Educational Psychology

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This is a report on the more recent developments and the present state of research into educational psychology in German speaking countries. Particular emphasis is given to research on: parental upbringing and its effects on child development; the examination of socialization effects within and across different school systems; studies on teaching-learning processes and on social interaction in the classroom; the systematic promotion of the development of cognitive abilities and motives in students; and, finally, the design of improved instruments in methods of describing, explaining and predicting school success. Subsequently, the report will look into problems in the practical application of research findings in educational psychology. Finally, there follows a short discussion of various metatheoretical positions in educational psychology in German speaking countries and their possible effects on the future development of the field.

The history and current state of the field

Educational psychology is given a far wider definition in German speaking countries than is usually the case in Anglo-American countries. It comprises the development and application of empirically founded theories that describe, explain, predict and optimize socialization, educational and instructional processes (cf. Brandtstädter et al., 1974). Despite these comprehensive terms of reference, educational psychology in Germany also emphasizes, and always did emphasize, psychologically oriented research on schools and instruction. In history, this tendency can be traced back to the roots of the discipline at the end of the 19th and beginning of the 20th century. Various starting-points and traditions in the empirical concern with matters of educational psychology can be identified which have developed partly parallel to one another and partly in conflict with each other. On the one hand, there exists the viewpoint, attributable to Friedrich Herbart, that the generally applicable laws of human learning are also the best guidelines for designing a natural form of instruction. The rigid reglementation of teaching-learning processes, which were (incorrectly) deduced from this position at the end of the 19th century, have since been corrected by experimental educational science (Lay, 1912; Meumann, 1914). This latter (second) root of educational psychology was characterized by the systematic application of newly developed experimental-psychological techniques to matters of education. The methods of investigation formulated at the turn of the century under the influence of the association theory, for use in the experimental analysis of the skills necessary for, the acquirement of and the difficulties inherent in reading, writing, grammar and arithmetic etc., have only very recently been continued on the basis of a more cognitive standpoint. A third approach to educational-psychological research, initially strongly influenced by the ideas of the romanticists, is child psychology; this approach developed relatively independently of the two

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[1] This survey extends over all German speaking countries, but chiefly stresses the state of research in the Federal Republic of Germany. It concentrates mainly on the last decade 1967 to 1977. As only a small percentage of the large number of publications can be mentioned, the prime objective of this study will be to outline the most important trends in German speaking countries.

traditions mentioned above and originated in the last 30 years of the 19th century. Closely related to this development was, finally, the growing influence of reform theory that emphasized, in particular, the significance of unique teacher personality and the child's free spontaneous activity in the educational process. In comparison with the constitutive significance of these starting-points of educational psychology in Germany the traditions of test psychology, psychagogic-therapeutic and social psychology have been of minor significance, although they have not been unimportant. In view of the diversity of survey and theory in simultaneous research activities, and of the discrepancy often to be observed between scientific trends and the reception of research results by the public, school administration and teachers, it is not possible to describe the history of ideas, results and effects of educational psychology in a uniform and unambiguous way. Despite such difficulties it is nonetheless possible to discern a decisive turning point in the development of the field in Germany between the two World Wars. The initially dominating orientation towards experimental learning theory was increasingly replaced by a concentration on a normative maturation approach taken from developmental psychology. This tendency was indubitably augmented by the forced emigration of many eminent psychologists from Nazi Germany, and by the increasing isolation of German science. The accompanying stagnation in educational-psychological research lasted until well after World War II, both in West Germany and the German Democratic Republic (see H i l l e b r a n d , 1959; K o s s a k o w s k i , 1972). The first two decades after 1945 were characterized by a desolate infrastructure for research into educational psychology in Germany, by low public interest in the results of empirical research, by the conservation of the normative outlook on capabilities and maturation, and by the very gradual reception of foreign, above all Anglo-American, theories and research methods.

The situation changed in the mid 1960ies in an impressive way. Powerful social and political trends led to a new assessment of the social role of education and encouraged an improvement in equality of educational opportunity for persons of different social status. Theories on the significance of the environment and of learning for cognitive development (J. McV. H u n t , 1961), on the importance of early experiences (B l o o m , 1964) and on the effective designing of teaching-learning processes (G a g e , 1963) were adopted relatively quickly and assimilated into education programs (R o t h , 1969). The waves of the 'sputnik shock', which had started in the USA, broke with a slight delay onto the scene of German educational politics as well. The call for an improved and more effective educational system led to a plethora of schemas for (limited) organizational changes in the school system (experiments with elementary schools and comprehensive schools), to intensive work on curricula, to great interest in (compensatory) pre-school programs, to vigorous (state and private) support of instructional technology, and to a considerable increase in psychological test procedures and other instruments of assessment, and so on. In this time of change educational psychology, as well as educational science and educational sociology, suddenly took on the task of giving general advice on policies, of providing direct aid in decision making in educational planning and providing legitimatory arguments for pushing through decisions in educational policy; all in all it assumed the function of a 'descriptive early warning system' for foreseeable problems in the education system. As a result, educational-psychological research was itself stimulated and received growing support. Both staff and student numbers rapidly increased, research

institutes were founded, scientific bodies were formed, new journals were published and the number of publications increased considerably (cf. Table 1).

Table 1: Number of educational psychology publications in specialist journals in the Federal Republic of Germany in the years 1967, 1972 and 1977, in comparison to the publications listed under 'Educational Psychology' in 'Psychological Abstracts'.

Year	1967	1972	1977
Educational psychology publications in specialist German journals	125	144	215
for comparison: Publications under 'Educational Psychology' in Psychological Abstracts	1378	2283	1125

Table 2: Educational-psychology publications in German language specialist journals and in 'Psychological Abstracts' in the years 1967, 1972, and 1977, classified according to specific areas.

	1967		1972		1977	
	absolute	%	absolute	%	absolute	%
German publications general	60	48	55	38	33	15
Psychological Abstracts	248	18	100	4	86	8
German publications educational administration and personnel training	6	5	13	9	28	13
Psychological Abstracts	168	12	200	9	132	12
German publications curricula, programs and teaching models	22	18	23	16	42	20
Psychological Abstracts	201	15	487	21	186	17
German publications school learning and academic achievement	8	6	7	5	27	13
Psychological Abstracts	161	12	354	16	111	10
German publications classroom dynamics and student adjustment	13	10	19	13	33	15
Psychological Abstracts	207	15	237	10	179	16
German publications special and remedial education	7	6	10	7	20	9
Psychological Abstracts	138	10	394	17	192	17
German publications counseling and measurement	9	7	17	12	32	15
Psychological Abstracts	255	19	511	22	239	21
German publications total	125	100	144	100	215	100
Psychological Abstracts	1378	100	2283	100	1125	100

Table 1 shows a continual increase in German educational-psychology publications in the last ten years. The sudden upward rise in publications should no doubt be attributed to changes in the classification scheme applied in 'Psychological Abstracts', and, on the other hand, to the flood of publications due to the large number of state and private research programs at the end of the 1960ies and the beginning of the 1970ies. The quantitative increase in scientific publications in educational psychology in the German language covers all the important areas of the field (cf. Table 2).

As Table 2 shows, only in the general publications is there both an absolute and relative decrease between 1967 and 1977; in the various areas, however, the number and percentage of scientific publications have increased. Considerable improvement can also be recognized in the orientation to theory, in the sophisticated planning of studies, and statistical data analysis. Mainly as a result of a more rational outlook on the part of educational administrators, of the re-ideologification of many educational viewpoints and growing scepticism with regard to the direct, practical relevance of empirical research findings, expectations of what educational psychology can achieve have become more realistic. This, however, can only have a beneficial effect on future theory-directed research and its practical application.

Main areas of research

Although the scientific analysis of the effects of the home environment and, in particular, of parental upbringing on child development is being given more attention (cf. below), research activities in educational psychology have mainly been concerned with the fields of school and classroom instruction in the last decade. Stimulated by political controversies on educational reforms, inter- and intra-system comparisons have been made of the socialization effects, particularly at the secondary school level. Classroom processes formed another center of attention in educational-psychological research. Of particular interest here was the theoretical reconstruction of existing teaching-learning processes, the theoretical construction of improved teaching-learning models and the description and analysis of teacher-student interactions. Examinations of educational attempts to further cognitive and motivational development, particularly when learning difficulties occur, is another important field of investigation. In this context, there exists a more obvious need for multilevel analyses in which the simultaneous and cumulative effects of the home milieu, school, and context conditions are assessed and analysed. What clearly emerges in this connection is the lack of studies on the socialization effects of peer groups, of other social reference groups, of the mass media and other features of the 'Zeitgeist'.

Socialization-oriented studies

Socialstatus. As in Anglo-American countries, particular attention has been paid in the last decade to social class as a rough indicator of home environment, and thus of the (varying) quality of ecological, economic and psychological conditions of child development. Many authors of educational-psychological studies were stimulated by early work in the German language (eg. H e t z e r, 1929), by the reception of foreign studies and by sociological theories, and were motivated by a strong interest in social and political questions. They concentrated

on assessing the relations between social class, on the one hand, and the development of various psychological attributes and differences in the opportunities children have in education, on the other. German studies have essentially confirmed the results of Anglo-American investigations. Class differences were found, for example, in various intelligence tests (F e r d i n a n d, 1969), in speech patterns (O e v e r m a n n, 1972), in the field of cognitive styles (K ö s t l i n - G l o g e r, 1974), with regard to gratification delay, in the genesis of achievement motive (V o n t o b e l, 1970), in teacher assessment in student's achievement with IQ partialed out (G r e s s e r - S p i t z m ü l l e r, 1973; S t e i n - k a m p, 1971), and in the length and type of school career (H e l l e r, 1970; P e i s e r t & D a h r e n d o r f, 1967). In some other studies, however, the differences expected were not always confirmed. This is true of the capacity for role-taking, for instance (B e r t r a m & B e r t r a m, 1974; K e l l e r, 1976). But the statistically significant correlations between social class and characteristics of behavior development, or of school career, were rarely higher than 0.4. The lack of control of interfering factors (genetic aspects, social context variables), and the large explanative distance between the independent and dependent variables found, make any theoretical interpretations of the results difficult, if not impossible. Thus, in line with trends in the U.K. and the USA, there have been still stronger demands in recent years for a replacement of rough indicators like social class by psychologically meaningful multiple process variables. Two examples should serve to illustrate this trend:

In a multilevel analysis of three cognitive variables (role-taking, concept formation, general intelligence) in 136 nine-year-old boys, B e r t r a m (1977) takes into consideration 45 variables in parental attitudes to education, apart from social class (traditional obedience-oriented approach, independence-oriented approach, success-oriented approach, sense of social responsibility), in parents' personalities (16 PF Questionnaire by R.B. C a t t e l l), and in organizational details of family life (whether the mother goes out to work, size of house or flat, number of children, order in birth, amount of time the mother spends at work away from the family). While the linear and non-linear correlations between social class and the cognitive abilities of the child lie, as was expected, between 0.1 and 0.32, a multiple R of 0.73 is found when all the groups of variables are considered in a stepwise regression analysis. In the 53 % of the total variance which is explained in this way, the relatively stable personality characteristics of the parents have the greatest significance (42 % as compared to 5 % for the parental attitudes to upbringing, 3 % for the way the family life is organized and 3 % for social status). "By taking dimensions of social structure and relatively stable parameters of the family environment into consideration as well, and by analyzing non-linear and contextual effects of these dimensions and parameters on the variables of cognitive structure, it has been possible to increase considerably the proportion of variance which can be accounted for" (B e r t r a m, 1977, p. 481).

The second example is a study by T r u d e w i n d (1975) on the relation between home environment and the development of achievement motivation. Proceeding from H e c k h a u s e n's pluralistic theory of the genesis of motivation (1966), T r u d e w i n d (1975) drew up a taxonomy of achievement-oriented conditions in the immediate environment of the developing child, which took into consideration stimulatory factors (scope of experience, stimulation through the design of the home environment, helping with and supporting school work, social contact, intensity and quality of language acquisition), aspects of the pres-

sure to achieve (parental expectancies regarding the child's school performance, measures taken by parents to ensure good school performance, parental sanctions, requirements regarding independence), and the factor of the accumulated experiences of success and failure. The hypotheses regarding the curvilinear relation between environmental conditions and characteristics of achievement motivation (hope of success and fear of failure, overall motivation and net hope) were all confirmed.

Style of upbringing. In recent years parents' styles of upbringing have been in the forefront of interest in educational-psychological research on socialization in the Federal Republic of Germany. They are understood as a group of characteristics of upbringing behavior "in which greater common variance is present than could occur by chance on the basis of the variation of the characteristics, and which allows of a more exact prediction of the idiosyncracies of children brought up in this style than individual characteristics" (E y f e r t h , 1966, p. 23). The goals of upbringing, attitudes to upbringing and parents' methods of upbringing and their interaction, are taken into account. Recording the upbringing style can be carried out either by the parent employing his/her self-perception, or from the point of view of the perception of the child concerned, by another member of the familiy or by neutral observers (see S c h n e e w i n d et al., 1975; S c h n e e w i n d & H e r r m a n n , 1977; L u k e s c h , 1976, 1977; S c h n e e w i n d & L u k e s c h , 1978). A two-dimensional model of parental reinforcement behavior set up by H e r r m a n n et al. (1971) has made a lasting impression on research into styles of upbringing in the Federal Republic of Germany. Proceeding from the premises of learning theory, an a priori differentiation was made between two independent dimensions of parental behavior, namely: strictness (punishment) and support (rewards) experienced by the child. On this theoretical foundation, the 'Marburg Scales for Recording Parental Styles of Upbringing' were drawn up in which children are questioned on their perception of the strictness and support they receive from their parents – distinguishing between father and mother. The effects of parental upbringing defined and recorded in this way are classified with the aid of two behavior syndromes: (a) orientation towards prohibition (being the result of the dominance of parental strictness in the child's perception: with reduced activity, a high degree of general anxiety, insecurity, fear of failure, dependence on the teacher in dilemma situations in school, pessimistic view of the future); and, (b) orientation towards support (being the result of the experience of parental support; active, self-confident, prepared to make an effort, success-motivated with an optimistic view of the future) (S t a p f et al., 1972; A. S t a p f , 1975; S t u r z e b e c h e r & H e r r - m a n n , 1974; R o l l e t t et al., 1972; F i n k , 1975, etc.). For criticism of the scales and the results obtained in using them cf. L u k e s c h (1977) and H e r r - m a n n & S t a p f (1977).

A very comprehensive and differentiated research project by S c h n e e w i n d is concerned with the psychological and socio-ecological determinants of the parent-child relationship, and with the effects of the family environment and of parental style of upbringing on the development of behavior tendencies in the child on the cognitive, affective-motivational and social planes (see S c h n e e - w i n d et al., 1975). A number of procedures for measuring parental styles of upbringing, attitudes, and practices, as perceived by the self and others, have been drawn up for this purpose. The first results appear to show that there are relations of varying proximity between aspects of the style of upbringing practiced by

parents, on the one hand, and the specific intelligence (D a r p e et al., 1975), personality characteristics such as extraversion, emotionality, and emotional stability (D a r p e & S c h n e e w i n d , 1978), experience of internal versus external reinforcement control (S c h n e e w i n d et al., 1974; S c h n e e - w i n d & P f e i f f e r, 1978), delay in reinforcement (S c h m i d t & S c h n e e w i n d , 1978) and self-reinforcing behavior (R i n k e & S c h n e e - w i n d , 1978) shown by children, on the other. The sex of the parent concerned and of the child, and intervening context variables appear to have considerable significance in this connection. The complicated interactions found between the various elements of upbringing influences exercised by the family, the partial dependency of the value for parental upbringing behavior on the perception of the child, which can only be identified in longitudinal studies, and the influence of the parental style of upbringing on the child's behavior could be important reasons for the fact that many of the studies in international and in German literature either appear contradictory or have not been replicated in subsequent investigations.

School-oriented studies (socialization effects of school)

Specific deficits in the conventional school system. The faults and the weak points in the traditional school system have been reflected in scientific discussions, and particular attention has been paid to the question of school entrance and to transfering to secondary school after four years at primary school ('Realschulen' − secondary modern schools; 'Gymnasien' − grammar schools).

In the concentional school-entrance procedure, age and general level of development were the main criteria of selection. The most important diagnostic processes applied were the so-called 'school-maturity' or 'school-readiness' tests, which were supposed to be more suitable than the teacher's judgment in predicting school success. As originally conceived, the construct 'school maturity' postulated a (mainly endogenously controlled) developmental level (level of maturity) in the child which corresponded, on the one hand, to the requirements of school entrance and was supposed, on the other, to be relatively independent of the child's general intelligence. But the validity of these two assumptions could no longer be upheld after more recent empirical studies had unambiguously demonstrated both the possibility of training 'school maturity' and its close relationship to intelligence (see K r a p p & M a n d l, 1971, 1977; T i e d e - m a n n , 1974b; T i e t z e , 1973). Studies on the usefulness of school-maturity tests as instruments of selection (e.g. K r a p p & M a n d l , 1971; T i e d e m a n n , 1974a) have also shown that, when school maturity tests were applied, false assessment rates were obtained which at best equalled those which would have been expected if all the children had entered school without being tested at all. So the tests turned out to be problematic instruments for selecting children who had reached school level of maturity. The newer procedures designed to determine learning abilities at school entrance (see M a n d l & K r a p p , 1978)), which attempt an assessment of overall cognitive development, have not yet been tested sufficiently, so it is difficult to evalute their effectivity.

As with school entrance procedure, criticism has also been directed at transfer selection based on points. In a longitudinal study on almost 1000 school children in the 4th year of school, T e n t (1969) came relatively early on to a conclusion which attracted considerable attention: the selection procedure is of insufficient validity. The results demonstrated that the predicting of school performance is

unsatisfactory and that not even an approximation to educational success is guaranteed. This unsatisfactory situation regarding the long-term achievement prediction, and the selection based on it, have led to a number of reform concepts designed for application on the elementary, the primary and the secondary levels in order to ensure better possibilities of promotion and support for individual pupils.

Pre-school education. Reform efforts in the field of institutionalized early education have been encouraged not least by, and intensified as a result of, the new outlook discussed above on school maturity, and particularly by the fact that test results were shown to depend on experience to correlate with variables of social class (see O d e r i c h , 1971a, 1971b; F e r d i n a n d & U h r , 1970). According to W i n k e l m a n n et al. (1977), on the other hand, the fact that pre-school experiments have been promoted so intensively is to be attributed mainly to economic requirements and to the principle of equality of educational opportunity. While the efforts of the adherents to early reading which were, initially, especially stimulating, proved to be relatively unproductive (see R ü d i - g e r , 1970, 1971), several promotional programs for elementary education which were started subsequently (see B e n n w i t z & W e i n e r t , 1973), and in which curricula for language development, social experience, specific cognitive abilities and introduction to mathematical and scientific problems were developed and studied, were partly able to demonstrate the efficacy of such attempts.

A fierce controversy arose over the question as to whether pre-school education should be conceived as a free offer of education complementary to the family (i.e. kindergarten), or whether it should be adjoined to the school system in the form of pre-school classes. Although the intersystem comparison of both reform models, which is necessary to throw light on the question, has been started in several regions of the Federal Republic of Germany, only the results of the comparative study in North-Rhine Westphalia have been made known (W i n k e l - m a n n et al., 1977), in which 50 model kindergartens and pre-school classes were compared in an attempt to assist in making decisions in allocating five-year-olds to the elementary or primary level. The variables taken as criteria for the efficacy comparison were investigated with regard to both short-term and long-term effects. In as far as significant differences were found at all, they were in favor of pre-school classes, but altogether the differences in long-term and short-term effects were negligible. While the superiority of institutional as opposed to family pre-school education was convincingly demonstrated (see F e r d i n a n d , 1971), it was seen, on the other hand, that the performance discrepancy between children from different social classes was not essentially reduced by the programs.

Traditional versus comprehensive school system. The school comparisons which are listed below refer to a comparison of achievements in, and other effects of, the traditional three-fold school system and the comprehensive system, and they are paradigmatic for intersystem comparisons, i.e. for evaluations of different kinds of schools. In this connection it will be particularly interesting to find out whether the model schools will be able to satisfy the standards set for them, which in many places are quite ambitious requiring that they minimize, if not eliminate, the factors which were targets of criticism in the traditional school system (rigidity of the system, lack of differentiation according to talents, suboptimal selection procedure, pressure to achieve etc.). Particular methodological problems arise in the empirical implementation and evaluation of school studies,

on the one hand, because the complexity of the differences begs the question of how to assess specific socialization effects which are defined only by characteristics of school organization (S t r a k a & S t r i t t m a t t e r, 1978; W e i n e r t, 1972). On the other hand, the functional division of research activity into efficacy testing and (multi-level) counseling, which is a difficult task, contributes to specific conflict constellations which can have an uncontrolled effect on the results (see J ü n g s t & S c h a u d e r, 1978). Nevertheless, a number of methodologically well founded, comprehensive and detailed reports have hitherto appeared on this subject.

F e n d et al. (1976a) mainly investigated variables such as mobility and equality of educational opportunity which are closely associated with the aims of comprehensive school experiments. Samples from the traditional and the comprehensive school system were tested. While this study could also clearly demonstrate the lack of mobility between the various sectors of the traditional school system, it was impressive that there were well institutionalized rises and falls in the flexible system of comprehensive schools, the overall result being in general a gain: thus, it seems that it is only here that the irreversibility of educational decisions based on a point system has been overcome. However, studies by S c h o r b (1977) produced different findings with regard to this problem. He also found greater reallocation rates in comprehensive schools, but it turned out that only a few pupils had reached different course levels at the end of the period covered by the study. Both studies concurred in confirming, however, that the equality of educational opportunity aimed at in the comprehensive system (school career decisions made more in line with pupils' talents) actually is better implemented there: F e n d et al. designed an 'inequal opportunity measure' in which the inequality of educational opportunity specific to social class appears to be considerably reduced, although not completely eliminated, in the comprehensive school system. S c h o r b found a considerably closer relation between achievement expectancy and the kind of school attended than between social class and the kind of school attended, and, like F e n d et al., he discovered that the school leaving aspirations were considerably higher in the comprehensive than in the traditional school system. The comparatively low expectancy for primary school leaving certificates ('Hauptschulabschluß') in the comprehensive school system documents a particularly beneficial effect (aspiration boost) for pupils from the lower and middle classes.

The comparisons of achievement attempted in both studies should, in contrast to the factors mentioned above, not be overvalued as neither achievement status indices (F e n d et al., 1976a) nor testing using norm-oriented test procedures (S c h o r b, 1977) give exact information about the actual current state of pupils' knowledge. Altogether the results can be interpreted in such a way that the increase in learning amounts do much the same in both school systems (see also J ü n g s t & S c h a u d e r, 1978).

F e n d et al. (1976b) and F e n d (1977) tried in further comprehensive studies to establish a number of latent learning processes which reach beyond the results of learning in the specific subjects and can be understood as the consequences of systematically organized learning processes ('hidden curriculum'). In terms of educational politics it is particularly interesting in this context to know whether symptoms of school anxiety and stress can be effectively reduced in the comprehensive school system. Although the hypothesis of a generally lower anxiety level in pupils from comprehensive schools was confirmed empirically, the difference

between them and pupils from the traditional system was due mainly to the lower level of anxiety found in comprehensive school pupils with an average or high achievement status. Children on the lowest level of qualification did not, on the other hand, differ from those in the traditional system. These results of a study on children in the ninth and tenth years of school can also be generalized to include pupils in the fifth to eighth years of school, as is shown by the finding made by S c h w a r z e r & R o y l (1976) in combined longitudinal and cross-sectional studies.

With regard to the problem of dislike of school (boredom with school) which is closely connected with anxiety, S c h w a r z e r & R o y l found a marked increase in values over the period covered by their study only in pupils in the traditional system. The increase was manifested particularly in pupils at 'Realschulen' (secondary modern schools) and 'Gymnasien' (grammar schools). F e n d et al. (1976b) found above all that the attitude to teachers was far more favorable in the comprehensive system and that there was a direct correspondence between the children's wellbeing and their performance.

Specific problems in the comprehensive school system emerged in the group of weaker pupils owing to the fact that they have their whole age group against which to measure their achiements. This could result in a particularly negative self-concept of their own ability (see R h e i n b e r g & E n s t r u p , 1977).

Instruction-oriented studies

Curriculum. Empirical curriculum analyses are in the process of being radically revised. Over the last ten years new developments and adaptations of curricula have become necessary in almost all school subjects. The aim has been to optimize and legitimize the design and implementation of the curricula and give both the power of decision and the scope for direction and control. Owing to the extent of the innovations envisaged, the field covered by these curricular studies is conceived of as being very broad. It includes the reconstruction of processes and the results of decisions on teaching goals, teaching content, and teaching-learning organizations and evaluation forms as well as the planning and direction of curricular processes and the actual dissemination and implementation of curricula (A c h t e n h a g e n & M e y e r, 1971; F l e c h s i g & H a l l e r , 1973). However, the actual performance of empirical curricular analyses is limited to dealing with, and providing solutions for, limited topics using analyses of the functions, conditions, processes, and products of curriculum-specific forms. methods, and media of instruction in order to attain defined curricular goals (F r e y , 1975). Up to now reports based on experience, case studies, descriptions of material, examples of instruction, and documentation of models have been predominant and there have hardly been any systematically controlled (quasi-)experimental analyses. The focus of empirical curriculum analyses (see F r e y ' s summary, 1973) has been on
– the selection, substantiation, classification, and hierarchification of teaching goals (H o r n , 1972)
(for instance, by determination of professional qualifications in the questioning of, and discussion with, users, experts and selected groups of addresses; by qualitative analysis of thinking and learning processes; by working place analyses; by evalution of curricula and existing teaching-learning materials; by documentation of decision processes regarding curricula; by validation of goal hierarchies, 'relevance trees', and preference lists);

— the selection and implementation of curriculum-specific teaching content, teaching methods, and teaching media as well as of teacher competencies (this is the weakest area of empirical curricula research, as regards both quality and quantity, with only a few detailed studies up to now which are limited to case study documentations of the curricular work done by individual project groups);

— the evaluation of curricula and curricular elements (here the discussion has been guided by the controversial search for, and substantiation of, relevant fields of evaluation among normative and summative, micro and macro, external and internal, intra-analytical and inter-analytical approaches in curriculum evalution in the light of the various requirements of a curriculum strategy which is oriented towards modification, development, product or theory. At the counter of this controversy lies the methodological concept of practically based, cooperative action research which touches on central methatheoretical and methodological controversies in the social sciences (for examples of application see M o s e r , 1975; H e i n z e et al., 1975).

Media research. To begin with, instructional media research has concentrated on the design, comparison, and evalution of media taxonomies. The determination of media-specific variables of the organizational and infrastructural conditions of media handling and of their effects on information processing in students and on lesson structure has created a matrix for the design and optimization of instructional media systems and the empirical media research which runs parallel to it (D ö r i n g , 1971). Media research is a broad field which covers the evaluation of the product and development of the following: the use of media packages and integrated media systems within a curriculum segment (particularly in teacher training and in correspondence courses: K a d e l b a c h & R e b e l , 1975); the marketing research of both private instructional media firms or institutes and public radio and TV companies into the software and hardware requirements of prospective media users; studies on statewide transmitted radio and TV courses and radio and TV programs for schools (T u l o d z i e c k i , 1977); basic research on the theoretically significant manipulable function of picture and text variables in verbal learning (B o c k , 1976, 1977).

A series of analyses which are part of the media research program concentrate on questions of text design and reception. In agreement with a large number of American research findings, G r o e b e n (1972) and S c h u l z v o n T h u n et al. (1974), although using different approaches, were able to find the main dimensions of texts which are easily understood (simplicity, organization, conciseness, heightened interest) and made them applicable in optimizing various kinds of texts (L a n g e r & S c h o o f - T a m s , 1976). The working group led by S c h u l z v o n T h u n et al. (1974) put together an empirically tested self-instruction program using these methods. Research interest in this field is now concentrated on establishing more precisely the process motivation and the motivational effects in continuation of the theory approaches represented by R o t h k o p f and B e r l y n e .

Methods of instruction. Empirical instructional research has made several attempts to find concrete indications of the general superiority of one method of instruction over another (frontal instruction, group instruction, pupil-versus teacher-oriented instruction, discovery learning). Comparison of effectivity between individual methods of instruction (for computer-assisted instruction cf. R o l l e t t & W e l t n e r , 1972) have not been very productive as they only

insufficiently take into account the complex relation between pupil input differences and teacher variables, content comparability, actual method implementation and method specificity of instructional goals (A n t e n b r i n k , 1973). Studies which take these problems at least partly into consideration are the following:

R o t h (1971) compared the effects of the methods of frontal, group, and programed instruction on various levels of knowledge and on student satisfaction in sixteen 8th year classes which were matched for test intelligence. E i n s i e d - l e r (1976) investigated the influence of organizer, basic concept, discovery and hierarchical strategies of instruction on short-term learning and memory achievement at various cognitive hierarchy levels (knowledge, application, transfer, analysis, synthesis) and found a number of level-specific aptitude-treatment interactions with various cognitive and non-cognitive student variables.

However, studies which, like the above, explicitly look for aptitude-treatment interactions are rare.

In a pilot study on 368 student teachers M e i s t e r (1974) investigated what influence differences in instruction method (seminar, small group seminar, and individual method of working) have on learning achievement and student satisfaction when at the same time the teacher is changed, and the information given to the students about learning goals and learning success is varied. He too found a number of higher interactions between non-cognitive student and instrumental method variables.

G a r t e n (1977) combined two versions of programed instruction (book versus teaching machine program) with two social situations (individual versus group work). After recording a large number of both dispositional and situation-specific student variables she found a low 'time stability' of aptitude-treatment interactions over 7 performance situations.

Content. General descriptions of instructions which are not specific to content and global assessments of the relevance of the criterion of verbal expressions during instruction are being replaced by several new descriptive approaches. These make it possible to assess the organization, introduction, and distribution of content variables (more specially scope extent, similarity, and subject-matter goals, didactic measures, instructional steps and sequences; D a h l k e , 1977), both in their objective structure and in their subjective use by teachers and students. They are:
— general systems of description in the form of artificial languages (e.g. predicate logic) in K l a u e r , 1974, and S c h o t t , 1975;
— content specific systems of description in the form of linguistic models (e.g. on the basis of the generative transformational grammar model) in A c h t e n - h a g e n - W i e n o l d (1975);
— subjective association matrices of the relative similarity and dissimilarity of concept structures (W e l t n e r , 1973);
— experimentally manipulable inference variables (e.g. reaction time delay) in the reproduction of concepts of varying content similarity (F l a m m e r , 1975).

Teacher behavior, teacher-pupil interaction. Analyses of instruction have mainly been limited to the assessment of teachers and pupils by themselves or by neutral observers in high-inference assessment scales and in questionnaires which approach the process more circumstantially (B a s t i n e et al., 1970; K o c h et al., 1971; D a v i s & V i e r n s t e i n , 1972; M a s e n d o r f & T s c h e r - n e r , 1973, H e i n r i c h , 1974; L a n g f e l d t & F i n g e r h u t , 1975, K a h l , 1977, K a h l et al.,1977).

Thus, following the tradition of L e v i n , L i p p i t t & W h i t e , the group
working with T a u s c h & T a u s c h has developed several bipolar concepts of
educational style (respect versus disrespect; warmth — coolness; sympathy —
antipathy; understanding — lack of understanding; reversibility — irreversibility),
and have designed appropriate assessment scales and used them mainly in process-
process studies (F i t t k a u , 1969; T a u s c h et al., 1969; N i c k e l & F e n -
n e r , 1974; S c h r ö d e r , 1975).

Over and above this there are but few studies on teacher-pupil interaction
(B a u m a n n , 1974), and those there are mainly take over or adapt American
instruments for process-process description (M e r k e n s & S e i l e r , 1978).
(Flanders system used by H a n k e et al., 1973; Medley-Mitzel-Oscar system by
M e r k e n s , no date; the Brophy-Good-Dyad system used by H o f e r et al.,
1978; the Bellack system by R o e d e r & S c h ü m e r , 1976; the Chapple
system used by K e i l , 1973). The independent studies and developments of
methods that should be mentioned are:
— L o u i s ' system of observation (1974), which illustrates the character of the
   process of instruction in a cybernetic model ('circle of differential standards'
   (Differential-Regelkreis)), and developed besides an appropriate observation
   instrument. The aim of her work was to establish a connection between the
   spontaneous flexibility and creativity of students' expressions, and the number
   and complexity of teachers' questions and impulses, the correctness of answers,
   the frequency of corrections by the teacher, linearity in controlling instruction,
   the reversibility of teacher-student relationships and the rigidity of adhering to
   fixed goals of instruction.
— A scheme for content analysis and a system of observation categories set up by
   the A c h t e n h a g e n - W i e n o l d (1975) working group for later analysis
   of videotaped classroom lessons. In the former, the content structure of every
   verbal expression and simultaneously, the direction of interaction between
   teachers and students are recorded. These factors enable one to trace the emer-
   gence of student learning problems, as also the success of learning aids, back to
   the qualitatively and quantitatively variable range of instruction differentially
   assigned to different students (or groups of students).
— A qualitative, ethnographic model for analyzing records kept of periods, which
   H e i n z e (1976) has developed with reference to W a t z l a w i c k ' s ,
   B e a v i n ' s and J a c k s o n ' s communications theory model, and whose
   main dimensions comprise the 'teacher's dominance', 'economy of communi-
   cation', 'universality' and 'integration of contents from the life world'.
— A symbolic, interactionistic framework of analysis with which W e l l e n -
   d o r f (1973) recorded several critical interactions in everyday school life
   (rituals of substantiation and examination), in which, in a ritualized way of
   which the teacher is hardly conscious, the indications and implications which
   are important for the emergence of socially induced behavior expectancies
   (social identity) and for the possibility of satisfying one's own needs (personal
   identity) are expressed.
Recently, interaction systems have been used predominantly in the analysis
of the pre-conditions and effects of teachers' differential interaction patterns
(N i c k e l , 1976) with various kinds of pupils. Elements particularly made use
of here are components of attribution, expectancy valence, person perception,
self-awareness, social judgment, and implicit personality theories on the part of
both the pupils and the teacher (cf. H o f e r , 1976; R h e i n b e r g , 1975,

1977; B o t e r a m , 1976; M a s e n d o r f et al., 1974; M e y e r et al., 1978; K r a m p e n & B r a n d t s t ä d t e r , 1976; D u m k e , 1977).

Assessment of pupils. In general German teachers still use marks from 1 to 6 to grade the written and oral work of their pupils. The implications this kind of assessment can have, both for the individual and for institutions, have long acted as an incentive for research studies of several kinds.

(1) Psychometric analyses of school marks (in standard studies or in experiments) arrive at critical or indeed negative evaluations of the usefulness of marks as an instrument for judging school performance. According to these findings marking by teachers is neither sufficiently objective nor reliable, and the results are neither predictively nor concurrently valid (with school achievement tests for instance) (H e l l e r , 1974).

(2) Interindividual and intraindividual teacher differences in marking regularly show a connection with the kind of school performance being judged (L o h - m ö l l e r et al., 1976), with the characteristics of the pupil being judged, with the subject being taught (M a n d l et al., 1975), and with the characteristics of the class (R h e i n b e r g , 1977) in which the performance of a pupil is assessed (I n g e n k a m p , 1977).

(3) Other points of interest are the functional and cognitive-structural attributes and the capacity for information processing that the teacher, who assesses work done, employs in making the judgment (implicit personality theory, personal constructs, subjective ordering schemata, expectancies, attribution styles), for it is these which determine the selection, the weighting, the evalution, and the relation of judgment variables to each other (K l e i t e r , 1973; U l i c h & M e r t e n s , 1973; H o f e r , 1974; M e y e r & B u t z k a m m , 1975; S c h w a r z e r , 1976; L i e b h a r t , 1977).

The often analyzed weaknesses of the traditional practice of marking, and its well explained sources of error, indicate a number of improvements which consist mainly in the use of more precise items of assessment and of more standardized observation, assessment and test processes (P r o j e k t g r u p p e , 1973; Z i e - l i n s k i , 1973). A particularly important part of this is the development and implementation of a criterion-oriented, formative and summative measure of school performance for optimal control of both instructional progress and individual student advancement in adaptive teaching-learning systems (H o p f , 1975; I n g e n k a m p , 1975). However, criterion-referenced educational measurement and individualized testing both prove to be problematic on conventional norm-oriented, variance-dependent tests which are specific to both population and item parameters, and are based on classical test models (F i s c h e r , 1974). Hence, new test and measurement models (the preference has been for the latent trait model type) have been introduced (G a r t e n , 1976). These innovations will be discussed later.

Pupil-oriented studies

Among the subjects traditionally brought under analysis by European educational psychology belong the design of models for developing and promoting cognitive abilities, the increase of insight sufficient for the improvement of motivation in learning and the prevention and handling of individual learning difficulties. A large number of studies on these subjects has been carried out during the period covered by this review, both under experimental and classroom conditions.

Encouragement of cognitive development. The answer to the question as to how, and to what extent, the cognitive development of children can be influenced by learning processes which are instigated didactically, depends on the preferred theory of developmental psychology (W e i n e r t , 1979). As a result of the influence of the "stage by stage" development models the possibility of furthering mental abilities is commonly viewed with scepticism. Nevertheless, in a discussion of Piaget's concept, A e b l i has relatively exactly described the function of systematic teaching:

'It guides the child in his search for appropriate assimilation schemata; it helps him to bring these into a proper relation to the problem situation; it repeats difficult steps of elaboration until they are consolidated, varies the situation and the operation so as to allow the corresponding structures to become transparent and mobile; it introduces appropriate aids for perception and symbolic representation; and, finally, it gives the child an opportunity to test his ability independently in new circumstances both with objects and with problem situations' (A e b l i , 1977, p. 161; cf. also A e b l i , 1963, 1976).

A e b l i ' s suppositions agree with the results found in most of the empirical studies which have been done. This is true of studies on training with Piaget tasks which aim to accelerate the transition from the pre-operative stage to thinking in concrete operations (A e b l i et al., 1968; R a u h , 1972; S c h m a l o h r & W i n k e l m a n n , 1969; W e i n e r t , 1967), of studies in which the improvement of intellectual performance was aimed at directly (K l a u e r , 1969), and of investigations in which the influence of prompted verbalizations on the performance in non-verbal intelligence tests is analyzed (F r a n z e n & M e r z , 1976), as well as of the effects of attention training with impulsive children and children with learning difficulties (W a g n e r , 1976, 1977; F l o r i n et al., 1978).

The differing effectiveness of various training methods for logical problem solving has been demonstrated in a study by P u t z - O s t e r l o h (1974), in which the effects on problem-solving performance of training in tactics, of strategy training, and of a combination of both forms were compared. Measured against the results from a control group whose members were not trained, it was above all the strategy and the combined training which proved to be superior. The members of the experimental group needed less time, fewer steps for the solution, used fewer 'illegal' solutions to the problems and planned the individual steps of the solution with more forethought.

In this plan of investigation it is, however, unclear what theoretically postulated learning processes were given support and stimulated. Are we faced with the promotion of relatively global heuristic patterns of problem solving or (perhaps additionally) with drilling of relatively elementary operations (cf. S c h e i b - l e c h n e r , 1972)? That basic mental operations can be promoted not only experimentally (on a short-term basis) but also under classroom conditions (on long-term basis) has been shown in extensive investigations done by L o m p - s c h e r and his co-workers in the German Democratic Republic (1975, 1976, 1977).

This research group studied practice in basic operations of analysis and synthesis (e.g. dividing an object up into its parts and putting the parts together to make a whole; sorting out the qualities of an object and relating these characteristics both to each other and to the object; recognizing differences between comparable objects etc.). Apart from these elementary operations, L o m p s c h e r also takes

the following 'procedural qualities of mental activity' into consideration: agility, planning, exactness, independence and activity. The stimulation of such operations and procedural qualities did not take place experimentally and in isolation, but during normal classroom instruction, whose contents and methods were carefully chosen and planned with regard to the aims of the investigation. The findings reported appear promising: 'All the performer groups in the experimental classes profited — even if to a different degree — from the experimental instruction and attained a higher level of mental performance' (L o m p s c h e r , 1975, p. 315).

Although the present studies are far from providing the basis for a consistent theory of mental learning and have not been subject to adequate component-process analysis, the empirical results do nonetheless justify the increasing interest shown by educational psychologists in this subject (cf. L ü e r , 1977; K l u w e , 1978).

Stimulation encouragement of learning motivation. Motives are relatively long-lasting elements of a person's disposition which determine both his actions and his judgments (of values). From the viewpoint of educational psychology, they can be analysed both as circumstantial conditions and as results of the teaching-learning process. Owing to the influence of varying situational factors and to the theoretically predicted curvilinear predictor-criterion relations, generally only low correlations have been found between data on achievement motives, on the one hand, and actual school or study performance on the other (M e y e r et al., 1965; S c h m a l t , 1976). The relations between interest in a subject and learning performance are equally weak (T o d t , 1978). Thus research is at present focussed increasingly on motive-specific interactions of person and situation variables in the classroom (R h e i n b e r g , 1977). The long-term effects which they could be expected to have on the development of individual motive systems have been demonstrated in smaller studies by R h e i n b e r g & E n s t r u p (1977) and K r u g & P e t e r s (1977). These studies both found that pupils in special schools for slow learners had, in contrast to IQ-matched primary school pupils, a better self-concept of their own ability and less test anxiety, and they interpreted this as a peer-group effect. Lastly, the study by K r u g & H a n e l (1976) verifies the possibility and (limited) effectiveness of a systematic program for modifying motives carried out with children in the 4th year of primary school.

Another important part of the work on motivation in schools, which very much takes its lead from Anglo-American research traditions, is the prblem of anxiety. The studies examine, on the one hand, the relation between pupils' anxiety in the general school situation and in examinations, and their school or examination performance and, on the other hand, the possibility of a planned reduction of anxiety at least when its effects are a hindrance and impair performance (F l o r i n & R o s e n s t i e l , 1976; G ä r t n e r - H a r n a c h , 1973; L i s s m a n n , 1976; S c h w a r z e r , 1975; V a g t & K ü h n , 1976; T e w e s , 1971; G i e s e n et al., 1976). In agreement with recent international research, German studies also pointed out a weak negative correlation between anxiety and school performance; however, this depends very much on anxiety-inducing effects of instruction as experienced by the pupils, on the possibility of preparation, on the attitude to achievement situations and on the difficulty of tasks. Systematic desensitization has proved especially useful in the reduction of test anxiety; in this process particular efficacy is at present attributed to cognitive approaches (e.g. P e s t a & Z w e t t l e r , 1977).

Reduction of learning difficulties. Although a relatively large number of individual studies have been published on the analysis and treatment of learning difficulties, it is difficult to assess their scientific and practical value. Differential psychology does not offer a theory of cumulative learning performance and performance deficits, and the differences in pupil's age groups and in the subjects taught, as well as the isolated treatment of highly specific questions, which is the preferred approach in most of the studies, make it difficult to arrive at a theoretical systematization of the present findings. In this point, too, research in Germany is in a similar state as that in other countries (cf. Z i e l i n s k i , 1979). Thus, at present many educational psychologists take a relatively pragmatic approach and concentrate on the development of practical models of diagnosis and instruction therapy (R o l l e t t & B a r t r a m , 1975; K o r n m a n n , 1977).

The so-called underachievement concept poses a particular problem in the field of learning disabilities. The term is used to describe pupils whose performance in some or in all subjects is poorer than would be expected from their intelligence. In Germany, special attention has been paid to pupils who show poor reading and spelling ability despite possessing a level of intelligence which is at least average (legasthenia: A n g e r m a i e r , 1974; V a l t i n , 1974; K o s s o w , 1972). Recently, vehement methodological criticism has been levelled at the concept of underachievement; at the concept in general by W a h l (1975), and at the legasthenia concept in particular by S c h l e e (1976). The dependence of the population to be defined on the kind of predictor, the kind of criterion and the kind of statistical procedures applied, makes the underachievement concept appear as an unstable, fluctuating psychometric creation. This justified methodological criticism should not, however, lead to neglect of the question of the varying differential and situative determinants of success in school (S i m o n s & M ö b u s , 1976; K r u g & R h e i n b e r g , 1979, W e i n e r t & P e t e r - m a n n , 1979).

Methods, models and multilevel-oriented studies

Learning tests. The fact that the predictability of students' achievement differences facilitated by the use of conventional dispositional variables is limited, has led to the trial and validation of learning tests which integrate learning possibilities and performance aids in the test situation and thus come ecologically closer to the school criterion situation (P a w l i k , 1976).

A group working with G u t h k e (1972, 1976, 1978) has been particularly engaged in the development and practical assessment of learning tests. The tests contain items from the Progressive Matrices, for instance, series of digits and word analogies, and generally consist of a pre-test and a post-test with either a shorter or longer period of training (30–360 minutes, with standardized feedback, mental aids, practice runs, etc.) or with normal or experimental instruction in between. The tests are usually administered to children in elementary school. Their results show post-test improvements which are relatively independent of pre-test level, and they make possible a better concurrent predictability of achievement test scores. Performances after training also appear to have a better differential predictive power for pupils who are weak learners; they are independent of background measures, correlate with motivational variables at a level as low as in pre-tests, but at a much higher level with creativity values and experimentally induced school-like learning measures.

Future research will concentrate on theory-oriented analysis of the ecological equivalents of test and learning situations and the matching attributes (design) of the training phase, which up to now have been done by trial and error rather than on the basis of theory decisions (W i e d l & H e r r i g , 1978).

Non-cognitive variables. Now that the dispositionalism versus situationalism controversy has reached Germany, the development of situation-specific processes of motive dispositions is gaining significance in the sphere of motivational variables and is displacing projective techniques or conventional questionnaire methods which assume, at least implicitly, situation-invariant motive structures.

Thus S c h m a l t (1976) has developed a 'structure-matrix' technique for recording achievement-related motive tendencies, which evaluates the answers to a number of questionnaire items on motive-relevant, semi-projective situations for information of motive intensity and extent.

Test models. The limited usefulness of learning-oriented tests for the description of individual learning progress, for the registering of instructional effects and the control of instructional systems, and the discussions on item bias, item-parameter invariance, and criterion-referenced individualized testing (cf. K l a u e r , 1972) have led to the development and improvement of latent-trait test models with one, two or multi-parameter variants for both dichotomous and multiple choice item response forms (F i s c h e r , 1974), with the emphasis still on the R a s c h and the binomial model (K l a u e r , 1972). Examples of application in educational measurement problems have in the meantime been published in the following areas: task-structure analyses and the testing of models of thinking, practice, learning and transfer (F r e y & L a n g , 1973; S p a d a , 1976); deterministic model developments (R e u l e c k e , 1977); selecting items for a conventional test or questionnaire (H e h l & H e h l , 1975); for redesigning existing tests (C o n r a d et al., 1976); mastery testing (F r i c k e , 1972, 1974; K l a u e r et al., 1972); tailored testing (H o r n k e , 1976), and item-bias problems (M ö b u s & S i m o n s , 1976).

Learning hierarchies. Problems in measuring individual change and instructional effects within sequenced teaching units, in explaining differential learning rates and patterns, and in controlling learning transfer within criterion-referenced instruction, pointed early to the significance of the requirements for learning and learning sequences and to their representation as hierarchies in previous knowledge. The methodological implications of their representation (using scalogram, path, cluster and R a s c h methods of analysis) have been discussed in several theoretical papers (K l a u e r , 1974; E i g l e r , 1976), followed up in empirical work (S i m o n s et al., 1975; K l a u e r , 1976) and reviewed in a summary by K l e i t e r & P e t e r m a n n (1977).

Longitudinal studies. The majority of the predictive and explanative studies published up to date bring school performance into an additive-linear, cross-sectional relationship to a number of cognitive and non-cognitive variables of altogether limited predictive power (cf. W i n k e l m a n n , 1971; G a e d i k e , 1974; K r a p p & M a n d l , 1976). In only a few empirical works the differential time-dependent influence of student, home, and peer groups, and of school and instructional variables on longitudinal school and student careers has been simultaneously taken into account and the problems connected with it taken up for discussion.

The Augsburg longitudinal study followed the course of school performance of circa 3000 children from 1967 to 1968 from their first day at school until the transfer to secondary school (4th or 5th year). K r a p p (1973) investigated the school performance of first year pupils in a static regression analysis model of explanation. M a n d l (1975) accompanied the same sample through four

years of school, selected the gainers and the losers by observing trend changes in seven intelligence test repeats and explained the intraindividual change in test results by a number of family and student variables.

Since 1972 the working group 'Bildungslebensläufe' ('School and Study Careers') at the German Institute for International Educational Research (Deutsches Institut für Internationale Pädagogische Forschung, Frankfurt) has been studying 1000 students randomly selected from the 11th class at a Gymnasium (grammar school) during each of four years (1972—1976), is following their continued education until they take up an occupation, and is attempting to relate these careers to a large number of student, home, university and other context variables. However, the data gained up to now have hardly ever been used for longitudinal analysis.

B e d a l l & B o f i n g e r (1975) describe changes in the choice of friendships within 8 periods in time in two differently managed first year classes with the aid of a M a r k o f f model.

Causal models. The cross-sectional versus longitudinal relation of different units of analysis (for example in the achievement process) has in educational psychology often been limited to explorative, soft model building, using data-reduction approaches such as regression, factor or cluster analysis (almost exclusively in the routine form as avaiable in the SPSS). It is only in the last few years that new statistical developments have been taken up and tried out. The use of recursive path analyses for instance (K n i e l & M i t z l a f f , 1972; S i m o n s et al., 1975; B r a n d s t ä d t e r & B e r n i t z k e , 1976) has remained limited to a few outstanding examples. Criticism of the inherent implications of the statistical pre-conditions involved in the routine programs used (generally regression analysis), has not yet been widely accepted, however, and more sophisticated models with more pre-requisites such as confirmatory factor analysis and structural equation models, with multiple indicators, error adjustments, time-lagged variable interdependence and a-priori parameter fixation are still scarcely understood and have not yet been applied (W e e d e , 1977).

Multi-level analysis. Models which seek to explain school performance and learning careers use variables which are assigned to various levels of analysis (individual, classroom, school and context). Problems in relating these variables to one another have been worked on in great detail in educational sociology (H u m - m e l , 1972), but in educational psychology they have only rarely been examined (W e i n e r t & Z i e l i n s k i , 1977) and observed in empirical analyses (E i r m b t e r , 1977). The unit of analysis used is almost exclusively the individual student regardless of the dependency of student data on classroom, school and marginal contextual conditions, all operating at separate levels (T r e i b e r & S c h n e i d e r , 1978).

The problem of the application of educational-psychological research results

In Germany, as in the United States, the question of the practical relevance of educational-psychological research has led to a number of contradictory standpoints that range from extreme caution in the direct application of psychological results in educational practice (W e i n e r t et al., 1974) to the definition of the discipline as a purely technological science (H e r r m a n n , 1979). Apart from

these rather academic discussions on the relationship of theory and practice in educational psychology, there have been many attempts in recent years to improve educational practice more or less directly with the aid of psychological research and/or development work.

Instruction technology, programed instruction, and computer-assisted instruction. It is clear that instruction technology has developed in an area which is relatively devoid of theory, if one disregards the superficial references made to its alleged foundations in the psychology of learning. In general, research took on the task of evaluating apparatus, programs and models which had already been developed. The volumes 'Fortschritte und Ergebnisse der Unterrichts- bzw. Bildungstechnologie' (advances and results in instructional and educational technology) published by R o l l e t t & W e l t n e r (1971, 1972, 1973) provide an excellent documentation of the developments in this field. In past years language laboratories, films and television for schools have after all become widespread in Germany, as elsewhere, and today they play a considerable part in structuring periods. In contrast, programed instruction has not been used in school practice to the extent expected. Although its efficacy, and a generally positive assessment by students have been documented in long-term studies (G o t t s c h a l d t , 1972; K ö b b e r l i n g , 1971), this method of instruction is used only in a limited way and mainly as a complement to conventional teaching methods. The situation as regards computer-assisted instruction is similar (E y f e r t h et al., 1974; F r e i b i c h l e r , 1974).

Behavior modification in schools. Another controversial field for the application of psychological theories in education is systematic behavior modification in schools. As in the United States, these programs are for the most part directed at the modification of students' undisciplined and disrupting behavior and above all techniques of token economies and of contract management, are used in dealing with it (cf. R o s t et al., 1975; P e r l w i t z , 1978).

More recently, however, attention has been paid to the promotion of behavior related to schoolwork and learning (F l o r i n et al., 1978), to making behavior modification part of a general improvement in instruction as a whole (B a r - k e y , 1978), to the relation of the modification of students' behavior to teacher (and parent) training (I n n e r h o f e r , 1974), to the specific treatment of difficulties in learning and performance (L u k a n & B l ö s c h l , 1977), to increased consideration of cognitively oriented programs of self-observation, self-evaluation, and self-verbalization (K r u g et al., 1978; F l o r i n et al., 1978), and to the replacement of material reinforcers by favored activities (K a n e & G a n t z e r , 1977). Thus, besides its corrective function, behavior modification during instruction is also increasingly assuming a preventative function. However, this just serves to show all the more clearly the weak theoretical foundations of the techniques of behavior modification practiced at present.

Teacher training. Many of the programs developed in the United States for modifying teacher behavior have in the meantime been adapted to the German situation and tried out, and have become relatively widespread. These are mainly models of micro-teaching (Z i f r e u n d , 1976; B r u n n e r , 1973) and developments thereof in the form of various mini-courses. While F i t t k a u et al. (1977) offer relatively generalized communication training, B e c k e r (1976) has training programs for different, clearly defined lesson and conflict situations which occur in the teacher's daily routine. A more differentiated approach is that taken by

M i n s e l et al., (1976), who suggest exercises for instruction goals, self-control, guidance, reactions, teaching decisions, and analysis and resolving of conflicts. All these programs are criticized by H o f e r (1977) on account of their deficient theoretical and empirical foundations. He himself, like W a h l (1976), proceeds from the scientific analysis of naive theories which direct and justify the teacher's actions, and transforms a cognitively oriented descriptive model of teacher behavior into a set of instructions which prescribe how the theoretically based teacher training should proceed. Nevertheless, in this attempt too it is unclear what scientific or ideological criteria should be taken as the basis of the alteration of the teacher's (or parents') naive theories, what competencies should be acquired at the same time, and how the external conditions of the educational or instructional situation should be changed if the newly formed behavior of teachers and parents is to be put into practice and maintained in everyday life.

Psychological counseling in schools. The counseling activity of school psychologists is thought by many to be the most important area of application of educational psychology. At present, however, there are only 400 school psychologists working in the Federal Republic. The government is planning a steady growth, so that there should be one school psychologist per 5000 pupils in 1985.

The task of the practising school psychologist consists in providing school, career, and educational counseling, in giving individual aid to children with learning difficulties and behavior disorders, and in advising the school administration with regard to improving the conditions for both socialization and learning in the school system, whether as a whole or in certain sectors. Although this last task is stressed for its importance in connection with the heated public discussion of the heavy demands made on pupils and with the consequent 'school stress', it only takes up a very subordinate part of most school psychologists' available time budget (see A u r i n et al., 1977; S t a r k et al., 1977). Independently of this fact, it must nevertheless be stated that at the present time educational-psychological theories are by no means in a position to justify school psychology counseling in a sufficiently scientific way.

This has led many people to question the empirical and analytical educational-psychological paradigm as such. There are not only the representatives of a neo-Marxist position who do so in reproaching educational psychology as a whole for its "false consciousness", its ideological function and for veiling the true conditions in the fields of socialization and education, but also many subscribers of a hermeneutic, ethnographic and symbolic-interactionistic conception of science. The latter believe that the adoption of socially induced expectancies in behavior, on the one hand, and the possibilities of satisfying needs, on the other, must repeatedly be confronted with one another in conflict situations and balanced out. For this reason, symbolic-interactionistic analyses prefer to work with global concepts such as role distance, tolerance of ambiguity, empathy, identity, communicative competence, self-development and scenic arrangement. The structure of meanings and implications, of one's own and others' interpretations is, in their opinion, not directly approachable, but is expressed in an encoded form in interaction patterns which tend to be ritualized and of which the person using them is only half aware. Their decoding requires not analytical research, but understanding, empathic observation, documentary and hermeneutic interpretation of the educational processes, ethno-methodological and phenomenological reconstruction of interaction patterns, role expectancies, norms and rules in the

context of conflicts which are often suppressed, and attentive working of socio-analytic and psychoanalytic special researcher-client arrangements.

In Germany such positions are represented with more emphasis in educational science (Erziehungswissenschaft) than in educational psychology, where the empirical-analytical research paradigm is clearly dominant. This approach proceeds from the assumption that the description, explanation and optimization of the processes and effects of socialization can only succeed on the basis of inter-subjectively verifiable and empirically valid 'if-then' relations and their cumulative elaboration, nomological integration and technological application. It is symptomatic, and encouraging for future research, that, independently of the societal environment, most educational psychologists and many persons involved in educational practice, both in the German Democratic Republic and in the Federal Republic of Germany, believe that theory-guided empirico-analytical research makes a limited, but important and probably necessary contribution to a clarification and improvement of the educational processes.

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