

Summer School SG-ORL
29.-30.08.2014

Speech and language development disorders
Fluency disorders

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Speech and language development disorders - Fluency disorders

1. Speech and language development

- Speech and language development
- General development
 - Physical development
 - Mental development
 - Emotional development
 - Social development



Behaviour in
playing

Speech and language development disorder

- 2-15% of all monolingually raised children
- ♂ twice as much as ♀

(AWMF-Leitlinie Sprachentwicklungsstörungen, 2011)

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Speech and language development disorders - Fluency disorders

Normal development of speech and language: pre-verbal phase (1. year)

- First vocal utterance:
 - Cry reflex of the newborn
- 1. Period of babbling (1,5.-6. mon.):
 - Playful sound production
- 2. Period of babbling (6.-12. mon.):
 - Imitation of sounds

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Normal development of speech and language: verbal phase (>1. year)

- 12 months:
 - Five meaningful utterances
- 24 months:
 - 200 words, use of two-word-sentences
- 36 months:
 - Use of sentences with more than three words
- 4 years:
 - Use of all single phonemes and phoneme combination (except for /g/, /k/, /s/, /sch/)

Linguistic levels of speech and language

- Discrimination and production of utterances:
 - Phonetic - Phonology
- Passive and active vocabulary:
 - Semantics - Lexicon
- Comprehension and use of grammatical rules:
 - Morphology - Syntax
- Comprehension and use of speech and language for communication:
 - Pragmatics - Communication

Disorder of speech and language development:

**The development of verbal skills
deviates from the age norms.**

Symptoms of a speech and language development disorder at age 1:

- No second period of babbling
- No comprehension of speech and language with 12 months
- Strong visual interest

Symptoms of a speech and language development disorder at age 2:

- Active vocabulary < 50 words
- No 2-word-utterances.

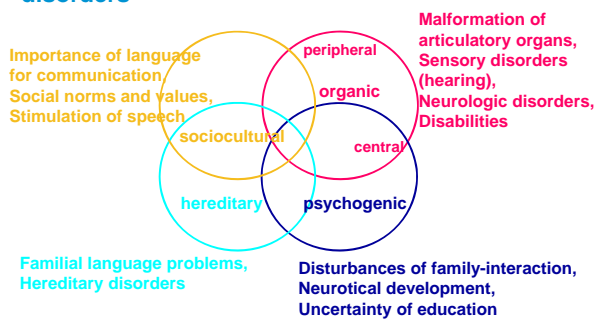
Symptoms of a speech and language development disorder at age 3:

- Active vocabulary < 100 words
- No sentences with more than three words
- Final position of verbs
- Incorrect formation or omitting of many phonemes
- No comprehension of simple questions

At 4th birthday should

- Colloquial speech almost be mastered
- Simple sentences be formed correctly
- First subordinate clauses be formed
- Only slight grammatical errors appear
- At most only sibilants be misarticulated

Causes of speech and language development disorders



Diagnosis of speech and language development disorders

- General development („Entwicklungsprofil“ Zollinger): 1.-3,5. (4.) y
- Comprehension: Pizzamiglio-Test 4-6 y
- Pronunciation: Schubi - Picture cards
 - Production of phonemes
 - Omission of phonemes
 - Confusion of phonemes
- Free play (Farm)
- Communication with therapist/parents
- Auditory perception: processing of auditory impressions.
- Visual perception: processing of visual impressions.

Global development: Entwicklungsprofil (Zollinger)

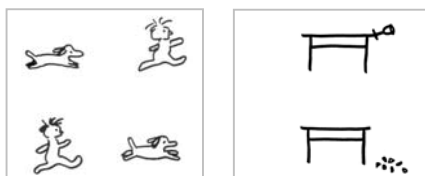
- Practical-gnostic competences.
 - Painting:
 - dots and bars 15-18 mos
 - scribbling squared 18-24 mos
 - scribbling round 24-30 mos
 - closed shapes 30-36 mos
 - Formbox:
 - only single forms 15-18 mos
 - all forms, try and error 18-24 mos
 - all forms anticipating 30-36 mos
 - ...
- Symbolic competences
- Social-communicative competences
- Competences in speech and language

Competences in speech and language (Zollinger)

- Comprehension:
 - Obey situational demands 15-18 mos
 - Handle every-day-objects 18-24 mos
 - Understand non-situational utterances 24-30 mos
 - Understand absurd utterances 30-36 mos
- Level of phonemes
- Level of words
 - Single words 12-15 mos
 - Name single pictures 15-18 mos
 - Name every-day-objects or actions 18-24 mos
 - Sophisticated use of words 30-36 mos
- Level of sentences
 - one-word-sentence 18-24 mos
 - two-word-sentence 18-24 mos
 - sentence with more than 2 words 24-30 mos
 - subordinate clauses 36-42 mos

Comprehension of speech and language: Pizzamiglio-Test

- 40 Statements:
 - 1. De Bueb rännt em Hund nah.
 - ...
 - 40. S'Glas isch abegheit.



Pronunciation: Schubi-picture-cards

- 90 drawings
- Every phoneme of German, (D – CH – A) at initial, medial, final sound

Production of phonemes
Omission of phonemes
Confusion of phonemes



Speech and language therapy...

... as part of a general encouragement of the child's development:

- Speech and language
- Perception
- Motor activity
- Social behaviour (playing)
- Cognition...

Speech and language encouragement:

Good examples of language

- Rich use of language?
- Correct pronunciation?
- Correct use of grammar?
- Adequate speed for the infantile listener?
- Are there opportunities for the child to say something by himself („turn taking“)?
- Good examples of language, name time and again objects, actions, characteristics...
- Speech and language is acquired in real situations and objects

Speech and language encouragement:

Language model which **advances** the utterance of the child:

- Presentation → repeated introduction of the phrase
- Alternative question → Offer of two different possibilities to answer the question

Language model which **follows** the utterance of the child :

- Corrective feedback → Repetition of the utterance of the child in correct form
- The child has to feel well and accepted

2. Fluency disorders: Stuttering

• **Primary Symptoms („Kernsymptome“)**

- Repetitions
 - Prolongations
 - Blocks
- } of phonemes, syllables, words

• **Secondary Symptoms („Begleitsymptome“)**

- are supposed to improve fluency
- become independent from the primary symptoms
- and become a symptomatology of its own

audiofile 1



Stuttering

• **Beginning:**

- In 98% of all patients between 2nd and 5th birthday
- Only in 2% after the 12th birthday



Egypt, 3000 B.C.

• **Incidence:**

- 5% of all children
- 80% Remission within the 1st year after beginning

Demosthenes,
Isaac Newton,
Charles Darwin,
King George VI
Winston Churchill,
Marilyn Monroe...

• **Relation ♂ > ♀:**

- initially 1:1, later 3:1

Disfluent speaking

Normal: up to 20% of speaking time as "functional" disfluency

Kind of disfluency	Description	Function
Repetitions	Single word or several words	Gaining of time
Unfilled breaks	Silent break within a sentence (<1 s)	Emphasising e.g. an important event
Filled breaks	Sounds and interjections (äh, hm...)	Gaining of time
Functional prolongation		Emphasising a word
Interruption of sentences and correction		correction of a sentence in form or content
Flowery phrases and interjections	"nicht wahr", "ja also", "wo'll'n mal sagen" ...	Gaining of time

Disfluent speaking: Stuttering

Qualitative deviance as symptomatic disfluency

Kind of disfluency (primary symptoms)	Description	Function
Repetition of phonemes and/or syllables	Often at the beginning of a phrase consonant > vowel	no
Prolongations	Longer duration of a phoneme than expected	no
Blocks	Silent breaks within a speaking sequence	no

- *Earlier in literature (in German language) :*
 - *Kloni*: short repetitions of the articulatory muscles (B-B-B-B-Ball).
 - *Toni*: longer time lasting spasms ("blocks") of the articulatory muscles (-----Ball).

Secondary symptoms

- Dysfunction of Respiration and Phonation:
 - Disturbance of coordination of abdominal and thoracic respiration, phonation, articulation
- Dysfunction of articulation:
 - Mainly by primary symptoms, stammering
- Alteration of syntax:
 - Patchy utterances, patchy words, starters
- Primary and secondary motor movements
- Verbal and non-verbal avoidance behaviour
- Vegetative, emotional and psychological reactions

Physiological disfluency vs. stuttering

	Physiological disfluency (2½-5y)	Chronic stuttering
Repetitions	phrases, words, syllables	Phonemes, syllables with /a/, > 2x
Prolongations	< 1 sec	> 1 sec, strain of mimic muscles, increase of fundamental frequency and loudness of voice
Silent breaks	within/before a sentence	within/before a word, strain of mimic muscles
Prim./sec. motor movements	no	avoided
Eye-contact	normal	avoided
Body posture	normal	frozen
Verbal avoidance behavior	no	Synonymes, patchy utterances
Nonverbal avoidance behavior	no	Avoidance of communication situations
Emotional disturbance	no	Anger, angryness, shame
Awareness of disfluency	no	yes

Three basic ideas over all theories of stuttering

- Breakdown-hypothesis:
 - Temporary breakdown of the coordination of the articulatory muscles
 - Genetically caused brain function deficits
- Anticipatory-struggle-hypothesis:
 - Reaction of fight or avoidance of the expectation of stuttering
 - Organic predisposition.
 - Society with high pressure to perform speech and language.
- Unconscious-need-hypothesis:
 - Attempt, to fulfill two competitive (unconscious) needs simultaneously

(according to Bloodstein 1993)

Causes: genetic factors

- Clue: familial incidence $\sigma^2 > \varphi^2$
- Proof only by linkage- or adoption-studies possible.
(Bloodstein 1993)
- Pedigree-analysis:
 - Indication for major locus but as well for polygenic components
(Ambrose 1993, 1997)
- Twin studies:
 - 95 monozygotic twins, 5 stuttering – but only one twin
(Farber 1981)
 - 3810 twins, variance of stuttering: 71% genetic factors, 29% environmental factors (Andrews 1991)
 - 91 twins: 70% to 30% (Felsenfeld et al. 2000)

Stuttering: genetic vs. environmental factors

- Genetic factors are important in the development of stuttering:
 - At the moment no proof for an exclusive genetic cause
- Genetic transmission and congenital constitution as predisposition for vulnerability:
 - Structural (anatomical-physiological) deficiency
 - Functional deficiency (increased sensibility, lower tolerance for frustration,...)
- Environmental factors:
 - No stuttering results from predispositions only, environmental factors are important as well

Recent brain research (PET, fMRT, MEG)

- Activity of the same brain regions during stuttering and fluent speaking, but:
 - Increased activity of the right-hemispheric regions (prim. motor cortex, auditory cortex, operculum rolandii)
 - Decreased activity of the left-hemispheric regions („left-right-shift“)
 - Decreased activity of the auditory regions bilaterally
 - Increased activity of the medial motor structures (Suppl. Motor regions, cingulum, vermis cerebelli)
(Meta-analysis, Brown et al. 2005)
 - Structural changes of the left white brain region links with hyperactivity (compensation?) of the right frontal operculum
(Neumann et al. 2005)
- Cave: Studies with adults
- Are the changes *cause* or *result* of stuttering?

Environmental factors: situation of communication

- Stuttering – major or highly increased symptoms:
 - Important situations,
 - With authorities, bosses...
 - Phone calls
- Stuttering – minor or no symptoms:
 - Speaking not used as medium of communication
 - Syllables without sense, counting, speaking simultaneously with therapist, singing...
 - Children: role-play, playing with dolls, teddy bear...
- Stuttering people are able to speak fluently in some (many) situations!

audiofile 2



Social environment of preschool kids: family-parents Development of the child between 2 and 5 years

- Discovering of speech and language:
 - 2y: representative and communicative meaning
 - 3y: „no“ und „me“
 - Take influence by speech and language: power, helplessness
 - Emotional utterances: anger, angriness, fury...
- Reaktionen of the parents:
 - Understanding: accepting or refusing of desires
 - Misunderstanding: individuation of the child taken as offense
- Increased sensitivity of the parents:
 - Being ignored in their own childhood
 - Influences of the generation of the grandparents

Parents of children who stutter

- No more frequent increased psychopathology
- But:
 - high expectations at themselves and their children
 - dominance and demands of discipline
 - spoiling and hyperprotective attitude
 - lability: too yielding after strict expectations
- Direct interaction with the child:
 - Interruptions, lots of questions, only less patience
 - Often criticizing
- Conflicts:
 - Rarely openly settled

(Summarized from 59 studies, Kollbrunner 2004)

Parents of children who stutter

- Strict control of behaviour in the family:
 - Emotions are not allowed to be shown intensively
 - being a bit happy, being a bit angry, a bit furious...
 - Emotional releases (parents, children) are excessively sanctioned: "throw a tantrum", "shout for joy", ...
 - Children may not learn to express themselves affectively

(according to Krause 1981)

Disruption of emotion and intellect: „alienation from self“

- Stuttering in the conflict between:
 - Desire to express one's emotions
 - Desire to respect the strict control of behaviour
- Unconscious-need-hypothesis:
 - Attempt, to fulfill two competitive (unconscious) needs simultaneously. (Bloodstein 1993)
 - Contradicting muscle impulses:
 - want to speak – don't want – want to speak – don't want...

Stuttering as symptomatology

Approaches of therapy

- Modification of stuttering
 - „stutter more fluently“
 - Identification of stuttering (vs. speaking fluently)
 - Diminishing of fear, avoidance behavior, muscle tension („desensitizing“)
 - in the consequence: fluent („charming“) stuttering
- Achievement of fluent speaking
 - „speak more fluently“
 - soft voice onset, prolongation of speaking
 - learning of fluent speaking
 - in the consequence: diminished fear of stuttering

symptomatically


Holistic approach of therapy:

Considering the social background (family):

Understanding the symptom

- What is the child going to say with his/her symptom?
- Looking for the way, „searching“, together with the parents!


Speech and language development disorders - Fluency disorders

1. Consultation 

- Child and parents
- To get to know the child:
How does he/she show him/herself?
 - Speech and language
 - Playing
 - Emotionally
- Argueing with his/her
"Stuttering"
- ENT-Examination
- Audiometry

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2. Consultation 

- Talk to and information of the parents
- Feedback of the 1st consultation
 - positive developmental steps of the child
- To get to know the parents and the family
- Biography of the parents („3-generations“)
- Understanding the symptomatology of the child

- Question of "blame" and "guild":
 - Focussing interest in connections instead of blaming for guild

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Pathes of therapy

- Play- and speech-language therapy with the child
(Speech-language-therapist/Logopädie)
- Play-, speech-language therapy with the child,
regular talks with the parents
(Speech-language-therapist ± Psychologist)
- Communication-therapy with the parents
(Psychologist)

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Literature