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Perceived Childrearing Practices and the Development of Locus of Control in Early Adolescence

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The development of three dimensions of locus of control orientation, namely, perceived internal, powerful others, and chance control, was analysed in a sample of 127 adolescents (11–13 years) as well as the relation between such orientations and childrearing practices of their mothers (practices of reinforcement and punishment). At two times (10 months apart) questionnaire data were obtained about (1) locus of control for problem-solving of the child, (2) childrearing practices of the mother, and (3) childrearing practices of the mother as perceived by the child. The cross-sequential results showed that perceived internality increases and chance control (fatalistic externality) decreases in early adolescence, whereas powerful others control orientations show no age-related change. Results of cross-lagged regression and correlation analyses point toward differential relations between childrearing practices and the three aspects of locus of control: (1) parental approval and attention to positive behaviour of the child predicts internality; (2) parental reinforcement which is based on social comparisons of the child's behaviour and achievements predicts powerful others control; (3) disparagement of the child—without attention to the specific behaviour of the child—predicts chance control orientations. The longitudinal results show that findings of cross-sectional and retrospective studies tend to overestimate the developmental significance of parental childrearing practices for locus of control in early adolescence.

INTRODUCTION

A central assumption in developmental research concerning competence and control orientations is the hypothesis that such variables are learned through socialisation by the generalisation of contingence experiences (generalisations of situation–action and action–outcome expectations; cf. Rotter, 1982; Weisz & Stipek, 1982). Present research confirms the

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plasticity of control orientations in the life-course (e.g. modest developmental stability during adolescence; see Prawatt, Jones, & Hampton, 1979; Zerenga, Tseng, & Greever, 1976) and points toward relations between their development and socialisation conditions in family, school, occupation, and institutions as well as critical life-events (e.g., Baltes & Baltes, 1986; Gilmore, 1978; Krampen, 1987, Lachman, 1986; Lefcourt, 1983).

Because late childhood and adolescence are considered to be crucial for the development of action orientations in general (Brandtstädter, 1985) and for the development of conceptualisations of person–environment transactions (e.g. action–outcome contingencies) in particular (Piaget, 1954; Smedslund, 1963), family education should be especially relevant for the development of locus of control orientations during this developmental period. This is supported by research results: Significant correlates of locus of control orientations in children, adolescents, and young adults include structural features of families (e.g. family completeness and number and type of siblings; Krampen, 1982; Parish & Copeland, 1980), parental childrearing style (e.g., consistency of behaviour, emotional warmth, and support; Krampen, 1982; Levenson, 1973; Wichern & Nowicki, 1976), and family climate variables (Nowicki & Schneewind, 1982). Although in questionnaire studies interdependences between children's locus of control data and parents' childrearing style could rarely be found, such relations between children's locus of control orientations and children's perceptions of parental childrearing style could be consistently established (see e.g. Davis & Phares, 1969; Levenson, 1973; Schneewind & Pfeiffer, 1978). Lefcourt (1976) concludes, that although information from parents about their childrearing style is rather bad, information from children about the childrearing style of their parents is, in contrast, a good predictor of children's locus of control orientations. This conclusion is in part consistent with the transmission hypothesis according to which children's perceptions of parental childrearing style constitute a link between actual parent behaviour and children's perceived control.

With reference to the methodological foundations of these research results, three arguments must be considered:

1. Most researchers use relatively indirect, non-behaviourally-oriented indicators of parental childrearing style (like childrearing attitudes or objectives), which are not easily observable and for which therefore *a priori* a lower correspondence between data from children and that from parents as well as a wider gap in the transmission process must be presumed. For more direct, behaviourally-oriented indicators of childrearing style (like reinforcement and punishment practices), which also

have a closer reference to the social learning hypothesis of generalisation of action–outcome contingencies, a higher correspondence between parental and filial responses as well as in the transmission process can be expected.
2. The majority of studies uses retrospective methods in which young adults (mainly university students) recall their family socialisation—resulting in data for which doubts about their genuine developmental interpretability are reasonable because of uncontrolled biases and gaps in recall.
3. Last but not least, it must be accentuated that most research is restricted to cross-sectional (or retrospective) analyses of the relations between locus of control and childrearing style variables, which do not allow a true prediction of locus of control orientations with reference to former parental educational style across a certain span of time. The same is true for developmental analyses of different aspects of control orientations in particular domains of outcomes in adolescence (see e.g. Connell, 1985).

Based on these considerations about the methodological foundations of present developmental research concerning parental childrearing practices as determinants of children's control orientations, an empirical study—focusing on a special aspect of parental behaviour—was planned and carried out. The predictive value of mothers' childrearing practices (data obtained from mothers and their children) for three aspects of children's domain-specific locus of control orientations is analysed longitudinally. Childrearing practices refer among other things to parental reinforcement and punishment of the child's behaviour and achievements, which are directly related to the child's experiences of contingency between its actions and their consequences. In this context we must differentiate between at least two aspects of childrearing practices. First, reinforcement and punishment of child's behaviour and achievement can differ in the degree of action–outcome contingency (e.g. a reward or punishment is given directly after child's behaviour—high contingency; e.g. parents tell other people about the child's behaviour some time or other—low contingency). Second, the content or nature of the parental reaction may differ (e.g. emotional warmth, material reinforcement, or limited praise as reward; e.g. withdrawal of love, deprivation of material reinforcers, physical punishment, or anger reactions as punishment). The structural feature of more or less contingency *per se* and the nature of parental reactions can be distinguished analytically, but they are connected in childrearing practices *in vivo*. Both aspects must be considered in analyses of family antecedents of childrens' control orientations.

After descriptive analyses of the development of various aspects of locus of control in the age group 11 to 13 years (stability/plasticity, developmental gradients), the hypothesis is tested that childrearing practices in the family predict children's control orientations as measured later. Besides (cross-lagged) multiple regression analyses, which start from the hypothesis of causal relations between the variables, cross-lagged correlation analyses are also carried out on the data, which test the null hypothesis bidirectionally, that there are no causal relations between childrearing practices and children's control orientations.

METHOD

Sample

The analyses reported below are based on questionnaire data obtained from students of six high school classes and their mothers ($N = 146$) at two times of measurement (interval of 10 months). Complete data exist for 127 children (mean age: 11.9 years, S.D. = 1.45; 69 girls and 58 boys), who were grouped according to their age at the first time of measurement into three age cohorts (11 years: $n = 44$; 12 years: $n = 57$; 13 years: $n = 26$). No significant drop-out effects were observed on any of the ten variables considered with reference to the data from the first measurement, $t(125) \leqslant 1.47$ (all variables obtained at $t(1)$). Complete data of dyads exist for 96 mother–child dyads (mean age of children: 11.8 years, S.D. = 1.34; 49 girls and 47 boys). Mothers, who did not participate in the study, are perceived by their children as more disparaging and less loving, $t(125) \geqslant 2.41$, $P < 0.05$; no other significant drop-out effects, $t(137) \leqslant 0.96$, or effects of refusal to participate in the study were observed, $t(125) \leqslant 0.79$, for all the variables obtained at the first time of measurement. Thus, out of 34 tests to analyse drop-out effects and those of refusal to participate only two reached significance, which nonetheless could be due to chance ($P = 0.83$; see Feild & Armenakis, 1974).

Variables

The children and their mothers filled out the same questionnaires two times (interval of 10 months). The children responded to:

1. The domain-specific IPC scales (Krampen, 1984), a questionnaire constructed in accordance with Levenson's (1973) distinction between internality (I; item example: "Concentration helps me to succeed in problem-solving"), powerful others control (P; "In problem-solving I need

the help of others") and chance control (C; "It is a question of luck, if I succeed in solving a problem") measuring these three aspects of locus of control orientations for problem-solving behaviour ($r(tt) \geqslant 0.59$).
2. The sex-specific version of a questionnaire measuring mothers' childrearing practices as perceived by their daughters/sons (FDTS; Schneewind, Beckmann, & Hecht-Jackl, 1985; $r(tt) \geqslant 0.78$). The mothers answered an analogous questionnaire measuring their childrearing practices with reference to their daughters/sons (FDTS; Schneewind et al., 1985; $r(tt) \geqslant 0.79$). These four sex- and mother–child-specific questionnaires stem from the "Family Diagnostic Test System" (FDTS), which was developed within a large research project on parent–child relations (see also Schneewind, Beckmann, & Engfer, 1983).

They measure the following childrearing practices as perceived by the child or the mother (item examples see below):

1. Emotional warmth and contingent reinforcement of the child's positive behaviour (scale A).
2. Material reinforcement and non-contingent public praise of the child (scale B).
3. Limited praise, in which the child's achievements are compared with those of other children (behaviour-contingent social comparisons; scale C′).
4. Contingent punishment by withdrawal of love and non-observance of the child's behaviour (scale D);
5. Contingent punishment by deprivation of material reinforcers and making the child responsible for doing aversive things (scale E).
6. Non-contingent disparagement and anger, which is not related to specific behaviour of the child (scale F).
7. Contingent, spontaneous physical punishment (scale G).

As mentioned above, children's and mothers' perceptions of these aspects of childrearing practices were measured by behaviourally-oriented items, in which direct contingencies between the child's behaviours (e.g. "When my daughter did something very good/bad . . .") and the reactions of the mother are described (e.g. ". . . I give her a hug", scale A; ". . . I give her some money as a reward", ". . . I tell other people", scale B; ". . . I ask her if other children did better", scale C′; ". . . I don't talk to her for a while", scale D; ". . . I don't let her watch TV", scale E; ". . . criticise her and tell her again that she won't amount to anything", scale F; ". . . I give her a good spanking", scale G). Although the FDTS scales on childrearing practices—as *a posteriori* (factor analytically) derived instruments (see Schneewind et al., 1985)—mix up some relevant conceptual distinctions (e.g. positive behaviour *per se* and positive contingent

behaviour in scale A) they cover (non-)contingent behaviours as well as some other important dimensions of parent behaviour in control research (like emotional warmth; see above), which seem to be correlated empirically (see Schneewind et al., 1983; 1985) and thus can be used in analyses of childrearing practices as a relatively broad descriptive tool. All data were gathered anonymously; questionnaires were assigned to persons and dyads by using a stable code.

RESULTS

Cross-Sequential Findings

Cross-sequential findings for internality, powerful others, and chance control orientations were calculated using non-orthogonal analyses of variance (ANOVA) involving the factors age/cohort (A) and time of measurement (T) with repeated measurement on the second factor. The analysis for internality in locus of control for problem-solving yielded significant main effects for A, $F(2,124) = 6.787$, $P < 0.01$, as well as for T, $F(1,124) = 4.971$, $P < 0.05$, but no significant interaction effect, $F(2,124) = 1.220$. Figure 1 illustrates the convergence of longitudinal and cross-sectional findings. Consistently, a significant increase in internality during early adolescence was found.

A non-orthogonal ANOVA involving again the factors of age/cohort (A) and time of measurement (T) for powerful others control yielded neither significant main effects (A: $F(2,124) = 0.329$; T: $F(1,124) = 0.773$, nor a significant interaction effect, $F(2,124) = 0.567$. Thus, differences in powerful others locus of control orientations were not found between age/cohorts and between the two times of measurement. On the other hand, an analogous ANOVA for chance control orientations yielded significant main effects for A, $F(2,124) = 8.953$, $P < 0.01$, and T, $F(1,124) = 7.739$, $P < 0.01$, and no significant interaction effect, $F(2,124) = 1.359$. Figure 2 illustrates these cross-sequential findings. Longitudinally as well as cross-sectionally a marked decrease in chance control orientation in early adolescence was revealed. While the results on internality and chance control confirm the cross-sectional findings of Connell (1985) for control orientations of adolescents in the domain of school performance, Connell's finding of a linear decrease in perceived control due to powerful others can be confirmed neither cross-sectionally nor longitudinally in the present sample.

These results concerning the development of different aspects of locus of control in early adolescence confirm that different dimensions of control orientations show unique developmental patterns—a result, which has

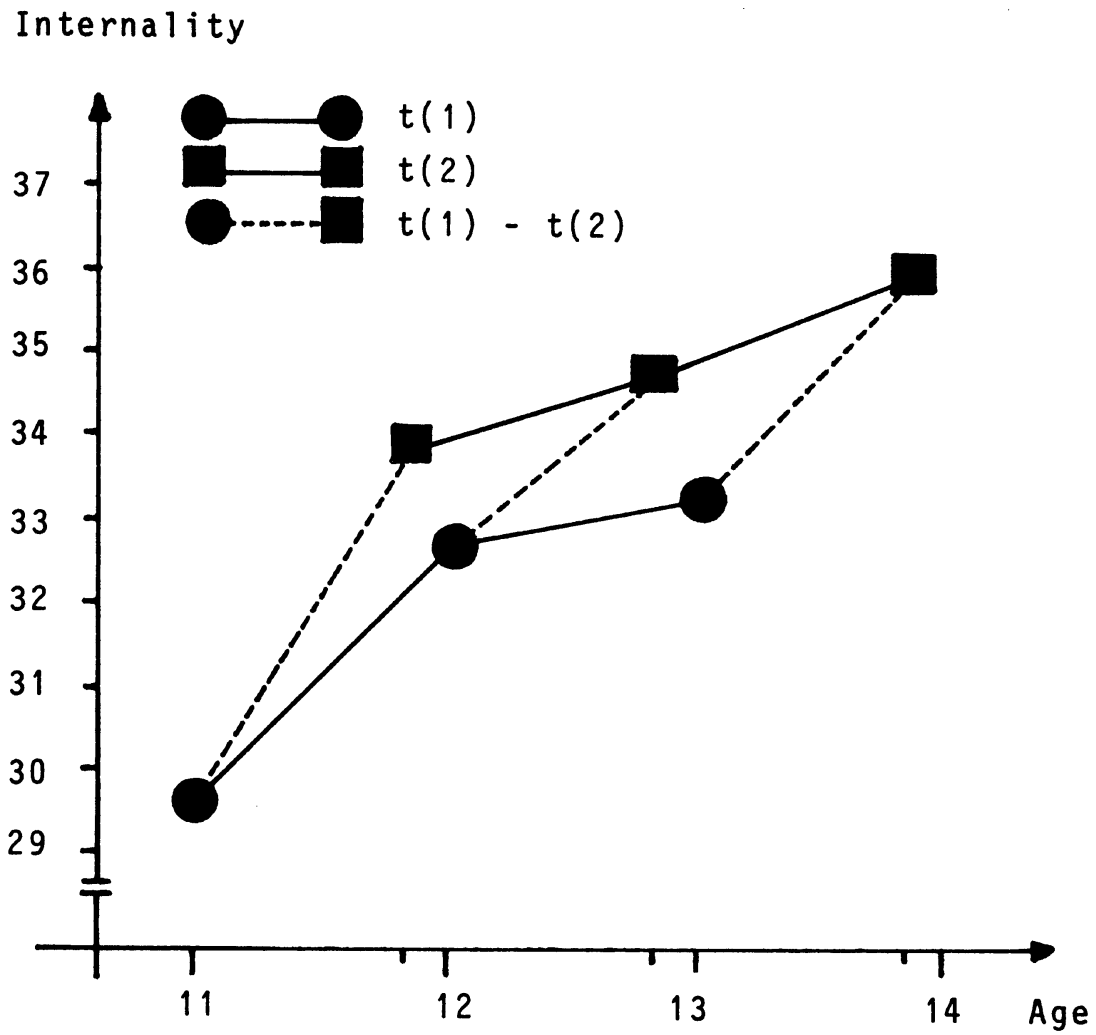

FIG. 1. Cross-sequential findings for internality in locus of control.

been observed in adulthood and old age (see e.g. Lachman, 1986), but not yet longitudinally in adolescence, which in research up to now has included only one-dimensional measures of generalised locus of control (Prawatt et al., 1979; Zerenga et al., 1976). But in accordance with results from these studies, a moderate level of developmental stability/plasticity is observed in adolescence in our study: with reference to the interval of 10 months, the stability coefficient of internality is $r = 0.57$, that of powerful others control is $r = 0.62$, and that for chance control is $r = 0.59$—values which are in agreement with those computed by Prawatt et al. (1979; $r = 0.52$ for a year interval using the Nowicki–Strickland Locus of Control Scales) and Zerenga et al. (1976; $r = 0.55$ for an interval of 8 months using the Rotter I–E scale) in samples of adolescents. These medium levels of (normative) developmental stability illustrate the plasticity of control orientations in adolescence and point out the need for (longitudinal) studies that search for the developmental determinants of such age-related changes.

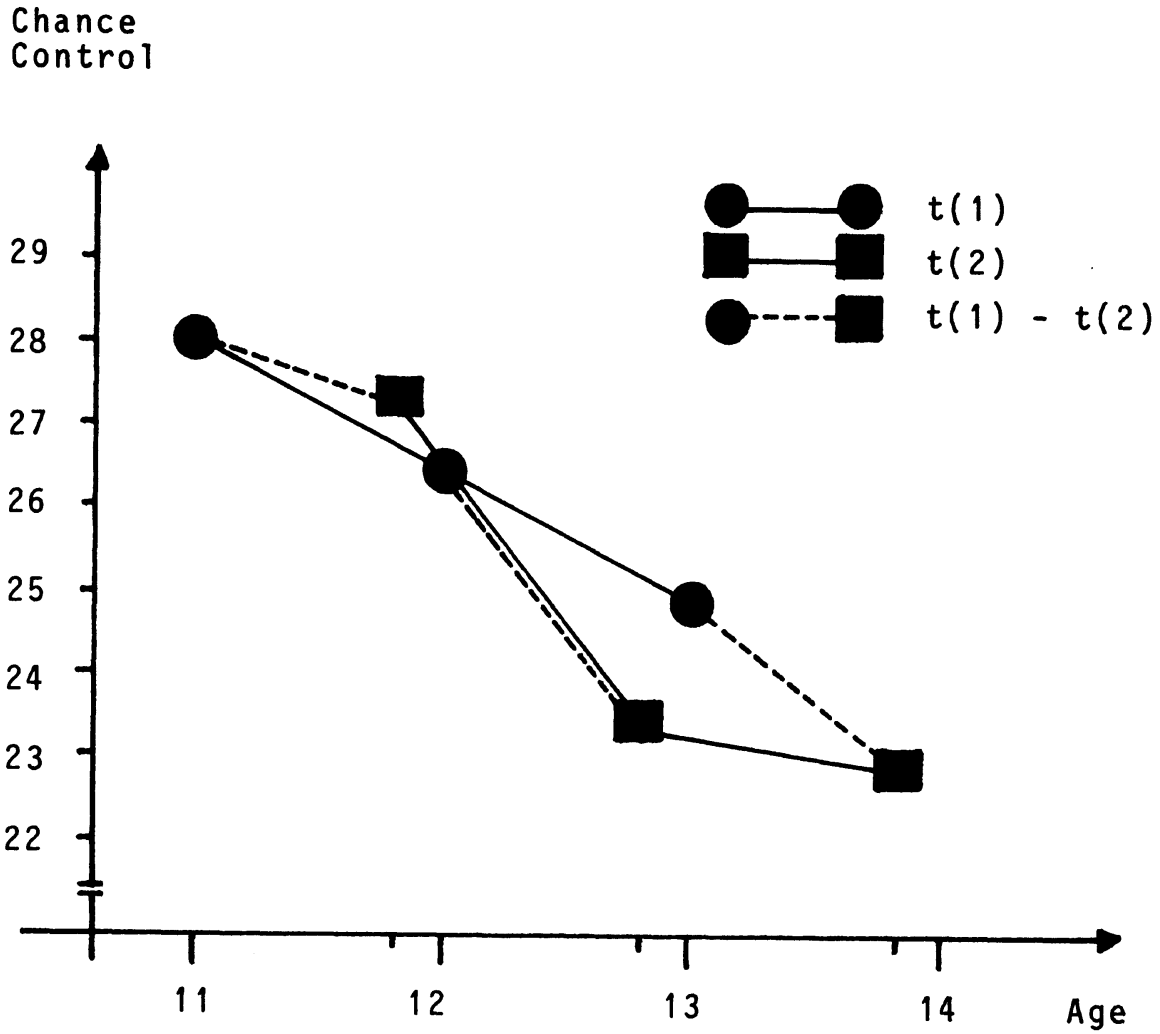

FIG. 2. Cross-sequential findings for chance control.

Childrearing Practices and Locus of Control

Different methods of correlational analysis were used to investigate cross-sectional and longitudinal interdependences between childrearing practices and children's control orientations. Given the rather large number of correlational relationships (or Pearson-Filon tests), we safeguarded against chance findings within each family of analysis by using binominal tables to determine the number of significant findings likely to arise by chance given the number of coefficients (or differences) tested (see Feild & Armenakis, 1974). For all findings presented in the following analyses, the probability of obtaining the number of significant results observed is less than 1%. Thus, the number of significant results within each analysis can be attributed to chance with a probability of only $P < 0.01$.

Before the longitudinal results concerning the relations of childrearing practices and control orientations are presented, some cross-sectional

findings will be described, because they constitute the foundation of the following analyses. First, it must be noted that the data on the childrearing practices obtained from the children and their mothers were highly correlated, $r \geq 0.68$, $P < 0.01$, on an average: $\bar{r} = 0.79$. Thus, in contrast to childrearing attitudes and objectives, a relatively high degree of agreement between parental and filial responses was found. Second, the intercorrelations between the seven childrearing practices measured were in accordance with previous findings (Schneewind et al., 1985) and confirmed—together with the good reliabilities of the scales—high values of profile reliability, *(prof)r(tt)* ≥ 0.63, which indicated that the FDTS scales reliably measured sufficiently differential aspects of childrearing practices. Third, it is worth noting that time-synchronous (cross-sectional) correlation and multiple regression analyses showed, that the three different aspects of children's locus of control could be predicted significantly by (1) data on the childrearing practices of the mothers $0.42 \leq R \leq 0.64$, $P \leq 0.05$) and (2) data about the childrearing practices obtained from the children ($0.52 \leq R \leq 0.77$, $P < 0.01$) at both times of measurement.

The results of the cross-lagged multiple regression analyses, in which data about childrearing practices gathered at the first time of measurement were used to predict children's locus of control orientations measured 10 months later, are presented in Table 1. Data about childrearing practices obtained from the children resulted in significant multiple correlations for the three aspects of locus of control: perceived childrearing practices explained 31% of the variance of internality, 24% of the variance of powerful others control, and 18% of the variance of chance control. Data from the mothers about their childrearing behaviour predicted only internality in children's locus of control significantly (multiple determination of 20%), but not that of both aspects of externality.

These results are consistent with the transmission hypothesis, according to which children's perceptions of childrearing practices mediate between actual parental behaviour and children's locus of control. It is worth noting that the rank orders of the seven aspects of childrearing practice—stemming from their relative prognostic value for children's control orientations—were in high agreement with the data obtained from the children and their mothers: rank correlations of the structure coefficients (see Table 1) are $r(s) = 1.00$ for internality, $r(s) = 0.72$ for powerful others control, and $r(s) = 0.78$ for chance control (all: $P < 0.05$). Thus, we found a high qualitative agreement in the results of the children's and mothers' data, but a somewhat lower quantitative agreement, which may be due to selective perceptions of the child in the transmission process.

The structure coefficients of the multiple regression analyses (see Table 1) show, that internality was determined primarily by (a) a high level of emotional warmth and contingent reinforcement of the child's positive

TABLE 1

Multiple Regression of Childrearing Practices (Data from Children and Mothers) for Three Aspects of Locus of Control of Children at the Second Time of Measurement ($N = 96$)[a]

	Perceived Childrearing Practices (Data of the Child)						*Childrearing Practices (Data of the Mother)*					
	Internal		*Powerful Others*		*Chance*		*Internal*		*Powerful Others*		*Chance*	
Predictor (t_1)	r_c	*st.*	r_c	*st.*	r_c	*st.*	r_c	*st.*	r_c	*st.*	r_c	*st.*
A Emotional Warmth	38	69	03	06	−12	−29	32	71	10	28	−08	−28
B Material Reinforcement	06	11	23	47	08	19	−05	−11	19	53	−03	−10
C′ Limited Praise	29	52	41	83	03	07	17	38	22	62	03	10
D Withdrawal of Love	17	31	08	16	13	31	14	31	−04	−11	11	38
E Material Punishment	−08	−14	13	26	11	26	−08	−18	07	20	17	59
F Disparagement	−15	−27	06	12	37	88	−12	−27	03	08	22	76
G Physical Punishment	03	05	03	06	14	33	−03	−07	02	−06	16	55
Multiple Correlation (R)	0.55[b]		0.49[b]		0.42[c]		0.45[b]		0.36		0.29	
Multiple Determination (R^2)	0.31		0.24		0.18		0.20		0.13		0.08	

[a] r_c = predictor-criterion correlation (cross-lagged correlations); st. = structure coefficients; without decimal point; $r_c \geq |0.25|$, $P < 0.01$; $r_c \geq |0.20|$, $P < 0.05$.

[b] $P < 0.01$.

[c] $P < 0.05$.

behaviour, (b) limited praise, which is oriented toward social comparisons of the child's achievements, and (c) contingent withdrawal of love as a reaction to negative behaviour of the child. The development of powerful others externality was especially dependent on (a) limited praise based on social comparisons and (b) material reinforcement and non-contingent public praise of the child's behaviour. Determinants of chance control orientations were primarily (a) disparagement of the child without reference to specific behaviours of the child, (b) physical punishment, (c) withdrawal of love, and (d) a low level of emotional warmth and contingent reinforcement of positive behaviour of the child. These results confirm the hypothesis that the three different aspects of locus of control orientations are founded on differential patterns of parent behaviour. Up to now this has been shown only with cross-sectional and retrospective data (see Krampen, 1982; Levenson, 1973).

It is, however, worth noting that the results obtained with the children's data may simply reflect the biased contingency perceptions of children with different locus of control (who may have rather similar actual contingence experiences). For example, when child's self-reports reveal a significant correlation between internality and the child's perception of contingent reinforcement by the parent, one possible alternative interpretation may be that children with strong perceptions of internal control are particularly likely to perceive events (including parental reinforcement) as being contingent on their own behaviour. The results presented can be defended against this alternative interpretation by the fact that (1) the results obtained with the mothers' data are structurally similar to those obtained with the childrens' data, and (2) the results of cross-lagged correlation analyses reported below.

The causal hypothesis that family childrearing practices precede adolescents' locus of control orientations was analysed bidirectionally by cross-lagged correlation analyses (see Kenny, 1979). Cross-lagged correlations are presented in Table 2 (data obtained from children) and Table 3 (data obtained from mothers). The null hypothesis, that there were no causal relations between childrearing practices of the mother and the child's locus of control, could be rejected with reference to a significant z-value in the Pearson-Filon test for the following pairs of variables:

1. Emotional warmth and contingent reinforcement of positive behaviour of the child was a developmental condition of children's internality in locus of control, $z = 2.808$ (data obtained from mothers), respectively $z = 2.388$ (data obtained from children), $P < 0.01$. Figure 3 illustrates this finding exemplarily for the results presented in the following.
2. Material reinforcement and non-contingent, demonstrative public praise of the child's achievements (data obtained from mothers) preceded powerful others control in children, $z = 1.726$, $P < 0.05$.

TABLE 2
Autocorrelations and Cross-Lagged Correlations of Locus of Control and Childrearing Practices (Data from Children, $N = 96$)

	Second Measurement (t_2)									
First Measurement (t_1)	*I*	*P*	*C*	*A*	*B*	*C'*	*D*	*E*	*F*	*G*
I Internality	*0.57*	−0.20	−0.16	0.11	0.04	0.13	0.10	−0.03	−0.09	−0.06
P Powerful Others Control	−0.12	*0.62*	0.32	0.07	0.11	0.17	0.11	0.07	−0.01	−0.04
C Chance Control	−0.15	0.29	*0.59*	−0.07	0.09	0.05	0.07	0.13	0.12	0.04
A Emotional Warmth	0.38	0.03	−0.12	*0.86*	0.18	−0.01	0.19	−0.08	0.00	−0.04
B Material Reinforcement	0.06	0.23	0.08	0.19	*0.72*	0.16	0.14	0.03	0.16	0.09
C' Limited Praise	0.29	0.41	0.03	−0.05	0.18	*0.93*	−0.03	0.06	0.22	0.13
D Withdrawal of Love	0.17	0.08	0.13	0.16	0.19	0.01	*0.76*	0.09	0.18	0.06
E Material Punishment	−0.08	0.13	0.11	−0.03	0.08	0.08	0.10	*0.87*	0.20	0.21
F Disparagement	−0.15	0.06	0.37	0.05	0.17	0.21	0.17	0.31	*0.81*	0.37
G Physical Punishment	0.03	0.03	0.14	−0.02	0.15	0.27	0.21	0.32	0.42	*0.94*

TABLE 3
Autocorrelations and Cross-Lagged Correlations of Locus of Control and Childrearing Practices (Data from Mothers, $N = 96$)

	Second Measurement (t_2)									
First Measurement (t_1)	*I*	*P*	*C*	*A*	*B*	*C'*	*D*	*E*	*F*	*G*
I Internality	*0.57*	−0.20	−0.16	0.08	0.03	0.06	0.10	0.03	−0.02	−0.07
P Powerful Others Control	−0.12	*0.62*	0.32	0.06	0.03	0.13	−0.07	0.06	−0.01	0.01
C Chance Control	−0.15	0.29	*0.59*	−0.02	−0.02	0.06	0.09	0.10	0.12	0.07
A Emotional Warmth	0.32	0.10	−0.08	*0.83*	0.16	0.22	0.27	0.13	0.05	0.03
B Material Reinforcement	−0.05	0.19	−0.03	0.18	*0.70*	−0.02	0.00	−0.01	0.00	0.08
C' Limited Praise	0.17	0.22	0.03	0.28	0.03	*0.87*	0.14	0.11	0.13	0.16
D Withdrawal of Love	0.14	−0.04	0.11	0.32	−0.05	0.27	*0.61*	0.41	0.28	0.20
E Material Punishment	−0.08	0.07	0.17	0.17	−0.06	0.17	0.44	*0.78*	0.19	0.09
F Disparagement	−0.12	0.03	0.22	0.03	−0.01	0.19	0.27	0.17	*0.77*	0.37
G Physical Punishment	−0.03	−0.02	0.16	0.07	0.03	0.29	0.31	0.23	0.38	*0.89*

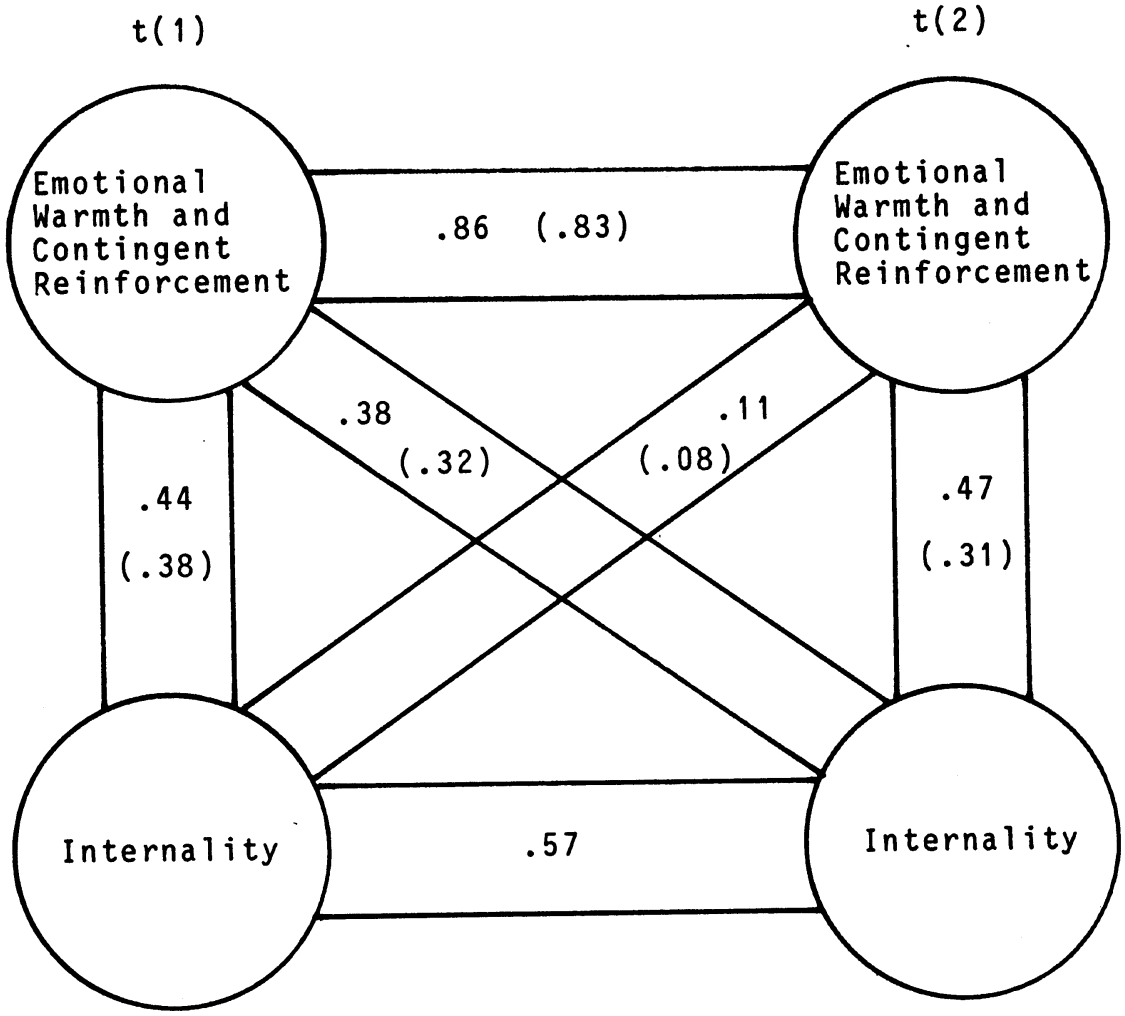

FIG. 3. Cross-lagged panel correlations for "emotional warmth and contingent reinforcement" and "internality" of the data from the children (in parentheses) and that from mothers (time interval: 10 months).

3. Limited praise with reference to social comparisons of the child's behaviours and achievements (data obtained from children) was a developmental condition for children's powerful others externality, $z = 2.711$, $P < 0.01$.
4. Disparagement of the child not contingent on specific behaviours of the child (data obtained from children) was a determinant of children's chance control, $z = 2.571$, $P < 0.01$.

Differences between all the other cross-lagged correlations (see Tables 2 and 3) were not significant in the Pearson-Filon test, $z \leq 1.167$. Therefore, the null hypothesis, that there were no causal relations between the other childrearing practices measured and children's locus of control orientations, cannot be rejected—a result which relativises the results of the regression

analyses. The probability of obtaining the number of significant differences by chance in this group of cross-lagged analyses is $P = 0.002$.

DISCUSSION

The relevance of late childhood and early adolescence for the development of locus of control orientations could be confirmed with longitudinal data. Given modest normative (correlative) developmental stability, which points toward the necessity of explaining developmental dynamics and plasticity, there are marked mean differences in longitudinal and cross-sectional comparisons of 11- to 13-year-old adolescents. This extends longitudinally the cross-sectional findings of Connell (1985) on the development of different aspects of domain-specific control orientations in early adolescence. In contrast to the results of Prawatt et al. (1979) and Zerenga et al. (1976), who used one-dimensional measures of generalised control beliefs, this could be confirmed for different aspects of locus of control: Whereas there is a significant increase in internality during early adolescence, chance control decreases, and powerful others control shows no age-related changes. The last finding may be explained by the fact that during adolescence there is an objective dependence in problem-solving on "powerful others" (like teachers and parents) who help the child to learn and to have success. It is worth noting that different dimensions of control orientations show different developmental gradients—a result which has been found up to now only in some recent studies on the development of control orientations in adulthood and old age (Krampen, 1987; Lachman, 1986) and in a recent cross-sectional analysis for adolescence (Connell, 1985)—and that all longitudinal and cross-sectional findings are in agreement.

The ascertained plasticity of control orientations in early adolescence was analysed in the present study with reference to childrearing practices in the family. From a superficial point of view the longitudinal results seem to confirm findings of cross-sectional and retrospective studies: internality is founded on emotional warmth, contingent reinforcement, and withdrawal of love (as punishment); externality is founded on disparagement and non-contingent punishment of the child (see Davis & Phares, 1969; Krampen, 1982; Levenson, 1973). Besides the fact that differential interrelations between childrearing style variables and different aspects of control could be found (which up to now has only been confirmed by retrospective data; Krampen, 1982; Levenson, 1973), it is worth noting that some relations appear somewhat more marked because of the behaviourally-oriented operationalisation of the parental practices and their direct relation to the child's experience of contingency between its actions and their consequences as well as the nature or content of these consequences. In sum, the

following specific relations were confirmed: (1) Parental approval and attention to positive behaviour of the child predicts internality; (2) Parental reinforcement which is founded on social comparisons of the child's behaviour and achievements predicts powerful others control; (3) Disparagement of the child—without attention to the specific behaviour of the child—predicts chance control orientations.

A closer look at the results shows that we have to be cautious about genuine developmental interpretations. Whereas cross-sectional and retrospective findings concerning the relations of childrearing practices and control orientations could be confirmed qualitatively with longitudinal data, the results demonstrate that cross-sectional and retrospective data tend to overestimate the relationships quantitatively. The results of the cross-lagged correlation analyses accentuate further that only a few of the predictor variables used in the multiple regression analyses survive in quasi-experimental causal analyses which test the causal hypotheses bidirectionally and not only unidirectionally. It is interesting to note that this is in accordance with experimental findings on the social determinants of locus of control in children (see e.g. Chandler et al., 1980; Skinner, 1986). In sum, it can be concluded that questionnaire data, which are analysed under a unidirectional developmental causal hypothesis, tend to overestimate the developmental effects of childrearing style variables on children's control orientations. The extent of this overestimation increases, when the data are gathered cross-sectionally or retrospectively.

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