“I’M IN HERE”-

LIFE WITH THE AUTISM-SPECTRUM-DISORDER

BACHELORARBEIT

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Vorgelegt von: **Karoline Marko**, **MA**
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Betreuung: Andrew Peaston B.Sc.

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Graz, am: Unterschrift: Karoline Marko

1. Introduction

This Bachelor's Thesis deals with the wide range of Autism-Spectrum-Disorders, their symptoms, diagnosis, and treatment. Autism is one of the fastest rising disorders in children. Most people do no understand autistic people and therefore also do not know how to treat them and how to interact with them. Most autistic children are, however, despite being non-verbally almost as intelligent as their "normal" peers; that is, if they are not diagnosed with a mental retardation as well.

What inspired me to write about this interesting perceptional disorder was the internship I carried out in the summer of 2012. My work included dealing with autistic children and seeing how they undergo a variety of therapies. Many of the kids seemed normal at first sight – but this was deceptive. They were autistic through and through. What I was especially interested in, and what will be the focus of this thesis as well, was the language disorders the children suffer from. While some children are completely non-verbal, others are able to communicate quite normally. Nevertheless, they all show interesting symptoms, such as echolalia and taking metaphorical sayings literally, which will be discussed in detail in this thesis.

While writing the thesis I came across an abundance of material about the classification of Autism-Spectrum-Disorders (ASD's), which all classified the disorders slightly differently. However, I will basically rely on the ICD-10 classification system by the World Health Organization (WHO). Despite the abundance of classifications, hardly anything is known about the actual causes of the disorder, which makes the topic all the more interesting, especially since numbers have been rising dramatically over the past years.

As mentioned before, the main focus of the thesis will be on the language and communication problems of autistic children, but also on how these language disorders can be treated and how communication can be made possible even with non-verbal children.

Throughout the thesis I will use practical examples from books of both parents raising an autistic child and of personal experiences by autistic people themselves. These examples serve to illustrate many aspects of the disorder quite vividly. Furthermore, I will use examples from my personal experience with autistic children.

The research questions that will be addressed and answered in this paper are:

- ⇨ "What types of language disorders do autistic children have?"
- ⇨ "How are language disorders in autistic children treated?"
- ⇨ "What therapies can improve the condition of autistic children?

- ⇨ “Are children diagnosed with ASD able to learn more than one language?”
- ⇨ “How do children and adults with ASD perceive themselves and the world around them?”

The last question is extremely difficult to answer and it is mostly high functioning autistic people who can communicate about what their world looks like. Despite some explanations, the world of autistic people remains a mystery to most of us, but we can still try to understand as much as we can. Understanding them is not only vital when living or working with them but also in research. Only if researchers acquire a better understanding of autistic people it will be possible to improve on therapies and medication.

Something else that the paper will try to give an answer to is whether autistic children are able to acquire more than one language, despite their difficulties in the acquisition of their first language. Furthermore, an area that will be investigated into is the disturbed perceptions of autistic children and adults.

Autistic children and adults are often viewed as mysteries. This thesis will try to shed light on at least some of these mysteries and make people with this disorder easier to understand.

The title of this thesis “I’m in here” refers to the autism awareness song “I’m in here”, by Cathy Hutch and B.J. McKelvie. The song was written in order to raise money for autism research and the like.

2. General Overview of Autism-Spectrum-Disorders (ASD)

Autism has many faces. It is not only that various ends of the spectrum exist (severe to mild forms) but also severity within the same spectrum varies. Parents, who have an autistic child usually dedicate their whole lives to the therapy of the child. This can be an enormous burden, as the following quotation by a mother of an autistic child illustrates:

> Sometimes I love my son passionately, sometimes I just want to get on a train and ride away. I could never give him up - he's a part of me. But living with him costs all the strength I have. Often I have dreamed about holding him tightly in my arms and jumping from a rooftop together with him (Korber 2012: 11).

2.1 What are Autism-Spectrum-Disorders?

Autism-Spectrum-Disorders, or ASD's, are perceptional disorders that have a wide range of characteristics and symptoms. Usually, people diagnosed with ASD are dependent on other people, do not develop a language, show stereotypical behavior, and peculiar interests, as well as disinterest in social interactions (cf. Poustka et al 2009: 13).

The first time "autism" was described was probably more than 200 years ago, in 1799, by Jean Itard. However, back then, "autism" was not known as a disorder yet. In 1908, people showing symptoms typical of autism were thought of having "Heller's Dementia". A few years later, "autism" was known as a typical symptom of schizophrenia and for a long time, autism was thought to be an early form of Schizophrenia. Only in 1943 did Leo Kanner, an Austrian child psychiatrist, discover autism to be an innate disorder found in children. From then on, this form of autism was known as Kanner's Autism, now known as childhood autism. A year after Kanner discovered childhood autism, Hans Asperger, also an Austrian doctor, found out about a disorder later to be known as Asperger's Syndrome.

The prevalence of autism has been rising over the past few years. Only a few years ago, prevalence was thought to be 5 in 10.000 but recent studies have proven that these numbers are much higher. In Austria, about 17 in 10.000 children suffer form Autism and 8 from Asperger's syndrome. Altogether, about 48.500 children are diagnosed with a form of the Autism-Spectrum-Disorder (13.600 of them suffer from childhood autism). Furthermore, boys are affected by autism four times more often than girls (cf. ÖAH 2012).

The United States show a much higher prevalence of ASD's in children: While in the 1970's, about 1 in 10.000 was affected by the disorder, this number rose to 1 in 500 in 1999, 1 in 110 in 2009 and to 1 in 88 in 2012. These numbers show a dramatic rise in the prevalence

and a high number of affected children (cf. “Talk About Curing Autism” 2012).

With regard to the male/female ratio of affected people, the number has been estimated to be 4:1 (male: female). However, this number seems to have been very optimistic, as recent studies from 2010 in Great Britain have shown: The average number of male ASD-patients in the years between 1987 and 2006 has been almost 7 times higher than of female patients. Furthermore, four years in this continuum (1992, 2001, 2003, and 2005) have shown extreme increases in this ratio: 15:1, 12.44:1, 13.6:1, and 13.5:1 respectively (cf. Whiteley et al 2010: 23).

Ever since the 1980’s movie “Rain Man”, autism has become a widely known disorder, yet only little is known about its causes and emergence. Nevertheless, several myths have arisen ever since the 1980s. Some of them are as follows: “Everyone with an ASD has a special, extraordinary talent”, “Everyone who has an ASD is mentally retarded”, and “There is no cure for (or recovery from) ASD”. While there are several people diagnosed with a form of ASD who have a special talent, by far not every autistic person has one. Nevertheless, most autistic people have certain talents with numbers, meaning they are extremely good mathematicians, others are good with music, and again others have a photographic memory. However, this does not mean that all autism patients are mentally retarded as well. For example, Asperger’s patients hardly every suffer from mental retardation but are rather smart people. That all ASD patients are mentally retarded can be traced back to the fact that they often have problems with communication and therefore *seem* as though they were mentally retarded when in fact they are not. Also, the myth of there not being a cure for or recovery from ASD has been around for a while. Although no cure has yet been found, enormous advances have been made over the past years. However, while several experience reports have been written about the recovery from ASD, it is not completely clear today whether these people who recovered actually did suffer from ASD or some other mental disorder. Nevertheless, progress has been made in the last years and treatment methods, such as therapy and medication, have evolved tremendously, so that a great part of autistic people can live more or less symptom-free lives (cf. Sicile-Kira 2004: 2ff).

In order to give a general overview of how the world changes for autistic people once the disorder emerges, I will provide a quotation below:

> When I was two years old and already lived in the semi-detached house, the people around me lost their appearances. Their eyes dissolved. Fog concealed their faces. Their voices evaporated. After a while, the people around me transformed into volatile shadows that seemed to have come from out of space. (…) Their puddle-like faces

> were steaming like after a rain and noise came out of their mouths, which I could neither hear properly nor understand. (…) I lost the urge to share my world with others. (…) I talked less and less and my sentences became shorter. At one point I could only stammer anymore. My language impoverished. (…) I was content with my own company. Only a year later did I first make sense of the noise the colored shadows call language (Brauns 2004: 15).

This quotation addresses multiple interesting aspects of autism, namely the sudden loss of language and the disturbed perception of the world. This quotation illustrates vividly how the world suddenly changes, which is one of the most interesting and mysterious aspects of ASD's. The following chapters of the paper try to explain at least some of these aspects, how they are caused and what can be done about them.

Autistic people are often said to be living in a different world. This is true to some degree and it is also the reason why we often have problems in understanding them and their behavior, as the following quotation shows:

> Most of the time, Simon is smiling, fortunately. But sometimes it happens without an apparent cause, wholeheartedly and uncontrolled. I prefer the laughing to the screaming – it is the more bearable mystery. Often it even reminds me of the archaic smiles of Greek Gods. (...) But then again I just want this smile (...) to finally end. Because what we cannot understand is so hard to bear (Korber 2012: 10).

2.2 Types of Autism and Classification

Various different types of Autism-Spectrum-Disorders exist and the classification varies in literatures. However, the disorders most commonly referred to as being part of the ASD are: childhood autism, Asperger's syndrome, atypical autism, and Rett's syndrome.

The World Health Organization classified Pervasive Developmental Disorders in the ICD-10 (cf. ICD-10, 2010) as follows:

Pervasive Developmental Disorders	**F84**
Childhood Autism	F84.0
Atypical Autism	F84.1
Rett's Syndrome	F84.2
Other Childhood Disintegrative Disorder	F84.3
Overactive Disorder Associated with Mental Retardation and Stereotyped Movements	F84.4
Asperger's Syndrome	F84.5
Other Pervasive Developmental Disorders	F84.8
Pervasive Developmental Disorder, Unspecified	F84.9

2.2.1 Childhood Autism

Childhood autism is the most common and the most well-known type of Autism-Spectrum-Disorder. Usually, when people talk about autism, they are referring to this type of the spectrum. A child suffering from childhood autism is normally diagnosed before the age of three. Patients show impairments in their social interactions, language development, behavior, interests and activities. (cf. Sinzig 2011: 8ff).

2.2.3 Atypical Autism

Patients who are diagnosed as atypical autists do not show all the symptoms of childhood autism, and symptoms only occur after the child turns three years. However, most patients suffer from strong somatic syndromes and an extreme mental retardation. Furthermore, patients often have an extreme impairment of their receptive language development. Atypical autism can be either classified as such by an atypical age of the emergence of the disorder, atypical symptoms, or a combination of both (cf. Sinzig 2011: 13f).

2.2.4 Rett's Syndrome

One of the most interesting facts with regard to Rett's syndrome is that it only occurs in females. Their development is inconspicuous until the age of seven to 24 months. However, after the emergence of Rett's syndrome, a heavy mental retardation follows. Frequently, girls affected lose their abilities to speak and the use of their hands. Furthermore, the growth of their heads is delayed and stereotypical movements of arms and hands emerge. Interestingly, many physical symptoms can occur as well, such as apraxia, scoliosis, or hyperventilation (cf. Sinzig 2011: 15).

2.2.5 Other Childhood Disintegrative Disorders

Children who are later diagnosed with other childhood disintegrative disorders develop rather normally but at some point during their first three or fours years of life they suffer a dramatic loss of already acquired abilities, such as in the area of language, playing, socialization, adaptive behavior, motor skills, and control of bladder and bowels. After the diagnosis of other childhood disintegrative disorders, the symptoms are very similar to the ones of childhood autism, though they are characterized by severe deterioration (cf. Poustka et al 2009: 15).

Disorders that fall into this classification are dementia infantilis, disintegrative

psychosis, Heller's syndrome, and symbiotic psychosis. Not long ago, Rett's syndome was seen as a part of other childhood disintegrative disorders, but has become an independent diagnosis now (cf. ICD-10, 2010).

2.2.6 Overactive Disorder Associated with Mental Retardation and Stereotyped Movements

This disorder includes children with very low IQ (below 35), and who show an attention deficit, as well as hyperactivity, and stereotyped behaviors. Interestingly, these hyperactive children tend to be underactive as adults. Furthermore, children diagnosed with overavtive disorder associated with mental retardation and stereotyped movements do not respond well to stimulant drugs (cf. ICD-10, 2010).

2.2.6 Asperger's Syndrome

Children with Asperger's syndrome have a relatively normal development of language, which distinguishes this type from other forms of Autism-Spectrum-Disorders. However, very often motor skills are bad. In addition, Asperger's patients hardly ever suffer from mental retardation, which is why they are also known as high-functioning autistic people. Nevertheless, some of the symptoms typical for ASD's, such as problems in social interactions, stereotypical interests, behavior, and activities, prevail (cf. Poustka et al 2009: 14).

2.2.8 Pervasive Developmental Disorder, Unspecified

The criteria of whether a child has a pervasive developmental disorder, Unspecified, are not very clearly stated. Although these children have symptoms similar to Childhood autism, they do not coincide completely. Mostly, these kids show symptoms later that children with childhood autism do, or they show less of the symptoms. However, the criteria is left very vague, which makes this group of children an extremely heterogenic one (cf. Kamp-Becker 2011: 20).

2.3 Causes of ASD's

The definite causes of Autism-Spectrum-Disorders have not been detected yet. However, many theories exist and all of them try to explain at least one part of the symptoms autistic people show. Some people say that mainly genetic factors are responsible for the emergence of ASD, while others say that nurture (meaning the environment) plays an

important part as well. Furthermore, there are psychological theories, such as the "Theory of Mind", and neurological theories, which try to explain at least the neurological abnormalities of ASD patients.

2.3.1 Nature vs. Nurture

Poustka et al (2009: 29f) state that ASD's are mainly of genetic origin and that "nurture", meaning the environment, has nothing or little to do with the emergence of these disorders. They justify their opinion by saying that most ASD patients suffer from other forms of genetic disorders (see Co-morbidities) as well, such as the fragile-X-Syndrome, and others. However, with the exception of Rett's syndrome, it has not been found out yet which genes or processes are responsible for the emergence of autistic behavior. Only with Rett's syndrome are scientists sure that several defects on chromosome X lead to the disorder.

The following graphic illustrates very vividly that it is in fact not only genetic factors that play a crucial role in the emergence of autism. Neurobiological factors such as biochemical and anatomical abnormalities, brain injuries and cerebral dysfunction, physical illnesses, and genetic syndromes also play a part in the emergence of autism as well as neuropsychological ones, such as impairment of executive functions, theory of mind, and central coherence as well as a disorder of the regulation of emotions. All of these factors contribute to the severity of ASD's and up until now it is impossible to say which factors are most responsible for the development of the disorder. Although it has been proven in twin studies that the concordance rates among identical twins is 35-96% and among non-identical twins it is only 0-5%, the genes responsible for the disorder have not been detected yet (cf. Kamp-Becker 2011: 35f).

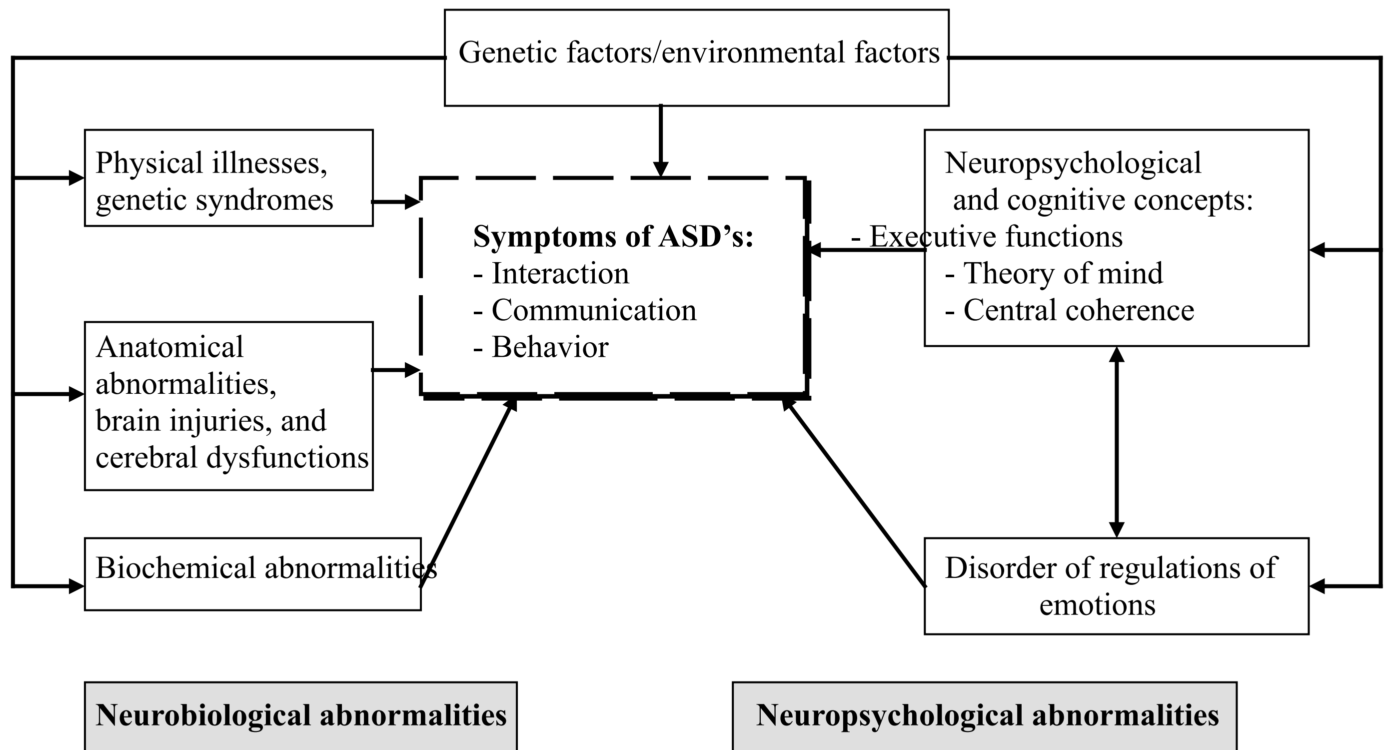


Fig. 1. Model of the etiopathogenesis of Autism adapted from Kamp-Becker et al (2011: 34).

According to Saey (2011), genes may not play the biggest part in the development of autism, as researchers found. The newest results show a great influence of the environment of children in the emergence of ASD's. Previously, it was estimated that the hereditary rate of autism was 90%, whereas newer research has lowered this number to 9-81% and raised the rate of environmental influences to 8-84%. The large variation in numbers shows the uncertainty of the results. However, a lot of research is currently being conducted in this direction.

Environmental factors contributing to the development of ASD's are thought to be the age of the parents, infections during pregnancy, multiple births, and low birth weight, among others (cf. Park 2011).

2.3.2 Psychological Theories of Autism

Psychological theories of autism refer to the following three theories: theory of mind, impaired executive functions, and poor central coherence. Impairment in the areas these theories address are said to result from genetic, or neurological, disorders. The theory of mind tells us about those psychological functions that make it possible for "normal" people to express their emotions, imaginations, feelings, thoughts, and intentions, as well as understand what other people express. Executive functions allow people to plan actions step-by-step,

logically, and anticipatory. This is another aspect impaired in ASD patients. The theory of poor central coherence explains why autistic people have problems with the processing of information from their environment because they are unable to perceive their environment as a whole, like most people do. Instead, autistic people concentrate on details no one else consciously perceives (cf. Poustka et al 2009: 31f).

2.3.3 Neurobiological Factors

Neurobiological factors play an important part in the emergence of ASD's. Scientists have found that certain structural and functional disorders of the central nervous system exist in autistic people, which can be accounted for the neurological symptoms such as the uncontrolled movements of hands, arms, and fingers, as well as disorders in the fine and gross motor skills. Although irregularities or deviations from "normal" brains have been detected, it is still not completely clear what the actual causes of autistic behaviors are. What has been found out so far is that there is a high number of patients who do not only have an ASD but also suffer from epilepsy, and/or have a high concentration of the neurotransmitter Serotonin, an enlarged (infantile) head circumference, as well as deviations in the parts of the brain that are responsible for the recognition of faces (Fusiform gyrus), and responsible for emotions (Amygdala) (cf. Poustka et al 2009: 30f).

3. Symptoms

Symptoms of autism vary in severity according to what type of autism a person suffers from. However, the basic symptoms are similar across the whole spectrum. The three main areas of impairment are social interaction, language and communication, and behavior. The "original" symptom of autism is the perceptional disorder that children suffer from. All of these will be outlined in the following chapter.

3.1 Impairment of Social Interaction

Autistic children have severe problems with eye contact. Frequently, when they do look at someone, it seems as though they are looking *through* the other person or as though they are staring at them. Often, autistic children exhibit a lack of spontaneous imitation, and imaginative games (e.g. with dolls, cars, and other toys). Furthermore, they are not interested in-group activities and they do not like taking part in games with others. Additionally, it is overly difficult for them to both share their emotions with others and to recognize emotions of

others. The latter can be traced to their lack of empathy. They are often unable to express what they are feeling. Parents report that, although they sometimes see their child smiling and laughing, the child would never share their happiness with them (cf. Poustka et al 2009: 16f).

According to Sicile-Kira (2004: 21f), some other symptoms with regard to the impairment of social relationships, aside from the ones mentioned above, apply. For example, autistic children do not want to be held, touched, or cuddled, not even by their parents. Furthermore, they prefer being alone than with adults or even peers and often become so occupied with an activity that they do not respond to their name or any other noise in the surroundings. Additionally, autistic children often seem to be insensitive to pain, as well as a lack common sense. With regard to physical symptoms, autistic children exhibit frequent cases of gastro-intestinal illnesses, such as diarrhea, upset stomach, and constipation.

3.2 Impairment of Communication

Children diagnosed with childhood autism usually suffer from severe delay or impairment of language development. About a quarter of them never learn to speak, meaning they stay mute throughout their whole lives or are able to speak only a few words. This makes it extremely difficult to find out what needs a child has and if they are feeling fine or not. Due to the fact that not only do they not understand and express themselves, they are mostly unable to conduct any kind of communication. Therefore, it frequently happens that autistic children have tantrums and hurt themselves, simply because they do not know how else to communicate their feelings. If, however, autistic children are able to acquire a language, their use of language is restricted to specific social situations. The two main symptoms autistic children with an ability to acquire a language are immediate echolalia and deferred echolalia. The first one refers to the immediate repetition of words and phrases heard in a conversation, while the latter one talks about the delayed repetition of phrases that were heard on, for example, television or radio (cf. Poustka et al 2009: 17f).

Children and adults with Asperger's syndrome sometimes develop language abilities very early in life. However, their use of language is often striking: they sound precocious, superimposed, monotonous, either too loud or too quiet, too fast or too slow. Therefore, their language seems mechanical, something which causes problems in conversations. Even later in life, many Asperger's patients are incapable of participating in dialogs and interactions. Thus, the results of "conversations" are often monologs, in which the autistic person hardly acknowledges the presence of the other interlocutor (cf. Poustka et al 2009: 18f).

Another very interesting symptom with regard to language development and

communication is that autistic people take sayings, proverbs, jokes, and ironic expressions literally. This often results in misunderstandings, as autistic people cannot adequately understand such phrases (cf. Poustka et al 2009: 18f).

3.3 Repetitive, Stereotypical Behaviors, and Interests

Children diagnosed with some form of Autism-Spectrum-Disorders mostly do not show similar playing behaviors as other children their age do. This means that they usually are interested in objects, or even only certain parts of these objects, that are not typically used by peers. For example, objects such as screwdrivers or ball pens might take up all their attention for hours. Furthermore, it can happen that affected children are mesmerized by certain objects or places and show excessive interest in common or uncommon objects, such as computers, bus schedules, movies, or even trash (cf. Poustka et al 2009: 19).

According to Poustka et al (2009: 19), affected children and adolescents exhibit bizarre movements of arms, fingers, hands, or repeatedly touch, or smell certain object or people. In severe cases, obsessive-compulsive disorders can co-occur that results in compulsions to do certain things they same way over and over again. However, not only severe forms but most of the people affected by autism show a great resistance to change. This means that some autistic children have tantrums, simply because some parts of the furniture were moved, or because an event that usually takes place on a certain day was cancelled or postponed. Often, as mentioned before, autistic people are auto-aggressive in some way or another, meaning that they hit themselves on the head, hit a wall with their hands, or tear out their hair. One of the explanations of why children exhibit these forms of auto-aggressive behaviors is that they have a disturbed perception of their body and often cannot feel their bodies – only when they hurt themselves.

3.4 Perceptional Disorder

The main symptom of autism, which is not visible to outsiders, is autistic people's disturbed perception of the world. In order to illustrate what the world looks like to autistic people, the following short extract from the song "Through My Eyes" by Scott James gives insight:

> See the world through my eyes, it changes shape and it changes size,
> it's not quite the world you see. If you could find a way to look around
> inside my mind, maybe you would understand me.
> I'm not blind, but I can't always see. I'm not deaf, but things can

> sound strange to me. I'm not trapped, but it's hard to feel free. Imagine what it's like to be me.

This short extract shows vividly how the perception of autistic people is disturbed and how different "our" world looks to them. Due to their different visual perception, they often have problems with recognizing faces, or are unable to see faces altogether. It has been said that this inability results from their social interaction disorder (cf. Behrmann et al 2006: 258). The autistic perceptional disorder is not restricted to the perception of faces, but it explains their difficulties to hold eye contact and recognize facial expressions.

Interestingly, autistic people often touch things and people, or smell them, so they can recognize them. This does not mean that they are blind – on the contrary, their visual perception my even be over-developed, meaning that they perceive many details that other people would not be able to see at first sight. However, this view of details often prevents them from "getting the whole picture", which often leads to misunderstandings in social situations (cf. Albano 2008).

One of the most interesting difficulties of autistic perception is their perception of time. "Individuals with autism have trouble perceiving the passage of time, and pairing sights and sounds that happen simultaneously" (Mascarelli 2010). This disordered perception is attributed to other cognitive disorders typical for autistic people. Scientists have now come to think that this different perception of time may be the cause of difficulties in the procession of language and gestures, as words and gestures may be paired imprecisely. While some studies show that the disturbed perception of time of autistic people is attributed to the disorder in their brain (working memory, multitasking, and planning), others show no impairment of temporal perception in autistic people (cf. Mascarelli 2010). Due to this disturbed perception of time, caregivers, teachers, and parents should make sure they structure the autistic child's day clearly and always use precise temporal information. However, they have to keep in mind to only mention exact data if they are completely sure about them, as even slight variations in temporal structures may cause tantrums, and the like, in autistic children.

Due to their disturbed perception and state of muteness, it is often thought that autistic children and adults are unable to perceive anything from the "real world" and that they do not know about their own situation. While for autistic children with the co-morbidity of mental retardation this might apply, it does not only apply to autistic children without a mental disorder. Although they might be mute, they might have extraordinary non-verbal communication skills, good written language skills, and a "normal" perception of the world. This simply means that they often do know about their disorder. The following short quotation

illustrates this very well:

> During a session of studying with the new learning program on the computer, I asked Simon how he was feeling. Simon wrote: “angry”. I asked him why, and he typed his answer: “Because: Jonathan (his brother) is normal.” (Korber 2012: 99).

From this quotation, as well as from the following one, it becomes clear that Simon, the autistic child, does realize the situation he is in and that he does realize what is going on around him, although this is not always obvious to his surroundings:

> Soon, probably too early, I started asking Simon short questions. I was addicted to hearing his “voice”. (...) “Where would *you* want to go?”. And my son answered: “To Sardinia.” (...) I was moved to hear that he wanted to go there again, given that I had not even thought he remembered it at all (Korber 2012: 234)

Another interesting symptom caused by the disturbed perception of autistic people is their frequent tantrums. Tantrums can happen at any point in time without an obvious reason – at least none visible to the outsider. Also, tantrums can last for a very long time and autistic people are extremely difficult to console. The following quotation gives insight into why tantrums happen and how autistic people perceive changes in their structure of the world:

> One experience diffused into the next. And every experience settled in my mind as an example of a natural phenomenon, which laid down the rules of the world. For instance, if I saw a bird on a tree, and, at that very moment, I saw someone walking across the street in front of our gate, I concluded that every time a bird sits on a tree, someone needs to walk across the street. What if they did not happen together? Well, I would panic and get so anxious that I would scream (Mukhopadhyay 2011: 7).

3.5 Co-morbidities

Very frequently, children diagnosed with childhood autism are often also diagnosed with other diseases and disorders, such as mental retardation (25 to 50% of all cases), epilepsy (15 to 30% of all cases), gene-related neurobiological and metabolical diseases, such as fragile-X-Syndrome, William’s syndrome, phenylketonuria, and neurofibromatoses (10% of all cases). With regard to Rett’s syndrome, the numbers of mental retardation and epilepsy seem to be a lot higher, whereas with regard to Asperger’s syndrome, patients suffering from mental retardation, epilepsy, or metabolic diseases are rare. Nevertheless, most ASD patients

show symptoms of a hyperkinetic syndrome, indications of tic-disorders, and depression (cf. Poustka et al 2009: 21f).

Furthermore, co-morbidities such as disturbed eating behaviors, and sleep disorders are very common among autistic children and adolescents. It is not uncommon that autistic children do not develop the ability to chew very well or develop ot extremely late, which frequently results in preferences towards soft meals. Additionally, most autistic children and adolescents have strong preferences for specific dishes and will refuse to eat anything besides them. This often leads to an imbalanced nutrition. Many autistic children also have preferences towards meals with certain colors, forms, shapes, temperatures or consistencies. Thus, it can be extremely difficult for parents to find out what their child likes and dislikes. Sleeping disorders are also overly common in autistic children and adults. Often, even babies show disorders in their circadian rhythm and scream for many hours before going to sleep, which is a great burden and strain for parents (cf. Poustka et all 2009: 23).

Kamp-Becker et al (2011: 23) also claim that aggressive behavior in autistic children is not a rare case. They do not only exhibit auto-aggressive behavior but often behave aggressively towards other people, such as their parents, sisters or brothers, teachers, and doctors. Interestingly, Asperger's syndrome patients show more of this aggressive behavior, especially at a young age, in comparison with children diagnosed with childhood autism.

3.6 Savantism

"'Autistic savant' refers to a person with autism who has an unusual gift or an outstanding skill or knowledge clearly above their general level of ability and above the population norm." (Better Health Channel 2012). This definition of savants is very apt, as it describes savants as being extraordinarily talented "above their general level of ability". This is specifically true for autistic people, as they often possess such a talent but are otherwise unable to live a life without help from the outside (parents, nurses, etc.). According to the Better Health Channel (2012), three different types of savant skills exist, namely the splinter skills, the talented skills, and the prodigious skills. While many autistic children and adults possess a form of splinter skills, rarely any possess prodigious skills, which are extraordinary talents in either music, arts, mathematics, language, or the like.

According to Edelson (n.d.), the prevalence of savant-like skills in autistic people is around 10%, while it is as low as 1% in the rest of the population. Usually, autistic children and adults are specifically gifted with numbers. For example, some are able to remember any important or unimportant event in history, while others can tell you exactly what day of the

week July 1st, 1943 was. It is as yet largely unknown as to what factors contribute to the emergence of these talents. However, what they all have in common is some form of regularities, details, and systems. So in fact it could be that their orientation towards rules, and systems, which is a general symptom of autism, are milder forms of these savant-like talents. The following subchapters briefly introduce three autistic men with such special talents.

3.6.1 Stephen Wiltshire

Stephen Wiltshire, a London-born 36-year-old autistic man, has a special talent: he has a photographic memory. He has proven his talent frequently: after a 45-minute helicopter ride above cities like Venice, Hong Kong, and Rome, he was able to reproduce a panoramic drawing of these cities, without making any mistake or leaving any window or chimney out! (cf. *Daily Mail* 2009).

(http://bettertastethansorry.com/2009/10/stephen-wiltshire-draws-manhattan-skyline/)

3.6.2 Daniel Tammet

Daniel Tammet, who was also born in London, attended a regular school despite his autism. Very early in life it was found that Daniel had a special talent in the field of languages. After only two years of studying at university, he completed his studies of French, German, and History. It was also detected that Daniel had a special talent with numbers, and in 2004, he was diagnosed with savant syndrome. The first time his mathematical talent was publicly talked about was when he recited the mathematical constant Pi from memory to 22.514 decimal places. Moreover, he is able to learn a new language and speak it fluently within a week. Daniel Tammet has also published books in which he describes what his life, especially with numbers, looks like, such as *Born on a Blue Day,* and *Embracing the Wide Sky* (cf. Tammet 2012)

3.6.3 Matt Savage

Matt Savage, who was born in 1992, is an extraordinary musician despite his autistic disorder. Matt was not only diagnosed with Asperger's syndrome but also with hyperlexia when he was about three years old. At a very young age he was able to play the piano perfectly well and even composed his own songs. Supposedly, he possesses perfect pitch as well (cf. Treffert 2009).

4. Diagnosis, and Tests

The diagnosis of autism usually takes a long time and involves numerous steps. The first signs of autism can be evaluated by the parents themselves. So, for example, if the child doe not babble or gesture at the age of 12 months, if it does not speak single words at the age of 16 months, does not speak two word sentences spontaneously at the age of 24 months, or loses language or social abilities at any time during its development, parents should consult a doctor and have their child tested for autism (cf. Poustka et al 2009: 24).

At first, parents, family members, friends, as well as pediatricians, and kindergarten teachers evaluate the behavior of the child and express their concern. After that, parents are asked to watch the child carefully at home, fill out checklists and scales, as well as record the child in everyday situations, in order for the doctor to get an insight into the child's life and behavior. The next step includes a variety of screening tests, such as standardized tests and interviews, tests for co-morbidity, neurobiological and psychological tests. These are done in order to rule out any other disorder that has similar symptoms as autism. If the child is still thought to have autism, a differential diagnosis has to be made. Once other diagnoses can be ruled out, the doctor has to determine which treatment the child will receive in the future (cf. Kamp-Becker et al 2011: 55).

According to Sicile-Kira (2004: 24f), six commonly conducted medical tests for the detection of ASD exist: Hearing tests, genetic tests, EEG (Electroencephalogram), metabolic screening, MRI (magnetic resonance imaging), and CAT-scans (Computer-assisted axial tomography). When children are tested for their hearing, this is done in order to rule any hearing impairments out. Blood tests supposedly show abnormalities in the children's genes, while an EEG can find possible brain tumors or other abnormalities which could be causing the symptoms. Furthermore, through metabolic screenings, food allergies and intolerances can be detected, which could be a factor in the cause of retarded development of children. MRI's and CAT-scans are also used to assess the condition of the children's brains in great detail in order to rule out brain diseases.

In addition to all the medical tests that are conducted in order to evaluate the child's situation, specific screening and standardizes tests have to be performed as well. First of all, there is the M-CHAT (Modified Checklist for Autism in Toddlers), the FSK (Fragebogen zur sozialen Kommunikation), a questionnaire to find out about the child's social communication, and the MBAS (Marburger Evaluation Scale for Asperger's Syndrome). Secondly, there are standardized test a child has to go through, such as IQ tests, language development tests, and autism-specific investigation, such as the ADOS, and the ADI-R (cf. Kamp-Becker et al 2011: 61ff).

4.1 Differential Diagnoses

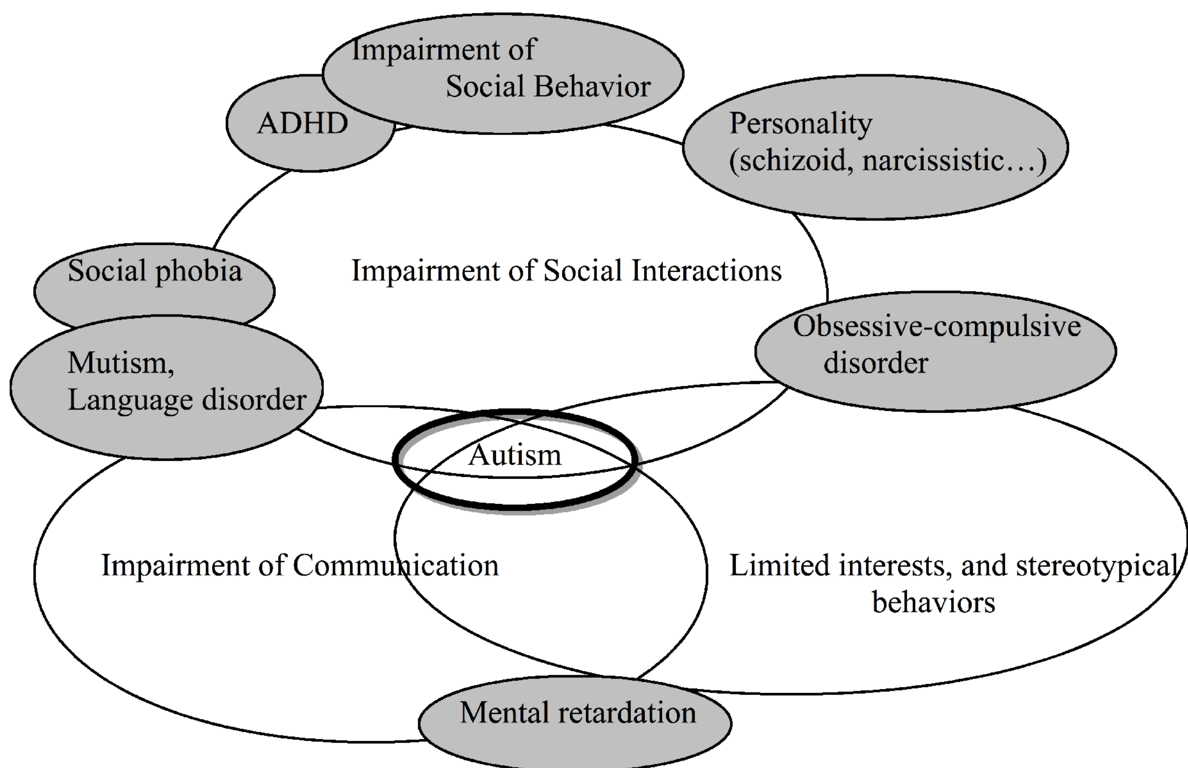


Fig. 2: Differential Diagnoses adapted from Kamp-Becker et al (2011: 66).

As mentioned in previous chapters, the exclusion of disorders other than autism is a crucial step in the diagnostic process. Therefore, children have to take several tests and screenings, which can be strenuous for them. However, from the graphic above it becomes clear how difficult it is to determine which disorder the child is suffering form, as autism shares symptoms with other disorders as well.

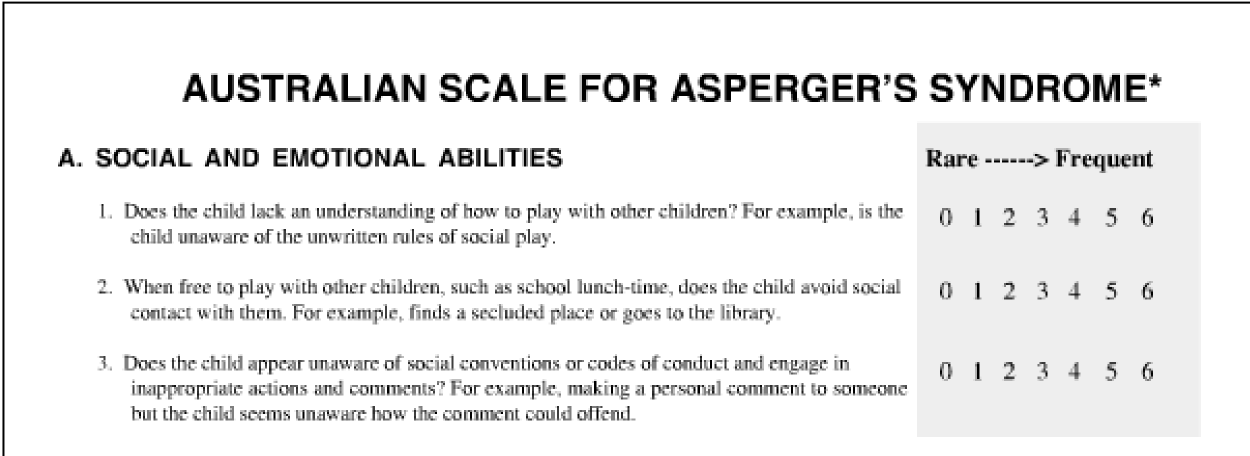
Autism, as can be seen, exhibits symptoms that are also related to mental retardation, mutism and language disorders, social phobia, ADHD, impairment of social behavior,

obsessive-compulsive disorder, and personality-related disorders such as schizophrenia. Therefore, doctors have to be extremely careful in making the right diagnosis, which is not always simple and can be a protracted process.

4.2 Assessment Scales

An interesting means for diagnosis is the Australian assessment scale. It was designed to be used by parents or teachers to assess conspicuous children before taking them to a doctor. Several such scales exist and are based on official diagnostic criteria as they are found in the literature. The scale consists of 24 questions about the social and emotional, communicative, cognitive, and motor abilities as well as about specific interests. Furthermore, there are five questions about other features of autism, such as fears, sensitivity to pain, and language development (cf. Atwood 2010: 15ff).

The following figure shows what the Australian assessment scale looks like:



AUSTRALIAN SCALE FOR ASPERGER'S SYNDROME*

A. SOCIAL AND EMOTIONAL ABILITIES	Rare ------> Frequent
1. Does the child lack an understanding of how to play with other children? For example, is the child unaware of the unwritten rules of social play.	0 1 2 3 4 5 6
2. When free to play with other children, such as school lunch-time, does the child avoid social contact with them. For example, finds a secluded place or goes to the library.	0 1 2 3 4 5 6
3. Does the child appear unaware of social conventions or codes of conduct and engage in inappropriate actions and comments? For example, making a personal comment to someone but the child seems unaware how the comment could offend.	0 1 2 3 4 5 6

Fig. 3: Australian Scale For Asperger's Syndrome, docstoc (2011)

If most of the five additional questions are answered with "yes" and the total score is between two and six, it is possible that the child is autistic. However, the final diagnosis has to be made by a doctor (cf. Atwood 2010: 18). The assessment scale was designed for children as in most cases the diagnosis is made at a young age. Nevertheless, it can happen that grown ups are diagnosed with autism. Sometimes grown ups themselves ask for an evaluation. Very often, these patients are diagnosed with atypical schizophrenia or alcoholism rather than autism. This happens because the symptoms of grown ups can be misleading or are not regarded as typical symptoms of autism (cf. Atwood 2010: 26f).

5. Language Development and Language Impairment

Children acquire language very early in life, which is important for any sort of communication ability to evolve. Language is a complex system of signs that consists of a wide range of elements, such as phonetics, grammar, semantics, pragmatics, and non-verbal language (gestures and facial expressions). Language skills of autistic children can be impaired in each of these areas. However, the main distinction with regard to autistic children is made between the impairment of receptive and expressive language skills. While autistic children are sometimes able to speak quite normally, e.g. Asperger's patients, their ability to communicate with others, or their intonation patterns and understanding of language, may still be impaired.

As the causes for language disorders in autistic children are mainly unknown even today, they are nevertheless thought of having to do with some conditions before, during, or after birth (cf. Kostyuk et al 2012: 33). It is interesting to see that a about a third of autistic children develop normal language skills during their first years of life. It is only at the age of around two years that these children lose their language abilities and exhibit regressions in both language and behavior (cf. Kostyuk et al 2012: 36).

Typically, verbal autistic children acquire their first words later than normal children and have a distinctive impairment in the ability to understand language. Sometimes their articulation might seem advanced for their age, which makes these autistic children seem precocious. Other language-related symptoms of autistic children are that they both create new words (neologisms) and have an unusual use of set phrases, especially such with idiosyncratic meanings. Sometimes these children also use grammar over-precisely and pay a lot of attention to the distinction of grammatical and functional use of language. Additionally, echolalia is an extremely prevalent symptom of autism. There are two forms of echolalia, the immediate and the delayed one, which was discussed in a previous chapter. Frequently, autistic children confuse the pronouns "you" and "I" especially often. Interestingly, even high-functioning autistic children have an odd quality of voice, intonation, and stress of words, which sets them apart from other children of the same age. Moreover, high-functioning autistic children have problems with understanding metaphorical utterances, which means they take such utterances literally. People who are not aware of this, often perceive it as a big problem, as language is full of metaphorical expressions which most people are not aware of. Autistic children, high-functioning or not, hardly ever start spontaneous conversations, take part in conversations, or successfully participate in dialogs. This means that autistic children

who are able to speak still often only lead monologs because they are unable to participate in dialogs. Another deficit they suffer from is their lack of cohesion and of references to their own mental status and emotions. This makes it difficult for outsiders to know how they are feeling. Something else that sets autistic children apart from their peers is that they persistently ask the same questions, even though they have already received an answer (cf. Bishop 2003: 215). This repetitive behavior is often extremely exhaustive for the parents of an autistic child and the best way to stop such a behavior is to simply tell the child very clearly to stop.

5.1 Receptive and Expressive Skills

Receptive language skills refer to the understanding of language and other communication-related signs, while expressive language skills refer to the active use of language in order to express own ideas, feelings, and the like. Normally, children develop a comprehension of words at the age of 9 months, which makes it possible for them to understand certain words and even short phrases. Around their first year, or a little later, the repertoire of receptive and expressive skills increase fast. At this stage of development, children can talk about things outside their own context already, meaning their language is less context-bound at that age. Before children enter school, they are able to form phrases and sentences, but at around the time school starts, their grammar skills and language abilities increase tremendously (cf. Maljaars et al 2012: 2182).

Autistic children generally use a lot of repetition in their speech. This is called echolalia, and has been mentioned before. The following quotation is a perfect example of delayed echolalia:

> Simon behaves like all autistic children: they learn and repeat sentences whenever they think them appropriate. So Simon would say “Bye, David, and thank you for the cake” in any farewell situation for a very long time, because he heard me say that once and did not realize that this phrase requires at least one David and a cake (Korber 2012: 112).

This quotation demonstrates that the autistic child, Simon, heard his mother say “Bye, David, and thank you for the cake” in a farewell situation, which Simon thought to be appropriate in any farewell situation. Therefore, he repeated it whenever he thought it was appropriate.

What makes research into language skills of autistic children so interesting is that, for

example, autistic children with good language skills receive better prognosis later in life than those with poor language skills (cf. Maljaar et al 2012: 2183). Therefore, even low-functioning autistic children should be supported in learning a language, as this ability can have positive contributions to their overall condition and development.

5.2 Phonology

Phonology seems to be the area least impaired in autistic children. However, it was found by the means of MRI that autistic children process sounds slightly later than with normally developing children. Nevertheless, autistic children often have a talent with sounds and hear sounds other people cannot hear. Many are said to even possess absolute pitch (cf. Kostyuk et al 2012: 34f).

It was mentioned before that autistic children often use odd intonation and word stress, which might be an indication for phonological impairment. This does not mean that they cannot hear the correct pronunciation or sound but they might simply be unable to produce the correct sounds, indicating a motoric problem rather than a phonological or cognitive one.

5.3 Grammar

According to Bishop (2003: 217) autistic children score very low in all grammar-related areas, though the two areas they score highest in are sentence structures and sentence assembly. This contradicts the study by Kostyuk et al (2012: 35) who claim that grammar is extremely impaired in autistic children. They further claim that these children specifically have problems with "pronoun reversal, which occurs when individuals confuse first and second pronoun in speech". However, in my opinion, this does not fully fall into the category of grammar but rather in the one of semantics and pragmatics, as it is not the position of the pronoun in the utterance that is incorrect but the meaning of the words.

5.4 Semantics and Pragmatics

Autistic children clearly have tremendous problems with the areas of semantics and pragmatics, which refer to the meanings of words, phrases, and sentences, and the social meanings of words, phrases, and sentences, respectively (cf. Yule 2006: 100, 112). Autistic children have specific problems in the understanding of abstract words, idioms, sayings, and slang expressions and words that relate to feelings, emotions, status, degree. Due to their lack of understanding spoken language, many autistic children memorize certain words, phrases, and sentences and then repeat them in situations they think are appropriate. Very often, the

memorized phrases they repeat seem out of context to other people. This use of language is called echolalia. For many children echolalia is the only means of communication they possess, while others may be able to learn the meanings of words up to a certain degree, which makes it possible for them to produce their own sentences (cf. Kostyuk et al 2012: 35).

A nice example for the literal interpretation of idioms and metaphorical phrases is provided by the following quotation (unfortunately, it cannot be translated into English, as it would lose its idiomatic sense):

> ""Der hat dir einen Bären aufgebunden."
> "Nein." Die Haha kuckte mich streng an. "Er hat dir einen Bären aufgebunden."
> "Was für einen Bären meinst du? Einen Kodiakbären oder einen Eisbären?"
> "Rede keinen Unsinn."
> Die Haha hatte Unrecht. Wolfgang könnte mir nie und nimmer einen Bären auf dem Rücken festbinden. Nicht einmal einen Waschbären."
> (Brauns, 2004: 144).

This dialog between Axel and his mother, who he calls "Haha" is typical for autistic people. He does not understand why his mother is talking about bears although at the time of this conversation he is already eleven years old. Often, such incidences are funny to outsiders, especially if they are not aware of the severe disorder which causes this inability. Other people, however, might think that Axel is a stupid child, which is not true.

Many autistic children at least learn to answer yes or no questions at some point in their lives. However, pragmatic abilities of language also include the ability to hold eye contact in a conversation, to maintain or change topics, to take turns with other speakers, and to distinguish whether the situation requires formal or informal language. Autistic children hardly ever master all of these aspects of language, which contribute to severe impairments in communicative skills (cf. Kostyuk et al 2012: 36).

5.5 Non-Verbal Language

Non-verbal language refers to the use and understanding of gestures and facial expressions. Both of these areas are severely impaired in autistic children, which makes them unable to process non-verbal information. Especially deictic gestures (gestures that refer outside the given context) seem to pose problems for them. Kostyuk et al (2012: 36) say that the support of non-verbal language is crucial in autistic children as this might lead to a lower rate of tantrums, anxiety, auto-aggressive and general aggressive behavior and promote

cognitive structures in the brain that are necessary for the processing and producing speech and communication.

Autistic people are often completely unable to understand gestures and facial expressions, as gestures and facial expressions deviate from the autistic people's detail-oriented perception. Axel Brauns, an autistic person, states that he had to study non-verbal language like a foreign language (cf. SWR 2009). This will be discussed in more detail in one of the subsequent chapters.

5.6 Language Acquisition and Bilingualism

Language acquisition refers to "the gradual development of ability in a first or second language by using it naturally in communicative situations." (Yule 2006: 236). The acquisition of a child's first language takes place in remarkable speed and it seems as if every person's brain possesses a special capacity for language learning (cf. Yule 2006: 149). For children, with autism, this seems to be different – at least at first sight. They seem not to have the same cognitive ability to learn languages, as has been shown in preceding chapters.

Language disorders are the greatest impairments in autistic children. For a long time it was thought that they are unable to acquire languages at all – let alone two languages. However, it was proven not only that they are able to learn one language very well once the right interventions are used, but their impairment does not prevent them from learning or even acquiring a second language. A study by Seung et al (2006) showed that if the correct interventions are used very early in life and that if speech, language and communication are supported from the very beginning, children may show the same language developments as normally developing children. The tested subject showed an increase not only in receptive and expressive language skills but also his vocabulary increased and he was able to use two- and three-word sentences in both his first and second language (Korean and English respectively). The outcomes of the study showed that the subject could follow instructions, request activities on his behalf, use two- and three-word sentences, and spontaneously greet other people and make eye contact with them. Furthermore, these abilities seemed to have made an impact on this social behavior, as he occasionally smiled at other people, which is something autistic children hardly ever do out of their own motivation. Furthermore, a decrease in unwanted behavior, such as tantrums, was noted as well. Additionally, the boy exhibited an increase in non-verbal communication and would even play with other kids on some occasions instead of on his own. He even showed some sort of imaginative play, which is atypical for autistic children. With regard to language development, the boy investigated was able to not only use

and answer yes or no questions but also wh-questions. He also mastered simple utterances and word combinations in his second language, which proves that second language acquisition is possible for autistic children. The study has proven that the promotion of language learning and language acquisition in autistic children has positive effects not only on their language and communication abilities but also on their social abilities. Therefore, the promotion of language should be made a primary aspect of therapy.

It was shown that autistic children, despite their language impairments, are able to acquire a second language. Bilingualism in autistic children has previously been thought of having negative effects on them and on their first language. However, relatively recent studies have found out that this does not apply at all. In fact, bilingualism seems to have positive effects on non-verbal language. This means that learning a second language improves their ability to gesture and communicate with others (cf. Wright 2012).

Another benefit of bilingualism that was detected in several studies is that bilingual autistic children apparently have a larger vocabulary in their first language than monolingual autistic children. However, other studies in this area have proven that bilingual autistic children have a smaller range of vocabulary in comparison to monolingual ones. This shows that still a lot of research has to be conducted in order to find out the truth about bilingualism in autistic children (cf. Hughes 2011).

Interestingly, it has been said that bilingualism in autistic children has neither positive nor negative effects on them. It is significant that studies have shown that bilingual autistic children do not face greater problems in language learning than monolingual ones, although this had been the prevalent opinion for a long time. However, it always depends on the child whether he or she will face difficulties in the acquisition of a second language or not. No generalizations can be made at this state of research (cf. Lowry 2011).

6. Treatment: Therapies and Medication

Quite a variety of therapeutic approaches and methods exist for the treatment of autism, such as Cognitive-Behavioral Approaches (Applied behavior analysis, TEACCH, Cognitive-behavioral therapy, Denver Health Sciences Program, DIR/Floortime method, LEAP, Miller method), Approaches for the development of social interactions (Social Stories, Circle of Friends), for the developing of alternative communication (PECS, sign language), approaches based on play (non-directive play, pivotal response training, integrated play groups), sensorimotor approaches (music therapy, sensory integration, auditory integration,

visual therapies, facilitated communication, Daily Life Therapy), biochemical approaches (pharmacotherapy, secretin) and others (psychoanalytic approaches, holding therapy, son-rise program) (cf. Kalyva 2011: v).

As can be seen, many different approaches to the treatment of ASD exist, which is why only a selection of therapies will be discussed in the following chapter, such as Applied Behavior Analysis, the TEACCH program, cognitive-behavioral therapy, PECS, facilitated communication, social stories, and others.

The most important aspect of autism therapy is early intervention, because intervention should take place as soon as the child is diagnosed with some sort of developmental disorder, or even before the actual diagnosis is made, so that the developmental gap between the (autistic) child and peers will not get too large. At a young age, children can still develop language, communication, and social abilities up to a certain level, which is another indication for intervention to take place as early as possible. Usually, such early interventions are either concerned with language (speech-language pathology), motor skills (occupational therapy), or behavioral patterns (cf. Poustka et al 2009: 43f).

6.1 Behavioral, Occupational, and Physical Therapy

In order for behavioral, occupational, and physical therapies to be successful, it is indispensable to include the whole family into the process. Only if therapists and families work together, can the surrounding needed for the autistic child be guaranteed. In behavioral and occupational therapy, the child trains certain behaviors, such as social and partly communicative behaviors, self-management, and regulation of emotions. Conditioning is the most prevalent and widespread form of therapy in this area, which is done by the use of reinforcements. At first, the therapist would render the child assistance in the execution of behaviors (prompting), would then shape their behaviors the correct way (shaping), and reduce the amount of assistance (fading). Finally, the child supposedly learns through imitation and modeling (cf. Kamp-Becker et al 2011: 77).

The most important aspect of therapy with autistic children is the use of reinforcements. Primary reinforcements, such as candy and sweets, are important in the first part of therapy, but are later replaced by other forms of reinforcements. These reinforcements can either be of social or emotional nature. For example, letting the child play his or her favorite game, or by praising their actions frequently and in an exaggerated way will be a strong reinforcement. Other ways of conditioning autistic children are through reward systems. Also important in that respect is the non-reinforcement of undesirable actions and

behaviors.

6.1.1 Applied Behavior Analysis (ABA)

The two most important aspects of the Applied Behavior Analysis (ABA) are the start of the therapy at a very young age and an extremely intensive therapy, into which the parents and the family of the autistic person need to be included. The therapy is most successful when started prior to age three and if the amount of therapy given over months or years amounts to 15 to 40 hours a week. The symptoms that are mainly addressed with this form of therapy are attention and imitation, communicative and social abilities of the young patient. The therapy is applied by using step-by-step instructions, which are clearly structured, which makes the single steps easily distinguishable for the child. Over the past years, this therapy has proven to be very successful (cf. Kamp-Becker et al 2011: 80).

The ABA method is comparable to operant conditioning methods, and is structured to change unwanted behavior in a child and promote wanted behavior. In addition to the above mentioned goals of the improvement of communicative as well as social skills, the "consumption of food, use of toilet, getting dressed, personal hygiene, the ability to find their way around in the house" (Kalyva 2011: 2) are abilities to be trained in this therapy. Due to the hypothesis of the symptoms of autism being a result of a neurological disorder, the autistic child receives instructions in small units, which means that actions are broken up into smaller steps. One of the problems with this method is, however, that apart from a few outcomes (such as eye contact) most outcomes are extremely difficult to measure. Furthermore, the temporal and financial effort is often too big for families, which results either in no therapy at all or in one that is below the recommended temporal frame (cf. Kalyva 2011: 2, 17).

6.1.2 TEACCH – Treatment and Education of Autistic and Related Communication-handicapped Children

The TEACCH method for the therapy of autistic children has become very popular all over the world in the past few years. It "is a comprehensive programme that deals with the diagnosis, the treatment, the professional training and the lives of individuals with ASD." (Kalyva 2011: 19). It differs from ABA in so far as it does not aim at "curing" ASD but rather at the improvement and the maximization of the children's skills and abilities. Important factors in this therapy are, again, the parents and the family. At home, the children should be instructed in the same manner as in the therapy and parents should support their child by establishing the same, or similar, routines as in the therapy lesson. "The cornerstone of

TEACCH is structured instruction that is used systematically to make the environment predictable, to help the child understand the environment and to function feeling safe, to make use of his skills and to practise them." (Kalyva 2011: 19). Therefore, this method addresses the autistic people's need for structures and rules. As has been mentioned earlier, autistic people very easily get lost without a structured environment and rules they can follow, which is supposedly prevented by this therapy.

An important aspect of the TEACCH method is that it tries to train children in a way that makes it possible to function in school and later in society once they are grown up. High-functioning autistic children who receive this training can supposedly be educated in regular classrooms. Low-functioning autistic children should not be educated in normal classrooms but rather in special ones in order for their needs to be addressed accurately (cf. Kalyva 2011: 23).

The success of the TEACCH program is clearly visible in numbers of autistic people institutionalized as adults: While between 39 and 75 percent of those who did not receive TEACCH treatments as children were later institutionalized, only 7 percent of treated children were later put into an institution. These numbers clearly show the success of the TEACCH program in preparing autistic children for a life on their own and in developing and promoting their independence. However, it has been shown that other factors influence the independence of these children as well, and the success can therefore not merely be attributed to the TEACCH training program (cf. Kalyva 2011: 30).

6.1.3 Cognitive-Behavioral Therapy

Cognitive-Behavioral Therapy is mainly used for high-functioning autistic children and adults, as they often suffer from loneliness, phobias, depression, and eating disorders. This form of therapy addresses these problems as well as their problems with relationships with others and gives them psychological support in whatever problems they face. The cognitive-behavioral therapy aims at the reduction of "fear, depression, anger, self-destruction and self-defeat" (cf. Kalyva 2011: 37) and helps them understand behavioral patterns. As this approach helps high-functioning autistic children and adults in understanding these patterns, the rates of sudden outbreaks of tantrums, fear, and anger can be reduced drastically. With the help of this therapy, autistic people learn to perceive themselves, others, and behavioral patterns differently, which leads to higher rates of independence (cf. Kalyva 2011: 37f).

6.2 Training of Social and Communicative Skills

Since the impairment of language, communicative and social skills are enormous in autistic children, intervention in these areas is crucial. As has been discussed earlier, even if communicative and linguistic skills are improved and receive therapy, social skills advance simultaneously. Therefore, any kind of therapy a child receives has a positive effect on his or her development.

6.2.1 Speech-Language Pathology

Language and the ability to express one's thoughts and feelings are essential for every human being. If this ability is impaired, which is the case for all autistic people, therapy is inevitable. Speech-language pathology is an integral part of the therapy for autistic people and should be started as soon as the disorder emerges or as soon as any signs show. Important parts in the therapy of speech and language are the training of holding eye contact, the intensification of certain sounds, the linkage of a variety of sounds to form words, phrases, and sentences. Psycholinguistic approaches try to teach children a language in a way that is as natural as possible. Furthermore, not only the production of sounds, words, and sentences are focused on but also the ability to communicate and interact with other people are supported and promoted (cf. Poustka et al 2009: 53f).

While the autistic child is still in school, speech-language pathologists normally do not only work with autistic children alone but also with their parents, teachers, and sometimes even schoolmates. When working with family, teachers, and peers, the speech-language pathologist tries to teach them how to communicate with the autistic child in order to make conversations and interactions successful. The speech-language pathologist also works with the children on non-verbal communication, such as gestures, and facial expressions, but also on reading and writing abilities (cf. Vann 2010).

As speech-language pathology does not only train the communicative skills of autistic children but also their social skills, several software programs have been developed to serve this purpose. One of these is called "Faceland" and helps autistic children and adults to learn to recognize facial expressions and emotions. This is done through showing pictures of people exhibiting various emotions and by including clues in the pictures, which supposedly help the autistic person to recognize the emotion. The program works with the theme of an amusement park, so that children get engaged into the learning process more. When the autistic person hits "school", he or she is taught a variety of emotions by a robot teacher. One of the principles the program works with is repetition. Furthermore, the students are not only shown

pictures of emotions but also videos that show the experience of specific emotions in the correct situations. After these two steps, the autistic children and adults are presented with a quiz in which they can test what they have learned. Emotions are also broken down into several pieces of information, which means that only pictures of the eyes, or mouth, and so on are shown. The software also includes eleven game-like activities, in which children and adults can practice their knowledge about emotions and facial expressions and consolidate their abilities. For autistic adults, specific "adult options" exist, so that the game-like learning process does not feel too childish. The pictures in figure 3 are examples of how the software works:

Fig.4 Software for learning emotions, http://www.do2learn.com/subscription/product_details/cd_Faceland.php

6.2.2 PECS – Picture Exchange Communication System

PECS, or Picture Exchange Communication System, was invented to allow non-verbal autistic children and adults to communicate at least in a limited way. First and foremost, it was thought of as a training facility that supports the initiation of communication by autistic people. Generally, it can be said that PECS consists of six stages (cf. Kamp-Becker et al 2011: 84):

1. Exchange of Pictures
2. Distance and Persistence
3. Visual Differentiation
4. Sentence Structure and Extension thereof
5. Answering Questions
6. Comment

The first stages involve the exchange of pictures for the purpose of simple interactions. These interactions are supposedly introduced by the autistic person him- or herself. The pictures are supposed to facilitate the initiation if such interactions. The final goal of a therapy supported by the PECS system is to promote the production of sentences in verbal autistic children. For non-verbal autistic children, the PECS system can also be used to support interactions.

The general idea of PECS is that autistic non-verbal children and adults use picture cards, photos or the like to show what they want, or feel. This method has been proven to be very successful, as it can later be combined with words and short sentences, which the child might learn to use as well (cf. Poustka et al 2009: 54). The pictures below are examples of what PECS cards look like:

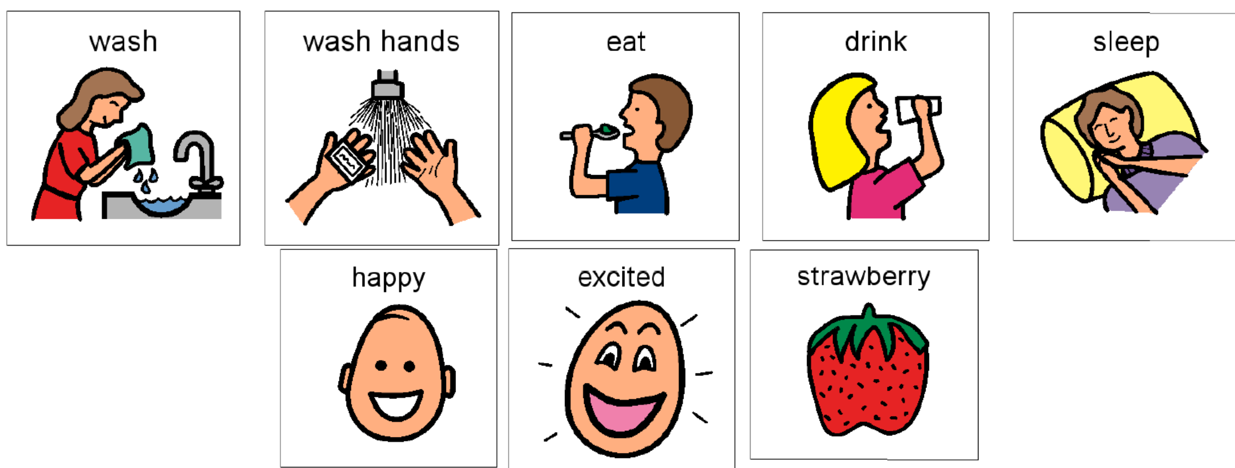


Fig.5: PECS, http://www.childrenwithspecialneeds.com/index.php/downloads.html

6.2.3 Facilitated Communication

Facilitated Communication refers to an alternative form of communication where one person supports the autistic person in communicating by holding his or her arm, so that he or she can type on his or her computer or board. Why this method works has been explained through the emotional and physical component of it. This method is used with non-verbal autistic children and adults who have a motoric inability to communicate rather than a cognitive one. Through the touch of the non-autistic person, the autistic person is able to feel his or her hand, which facilitates the typing of letters and thus communication can occur (cf. Kamp-Becker et al 2011: 86).

The following two quotations depict how facilitated communication helped a family to realize the talent and intelligence their autistic son has: something which had previously been unknown to them, as Simon is a more or less non-verbal autistic child:

> During the course of several months we, him and I, learned to use Facilitated Communication and found the key to what is possible in our dialogs in this method. Thanks to this method, we found that Simon is intelligent, inquisitive and eager to learn, just like any other normal child. (...) The child (...) was finally able to make intelligent contributions in the classroom. Simon showed that he perceived texts that were read out to him aloud by answering text-related questions through pointing at the correct answer. At some point, Ms. Kaarmann realized that she did not have to read texts out aloud: Simon could read. He mastered the English language, his lexicon in this foreign language was enormous, and he calculated, even as high up as in the millions. Simon turned into a child that answered those questions that no other kid in his classroom could answer; because he could (Korber 2012: 230).

Not only were the parents, his mother especially, able to find out about his needs, which helped her a lot in understanding her son, but it also helped the boy to express his needs and wants, which helped him a lot in breaking free of his world:

> He typed, "i want to really learn and in a different school and the stupid lessons are making me crazy." (...) Or – because he was almost fluent in English as well, as we realized: "I want a teacher who can tell me something about helium and chemistry." (...) "i want to learn about the relativity theory", Simon typed on his iPad, "something about sharks", "i want good water experiments", "do fractions", "something about the broken nuclear power station" (Korber 2012: 235).

Despite the apparent individual success stories, scientists have argued that the supporting person influences the answers of the autistic child or adult thought movement of the arms. It has been said that this form of communication should not be used with autistic people, as it can happen that autistic people's abilities are overrated through facilitated communication. Also, the supporting person's expectations may not be met, which can lead to all sorts of negative feelings (cf. Kamp-Becker et al 2011: 86f).

6.2.4 Social Stories

Social Stories are used to convey rules, patterns, and expectations of certain behavior to autistic children. This form of therapy was first developed by Carol Gray in 1991 and tries to explain structured of social interactions and encounters. The stories are typically structured in the following way: They are told in small steps with as many details as possible and from the child's perspective. Mostly, these stories are written in the present or future tense and can be accompanied by pictures, symbols, or the like. It consists of an introduction, a main part

and a conclusion. Furthermore, they are easily understandable and individually adaptable. Parents, teachers, or therapists write the stories themselves in order to either prepare the child for a potentially difficult upcoming event or to talk about something that happened in the past. The story can either make use of descriptive sentences, perspective, directive or affirmative sentences, which should be set before the story is written (cf. Schirmer 2006: 118f).

When I worked with autistic children, I experienced the successful use of Social Stories with a nine-year-old boy. He was extremely nervous about having to go to the dentist, which is why his caretaker wrote a Social Story for him. The story explained the appointment at the dentist in very small steps. Before the appointment, the boy read the story multiple times and he managed the appointment without too much anxiety. This shows, how Social Stories can be successful, if used correctly.

6.3 Medication

Medication is essential in the therapy of autism. Psychotropic drugs especially are very wide spread. These drugs are mainly used to improve the children's stereotypical, repetitive, self- and auto-aggressive behavior, as well as the common hyperactive reactions (cf. Poustka et al 2009: 56).

Among the most commonly used drugs in the treatment of ASD's are neuroleptics/ antipsychotics (atypical neuroleptics especially), stimulants (e.g. amphetamines), selective noradrenaline reuptake inhibitors (SNRI's), selective serotonine reuptake inhibitor (SSRI's), antidepressants, and melatonin. Atypical neuroleptics are used for the treatment of aggressions, increased anxiety and irritability, depressions and repetitive patterns of behavior, while stimulants are used for the treatment of attention deficits, hyperactivity, and impulsive behavior. SNRI's and SSRI's are utilized to alleviate symptoms such as hyperactivity, anxiety, aggression, and depression, as well as repetitive behavior. The symptom of insomnia, which is extremely prevalent among all types of autism, is treated with melatonin (cf. Kamp-Becker et al 2011: 92ff).

Generally, medication is a useful supplement to the other forms of therapy mentioned above (occupational therapy, logopedics, etc.), as especially symptoms that are directed towards other people, such as aggressive behavior, are alleviated. Several symptoms, such as aggression, stereotypical behavior, and hyperactivity can be treated extremely well with medication (cf. Kamp-Becker et al 2011: 92ff).

6.4 Other Forms of Therapy

In addition to the therapies mentioned above, other alternative therapies exist as well, which could be helpful in the treatment of autism, though they do not explicitly address typical autistic deficits. Among these therapies are music therapy, and dietary changes.

6.4.1 Music Therapy and Diets

Music therapy is used for the restoration, conservation, and promotion of the mental, physical, and emotional health of individuals. Autistic children have attention deficits, which are supposedly improved upon through joint production of music. Furthermore, the children's non-verbal communication skills are supposedly advanced through music therapy. Often, the children's abilities to hold eye contact and taking turns in conversations can be improved through this form of therapy as well (cf. Kamp-Becker et al 2011: 84f).

Very often, the playing of an instrument, such as the flute, can help to strengthen facial muscles, which are important in the production of sounds. Therefore, playing the flute can promote motoric speech and language skills.

Among a variety of diets, it has been found out that, for example, gluten-, casein-, wheat-, sugar-, and milk-free diets, as well as extra intake of vitamins, dietary supplement, or even yoga, meditation, and massages are used by families with autistic children. However, none of these therapies are scientifically proven to be effective (cf. Kamp-Becker et al 2011: 86).

Music Therapy, http://parentingspecialneeds.org/article/317

7. Conclusion

This Bachelor's Thesis has addressed many aspects of the Autism-Spectrum-Disorders and shed light on some of the typical and often regarded as mysterious behaviors that appear. However, it was also discussed in numerous parts that recent research has not been able to detect the causes of autism, which is why no cure has yet been found.

The main part of this thesis dealt with the speech and language disorders that autistic children and adults suffer from and how they can be treated. Language disorders are prevalent among all types of the Autism-Spectrum-Disorders yet different types show different impairments. Despite the language impairments, the thesis has shown that it is also possible for autistic children and adults to acquire a second or third language. It is not only autistic savants who are able to do that but any autistic child could manage it. Furthermore, different methods for the treatment of language impairment have been discussed and supported by several examples.

One of the most interesting questions is how autistic people perceive the world around them. It is not possible to clarify this question completely, yet some answers have been provided through examples of high-functioning autistic men, who have written books about their lives. Nevertheless, still a lot of research will have to be carried out in order to bring about a better understanding of the autistic perception of the world.

As the numbers of autistic people are rising dramatically, especially in the United States, but also in Austria, a lot more research will have to be conducted in the future, so that maybe one day a cure can be found. Once there is a better understanding of what causes autism, the therapy and medication can be improved upon quite a lot. Due to the dramatic rise of autism, environmental factors are also implicated in the causes of the disorder- not only genetic ones. This is another field of research for the future.

Autism Ribbon, http://saypeople.com/2011/11/24/exactly-opposite-disturbances-cause-two-autism-related-disorders/#axzz2AF31cXgG

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