA results obtained for the dependent variable of subjective potential for developmental progress (as measured by the basic variable pp_g, see above [aggregation of variables]. The corresponding question was worded as follows: "Given you would try hard, to what extent could you approach this goal . . . ?").

Effects Related to Goal Dimensions (G). As the highly significant main effect for goals indicates, subjective potential to achieve developmental progress clearly depends on the goal dimension under consideration. A

TABLE 3
Summary of Analysis of Variance: ANOVA 2[a]

Source	*df*	*MS*	*F*	*p*
Between				
Control (C)	1	1949.06	73.80	0.000
Age (A)	4	98.65	3.74	0.005
Sex (S)	1	90.26	3.42	0.065[b]
C × A	4	16.06	0.61	0.657
C × S	1	3.85	0.15	0.703
A × S	4	12.18	0.46	0.765
C × A × S	4	16.83	0.64	0.636
Error (between)	1000	26.41		
Within				
Goals (G)	16	207.57	102.35	0.000
G × C	16	5.10	2.51	0.001[c]
G × A	64	6.07	2.99	0.000
G × S	16	14.83	7.31	0.000
G × C × A	64	1.24	0.61	0.994
G × C × S	16	2.54	1.25	0.219
G × A × S	64	2.09	1.03	0.412
G × C × A × S	64	2.15	1.06	0.352
Error (within)	16000	2.03		

[a] Dependent variable: Subjective potential for developmental progress (n = 1020. Listwise deletion of missing data).
[b] for GLM solution: $p < 0.05$.
[c] for GLM solution: $p > 0.05$.

posteriori analyses reveal that efforts to enhance personal development are seen as most effective with respect to harmonious partnership and family security, whereas developmental aspects such as prosperity or commitment to ideals apparently are perceived as less amenable to such ameliorative efforts.

Effects Related to Age (A). The highly significant main effect of A is due to the fact that subjective potential for developmental progress significantly diminishes with age. The G × A interaction hints that this age-related effect is differentially displayed on the different goal dimensions. It involves above all the following dimensions (means are different at the 0.05 level of significance if they have different subscripts): health (I: 6.08_a, II: 5.47_b, III: 5.31_{bc}, IV: 5.07_{bc}, V: 4.80_c); emotional stability (I: 5.74_a, II: 5.45_{ab}, III: 5.37_{ab}, IV: 5.35_{ab}, V: 5.23_b); occupational efficiency (I: 5.55_a, II: 5.16_{ab}, III: 4.96_{abc}, IV: 4.90_{bc}, V: 4.42_c); assertiveness, self-assurance (I: 5.78_a, II: 5.48_{ab}, III: 5.31_{ab}, IV: 5.18_b, V: 5.17_b); prosper-

ity, comfortable standard of living (I: 5.00_a, II: 4.61_{ab}, III: 4.35_b, IV: 4.43_{ab}, V: 4.34_b); intellectual efficiency (I: 5.86_a, II: 5.39_{ab}, III: 5.27_b, IV: 5.25_b, V: 5.16_b); self-development, actualisation of personal potential (I: 5.81_a, II: 5.48_{ab}, III: 5.39_{ab}, IV: 5.29_b, V: 5.22_b); physical fitness (I: 5.93_a, II: 5.46_{ab}, III: 5.43_{ab}, IV: 5.02_{bc}, V: 4.75_c); and satisfying friendship (I: 5.84_a, II: 5.34_b, III: 5.23_b, IV: 5.19_b, V: 5.18_b). The corresponding pattern of effects is depicted in Fig. 3.

Effects Related to Gender (S). The main effect of S closely approaches the 0.05 level of significance. Although giving a more negative account of their actual developmental achievements (in terms of perceived goal distances, as already discussed), female respondents ascribe themselves a greater subjective potential for developmental progress than male respondents (comparison of means: *f*: 5.42, *m*: 5.26). This holds for all considered dimensions of personal development except occupational efficiency. Further analysis of the G × S interaction reveals that sex-related differences in subjective potential for developmental progress are most clear-cut

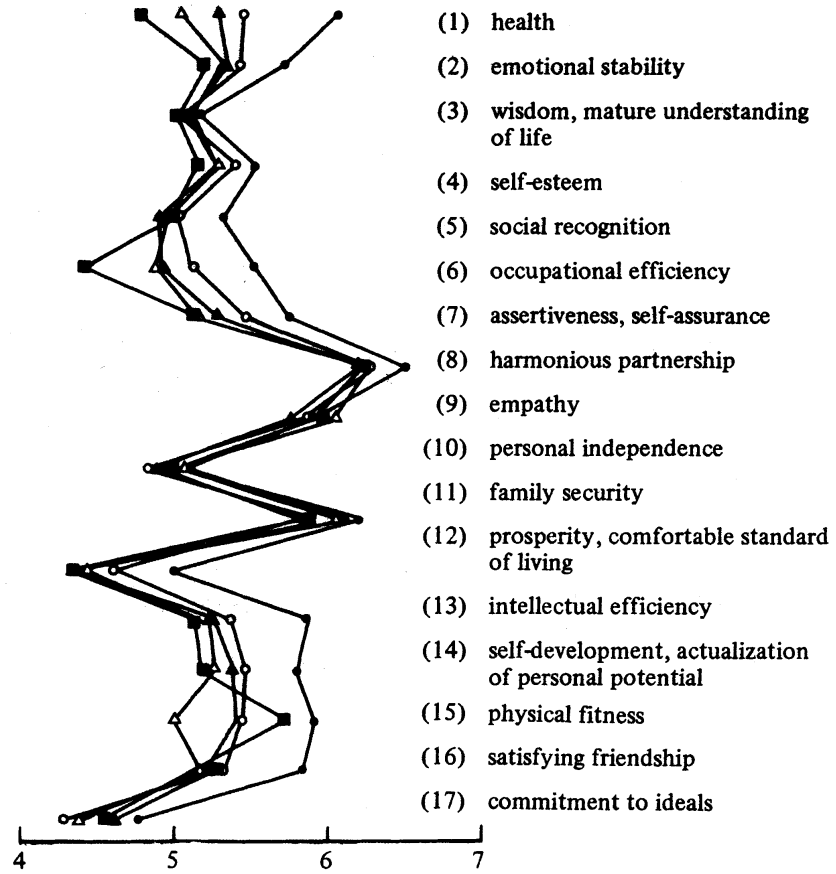

FIG. 3 Subjective potential for developmental progress on goal dimensions (1–17) by age cohorts I [●], II [○], III [▲], IV [△], V [■] (profiles of means).

on the following goal dimensions: emotional stability; wisdom, major understanding of life; assertiveness, self-assurance; harmonious partnership; empathy; family security; and satisfying friendship (differences on these dimensions are significant at the 0.01 level throughout).

Effects Related to Personal Control Over Development (C). The main effect of C on subjective potential for developmental progress is highly significant. Individuals with self-percepts of high personal control do not only give a more favourable account of their actual developmental situation (in terms of perceived goal distances, see Table 2), they also evaluate more positively their prospects for achieving further developmental pro-

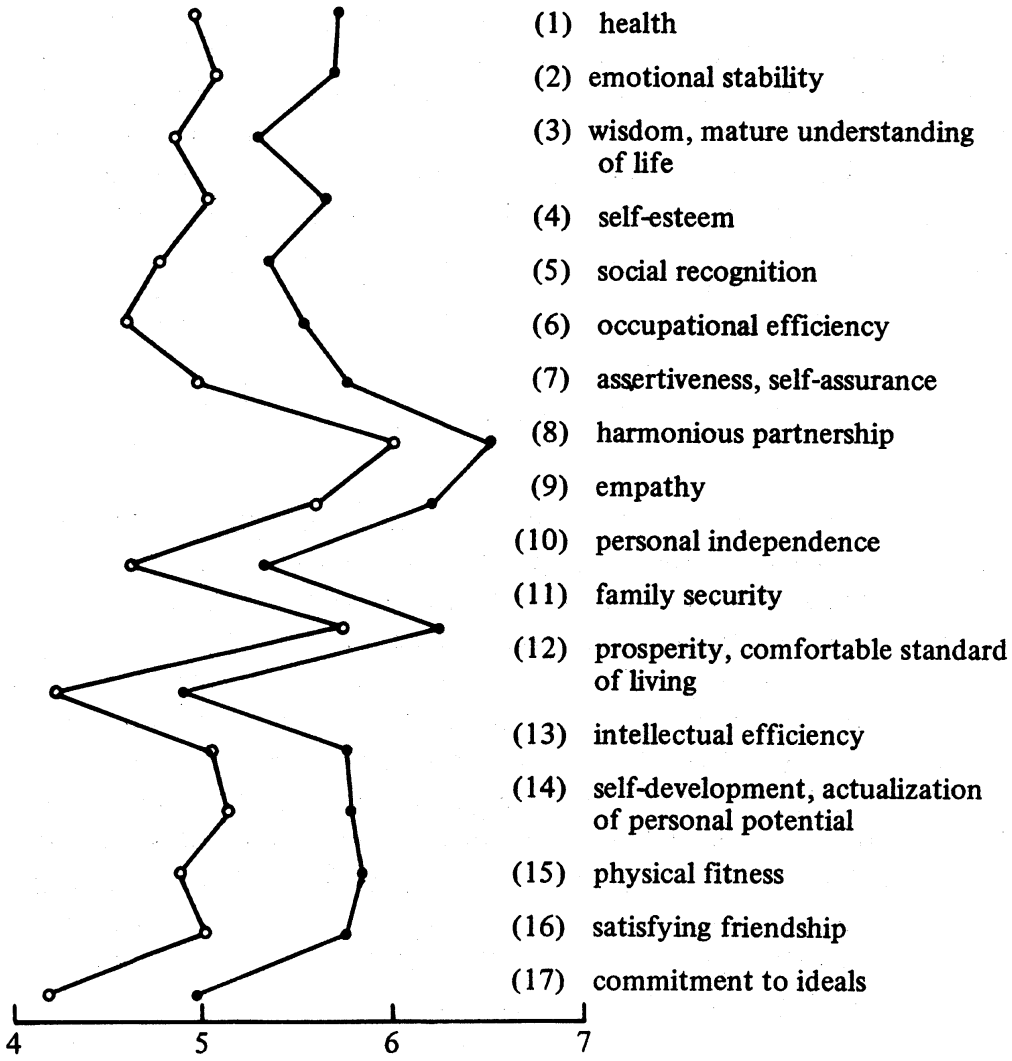

FIG. 4 Subjective potential for developmental progress on goal dimensions (1–17) as a function of personal control over development (PCD ≧ *Md* [●] versus PCD < *Md* [○]; profiles of means).

gress through determined efforts. This holds for all developmental dimensions considered (all contrasts on means are significant at the 0.01 level). The C × G interaction results from the fact that the effect of C on subjective potential for developmental progress varies between goal dimensions; it is most clear-cut with regard to occupational efficiency and physical fitness. Figure 4 depicts these findings.

SUMMARY AND GENERAL DISCUSSION

The goal of this research was to explore consequences and correlates of development-related control beliefs on the perception and emotional evaluation of personal development in adulthood. The analyses are based on questionnaire data that were obtained on a sample of over 630 couples in the age range of 30 to 60 years. By means of an aggregational procedure, index variables were derived from the questionnaire data that encompass different aspects of personal development (subjective developmental attainment, personal control over development, subjective developmental reserve, perceived marital support, self-corrective tendency, depression). Exploratory analyses (path analysis, ANOVAs) confirm our general assumption that self-percepts of control over personal development are intimately related to the individual's cognitive and emotional evaluation of personal development in adulthood. The main findings may be summarised as follows.

Personal Control Over Development and Depression

Self-percepts of low control over personally important areas of development are clearly associated with depressive tendencies. For the entire sample, the correlation between personal control over development (PCD) and depression (DEP) is substantially negative (-0.38, $p < 0.001$). Subjects scoring low on PCD describe their feelings with regard to past and future personal development in terms such as "depressed", "powerless", "discouraged", "being at a loss", whereas individuals with high PCD scores feel more "hopeful", "confident", and "vigorous" (see also Brandtstädter, Krampen & Warndorf, 1985). These findings are evidently consistent with self-efficacy and learned helplessness formulations concerning the etiology of depression (see Abramson et al. 1978; Bandura, 1982; Peterson & Seligman, 1984) and suggest extension of these theoretical notions to the domain of development-related control. However, our path-analytic findings indicate that the relationship between depression and perceived control deficits might be mediated by specific developmental process variables; subjective developmental attainment (defined as a function of perceived distance from personally valued goals of development) seems to

be of key importance in this respect. We advanced the proposition that low personal control over development impedes efficient realisation of developmental options and, thus, is conducive to an increasingly unfavourable subjective balance of developmental gains and losses. This explanatory account seems to fit with clinical evidence indicating that depressive disorders in middle and higher adulthood do not necessarily presuppose "bad events" (Peterson & Seligman, 1984) or other discrete developmental changes (see e.g. Beck, 1974). The observation that perceived marital support apparently has a protective function in this respect underscores the importance of social support systems for the prevention of depressive disorders (see Becker & Minsel, 1982).

Cross-sectional comparisons of our sample which have been reported elsewhere in more detail (Brandtstädter, Krampen & Heil, 1986) show that perceived control over personally relevant dimensions of development decreases with age, and that this decrease is accompanied by an increasingly depressive outlook on personal development. Since the negative relationship between personal control over development and depression is obtained also within age cohorts (the corresponding intracohort correlation coefficients range between -0.30 and -0.40), we may assume that it is not just a spurious correlation mediated by the age variable.

Self-corrective Tendencies

Self-regulatory activities by which individuals monitor their behavior or personality are an important aspect of development-related control. If one follows the (perhaps not very sharp) distinction proposed by Rothbaum, Weisz and Snyder (1982) between primary control ("changing the world") and secondary control ("changing the self"), self-regulatory or self-corrective activities may be considered as a mode of secondary control which possibly becomes predominant when potentials of primary control are limited. Our results hint that inclination to change one's own behavior (as measured by the index variable SCT) is induced or intensified by initially unsatisfactory prospects of personal development. Self-corrective tendencies are apparently enhanced by discrepancies between real and ideal self, which may indicate neurotic problems or even identity crises (see Harré, 1983; Rogers, 1961; Wicklund & Gollwitzer, 1984). In fact, the aggregate variable SCT shows low but highly significant correlations with several indicators of socio-emotional strain; e.g. with FPI "depression" (0.18, $p < 0.001$), with FPI "emotional lability" (0.15, $p < 0.001$), and—negatively—with DAS "consensus" (-0.16, $p < 0.001$).

Our correlational and path-analytic results further reveal that self-corrective tendencies are enhanced by high subjective developmental reserves (SDR), i.e. by a positive appraisal of one's efficacy to achieve

developmental progress through determined effort. Together with the above-mentioned findings, this observation conforms to the assumption that there are two interlocking motivational inducements for self-corrective action: (1) negative evaluation of actual developmental prospects (in terms of "initial expectations", see previous discussion); (2) positive evaluation of chances to ameliorate developmental prospects by active intervention (see also Brandtstädter, 1984b). This action-theoretical assumption also accounts for the absence of any substantial correlation between personal control over development (PCD) and self-corrective tendencies (SCT): on the one hand, PCD (through its effect on subjective developmental reserve, SDR) tends to enhance self-corrective tendencies, see condition (2); at the same time, however, PCD tends to be associated with high levels of subjective developmental attainment (SDA), an effect that according to our assumption, see condition (1), should reduce the motivation for self-corrective change. Taken together, our results indicate that self-corrective tendencies should be considered as a strategy to cope with problems of personal development and identity. This assumption is also supported by the observation that the inclination toward a self-corrective change is more pronounced among older subjects, who tend to report greater developmental deficits and emotional strains (see Brandtstädter, Krampen & Heil, 1985).

Personal Control Over Development and Subjective Developmental Prospects

Our ANOVA results further confirm the assumption that personal control over development has a pronounced effect on the subject's appraisal of his or her developmental achievements and prospects. Subjects having self-percepts of high control over development not only give a more positive picture of their actual developmental situation (in terms of perceived distances from developmental goals), but also are more optimistic about their chances to achieve further developmental progress through determined effort. Remarkably, that this finding holds for all developmental dimensions considered; it is, however, most clear-cut on developmental dimensions such as health and occupational efficiency. These results conform to the observation that high personal control over development predicts a more positive emotional appraisal of one's developmental past and future (see also Brandtstädter, Krampen & Warndorf, 1985).

Further observations of interest concern effects of age and gender. On almost all dimensions considered, female subjects report a lower level of goal attainment than male subjects; at the same time, however, they tend to ascribe themselves a greater potential for developmental progress. Conversely, male subjects apparently feel more close to their personal

limits of developmental attainment. As an aside, we should note that personal control over development (PCD) is not significantly related to gender; female subjects, however, show a higher inclination toward self-corrective change than male subjects (comparison of means on SCT, *f*: 2.29, *m*: 2.09; $t = 4.47$, $p < 0.001$). For the age factor, the pattern of effects is more complex. Perceived distance from goals tends to increase with age on most dimensions considered, at least through the first four age cohorts (30 to 54 years). For the highest age group (55 to 59 years), however, there is some indication of a stabilisation or recovery. This turnaround, which also shows up in certain emotional aspects (see Brandtstädter, Krampen, & Heil, 1985), may be related to normative life changes such as the approaching retirement; further longitudinal research is needed, however, to substantiate this finding which may also be due to nonequivalent cohort sampling.

As might already be expected from the observed negative correlation of personal control over development (PCD) with age (see Table 1), our older subjects feel somewhat more sceptical about their potential to enhance developmental prospects through active effort. Personal development in late adulthood, thus, seems to be affected in a double respect: first, by a perceived increase of developmental deficits; second, by a subjectively reduced reserve potential to overcome or alleviate such deficits. Our results, however, clearly show that self-percepts of high control over development as well as a supportive social environment may substantially mitigate this problem (see also Shupe, 1985; Thomae, 1981).

Finally, some methodological caveats should be added. As is well known, path-analyses as well as analyses of variance involving assigned variables do not allow for a stringent test of causal assumptions, but can only demonstrate the compatibility of results with a given hypothesis. As far as they involve cross-sectional comparisons, our results further need to be supported by longitudinal evidence. This notwithstanding, the present research highlights the heuristic value of a developmental perspective that takes into account the active and productive role of the adult person in shaping his or her development. More specifically, the findings presented converge in their support for the assumption that control activities and control beliefs are key variables of successful development and aging. Considering the interchange between scientific and lay perspectives on human development, such control activities and beliefs may be fostered by research paradigms that lend theoretical and empirical substance to the notions of plasticity and modifiability of development across the life span.

Manuscript received 30 May 1986

REFERENCES

Abramson, L. Y., Seligman, M. E. P. & Teasdale, J. (1978). Learned helplessness in humans: Critique and reformulation. *Journal of Abnormal Psychology, 87*, 49–74.

Baltes, M. M. & Baltes, P. B. (Eds.). (1985). *The psychology of control and aging*. Hillsdale, N.J.: Lawrence Erlbaum Associates Inc.

Baltes, P. B., Reese, H. W. & Lipsitt, L. P. (1980). Life-span developmental psychology. *Annual Review of Psychology, 31*, 65–110.

Bandura, A. (1981). Self-referent thought: A developmental analysis of self-efficacy. In J. H. Flavell & L. Ross (Eds.), *Social cognitive development: Frontiers and possible futures*. Cambridge: Cambridge University Press.

Bandura, A. (1982). Self-efficacy mechanisms in human agency. *American Psychologist, 37*, 122–147.

Beck, A. T. (1974). The development of depression: A cognitive model. In R. Friedman & M. M. Katz (Eds.), *The Psychology of depression: Contemporary theory and research*. New York: John Wiley.

Becker, P. & Minsel, B. (1982). Primäre Prävention schizophrener, neurotischer und psychosomatischer Störungen. In J. Brandtstädter & A. von Eye (Eds.), *Psychologische Prävention: Grundlagen, Programme, Methoden*. Bern: Huber.

Brandtstädter, J. (1981). Entwicklung in Handlungskontexten: Aussichten für die entwicklungspsychologische Theorienbildung und Anwendung: Trierer Psychologische Berichte Band 8, Heft 8, Wiederabdruck. In H. Lenk (Ed.), *Handlungstheorien—interdisziplinär. Band 3: Verhaltenswissenschaftliche und psychologische Handlungstheorien.* München: Fink.

Brandtstädter, J. (1984a). Action development and development through action. *Human Development, 27*, 115–119.

Brandtstädter, J. (1984b). Personal and social control over development: Some implications of an action perspective in life-span developmental psychology. In P. B. Baltes & O. G. Brim Jr. (Eds.), *Life-span development and behavior*. Vol. 6. New York: Academic Press.

Brandtstädter, J. (1986). Personale Entwicklungskontrolle und entwicklungsregulatives Handeln: Überlegungen und Befunde zu einem vernachlässigten Forschungsthema. *Zeitschrift für Entwicklungspsychologie, 18*, 316–334.

Brandtstädter, J. & Bernitzke, F. (1976). Zur Technik der Pfadanalyse: Ein Beitrag zum Problem der nichtexperimentellen Konstruktion von Kausalmodellen. *Psychologische Beiträge, 18*, 12–34.

Brandtstädter, J., Krampen, G. & Heil, F. E. (1986). Personal control and emotional evaluation of development in partnership relations during adulthood. In M. M. Baltes & P. B. Baltes (Eds.), *The psychology of control and aging*. Hillsdale, N.J.: Lawrence Erlbaum Associates Inc.

Brandtstädter, J., Krampen, G. & Warndorf, P. K. (1985). Entwicklungsbezogene Handlungsorientierungen und Emotionen im Erwachsenenalter. *Zeitschrift für Entwicklungspsychologie und Pädagogische Psychologie, 12*, 41–52.

Bühler, C. & Marschak, M. (1969). Grundtendenzen des menschlichen Lebens. In C. Bühler & F. Massarik (Eds.), *Lebenslauf und Lebensziele*. Stuttgart: Fischer.

Chapman, M. (Ed.) (1984). Intentional action as a paradigm for developmental psychology: A symposium. *Human Development, 27*, 113–144.

Fahrenberg, J., Hampel, K. & Selg, H. (1973). *Freiburger Persönlichkeits-Inventar (F-P-I)*. Göttingen: Hogrefe.

Harré, R. (1983). *Personal being*. Oxford: Blackwell.

Krampen, G. (1981). *IPC-Fragebogen zu Kontrollüberzeugungen*. Göttingen: Hogrefe.

Lerner, R. M. (1984). *On the nature of human plasticity*. Cambridge: Cambridge University Press.

Lerner, R. M. & Busch-Rossnagel, N. A. (1981). *Individuals as producers of their development*. New York: Academic Press.

Peterson, C. & Seligman, M. E. P. (1984). Causal explanations as a risk factor for depression: Theory and evidence. *Psychological Review, 91*, 347–374.

Reese, H. W. & Overton, W. F. (1970). Models of development and theories of development. In L. R. Goulet & P. B. Baltes (Eds.), *Life-span developmental psychology: Research and theory*. New York: Academic Press.

Rogers, C. R. (1961). *On becoming a person*. Boston: Houghton Mifflin.

Rokeach, M. (1973). *The nature of human values*. New York: Free Press.

Rothbaum, F., Weisz, J. R., & Snyder, S. S. (1982). Changing the world and changing the self: A two-process model of perceived control. *Journal of Personality and Social Psychology, 42*, 5–37.

Schneewind, K. A., Schröder, G. & Cattell, R. B. (1983). *Der 16-Persönlichkeits-Faktoren-Test (16PF). Testmanual*. Bern: Huber.

Shupe, D. R. (1985). Perceived control, helplessness and choice: Their relationship to health and aging. In J. E. Birren & J. Livingston (Eds.), *Cognition, stress, and aging*. Englewood Cliffs, N.J.: Prentice-Hall.

Spanier, G. B. (1976). Measuring dyadic adjustment: New scales for assessing the quality of marriage and similar dyads. *Journal of Marriage and the Family, 38*, 15–28.

Steyer, R. (1979). *Untersuchungen zur nonorthogonalen Varianzanalyse*. Weinheim: Beltz.

Thomae, H. (1981). Expected unchangeability of life stress in old age: A contribution to a cognitive theory of aging. *Human Development, 24*, 229–239.

Von Cranach, M., Mächler, E. & Steiner, V. (1983). Die Organisation zeilgerichteter Handlungen: ein Forschungsbericht. *Forschungsberichte aus dem Psychologischen Institut der Universität Bern Nr. 4.*

Wicklund, R. A. & Gollwitzer, P. M. (1984). *Symbolic self-completion*. Hillsdale, N.J.: Lawrence Erlbaum Associates Inc.

Woodward, J. A. & Overall, J. E. (1976). Nonorthogonal analysis of variance in repeated measures experimental designs. *Educational and Psychological Measurement, 36*, 855–859.