

Supplementary Material - Detailed description of the Frankfurt early intervention program (A-FFIP)

A-FFIP is manualized as a comprehensive approach which contains evidence-based elements and state-of-the-art methods. Developed for the restricted frame of the German well-fare system it is conceptualized as a low intensity program (2 hrs/week over 2-3 years). Many ASD-relevant contents are combined in the A-FFIP approach which make it unique. Although the high number of different ingredients, the manual is very detailed and conceptualized to enable easy adoption in different interventional settings and the patient-centered care system.

1) Comprehensive approach

- A-FFIP targets the following five developmental domains: (1) communication and language, (2) interaction and play, (3) emotion regulation, (4) cognition and (5) adaptive behavior
- A-FFIP targets and the following six core basic abilities: (1) attentional control, (2) joint attention, (3) imitation, (4) representation, (5) planning and (6) self/other distinction.

2) Evidence-based elements and methods

- Short and long-term intervention targets are individually planed and practiced based on the current abilities of the child.
- Intervention targets are documented based on a detailed checklist of six core basic abilities and five developmental domains typically impaired in children with ASD. Each domain comprises specific developmental targets.
- In A-FFIP standard behavioral, motivating techniques are used in natural social interaction to ultimately enable self-initiated learning and play. For example, when teaching new skills, error free learning is provided by the two-therapist concept.
- Two therapists work with the child to teach new skills, and practice and generalize already acquired skills. While the main therapist is naturally interacting with the child and differentially reinforcing the child's initiations and reactions, the co-therapist works as a "shadow" behind the child directly helping to acquire new skills through individual and situational adequate prompting, shaping and fading techniques.
- Aggressive, oppositional and stereotyped behavior that interferes with learning processes is addressed by antecedent and consequence behavior models focusing on enhancing the child's coping skills (e.g. by providing structure and

routine), and by increasing interest and motivation to cooperate through natural reinforcement of the child's abilities.

- Exercises are imbedded in natural situations with high individual motivation.

3) Special features of the A-FFIP manual

- Theoretical background of the normal development in typically developed children is provided and compared to ASD specific development for all core basic abilities and developmental domains addressed in A-FFIP.
- The manual contains a detailed checklist for the core basic abilities and the developmental domains and explicit exercises for all these areas.
- For each developmental target exercises over three levels (beginners, intermediate, advanced learners) are provided in the manual.
- All exercises are described in great detail by providing explicit examples with information of necessary motivational material, prompting and possible natural reinforcers. Still, because of also presenting ideas for variation all exercises can (and should) be individually adapted regarding to the child's interests and needs.

4) Ensuring Generalization

- Parents are involved in the intervention by joint planning of therapy targets and practicing with the child during intervention sessions and at home.
- Generalization of new skills is also ensured through 3x/year meetings with kindergarten teachers.
- Once the child is competent to socially interact with another child, the setting changes to 1x/week individual and 1x/week group-based intervention together with another child with ASD to practice peer play and interaction.
- Examples for practicing new skills in daily situations are given for each target.

Supplementary Material - A-FFIP Intervention targets checklist

	<u>Developmental targets</u>	<u>Sub targets/ difficulty level*</u>
<i>Developmental targets are subdivided into 3 difficulty levels regarding the child's current developmental status (beginners, intermediate, advanced learners). For each sub target detailed exercises are provided containing tips for prompting, reinforcement, fading, examples for material and exercises for generalization in day-to-day activities.</i>		
<u>Core basic abilities</u> <i>Key basic skills are constantly trained to set free natural developmental dynamics in various developmental domains.</i>	Attentional control	Reaction on name calling
		Staying focused
		Flexible attention shifting
	Joint Attention I: Eye gaze following	Following an object visually
		Using eye contact in a social interaction
		Using informational eye gaze
	Imitation	
	Representation	
	Planning	
	Self/other distinction	
<u>Developmental domains</u>		
Communication & Language	Eye contact	
	Receptive vocabulary	
	Gestures	
	Initiation of language development (supported)	
	Expansion expressive vocabulary	
	Question asking and answering	
	Social interaction & communication	
Social interaction & Play	Joint Attention II: Reciprocity	
	Give & exchange	
	Sharing	
	Play (non-interactive)	
	Basic interactive play	
	Interactive board games	
	Act-as-if play	
Emotion regulation	Roleplay	
	Emotion recognition	
	Emotion expression	
Cognitive abilities	Emotion regulation	
	Principles of matching I: Categories	
	Principles of matching II: Characteristics (same and opposite)	
	Memorizing abilities	
	Drawing	
	Quantity understanding	
	Theory of mind	
	General knowledge	
Adaptive behavior	Daily Routines	
	Toilet training	
	Problem solving	
	Consciousness of dangerous situations	
	Orientation (spatially)	
	Orientation (temporal)	

* Only selected sub targets are provided here as informational examples. For more information and detailed exercises see: Teufel, K., Valerian, J., Wilker, C. & Freitag, C. (2017) *A-FFIP - Autismusspezifische Therapie im Vorschulalter*. Springer

English adaptation from the German manual with the agreement of the authors © Springer Verlag: Teufel, K., Valerian, J., Wilker, C. & Freitag, C. (2017) *A-FFIP - Autismusspezifische Therapie im Vorschulalter*