

TEACCH-based interventions for families with children with Autism Spectrum Disorders: Outcomes of a parent group training study and a home-based child-parent training single case study

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Abstract

Recent guidelines derived from international research literature (Dingfelder & Mandell, 2010) recommend conducting more real-life field studies as a first-step evaluation strategy for bridging the research-to-practice gap in autism intervention. In particular, there is urgent need for more intervention outcome studies for families with Autism Spectrum Disorders (ASD) children in European countries. This paper presents the outcome of two TEACCH-based intervention studies for children with ASD and their parents, carried out in Germany. Both studies aim at examining the effectiveness of TEACCH-based interventions within family settings. The first study, a within-group study, addresses the effectiveness of a three full day, centre-based education and skills parent group training with 23 school-aged children. The second, a descriptive single case study, examines the effectiveness of a medium-intensity TEACCH-based home child-parent program, which additionally included a classroom support component as well as advisory contacts with both health care institutions, and a five-year-old boy over a period of two years. Overall, the outcomes of both studies provide tentative support for the effectiveness and social validity of TEACCH-based interventions in terms of child, parent and teacher outcomes across different settings. For future research into the TEACCH approach, more controlled individual and group research is needed.

Keywords: Family interventions, Autism spectrum disorder, TEACCH approach, Outcome research, Program evaluation

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1. Theoretical background of study 1: TEACCH-based parent group training

Parents of children with autism describe the benefits they can receive such as the gratification they gain as they experience the small steps of improvement in their child's developmental progress or the discovery that through this experience the parents can derive greater meaning from their lives (Marcus, Kuncze, & Schopler, 2005), and not all of these children need professional help. However, there is much evidence from empirical studies that a great number of these parents do face challenges and stress that, on average, accumulates at an intense level (Sanders & Morgan, 1997). The generalized "Double ABCX model" of caregiver coping (Probst, Jung, Micheel, & Glen, 2010; adapted from McCubbin & Patterson, 1982 and Pakenham, Samios, & Sofronoff, 2005) has also proven to be valid in planning and delivering adequate professional support to ASD families (Pakenham *et al.*, 2005). For this model, there is broad evidence from empirical studies that parent training through education and skills interventions contributes to the following: (1) the enhancement of parents' psychological resources, primarily by strengthening the "sense of personal efficacy" (cf. Bandura, 1997) and the "sense of coherence" (Antonovsky, 1979), which refers to the parents' trusting in their own and significant others' abilities for managing the given challenging situations, and experiencing an understandable and meaningful world; (2) the enhancement of social resources, for instance, by learning from other parents how to use community supports; (3) the enhancement of behavioural coping skills, specifically by acquiring parenting strategies and skills; (4) the strengthening of adaptive emotional coping abilities when discussing emotional experiences regarding the child with other parents, possibly resulting in the reappraisal of stress and demands; (5) the enhancement of family adaptive functioning, in terms of reduced parent stress, strengthened parent health, and improved parent-child relationships (Marcus *et al.*, 2005).

Matson, Mahan and Matson (2009), addressing the effectiveness of parent training programs in their narrative review, have summarized that behavioural parent training programs have proven to be an effective, evidence-based methodological approach. Singer, Ethridge and Aldana (2007) come to a similar overall conclusion in their meta-analysis.

The TEACCH approach, emphasizing (a) "structured teaching" based on visual cues (Schopler, 1997), (b) broad-spectrum cognitive-behavioural strategies and (c) close professional-parent cooperation (Schopler, 1997), was selected as a framework for designing the present parent group training program because of its best-practice characteristics discussed in detail in Probst *et al.* (2010) (see also Francis, 2005).

In German-speaking countries, there are a few descriptive and informal studies on the TEACCH approach with children and their families that sug-

gest both the effectiveness and practicability of this method (e.g., Czerwenka, 2008). However, there is a total absence of formal evaluative studies in international journals on the efficacy, effectiveness and social acceptance of TEACCH-based parent training in Germany.

2. Aims of study 1

The present observational within-group study aimed at examining the parent-reported implementation quality, effectiveness and social acceptance of a centre-based education and skills group training program for parents of children with ASD. The hypotheses to be tested include the following: (1) Do parents evaluate the implementation of the group training positively in terms of overall quality, trainer behavior, group atmosphere and manual quality at the end of the group training? (2) Do parents report positive effects of the group training on parenting skills for enhancing the child's educational and behavioural functioning, parental health family's emotional setting at home and transfer onto the child's support system at the three-month follow-up? Specifically, do parents report positive effects of the core training contents on everyday life including: "education in a science-based autism" concept "training in structured teaching strategies", and "participating in communications based on the parent-as-teacher-to-parent" concept (Schopler, 1997) at the three-month follow-up? (3) Do parents report some implementation of structured teaching methods taught in the group training in everyday life at the three-month follow-up?

3. Method of study 1

3.1 *Participants*

A total of 24 parents (83% mothers, 17% fathers, mean age = 39.4, $SD = 9.2$) of 23 autistic children (61% male, mean age = 8.9, $SD = 3.6$) with medically verified diagnoses of childhood autism ($n = 22$) and atypical autism ($n = 1$), and 96% of them attending special preschools and normal schools participated in the parent training in three small groups in three German towns. The sample of parents was recruited with the support of the German Autism Parent Association and its treatment centres, and related welfare services based on the Red Cross and the German Evangelical Church welfare organization, and was organized through a process of voluntary self-selection.

The pre-intervention assessment included a 48-item Parent Stress Reaction to Child's Behavioural Symptoms Questionnaire (adapted from Stone & Hogan, 1993). The five behavioural symptoms that were associated with the strongest parental stress reactions are reported in Table 1.

Table 1 - *Results from the parents' Stress Reactions to Child's Behavioural Symptoms Questionnaire*

Items showing highest stress reactions in parents	2 = moderate stress (%)	3 = high stress (%)
My child lives in its own world, which is difficult for others to reach	17	61
My child prefers to play alone than with other children	35	40
My child has tantrums	22	56
My child is quickly disappointed if unable to express him- or herself	32	42
My child does not do as her or she is told and does not accept rules and respect limits	16	53

Note: Responses scoring on a 3-point Likert scale with 1 = this behaviour causes me no or little stress, 2 = causes moderate stress, 3= causes high stress.

The results in Table 1 indicate that autism-specific behaviours (items 1, 2, 4) as well as unspecific behaviours (items 3 and 5) are stressful challenges for the large majority of parents.

3.2 Intervention

Curriculum: The key curriculum components of the parent training comprise (1) teaching a state-of-the-art concept of autism including causes, nature, life-long consequences of this developmental disability, as well as treatment goals and methods, (2) enhancing parent emotional and cognitive coping abilities by exchanging experiences with other parents about development and behaviours of one's child and sensitizing them to family issues resulting from ASD, and (3) teaching strategies and skills for enhancing the child's development and behaviour management, focusing on the elements of *Structured Teaching* (Schopler, 1997; Probst *et al.*, 2010) including (a) methods of visually structuring the child's environment and establishing behavioural routines, (b) additional antecedent and consequence-based structuring methods, (c) methods of enhancing child's functional communication, pre-academic skills, play skills, daily life routines and self-management skills through the combined use of structuring methodology. The parent training manual which was delivered to parents was structured according to the three goal domains described above and divided into three main parts (Probst, Brakemeier, Faecks, Gewohn, & Jung, 2008).

3.3 Measures

(a) The implementation of the training was assessed at each of the three training sessions by the *Parental Evaluation of Training Sessions Questionnaire*.

naire, a Likert-type 9-item parent questionnaire covering “therapist behaviour”, “emotional group atmosphere” and “overall assessment” on 4-point scales (e.g., “Looking at this Saturday’s session, how satisfied were you with this session overall?” 1 = *satisfied*, 2 = *rather satisfied*, 3 = *rather unsatisfied*, 4 = *unsatisfied*). The questionnaire was completed by all 24 parents.

(b) The effects of the training program on daily family life were assessed at a three month follow-up after completion of the three training sessions (83% return rate) by the 26-item Likert scale *Parental Evaluation of Training Effects on Daily Family Life Questionnaire* (adapted from Mattejat & Remschmidt, 1998) covering aspects of “parenting behaviours”, “parent health”, and “family climate” (e.g., “The parent training has helped me to better control my child’s behavioural problems”, 1 = *I don’t agree*, 2 = *I moderately agree*, 3 = *I strongly agree*). The items assess the change in daily family life and thus can be considered as an implicit and retrospective pre-post assessment.

For the current presentation a representative selection of related items in terms of psychological-educational content were subsumed under the following seven categories (see also Figure 2):

(1) *Improved parental skills* [averaged across items numbered 1, 2 and 3 in Table 9, Probst & Leppert, 2007: (1) “Overall, the parent training has been effective in improving the daily management of my child”; (2) “Parent training has meant that I can better enhance my child’s abilities than before”; (3) “Parent training has helped me to better control my child’s behavioral problems”];

(2) *Improved parental health* [averaged across items 4 and 7, ibd.: (4) “Parent training has had a positive influence on me both physically and psychologically”; (7) “Parent training has lead to a reduction in daily demands and stress”];

(3) *Improved family climate* [item 5, ibd.: “Parent training has had a positive effect on our family atmosphere”];

(4) *Autism concept teaching helpful* [averaged across items 12, 13, 14, 15, ibd.: (12) “Studying the nature of autism was helpful and useful for me and had a positive effect on my everyday behavior”; (13) Studying causes of autism (...); (14) “Studying concepts and treatment goals in rehabilitation of autism was helpful (...); (15) “Group discussion (...) on the sensitization for greater sensitivity to family issues and sibling problems was helpful (...);

(5) *Practical training helpful* [item 16, ibd.: “Practical exercises in parent training on how to organize everyday life (...) were helpful and effective and had an influence on my everyday behavior”];

(6) *Parents as teachers to parents” helpful*: [averaged across items 10 and 11, ibd.: (10) “The other parents (...) were important “teachers for me”; (11) “The exchange of experiences with other parents was helpful and had a positive effect on my everyday behavior”].

(7) *Transfer to child support team* [item 9, ibd.: “I was able to pass on ideas from the parent training to other members of my child’s support team (teachers etc.)”].

(c) The outcome of the training was also assessed by a semi-structured 8-item *Home Diary Experience Questionnaire*. Parents were asked to report on the implementation of *Structured Teaching* methods that had been taught in the parent group training in everyday life. The eight items referred to “physical organization”, “schedules”, “work and learning systems”, “task organization”, “behavioural prompts”, “behaviour shaping”, “consequence-based methods”, and “language, communication and social skills enhancement methods” (cf. Probst *et al.*, 2010). This questionnaire was completed by 16 parents at the three month follow-up, which is a return rate of 65%. The contents of the questionnaire were scored on a 2-point rating scale with 1, if parents reported the implementation of at least one *Structured Teaching* method over four or more weeks in a comprehensible and detailed manner, otherwise with 0.

3.4 Procedure

The group training programs were conducted in small groups in three German towns in rooms belonging to the local autism health care centres. The training comprised three sessions, one per month, lasting a full day each. The three small groups contained 12, 8 and 3 parents, respectively. The teaching methods used included video and in vivo modelling, group discussion, and assignment of homework. The trainings were performed by two professionals, the first author (P. P., licensed clinical psychologist) and a master-level psychologist, both trained in TEACCH and related methods of contemporary ABA. All parents participating in the group training utilized the local autism health care centres. The therapists who performed the parent trainings routinely exchanged information about course and contents of the training with the staff of the local autism centres at regular intervals.

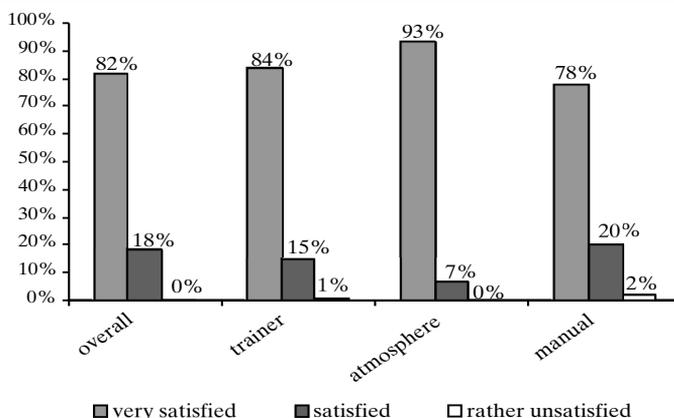
3.5 Data analysis

Quantitative questionnaire data were analyzed with SPSS (version 15). Qualitative verbal data were analyzed by using summarizing and categorizing techniques of “Qualitative Content Analysis” methodology described by Mayring (2000).

4. Results of study 1

(1) *Parental Evaluation of Group Training Implementation Questionnaire*: The results, summarized in Figure 1, show that the training implementation was evaluated positively regarding overall quality, trainer quality, group atmosphere, and parent manual quality by almost all parents.

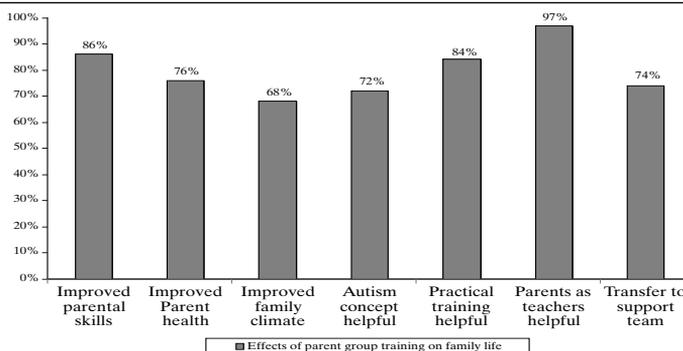
Figure 1 - Results of the parent's evaluation of the training implementation Questionnaire



Note: The y-coordinate describes the percentage of evaluative parent responses (averaged across 3 sessions); the x-coordinate includes the evaluative categories.

(2) *Parental Evaluation of Training Effects on Daily Family Life Questionnaire*: The parents' evaluation of the training effects on daily family life three months after the completion of the training is presented in Figure 2. It shows that the vast majority of about 70 to 90 percent of parents evaluated the training outcomes positively. They reported beneficial effects on parental skills, parent health, and family atmosphere. In addition, both components of the group training, autism concept education and practical skills training were evaluated as helpful and effective. Finally, some positive transfer of concepts taught in the group training to members of the child's report team was reported.

Figure 2 - Results of the follow-up "Parent Evaluation of Training Effects on Daily Family Life Questionnaire"



Note: The y-coordinate describes the percentage of parents evaluating the effects of the parent group training as "moderately" or "strongly positive" (with scores of 2 or 3 on the 3-point Likert scale); the x-coordinate includes seven categories of reported effects on daily family life (see also section 2.3 above).

(3) *Home Diary Experience Questionnaire*: The protocols from this instrument contained a detailed description on how the methods presented in the trainings, such as “implementation of daily schedules”, were put into practice. 12 of 16 responding parents reported one or more implementations of structured teaching methods in everyday life. The most frequently reported methods included “schedules”, “physical organization” and “task organization”. Overall, there was a high consistency between the answers in the Follow-up questionnaire and the reports in the Home Diary Experience Questionnaire.

5. Conclusions of study 1

In the current study, the effectiveness and social validity (Foster & Mash, 1999) of a TEACCH-based education and skills group training for parents of children with autism were evaluated.

Overall, both child- and parent-related positive effects of the group training on “real family life” at a 3-month follow-up were reported by the large majority of about 70-90 percent of parents. These results of the first formal TEACCH-based parent group intervention evaluation in the German sociocultural setting suggest an implicit pre-post effect of the training and are consistent with those of evaluation studies on autism group parent trainings from Bernard-Opitz and Kok (1992), Harris (1986), Schopler, Mesibov, and Baker (1982), and Panerai, Zingale, Trubia, Finocchiaro, Zuccarello, Ferri and Elia (2009). Further, the findings are congruent with those of a TEACCH-based teacher group training study, conducted in German special schools for children with intellectual and developmental disabilities, showing positive effects on pupil symptom behaviours, teacher-pupil interaction behaviours, classroom atmosphere, and teacher health and stress levels (Probst & Leppert, 2007, 2008).

Regarding social validity, the result of the overall positive acceptance of the concept, method and effect of the training program by parents is consistent with a large-scale study by Schopler *et al.* (1982) conducted in the USA suggesting that a significant percentage of parents are adequately motivated to participate in parent education and training, and to assume facilitator roles.

However, in the interpretation of the results, limitations to the “experimental validity” (comprising *internal* as well as *external* validity) must be taken into consideration.

The internal validity is constrained by the absence of a control group and formal pre-assessment measurement, and also by the limited range of the outcome measures focusing on parental reports. The external validity is limited because the study was carried out on a convenience sample, which was comprised of self-selected, voluntary participants.

In spite of these methodological limitations, which are common to real-life evaluative pilot studies, this study provides some evidence that a low-intensity and low-cost intervention as shown in the present group parent program meets some needs and capacities within the current health care setting in Germany, in particular, when considering the situation that many autism treatment centres currently fail to provide group parent training or related family interventions as standard operating procedures.

The group training could be provided as a middle-level intervention within a graded multiple-level family intervention continuum reaching from low-level parent interventions including low-threshold contacts to high level interventions including individually provided comprehensive parent and family support (cf. Schopler, 1997; Sanders, Mazzuchelli, & Studman, 2004).

6. Theoretical background of study 2:

Outcomes of a home-based child-parent intervention

A significant number of parents of children with Autism Spectrum Disorders and related disabilities need individualized in-home intervention with professionals modelling parenting skills, giving feedback and individual directions to parents, and advocating parent interests in school and other community fields. Home programming is considered a cornerstone of the TEACCH program, where parents are supported to serve as their child's "co-therapist" as informed and skilled parents (Ozonoff & Catheart, 1998). The therapist's role is characterized by (a) a "generalist" orientation, that means avoiding too much concentration on single aspects, forcing professionals to see children the way their parents do, and *not* unduly influenced by narrow parameters governing their professional disciplines (Mesibov, 1994), and (b) a "holistic" approach, which means over-all attention to the person as a "whole" entity rather than fragmenting the individual into arbitrary categories such as speech, behavior, and social skills (cf. Mesibov, 1994; Schopler, 1997). Conceptual and procedural transfers from home intervention to classroom are of paramount importance for the child (cf. Marcus *et al.*, 2005).

7. Aims of the study 2

The present descriptive multiple-level single subject study with a 5-year old child (M) with child autism aimed at examining the effects of a TEACCH-based home programming intervention on child, parent, teacher, and health professional outcomes. The child-related hypotheses to be tested included improvements in (1) task behaviour, (2) language and

communication skills, (3) play skills, (4) pre-academic and self-management skills, (5) developmental functioning in family, and (6) developmental functioning in the classroom. The parent-related hypotheses to be tested included improvements in (1) implementation of structured teaching in the family, (2) acquisition of an individualized concept of autism and (3) overall positive program acceptance. The teacher-related hypotheses to be examined comprised (1) the enhancement of implementation of structured teaching in the classroom and (2) acquisition of an individualized concept of autism. Finally, the health professional-related hypothesis addressed the provision of formal social support for parents and classroom teachers.

8. Method of study 2

8.1 Participants

The subject of the home programming was a boy (M), aged 5, with a medically confirmed diagnosis of child autism (WHO, 1992: ICD-10). M was living with his parents and his typically developed 1 year-old sister in Hamburg, Germany. M's mother and main caregiver, aged 25 was of German origin, M's father, aged 29 was Russian. M was referred to the ASD research unit (Department of Psychology, University of Hamburg) by the community mental health service due to severe behaviour problems in preschool, in particular physical aggression against other children, temper tantrums and lack of compliance. The present in-home training, extending over a period of 22 months, was performed by the first author (P. P.). The intervention was partly funded by the parents' health insurance company. The *diagnostic assessment* of M at the beginning of the intervention included (a) autism symptoms, (b) language functioning, (c) cognitive functioning, and (d) social functioning.

(a) *Autism symptoms*: In the Autistic Diagnostic Interview-Revised (ADI-R, Lord *et al.*, 1994; Bölte, Rühl, Schmötzer, & Poustka, 2006), M scored above the autism cut-off on all four scales: social interaction = 27 [cut off = 10], communication = 14 [cut off = 7], stereotypes = 5 [cutoff = 3], and abnormal early development = 5 [cut off = 1].

(b) *Language functioning*: Information from different sources including the Munich Functional Developmental Scales (Ernst, 2010), mother-reported qualitative information from ADI-R, preschool teacher report, and in-home therapist behavioural observation, consistently indicated severe deficits in the verbal domain, both in expressive and receptive language functioning, with developmental ages of 13 and 18 months, respectively. His percentile score of 2 in the Peabody Picture Vocabulary Test (Dunn & Dunn, as cited in Bondy, Cohen, Eggert, & Lürer, 1992) based on a reference group of children with intellectual disabilities, was congruent with these findings.

M was raised bilingually (German and Russian). No use of spoken language was observed at age 5; 6. There was no naming, no functional verbal communication and only sporadically immediate echolalia of syllables or single words. Vocal expressions including song-like, mostly high-pitch, sequences of sounds were observed frequently, for example when playing with puzzles.

(c) *Cognitive functioning*: M's percentile score of 99 in Raven's Coloured and Progressive Matrices (Raven, as cited in Bondy *et al.*, 1992) and his percentile score of 62 in the Columbia Mental Maturity Scale (Burgemeister, Blume, & Lorge, as cited in Bondy *et al.*, 1992) based on an intellectual disability norm group, indicated a comparatively higher ability in visual-spatial reasoning.

(d) *Social Functioning*: His social developmental age of 18 months in the Munich Functional Developmental Scales indicated severe deficits in social functioning, as is indicated consistently by the ADI-R and teacher reports.

8.2 Goals, conceptual framework and intervention methods

Intervention goals: The goals for M comprised four domains (1) *child-centred* goals of enhancing M's (a) language and functional communication skills, (b) pre-academic and play skills, (c) social and emotional functioning in family, preschool and primary school; (2) *parent-centred* goals of (a) enhancing structured teaching skills (focusing on mother, the main care-giver), and (b) establishing an adequate individualized autism disability concept; (3) *teacher-centred* goals (a) of enhancing M's inclusive classroom adaptation, which included supporting his transition from preschool to primary school and later from primary to secondary school, and (b) establishing an appropriate individualized autism concept for him; and (4) health-professional-related goals of providing formal social supports for M in family and classroom.

Conceptual framework: Overall, the in-home intervention program was conceptually based on methods of Structured Teaching and the principle of establishing excellent professional-parent cooperation and considering parents as powerful agents for promoting and managing their child (Probst *et al.*, 2010).

Methods of intervention: The overall intervention comprised child, parent, teacher-related and health professional-related methods.

(a) The *child-related* intervention methods included (1) *Visually Structuring* M's home environment, for example by providing a clearly designed workplace area, and a picture schedule indicating the sequence of events during the home session, (2) *Vocal Imitation Language Training* (conducted during months 5 to 7 of intervention), in which the child was supposed to repeat simple vocal expressions (vowels, syllables, single words) presented by therapist or mother, (3) *Object Naming Language Training* (months 9-10), in which the child was supposed to name daily life objects, such as "dog" or "ball" presented on pictured cards by the therapist or mother (4) *Functional Communica-*

tion Training (months 11 to 20), in which the child was taught to use nonverbal and verbal functional communication spontaneously. For example, M was taught to use pictorial “request cards” containing a pictured glass of juice or pictured crackers for requesting a drink or crackers; later he was taught to replace the request cards by the verbal expressions of “want drink” or “want crackers”, (5) *Play Skills Training* including closed-ended functional play (e.g., puzzles, form boards, sorting and assembling tasks), open-ended functional play (e.g., playing a rhythm instrument), closed-ended cooperative play (e.g., animal picture Lotto, Memory, card games), symbolic play (e.g., watching a picture book and commenting, playing and talking with a toy animals; for taxonomy, see Quill, 2000), (6) *Pre-Academic and Self-Management Skills Training* including categorical and numerical matching, and copying tasks conducted within the context of visually cued routines of Work and Learning Systems (see Probst *et al.*, 2010, Table 1).

The training elements (2) to (6) were based on *Structured Teaching* methods of visually cueing, physical, gestural, and verbal prompting, instruction, behavioural shaping and material and social reinforcement (mostly by small snacks, applause and praise).

(b) The *parent-related* intervention methods included (1) “Parent Education” regarding an adequate concept of autism, individualized for M, by providing information and discussion, (2) “Parent Teaching” about how to design and implement methods of Structured Teaching, including instruction, discussion, assigning home-work and giving feedback, (3) “Parent Teaching” on how to carry out Skills Trainings such as Vocal Imitation Language Training, Object Naming Language Training, and Functional Communication Training, including using instructions, modelling assigning homework, and giving feedback, as well as homework comprising conducting and documenting training activities, whereby parents were asked to do exercises with the child for a maximum of 10 minutes per day, three to five days per week, and finally (4) “Broad-Spectrum Parent Counselling” and support during in-home sessions, based on the principles of client-centred listening and responding.

(c) The *teacher-related* interventions comprised (1) school visits with participation in classroom activities and teacher conferences, and (2) information by providing printed and video materials on autism issues.

(d) The *health professional-related* interventions based on contacts with a paediatrician, a health insurance authority, social security office, and school board, including (1) authoring reports from experts on M, (2) participation in conferences, and (3) information exchange via written and phone correspondence.

8.3 Measures

The instruments used for program evaluation measured child-, parent-, and teacher-related outcomes are summarized in Table 2.

Table 2(a) - Home programming pre/post outcome measurement instruments

Measures
<i>Child-related measures</i>
(1) <i>On-task and Vocal Stereotypic Behaviours Observations</i> : Behavioural samples were drawn from video recordings of in-home sessions during the first (Pre) and last third (Post) of the intervention. The child's behaviours observed during typical play and preacademic activities included (a) off-task behaviour including inattentive and restless behaviours such as fidgeting, leaving one's place, and gaze aversion, and (b) vocal stereotypes, which mostly had the form of sing-song-like vocalizing. Percentage scores were calculated for both behavioural categories from the number of intervals in which the target behaviour occurred, divided by the total number of observational intervals.
(2) <i>Vocal Repeating Language Skills Inventory</i> including 25 items including vowels and syllables, such as "a", "mu", "bebe", "ola", "mama", "bepo". All items were presented orally by therapist or mother in each trial. Scoring was 1 = <i>correct repeating</i> , 0 = <i>incorrect or no repeating</i> . A sum score was calculated. This inventory was completed at Pre (at month 3 of the in-home intervention = <i>beginning of the vocal training</i>) and Post (at month 7 = <i>end of the vocal training</i>).
(3) <i>Object Naming Language Skills Inventory</i> including 33 items of daily life objects, such as car, ball, ship, and knife, corresponding to 33 picture cards including these objects. Scoring was 1 = <i>correct response</i> , 0 = <i>incorrect or no response</i> . A sum score was calculated. This inventory was completed at Pre (at month 9 = <i>beginning of the naming training</i>) and Post (at month 11 = <i>end of the naming training</i>).
(4) <i>Spontaneous Functional Communication Skills Inventory</i> including 9 items reflecting categories of functional communication (adapted from Watson, Lord, Schaffer & Schopler, 1989) such as "Requesting", "Getting attention", "Rejecting", "Giving information", "Commenting", "Seeking information", "Greeting", "Saying Hello", "Thanking". Each item was scored by therapist on a 2-point rating scale with 1 if the communicational modality was reported by parents and observed by therapist, otherwise 0. A sum score was calculated. This inventory was completed at Pre (at month 12 = <i>beginning of the communication training</i>) and Post (at month 22 = <i>end of the communication training</i>).
(5) <i>Child-related Qualitative Verbal Information Collection</i> was based on (a) mother diary reports; (b) therapist in-home session logs taken from session notes, memory minutes, and video records, (c) therapist notes based on phone and letter correspondence with parents and teachers, and (d) teacher reports including information about M's behaviours within the family and the classroom. Child-related qualitative data were collected during all intervention activities.
<i>Parent-related measures</i>
(1) <i>Implementation of Structured Teaching Strategies in Everyday Family Life Inventory</i> including 11 items (adapted from Schopler, Mesibov, & Hearsey, 1995; Bregman, Zager, & Gerdtz, 2005), reflecting five "Visually Structuring" methods and six "Further Components of Structured Teaching" (cf. Probst et al., 2010, Table 1). Each item was scored by therapist on a 2-point rating scale with 1 if parents reported implementation of a strategy over more than 4 weeks and the therapist observed the implementation in life-situations or from parent video records. A sum score was calculated. This inventory was completed at Pre (at month 1 = <i>beginning of home-based training</i>) and Post (at month 22 = <i>end of the home-base training</i>).
(2) <i>Parent Concept of Autism Quality Inventory</i> included the 5 items (1) Knowledge about defining symptoms of autism and insight into specific deficits and strengths of M, (2) adequate knowledge of causes and consequences of autism, (3) adequate self-efficacy and control beliefs regarding behavioural management and development enhancing in M and gaining social support for M, (4) insight into specific needs of M relating to family and school life, and (5) realistic cognitions on future development and psychosocial prognosis of M. Each item was scored by the therapist on a 2-point rating scale with 1 if oral discussions or written parent reports reliably indicated advanced knowledge and insight on the current topic, otherwise 0. A sum score was calculated. This inventory was completed at Pre (at month 1 = <i>beginning of the home-training</i>) and Post (at month 22 = <i>end of the home-training</i>).
(3) <i>Parent-related Qualitative Verbal Information Collection</i> was based on therapist session notes and therapist-parent correspondence. It included information on parent experiences and behaviours. Parent-related qualitative data was collected during the whole course of intervention.
(4) <i>Parent Treatment Evaluation Questionnaire</i> (adapted from Matthejat & Reimschmidt, 1998). The questionnaire contained 21 Likert items on a 5-point scale, for example "The treatment was helpful for my child" (from 0 = <i>I disagree strongly</i> to 4 = <i>I agree strongly</i>), from which two scales were derived: "Perceived Effectiveness of the Program" and "Perceived Parent-Professional Relationship Quality". This questionnaire was completed by mother at Post-occasion (after month 22 = <i>end of the home-training</i>).

Table 2(b) - *Home programming pre/post outcome measurement instruments*

Measures
<i>Teacher-related measures</i>
(1) <i>Teacher Implementation of Structured Teaching Strategies in Classroom Life Inventory</i> was structured similarly to the corresponding parent instrument described above. Each item was scored with 1 if teachers reported implementation of a strategy over more than 4 weeks and the therapist observed the implementation in classroom life-situations. A sum score was calculated. This inventory was completed at Pre (at month 18 = beginning of primary school contacts) and Post (after month 22 = end of the home-based training).
(2) <i>Teacher Concept of Autism Quality Inventory</i> included the 3 items (1) State-of-the-art knowledge of causes, nature, and educational consequences of autism, (2) insight into specific deficits, strengths, needs, and psychosocial prognosis of M, and (3) high self-efficacy and control beliefs regarding education and behavioural management of M. Each item was scored by therapist on a 2-point rating scale with 1 if the item could be confirmed positively on the basis of therapist notes relating to therapist-teacher interactions, otherwise 0. A sum score was calculated. This inventory was completed at Pre-occasion (at month 18 = beginning of primary school contacts) and Post-occasion (after month 22 = end of the school contacts).
(3) <i>Teacher-related Qualitative Verbal Information Collection</i> was based on therapist notes and therapist-teacher correspondence. It included information on teacher experiences and behaviours in the classroom. Teacher-related qualitative data was collected from all classroom and school contacts.
<i>Health professional-related measures</i>
Health professional-related <i>Qualitative Verbal Information Collection</i> comprising therapist-health professional correspondence, therapist notes, parent reports on health professional contacts, and therapist expert reports.

Follow-up measures: The measures used at Follow-up 1 (M aged 15;8) included (a) Autism Diagnostic Observation Schedule (ADOS, Lord *et al.* 2001; Rühl *et al.* 2004), (b) Wechsler Intelligence Test for Children (WISC-IV) (German form: HAWIK-IV, Petermann & Petermann, 2008) and (c) qualitative verbal information based on therapist-parent contacts. The measures used at Follow-up 2 (M aged 17;5) included (a) qualitative verbal information based on informal interview and mail correspondence with mother, and (b) school reports.

8.4 Procedure

Each in-home session lasted 3 hours on average, and was subdivided into 2 sections. In section 1 (2 to 2.5 hours including breaks), the therapist in the main part interacted with the child doing developmental assessment tasks, play skills training, language training, pre-academic skills training and related activities, while his mother observed the activities in the background. In section 2, the therapist focused on parents (mostly the mother) by discussing broad-spectrum child, family and school issues, giving feedback on homework, and giving instructions for parental behaviours, while M was doing activities alone such as watching videos or doing puzzles.

Interventions with teachers and related professionals focused on providing information on causes, nature, and educational consequences (in particular Structured Teaching) of autism, and discussing developmental,

educational and social issues relating to M and his family. Classroom visits lasted 3 to 5 hours.

The sum of intervention activities over 22 months amounted to about 100 hours, including (a) 20 in-home parent-child assessment and intervention sessions, 3 hours per session (60 h), (b) broad-spectrum parent counselling by phone and written communication (10 h), (c) interactions with M's classroom teachers via classroom visiting contacts and mail correspondence (15 h), and (d) interactions with health care professionals (15 h).

Aftercare and follow-up activities: After the termination of the 22-month home programming intervention (M aged 7;4) contacts between therapist, and parents, teachers and health professionals, were maintained and took place sporadically, predominantly "on demand" from parents, such as in supporting the transition from primary to secondary school (M aged 11;0), providing reports from experts for determining the "level of care" for M (M aged 16;6), utilizing expert opinion to influence the family's decision to move to a larger apartment with separate rooms for M and his younger sister (M aged 16;10), and also to support M's transition from secondary school to a sheltered vocational facility (M aged 17;6). The formal follow-up assessment at age 15 took place at the ASD unit at the University of Hamburg. The informal assessment at age 17 was conducted via phone and email correspondence between therapist and mother.

8.5 Data analysis

For the data analysis of video-based child behavioural observation, "one-zero sampling" (Martin & Bateson, 2007) was used, in which an observational interval is scored if a defined behaviour occurs at any point during a specified time interval (15-seconds). Qualitative verbal data was analyzed using methods of categorizing and summarizing described by Mayring (2000).

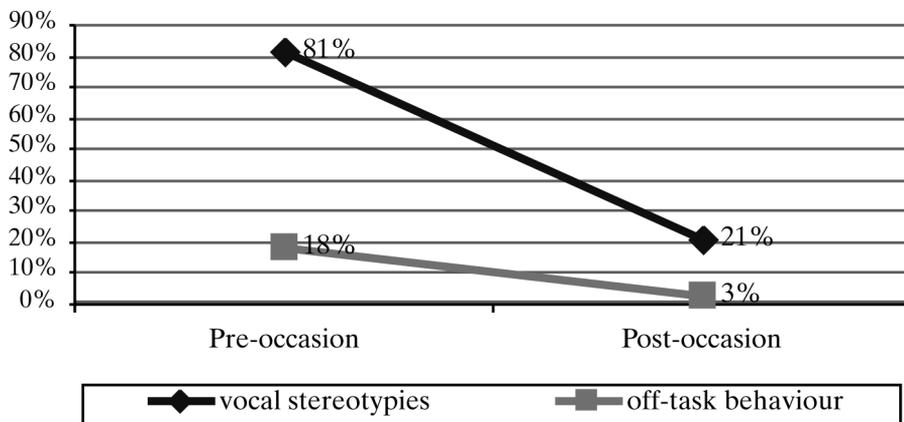
9. Results of study 2

9.1 Child outcomes

In the following, the results of child outcomes for the 22-month home program intervention are summarized.

(1) *On-task behaviour:* The systematic behavioural observation showed that M's frequency of stereotyped vocalizations during play and pre-academic activities decreased from an initial high level of about 80% during the first third of the home intervention sessions to about 20% during the last third of intervention. Similarly, off-task behaviours clearly decreased. (see Figure 3).

Figure 3 - *Outcomes of on-task and stereotyped behaviour observations during therapy session*



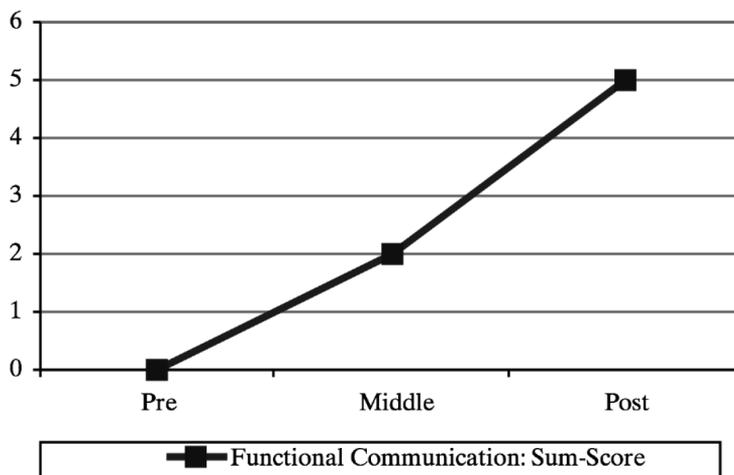
Note: The y-coordinate represents the percentage of intervals in which the specified behaviours of “vocal stereotypies” and “off-task behaviour” occurred at “Pre-occasion” and “Post-occasion”.

(2) Language and Communications Skills:

(2a) *Vocal Repeating Skills Inventory*: Results indicated improved skills with an increase from 4% percent of correct responses (sum score = 1) at Pre to 100% (sum score = 25) at Post (the end of the vocal training), with a transfer of prompting from therapist to mother.

(2b) *Object Naming Skills Inventory*: Results indicated improved skills with an increase from 0% (sum score = 0) at Pre to 100% (sum score = 33) at Post (the end of the naming training), with a transfer of presenting the cards from therapist to mother.

(2c) *Spontaneous Functional Communication Skills Inventory*: At Pre no functional language communication was observed (sum score = 0). In the course of the communication training, M began using spontaneous functional nonverbal communication, at first with holding up his pictured “I want salt crackers-card” for requesting; later, he increasingly used functional verbal communication. At the end of this period, M spontaneously and reliably used the following five verbal communication categories (a) “Requesting”, e.g., “want apple” or “want Simba” (the Lion King video, expressed first in Russian, then in German), “I like better”, (b) “Rejecting/ Refusing” (“No!”, “Stop it”); (c) “Saying hello”, (d) “Saying good bye”, and (e) “Saying thanks”. At the Post the sum score = 5 (Figure 4), M also generalized these skills to preschool classroom. These findings are confirmed by therapist notes, parent diaries, and preschool teacher reports.

Figure 4 - *Outcomes of the Functional Communication Training*

Note: The y-coordinate represents the sum score of functional communication categories used by M; the x-coordinate represents the occasions of "Pre", "Middle" and "Post" assessments for the communication training (cf. Table 2).

(3) *Play skills*: Evidence of M's expanded play skills from functional play alone (e.g., puzzle) to cooperative/ social play (e.g., playing animal memory game with therapist or parents) and elementary symbolic play (e.g., using animal toys) is extensively shown in both informal therapist and parent reports.

(4) *Pre-academic skills and self-management competencies*: Evidence for increased pre-academic skills in copying, sorting, numbering, matching, numerically and semantically categorizing, and managing skills was broadly found in informal therapist and parent reports. For example, M was able to do pre-academic tasks (e.g., copying, semantic-categorical matching) independently and alone on his work-place for 30 to 60 minutes, following a pictorial four element "Work and Learning System" informing the child of what is expected of him in work activities (cf. Probst *et al.*, 2010, Table 1, p. 144).

(5) *Developmental functioning in the family*: According to parent reports (M aged 6;7 to 6;9) M showed improved compliance with verbal directions, increased social play with the younger sister (e.g., hide and seek), use of reconciliation gestures, seeking and accepting consolation when in pain, attempts to draw attention to objects and events that interested him by using a pointing gesture, increasing tendencies to sleep in his bed alone instead of coming to parents during the night; increased independence at the playground.

(6) *Developmental functioning in classroom*: According to (1) inclusive preschool teacher reports (M aged 6;7-6;11) M took part in group activities and played with other children more often, and showed less aggressiveness. (2) Classroom visit notes and primary school teacher reports (M aged 7;

0-7;6) suggested that M (a) sought and appreciated contacts with pupils and, in particular, with teachers and very often (b) achieved learning progress in many small steps. For example, in phonetic reading, naming pictures, copying words and increasingly using spoken language for communicating requests (“Please I want x”, “Please I like better x”), (c) made efforts to identify regularities and participate in shared activities, and (d) profited from using visual schedules and activity plans.

To summarize, evidence of improved child functioning came from multiple sources, such as therapist, teacher, and parent’s reports, as well as multiple measurement methods including systematic behavioural time sampling, quantitative training outcome inventories, and qualitative-verbal data collections. The results are consistent over different developmental domains, thus indicating improvements in language and communication skills, play and pre-academic skills, and self-management abilities, as well as enhancement of emotional and social functioning.

9.2 Parent outcomes

The results of parent outcomes for the home program intervention are summarized as follows:

(1) *Implementation of Structured Teaching Methods Inventory*: Results indicate that at Post 7 of 9 *Structured teaching* strategies were implemented reliably: Physical Structure, Daily Schedule, Work & Learning System, Concise Directions, Prompting, Consequence-Based Methods (reinforcement), and Language and Communication Skills Training; at Pre no strategy was implemented.

(2) *Parent Autism Concept Quality*: Results indicate a score of 5 (maximum) at Post-occasion reflecting mother’s adequate cognitions, attitudes and expectations relating to autism and resulting consequences for M. For example, she contradicted her mother strongly, who blamed her for having caused M’s problems by parenting faults. Further, she took much effort to place M as disabled child in an inclusion classroom and finally was successful. At Pre-occasion, mother attained a score of 2 reflecting self-blaming and less optimistic attitudes relating to M’s school transition.

(3) *Program evaluation on the basis of the Parent Treatment Evaluation Questionnaire*: The program outcome was rated “very positively” by the mother with a score of 4.0 on the “effectiveness scale”. Similarly, the professional-parent relationship was rated very positively, with a score of 3.9 on the “intervention process scale”.

In sum, evidence of improved parent functioning comes consistently from two outcome sources, reflecting the adoption of both a functional autism concept most helpful for promoting M and advanced skills of implementing *Structured Teaching* methods in the Family. Further, the process as well as the effects of the home programming intervention was evaluated very positively.

9.3 Teacher-related outcomes

The following results of teacher outcomes resulting from extending the home program to school can be shown:

(1) *Teacher Implementation of Structured Teaching Inventory*: Results from the Inventory indicate that at Post, 5 of 9 structured teaching strategies were implemented explicitly and reliably: Physical Structure in classroom, Picture Schedule, Concise Directions, Prompting, and Consequential Methods (e.g., contingent praise, applauding). According to M's classroom teacher, the implementation of a daily schedule was extremely helpful for his orientation. It contained picture symbols of various activities in the classroom. For example, it enabled him to stay more patiently in line among other pupils and wait for preferred activities such as working on PC; at Pre 3 strategies were implemented.

(2) *Teacher Autism Concept Quality Inventory*: Results indicate a score of 3 (maximum) for M's classroom teacher meaning that the classroom teacher showed good autism concept quality, which included high self-efficacy and control beliefs regarding M. Concepts from the autism parent group training manual (Probst *et al.*, 2008) and corresponding model video material were integrated into the individualized education plan for M. M was continuously supported in the inclusion classroom, which included 17 normally developed children and 3 children with disabilities, by a semi-professional assistant who worked with him in a one-to-one setting and joined him for activities in groups. M's tendencies of rigid and compulsive behaviours were counteracted by proactive communication strategies by which future events (e.g., excursions) were made as predictable as possible. At Pre the teacher attained a score of 2 reflecting somewhat lower self-efficacy and control beliefs.

To summarize, evidence of improved teacher functioning comes consistently from both outcome measures revealing the existence of a beneficial autism concept as well as enhanced skills of implementing *Structured Teaching* appropriate for M in the classroom.

9.4 Health-professional related outcomes

Results from health professional related measures suggest that therapist expert reports and additional therapist-health professional interactions contributed to the provision of social support in the form of (a) giving health insurance and social welfare benefits to the family, (b) assisting parents in school placement issues, such as transition from preschool to primary school, and (c) allocating full-time inclusion classroom aid for M in primary school.

Overall, there is evidence of positive effects of therapist-health professional interactions on family and classroom environments.

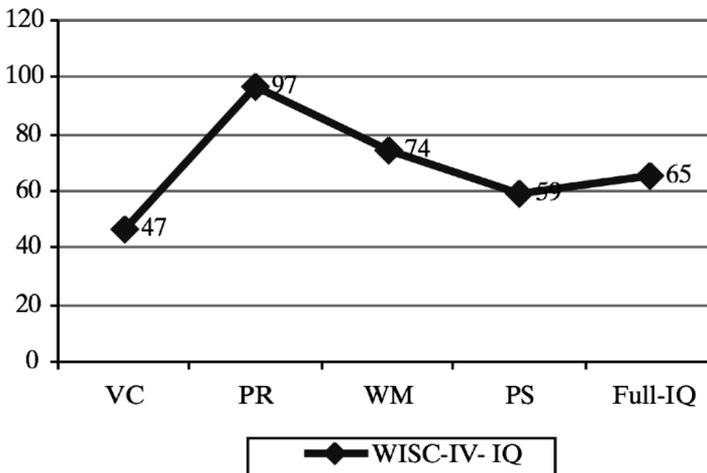
9.5 Results for the Follow-up 1 assessment

(1) *Autism symptoms:* In ADOS (module 2, for non-fluently speaking individuals), M attained at follow-up 1 (aged 15) scores exceeding cut-offs for autism in both communication scale [$A = 7$; cut-off = 5] and social interaction scale [$B = 13$; cut-off = 6] and composite scale [$A+B = 20$; cut-off = 12], and thus revealing ongoing significant autism symptomatology.

(2) *Overall cognitive functioning:* In WISC-IV (Figure 5), M attained a Full Scale-IQ of 65, a Verbal Comprehension Index of 47, a Perceptual Reasoning Index of 97, a Working Memory Index of 74, and a Processing Speed Index of 59. According to this result, M's overall cognitive functioning scores in the area between subnormal intelligence and mild intellectual disability. However, the results from WISC-IV reveal a marked uneven cognitive profile with high deficits in verbal comprehension and perceptual reasoning ability in the normal range.

(3) *Functioning in Family:* According to parent reports, at an age of 8 years M first addressed his parents with "papa (daddy)" and "mama (mom)" and greeted strangers with "hello man". "What is it?" questions were first asked with 8.5 years. From an age of 10 on, M regularly reported about what he had drawn in school and what he wanted to do in the near future (e. g. watching a special TV program). He enjoyed continuously going to both primary and later secondary school. After school, he predominantly preferred to stay alone in his room drawing, watching and reading pictured books (e.g., with dinosaurs), and watching TV. There were no serious behaviour problems at home; however, a moderate problem was that he had a very hard time complying with a strict ban (e.g. "No more TV!").

Figure 5 - Results for M in WISC-IV at "Follow-Up-I"



Note: y-coordinate: IQ scores; x-coordinate: VC= Verbal Comprehension Index, PR= Perceptual Reasoning Index, WM= Working Memory Index, PS= Perceptual Speed Index.

9.6 Results for Follow-up 2

(1) *Functioning in Classroom*: According to school reports from grade 1 to 10, M. attended an inclusive class including 17 normally developed and 4 developmentally disabled children at primary school (aged 7-11), then an inclusive class at secondary school (similarly structured as in primary school; aged 11-16), which he completed at the age of 16. For the most part during his primary and secondary school time, he was given individual classroom support. The final grade certificate at the end of the 10th grade described M as “friendly and in love with life”, a student who in fact preferred contact with his familiar teacher, but increasingly often approached peer students. Further, the report said that M could read, write and understand basic texts in German, and was able to master adding, subtracting, multiplying and dividing tasks in the domain of numbers 1 to 100, and could read, write and understand basic texts in English, and that he skilfully completed technical and prevocational tasks with sheet metal, wood, and textiles, and finally acquired respectable skills in cooking.

At present, M attends a preparatory class for some vocational training for attending a sheltered workshop in the near future.

(2) *Functioning in Family*: According to the mother - who has been a single parent for a few years and presently works part-time as employee in a Russian-German logistics company, M has continued functioning well in the family and has a good relationship with his younger sister. In addition, the mother reported that M attends a preparatory class for vocational training and that she was trying to find a day care centre for him with sheltered vocational training in technical and artistic domains. In general she is optimistic about the immediate future.

10. Conclusions of Study 2

In the present descriptive single-subject study, the effectiveness and social validity of a TEACCH-based home programming intervention were evaluated involving a 5-year old boy with autism (M), and his parents, with the focus being on the mother, and also his classroom teachers and relevant health professionals. The multiple method measures used for evaluation included video-based behavioural observation, standardized developmental tests, structured interviews, quantitative questionnaire and inventories, and qualitative-verbal information collection. The pre/post intervention results based on child, parent, therapist, teacher, and health professional sources, showed (a) improved child functioning in language, communication, play and pre-academic domains, improved family adaptation, successful transition to primary school and adequate classroom adaptation, (b) enhanced parent functioning in terms of structured teaching skills and functional health cognitions in terms of an individualized autism concept, as well as strong acceptance of both home programming process and outcomes, (c) enhanced teacher functioning in terms of autism-specific teaching methods

and expanded health cognitions regarding autism, and (d) beneficial health professional outcomes providing relevant social support for parents and teachers.

Further, the follow-up assessments suggest that positive trends in child functioning both in family and classroom were maintained, while autism symptoms and an uneven cognitive profile with a low aptitude for verbal abilities and a higher aptitude in visual reasoning continue to exist (cf. Howlin, 2004).

Overall, these results are consistent with a number of studies on ASD home programming trainings in various countries (Schopler, 1997; Schopler, 2005; Mesibov, Shea, & Schopler, 2006; Mesibov & Shea, 2009; Welterlin, 2009).

Limitations to the internal validity of the study include the lack of internationally common child behaviour measures as, for example, used in the studies described in Probst *et al.* (2010), and the use of an A-B design, in which pre/post intervention effects cannot be clearly separated from the effects of other variables, such as the child's maturation or numerous uncontrolled environmental factors. Limitations to the external validity are caused by the problem that findings originating from a single subject study can only be generalized to other subjects and settings with due caution. However, though the overall positive results must therefore be viewed carefully, they can still make some contributions to the further development of parent in-home programs.

Overall, the results of this first formal TEACCH-based home programming evaluation in the German-speaking world are encouraging and suggest some tentative evidence for both clinical and social validity. The positive social acceptance of the program by parents and classroom teachers supports the assumption that this kind of intervention does function in everyday life (Kazdin, 2008).

Considering the medium-intensity of about 100h and the corresponding estimated medium cost of the TEACCH home program, it might fit the needs and capacities of local health care systems. Furthermore, there is evidence resulting from an international comparative study (Häussler, 1998) and also clinical expertise (e. g. Degner & Müller, 2008) that German parents want to be more involved in the treatment of their children and adolescents than is currently the case at autism treatment centres whose administrative policies are frequently based on strongly child-focused orientations where, to put it simply, parents take their child to the autism centre for one hour of child-centred, one-to-one therapy, and pick them up one hour later once a week over a period of one or two years, and where parent support is only sporadically provided as an adjunct intervention. Similarly, there is also evidence for the need of more involvement of classroom teachers in the treatment of their students, such as providing group and individual teacher education and skills trainings at autism treatment centres or related health care institutions (cf. Probst & Leppert, 2008).

11. Overall conclusions

In the present article, two TEACCH-based intervention outcome studies addressing families with children with autism and aiming at tertiary prevention or rehabilitation (Probst *et al.*, 2010) are reported. Both the education and skills training parent group study and the home-based child-parent training single case study are *first* formal evaluations of TEACCH-based family interventions in the German-speaking world.

Common aims of tertiary-preventive and rehabilitative intervention across both reported studies included (a) reducing behavioural and non-core symptoms, enhancing social-communicative and developmental abilities and thus strengthening autonomy and social participation in children with autistic disorders, and (b) enhancing skills and coping abilities of care-takers in family and classroom by teaching a science-based and individually shaped concept of autism as well as educational strategies and skills.

Though there are limitations to the internal and external validity, both studies provide tentative evidence for (a) the effectiveness of TEACCH-oriented family interventions in terms of child, parent, family and classroom outcomes, and (b) practical relevance and social validity of the intervention method in terms of parental acceptance as well as meeting the needs of the current health care setting, and the values and attitudes of a significant number of German parents.

The evaluation methodology followed a multimodal and multi-method strategy.

The results of both studies are consistent with recent evaluative studies on TEACCH-based interventions for autism from the USA (Welterlin, 2009) and Italy (Panerai *et al.*, 2009), and with evaluative studies conducted in Germany on TEACCH-based interventions for autism within various educational settings including a specially equipped classroom for children with intellectual disabilities (Probst & Leppert, 2008), a residential home for children with severe developmental disabilities (Probst *et al.*, 2010, study 1) and a day care and vocational setting for adults with autism and related disabilities (Probst *et al.*, 2010, study 2).

Furthermore, the reported findings are in congruence with international review studies (NRC, 2001; Francis, 2005; Singer *et al.*, 2007).

All five studies examining the effectiveness and social validity of the TEACCH program in clinical and educational settings in Germany (Probst & Leppert, 2008, Probst *et al.*, 2010: study 1 and 2), and the two studies by Probst & Glen (reported in the present paper) were coordinated within a clinical research program by the first author at the Department of Psychology of University of Hamburg (Germany).

The evaluation strategy was guided by a concept of dissemination of novel interventions in public mental health and educational systems adapted from Dingfelder & Mandell (2010) focussing on a stepwise strategy begin-

ning with single subject and within-group studies examining treatment effects (“effectiveness”, NRC, 2001) in real-life clinical practice conditions and naturalistic settings, and followed by studies addressing effects of interventions more in controlled laboratory settings (“efficacy”, NRC, 2001) in later steps, instead of using the efficacy-to-effectiveness sequence, called also “stage pipeline” model (Rohrbach, Grana, Sussman, & Valente, 2006, as cited in Dingfelder & Mandell, 2010) criticised as counterproductive in creating “most robust practice-robust treatments” (Dingfelder & Mandell, 2006).

Further research should expand (a) to stricter controlled single-subject and within-subject studies, and (b) to controlled between-group studies systematically examining the impact of child variables (e.g., symptomatology, developmental functioning, and personality), parent/caregiver variables (e.g., psychological and social-economical resources), and therapist variables (e.g., training, personality) on intervention outcomes. Research strategies of this kind can reduce the gap between clinical research and practice, enhancing the knowledge base and improving patient and student care (cf. Kazdin, 2008).

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