

**Faculty of Medicine  
University of Duisburg-Essen**

**Department of Neurology**

**“Causal attributions of headache and functional abdominal pain  
at the end of the primary school period”**

*A gender and pain-related analysis of subjective causal descriptions  
Provided during the Essen Children's Pain Interview*

**I n a u g u r a l – D i s s e r t a t i o n**  
For the purpose to  
achieve the degree of Doctor of Medicine  
at the Faculty of Medicine  
University of Duisburg-Essen

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2015

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**Date of the oral examination: 2 November 2016**

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# **1. Introduction**

## **1.1 Epidemiology**

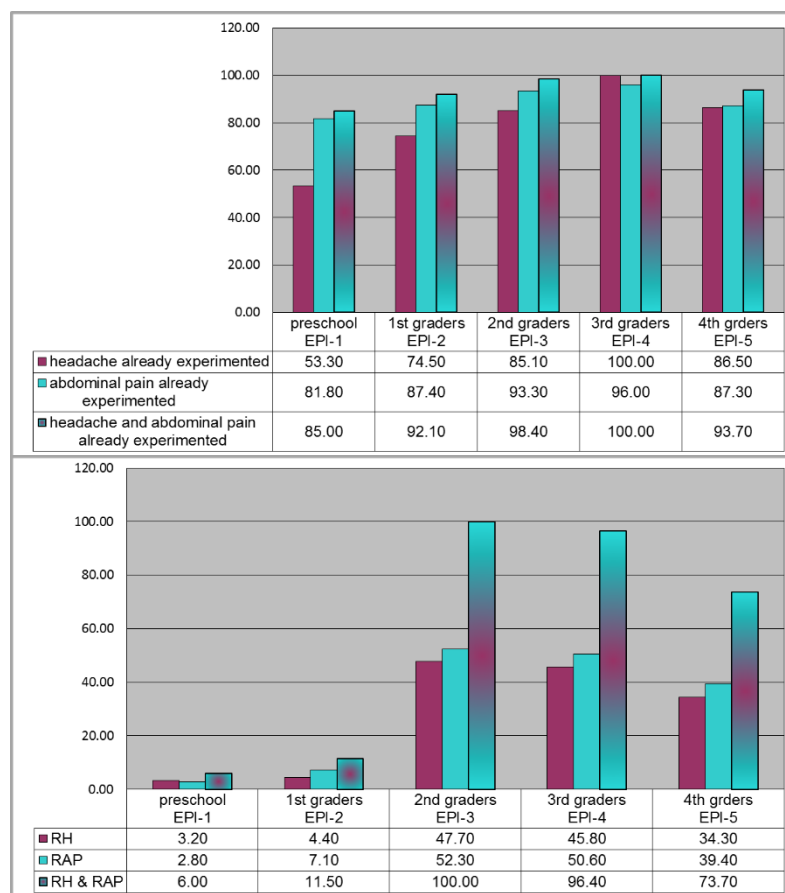
The primary headache is a multifactor clinical sign that is very common in children and adolescents. Both environmental and socio-psychological factors are influencing the occurrence of headache. Not only the clinical conditions such as fever, cold, sinusitis, pharyngitis or otitis but also other factors including stress, depression, anxiety, sleep disorder and fatigue are involved in causing headache. The chronic headaches in children are not only a clinical problem but also a main worry for the parents due to possible presence of a brain tumour. The incidence of headache and abdominal pain in children has been increased significantly with the passage of time. It is reported that 20% of children have headaches in preschool period and more than 50% headaches at the end of primary school period. A survey showed that 7000 German school pupils are complaining about tension type headache and 12% about migraine. In addition to this it is also reported that the children and young people are suffering from more tension type headache than adults. The German Association for the Study of Pain reported that around 350,000 children suffer from chronic and somatoform pain disorders in Germany.

In a study based in a specialist gastroenterology unit in Bristol, UK (serving the same population as Apley and Naish (1958) 50 years earlier) an irritable bowel syndrome was identified as the commonest cause of recurrent abdominal pain. Out of 103 children fulfilling the diagnostic criteria of recurrent abdominal pain and entering the study, after extensive investigations 72 were found to have no organic pathology. Thirty-seven of these 72 children (51%) fulfilled the diagnostic criteria for irritable bowel syndrome, making IBS the commonest cause of recurrent abdominal pain even in a specialist hospital setting. This recent study compared to Apley and Naish (1958) had the advantage of improved screening tests (celiac serology, *Helicobacter pylori* antibody titer, inflammatory markers, serum amylase and abdomen ultrasonography) as well as previously existing tests such as liver function tests, full blood count, urine and stool analysis. In addition to screening tests, endoscopy and oesophageal pH monitoring were performed where there was a clinical indication (Sandhu and Paul, 2014). This study shows that causal attributions are very important and have to be integrated into the patient's examination history.

According to a German study the prevalence of headache at the age of 6 months accounts about 54% according to information provided by the parents (Kröner-Herwig, 2009). Another study among 12 to 15 year-olds reported a 3-month prevalence of 69.4% in total, 59.5% for

boys and 78.9% for girls (Fendrich, Vennemann et al., 2007). Moreover, group of children aged 7 to 15 years with recurring or chronic headaches have a prevalence of 5%-10% (Kavuk, Yavuz et al., 2003). Abu-Arafeh (2002) reported even higher prevalence of recurring headaches among school children with up to 25%. The prevalence of headaches increases when a child is of school age and levels off to the same prevalence of adults when he or she is an adolescent (Abu-Arafeh, 2002). The ratio of headache experience between boys and girls is 1:1 and shifts to 1:1.5 in adolescence to the benefit of the male children.

Data from epidemiologic studies on the causes of headaches and abdominal pain in children reveal that abdominal pain is the most common in small children as compared to adolescents whereas headache is most common in adolescents. The Children and Youth Health Survey in a longitudinal study in 2007 with a total of 17.641 children and youths aged 3 to 17 years from 167 German towns and cities, resulted in the determination of a surprisingly high prevalence of recurring pain (Ellert, Neuhauser et al., 2007). The results of this study showed that the 3 to 10 age groups presented the highest prevalence of abdominal pain (69%) and headaches (56%). The parents observed recurring pain in 30.6% of the children and 9.9% suffered from pain once per week or more frequently.



**Figure 1:** Paediatric prevalence of headaches and abdominal pain from preschool to 4<sup>th</sup> year of primary school (upper: children know this pain; lower: children with recurrent pain)

Figure 1 presents the results of the paediatric prevalence of headaches and abdominal pain from the epidemiological studies (EPI-1 to EPI-5) of our project. Children knowing this pain from own experiences (upper part of figure 1) and those experiencing recurrent headache and abdominal pain (lower part of figure 1) are presented here. Respectively the third column shows the added prevalence. The highest prevalences for recurring pain are found for 2<sup>nd</sup> graders. From 2<sup>nd</sup> to 4<sup>th</sup> class prevalences are declining up to 34.3% for recurrent headache, 39.4% for recurrent abdominal pain and in sum 73.7%.

## 1.2 Subject of the Study

In relevance of lay theories concerning disease causalities as a fundamental aspect of the coping with, and management of diseases with a provable influence on the subjective well-being is known in medicine (Shiloh, 2002). According to Sensky (1997) the conjectural explanation for a certain body perception or a symptom can have far-reaching consequences; on one hand, subjective ideas about diseases influence the decision to seek medical assistance and on the other hand they also influence the medical judgement itself (Sensky, 1997). The greater part of an individual's reaction to his perception to body signals and symptoms or to a disease diagnosis depends on his own convictions and behavioural patterns. The patient looks upon causal attributions as a possibility to assert a decisive influence on the course of the disease or to make it more endurable. Therefore, an understanding of lay theories concerning disease causalities enables the behavioural patterns of the patient to be predicted with a greater accuracy, thereby making it the basis of an optimal clinical treatment strategy (Sensky, 1997). Lay theories (or 'implicit theories') are cornerstones for social cognition. Lay theories are most commonly used in daily life because they are not only socially transmitted and shared but also they are functional. Lay theories are providing better understanding and prediction of one's own common sense. People use lay theories to help them make sense of complex and ambiguous behaviour. In so doing, it is demonstrated that each theory does not act alone. Instead, each is associated with a set of allied beliefs, the sum total of which cohere into two distinct meaning systems. Evidences are presented that these meaning systems produce systematic differences in a range of fundamental social cognition processes, with important implications for the field's understanding of trait/situation attributions, moral judgments, person memory, and stereotyping.

Fritz Heider is regarded as the founder of the attribution theory. His theory "The Psychology of Interpersonal Relations" emphasizes the notion of how people see the causes of behaviour, and the explanations they make for it. Heider (1958) was the first to propose a psychological theory of attribution, but Weiner and colleagues (e.g., Jones et al, 1972; Weiner, 1974, 1986) developed a theoretical framework that has become a major research paradigm of social

psychology. Heider discussed what he called “naive” or “common sense” psychology. In his view, people were like amateur scientists, trying to understand other people’s behaviour by piecing together information until they arrived at a reasonable explanation or cause. Heider (1958) believed that people are naive psychologists trying to make sense of the social world. People tend to see cause and effect relationships, even where there is none. Heider did not so much develop a theory himself he rather emphasized certain themes that others took up. There were two main ideas that he put forward that became influential.

1. Internal Attribution: The process of assigning the cause of behaviour to some internal characteristics, rather than to outside forces. When we explain the behaviour of others we look for enduring internal attributions, such as personality traits. For example, we attribute the behaviour of a person to his personality, motives or beliefs.
2. External Attribution: The process of assigning the cause of behaviour to some situations or events outside a person's control rather than to some internal characteristics. When we try to explain our own behaviour we tend to make external attributions, such as situational or environment features. Roesch and Weiner differentiate three factors influencing the attribution process (Roesch and Weiner, 2001).
  - location, i.e. endogenous vs. exogenous causes  
(e.g.; the patients feel responsible for the pains or are they caused by environmental conditions?)
  - stability, i.e. stable vs. variable causes  
(Does a certain event have the same causality every time or can this change?)
  - controllability, or to be more accurate: controllable vs. uncontrollable causes  
(Can the causes of a certain event be controlled or at least be influenced or not?)  
(Roesch and Weiner, 2001).

Exogenous causes have an effect on an individual from outside, examples from a medical point of view being environmental pollution, noise, viruses, bacteria and allergens. Contrary to this, internal factors depend on the expression of individual characteristics, e.g.; the different genetic make-ups that individuals have, certain previous experiences or the personal stress resistances.

Majority of patients that suffer from the chronic or recurring disease are unaware of the reasons of this disease. In a breast cancer study a large number of participants (95%) stated that they have a concern about various disease causalities (Taylor, Lichtman et al., 1984). A survey conducted among 200 patients suffering from multiple sclerosis shows that self-monitoring has an influence on the psychological state and results in a more optimistic attitude towards the disease (Wiesmann, Machtemes et al., 2001). A patient that suffers from headaches and



knows the exact triggers of his recurring pain is often able to control them by avoiding these triggers. In order to identify the triggering factors, it is essential to keep track of a headache diary to record the frequency, the degree of severity, lifestyle, the duration and medication of the patient. This can provide a foundation for individual and personal needs (Ostkirchen, Andler et al., 2006).

The question, why subjective causal descriptions of the disease concept are to be compiled at all, is answered by Hoefert and Brähler (2013) as follows:

Whatever the respective disease attributions would provide, (either vague assumptions or self-contained theories) it seems essential for the history of any medical or psychotherapeutic examination, asking about such cognitive representations and attributions. The authors mention some empirical facts:

- a) Assumptions or subjective theoretical contexts motivate to a considerable extent the willingness of the patient to cooperate and to follow the medical therapy adherently (Hoefert and Brähler, 2013).
- b) Further the conviction that a disease is controllable at all ameliorates adherence (Baines and Wittkowski, 2013).
- c) Probably the conviction of controllability is even more important than the quality of doctor-patient interaction for the compliance of the patient (Phillips, Leventhal et al., 2012).
- d) In case the disease perceptions of the medical practitioner coincide with those of the patient and if this theoretical discrepancy is ignored, the patient does not only feel misunderstood but also stop claiming for more special and better treatment. This leads to an excessive doctor hopping (Hoefert and Brähler, 2013).
- e) If a patient defines a disease as being very severe, he might not develop the willingness to restart employment again (Hoving, van der Meer et al., 2010).

These few examples highlight the relevance of disease description and attributions of patient. They are not only causal cognitive constructions but also motivational and absolutely effective components of the personal competence to manage the disease actively and to increase the chance of recovery and rehabilitation in medical and psychological therapy (Hoefert and Brähler, 2013).

In the light of subjective disease concepts for the genesis of diseases, it is observed that there has not been conducted sufficient empirical research (Goldbeck and Bundschuh, 2007). The attribution behaviour of children with a chronic or recurring disease has been insufficiently studied. Empirical studies on the understanding of clinical disease concepts are gaining importance.

### **1.3 Structure of the dissertation**

Part 1 of this research project highlights the introduction of the study, rationale of study and main objective. General definitions of pain and its temporal components are also described in Part 1. This emphasizes on paediatric pain and paediatric pain concepts during the developmental stages. Various pain forms of headaches and abdominal pain are discussed in this research work as well as consequences for the treating physician. Part 2 of this project is the methodological study defining control and category system for paediatric statements on pain. This is followed by the descriptive part (Part 3, Results), where the results of the fourth graders sampling are presented in the form of tables. The derived hypotheses are then validated in the following inference statistical part. The analysis of results and the discussion are composed in Part 4, along with the critical reflection of the methodology. The Part 5 provides the conclusion of this dissertation.

### **1.4 Definition of pain**

According to the definition of the International Association for the Study of Pain (IASP), "Pain is an unpleasant sensory or emotional feeling that is accompanied by real or potential tissue damage", (IASP, 1994).

Pain is a basic sensory apperception that is generally an aversive experience in which pathological finding is not necessarily demonstrable. This definition includes the differentiation between emotional and sensory aspects. Pain is linked with perception and interpretation processes within the perceptive subject. The perception of pain therefore takes place on a psychological-cognitive experience level and is strongly characterized by subjective factors.

Some authors criticise however that the above definition does not justify the complex nature of the term "Pain". An alternative definition by Mühlig (1997) states that "the pain is a complex and dynamic occurrence at bio-neuro-physio-psychological system levels that presents itself as a multidimensional and active response of the organism to a toxic stimuli (e.g. tissue damage) or a disorder within the nociceptive system or the expression of a psycho-social functional disorder that comprises sensory-discriminative, cognitive-evaluative, affective-emotional and motor-behavioural components and which is influenced by learning factors and social/interpersonal contextual conditions" (Mühlig, 1997).

## **1.5 Classification of pain according to the temporal aspects**

Pain can be subdivided into three areas based on the temporal dimension.

### **1.5.1 Acute pain**

Acute pain is mainly an alarming function and prevents the body tissues for further damages. This type of pains can either appear directly after an event has occurred (e.g. operation, trauma, neuritis), or in the case of acute recurring pain diseases such as a migraine (Diener and Maier, 2009). Normally acute pain results in health-promoting behaviour such as adopting a relieving posture or bed-rest. The duration and intensity of the acute pain normally correlates with the pain inducing cause (Diener and Maier, 2009).

### **1.5.2 Recurrent pain**

An exact cause of recurring pain is often not apparent. There are frequently no pathophysiological findings. Recurring pain mainly occur without warning in different durations, frequency and intensity (Mühlig, 1997). There are often longer remissions periods between the pain episodes, during which there are no medical complaints (Diener and Maier, 2009). Triggers of such pain episodes can be of social (such as certain life events, stress situations in the family and at school) or physical (including weather influences, foods, stimulants) or intrapersonal nature (like emotions, moods and cognitive disturbance) (Mühlig, 1997). The most frequent form of recurrent pains that manifest in childhood are tension type headache, abdominal pain, migraines and pain affecting the locomotors system (Ellert, Neuhauser et al., 2007).

### **1.5.3 Chronic pain**

The pain persists for a longer period of time from 3 to 6 months is called chronic pain. The chronic pain has lost its original biological alarming function. The cause could be a persistent tissue damaging (e.g. as a result of accidents, burns) or chronic diseases such as polyarthritis or other malignant processes (Mühlig, 1997). Almost 5 to 8 million citizens in the Federal Republic of Germany suffer from chronic pain which severely disturbs them from leisure activities, during school work and in their everyday life (Schmidt, Fahland et al., 2011).

## **1.6 Pain in childhood**

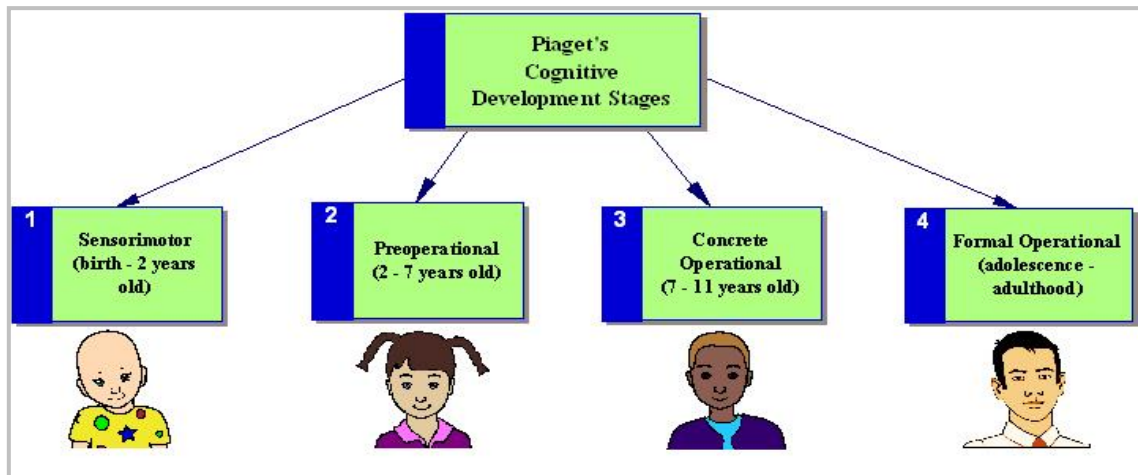
Premature infants and new-borns also feel pain and react to it with stress and sustained pain memory (Liniger, Stucki et al., 2002). It has been found that the theory was recognized in the past and the reason being that premature infants have no verbal pain indicators (Kröner-Herwig and Zernikow, 2011). It has even been assumed until the 1980's that new-borns and infants are insensitive to pain or at least unable to feel pain to the same extent as the nervous system is underdeveloped in this period. It is now evident that recurrent pain in new born has a physiologically disturbing effect which causes a negative influence on the development of the child's brain (Anand and Hall, 2008). Pain experienced during childhood can have negative effects on the processing of pain in later stages of development (Kröner-Herwig and Zernikow, 2011).

Depending on the age group pain has different prevalence from infant to adult. According to international estimates, approximately 15% to 25% of the children and youths suffer from persistent or recurring pain (Roth-Isigkeit, Thyen et al., 2005). In a Dutch study more than 54% of the children and youths had suffered from pain in the past 3 months (Perquin, Hazebroek-Kampschreur et al., 2000). In another study of pre-school children a combination of headache and abdominal pain is found in around 50% of the cases (Ostkirchen, Andler et al., 2006).

The consequences of recurring or chronic pain in childhood are occasionally serious resulting in the absence from school, restrictions to everyday activities, problems within the family and social isolation. The frequent intake of pharmaceutical drugs due to easy medical availability leads to high costs and side effects (Ellert, Neuhauser et al., 2007, Mühlig, 1997, Schmidt, Fahland et al., 2011).

## **1.7 Causal attributions and child pain concepts during cognitive developmental stages**

Most of the empirical studies on paediatric disease concepts are based on the theory of cognitive development as propagated by Jean Piaget. According to Piaget, each child goes through four developmental stages, whereby a higher abstraction level is characteristic for each of them. A differentiation is made here between a *sensorimotor* (0 to 2 years old), a *pre-operational* (2 to 7 years old), a *concrete operational* (7 to 11 years old) and a *formal-operational* (from 12 years old) developmental stage.



**Figure 2:** Piaget's four cognitive development stages; sensorimotor (birth-2 years), preoperational (2 - 7 years), concrete operational (7 - 11 years), and formal operational (adolescence - adulthood) (Davis, Hummel & Sauers, 2006) as described by Wood (2001).

The paediatric perception of pain and disease is subjected to age-related and characteristic changes during the course of the child's development. The answers given by the children move from a "now" related description in the direction of a future-oriented understanding of pain and disease (Harbeck and Peterson, 1992, Wiedebusch, 1994). Since children of the analysed sample of fourth graders are in the concrete operational stage, this period is further described in detail.

### **1.7.1 The sensorimotor developmental stage (0-2 years)**

The child learns by doing, looking, touching, and sucking. The child also has primitive understanding of cause and effect relationship. Object permanence appears around 9 months.

### **1.7.2 The pre-operational developmental stage (2-7 years old)**

At the age of two to seven years, the thinking process is linked to specific events; therefore, the cause of pain is attributed to an inappropriate event, e.g. a fall or a blow (Wiedebusch, 1994). The child uses language and symbols, including letters and numbers. Egocentrism is also evident. At this stage, it is not possible for the child to differentiate between different forms of pain. According to Bibace and Walsh (1981), infection as a pathogenic principle is a central element at this developmental stage. The pre-school children merely use this concept for diseases such as colds and varicella but not for events such as a myocardial infarction (Bir and Podmore, 1990). In the pre-operational phase, the children's answers are taken on a more concrete and specific form. The objects of people that are in a spatial or temporal connections with a disease are also associated at this stage (Lohaus and Ball, 2006).

### **1.7.3      The concrete operational developmental stage (7-11 years old)**

This is the stage at which children interact with their environment and develop the understanding of time and space and categorical relations (Mühlig, 1997). The children demonstrate conservation, reversibility, serial ordering, and mature understanding of cause and effect relationships. Thinking at this stage is still concrete. The thinking process is increasingly multi-perspective, differentiated and no longer linked to specific events. The children think more specifically and establish connections with events (Perrin and Gerrity, 1981). At this age, children are especially receptive for simple explanations on how pain occurs, the functions of pain and how to cope with it develops a positive health-related behaviour (Mühlig, 1997, Petermann, 1994). Children at operational developmental stage can generally differentiate between internal and external pain causalities and between different forms of pain such as injury-related and disease-related (Wiedebusch, 1994). That is the reason a disease is transmitted by the child coming into contact with damaging objects or people (Bibace and Walsh, 1981, Lohaus and Ball, 2006).

The disease concepts at the concrete operational stage are therefore based on a direct connection between the triggering conditions and the body reactions itself. At this phase, the children believe that the most important causes are pathogens such as viruses or bacteria (Lohaus and Ball, 2006). From a child's point of view, other causes of diseases during the concrete operational phase includes a poor diet, inappropriate clothing, inattentiveness and environmental influences such as the cold (Schmidt and Fröhling, 2000). Children in the concrete operational phase are willing to get explanations of medical interventions and show least reaction about whether they understand what is happening (Lincoln, 1992).

### **1.7.4      The formal operational developmental stage (12 + years old)**

The period from childhood to adulthood is the formal operational developmental stage. Adolescents and adults use symbols related to abstract concepts. Adolescents can think about multiple variables in systematic ways, can formulate hypotheses, and think about abstract relationships and concepts. Huitt and Hummel (2003) assert that "only 35% of high school graduates in industrialized countries obtain formal operations; many people do not think formally during adulthood".

### **1.7.5 Paediatric causal attributions for general and special diseases in research**

Some studies concerning paediatric attribution research focus on diseases such as colds, varicella, measles, cardiac infarctions, cancer and depression (Bir and Podmore, 1990, Charman and Chandiramani, 1995, Lohaus and Ball, 2006). Beales, Holt et al. (1983) asked 75 children aged between 7 and 17 suffering from juvenile chronic arthritis, what their ideas were concerning their disease. It was proven in a group of primary school children that the widening of the cognitive concept for a disease (such as measles, varicella, whooping cough and colds, i.e. those that the children often caught themselves) correlates with the experienced occurrence. Concepts concerning specific diseases that children are not as often confronted with (e.g. cardiac infarction, cancer AIDS), develop more slowly (Lohaus and Ball, 2006). Children initially mentioned partial aspects of diseases (e.g. smoking was generally looked upon as being the main cause of cancer (Lohaus and Ball, 2006). Schmidt and Fröhling (1998) interviewed children asking the causes of diseases in general. The causal attributions of paediatric headaches and abdominal pain have been inadequately studied to date.

## **1.8 Factors influencing the development of pain in childhood**

### **1.8.1 Gender**

The development of the concepts of paediatric diseases are influenced by different other factors. In many studies, it was not possible to determine the influence of sexual factor on the paediatric development concept (Kury and Rodrigue, 1995, Paterson, Moss-Morris et al., 1999). Girls reported more often that their pain had a psychogenic cause (Gaffney and Dunne, 1987). The pain triggered in children and youths varied depending on gender (Roth-Isigkeit, Thyen et al., 2005). The girls more frequently believed that their pain was caused by the weather, diseases such as colds, an injury, anger, conflict, family reasons or sadness (Roth-Isigkeit, Thyen et al., 2005). In contrast the boys primarily believed that their pain was caused by physical exercise.

### **1.8.2 Pain recurrence**

It is understandable that the person experiencing recurring pain is more concerned with health aspects (Lohaus and Ball, 2006). The authors describe the theory of cognitive regression contrastingly, stating that long-term disease experiences cause an emotional and cognitive regression, it leads to the creation of disease, stress and feelings of anxiety (Lohaus and Ball, 2006). It became obvious in a survey conducted among children incurring cancer that the younger patients suffering from the disease had better general knowledge of illnesses than those of the same age who were in the health control group. It was not possible to reproduce

this finding in the study group on older children suffering from cancer in which no differences were found concerning knowledge of diseases (Crisp, Ungerer et al., 1996). In a study conducted by Paterson, Moss-Morris et al. (1999), 182 school pupils aged 7 to 14 years, from which 35 were suffering from bronchial asthma, were asked about their ideas concerning asthma and colds. Lohaus and Ball (2006) therefore adduce that an accelerated concept formation only occurs with regard to the own disease but that it cannot be attributed to the general ideas of health and sickness.

### **1.8.3 Pain intensity**

Paterson, Moss-Morris et al. (1999) are able to show in a study that children suffering from a severe disease such as bronchial asthma have a refined knowledge of the consequences of their disease. According to Abramson (1998), the intensity with which one attributes correlates positively with the severity of an event (Shiloh, Rashuk-Rosenthal et al., 2002). When taking the above considerations into account, it can be derived that more severe pain is perceived as a more serious symptom as compared to a weaker pain. It is assumed that the children, who state higher pain intensity, would develop a differentiated picture of disease causes and symptoms due to an increased level of suffering.

It is the aim of this study to analyse the data of the fourth graders according to these three factors.

## **1.9 Paediatric functional abdominal pain and primary headache**

### **1.9.1 Paediatric functional abdominal pain**

Abdominal pain belongs to the most frequent symptoms suffered by children. Table 1 shows an overview of established differential diagnoses of chronic recurrent abdominal pain (Bähler, 2009). Approximately every 5<sup>th</sup> to 10<sup>th</sup> child suffers from recurring sessions of abdominal pain (Mühlig and Petermann, 1997, Nygaard, Stordal et al., 2004). They state that the prevalence of recurring abdominal pain is 10% to 15% by school pupils.

Chronic recurring abdominal pain is occasionally the cause of serious impairment in everyday life and they can cause absenteeism at kindergarten and school, resulting in frequent visits to the doctor, burdening diagnostics and various therapy attempts and thereby having a negative effect on the quality of life (Bufler, Gross et al., 2011). In spite of those chronic functional gastrointestinal complaints also cause considerable medical costs (Dhroove, Chogle et al., 2010). Moreover, children and youngsters who suffer from functional abdominal complaints in



childhood also suffer an increased risk of functional gastrointestinal disorders at the later stages in their life (Dengler-Crish, Horst et al., 2011).

**Table 1:** Differential diagnoses of chronic recurrent abdominal pain  
Source: (Bähler, 2009)

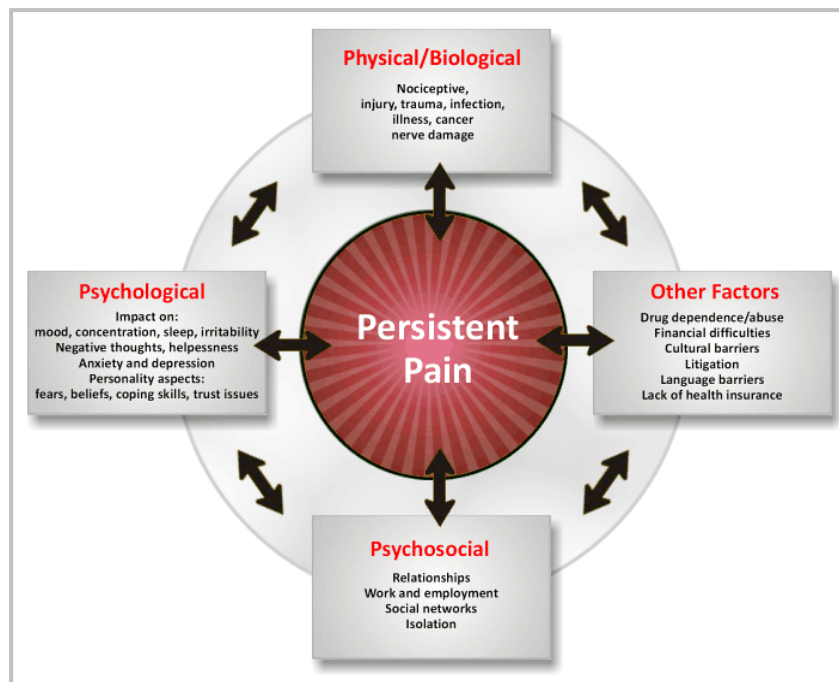
Chronic Recurring Abdominal Pain in Childhood
Differential diagnosis of chronic recurring abdominal pain association with etiology
<b><u>Infectious causes:</u></b> <ul style="list-style-type: none"> <li>&gt; Viral Gastroenteritis</li> <li>&gt; Chronic Gastritis ( H. pylori Bacteria)</li> <li>&gt; Parasites ( Giardia, Blastocystis hominis, Dientamoeba fragilis</li> <li>&gt; Colitis with Clostridium difficile, Campylobacter spp, Yersinia spp, Tuberculosis</li> </ul>
<b><u>Inflammatory Causes :</u></b> <ul style="list-style-type: none"> <li>&gt; Gastro-oesophageale Reflux Disease</li> <li>&gt; Peptic Ulcer</li> <li>&gt; Side Effects of NSAID</li> <li>&gt; Chronic Inflammatory Bowel Disease ( M. Crohn, Colitis ulcerosa )</li> <li>&gt; Eosinophile Oesophagitis / Gastroenteropathie</li> <li>&gt; Lymphocytic Gastritis e.g. Sprue</li> </ul>
<b><u>Motility Disturbances :</u></b> <ul style="list-style-type: none"> <li>&gt; Functional Constipation</li> <li>&gt; Malrotation with recurring bowel obstruction e.g. Volvulus</li> </ul>
<b><u>Extraintestinal Causes :</u></b> <ul style="list-style-type: none"> <li>&gt; Recurring Urinary Tract Infection, Ureterstenosis</li> <li>&gt; Chronic Pancreatitis</li> <li>&gt; Gynaecologic reasons</li> </ul>

Chronic abdominal pain in childhood mainly has a functional cause that might be due to complex interactions between different organs and systems (Bufler, Gross et al., 2011). In the case of an irritable bowel syndrome and functional abdominal pain, causalities are seen to be an increased visceral sensitivity which expresses itself in the form of a lowered pain threshold with regard to stretching stimuli in the gastrointestinal tract (Di Lorenzo, Youssef et al., 2001, Faure and Wieckowska, 2007, Van Ginkel, 2001). According to latest knowledge, children suffering from functional abdominal pain also have a generally hypersensitive central nervous system (Bakker, Boer et al., 2010).

The focus of recent studies is on psychological and social influencing factors (Zernikow, 2009). Children with chronic abdominal pain report more daily stress factors such as school homework, unnecessary argumentation with friends, a ban on participating in activities, and sickness within the family. The children with abdominal pain, whose mothers react to their medical symptoms with protective behaviour, consult a doctor significantly more frequently

(Walker, Williams et al., 2006). Children displayed more pain symptoms if the parents paid more attention to the abdominal pain (Walker, Levy et al., 2006).

On the basis of current knowledge, recurring or chronic functional abdominal pain are caused by several different and mutually reinforcing influences as shown in figure 3.



**Figure 3:** Bio-psycho-social Model of Chronic Abdominal Pain  
Source: ([http://www.supportforchronicpain.com/wp-content/uploads/2014/09/bio\\_chart.gif](http://www.supportforchronicpain.com/wp-content/uploads/2014/09/bio_chart.gif))

The clinical picture and symptoms of chronic functional abdominal pain are defined and categorized in the Rome-III criteria (table 2). These criteria also serve to record functional gastrointestinal complaints suffered by children and adults. The paediatric functional abdominal pain is defined as intermittent or continuous abdominal pain that manifests at least once per week over a period of 2 months. The pain is hereby mainly per umbilical localised (Bufler, Gross et al., 2011) and not associated with any changes to the passing of stools.

**Table 2:** ROME-III Criteria

Table 2 : ROME -III Criteria for functional Stomach and Intestinal Disturbances in Children & Adolescents	
<b>1.</b>	<b>Vomiting and Aerophagia</b>
1.a)	Rumination Syndrom of Adolescents
1.b)	Syndrom of Cyclic Vomiting
1.c)	Aerophagia
<b>2.</b>	<b>Chronic reccuring abdominal pains</b>
2.a)	Functional Dyspepsia
2.b)	Irritable Bowl Syndrome ( IBS)
2.c)	Abdominal Migaine
2.d)	Functional Abdominal Pain
2.d).1	Syndrom of functional abdominal pain
<b>3.</b>	<b>Constipation and Incontinence</b>
3.a)	Functional Constipation
3.b)	Stool Incontinence without Retention

While table 2 shows the ROME-III Criteria, table 3 represents the definition of functional chronic abdominal pain in accordance with the latest Rome-III criteria.

**Table 3:** Definition of functional chronic abdominal pain

Definition of functional chronic abdominal pain
> pain persistence longer than two months
> pain occurance more than once per weak
> pain can not be explained through biochemical and structural parameters

#### 1.9.1.1 *Functional dyspepsia*

Patients complaining about persisting or recurring pain in the epigastria that does not reduce after defecation irrespective of the frequency and correlation of the stools (Rome-III criteria (2006) get the diagnosis functional dyspepsia. The clinical signs do not indicate any inflammatory, organic, neoplastic changes or metabolic processes that justify the causes. The diagnosis can only be established if the symptoms have existed for a minimum of 6 months. The main clinical symptoms are emesis, nausea, a feeling of fullness and a rapid sensation of satiety (Bufler, Gross et al., 2011). The pathogenesis of the functional dyspepsia is multifactorial and still remains unclear. The possible causes are especially motility disorders in the sense of a delayed emptying of the stomach and a reduced postprandial gastric relaxation (Ammoury, Pfefferkorn Mdel et al., 2009).

### 1.9.1.2 Irritable bowel syndrome (IBS)

The irritable bowel syndrome is characterized by abdominal pain or uncomfortable sensations which have occurred at least 3 days during the past 3 months and which are associated with the following symptoms (Bufler, Gross et al., 2011):

- alleviation of the medical complaints by passing stools;
- pain commences with changes of the stool frequency;
- pain commences with changes to the stool correlation.

### 1.9.1.3 Abdominal Migraine

An abdominal migraine (see table 4) has the clinical sign of acute intermittent severe per-umbilical pain that lasts for 1 up to 72 hours without showing any medical complaints in these episodes. The pain impairs everyday activities and has at least 2 of the following symptoms:

- |                     |                |
|---------------------|----------------|
| 1. Loss of appetite | 4. Headache    |
| 2. Nausea           | 5. Photophobia |
| 3. Emesis           | 6. Pallor      |

**Table 4:** Abdominal Migraine according to IHS-Classification

Abdominal Migraine (according to IHS-classification)		
An idiopathic disorder seen mainly in children as recurrent attacks of moderate to severe midline abdominal pain, associated with vasomotor symptoms, nausea and vomiting, lasting 2 - 72 hours and with normality between episodes. Headache does not occur during these episodes.		
Diagnostic criteria		
<b>A.</b>		At least five attacks of abdominal pain, fulfilling criteria B - D
<b>B.</b>		Pain has at least two of the following three characteristics:
	<b>1.</b>	midline location, periumbilical or poorly localized
	<b>2.</b>	dull or 'just sore' quality
	<b>3.</b>	moderate or severe intensity
<b>C.</b>		During attacks, at least two of the following:
	<b>1.</b>	anorexia
	<b>2.</b>	nausea
	<b>3.</b>	vomiting
	<b>4.</b>	pallor
<b>D.</b>		Attacks last 2 - 72 hours when untreated or unsuccessfully treated
<b>E.</b>		Complete freedom from symptoms between attacks
<b>F.</b>		No attributes to another disorder. <sup>1)</sup>
		<sup>1)</sup> In particular, history and physical examination do not show
		signs of gastrointestinal or renal disease, or such disease
		has been ruled out by appropriate investigations.

The criteria are met if two or more pain episodes have occurred during the past 12 months. Organic causes such as inflammations, surgical causes, metabolic processes or neoplasms should be excluded. Around 1% to 4% of all children suffered from an abdominal migraine. Whereas, it is slightly higher for girls. The mean age of the children is 7 when the diagnosis is made and physical or psychological stress situations are believed to be the triggering factors (Bufler, Gross et al., 2011, Rasquin, Di Lorenzo et al., 2006). Furthermore, children suffering from an abdominal migraine often develop migraine headaches in adulthood (IHS, 2004). This diagnosis exists in both classifications (Rom-III and IHS) which are relevant for abdominal pain and headache.

#### *1.9.1.4 Treatment of paediatric abdominal pain*

Despite of high frequency of functional abdominal pain in childhood and adolescent, relatively few randomized and controlled studies exist for the therapy of abdominal pain (Zernikow, 2009). Cognitive-behavioural therapy approaches have proven to be effective in the treatment of functional abdominal pain. The dysfunctional perception of body events and unfavourable disease concepts are to be changed with the assistance of psycho-educative behavioural therapy (Zernikow, 2009). Therefore, the care and treatment of the children concerned in the context of a bio-psycho-social model is seen to be the most suitable method (Di Lorenzo, Colletti et al., 2005). To support this model, parents must influence the psycho-social therapy of their children and increases the ability to keep the pain under control for a longer period of time without medical treatment (Zernikow, 2009).

A short medical therapy is recommended to reduce the frequency or intensity of functional abdominal symptoms and the use of proton pump inhibitors like pantoprazole for the treatment of dyspepsia or the administration of spasmodic or mild muscle relaxants (Di Lorenzo, Colletti et al., 2005). The administration of peppermint oil can provide alleviation from the symptoms of an irritable bowel syndrome (Kline, Kline et al., 2001). Various facilities rely on multimodal therapy approaches that are based on a bio-psycho-social model that has been applied in Paediatric and Youth Clinic in Datteln, North Rhine-Westphalia, Germany.

Interdisciplinary cooperation among child specialists, psychologists and paediatric nurses is required (referred to as a “belly dancer” program for children suffering from recurring abdominal pain). The program includes diverse basic measures such as abdominal respiration and distractive measures, group training with positive self-instruction and cognitive instruction measures.

Hospital treatment is only intended for those cases in which pain has been suffered with a mean severity of >5 at the visual analogue scale (VAS), pain peaks with a severity of >8 VAS and with a frequency of >2 pain episodes per week over a period exceeding 6 months. Other decision-making criteria for hospital treatment are the frequency of the days absent from school (Zernikow, 2009). At the Paediatric and Youth Clinic in Datteln for example, the patient stays at the clinic with her or his parents for 3 to 4 weeks. During this hospital stay single and family therapies are provided. The children continue to participate in school lessons and at the end of the treatment they are subjected to stress tests in their home environment. This treatment concept has the purpose of providing children with a routine of being together again with enabling the pain to be controlled adequately in the long-term (Zernikow, 2009).

### 1.9.2 **Paediatric primary headaches & Classification of headache disorders**

The International Headache Society (IHS) classified headache disorders initially in 1988, revised it in 2003 and finally provided a beta version in 2013 (see table 5 and table 6). The classification has been translated into more than 20 languages; hence it is available all over the world in the medical field. It is important in every medical field to accept the general classification globally.

**Table 5: IHS Classification (2013)**

IHS-Classification 2013	
<b>Part one: the primary headaches</b>	
1.	Migraine
2.	Tension-type headache
3.	Trigeminal autonomic cephalalgias
4.	Other primary headache disorders
<b>Part two: the secondary headaches</b>	
5.	Headache attributed to trauma or injury to the head and/or neck
6.	Headache attributed to cranial or cervical vascular disorder
7.	Headache attributed to non-vascular intracranial disorder
8.	Headache attributed to a substance or its withdrawal
9.	Headache attributed to infection
10.	Headache attributed to disorder of homeostasis
11.	Headache or facial pain attributed to disorder of the cranium, neck, eyes, ears, nose, sinuses, teeth, mouth or other facial or cervical structure
12.	Headache attributed to psychiatric disorder
<b>Part three: painful cranial neuropathies, other facial pains and other headaches</b>	
13.	Painful cranial neuropathies and other facial pains
14.	Other headache disorders

**Table 6:** ICDH I, ICDH II, ICDH IIIβ Classifications

Comparison	ICHD I	ICHD II	ICHD II-R1	ICHD IIIβ
Publication Year	1988	2004	2005	2013
Categories	keine	3	3	3
Main Groups	13	14	14	14
Targets of Revision		chronic migraine, to differentiate child headaches, especially migraine and periodic syndroms in the childhood	further differentiation of migraine & child headaches	<u>test version:</u> It is tried to aim at direct congruence between ICD II (WHO 11th classified edition) and the ICHD III. Numerous new findings concerning the diagnostic & the classification are included in edition 3 (Göbel, 2013)

### 1.9.2.1 Migraine

Migraine headache is one of the common forms of paediatric headache. Ostkirchen, Andler et al. (2006) stated a prevalence of 4%-5% in children and youths which can manifest even in the age of 3 years. The prospective studies demonstrate that the prevalence of migraine increases with the passage of time (Sillanpää and Anttila, 1996). The lifetime prevalence for migraine headaches is between 3.7% and 10.6% until the age of 12 (Lütschg, 2009).

#### 1.9.2.1.1 Migraine without an Aura

Migraine without an aura is the most frequent sub-form of migraine. In the IHS classification, the migraine without an aura is described as a recurring headache disease that manifests itself with attacks lasting between 4 and 72 hours. Characteristics for these are a one-sided localisation, a pulsating character, a moderate to strong intensity, worsening as a result of routine physical activity and nausea related to the pain (see table 7).

**Table 7:** Diagnosis Criteria for the Migraine without an Aura

Diagnostic Criteria for Migraine without Aura		
<b>A.</b>		At least five attacks fulfilling criteria B - D
<b>B.</b>		Headache Attacks lasting from 4 - 72 hours (untreated or unsuccessfully treated)
<b>C.</b>		Headache has at least two of the following four characteristics:
	<b>1.</b>	unilateral location
	<b>2.</b>	pulsating quality
	<b>3.</b>	moderate or severe pain intensity
	<b>4.</b>	aggravation by or causing avoidance of routine physical activity (e.g. walking or climbing stairs)
<b>D.</b>		During Headache at least one of the following:
	<b>1.</b>	nausea and / or vomiting
	<b>2.</b>	photophobia and phonophobia
<b>E.</b>		Not better accounted for by another ICHD-3 diagnosis

### 1.9.2.1.2 Migraine with Aura

According to the IHS Classification, a migraine with aura is a recurring disease with symptoms that manifest themselves as reversible focal neurological attacks, which gradually develop over a period of 5 to 20 minutes and lasts no longer than 60 minutes. These aura symptoms are normally followed by a headache which has the same character as a migraine without an aura.

IHS classified the migraine attacks lasting between 1 to 72 hours and it is not always the case that they are unilaterally localised (see table 8). The children frequently suffer from associated vegetative complaints such as abdominal pain, nausea and emesis (Ostkirchen, Andler et al., 2006). Following of three precursors of migraine so called periodic syndrome in childhood

1. cyclical emesis
2. abdominal migraine
3. benign paroxysmal dizziness during childhood

**Table 8:** Diagnosis Criteria for the Migraine with an Aura

Diagnostic Criteria for Migraine with an Aura		
<b>A.</b>		At least two attacks fulfilling criteria B and C
<b>B.</b>		One or more of the following fully reversible aura symptoms:
	<b>1.</b>	visual
	<b>2.</b>	sensory
	<b>3.</b>	speech and / or language
	<b>4.</b>	motor
	<b>5.</b>	brainstem
	<b>6.</b>	retinal
<b>C.</b>	<b>1.</b>	At least two of the following four characteristics: at least one aura symptom spreads gradually over $\geq 5$ minutes, and / or two or more symptoms occur in succession
	<b>2.</b>	each individual aura symptom lasts 5 to 60 minutes <sup>1)</sup>
	<b>3.</b>	at least one aura symptom is unilateral <sup>2)</sup>
	<b>4.</b>	the aura is accompanied, or followed within 60 minutes, by headache
<b>D.</b>		Not better accounted for by another ICHD-3 diagnosis, an transient ischaemic attack has been excluded.
<b>Notes:</b>		<sup>1)</sup> When, for example, three symptoms occur during an aura, the acceptable maximal duration is 3 x 60 minutes. Motor symptoms may last up to 72 hours. <sup>2)</sup> Aphasia is always regarded as a unilateral symptom; dysarthria may or maynot be.



### 1.9.2.2 Tension type headache

Tension type headache is frequently found in childhood. Zernikow and Berrang (2003) described a prevalence of up to 25% in the 7 to 15 years' age group. When compared with migraine, the pain attacks are of a shorter duration and have a lower intensity (Zernikow and Berrang, 2003). The pain symptoms occur bilaterally with a typically frontal accentuation. They show a pressing nature and no pulsation in contrast to migraine. Furthermore, the pain does not worsen with physical activity (Lütschg, 2009).

The tension type headache can be differentiated into episodic and chronic tension type form. A clear diagnosis and differentiation between these most frequent forms of headaches is often more difficult in children because they suffer in most time of the cases from a combination of a migraine and a tension type headache. The diagnostic criteria of tension type headache is shown in table 9 as below.

**Table 9:** Diagnosis criteria of tension type headache  
Source: (Anttila, 2006, Lütschg, 2009)

Tension Type Headache Diagnosis Criteria			
Frequency of Headache	Rare Episodes < 1 day / month >_ 10 Episode	Frequent Episodes ≥ 1 till ≤ 15 days / month during ≥ 3 Months ≥ episodes	Chronic ≥ 15 days / month during ≥ 3 months
Duration of Episodes	30 minutes till 7 days	30 minutes till 7 days	hours or continuous
<b>minimum 2 of the following criteria</b> > Intensity > Localisation > Quality > Impairment through body activity	mild bilateral pressure pain no	mild bilateral pressure pain no	mild bilateral pressure pain no
<b>Both of the following Criteria:</b> > Nausea > Vomiting > Sensitivity	no nausea or vomiting at the utmost: photophobia or phonophobia	no nausea or vomiting at the utmost: photophobia or phonophobia	only mild nausea at the utmost: photophobia or phonophobia

### 1.9.2.3 Chronic Headache

Around 15% of all children who had an appointment for specialized consultation suffer from chronic headaches. The overall prevalence in childhood fluctuates between 0.5% and 1.0% (Zernikow and Berrang, 2003). Chronic headaches can be categorised in 5 subgroups (Table 10). A continuous treatment of chronic paediatric headaches with medication can lead to analgesics-induced headache (Zernikow and Berrang, 2003).

**Table 10:** Chronic paediatric headaches  
Source: (Diener and Arnold, 2003)

Chronic Paediatric Headaches		
Types of Headache	Description	Prevalence
<b>Chronic Migraine</b>	<ul style="list-style-type: none"> <li>&gt; chronic daily or almost daily headache, which has slowly developed from pre existing classical migraine</li> <li>&gt; headache duration about 4 hours a day</li> <li>&gt; mixed image of symptoms of autonomic nervous system and tension type headaches, typical migraine headaches</li> </ul> <p><b>decrease in frequency and in intensity</b></p>	<b>15%</b>
<b>Chronic Tension Type Headache</b>	<ul style="list-style-type: none"> <li>&gt; Definition like in adults</li> </ul>	<b>5%</b>
<b>Newly Diagnosed Daily Headache</b>	<ul style="list-style-type: none"> <li>&gt; without positive headache history, sudden onset of daily headache</li> <li>&gt; headache duration about 4 hours per day</li> <li>&gt; headaches persist for more than 4 weeks</li> </ul>	<b>35%</b>
<b>Hemicrania continua</b>	<ul style="list-style-type: none"> <li>&gt; Daily, continuous, strength in the fluctuating, unilateral, mostly frontal headache of moderate intensity</li> <li>&gt; Pain triggers is not elicitable</li> </ul>	<b>10%</b>
<b>Combination of Headache</b>	<ul style="list-style-type: none"> <li>&gt; Daily tension type headache with recurring migraine attacks</li> </ul>	<b>30%</b>

#### 1.9.2.4 Treatment of paediatric headaches

There are various methods available for the treatment of paediatric headaches, depending on their nature. In frequently occurring tension type headaches, children are preferred not to use analgesic medication. It is preferred to avoid such triggers like avoidance of light and noise (Ebinger, Kropp et al., 2009). As a possible non-drug treatment used to reduce the paediatric tension type headache is the Transcutaneous Electrical Nerve Stimulation (TENS). In rare cases drugs including Ibuprofen and Paracetamol are prescribed (Ebinger, Kropp et al., 2009, Zernikow and Berrang, 2003). Amitriptyline can also be used for the treatment of chronic tension type headaches but its effectiveness in childhood has not been proven (Ebinger, Kropp et al., 2009, Zernikow and Berrang, 2003). Medical experts have agreed upon Ibuprofen as first choice of drug to treat acute cases, followed by Sumatriptan nasally applied as second choice for children aged 12 or older (Ebinger, Kropp et al., 2009). The effectiveness of triptans in childhood and adolescence is still disputed as a pronounced placebo effect can occur among children (Diener, Katsarava et al., 2008). Beta-blockers (Propranolol and Metoprolol) and Flunarizine can be prescribed as a prophylactic medication (Ebinger, Kropp et al., 2009, Lee, Stülpnagel et al., 2006).

Non-drug prophylactic methods such as relaxation and EMG-controlled biofeedback should be the first choice of managing the most frequent forms of paediatric headaches. The best efficacy for the treatment of tension type headaches has been proved for cognitive-behavioural related therapy approaches (Ebinger, Kropp et al., 2009). In addition to this, endurance sports and everyday-modifying measures such as regular meals, an adequate amount of sleep and the avoidance of triggers have been recommended (Lee, Stülpnagel et al., 2006, Ostkirchen,

Andler et al., 2006). Analogue to the therapy of paediatric abdominal pain, the Vestische Paediatric and Youth Clinic in Datteln offers a “Multimodal Pain Therapy Program for Children and Adolescents” for hospitalized patients, which means that the patient receives medical care at the clinic for 3 to 4 weeks with inclusion of the parents, accompanied by measures such as the keeping of a pain diary, physiotherapy, relaxation exercises and distraction. Inpatient treatment is reserved for children suffering from severe cases of chronic headache (Hübner, Hechler et al., 2008).

### **1.10 Migrants background and pain**

Many studies show a correlation between the ethnic origin, the cultural background and the subjective sensation of pain or pain reaction respectively (Bates and Edwards, 1992). Higher pain prevalence and the existence of chronic pain syndromes are especially attributed to migrants (Spiess and Kilcher, 2003). However, a study was presented at the European Pain Congress in September 2011, according to which the people with a migration background were able to withstand the most severe pain. According to Erim and Glier (2011), somatoform pain has a “different cultural character “. It is however not clear whether children with a migration background really are more sensitive to pain.

### **1.11 The consequences for medical action**

According to the medical point of view the subjective paediatric pain can influence the management of symptoms like nausea, vomiting and sensation. The adequate explanation about the medical interventions explanation alleviates fear and stress in children. The treating physician targets the therapeutic measures towards the actual needs of the child, optimizes treatment procedures and acts in a more economical manner like reducing the use of drugs and operative examinations. Against the background of increasing pain prevalence in childhood, the knowledge taking of paediatric sickness and pain concepts are indispensable components of responsible medical actions, particularly from moral and ethical point of view.

## **1.12 Questions and hypotheses**

The aim and objective of this study is to record the causal attributions of fourth year school pupils suffering from abdominal pain and headaches. This is on the basis of the categories system and rules using the Essen Paediatric Pain Interview in addition to presenting empirically substantiated reference data. The causal attributions are studied regarding their dependency on influencing factors such as gender, recurrence of the pain and the intensity of headache and abdominal pain. Each of the 3 most frequent categories will now be focused on, whereby the values exceeding 10% are designated separately.

### **Various aspects are examined in the scope of this dissertation:**

- Which subjective causal attributions do fourth-class pupils generally produce if they are asked about headache and abdominal?

### **The following special influencing factors are also studied:**

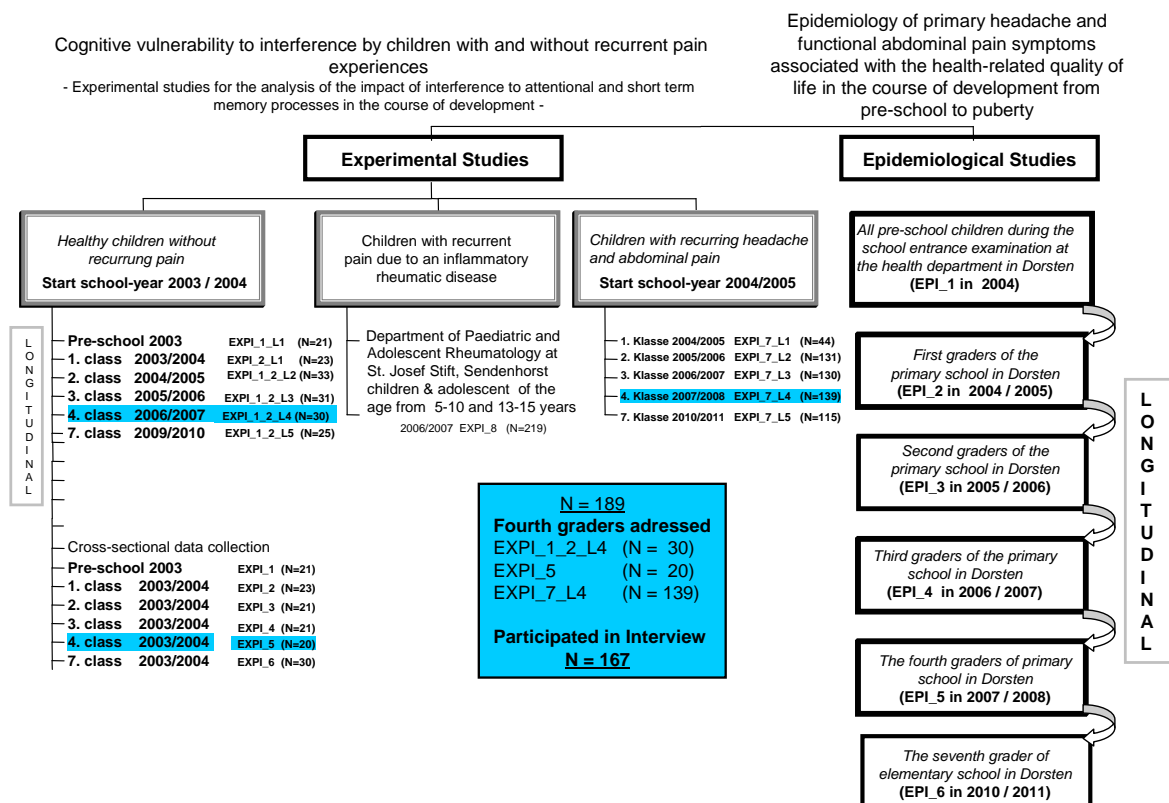
- (1) What influence does the gender factor have on the causal attributions of the fourth-class school pupils for abdominal pain (hypothesis 1)?
- (2) Does the gender factor have influence on the causal attributions of the fourth-class school pupils for the explanation of headache (hypothesis 2)?
- (3) Is there a difference between the causal attributions stated by children suffering from recurring headache and abdominal pain and those without recurring headache and abdominal pain (hypothesis 3)?
- (4) Does the intensity of the headaches have an effect on the generation of causal attributions (hypothesis 4)?
- (5) Do boys and girls differ in their medical knowledge when explaining the causes of abdominal pain (hypothesis 5)?
- (6) Are tensions, emotional stress and strain more strongly associated with headaches than with abdominal pain (hypothesis 6)?
- (7) Do second- and fourth-graders evaluate the influence of environmental conditions on headaches differently (hypothesis 7)? This comparison is based on the results of the second graders presented in the dissertation of Thewes (2011) and of the fourth graders analysed in this thesis.
- (8) Do fourth-graders attach a higher value of environmental conditions as causes for headaches than for abdominal pain (hypothesis 8)?

## 2. Methodology and Sampling

### 2.1 Study design and data collection

The data collection in this longitudinal study consists of two parts, an epidemiological and an experimental part. The study was started in the City of Dorsten in North Rhine-Westphalia, Germany in 2004 which was supervised by Dr. Gabriele Ostkirchen and under guidance of Prof. Dr. H. C. Diener from the University of Duisburg-Essen. This study project has been permitted by the Head of the Ethical Review Committee of the University Hospital Essen, Prof. Dr. K. H. Jakobs, No. 03-2345, on the 21<sup>st</sup> January, 2004. The whole investigation comprises a series of epidemiological studies started in 2004 as EPI-1. The children aged 5 to 14 years were asked about the headaches and abdominal pain for the first time during their medical examination at school entry.

### Prospective, Epidemiological and Experimental Research Strategy



**Figure 4:** Summary of the Entire Study

The questionnaires for the Simultaneous Recording of Headache and Abdominal Pain Symptoms for adults (FSEKB-E) and for children (FSEKB-K) were especially developed for the data collection (Ostkirchen, Andler et al., 2006). This general information on the children's health and the relevant symptoms of primary headaches and functional abdominal pain were recorded on the basis of the criteria of the International Headache Society (IHS, 2004), the Rome-III criteria (2006) and the KINDL-R (Revised Paediatric Quality of Life Questionnaire from Ravens-Sieberer (1998)).

The similar principal of data collection was followed as described in figure 4 / Table 11 and applied on all children in the experimental part of this project. The parents of the participants in partial study EXPI-7 received every year a request that their child should participate in the experimental part of this study if the child was suffering from recurring headache and/or abdominal pain according to the parent's subjective opinion. The epidemiological survey and the allocation of the children continued in the years 2004-2009 and in 2011. Children who had already fulfilled the allocation criteria remained in the experimental part of this research project (EXPI-7/L1–L5), irrespective of a possible change to the pain symptoms. The entire study was closed in 2011 by the questioning of the seventh-year pupils. Table 11 shows a summary of the testing methods that were used for data collection. The time requirement per child and stage was 6 school lessons of 45 minutes each.

**Table 11:** All testing methods used in the experimental part of studies

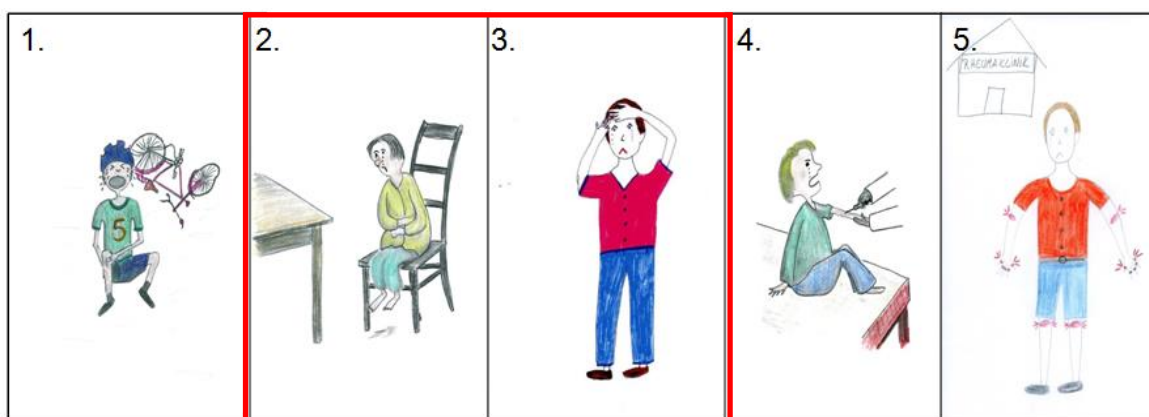
Order	Implemented Tests
1	verbal IQ HAWIK-GF HAWIK-ZN
	non-verbal IQ HAWIK-MT HAWIK-ZS
2	FWIT-1 FWIT-2 FWIT-3 (habitual interference tendency)
3	Attachment Test (BOBIT) (11 situations)
4	Essen Children's Pain Interview (5 pain situations)
5	Pro-active Interference (VLMT) TAP: (Testaufmerksamkeits-Prüfsystem)
6	D1: Alertness, normal (TAP)
7	D6: Go / Nogo D7: Incompatibility D8: Intermodal Comparison D9: Change of Reaction
8	D5: Divided Attention D1: Alertness, Time Pressure, Competition
9	Retro-active Interference (VLMT)
10	Catscreen: Health Related Life Quality

The data in this dissertation are exclusively related to fourth year primary school pupils: they are from the academic years 2003/2004 (EXPI\_5); 2006/2007 (EXPI\_1\_2\_L4) and 2007/2008 (EXPI-7-L4). 86 children participated as second and fourth graders; they were included to the longitudinal comparison (see section 3.3.4 and hypothesis 7).

## 2.2 The Essen paediatric pain interview

The children were asked about their pain experiences on the basis of the semi-structured “Essen paediatric pain interview”. The interview comprises the four pain situations “Bicycle accident”, “Abdominal pain”, “Headache” and “Receiving an injection from a physician”. The 5<sup>th</sup> situation “rheumatic pain” is only shown to children who were examined in a rheumatology clinic.

**Figure 5:** The five pain situations of the “Essen paediatric pain interviews”



**Table 12:** The five questions for each of the pain situations

Interview Domain	Questions
0.	<b>Description of the situation</b> What do you see on this picture? Please describe what happened. Did something similar happen to you already?
I.	<b>Description of Pain</b> The members of the Aralamos family never experience pain. Could you tell them, how humans feel the pain? Please illustrate exactly the pain in your own words.
II.	<b>Pain Intensity</b> What do you think how strongly does the child on the picture feel the pain? And how strong was the pain that you experienced in the same situation?
III.	<b>Attribution of Pain Causes</b> Why does it hurt so much? What do you think is the cause of this pain?
IV.	<b>Coping strategies</b> What could the child do to reduce the painful feeling? What would you do?
V.	<b>Question about Human Attachment</b> Whom could the child call for help in this situation? Whom would you ask for help?

The same 5 questions were asked for each of the pain situations (see table 12).

The pain situations that are the subject of the discussion were additionally explained using illustrations in a child-oriented manner (Fig. 5). The children depicted on the images are gender neutral with the exception of the first image showing the bicycle accident in order to prevent a possible influencing of the children by gender associated attributions. Three of the drawings are from (Becks, 1999), images 3 and 5 were realized within the project. The interview was digitally recorded using a dictation machine.

Question “0” should clarify whether the child knows the pain that is being shown and ensure that the child understands what the following questions are referring to. Question “I” refers to the exact description of the pain. The pain intensity is estimated in Question “II” “using the visual analogue scale (Fig. 6), which is explained in such a way that children can understand it.



Figure 6: The visual analogue scale (front and back)

**Question “III” refers to the attribution of the pain causality which is the subject of this dissertation.** Question “IV” discusses coping strategies whilst Question “V” focuses on the bonding of the child in the pain situation; whom will the child ask for help and support in moments of pain?

## 2.3 Categories system and rules

The emphasis of this study is on abdominal pain and headaches and according to the latest studies, these pain forms are the most common paediatric ones. The interviewed fourth year school pupils reported freely on the causes of abdominal pain and headaches in partially structured interviews. The recorded interviews were transcribed verbatim. The rules (see page 97 in the Annex) and category system (CAT\_SYS\_PED\_PAIN, see Table 13) was developed in order to evaluate the interviews. These were repeatedly discussed, adapted and expanded by the project participants in a lengthy process.



The responses and statements of the children were classified in the category systems for the areas “pain description”, “pain cause”, “coping with the pain” and “bonding in the pain situation”. Hereby, a statement made by a child was deemed to be an analysis unit/statement if it is a statement made by the child on the four guiding (description, cause, coping and binding) interview domains. An analysis unit can comprise a sentence, a predicative centre, a half sentence or a keyword. Table 13 shows the categories system for pain causes including examples of native German statements made by children.

**Table 13:** The Categories System for Pain Causes with Examples

Kategorie Nr.	Fragestellung III: Welche Ursache hat Deiner Meinung nach der Schmerz?	Beispiele
1.	Kind erlebt Ursache als abhängig vom Zufall	Die KS kommen einfach so, man kriegt das einfach, ...
2.	Kind nennt als Ursache einen Unfall oder einen schmerzhaften Vorgang	Ich habe mir den Kopf gestoßen, bin hingefallen, drangestossen, weil es sich verletzt hat....
3.	Kind nennt als Ursache eine Gewalteinwirkung von außen (durch Menschen)	Wenn dir einer auf den Kopf gehauen hat, ....
4.	Kind nennt als Ursache eine Gewalteinwirkung von außen (Instrumente/Gegenstände)	Weil die Nadel spitz ist, weil der Boden hart ist, wegen den spitzen Steinen, weil der Ball gegen den Bauch gekommen ist, weil ich irgendwas auf den Kopf bekommen habe, weil die Nadel in die Haut reingeht, weil die Hose zu eng ist, weil...
5.	Kind nennt als Ursache eine medizinische Behandlung	Weil der Doktor die Spritze reingestochen hat, weil das ist vom Einstich ist, wegen der Punktion,....
6.	Kind nennt als Ursache eine Erkrankung / Medikamente oder Nebenwirkungen der Erkrankung / Medikamente	Wenn man eine Erkältung kriegt und Fieber hat, wegen dem Mittel in der Spritze wenn man den Blinddarm rauskriegt, wenn man eine Magen Darm Grippe hat,... wenn ich mich krank / schlecht fühle, Schock, weil die Gelenke steif sind, man kann sich nicht mehr bewegen, ....
7.	Kind nennt als Ursache die Angst vor einer möglichen Erkrankung oder vor Medikamenten, deren Nebenwirkungen, schlimmen Ereignissen (wobei die Angst im Vordergrund steht)	Wenn Du Angst hast, daß es was sehr Schlimmes ist, wenn man nervös ist, MTx, das ist ein Horroremedikament, da kann einem von schlecht werden, weil man sich erschreckt, weil man tierische Angst hat, das kommt vom Kopf her, man hat ein schlechtes Gefühl / Gewissen, ...
8.	Kind nennt als Ursache kognitive Beanspruchungen	Wenn man zu viel denkt, sich ganz doll konzentriert, wenn man sich auf den Schmerz zu sehr konzentriert, ...
9.	Kind nennt als Ursache emotionalen Stress	Wenn man sich ärgert, streitet oder sich nicht traut, wenn man Stress hat wenn man traurig ist, das sacht auf den Magen, weil das Kind sehr doll weint wenn man einsam ist, beleidigt ist, ...
10.	Kind nennt als Ursache körperliche Überanstrengung	Wenn du zu viel getobt hast, Dich anstrengst, dich belastet, wenn man die Beine zu sehr streckt, wenn ich zuviel getobt habe, ...
11.	Kind sieht die Ursache in der falschen Ernährung	Wenn du zu viel oder gar nicht gegessen und getrunken hast, zu viel Alkohol wenn zu viel Luft mit reinkommt, wenn man zu viel Süßes isst oder zu kaltes gegessen / getrunken hast, Schlechtes gegessen, zu viel Bier trinken; Wetterwechsel, zu viel Sonne, ...
12.	Kind nennt als Ursache Umgebungsbedingungen	Wenn es zu laut ist, zu heiß ist, zu kalt ist, weil das Fahrrad kaputt ist, windig Wetterwechsel, zu viel Sonne, ...
13.	Kind nennt als Ursache verhaltensbedingte Auslöser	Wenn man zu viel Computer gespielt hat, das kommt vom Karussell fahren, zu viel Fernsehen, wenn man sich das einredet, wenn man das zu spät merkt, wenn man das nicht auskuriert hat oder Gleichgewicht nicht gehalten hat, ...
14.	Kind nennt als Ursache Verstöße gegen Normen und Werte	Wenn Du etwas tust, was nicht erlaubt ist, ....
15.	Kind nennt als Ursache das Erleben und Verhalten anderer Personen	Opa z. B. ist alt und kann die Kinder nicht mehr vertragen, ...
16.	Kind nennt keine spezifische Ursache	Ich weiß nicht, eigentlich nichts, weiß ich nicht mehr, ...
17.	Kind beschreibt eine sichtbare Körperreaktion ("sehen")	Weil das blutet, der hat eine Beule am Kopf, weil die Haut auf- geratscht ist, blauer Fleck, Gelenk ist dick, dass die Haut weg ist, ...
18.	Kind formuliert als Ursache medizinisches Wissen, pathologische Prozesse oder detaillierte Beschreibungen der Körperphysiologie	Weil da die Antikörper in den Gelenken kämpfen, weil da Blut durchfließt, weil da die Adern sind, weil da Dreck reinkommt, wenn man was gebrochen hat, man zu viel Luft im Magen hat, weil das im Gelenk ist, die Entzündung mit vielen Bakterien wegen dem Abwehrsystem / Immunsystem, stößt man auf das Fleisch, wenn das Fleisch angegriffen wird, wegen der Vererbung, genetisch bedingt, Nackenprobleme und Verspannungen, ...
19.	Kind nennt physiologische Grundbedürfnisse/ Körperprozesse	Weil man Hunger hat, auf die Toilette muss, müde ist, wenn man schlecht schläft wenn ein Mädchen seine Tage (Periode) hat, wenn man nicht so oft Pipi machen kann, ...; dann knurrt der Magen immer....;
20.	nicht einzuordnen	

The categories system for the causal attributions of pain comprises a total of 20 categories, whereby the 20th category serves as a back-up category 'Z'. The coders had the condition imposed on them that they were to categorise the units in the 19 stated categories if possible. The Z category was not used for the headaches and abdominal pain situations that are being analysed here. The classification in the category system was the responsibility of two Coders who worked independent of each other. The results of these two coders form the basis for the computation of the intercoder reliabilities that are explained in chapter 2.7. It was ultimately possible to categorise all of the statements made by the children without exception with the assistance of the rule system (see Annex, page 97) and the theoretically derived and empirically expanded category system (see Table 13) that was expanded on the basis of responses and statements made by the children. The corrected data are presented in the "results part" after the error analysis (see Annex, page 103). This dissertation exclusively relates to the area "causal attribution" in connection with the situations headaches and abdominal pain.

## **2.4 Study procedure**

The tests took place in the fourth school term (EXPI-5 school year 2003/2004; EXPI-1-2-L4 school year 2005/2006; EXPI-7-L4 school year 2007/2008). The head of the participating schools was introduced to the aims, objectives and structure of the study and a declaration of consent was then signed. The future plans were discussed with the class teacher and the period chart for data collection was arranged. The children were given a letter for their parents, including the information on the study, to obtain their consent to their child participation.

The tests were only carried out if the parents and children had provided their written consent. The tests were performed at regular school hours whenever possible. In order not to overexert the children with regard to their attention and motivation, and especially in order to uphold their motivation, a maximum timeframe of 2 hours was agreed upon with the class teachers when making the appointment for the tests. If it was not possible to avoid tests during regular lessons, it was ensured that the pupil was not absent during a change in subjects and that as less lessons were missed as possible. It was also important that the children did not have any headaches or abdominal pain at the time the data was collected.

For the children to keep attentive and motivated for this study, the same framework story was always read out at the beginning of the experimental study and to calm their stress level. To promote the motivation of participants in the test, a motivational story about animated "family

Aralamos" read out. The participants collect 100 points in 10 test parts to help that fictitious family. After all of the tests had been completed, the children were awarded a certificate and a small torch. In addition to that every class, which participated in the experimental study, received 50 Euros as class pooled money.

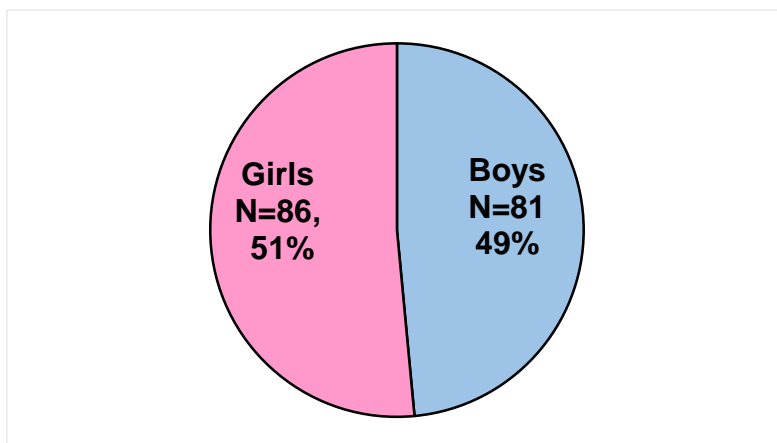
## 2.5 Description of the sample of fourth graders

A total of 189 fourth graders were asked for participation in the study. There are 22 of the 189 tested fourth year school pupils who did not take part in the Essen paediatric pain interview. The 167 children who generated causal attributions for both headache and abdominal pain remained in this study. The following table 14 illustrates the summarised description of the fourth graders sampling.

**Table 14:** Summary of the Fourth Graders Sampling

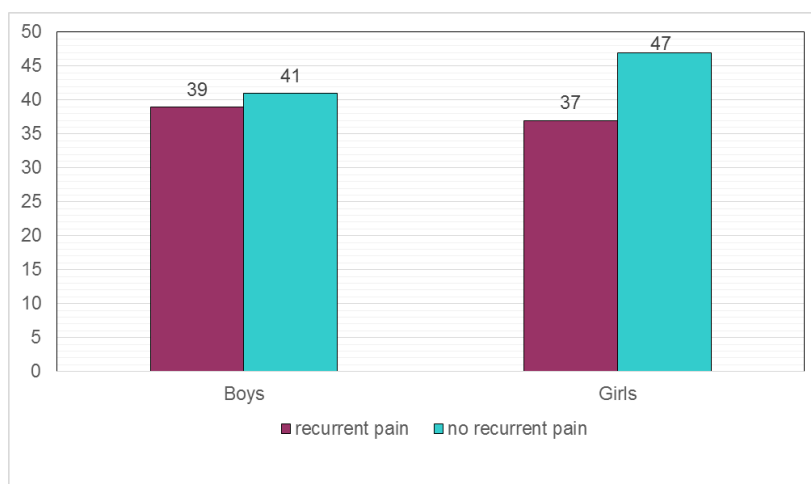
Fourth Graders	Boys	Girls	missing values	Total
addressed children	87	102		189
participants in the Essen Children's Pain Interview	81	86	22	167
Recurrence of abdominal pain and headache	80	84	3	164
recurrence of pain exists	39	37		76
no recurrent pain exists	41	47		88
Intensity of abdominal pain and headache	75	80	12	155
high	40	39		79
low	35	41		76

At the time the study was conducted, the pupils were in the fourth year at school and aged between 9 and 11 with the mean age 10.1 years (standard deviation 4.9 months). In order to explore the answers of research questions, an important differentiation had to be made between children suffering from recurring pain and children that suffered for less than a month. If a child stated that he or she suffered from headaches and/or abdominal pain at least once a month or more frequently when answering the frequency question, then this child was classified as suffering from recurring pain. If the child was suffering from pain less frequently, then he or she was allocated a "no recurring pain „group. The following illustration clarifies the gender distribution within the analysed random sampling (N=167; Figure. 7).

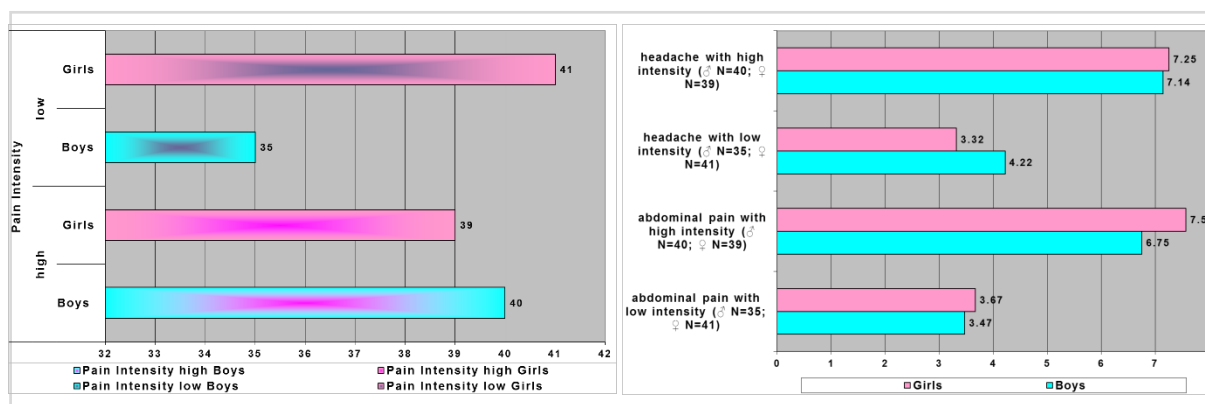


**Figure 7:** Gender distribution within the study group N=167

The gender-related distribution in dependency with the pain recurrence (Figure. 8: N=164) does not show a gender difference ( $\chi^2=.364$ ;  $df=1$ ,  $p=0.546$ ).



**Figure 8:** Pain Recurrence / Distribution of Gender



**Figure 9:** Distribution of gender in pain intensity groups / gender related pain intensities for headache and abdominal pain (visual analogue scale 0 – 10 cm)

For the purpose of the study, the mean pain intensities were analysed based on the abdominal pain and the headaches with the assistance of the visual analogue scale (see Fig. 4). On average boys stated lower pain intensities than girls (♂ AP 4.90cm; HA 4.70cm; ♀: AP 5.97cm; HA 5.48cm). The group distribution in high and low abdominal pain and headache intensities was carried out by means of median dichotomisation. The gender related distribution among each of the intensity groups is shown in Fig. 9; a gender-effect can be excluded ( $\chi^2=.005$ ;  $df=1$ ;  $p=0.942$ ).

## 2.6. Statistical Methods

The data were analysed and evaluated using the PASW Statistics program, version 20, Microsoft Excel and the ReCAL OIR ("Reliability Calculator for Ordinal, Interval and Ratio Data") software: Internet link: <http://dfreelon.org/utis/recalfront/recl-oir/> from D. Freelon.

## 2.7. Intercoder reliabilities

The quality of the correlation between both of the independent coders that categorised the detected causal units of the 19 causal categories in the category system (see table 13), are described below by means of three different approaches. Firstly, a check is made as to

1. the extent to which both of the coders agree upon the sum of the units that is to be categorised;
2. the next factor of interest is the quality of the correlation between both of the coders with regard to the number of units per category;
3. and finally a check is to be carried out in order to determine the accuracy with which both of the coders have estimated the number of children per category.

### 2.7.1 Intercoder reliabilities for the sum of the generated units

The intercoder reliability on the level of all units that both of the raters have independently detected and rated, were determined in PASW Statistics using the Krippendorfs' Alpha module

- for the abdominal pain situation with a Krippendorfs'  $\alpha = .9032$
  - for the headache situation with a Krippendorfs'  $\alpha = .8179$
- at the interval scale level

## 2.7.2 Intercoder reliabilities for the number of units per category

The table 15 and 16 provide information about the reliability between the intercoders with regard to the analysed causal units for each of the categories. The reliabilities are stated in the tables at ordinal, interval and rational scale levels in addition to the Pearson correlation coefficient being presented.

**Table 15:** Abdominal pain: Intercoder Reliabilities for the Number of Units per Category

Abdominal Pain: Intercoder reliability for the frequencies in the categories							
results for file "EXPI_7_L4_EXPI_5_EXPI_1_2_L4_Muhammad_Rasheed_Erst- und_Zweitater_Ursachen_Bauchschmerz_10042013.csv" File size: 13687 bytes N columns: 42 N variables: 21 N coders per variable: 2							
No.	Categories	Krippendorff's Alpha ( $\alpha$ )			Pearson	N Cases	N Decisions
		Ordinals kala	Intervall skala	Rationals kala	Korrelation (r)		
1.	... coincidence	.7975	.7975	.7975	.814	163	326
2.	... an accident	.7914	.8179	.7819	.831	163	326
3.	... external force applied (including by humans)	.9796	.9624	.9749	.962	163	326
4.	... internal force applied (medi. instruments, ...)	.8366	.7670**	.8130	.778	163	326
5.	... medical treatment	.J.*	.J.*	.J.*	.J.*	163	326
6.	... illness / medication/adverse reactions	.8224	.8649	.8211	.873	163	326
7.	... fear of illness, medication/adverse reactions	.6646	.6646	.6646	.705	163	326
8.	... cognitive load	1.000	1.000	1.000	1.000	163	326
9.	... emotional stress	.9211	.9491	.9123	.950	163	326
10.	... physical overexertion	.8875	.9319	.8861	.934	163	326
11.	... wrong nutrition	.9161	.8888	.9466	.890	163	326
12.	... environmental conditions	1.000	1.000	1.000	1.000	163	326
13.	... behaviour-related trigger	.8285	.7935	.8180	.843	163	326
14.	... contravention of norms and values	.J.*	.J.*	.J.*	.J.*	163	326
15.	... child describes the experience and conduct of other persons	1.000	1.000	1.000	1.000	163	326
16.	... child does not state a specific cause	.5310	.5310	.5310	.569	163	326
17.	... a visible physical reaction ("seeing")	.J.*	.J.*	.J.*	.J.*	163	326
18.	... child justifies the cause with "medical knowledge"	.7636	.6581**	.7616	.673	163	326
19.	... basic physiological needs	.8479	.8050	.8552	.805	163	326
20.	Analysis unit cannot be categorised	.J.*	.J.*	.J.*	.J.*	163	326
(*) Krippendorff's alpha and Pearson correlation coefficient are not defined because of invariant data!							
(**) The discrepancy of the resulting coefficients is caused by the sundry calculations of the differential function for the individual scales!							

**Table 16:** Headache: Intercoeder Reliabilities for the Number of Units per Category

Headache: Intercoeder reliability for the frequencies in the categories							
results for file "EXPI_7_L4_EXPI_5_EXPI_1_2_L4_Muhammad_Rasheed_Erst- und_Zweitater_Ursachen_Kopfschmerz_10042013.csv" File size: 13687 bytes N columns: 42 N variables: 21 N coders per variable: 2							
No.	Categories	Krippendorff's Alpha ( $\alpha$ )			Pearson	N Cases	N Decisions
		Ordinalskala	Intervallskala	Rationalskala	Korrelation (r)		
1.	... coincidence	.7445	.7445	.7445	.770	163	326
2.	... an accident	.8979	.8785	.8944	.880	163	326
3.	... external force applied (including by humans)	.8358	.8496	.8268	.850	163	326
4.	... external force applied (medi. instruments, ...)	.8474	.7789	.8481	.802	163	326
5.	... medical treatment	.J.*	.J.*	.J.*	.J.*	163	326
6.	... illness / medication/adverse reactions	.8453	.7397	.8542	.755	163	326
7.	... fear of illness, medication/adverse reactions	1,000	1,000	1,000	1,000	163	326
8.	... cognitive load	.9571	.7272	.9457	.783	163	326
9.	... emotional stress	.9753	.9902	.9734	.990	163	326
10.	... physical overexertion	.9328	.9320	.9321	.937	163	326
11.	... wrong nutrition	1,000	1,000	1,000	1,000	163	326
12.	... environmental conditions	.9629	.9474	.9528	.948	163	326
13.	... behaviour-related trigger	.7909	.9135	.7804	.915	163	326
14.	... contravention of norms and values	.J.*	.J.*	.J.*	.J.*	163	326
15.	... child describes the experience and conduct of other persons	1,000	1,000	1,000	1,000	163	326
16.	... child does not state a specific cause	.7822	.6776	.7877	.714	163	326
17.	... a visible physical reaction ("seeing")	1,000	1,000	1,000	1,000	163	326
18.	... child justifies the cause with "medical knowledge"	.8842	.9688	.8831	.969	163	326
19.	... basic physiological needs	.6507	.3833	.6552	.401	163	326
Z.	Analysis unit cannot be categorised	.J.*	.J.*	.J.*	.J.*	163	326
(*) Krippendorff's alpha and Pearson correlation coefficient are not defined because of invariant data!							
(**) The discrepancy of the resulting coefficients is caused by the sundry calculations of the differential function for the individual scales!							

### 2.7.3 Intercoeder reliabilities for the number of children per category

Table 17 on next page shows the quality of the correlation between the independent raters with regard to the accuracy, with which the children were allocated to a category. The consistently high reliabilities between the coders prove the high quality of the Essen paediatric pain interview categories and rules system.

**Table 17:** Abdominal Pain and Headache Causes: Intercooder Reliabilities for the Number of Children per Category

ReCal 0.1 Alpha for 2 Coders ( <a href="http://dfreelon.org/recal/recal2.php">http://dfreelon.org/recal/recal2.php</a> )									
results for file "EXPI_7_L4_EXPI_5_EXPI_1_2_L4_Muhammad_Rasheed_Erst- und_Zweitratr_Ursache_Bauchschmerz_Kopfschmerzen_10042013.csv" File size: 13687 bytes N columns: 42 N variables: 21 N coders per variable: 2									
No.	Categories	Percent Agreement	Scott's Pi	Cohen's Kappa	Krippendorff's Alpha (nominal)	N Agreements	N Disagreements	N Cases	N Decisions
<b>Causes of Abdominal Pain</b>									
1.	... coincidence	99.4%	0.797	0.797	0.798	162	1	163	326
2.	... an accident	96.9%	0.736	0.736	0.737	158	5	163	326
3.	... external force applied (including by humans)	98.2%	0.94	0.94	0.94	160	3	163	326
4.	... internal force applied (medi. instruments, ...)	96.9%	0.724	0.724	0.724	158	5	163	326
5.	... medical treatment	.J.*	.J.*	.J.*	.J.*	163	0	163	326
6.	... illness / medication/adverse reactions	97.5%	0.823	0.824	0.824	159	4	163	326
7.	... fear of illness, medication/adverse reactions	98.8%	0.494	0.494	0.495	161	2	163	326
8.	... cognitive load	1.000	1.000	1.000	1.000	163	0	163	326
9.	... emotional stress	98.2%	0.877	0.877	0.878	160	3	163	326
10.	... physical overexertion	99.4%	0.886	0.886	0.887	162	1	163	326
11.	... falsche Ernährung	87.7%	0.831	0.831	0.832	143	20	163	326
12.	... environmental conditions	1.000	1.000	1.000	1.000	163	0	163	326
13.	... behaviour-related trigger	98.2%	0.741	0.741	0.742	160	3	163	326
14.	... contravention of norms and values	99.4%	-0.003	0.000	0.000	162	1	163	326
15.	... child describes the experience and conduct of other persons	1.000	1.000	1.000	1.000	163	0	163	326
16.	... child does not state a specific cause	95.1%	0.53	0.533	0.531	155	8	163	326
17.	... a visible physical reaction ("seeing")	.J.*	.J.*	.J.*	.J.*	163	0	163	326
18.	... child justifies the cause with "medical knowledge"	93.9%	0.682	0.683	0.683	153	10	163	326
19.	... basic physiological needs	96.9%	0.858	0.858	0.858	158	5	163	326
20.	Analysis unit cannot be categorised	.J.*	.J.*	.J.*	.J.*	163	0	163	326
<b>Causes of Headache</b>									
1.	... coincidence	98.8%	0.744	0.744	0.744	159	2	161	322
2.	... an accident	91.3%	0.846	0.846	0.846	147	14	161	322
3.	... external force applied (including by humans)	97.5%	0.778	0.779	0.779	157	4	161	322
4.	... internal force applied (medi. instruments, ...)	96.3%	0.829	0.829	0.829	155	6	161	322
5.	... medical treatment	.J.*	.J.*	.J.*	.J.*	161	0	161	322
6.	... illness / medication/adverse reactions	97.5%	0.856	0.856	0.856	157	4	161	322
7.	... fear of illness, medication/adverse reactions	100%	1.000	1.000	1.000	161	0	161	322
8.	... cognitive load	98.8%	0.92	0.92	0.92	159	2	161	322
9.	... emotional stress	99.4%	0.974	0.974	0.974	160	1	161	322
10.	... physical overexertion	97.5%	0.914	0.914	0.914	157	4	161	322
11.	... falsche Ernährung	100%	1.000	1.000	1.000	161	0	161	322
12.	... environmental conditions	94.4%	0.886	0.886	0.887	152	9	161	322
13.	... behaviour-related trigger	93.2%	0.757	0.758	0.758	150	11	161	322
14.	... contravention of norms and values	.J.*	.J.*	.J.*	.J.*	161	0	161	322
15.	... child describes the experience and conduct of other persons	100%	1.000	1.000	1.000	161	0	161	322
16.	... child does not state a specific cause	97.5%	0.787	0.788	0.788	157	4	161	322
17.	... a visible physical reaction ("seeing")	100%	1.000	1.000	1.000	161	0	161	322
18.	... child justifies the cause with "medical knowledge"	98.8%	0.883	0.883	0.883	159	2	161	322
19.	... basic physiological needs	97.5%	0.655	0.655	0.656	157	4	161	322
20.	Analysis unit cannot be categorised	.J.*	.J.*	.J.*	.J.*	161	0	161	322
(*) Due to not use of the category by one of the coders the coefficient could not be defined!									
(**) One of the coders only used this category for one single unit, the second coder didn't define it at all!									

The project participants permanently worked on improving this system throughout the data collection phase until 2011. An error analysis was also carried out for the fourth graders that were analysed here (see in the Annex). Only the corrected data are presented in chapter 3.



## 2.8. Confidence intervals

The absolute and percentage frequencies of the categories mentioned by the children and the generated causal units analysed through the “Essen paediatric pain interview” are presented in the results part in a tabular form, depending on the factors “gender”, “pain recurrence” and “pain intensity” together with the determined confidence intervals

(CI = Confidence intervals, <http://statpages.org/confint.html>).

## 2.9. Significance level

As far as the testing of the hypotheses is concerned, an  $\alpha \leq 0.05$  is valid, this being conservatively adapted using the Bonferroni correction ( $\alpha_i = 0.05/n$ ) in order to avoid an inflation of the alpha error. A total of 7 hypotheses were tested for the sample of fourth graders ( $N=167$ ) and one additional hypothesis (hypothesis No. 7) that deals with the comparison between second and fourth graders ( $N=86$ ). An  $\alpha_i = 0.05/7 = 0.007$  is valid for the hypotheses 1 to 6 and 8. At the beginning of this hypotheses test, all of the dependent variables are tested for a normal distribution by using the Kolmogorov-Smirnov test. A non-production of significance by this test is indicative of a normal distribution of the variables that are to be analysed. The hypotheses can then be tested using parametric procedures. Should the curve significantly deviate from the normal distribution curve (K-S test is significant), non-parametric procedures are used for the testing of the hypotheses. In case of comparing two independent samples (see hypotheses 1, 2, 3, 5) the Mann-Whitney-U-Test is applied whereas for the comparison of four independent samples (hypothesis 4) the Kruskal-Wallis-Test is used. The comparison of two dependent samples (hypotheses 6, 7 and 8) is conducted by the Wilcoxon Signed-Rank Test.

### 3. Results

The aim of this research project is the exhaustive recording of the causal attributions of fourth-year school pupils with regard to abdominal pain and headaches in everyday language with the assistance of the categories and rules system that have been developed for this purpose and a closer analysis. The statements made by the children were hereby related to the factors “gender”, “pain recurrence” and “pain intensity”.

#### 3.1 Descriptive results of the fourth graders

Initially, a summary is provided of the type and number of causal attributions of fourth-year school pupils for “abdominal pain” (AP) and “headaches” (HA). The following tables show the frequency of the individual categories in both pain situations as mentioned by the 167 children. The 3 most frequently mentioned categories (formulated as “children per category”) and the 3 categories with the highest number of units are highlighted in colour in these tables. All frequencies exceeding 10% of the total frequency are also highlighted in colour.

In the following part the definitions of the most important terms are shown in order to render them more understandable (Thewes, 2011):

- Number of units

( $N_{\text{Units}}$ )

How many causal attributions (causal units) do the children generate?

- Number of children per category

( $N_{\text{Number of children per category}}$ )

How many children have mentioned this category? Each of the children is counted once, regardless of the number of causal units that he or she generates in this category.

The sum of the relative frequencies exceeds 100% as multiple answers are possible (= one child can make a statement on various categories).

- Number of units per used category

( $N_{\text{Units}} / N_{\text{Number of children that mentioned this category}}$ )

How many causal units were generated by those children who mentioned this category in total? A child can mention numerous causes within a category.

### 3.2 Causes of abdominal pain and headache in fourth graders

Table 18 on the next page presents the distribution of all generated causes of abdominal pain and headache.

Total numbers of fourth-class school pupils (N=167) generated a total of 421 causal attributions for the abdominal pain they experienced. This shows a mean of 2.52 units per child. The 20 categories that were available for categorisation were hereby mentioned 278 times. 1.67 categories were used for the causes of abdominal pain per child with 1.51 units per used category.

In the abdominal pain situation (see Table 18, left part), Category 11 (wrong nutrition) is the most frequently mentioned one (81.44% of the fourth-year school pupils). This is followed by Category 3 (external force applied by humans), stated by 17.96% of the fourth year pupils and Category 19 (basic physiological need), on which the 11.98% of the gave their responses. On the basis of the frequency of units, most of the causes were also generated for Category 11 (wrong nutrition) (58.43%).

The fourth class school pupils (N=167) generated a total of 425 causal attributions in the headache situation resulting in a mean of 2.54 units. The 20 categories that were available for categorisation were hereby mentioned 316 times. The categories were used for the causes of headaches per child were 1.89 with 1.34 units per used category.

In the headache situation (see Table 18, right part), Category 2 (accident) was frequently mentioned (44.31% of the fourth year school pupils). This was followed by Category 12 (environmental conditions), that was mentioned by 32.93% and Category 13 (behaviour-related trigger), which 17.96% mentioned. The majority of the causal units were also generated for Category 2 (accident) (20.71% of the causal units). This was followed by Category 12 (environmental conditions) with 32.93% of the causal units and Category 13 (behaviour-related trigger) with 17.96% of the causal units.

**Table 18:** Causes of abdominal pain and headache: distribution of the absolute and percentage frequencies of the persons and units across all categories

Absolute and percentage Distribution of the Mentioned Categories and Generated Units of Fourth Year Pupils in the pain situations "abdominal pain" and "headache" (multiple answers possible)													
Child believes that the pain is caused by...		"Abdominal pain"						"Headache"					
		Frequencies of persons/category			Frequencies of units			Frequencies of persons/category			Frequencies of units		
		N=167 Children / N-Distrib. o. Cat. $\Sigma$ 278			421 Units			N=167 Children / N-Distrib. o. Cat. $\Sigma$ 278			425 Units		
		abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)
1.	... coincidence	2	1.20	0,15 - 4,26	2	0.48	0,06 - 1,71	5	2.99	0,98- 6,85	5	1.18	0,38- 2,72
2.	... an accident	9	5.39	2,49- 9,98	10	2.38	0,98- 4,02	74	44.31	36,64- 52,19	88	20.71	16,95- 24,87
3.	... external force applied (including by humans)	30	17.96	12,46- 24,64	36	8.55	4,86- 10,02	8	4.79	2,09- 9,22	10	2.35	1,13- 4,28
4.	... internal force applied (medi. instruments, ...)	9	5.39	2,49- 9,98	11	2.61	0,98- 4,02	22	13.17	8,44- 19,26	32	7.53	5,21- 10,46
5.	... medical treatment	0	0.00	0,00- 2,18	0	0.00	0,00- 0,87	0	0.00	0,00- 2,18	0	0.00	0,00- 0,86
6.	... illness / medication/adverse reactions	14	8.38	4,66- 13,67	19	4.51	1,83- 5,52	15	8.98	5,11- 14,38	23	5.41	3,46- 8,01
7.	... fear of illness, medication/adverse reactions	2	1.20	0,15- 4,26	2	0.48	0,06- 1,71	1	0.60	0,01- 3,29	5	1.18	0,38- 2,72
8.	... cognitive load	1	0.60	0,01- 3,29	1	0.24	0,01- 1,32	15	8.98	5,11- 14,38	23	5.41	3,46- 8,01
9.	... emotional stress	13	7.78	4,21-12,94	18	4.28	1,65- 5,22	23	13.77	8,94- 19,95	32	7.53	5,21- 10,46
10.	... physical overexertion	4	2.40	0,66- 6,02	5	1.19	0,26-2,42	25	14.97	9,93- 21,30	34	8.00	5,60- 11,00
11.	... falsche Ernährung	136	81.44	74,70- 87,03	246	58.43	27,86- 37,00	8	4.79	2,09- 9,22	10	2.35	1,13- 4,28
12.	... environmental conditions	2	1.20	0,15- 4,26	2	0.48	0,06- 1,71	55	32.93	25,87- 40,62	75	17.65	14,14- 21,61
13.	... behaviour-related trigger	5	2.99	0,98- 6,85	5	1.19	0,39- 2,75	30	17.96	12,46- 24,64	44	10.35	7,62- 13,65
14.	... contravention of norms and values	0	0.00	0,00- 2,18	0	0.00	0,00- 0,87	0	0.00	0,00- 2,18	0	0.00	0,00- 0,86
15.	... child describes the experience and conduct of other persons	1	0.60	0,01- 3,29	1	0.24	0,01- 1,32	2	1.20	0,15- 4,26	2	0.47	0,06- 1,69
16.	... child does not state a specific cause	12	7.19	3,77- 12,22	12	2.85	1,48-4,93	12	7.19	3,77- 12,22	13	3.06	1,64- 5,17
17.	... a visible physical reaction ("seeing")	0	0.00	0,00- 2,18	0	0.00	0,00- 0,87	3	1.80	0,37- 5,16	7	1.65	0,66- 3,36
18.	... child justifies the cause with "medical knowledge"	18	10.78	6,51- 16,50	27	6.41	2,55- 6,67	11	6.59	3,33- 11,48	15	3.53	1,99- 5,75
19.	... basic physiological needs	20	11.98	7,47-17,89	24	5.70	2,93- 7,24	7	4.19	1,70- 8,45	7	1.65	0,66- 3,36
20.	Analysis unit cannot be categorised	0	0.00	0,00-2,18	0	0.00	0,00- 0,87	0	0.00	0,00- 2,18	0	0.00	0,00- 0,86
Total		278			421	100		316			425	100	
		167 children commented 278 times, generating 421 units						167 children commented 316 times, generating 425 units					
		Ø 2.52 units per child (421/167)						Ø 2.54 units per child (425/167)					
		Ø 1.67 categories per child (278/167)						Ø 1.89 categories per child (316/167)					
		Ø 1.51 units per stated category (421/278)						Ø 1.34 units per stated category (425/316)					

### 3.3 Causes of abdominal pain and headache in relation to gender, pain recurrence and pain intensity

#### 3.3.1 in relation to the gender

In the following part a presentation of the causal attributions in both pain situations with regard to gender is given (see tables 19 and 20 on the next pages).

In this study group the 81 boys mentioned a total of 206 units in the abdominal pain situation (an average of 2.54 units per boy). The 20 categories that were available for categorisation were hereby mentioned 137 times. 1.69 categories were used for the causes of abdominal pain per boy with 1.51 units per used category (see table 19, left part).

The most frequently mentioned category in the abdominal pain situation (see table 19, left part), is the Category 11 (wrong nutrition) that responded the 80.25% of the boys. This is followed by Category 3 (external force applied by humans), stated by 20.99% and Category 19 (basic physiological need), which 14.81% of the boys stated. On the basis of the frequency of units, most of the causes were also generated for Category 11 (wrong nutrition) (55.34% of the causal units). On the basis of the frequency of the units, the majority of the causes were also generated for Category 11 (wrong nutrition) with 55.34% of the causal units, followed by Category 3 ("external force applied by humans") with 10.68% of the causal units and Category 19 (basic physiological need) with 7.28% of the causal units.

In this study group, the 86 girls generated 216 units in the abdominal pain situation and mentioned the 20 categories a total of 141 times. The female partial random samples generated a total of 216 units (a mean of 2.51 units per girl), over an average of 1.63 categories with 1.53 units per stated category on average (see table 19, right part).

In the abdominal pain situation (see table 19, right part), the girls mentioned Category 11 (wrong nutrition) most frequently (82.56% of the girls). This was followed by Category 18 (medical knowledge), that was stated by 16.28% of the girls and Category 3 (external force applied by humans), which was mentioned by 15.12%. When based on the frequency of the units, most causes were also generated for Category 11 (wrong nutrition) with 61.11% of the causal units.

**Table 19:** Causes of abdominal pain in boys and girls: distribution of the absolute and percentage frequency of the persons and units across all categories

Absolute and percentage Distribution of the Mentioned Categories and Generated Units of Fourth Year Pupils in the pain situation "abdominal pain" (multiple answers possible)													
Child believes that the pain is caused by...		"Boys"						"Girls"					
		Frequencies of persons/category			Frequencies of units			Frequencies of persons/category			Frequencies of units		
		N=81 children / N-distrib. o. Cat. $\sum$ 137			206 Units			N= 86/ N-Distrib. o. Cat. $\sum$ 141			216 Units		
		abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)
1.	... coincidence	2	2,47	0,30- 8,64	2	0,97	0,12- 3,46	0	0,00	0,00- 4,20	0	0,00	0,00-1,69
2.	... an accident	5	6,17	2,03- 13,82	5	2,43	0,79- 5,57	4	4,65	1,28- 11,48	5	2,31	0,76- 5,32
3.	... external force applied (including by humans)	17	20,99	12,73- 31,46	22	10,68	6,82- 15,72	13	15,12	8,30- 24,46	14	6,48	3,59- 10,64
4.	... internal force applied (medi. instruments, ...)	6	7,41	2,77- 15,43	8	3,88	1,69- 7,51	3	3,49	0,73- 9,86	3	1,39	0,29- 4,01
5.	... medical treatment	0	0,00	0,00- 4,45	0	0,00	0,00- 1,77	0	0,00	0,00- 4,20	0	0,00	0,00- 1,69
6.	... illness / medication/adverse reactions	3	3,70	0,77- 10,44	5	2,43	0,79- 5,57	11	12,79	6,56- 21,73	14	6,48	3,59- 10,64
7.	... fear of illness, medication/adverse reactions	0	0,00	0,00- 4,45	0	0,00	0,00- 1,77	2	2,33	0,28- 8,15	2	0,93	0,11- 3,30
8.	... cognitive load	1	1,23	0,03- 6,69	2	0,97	0,12- 3,46	0	0,00	0,00- 4,20	0	0,00	0,00- 1,69
9.	... emotional stress	6	7,41	2,77- 15,43	8	3,88	1,69- 7,61	7	8,14	3,34- 16,05	10	4,63	2,24- 8,35
10.	... physical overexertion	3	3,70	0,77- 10,44	4	1,94	0,53- 4,90	1	1,16	0,03- 6,31	1	0,46	0,01- 2,55
11.	... falsche Ernährung	65	80,25	69,91- 88,27	114	55,34	48,27- 62,25	71	82,56	72,87-89,90	132	61,11	54,26- 67,65
12.	... environmental conditions	0	0,00	0,00- 4,45	0	0,00	0,00- 1,77	2	2,33	2,28- 8,15	2	0,93	0,11- 3,30
13.	... behaviour-related trigger	4	4,94	1,36- 12,16	4	1,94	0,53- 4,90	1	1,16	0,03- 6,31	1	0,46	0,01- 2,55
14.	... contravention of norms and values	0	0,00	0,00- 4,45	0	0,00	0,00-1,77	0	0,00	0,00- 4,20	0	0,00	0,00- 1,69
15.	... child describes the experience and conduct of other persons	1	1,23	0,03- 6,69	1	0,49	0,01- 2,67	0	0,00	0,00- 4,20	0	0,00	0,00- 1,69
16.	... child does not state a specific cause	8	9,88	4,36- 18,54	8	3,88	1,69- 7,51	4	4,65	1,28- 11,48	4	1,85	0,51- 4,67
17.	... a visible physical reaction ("seeing")	0	0,00	0,00- 4,45	0	0,00	0,00- 1,77	0	0,00	0,00- 4,20	0	0,00	0,00- 1,69
18.	... child justifies the cause with "medical knowledge"	4	4,94	1,36- 12,16	8	3,88	1,69- 7,51	14	16,28	9,20- 25,80	19	8,80	5,38- 13,40
19.	... basic physiological needs	12	14,81	7,90- 24,45	15	7,28	4,13- 11,73	8	9,30	4,10- 17,51	9	4,17	1,92- 7,76
20.	Analysis unit cannot be categorised	0	0,00	0,00- 4,45	0	0,00	0,00- 1,77	0	0,00	0,00- 4,20	0	0,00	0,00- 1,69
Total		137			206	100		141			216	100	
		81 children commented 137 times, generating 206 units						86 children commented 141 times, generating 216 units					
		Ø 2.54 units per boy (206/81)						Ø 2.51 units per girl (216/86)					
		Ø 1,69 categories per boy (137/81)						Ø 1.63 categories per girl (141/86)					
		Ø 1.51 units per stated category (206/137)						Ø 1.53 units per stated category (216/141)					

In this study group, the **79 boys** mentioned a total of 203 units in the **headache** situation (an average of 2.56 units per boy). The 20 categories that were available for categorisation were hereby mentioned 153 times. The categories used for the causes of headaches were 1.93 units per boy (see table 20, left part).

In the headache situation (see table 20, left part), Category 2 (accident) is the most frequently mentioned category by boys (46.84%). This is followed by Category 12 (environmental conditions), stated by 32.91% and Category 13 (behaviour-related trigger), which stated with 13.92%. On the basis of the frequency of the units, most of the causes were also generated for Category 2 (accident) (22.17% of the causal units) followed by Category 12 (environmental conditions) with 18.72% of the causal units.

In this study group the **88 girls** mentioned a total of 224 units in the **headache** situation (an average of 2.54 units per boy). The 20 categories that were available for categorisation were hereby mentioned 163 times. 1.85 categories were used for the causes of headaches per girl with 1.37 units per used category (see table 20, right part).

In the headache situation (see table 20, right part), Category 2 (accident) was the most frequently mentioned category by girls (42.05%). This is followed by Category 12 (environmental conditions), stated by 32.95% and Category 13 (behaviour-related trigger), which 21.59% stated and Category 9 (emotional stress), which was attributed to 15.91% of the causes. The majority of the causal units were also generated for Category 2 (accident) (19.20% of the causal units) followed by Category 12 (environmental conditions) with 16.52% of the causal units and Category 13 (behaviour-related trigger) with 13.39%.

In the following part a presentation of the causal attributions in both pain situations with regard to the factor pain recurrence is shown.

**Table 20:** Causes of headache in boys and girls: distribution of the absolute and percentage frequencies of the persons and units over all categories

Absolute and percentage Distribution of the Mentioned Categories and Generated Units of Fourth Year Pupils in the pain situation "headache" (multiple answers possible)													
Child believes that the pain is caused by...		"Boys"						"Girls"					
		Frequency of persons/category			Frequency of units			Frequency of persons/category			Frequency of units		
		N=79 children / N-distrib. o. Cat. $\sum$ 153			203 Units			N= 88/ N-distrib. o. Cat. $\sum$ 163			224 Units		
		abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)
1.	... coincidence	4	5,06	1,40- 12,46	4	1,97	0,54- 4,97	1	1,14	0,03- 6,17	1	0,45	0,01-2,46
2.	... an accident	37	46,84	35,51- 58,40	45	22,17	16,65- 28,51	37	42,05	31,60-53,05	43	19,20	14,25-24,97
3.	... external force applied (including by humans)	5	6,33	2,09- 14,15	6	2,96	1,09- 6,32	3	3,41	0,71- 9,64	4	1,79	0,49- 4,51
4.	... internal force applied (medi. instruments, ...)	10	12,66	6,24- 22,05	12	5,91	3,09- 10,10	12	13,64	7,25- 22,61	18	8,04	4,83- 12,40
5.	... medical treatment	0	0,00	0,00- 4,56	0	0,00	0,00- 1,80	0	0,00	0,00- 4,10	0	0,00	0,00- 1,63
6.	... illness / medication/adverse reactions	9	11,39	5,34- 20,53	15	7,39	4,19- 11,89	6	6,82	2,54- 14,25	12	5,36	2,80- 9,17
7.	... fear of illness, medication/adverse reactions	0	0,00	0,00- 4,56	0	0,00	0,00- 1,80	1	1,14	0,03- 6,17	5	2,23	0,73- 5,13
8.	... cognitive load	6	7,59	2,84- 15,80	6	2,96	1,09- 6,32	9	10,23	4,78- 18,53	17	7,59	4,48- 11,87
9.	... emotional stress	9	11,39	5,34- 20,53	13	6,40	3,45- 10,70	14	15,91	8,98- 25,25	19	8,48	5,18- 12,93
10.	... physical overexertion	14	17,72	10,04- 27,94	19	9,36	5,73- 14,23	11	12,50	6,41- 21,27	15	6,70	3,80- 10,80
11.	... falsche Ernährung	2	2,53	0,31- 8,85	3	1,48	0,31- 4,26	6	6,82	2,54- 14,25	7	3,13	1,27- 6,33
12.	... environmental conditions	26	32,91	22,75- 44,40	38	18,72	13,60-24,78	29	32,95	23,30-43,79	37	16,52	11,90-22,04
13.	... behaviour-related trigger	11	13,92	7,16- 23,55	14	6,90	3,82- 11,30	19	21,59	13,53-31,65	30	13,39	9,22- 18,56
14.	... contravention of norms and values	0	0,00	0,00- 4,56	0	0,00	0,00- 1,80	0	0,00	0,00- 4,10	0	0,00	0,00- 1,63
15.	... child describes the experience and conduct of other persons	1	1,27	0,03- 6,85	1	0,49	0,01- 2,71	1	1,14	0,03- 6,17	1	0,45	0,01- 2,46
16.	... child does not state a specific cause	7	8,86	3,64- 17,41	7	3,45	1,40- 6,98	5	5,68	1,87- 12,76	6	2,68	0,99- 5,74
17.	... a visible physical reaction ("seeing")	3	3,80	0,79- 10,70	7	3,45	1,40- 6,98	0	0,00	0,00- 4,10	0	0,00	0,00- 1,63
18.	... child justifies the cause with "medical knowledge"	6	7,59	2,84- 15,80	10	4,93	2,30- 8,87	5	5,68	1,87- 12,76	5	2,23	0,73- 5,13
19.	... basic physiological needs	3	3,80	0,79- 10,70	3	1,48	0,31- 4,26	4	4,55	1,25- 11,23	4	1,79	0,49- 4,51
20.	Analysis unit cannot be categorised	0	0,00	0,00- 4,56	0	0,00	0,00- 1,80	0	0,00	0,00- 4,10	0	0,00	0,00- 1,63
Total		153			203	100		163			224	100	
		79 children commented 153 times, generating 203 units						88 children commented 163 times, generating 224 units					
		Ø 2.56 units per boy (203/79)						Ø 2.54 units per girl (224/88)					
		Ø 1.93 categories per boy (153/79)						Ø 1.85 categories per girl (163/88)					
		Ø 1.32 units per stated category (203/153)						Ø 1.37 units per stated category (224/163)					



### **3.3.2 in relation to the pain recurrence**

In this study group the 76 children stated in the questionnaire that they had suffered from recurrent pain, mentioned a total of 177 units in the abdominal pain situation (average of 2.33 units per child). The 20 categories that were available for categorisation were hereby mentioned 125 times. The categories mentioned for the causes of abdominal pain are 1.64 per child used category (see table 21, left part on the next page).

In the abdominal pain situation (see table 21, left part), Category 11 (wrong nutrition) is the most frequently mentioned one (78.95% of the children). This is followed by Category 3 (external force applied by humans), stated by 21.05% of the children and Category 18 (medical knowledge), which 11.84% stated. The majority of the causal units were also generated for Category 11 (wrong nutrition) (57.06% of the causal units) followed by Category 3 ("external force applied by humans") with 10.17% of the causal units and Category 18 (medical knowledge) with 5.65% of the causal units.

In this study group the 88 children stated in the questionnaire that they did not suffer from recurrent pain, mentioned a total of 235 units in the abdominal pain situation (average of 2.67 units per child). The 20 categories available for categorisation were hereby mentioned 148 times. The categories used for the causes of abdominal pain were 1.68 with 1.59 units per used category (see table 21, right part).

In the abdominal pain situation (see table 21, right part), Category 11 (wrong nutrition) is the most frequently mentioned category by the children without recurring pain (82.95% of the children). This is followed by Category 3 (external force applied by humans), stated by 14.77% and Category 18 (medical knowledge), which 10.23% stated. The majority of the causal units were also generated for Category 11 (wrong nutrition) (57.02% of the causal units) followed by Category 3 (external force applied <by humans>) with 10.17% of the causal units and Category 18 (medical knowledge) with 5.65% of the causal units.

**Table 21:** Causes of abdominal pain in children with and without recurrent pain: Distribution of the absolute and percentage frequencies of the persons and units over all categories

Absolute and percentage Distribution of the Mentioned Categories and Generated Units of Fourth Year Pupils in the pain situation "abdominal pain" (multiple answers possible)													
Child believes that the pain is caused by...		"recurring pain"						"no recurring pain"					
		Frequencies of persons/category			Frequencies of units			Frequencies of persons/category			Frequencies of units		
		N=76 children / N-distrib. o. Cat. $\sum$ 125			177 Units			N= 88/ N-distrib. o. Cat. $\sum$ 148			235 Units		
		abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)
1.	... coincidence	2	2,63	0,32 - 9,18	2	1,13	0,14 - 4,02	0	0,00	0,00 - 4,10	0	0,00	0,00 - 1,56
2.	... an accident	3	3,95	0,82 - 11,11	5	2,82	0,92 - 6,47	6	6,82	2,54 - 14,25	7	2,98	1,21 - 6,04
3.	... external force applied (including by humans)	16	21,05	12,54 - 31-92	18	10,17	6,14 - 15,60	13	14,77	8,11 - 23,94	17	7,23	4,27 - 11,33
4.	... internal force applied (medi. instruments, ...)	3	3,95	0,82 - 11,11	5	2,82	0,92 - 6,47	6	6,82	2,54 - 14,25	7	2,98	1,21 - 6,04
5.	... medical treatment	0	0,00	0,00 - 4,74	0	0,00	0,00 - 2,06	0	0,00	0,00 - 4,10	0	0,00	0,00 - 1,56
6.	... illness / medication/adverse reactions	5	6,58	2,17 - 15,69	5	2,82	0,92 - 6,47	9	10,23	4,78 - 18,53	14	5,96	3,29 - 9,79
7.	... fear of illness, medication/adverse reactions	2	2,63	0,32 - 9,18	2	1,13	0,14 - 4,02	0	0,00	0,00 - 4,10	0	0,00	0,00 - 1,56
8.	... cognitive load	0	0,00	0,00 - 4,74	0	0,00	0,00 - 2,06	1	1,14	0,03 - 6,17	2	0,85	0,10 - 3,04
9.	... emotional stress	5	6,58	2,17 - 14,69	6	3,39	1,25 - 7,23	8	9,09	4,01 - 17,13	12	5,11	2,67 - 8,75
10.	... physical overexertion	0	0,00	0,00 - 4,74	0	0,00	0,00 - 2,06	4	4,55	1,25 - 11,23	5	2,13	0,69 - 4,90
11.	... falsche Ernährung	60	78,95	68,08 - 87,46	101	57,06	49,42 - 64,64	73	82,95	73,45 - 90,13	134	57,02	50,42 - 63,44
12.	... environmental conditions	1	1,32	0,03 - 7,11	1	0,56	0,01 - 3,11	0	0,00	0,00 - 4,10	0	0,00	0,00 - 1,56
13.	... behaviour-related trigger	1	1,32	0,03 - 7,11	1	0,56	0,01 - 3,11	4	4,55	1,25 - 11,23	4	1,70	0,47 - 4,30
14.	... contravention of norms and values	0	0,00	0,00 - 4,74	0	0,00	0,00 - 2,06	0	0,00	0,00 - 4,10	0	0,00	0,00 - 1,56
15.	... child describes the experience and conduct of other persons	0	0,00	0,00 - 4,74	0	0,00	0,00 - 2,06	1	1,14	0,03 - 6,17	1	0,43	0,01 - 2,35
16.	... child does not state a specific cause	6	7,89	2,95 - 16,40	6	3,39	1,25 - 7,23	6	6,82	2,54 - 14,25	6	2,55	0,94 - 5,47
17.	... a visible physical reaction ("seeing")	0	0,00	0,00 - 4,74	0	0,00	0,00 - 2,06	0	0,00	0,00 - 4,10	0	0,00	0,00 - 1,56
18.	... child justifies the cause with "medical knowledge"	9	11,84	5,56 - 21,29	10	5,65	2,74 - 10,14	9	10,23	4,78 - 18,53	17	7,23	4,27 - 11,33
19.	... basic physiological needs	12	15,79	3,43 - 25,96	15	8,47	4,82 - 13,59	8	9,09	4,01 - 17,13	9	3,83	1,77 - 7,15
20.	Analysis unit cannot be categorised	0	0,00	0,00 - 4,74	0	0,00	0,00 - 2,06	0	0,00	0,00 - 4,10	0	0,00	0,00 - 1,56
Total		125			177	100		148			235	100	
		76 children commented 125 times, generating 177 units						88 children commented 148 times, generating 235 units					
		Ø 2.33 units per child (177/76)						Ø 2.67 units per child (235/88)					
		Ø 1.64 categories per child (125/76)						Ø 1.68 categories per child (148/88)					
		Ø 1.42 units per category (177/125)						Ø 1.59 units per stated category (235/148)					

In that study group the 88 children stated in the questionnaire that they did not suffer from recurrent pain, mentioned a total of 172 units in the headache situation (average of 1.96 units per child). The 20 categories that were available for categorisation were hereby mentioned 136 times. 1.55 categories were used for the causes of headaches with 1.27 units per used category (see table 22, right part on the next page).

In the headache situation, Category 12 (environmental condition) is the one most frequently mentioned by the children with recurrent pain (35.53% of the children). This is followed by Category 13 (behaviour-related trigger), stated by 18.42% and Category 2 (accident), stated by 15.79%. The majority of the causal units were also generated for Category 12 (environmental conditions) (24.40% of the causal units) followed by Category 10 (physical overexertion) with 10.12% of the causal units (see table 22, left part).

In the headache situation (see table 22, right part) the children that do not suffer from recurrent pain mention Category 12 (environmental condition) most frequently (29.55% of the children). This is followed by Category 13 (behaviour-related trigger), stated by 18.18% and Category 10 (physical overexertion) stated by 15.91%. The majority of the causal units were also generated for Category 12 (environmental conditions) (18.60% of the causal units) followed by Category 13 (behaviour-related trigger) with 12.21% of the causal units (see table 22, left part).

**Table 22:** Causes of headaches in children with and without recurrent pain: Distribution of the absolute and percentage frequencies of the persons and units over all categories

Absolute and percentage Distribution of the Mentioned Categories and Generated Units of Fourth Year Pupils in the pain situation "headache" (multiple answers possible)													
Child believes that the pain is caused by...		"recurring pain"						"no recurring pain"					
		Frequencies of persons/category			Frequencies of units			Frequencies of persons/category			Frequencies of units		
		N=76 children / N-distrib. o Cat. $\Sigma$ 120			168 Units			N= 88/ N-distrib. o. Cat. $\Sigma$ 136			172 Units		
		abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)
1.	... coincidence	2	2,63	0,32- 9,18	2	1,19	0,14- 4,23	3	3,41	0,71- 9,64	3	1,74	0,36- 5,01
2.	... an accident	12	15,79	8,43- 25,96	15	8,93	5,08- 14,30	8	9,09	4,01- 17,13	9	5,23	2,42- 9,70
3.	... external force applied (including by humans)	1	1,32	0,03- 7,11	1	0,60	0,01- 3,27	6	6,82	2,54- 14,25	7	4,07	1,65- 8,21
4.	... internal force applied (medi. instruments, ...)	10	13,16	6,49- 22,87	15	8,93	5,08- 14,30	11	12,50	6,41- 21,27	14	8,14	4,52- 13,28
5.	... medical treatment	0	0,00	0,00- 4,74	0	0,00	0,00- 2,17	0	0,00	0,00- 4,10	0	0,00	0,00- 2,12
6.	... illness / medication/adverse reactions	8	10,53	4,66- 19,69	11	6,55	3,31- 11,41	7	7,95	3,26- 15,70	12	6,98	3,66- 11,87
7.	... fear of illness, medication/adverse reactions	1	1,32	0,03- 7,11	1	0,60	0,01- 3,27	0	0,00	0,00- 4,10	0	0,00	0,00- 2,12
8.	... cognitive load	7	9,21	3,78- 18,06	9	5,36	2,48- 9,93	7	7,95	3,26- 15,70	13	7,56	4,09- 12,58
9.	... emotional stress	10	13,16	6,49- 22,87	16	9,52	5,54- 15,00	12	13,64	7,25- 22,61	12	6,98	3,66- 11,87
10.	... physical overexertion	11	14,47	7,45- 24,42	17	10,12	6,01- 15,71	14	15,91	8,98- 25,25	17	9,88	5,86- 15,35
11.	... falsche Ernährung	3	3,95	0,82- 11,11	4	2,38	0,65- 5,98	5	5,68	1,87- 12,76	6	3,49	1,29- 7,44
12.	... environmental conditions	27	35,53	24,88- 47,34	41	24,40	18,12- 31,62	26	29,55	20,29- 40,22	32	18,60	13,09- 25,24
13.	... behaviour-related trigger	14	18,42	10,45- 28,97	21	12,50	7,91- 18,47	16	18,18	10,76- 27,84	21	12,21	7,72- 18,06
14.	... contravention of norms and values	0	0,00	0,00- 4,74	0	0,00	0,00- 2,17	0	0,00	0,00- 4,10	0	0,00	0,00- 2,12
15.	... child describes the experience and conduct of other persons	1	1,32	0,03- 7,11	1	0,60	0,01- 3,27	1	1,14	0,03- 6,17	1	0,58	0,01- 3,20
16.	... child does not state a specific cause	4	5,26	1,45- 12,93	4	2,38	0,65- 5,98	8	9,09	4,01- 17,13	9	5,23	2,42- 9,70
17.	... a visible physical reaction ("seeing")	2	2,63	0,32- 9,18	3	1,79	0,37- 5,13	1	1,14	0,03- 6,17	4	2,33	0,64- 5,85
18.	... child justifies the cause with "medical knowledge"	3	3,95	0,82- 11,11	3	1,79	0,37- 5,13	8	9,09	4,01- 17,13	9	5,23	2,42- 9,70
19.	... basic physiological needs	4	5,26	1,45- 12,93	4	2,38	0,65- 5,98	3	3,41	0,71- 9,64	3	1,74	0,36- 5,01
20.	Analysis unit cannot be categorised	0	0,00	0,00- 4,74	0	0,00	0,00- 2,17	0	0,00	0,00- 4,10	0	0,00	0,00- 2,12
Total		120			168	100		136			172	100	
		76 children commented 120 times, generating 163 units						88 children commented 136 times, generating 172 units					
		Ø 2.21 units per child (168/76)						Ø 196 units per child (172/88)					
		Ø 1.58 categories per child (120/76)						Ø 1.55 categories per child (136/88)					
		Ø 1.4 units per stated category (168/120)						Ø 1.27 units per stated category (172/136)					

### **3.3.3 in relation to the pain intensity**

The causal attributions in both of the pain situations (high pain intensity and low pain intensity) with regard to the factor pain intensity are explained as shown in the tables 23 to 26.

In that group the 35 boys with a low pain intensity, mentioned a total of 79 units in the abdominal pain situation (an average of 2.26 units per boy). The 20 categories available for categorisation were hereby mentioned 63 times. 1.8 categories were used for the causes of abdominal pain with 1.25 units per used category (table 23, left part).

In the abdominal pain situation (table 23, left part), Category 11 (wrong nutrition) is the most frequently mentioned one by boys with a low pain intensity (68.57% of the children). This is followed by Category 3 (external force applied by humans), stated by 25.71% and Category 16 (no specific cause) stated by 22.86%. The majority of the causal units were also generated for Category 11 (wrong nutrition) (43.04% of the causal units) followed by Category 3 (external force applied by humans) with 15.19% of the causal units and Category 16 (no specific cause) with 10.13% of the causal units.

The 40 boys that were in the group with high pain intensity mentioned a total of 81 units in the abdominal pain situation (an average of 2.02 units per boy). The 20 categories that were available for categorisation mentioned 54 times. 1.35 categories were used for the causes of abdominal pain with 1.5 units per used category (see table 23, right part).

In the abdominal pain situation (table 23, right part), Category 11 (wrong nutrition) is the most frequently mentioned one by the boys with a high pain intensity (75.00% of the children). This is followed by Category 3 (external force applied <by humans>) with 20.00% and Category 19 (basic physiological needs) stated by 11.43% of the children. The majority of the causal units were also generated for Category 11 (wrong nutrition) (58.02% of the causal units) followed by Category 3 (external force applied <by humans>) with 12.36% of the causal units.

**Table 23:** Causes of abdominal pain (♂): low (<4.9037; N=35) and high (≥4.9037; N=40) pain intensity; Distribution of the absolute and percentage frequencies of the persons and units over all categories.

Absolute and percentage distribution of the units with the "boys" in relation to the pain intensity in the pain situation "abdominal pain" (multiple answers possible)													
Child believes that the pain is caused by:		"low pain intensity"						"high pain intensity"					
		Frequencies of persons/category			Frequencies of units			Frequencies of persons/category			Frequencies of units		
		N=35 children / N-distrib. o. Cat. Σ63			79 Units			N= 40/ N-distrib. o. Cat. Σ163			81 Units		
		abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)
1.	... coincidence	1	2,86	0,07- 14,92	1	1,27	0,03- 6,85	1	2,50	0,06- 13,16	1	1,23	0,03- 6,69
2.	... an accident	1	2,86	0,07- 14,92	1	1,27	0,03- 6,85	1	2,50	0,06- 13,16	1	1,23	0,03- 6,69
3.	... external force applied (including by humans)	9	25,71	12,49- 43,26	12	15,19	8,10- 25,03	8	20,00	9,05- 35,65	10	12,35	6,08- 21,53
4.	... internal force applied (medi. instruments, ...)	5	14,29	4,81- 30,26	6	7,59	2,84- 15,80	1	2,50	0,06- 13,16	2	2,47	0,30- 8,64
5.	... medical treatment	0	0,00	0,00- 10,00	0	0,00	0,00- 4,56	0	0,00	0,00- 8,81	0	0,00	0,00- 4,45
6.	... illness / medication/adverse reactions	2	5,71	0,70- 19,16	1	1,27	0,03- 6,85	1	2,50	0,06- 13,16	1	1,23	0,03- 6,69
7.	... fear of illness, medication/adverse reactions	0	0,00	0,00- 10,00	0	0,00	0,00- 4,56	0	0,00	0,00- 8,81	0	0,00	0,00- 4,45
8.	... cognitive load	0	0,00	0,00- 10,00	0	0,00	0,00- 4,56	0	0,00	0,00- 8,81	0	0,00	0,00- 4,45
9.	... emotional stress	2	5,71	0,70- 19,16	2	2,53	0,31-8,85	3	7,50	1,57- 20,39	4	4,94	1,36- 12,16
10.	... physical overexertion	1	2,86	0,07- 14,92	2	2,53	0,31-8,85	1	2,50	0,06- 13,16	3	3,70	0,77- 10,44
11.	... falsche Ernährung	24	68,57	50,71- 83,15	34	43,04	31,94- 54,67	30	75,00	58,80- 87,31	47	58,02	46,54- 68,91
12.	... environmental conditions	0	0,00	0,00- 10,00	0	0,00	0,00- 4,56	0	0,00	0,00- 8,81	0	0,00	0,00- 4,45
13.	... behaviour-related trigger	1	2,86	0,07- 14,92	1	1,27	0,03- 6,85	2	5,00	0,61- 16,92	1	1,23	0,03- 6,69
14.	... contravention of norms and values	0	0,00	0,00- 10,00	0	0,00	0,00- 4,56	0	0,00	0,00- 8,81	0	0,00	0,00- 4,45
15.	... child describes the experience and conduct of other persons	0	0,00	0,00- 10,00	0	0,00	0,00- 4,56	0	0,00	0,00- 8,81	0	0,00	0,00- 4,45
16.	... child does not state a specific cause	8	22,86	10,42- 40,14	8	10,13	4,47- 18,98	0	0,00	0,00- 8,81	0	0,00	0,00- 4,45
17.	... a visible physical reaction ("seeing")	0	0,00	0,00- 10,00	0	0,00	0,00- 4,56	0	0,00	0,00- 8,81	0	0,00	0,00- 4,45
18.	... child justifies the cause with "medical knowledge"	2	5,71	0,70- 19,16	4	5,06	1,40- 12,46	2	5,00	0,61- 16,92	4	4,94	1,36- 12,16
19.	... basic physiological needs	7	20,00	8,44- 36,94	7	8,86	3,64- 17,41	4	10,00	2,79- 23,66	7	8,64	3,55- 17,00
20.	Analysis unit cannot be categorised	0	0,00	0,00- 10,00	0	0,00	0,00- 4,56	0	0,00	0,00- 8,81	0	0,00	0,00- 4,45
Total		63			79	100		54			81	100	
		35 children commented 63 times, generating 79 units						40 children commented 54 times, generating 81 units					
		Ø 2.26 units per child (79/35)						Ø 2.02 units per child (81/40)					
		Ø 1.8 categories per child (63/35)						Ø 1.35 categories per child (54/40)					
		Ø 1,25 units per stated category (79/63)						Ø 1.5 units per stated category (81//54)					

The 41 **girls** that were in this study group with low **pain intensity** mentioned a total of 108 units in the abdominal pain situation (an average of 2.63 units per girl). The 20 categories that were available for categorisation were hereby mentioned 67 times. 1.63 categories were used for the causes of abdominal pain with 1.61 units per used category (see table 24, left part).

In case of abdominal pain (table 24, left part), Category 11 (wrong nutrition) is the most frequently mentioned one by the girls with a low pain intensity (82.93% of the girls). This is followed by Category 18 (medical knowledge), stated by 19.51% of the children and Category 19 (basic physiological need) stated by 12.20%. The majority of the causal units were also generated for Category 11 (wrong nutrition) (62.96% of the causal units).

In that study group the 39 **girls with high pain intensity**, mentioned a total of 84 units in the abdominal pain situation (an average of 2.15 units per girl). The 20 categories that were available for categorisation mentioned 70 times. 1.8 categories were used for the causes of abdominal pain with 1.2 units per used category (table 24, right part).

In case of abdominal pain (table 24, right part), Category 11 (wrong nutrition) is the most frequently mentioned one by the girls with a high pain intensity (82.05% of the children). This is followed by Category 12 (environmental conditions) and Category 3 (external force applied by humans) that were each mentioned by 23.08% of the children. The majority of the causal units were also generated for Category 11 (wrong nutrition) (60.71% of the causal units) followed by Category 3 (external force applied by humans) with 11.90% of the causal units and Category 18 (medical knowledge) with 7.14% of the causal units.

**Table 24:** Causes of abdominal pain (♀): low (<5.9799; N=41) and high (≥5.9799; N=39) pain intensity; Distribution of the absolute and percentage frequencies of the persons and units over all Categories

Absolute and percentual distribution distribution of the units with the "girls" in relation to the pain intensity in the pain situation "abdominal pain" (multiple answers possible)													
Child believes that the pain is caused by...		"low pain intensity"						"high pain intensity"					
		Frequencies of persons/category			Frequencies of units			Frequencies of persons/category			Frequencies of units		
		N=41 children / N-distrib. o. Cat. $\Sigma$ 67			108 Units			N= 39/ N-distribution o Cat. $\Sigma$ 70			84 Units		
		abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)
1.	... coincidence	0	0,00	0,00- 8,60	0	0,00	0,00- 3,36	0	0,00	0,00- 9,03	0	0,00	0,00-4,30
2.	... an accident	2	4,88	0,60- 16,53	3	2,78	0,58- 7,90	2	5,13	0,63-17,32	2	2,38	0,29-8,34
3.	... external force applied (including by humans)	3	7,32	1,53- 19,92	3	2,78	0,58- 7,90	9	23,08	11,13-39,33	10	11,90	5,86-20,81
4.	... internal force applied (medi. instruments, ...)	2	4,88	0,60- 16,53	2	1,85	0,22- 6,53	1	2,56	0,06-13,48	1	1,19	0,03-6,46
5.	... medical treatment	0	0,00	0,00- 8,60	0	0,00	0,00- 3,36	0	0,00	0,00- 9,03	0	0,00	0,00-4,30
6.	... illness / medication/adverse reactions	4	9,76	2,72- 16,53	6	5,56	2,07- 11,70	7	17,95	7,54-33,54	8	9,52	4,20-17,91
7.	... fear of illness, medication/adverse reactions	1	2,44	0,06- 12,86	1	0,93	0,02- 5,05	0	0,00	0,00- 9,03	0	0,00	0,00-4,30
8.	... cognitive load	0	0,00	0,00- 8,60	0	0,00	0,00- 3,36	0	0,00	0,00- 9,03	0	0,00	0,00-4,30
9.	... emotional stress	3	7,32	1,53- 19,92	4	3,70	1,02- 9,21	1	2,56	0,06-13,48	1	1,19	0,03-6,46
10.	... physical overexertion	0	0,00	0,00- 8,60	0	0,00	0,00- 3,36	0	0,00	0,00- 9,03	0	0,00	0,00-4,30
11.	... falsche Ernährung	34	82,93	67,94 92,85	68	62,96	53,14- 72,06	32	82,05	66,46-92,46	51	60,71	49,45-71,20
12.	... environmental conditions	2	4,88	0,60- 16,53	2	1,85	0,22- 6,53	9	23,08	11,13-39,33	0	0,00	0,00-4,30
13.	... behaviour-related trigger	1	2,44	0,06- 12,86	1	0,93	0,02- 5,05	0	0,00	0,00- 9,03	0	0,00	0,00-4,30
14.	... contravention of norms and values	0	0,00	0,00- 8,60	0	0,00	0,00- 3,36	0	0,00	0,00- 9,03	0	0,00	0,00-4,30
15.	... child describes the experience and conduct of other persons	0	0,00	0,00- 8,60	0	0,00	0,00- 3,36	0	0,00	0,00- 9,03	0	0,00	0,00-4,30
16.	... child does not state a specific cause	2	4,88	0,60- 16,53	2	1,85	0,22- 6,53	2	5,13	0,63-17,32	2	2,38	0,29-8,34
17.	... a visible physical reaction ("seeing")	0	0,00	0,00- 8,60	0	0,00	0,00- 3,36	0	0,00	0,00- 9,03	0	0,00	0,00-4,30
18.	... child justifies the cause with "medical knowledge"	8	19,51	8,82- 34,87	10	9,26	4,53- 16,37	4	10,26	2,87-24,22	6	7,14	2,67-14,90
19.	... basic physiological needs	5	12,20	4,08- 26,20	6	5,56	2,07- 11,70	3	7,69	1,63-20,87	3	3,57	0,74-10,08
20.	Analysis unit cannot be categorised	0	0,00	0,00- 8,60	0	0,00	0,00- 3,36	0	0,00	0,00- 9,03	0	0,00	0,00-4,30
Total		67			108	100		70			84	100	
		41 children commented 67 times, generating 108 units						39 children commented 70 times, generating 84 units					
		Ø 2.63 units per child (108/41)						Ø 2.15 units per child (84/39)					
		Ø 1.63 categories per child (67/41)						Ø 1.8 categories per child (70/39)					
		Ø 1.61 units per stated category (108/67)						Ø 1.2 units per stated category (84/70)					



In that study group the **35 boys** with a **low pain intensity**, mentioned a total of 98 units in the headache situation (an average of 2.56 units per boy, see table 23). The 20 categories that were available for categorisation were hereby mentioned 74 times. 1.93 categories were used for the causes of headache with 1.32 units per used category (table 25, left part).

In the case of headache (Table 25, left part), Category 2 (accident) is the most frequently mentioned one by the boys with a low pain intensity (45.71% of the children). This is followed by Category 12 (environmental conditions), stated by 34.29% of the children and Category 16 (no specific cause) stated by 20.00%. The majority of the causal units were generated for Category 12 (environmental conditions) (18.37% of the causal units) followed by Category 2 (accident) with 19.39% of the causal units.

The **40 boys** who were in the group with a **high pain intensity** in the headache situation, mentioned a total of 96 units in the headache situation (an average of 2.4 units per boy). The 19 categories that were available for categorisation were hereby mentioned 75 times. 1.8 categories were used for the causes of abdominal pain with 1.3 units per used category (table 25, right part).

In case of headache (table 25, right part), Category 2 (accident) is the most frequently mentioned one by the boys with a high pain intensity (47.50% of the children mentioned this category). This is followed by Category 12 (environmental conditions) which was mentioned by 35% of the children and Category 13 (behaviour-related trigger) which was mentioned by 18.18%. The majority of the causal units were also generated for Category 2 (accident) (23.96% of the causal units) followed by Category 12 (environmental conditions) with 20.83% and Category 10 (physical overexertion) with 11.46% of the causal units.

**Table 25:** Causes of headaches (♂): low (<4.7073; N=35) and high (≥4.7073; N=40) pain intensity; Distribution of the Absolute and Percentage Frequencies of the Persons and Units over all Categories

Absolute and percentage distribution of the units with the "boys" in relation to the pain intensity in the pain situation "headache" (multiple answers possible)													
Child believes that the pain is caused by:		"low pain intensity"						"high pain intensity"					
		Frequencies of persons/category			Frequencies of units			Frequencies of persons/category			Frequencies of units		
		N=35 children / N-distrib. o. Cat. Σ74			98 Units			N= 40/ N-distrib. o. Cat. Σ75			96 Units		
		abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)
1.	... coincidence	1	2,86	0,07- 14,92	1	1,02	0,03- 5,55	3	7,50	1,57- 20,39	3	3,13	0,65- 8,86
2.	... an accident	16	45,71	28,83- 63,35	19	19,39	12,10- 28,61	19	47,50	31,51- 63,87	23	23,96	15,83- 33,75
3.	... external force applied (including by humans)	1	2,86	0,07- 14,92	2	2,04	0,25- 7,18	4	10,00	2,79- 23,66	4	4,17	1,15- 10,33
4.	... internal force applied (medi. instruments, ...)	5	14,29	4,81- 30,26	5	5,10	1,68- 11,51	5	12,50	4,19- 26,80	7	7,29	2,98- 14,45
5.	... medical treatment	0	0,00	0,00- 10,00	0	0,00	0,00- 3,69	0	0,00	0,00- 8,81	0	0,00	0,00- 3,77
6.	... illness / medication/adverse reactions	5	14,29	4,81- 30,26	9	9,18	4,29- 16,72	3	7,50	1,57- 20,39	3	3,13	0,65- 8,86
7.	... fear of illness, medication/adverse reactions	0	0,00	0,00- 10,00	0	0,00	0,00- 3,69	0	0,00	0,00- 8,81	0	0,00	0,00- 3,77
8.	... cognitive load	3	8,57	1,80- 23,06	3	3,06	0,64- 8,69	3	7,50	1,57- 20,39	3	3,13	0,65- 8,86
9.	... emotional stress	5	14,29	4,81- 30,26	8	8,16	3,59- 15,45	3	7,50	1,57- 20,39	3	3,13	0,65- 8,86
10.	... physical overexertion	7	20,00	8,44- 36,94	8	8,16	3,59- 15,45	7	17,50	7,34- 32,78	11	11,46	5,86- 19,58
11.	... falsche Ernährung	2	5,71	0,70- 19,16	3	3,06	0,64- 8,69	0	0,00	0,00- 8,81	0	0,00	0,00- 3,77
12.	... environmental conditions	12	34,29	19,13- 52,21	18	18,37	11,26- 27,47	14	35,00	20,63- 51,68	20	20,83	13,21- 30,32
13.	... behaviour-related trigger	5	14,29	4,81- 30,26	6	6,12	2,28- 12,85	6	15,00	5,71- 29,84	8	8,33	3,67- 15,76
14.	... contravention of norms and values	0	0,00	0,00- 10,00	0	0,00	0,00- 3,69	0	0,00	0,00- 8,81	0	0,00	0,00- 3,77
15.	... child describes the experience and conduct of other persons	1	2,86	0,07- 14,92	1	1,02	0,03- 5,55	0	0,00	0,00- 8,81	0	0,00	0,00- 3,77
16.	... child does not state a specific cause	7	20,00	8,44- 36,94	7	7,14	2,92- 14,16	0	0,00	0,00- 8,81	0	0,00	0,00- 3,77
17.	... a visible physical reaction ("seeing")	0	0,00	0,00- 10,00	0	0,00	0,00- 3,69	3	7,50	1,57- 20,39	6	6,25	2,33- 13,11
18.	... child justifies the cause with "medical knowledge"	3	8,57	1,80- 23,06	7	7,14	2,92- 14,16	3	7,50	1,57- 20,39	3	3,13	0,65- 8,86
19.	... basic physiological needs	1	2,86	0,07- 14,92	1	1,02	0,03- 5,55	2	5,00	0,61- 16,92	2	2,08	0,25- 7,32
20.	Analysis unit cannot be categorised	0	0,00	0,00- 10,00	0	0,00	0,00- 3,69	0	0,00	0,00- 8,81	0	0,00	0,00- 3,77
Total		74			98	100		75			96	100	
		35 children commented 74 times, generating 98 units						40 children commented 75 times, generating 96 units					
		Ø 2.56 units per child (98/35)						Ø 2.4 units per child (96/40)					
		Ø 1.93 categories per child (74/35)						Ø 1.8 categories per child (75/40)					
		Ø 1.32 units per stated category (98/74)						Ø 1.3 units per stated category (96/75)					

The 39 girls in the group with a **high pain intensity**, mentioned a total of 93 units in the headache situation (an average of 2.54 units per girl). The 20 categories that were available for categorisation were hereby mentioned 69 times. 1.85 categories were used for the causes of headache with 1.37 units per used category (table 26, right part).

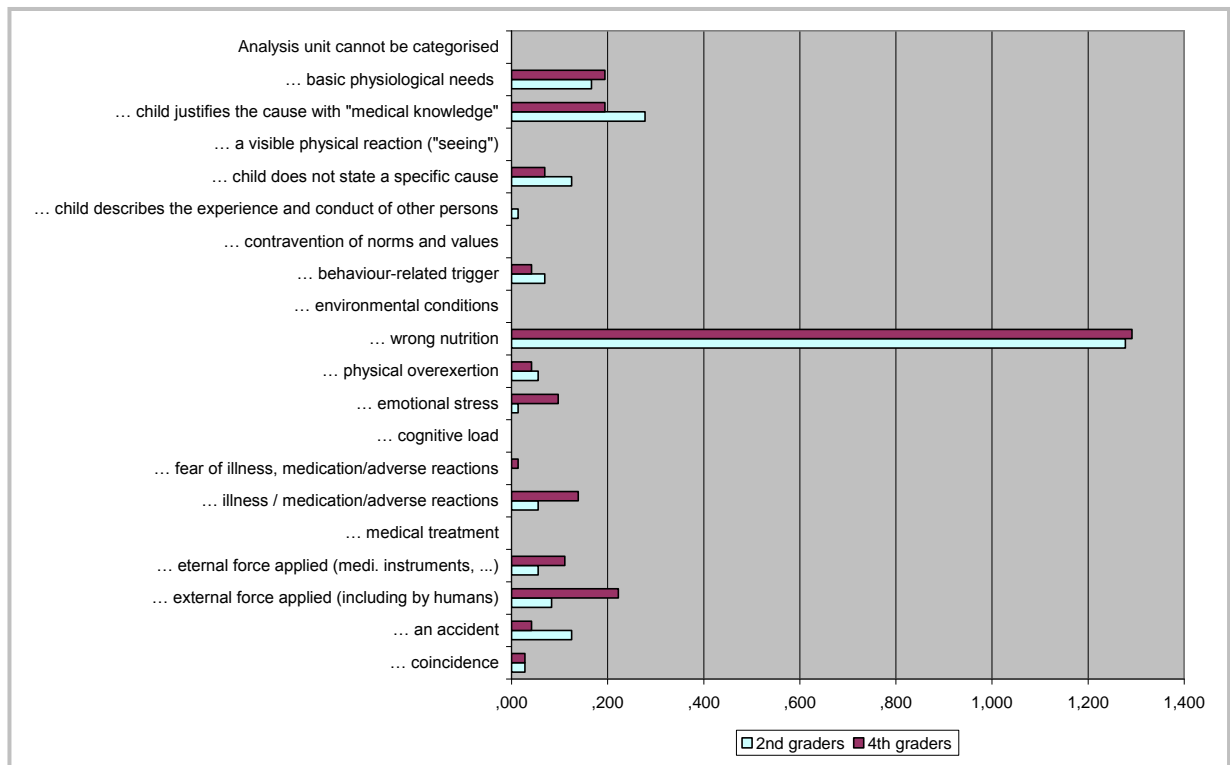
In case of headache (table 26, left part), Categories 2 (accident) and 12 (environmental conditions) were those most frequently mentioned by the girls that stated a low pain intensity (36.59% of the girls) followed by Category 13 (behaviour-related trigger) that was mentioned by 26.83% and Category 4 (external force applied by med. instruments, objects), that was stated by 19.51% of the girls. The majority of the causal units were generated for Category 13 (behaviour-related trigger) (19.17% of the causal units) followed by Category 2 (accident) with 15% of the causal units and Category 12 (environmental conditions) with 17.5% of the causal units.

The 41 girls that stated a low pain intensity mentioned a total of 120 units in the headache situation (an average of 2.92 units per girl). The 19 categories available for categorisation were hereby mentioned 80 times. 1.95 categories were used for the causes of headache with 1.5 units per used category (table 26, left part). In case of headache (table 26, right part), Category 2 (accident) is the one most frequently mentioned by the girls with a high pain intensity with 43.59% followed by Category 12 (environmental conditions) with 33.33% of them and Category 13 (behaviour-related trigger) which was mentioned by 25.64%. The majority of the causal units were generated for Category 2 (accident) (21.51% of the causal units) followed by Category 13 (behaviour-related trigger) with 19.35% of the causal units and Category 12 (environmental conditions) with 16.13% of the causal units.

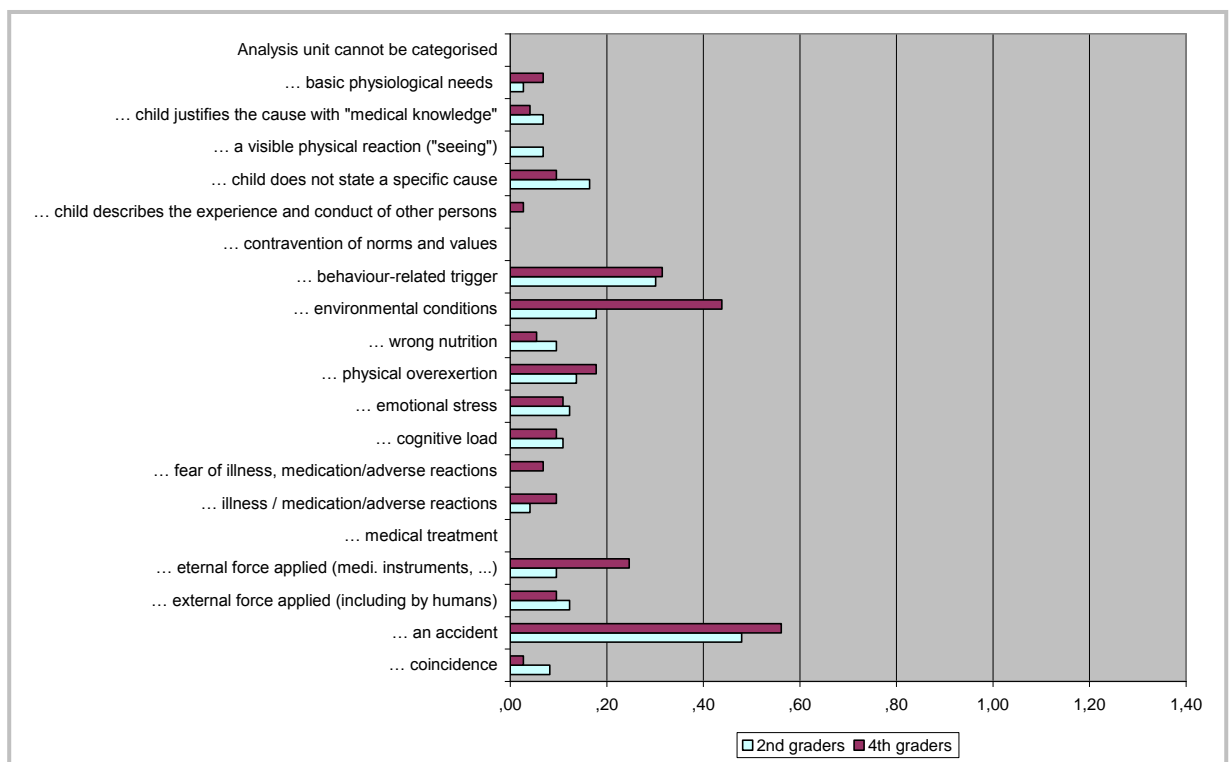
**Table 26:** Causes of headaches (♀): low (<5.4818; N=41) and high (≥5.4818; N=39) pain intensity; Distribution of the absolute and percentage frequencies of the persons and units over all categories

Absolute and percentual distribution distribution of the units with the "girls" in relation to the pain intensity in the pain situation "headaches" (multiple answers possible)													
Child believes that the pain is caused by...		"low pain intensity"						"high pain intensity"					
		Frequencies of persons/category			Frequencies of units			Frequencies of persons/category			Frequencies of units		
		N=41 children / N-distrib. o. Cat. Σ80			120 Units			N= 39/ N-distrib.o. Cat. Σ69			93 Units		
		abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)	abs.	%	CI (%)
1.	... coincidence	1	2,44	0,06-12,86	1	0,83	0,02-4,56	0	0,00	0,00-9,03	0	0,00	0,00-3,89
2.	... an accident	15	36,59	22,12-53,06	18	15,00	9,14-22,67	17	43,59	27,81-60,38	20	21,51	13,66-31,24
3.	... external force applied (including by humans)	1	2,44	0,06-12,86	1	0,83	0,02-4,56	2	5,13	0,63-17,32	3	3,23	0,67-9,14
4.	... internal force applied (medi. instruments, ...)	8	19,51	8,82-34,87	14	11,67	6,53-18,80	3	7,69	1,62-20,87	3	3,23	0,67-9,14
5.	... medical treatment	0	0,00	0,00-8,60	0	0,00	0,00-3,03	0	0,00	0,00-9,03	0	0,00	0,00-3,89
6.	... illness / medication/adverse reactions	0	0,00	0,00-8,60	0	0,00	0,00-3,03	0	0,00	0,00-9,03	0	0,00	0,00-3,89
7.	... fear of illness, medication/adverse reactions	1	2,44	0,06-12,86	5	4,17	1,37-9,46	0	0,00	0,00-9,03	0	0,00	0,00-3,89
8.	... cognitive load	4	9,76	2,72-23,13	5	4,17	1,37-9,46	3	7,69	1,62-20,87	9	9,68	4,52-17,58
9.	... emotional stress	5	12,20	4,08-25,20	8	6,67	2,92-12,71	8	20,51	9,30-36,46	9	9,68	4,52-17,58
10.	... physical overexertion	6	14,63	5,57-29,17	10	8,33	4,07-14,79	5	12,82	4,30-27,43	8	8,60	3,79-16,25
11.	... falsche Ernährung	4	9,76	2,72-23,13	4	3,33	0,92-8,31	2	5,13	0,63-17,32	2	2,15	0,26-7,55
12.	... environmental conditions	15	36,59	22,12-53,06	21	17,50	11,17-25,50	13	33,33	19,09-50,22	15	16,13	9,32-25,20
13.	... behaviour-related trigger	11	26,83	14,22-42,94	23	19,17	12,56-27,36	10	25,64	13,04-42,13	18	19,35	11,89-28,58
14.	... contravention of norms and values	0	0,00	0,00-8,60	0	0,00	0,00-3,03	0	0,00	0,00-9,03	0	0,00	0,00-3,89
15.	... child describes the experience and conduct of other persons	1	2,44	0,06-12,86	1	0,83	0,02-4,56	0	0,00	0,00-9,03	0	0,00	0,00-3,89
16.	... child does not state a specific cause	2	4,88	0,06-16,53	3	2,50	0,52-7,13	3	7,69	1,62-20,87	3	3,23	0,67-9,14
17.	... a visible physical reaction ("seeing")	0	0,00	0,00-8,60	0	0,00	0,00-3,03	0	0,00	0,00-9,03	0	0,00	0,00-3,89
18.	... child justifies the cause with "medical knowledge"	3	7,32	1,53-19,92	3	2,50	0,52-7,13	2	5,13	0,63-17,32	2	2,15	0,26-7,55
19.	... basic physiological needs	3	7,32	1,53-19,92	3	2,50	0,52-7,13	1	2,56	0,06-13,48	1	1,08	0,03-5,85
20.	Analysis unit cannot be categorised	0	0,00	0,00-8,60	0	0,00	0,00-3,03	0	0,00	0,00-9,03	0	0,00	0,00-3,89
Total		80			120	100		69			93	100	
		41 children commented 80 times, generating 120 units						39 children commented 69 times, generating 93 units					
		Ø 2.92 units per child (120/41)						Ø 2.54 units per child (93/39)					
		Ø 1.95 categories per child (80/41)						Ø 1.85 categories per child (69/39)					
		Ø 1.5 units per stated category (120/80)						Ø 1.37 units per category (93/39)					

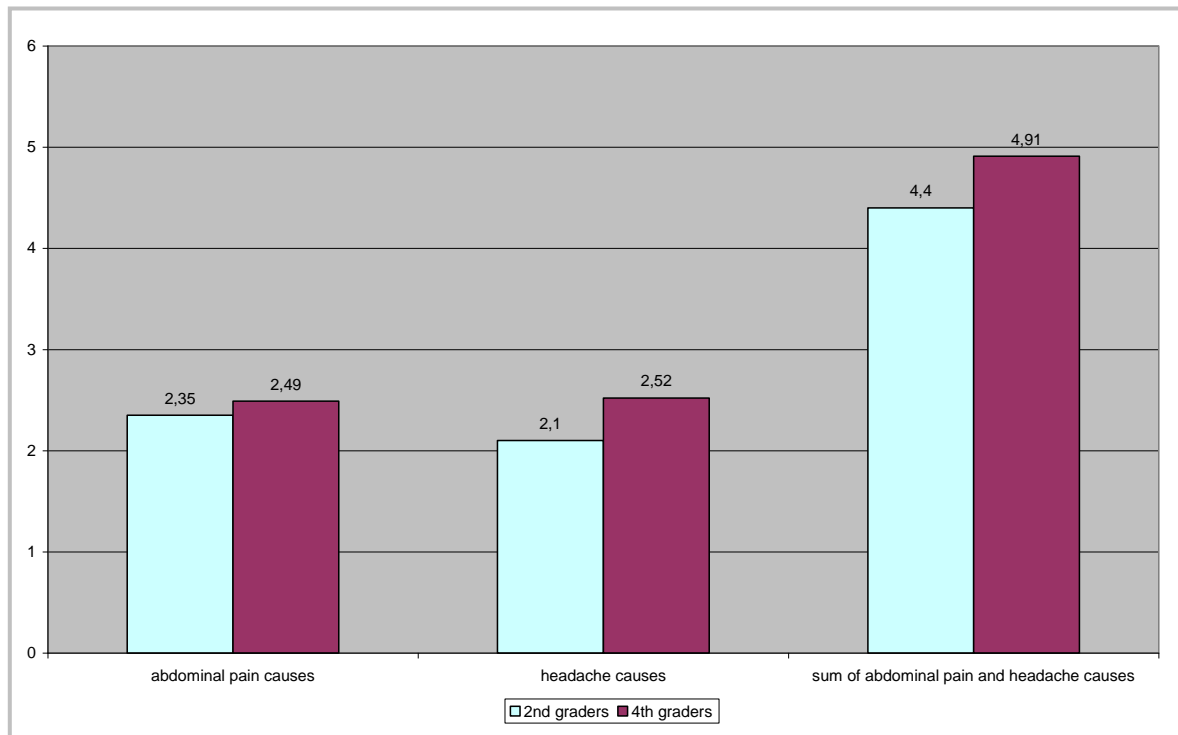
### 3.3.4 Comparison of the distribution of abdominal pain and headache causes by second and fourth graders



**Figure 10:** Longitudinal comparison of the generated causes for abdominal pain between second year and fourth year school pupils (N=86)



**Figure 11:** Longitudinal comparison of generated causes for headaches between second year and fourth year school pupils (N=86)



**Figure 12:** Longitudinal comparison of sums of causes for abdominal pain, for headache and combined between second graders and fourth graders

There is no significant difference between the average number of causal attributions, neither for the single comparisons nor for the combined comparison in statistical terms (Wilcoxon signed rank test: abdominal pain  $Z=-1.886$ ;  $p=0.059$ ; headache  $Z=-1.778$ ;  $p=0.075$ ; combined  $Z=-1.409$ ,  $p=0.159$ ), as illustrated in figure 12.

### 3.4 Inference statistics- validation of the derived hypothesis

**Table 27: Overview of hypotheses**

<b>Hypothesis 1</b>	Fourth Year School Pupils differ by gender in the number of causal attributions for the explanation of abdominal pain.
<b>Hypothesis 2</b>	Fourth Year School Pupils differ by gender in the number of causal attributions for the explanation of headache.
<b>Hypothesis 3</b>	Fourth graders with recurring headache and / or abdominal pain generate more causes than fourth graders without recurring headache and abdominal pain.
<b>Hypothesis 4</b>	Girls mention more causes than boys for headache and abdominal pain according to pain intensity.
<b>Hypothesis 5</b>	The girls of fourth grade declare their abdominal pain with more awareness of disease or with medical knowledge than the boys of the fourth class.
<b>Hypothesis 6</b>	Tension, emotional stress or strain are causes that are more strongly associated with headaches than with abdominal pain in fourth-graders.
<b>Hypothesis 7</b>	The environmental conditions are more important causal factors for the explanation of headaches for fourth-graders than for second class school pupils.
<b>Hypothesis 8</b>	The environmental conditions have higher relevance for headaches than for abdominal pain in fourth class pupils.

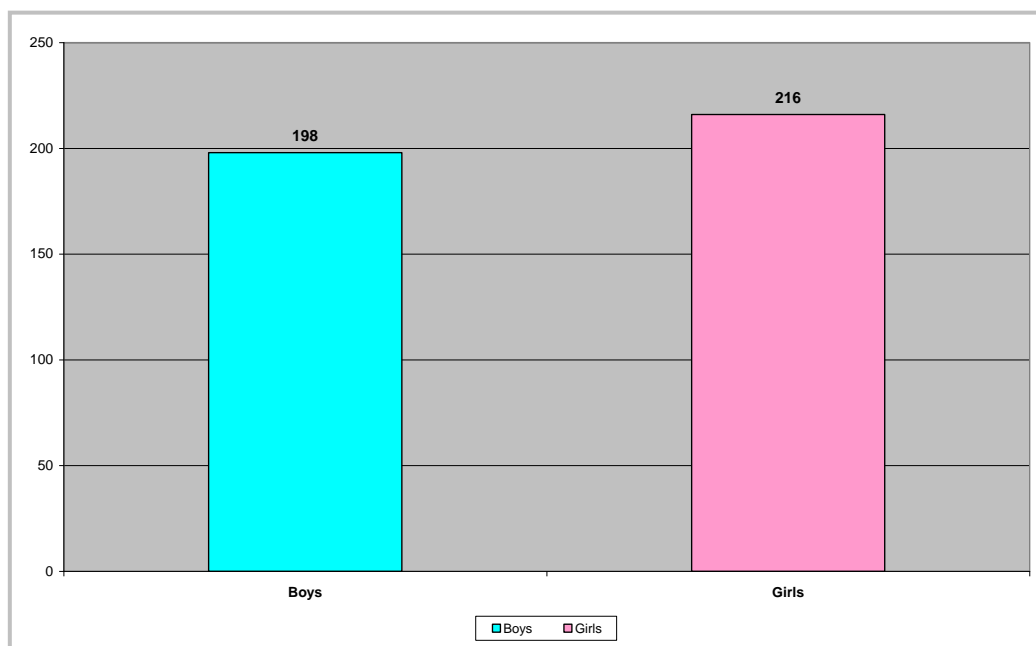
In this part, the above eight hypotheses are tested by applying standard statistical methods. The details for each test procedure can be found in chapters 3.4.1 to 3.4.8.

### 3.4.1 Hypothesis 1: Causality of abdominal pain in relation to gender

**Table 28:** Gender specific hypothesis for the causes of abdominal pain

Hypothesis Testing	
<b>Hypothesis 1</b>	Fourth Year School Pupils differ by gender in the number of causal attributions for the explanation of abdominal pain.
<b>Zero hypothesis</b>	Fourth Year School Pupils <u>do not differ</u> by gender in the number of causal attributions for the explanation of abdominal pain.
<b>Test</b>	Mann-Whitney-U-Test for two independent samples
<b>Value</b>	Mann-Whitney-U-Test = 3239,00
<b>Significance</b>	<b>p=0,595</b>
<b>Decision</b>	<b>Hypothesis 1 is rejected</b>

It was tested if a statistically significant difference exists between the dependant variable 'numbers of causal attributions for abdominal pain' in both of the independent gender-related samples. The data are at least at ordinal scale level. As a normal distribution does not exist (K-S Z=2.819,  $p < 0.001$ ), a non-parametric test was carried out using the Mann-Whitney U-Test in order to determine whether boys and girls come from the same population.



**Figure 13:** Comparison of causal attributions for abdominal pain between boys and girls

There is no difference between boys and girls in contrast to the formulated hypothesis. Both samples come from the same population (Mann-Whitney U-Test=3239.000;  $p = 0.595$ ).

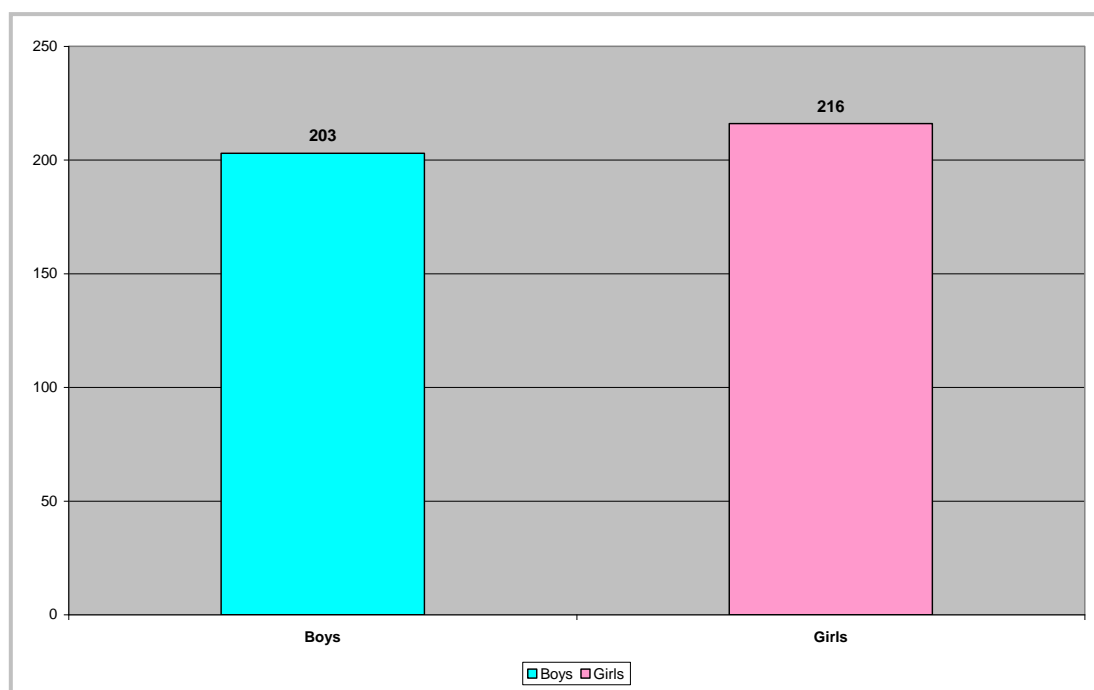


### 3.4.2 Hypothesis 2 Causality of headache in relation to gender

**Table 29:** Gender specific hypothesis for the causes of headache

Hypothesis Testing	
<b>Hypothesis 2</b>	Fourth Year School Pupils differ by gender in the number of causal attributions for the explanation of headache.
<b>Zero hypothesis</b>	Fourth Year School Pupils <b>do not differ</b> by gender in the number of causal attributions for the explanation of headache.
<b>Test</b>	Mann-Whitney-U-Test for two independent samples
<b>Value</b>	Mann-Whitney-U-Test = 3096,000
<b>Significance</b>	<b>p=0,308</b>
<b>Decision</b>	<b>Hypothesis is rejected</b>

The difference in the generation of causes for headaches between both groups (boy's vs girls) has been tested. The data are at least at ordinal scale level. As a normal distribution does not exist (K-S  $Z=2.369$ ;  $p<0.001$ ), a non-parametric test was carried out with the Mann-Whitney U-Test in order to determine whether both gender groups come from the same population.



**Figure 14:** Comparison of causal attributions for headache between boys and girls

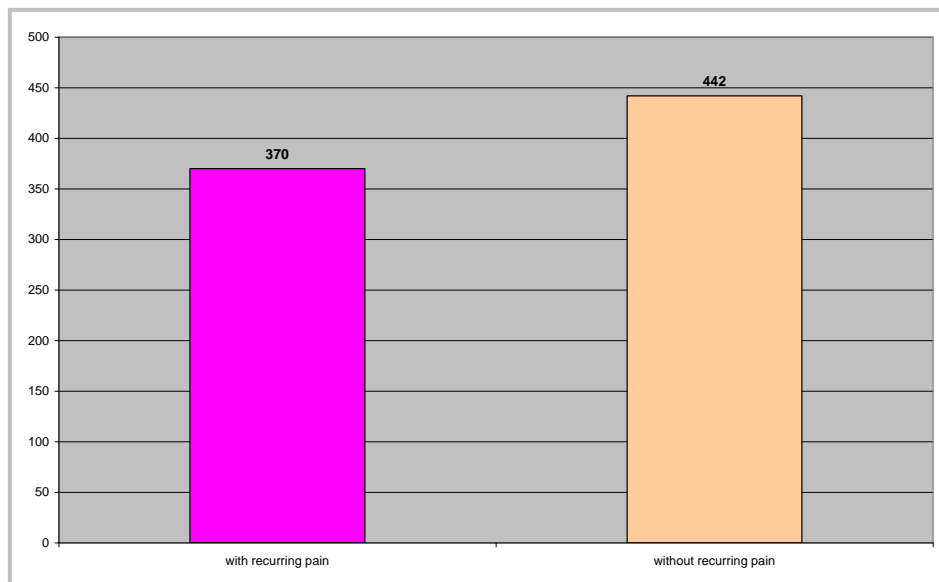
Contrary to the formulated hypothesis, no difference was found between boys and girls (see figure 14) in regard to the causal attributions for headache (both samples come from the same population: Mann-Whitney U-Test=3096.00;  $p=0,308$ )

### 3.4.3 Hypothesis 3 Causes of abdominal pain and headache in accordance to pain recurrence

**Table 30:** Causes of abdominal pain in fourth-graders according to pain recurrence

Hypothesis Testing	
<b>Hypothesis 3</b>	Fourth graders with recurring headache and / or abdominal pain generate more causes than fourth graders without recurring headache and abdominal pain.
<b>Zero Hypothesis</b>	Fourth graders with recurring headache and / or abdominal pain <b>do not generate</b> more causes than fourth graders without recurring headache and abdominal pain.
<b>Test</b>	Mann-Whitney-U-Test for two independent samples
<b>Value</b>	Mann-Whitney-U-Test = 3127,500
<b>Significance</b>	<b>p=0,647; unilateral p=0,324</b>
<b>Dicision</b>	<b>Hypothesis 3 is rejected</b>

It was tested if a difference exists between the numbers of causal attributions generated for headache and abdominal pain in both of the independent partial samples recurring versus non-recurring pain. The data are at least at ordinal scale level. As a normal distribution does not exist (K-S  $Z=2.205$ ,  $p<0.001$ ), a non-parametric test was carried out using the Mann-Whitney U-Test in order to determine whether both of the pain groups come from the same population



**Figure 15:** Comparison of the sum of causal attributions between the children with and without re-current pain

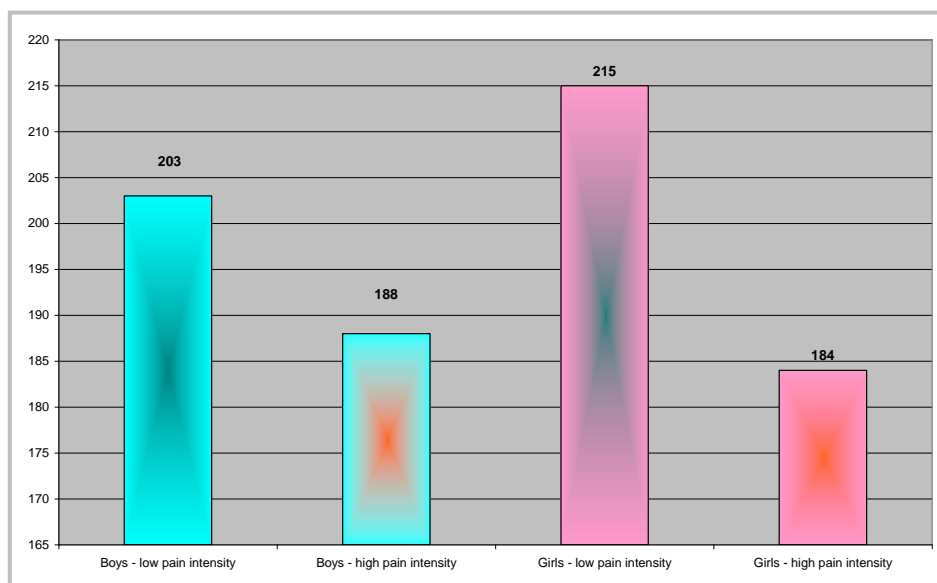
There was no evidence observed that there is a difference between children with and without recurring pain in regard to the number of generated causal units which is contrary to the formulated hypothesis (both samples come from the same population: Mann-Whitney U-Test=3127,500;  $p=0.324$ ).

### 3.4.4 Hypothesis 4: Causes of abdominal pain and headache in accordance to gender and pain intensity

**Table 31:** Gender-specific causes of headache and abdominal pain in fourth-graders according to pain intensity

Hypothesis Testing	
<b>Hypothesis 4</b>	Girls mention more causes than boys for headache and abdominal pain according to pain intensity.
<b>Zero Hypothesis</b>	Girls <b>do not mention</b> more causes than boys for headache and abdominal pain according to pain intensity.
<b>Test</b>	Kruskal-Wallis-Test for four independent samples
<b>Value</b>	Chi-Square = 1,627; df=3;
<b>Significance</b>	p=0,653; unilateral p=0,327
<b>Decision</b>	<b>Hypothesis 4 is rejected</b>

In order to check this hypothesis, the sum of the intensity statements for both abdominal pain and headache made by all children were added and then distributed between children with high and low pain intensity. The difference is checked in the four independent samples (boys and girls with high and low pain intensity). The data are at least at ordinal scale level.



**Figure 16:** Comparison of the sums of generated causes for headache and abdominal pain between boys and girls with low and high pain intensity.

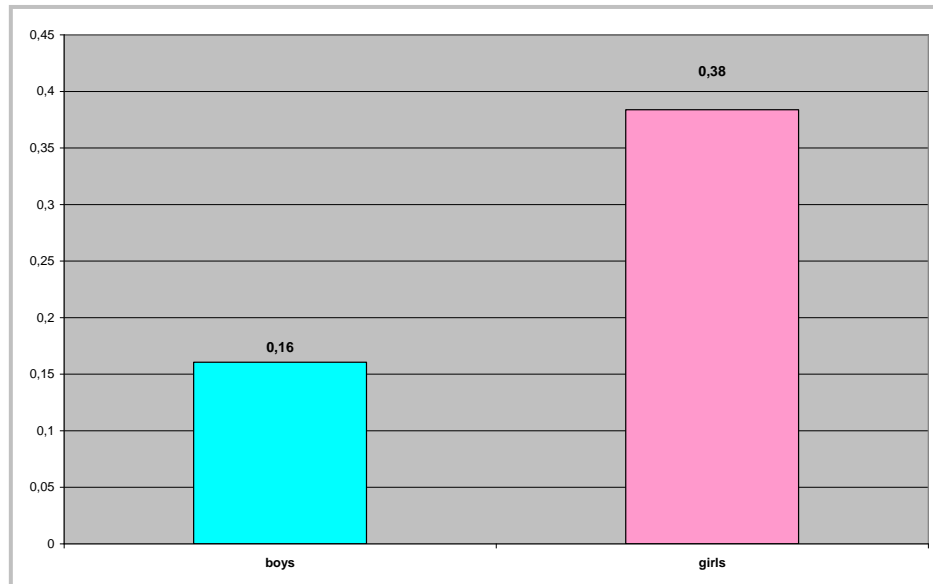
As a normal distribution does not exist (K-S  $Z=6.635$ ,  $p<0.001$ ), a non-parametric test is carried out using the Kruskal-Wallis-Test in order to determine whether the four groups have a statistical significant difference. Overall boys and girls do not differ in the amount of generated causal attributions for headache and abdominal pain in accordance with pain intensity (Kruskal-Wallis-Test  $X^2=1,627$ ;  $df=3$ ;  $p=0,327$ ). Contrary to the expectation (see figure 16) it has to be stated that children of the fourth class of primary school with low intensity generate at the average more units for the causes of headache and abdominal pain than children with high pain intensities.

### 3.4.5 **Hypothesis 5: Medical knowledge in the explanation of pain in accordance to gender**

**Table 32:** Gender-specific differences in the awareness of disease or in medical knowledge of fourth-graders

Hypothesis Testing	
<b>Hypothesis 5</b>	The girls of fourth grade declare their abdominal pain and their headache with more awareness of disease or with medical knowledge than the boys of the fourth class.
<b>Zero Hypothese</b>	The girls of fourth grade <b>do not declare</b> their abdominal pain and their headache with more awareness of disease or with medical knowledge than the boys of the fourth class.
<b>Test</b>	Mann-Whitney-U-Test for two independent samples
<b>Value</b>	Mann-Whitney-U-Test = 2825.000
<b>Significance</b>	<b>p=0,001; unilateral p&lt;0,001</b>
<b>Decision</b>	<b>Hypothesis 5 is accepted</b>

The data are at least at ordinal scale level. As a normal distribution does not exist (K-S Z=6.172,  $p<0.001$ ), a non-parametric test is carried out using the Mann Whitney U-Test in order to determine whether the two groups have a statistical significant difference.



**Figure 17:** Gender specific comparison of fourth graders in the awareness of disease or in the medical knowledge about abdominal pain and headache.

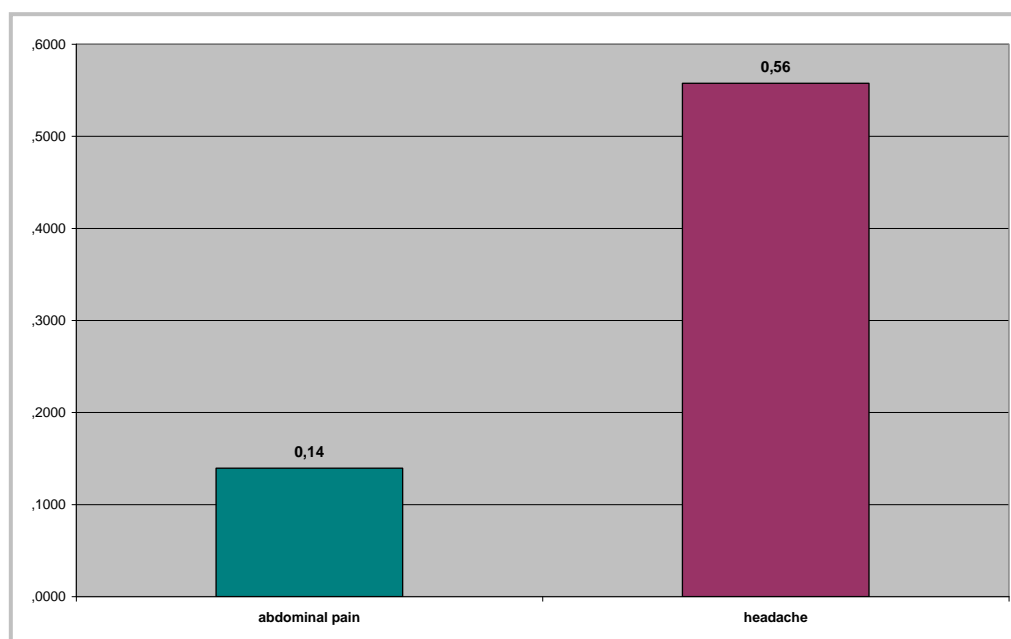
Boys and girls differ in their medical knowledge about abdominal pain and headache. Girls declare their abdominal pain and headache with significantly more awareness of the diseases in question (see figure 17). The hypothesis 5 has to be accepted (Mann-Whitney-U=2825.000,  $p<0.001$ ).

### 3.4.6 Hypothesis 6: Comparison of abdominal pain and headache caused by tension and emotional stress

**Table 33:** Comparison between headache and abdominal pain in association with tension emotional stress in fourth-graders

Hypothesis Testing	
<b>Hypothesis 6</b>	Tension, emotional stress or strain are causes that are more strongly associated with headaches than with abdominal pain in fourth-graders.
<b>Zero Hypothesis</b>	Tension, emotional stress or strain are causes that <b>are not more strongly</b> associated with headaches than with abdominal pain in fourth-graders.
<b>Test</b>	Wilcoxon Signed-Rank Test for dependent samples
<b>Value</b>	$Z = -4,401$
<b>Significance</b>	<b><math>p &lt; 0,001</math></b>
<b>Decision</b>	<b>Hypothesis 6 is accepted</b>

For the analysis of this hypothesis the sum of generated units for abdominal pain and headache in category 8 and 9 'tension, emotional stress' are compared. The data are at least at ordinal scale level. As a normal distribution does not exist (K-S  $Z=5.233$ ;  $p < 0.001$ ), a non-parametric test is carried out using the Wilcoxon Signed Rank Test for dependent samples to determine whether the number of causes in both pain situations have a statistical significant difference.



**Figure 18:** Comparison of emotional stress, tension or strain causes for abdominal pain and headache generated by fourth graders

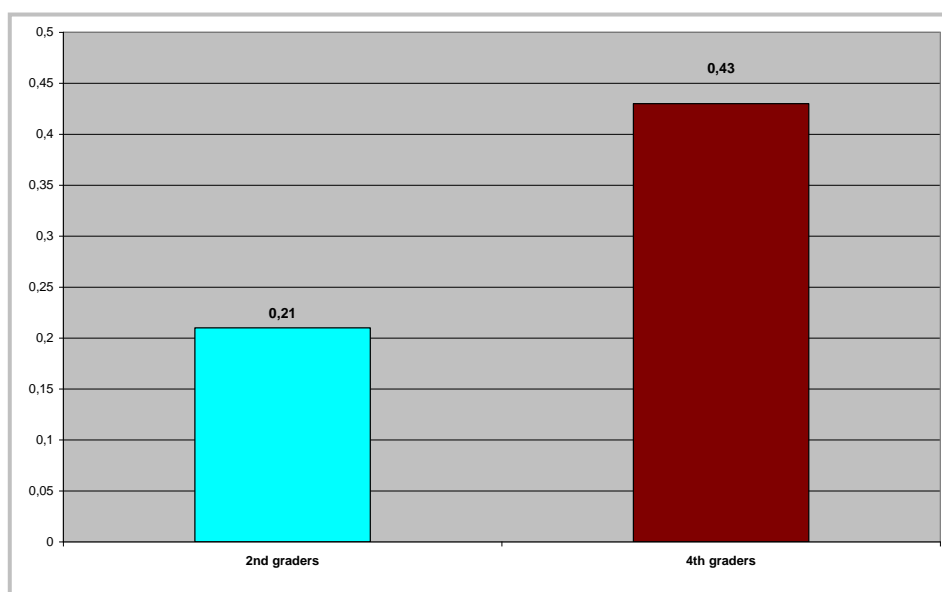
Fourth class pupil generate for headache significantly more causes dealing with tension, emotional stress and strain than for abdominal pain (Wilcoxon Signed Rank Test  $Z=-4.401$ ;  $p < 0.001$ ). Hypothesis 6 has to be accepted.

### 3.4.7 Hypothesis 7: Comparison of environmental causes for headache between second and fourth graders

**Table 34:** Comparison between second and fourth class pupils about the causes of abdominal pain and headache relating to environment

Hypothesis Testing	
Hypothesis 7	The environmental conditions are more important
	causal factors for the explanation of headaches
	for fourth-graders than for second class school pupils.
Zero Hypothesis	The environmental conditions <u>are not more important</u>
	causal factors for the explanation of headaches
	for fourth-graders than for second class school pupils.
Test	Wilcoxon Signed-Rank Test for dependent pairs
Value	N=86; Z = -2,525
Significance	p=0,012; unilateral p=0,006
Decision	Hypothesis 7 is accepted

N=86 pupils were tested twice as second and as fourth graders. The results of these two measurements are compared for the environmental causes generated in category 12. The data are at least at ordinal scale level. As a normal distribution does not exist (2<sup>nd</sup> graders: K-S Z=4.541; p<0.001; 4<sup>th</sup> graders K-S Z=3,483; p<0,001), a non-parametric test is carried out using the Wilcoxon Signed Rank Test for dependent samples to determine whether the number of environmental causes differ with statistical relevance in pupils if they are in the second or in the fourth class of primary school.



**Figure 19:** Comparison between second and fourth class pupils concerning the causes of abdominal pain and headache due to environmental conditions.

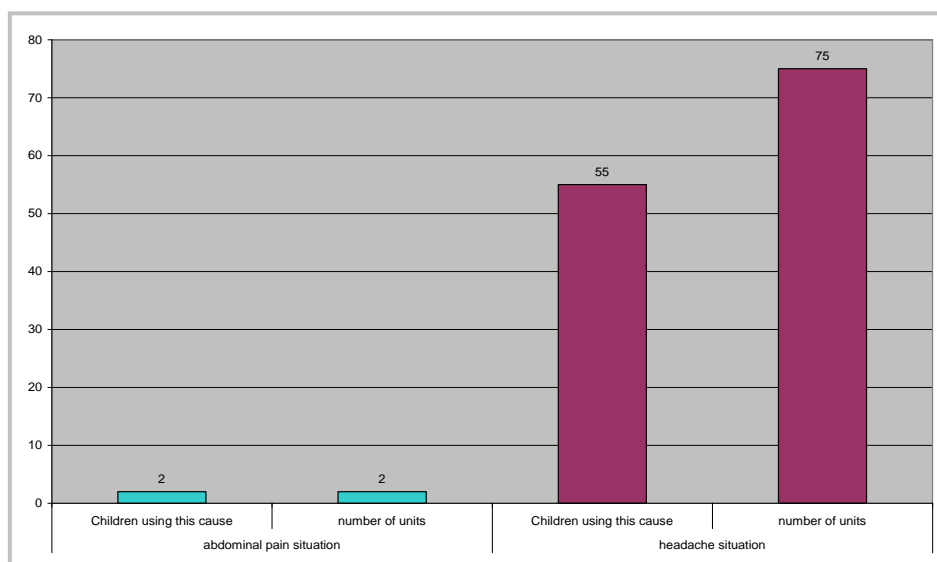
N= 86 fourth graders generate significantly more causes for abdominal pain and headache due to environmental conditions as compared to the time of second class school period (Wilcoxon Signed Rank Test Z=-2,525; p=0.006). Hypothesis 7 has to be accepted.

### 3.4.8 Hypothesis 8 Comparison between headache and abdominal pain attributed to environmental conditions by fourth graders

**Table 35:** Comparison between headache and abdominal pain caused by environmental conditions

Hypothesis Testing	
<b>Hypothesis 8</b>	The environmental conditions have higher relevance for headaches than for abdominal pain in fourth class school pupils.
<b>Zero Hypothesis</b>	The environmental conditions <b>do not have higher</b> relevance for headaches than for abdominal pain in fourth class school pupils.
<b>Test</b>	Wilcoxon Signed-Rank Test for dependent samples
<b>Value</b>	$Z = -6,624$
<b>Significance</b>	<b><math>p &lt; 0,001</math></b>
<b>Decision</b>	<b>Hypothesis 8 is accepted</b>

The generated causes due to environmental conditions are compared for N=167 pupils in the fourth class for the abdominal pain and the headache situation. The data are at least at ordinal scale level. As a normal distribution does not exist (abdominal pain causes in category 12: K-S  $Z=6.871$ ;  $p < 0.001$ ; headache causes in category 12: K-S  $Z=5.114$ ;  $p < 0,001$ ), a non-parametric test is carried out using the Wilcoxon Signed Rank Test for dependent samples to determine whether the number of environmental causes differ with statistical relevance between the abdominal pain situation and the headache situation.



**Figure 20:** Comparison between environmental conditions as causes for abdominal pain and headache in fourth class school pupils (left column: number of pupils / right column: number of units)

Fourth graders generate significantly more units due to environmental conditions as causes for headache than for abdominal pain (Wilcoxon Signed Rank Test  $Z=-6.624$ ;  $p<=0.001$ ). Hypothesis 8 has to be accepted.

The table 36 gives an overview over the result of the hypotheses testing.

**Table 36: Final summary of the results of the hypotheses testing**

No of Hypothesis	Alternative Hypotheses	predicted result	Found Results	Consequence
Hypothesis 1	Fourth Year School Pupils differ by gender in the number of causal attributions for the explanation of abdominal pain.	$\text{♀} \neq \text{♂}$	$\text{♀} = \text{♂}$ $p = 0.595$	Alternative Hypothesis rejected
Hypothesis 2	Fourth Year School Pupils differ by gender in the number of causal attributions for the explanation of headache.	$\text{♀} \neq \text{♂}$	$\text{♀} = \text{♂}$ $p = 0.308$	Alternative Hypothesis rejected
Hypothesis 3	Fourth graders with recurring headache and / or abdominal pain generate more causes than fourth graders without recurring headache and abdominal pain.	recurring pain > no recurring pain	recurring pain = no recurring pain $p = 0.324$	Alternative Hypothesis rejected
Hypothesis 4	Girls mention more causes than boys for headache and abdominal pain according to pain intensity.	$\text{♀} \neq \text{♂}$	$\text{♀} \neq \text{♂}$ Headache and AP intensity, $p = 0.327$	Alternative Hypothesis rejected
Hypothesis 5	The girls of fourth grade declare their abdominal pain with more awareness of disease or with medical knowledge than the boys of the fourth class.	$\text{♀} \neq \text{♂}$	$\text{♀} > \text{♂}$ $p = 0.001$	Alternative Hypothesis accepted
Hypothesis 6	Tension, emotional stress or strain are causes that are more strongly associated with headaches than with abdominal pain in fourth-graders.	headache > abd. pain	$H > AP$ $p < 0.001$	Alternative Hypothesis accepted
Hypothesis 7	The environmental conditions are more important causal factors for the explanation of headaches for fourth-graders than for second class school pupils.	fourth graders > second graders	$4\text{th} > 2\text{nd graders}$ $p = 0.006$	Alternative Hypothesis accepted
Hypothesis 8	The environmental conditions have higher relevance for headaches than for abdominal pain in fourth class pupils.	fourth graders headache > abd. Pain	$H > AP$ $p < 0.001$	Alternative Hypothesis accepted

The results are discussed in the following chapter 4.



## 4. Discussion

This thesis is part of a longitudinal project which is aiming to gather empirical data about pain concepts in different developmental stages. In the focus of interest here are the causal attributions of every day pain experiences generated by the homogeneous age-group of fourth-graders of primary school and to analyse, process and format the collected data according to the criteria “gender”, “pain-recurrence” and “pain-intensity” in order to enable direct comparisons with other age-groups of the whole project and with clinical pain groups of the same age.

Primary headache and functional abdominal pain among children and adolescents have been identified as a common and important public health problem, resulting in severe subjective impairments in everyday activities. The respondents reported restrictions in daily living activities attributable to pain, with moderate effects on school attendance, in the maintenance of social contacts, loss of appetite and bad sleep and as a result high costs of medical treatment. The Child and Youth Survey of the Robert Koch Institute in Berlin (Ellert, Neuhauser et al., 2007) illustrates as well the need of the expansion of research efforts in the field of paediatric diagnosis, prevention and treatment in order to avoid the everyday health problems of children and adolescents. Interestingly, causal attributions of headache and abdominal pain provide important information that have a deep influence on the therapeutic strategies for these disorders.

It is argued here, that the appropriate paediatric medical examination history should consist on the one hand of objective medical parameters and on the other hand on valid and reliable subjective information about the perception of the aversive body signals and their further information processing in the course of development. For Hoefert et al. (2013) the systematic analysis of lay theories is indispensable for a meaningful medical or psychotherapeutic anamnesis. Subjective illness convictions are not at all incidental; they are efficient components for the readiness of a patient to cope actively with his illness and they comprise the chance to increase the betterment or rehabilitation (Hoefert & Brähler, 2013, S. 11).

Subjective causes of the illness are an important source of information for the doctor or other health care providers. They can be medically right or not and might even be extremely different from medical theories. Not taking into account possible discrepancies between expert and lay knowledge can result in delay or even interruption of necessary treatment or it can explain incomppliant behaviour when treating the patient. Especially today a lot of patients or their parents are pre-informed through other patients, friends or colleagues, through the internet

and other electronic media. Taking into account patient's knowledge will help the doctor to better understand the reference frame of the patient about his illness history. Especially if body symptoms cannot easily be allocated to a specific illness, lay theories have to be taken into consideration. The medical expert aims to prevent processes which support cornification of the pain perceptions – independent of the fact whether aversive body signals can be objectively explained or not.

As aforementioned the current research project deals inter alia with the causal attributions for primary headaches and functional abdominal pain that were recorded by fourth class pupils from a normal population sample (healthy children and those suffering repeatedly from headaches and abdominal pain). The Essen research group developed the "Essen children pain interview" to deliver empirical data of pain representations from children and adolescents. There are key questions put during the interview, focussing on the description, the intensity, the causal attribution, the coping strategy and the bonding behaviour in pain situations. While Elskamp (2011) and Dannappel (thesis in preparation) investigated the pain descriptions, Thewes (2011) analysed causal attributions of second graders. Gossmann and Neumeyer (theses in preparation) highlight in their research work the importance of cognitive processes in the perception and management of acute pain occurrences and the analysis of Nehmet-Babilli (2010)) focus on the interdependence of the bonding quality and pain situations like headache and abdominal pain. The data of this study provide information about causal attributions for headache and abdominal pain of fourth graders in correlation with gender, pain recurrence and pain intensity. The awareness and knowledge created from these empirical data make it easier to understand the causal representations about headache and abdominal pain of pupils at the end of primary school. It could be helpful for bettering the therapeutic strategies.

#### **4.1 Discussion of the descriptive results**

The statements made by children of the fourth class of primary school are presented at the category and at unit level in the descriptive part of results. It can be summarized that on the general level, differences could neither be found for comparing the both pain situations 'headache' and 'abdominal pain' nor in dependence of the factors 'gender', 'pain recurrence' and 'pain intensity'. On average, fourth graders of the normal population mentioned 2.52 causal units for abdominal pain and 2.54 causal units for headaches. Whereas boys generate on average 2.54 units as causes for abdominal pain and 2.56 units for headaches, girls mention 2.51 units for abdominal pain causes and 2.54 units for headache causes. As to

recurrence of pain an average of 2.33 units vs. 2.67 units for abdominal pain and 2.21 units vs. 1.96 units for headache were mentioned by fourth graders with and without recurrent pain. From a pain intensity angle, children that stated high pain intensities generated for abdominal pain / headache on average (AP: ♂=2.02; ♀=2.15) / (H: ♂=2.40; ♀=2.54) and those with low pain intensities (AP: ♂=2.56; ♀=2.63) / (H: ♂=2.56; ♀=2.92).

The results of this dissertation showed that 81.4% of the children stated “wrong nutrition” as the most important cause of their abdominal pain. In this category the fourth graders generated 58.43% of all units. None of the remaining 19 categories achieves a frequency of units more than 10%. In a study from Schmidt und Fröhling (1998), in which 99 children aged 5 to 16 years were interviewed on health prevention measures, nutrition was also reported to be an important preventive factor (Lohaus and Ball, 2006). In the 8-year-old age group, 56% of the children stated healthy food/fruit/tea/juice as suitable preventive measures against illness.

The 17.96% of the children mentioned “external force applied by humans” as a cause for the explanation of abdominal pain. This category is followed by 11.98% of fourth graders referring to “basic physiological needs” and by 10.78% with reference to “medical knowledge” as explanations for the occurrence of their abdominal pain.

“Wrong nutrition” is an important cause for boys and girls (♂=80.25%; ♀=82.56%), whereas there is a relative difference of 5% between boys and girls mentioning “external force applied by humans” for the explanation of abdominal pain (♂=20.99%; ♀=15.12%). The girls stated additionally their “medical knowledge” (16.28%) and “illness, medication, and adverse reactions” (12.79%) as important causes for the abdominal pain and boys consider “basic physiological needs” (14.81%) as slightly more relevant.

The most frequently used categories for the explanation of abdominal pain are already pre-mentioned, but the distribution concerning the factor ‘recurring pain’ differs. While “wrong nutrition” (RP=78.95%, noRP=82.95%) and “medical knowledge” (RP=11.84%, noRP=10.23%) are somehow uniformly distributed, “external force applied by humans” (RP=21.05%, noRP=14.77%) and “basic physiological needs” (RP=15.79%, noRP=9.09%) are more important for children with recurrent pain than for those with abdominal pain that is occurring rarely.

When introducing the factor “pain intensity” (low/high), the 4 presented tables are additionally divided by the factors ‘abdominal pain’ and ‘headache’ and by ‘gender’ specification. The frequencies of the children per category are limited and their relative distribution between the

factors should not be over-interpreted. In this context it seems interesting, that 23.08% of the girls with high pain intensity complain about environmental conditions and 22,85% of the boys with low pain intensities are “not able to state a specific cause” for their abdominal pain.

The empirical data show that 44.31% of the children stated “accidents” as the most relevant cause for their headache; they achieve a relative portion of 20.71% of all generated units in this category whereas “environmental conditions” reach a part of 17.65% and “behaviour related triggers” share a part of 10.35% of all units generated for the explanation of headache. The two last-mentioned categories claim a share of 32.93% (environmental conditions) and of 17.96% (behaviour related triggers) for the participating children (N=167). Examples of “behaviour-related triggers” are playing computer games or watching television for a longer period of time. These results highlight the importance of children care by the parents with regard to the frequent confrontation of children with electronic media that increasingly takes place at an early age. Even when comparing second to fourth graders causes like accidents, environmental and behaviour related triggers are most relevant.

The causal attributions “accidents” are distributed ♂46.4% versus ♀42.05% in the study population in relation to gender. On the basis of the cognitive development theory according to Piaget, these results correspond to the concrete operational developmental stage. This is the reason why children mainly attribute the pain to an external event such as a push or a fall (Wiedebusch, 1994). In an interview conducted by Harbeck and Peterson (1992), the children were less able to understand the sense of a headache; they could better understand the sense of a knee pain and the pain caused by an injection given during a therapeutic intervention. The second most frequent cause of headaches “environmental conditions” such as noise, heat or cold is for boys and girls equally distributed (♂32.91%; ♀32.59%). These findings are consistent with the fact that children in the pre-operational and concrete operational phases mainly notice external factors as pain triggers. Medication and illness as causes for headache are more predominant in boys than in girls (♂11.39%; ♀6.82%).

Concerning the factor ‘recurring (RP) / no recurring pain (noRP)’ it can be noticed additionally that the “physical overexertion” (RP=14.47% of the children generate 10.12% of the units, noRP=15.91% of the children generate 9.88%) and the “emotional stress” (RP=13.16% of the children and 9.52% of the units; noRP=13.64% of the children and 6.98% of the units) play an important role in the explanation of headache.

When focussing the factor “pain intensity” (low/high and boys/girls) in case of headache attributions it seems interesting, that girls with high pain intensities share a relative part of 20.51% of the children for “emotional stress” whereas the boys’ relative part counts 7.50%. A share of 20.00% of the boys with low pain intensities is “not able to state a specific cause” for their headache whereas only 4.88% of the girls of the same group chose this category.

The data of the presented study provide information that even 10 to 12 years old fourth graders have specific concepts concerning the causes of abdominal pain and headache. They have sensible ideas about the prevention of sickness. Headache and abdominal pain in childhood were not for a long time the research focus of the science. They have to be differentiated from headaches and abdominal pain in adults. Headache and abdominal pain in children lead to significant and varied consequences. On the one hand this pain significantly affects the quality of life of concerned children. On the other hand, the risk of chronicity up into adulthood is very high, if the child's headache is not adequately treated. That results not only in health problems but also in economic problems due to possible significantly high health care costs. For these reasons the child's headache and abdominal pain increasingly become more interesting in science and scientific research.

To treat childhood headaches and abdominal pain sufficiently, to reduce the chronicity rate and loads of children with headache and abdominal pain, it is very important to do more research in this area.

It is the first time using this semi-structured interview with open questions which enables the studied children to express themselves freely and independently of requirements to their headache and abdominal pain. This study with help of “Essen children Pain Interview” can be judged as a great contribution to expand the knowledge about child's abdominal pain and headache and a progress in the field of pain diagnostic, pain management and pain prevention.

Piaget's development theory suggests that children in pre-operational phase attributing on external factors such as stumble, fall, etc. (Wiedebusch, 1994), whereas the children in concrete operational phase increasingly attributing internal causes of their pain. The investigated in these study children of fourth grade of primary school are assigned to the concrete operational stage of development. They called most frequently the following 3 categories mentioned "accident", "environmental condition " and "behaviour-related-trigger". While "accident" and "environment "are external categories, “behaviour-related triggers” can be described as internal category. Wiedebusch (1994) reported in this context, that children of concrete operational phase see gradually that pain and own behaviour are in relation to each

other. This statement can be substantiated in relation to the studied fourth year pupils due to the empirical data of this study. The fourth graders also mention two external categories and an internal category for the explanation of their headache. In case of abdominal pain, they mentioned these three categories most frequently: “wrong nutrition” with 81.44 %, “external force applied by humans” with 17.96% and “basic physiological needs” with 11.98 %.

It might be suggested that children being in the transition between externalizing and internalizing causes naming have more difficulties in generating causes for a more abstract pain, such as “headache”. This could be subject for another longitudinal analysis within our project or in a new study applying a comparison between children of the preoperational and the concrete operational stage of development which is sought with respect to the said internal locus and external causes of pain in the future. The findings here underline that especially the area of caring for the child is very important, in order to meet a child's headache already preventively.

The third factor of this study “headache intensity” also highlights the two most common categories “accident” (52.40%) and “behavioural triggers” (28.57%), but call beyond even the category “disease, medicine, adverse reactions” (23.81%) most frequently. This may be an indication that children with high intensities headache take medications more often and that children with lower head pain intensities more likely associate their aversive body reactions with a disease. This assumption should be verified in a future study. Moreover, these findings support results of Wiedebusch (1994) that children of the concrete operational stage of development as opposed to children of pre-operational stage of development can create relationships between pain and disease (Wiedebusch, 1994).

Furthermore, it should be lit in the future, whether children of the lower stratum see significantly more frequent acts of violence as causes of headache. A new study or the combination of these data with the data pool of the epidemiological part of this project would allow such an analysis.

The aspect of wrong diet should in future still be found closer attention in view of childlike abdominal pain and headache. The findings of Stallman (2014), who analyzed the epidemiological data of second graders in our project, strongly suggest, that children of the lower stratum more often report “hunger” as pain trigger for headaches. These findings underline that ‘food’ should be considered as a cause of pain. Even in our rich country children are sent to kindergarten and school without any breakfast. Preventive care could address this problem of poor nutrition which obviously did not yet become extinct.

The possible preventive efforts such as offering fresh fruits, vegetables or biological dairy products and to provide information about a healthy nutrition in lessons could be helpful in the reduction of abdominal pain. The planned new all day schools might also provide new opportunities in regard to the above mentioned points. A child-oriented diet might be secured by offering healthy meals that can be eaten regularly at school.

In case of headache, future preventive approaches for children should focus furthermore on avoiding 'accidents', improving 'environmental conditions' (e.g. install sun safety systems in classrooms during summer season) and teaching more attentiveness and emotional awareness in order to avoid 'stress and emotional overload'. Furthermore, the 'excessive media consume' should be discussed among parents, children and teachers.

## **4.2 Discussion of the hypotheses**

At the beginning of the statistical analysis eight assumptions were hypothesized in order to investigate

- the gender, pain-recurrence and pain-intensity-specific comparisons of causal attributions for abdominal pain and headache in fourth graders,
- and more specific comparisons on category level in order to target possible differences between boys and girls, between the abdominal pain and the headache situation and in a longitudinal analysis between second and fourth graders.

This first two hypothesis verify whether the fourth graders differ by gender in the number of causal attributions for the explanation of abdominal pain and headache. In the literature no comparable study results of this scientific field could be found for such a specific question and in a comparable homogeneous age-group.

Twycross et al. (2009) postulated that girls more often verbally express their pain than boys and Kury & Redrigue (1995) claimed that there is a difference between boys and girls with regard to the number of causal attributions for abdominal pain. Gaffney and Dunne (1987) reported a gender related difference for pain in general. Significantly more girls stated psychological factors as a pain trigger.

In some other studies, no gender related differences concerning the causal attributions for illness and pain were reported (Czerwinski, 2015; Paterson et al., 1999; Perrin & Gerrity, 1981).

A similar result was reported by Ball (2004) who could not find gender differences in health and disease-related concepts.

The presented study supports the latter findings. Gender specific differences in the number of generated causal attributions could not be confirmed neither for the abdominal pain situation nor for the headache situation in pupils of the fourth class of primary school. Considering that the examined sample analyzed fourth-graders who have little knowledge about pathophysiological processes of different pain processes in this age and could not verify a considerable difference between boys and girls at this age, the test result of the significantly lower average number of units in the interview area "cause of pain" is plausible.

The third hypothesis is based on the assumption that the fourth year school pupils with recurring headaches and abdominal pain generate more causes than fourth graders without recurrent headaches and abdominal pain. The experience of recurring pain events should influence affected children. One explanation for this could be the assumption that children who frequently suffer from abdominal pain or headaches easier associate in everyday life they experienced analogies to their pain experiences. A child who does not know abdominal pain or headache will hardly be able to associate in the same way. Lohaus and Ball (2006) presented this hypothesis that children with recurrent pain or a history of illness also had a greater knowledge of illness and pain. The authors concluded that children with recurrent pain might generate more causes but they could not prove this hypothesis with their empirical data. Therefore, it is hypothesized here that children with experiences of recurring pain events report differently and more detailed about their pain. Affected children are supposed to describe more causes of abdominal pain and headache than the healthy control sample. The literature does not provide directly comparable results. This hypothesis could also not be proven for fourth graders.

In a rheumatism study that is a part of our project, children at this age level that were being treated for rheumatoid arthritis explained their chronic pain with an average of 2.39 units ( $\text{♂}=2.5$ ;  $\text{♀}=2.27$ ) (Wiegemann, 2011), whereas the fourth year school pupils in our study generated an average of 2.54 units ( $\text{♂}=2.56$ ;  $\text{♀}=2.54$ ). This tendency also contradicts the assumption of Lohaus and Ball (2006). It should be noted however that this study conducted in a sample of normal population does not strictly differentiate between recurrent and chronic pain. In future studies, children who suffer from chronic pain - which requires inpatient treatment - should further be compared to this healthy control group aiming to investigate if there is a difference in the number of causes.



In addition, it is assumed in the 4<sup>th</sup> hypotheses that the girls mention more causes than boys for headache and abdominal pain according to the pain intensity. Kröner-Herwig et. al (2009) report on a quite high average pain intensity of 6 on the VAS in children during a migraine attack. Because of this and the postulation that children may underestimate the severity of headache attacks without recurrent pain experiences, it was assumed that the generated average pain causes would turn higher in children with recurrent headaches. Also the factor pain-intensity does not have a statistically relevant influence on the generation of causes for headaches in fourth-graders. This hypothesis has to be rejected as well.

Summarizing the first part of this statistical analyses it has to be stated that none of the factors 'gender', 'pain-recurrence' and 'pain-intensity' influences the general level of expression of causes for abdominal pain und headache in pupils of the fourth class of primary school.

The fifth hypotheses assumed that female fourth graders declare their abdominal pain with more awareness of disease or with more profound medical knowledge than the boys of the same age. Gaffney (1990) described a study in which 9- to 12-year-old girls produced in their pain descriptions significantly more frequent emotional consequences of pain experiences than their male classmates. A result supporting the assumption that girls associate pain experiences in a more complex and detailed way. A further possible explanation could be the age of the children examined (9-12 year olds), a period in the development known for the emergence of gender-specific differences in the capability of expression. These postulated gender differences could be statistically confirmed for the generated medical knowledge and the awareness of disease in female and male fourth graders.

The more profound strength of association of 'tension, emotional stress or strain' with headache causes compared to the importance of these causes for abdominal pain is assumed in hypothesis 6. The statistical investigation revealed the hypothesized stronger association of headache with tension, emotional stress and strain, regardless of gender. The fourth year pupils stated significantly more psychological causal attributions for headaches. One can assume that they more likely see a connection between headaches, psychological criteria (like stress, tension, emotional overload) and other pain-triggering factors. Fourth graders seem to be less able however to establish a connection between abdominal pain and psychological aspects. An empirical finding that supports the appropriate configuration of a more specific psychological treatment plan.

McGrath & Hillier (2002) reported that boys rather suppress their pain while girls are normally strengthened in their complaints by their environment. This empirical result and the observation that boys are more pre-dispositioned to discreetly bypass their complaints lead to the

assumptions formulated in hypotheses 7 and 8 which compare the importance of environmental conditions as causal factors for the explanation of headaches and abdominal pain. First of all, second graders (Thewes, 2010), who re participated in our project in the fourth class of primary school were compared in a longitudinal design. Environmental conditions become more important with age for the explanation of headache attacks. Fourth graders generate significantly more units as headache causes than second graders do. Furthermore, it can be empirically confirmed, that environmental conditions have a significantly higher relevance for the explanation of headaches than for the explanation of abdominal pain.

In conclusion it has to be stated, that on the general level no differences of statistical relevance can be found in fourth graders, neither in dependence of gender, nor for pain recurrence and pain intensity. A look to single categories shows that the sum of abdominal pain and headache causes concerning “medical knowledge” is significantly higher in girls than in boys. Tension and emotional stress are predominant for the explanation of headaches. With statistical relevance this study can demonstrate that environmental factors are more important for fourth graders than for second graders and they are predominant for the explanation of headaches through pupils at the end of primary school.

### **4.3 Discussion of the methodology**

The introduced “Essener Paediatric Pain Interview” and the associated categories system for the interview area “pain causes” as well as the corresponding rules system is an adequate scientific method to gather subjective concepts about pain events. Within this study all of the recorded statements of everyday speech made by the 4<sup>th</sup> class children during the Essen Children’s Pain Interview, could be classified by using the newly developed rules and categories system. High interrater reliabilities on all analysed levels including total units and categories confirm the good validity and reliability of the data. Our methodology with provision of good content validity show that the measuring instrument that was developed in the scope of this project can be used for further validation studies with clinical subgroups. This enables the coders to be guided by a detailed rules system which is based on the experience gained from ratings of more than 1000 interviews conducted with children of the normal population in the age from 5 to 14 years.

The subjective impairment of a child by the experienced abdominal pain and headache might possibly not adequately reflected: Children of the normal population and not of a clinical group have been investigated in this study and the operationalisation for impairment (recurrence and intensity of pain) was based on two single parameters. On the basis of the German language

Paediatric Pain Disability Index (P-PDI; Hübner, Hechler et al. (2008)) factors such as duration of the sickness, family burdens caused by the abdominal pain and headache as well as the impairment to the quality of life, school absenteeism, etc. possibly together with the pain recurrence and intensity could be combined to form a burden index that leads to a more adequate pain-related impairment measure. Furthermore, differences in the studied parameters might be shown more clearly. In the Pain Disability Index, children with pain that are aged 11 years or older were interviewed concerning diverse activities. Depending on the results of the interview it can be concluded, that on the basis of the biopsychological model knowledge transfer and behavioural instructions should be applied in preventive treatments. In severe cases of impairment in everyday lives more far-reaching actions have to be promoted (Hübner, Hechler et al., 2008).

The pain intensity of children can be measured with different scales. The method is depended on the developmental age, the type of pain and the purpose selected (see Hechler et al. 2009). The measurement methods for specific research projects that focus more on good psychometric properties, for example, differ from those applied in clinical practice where manageability, acceptance and child-friendliness are considered more. The experience of pain of the child can be better illustrated by a systematic and comprehensive pain survey and aims to simplify and improve the regimen (Hechler et al. 2009).

Previous methodological analysis of childhood pain concepts had difficulty determining valid and appropriate performance criteria for the applied instruments of research (Burbach and Peterson, 1986). In these studies, often neither the validity nor the reliability have been studied. The present study attempts to solve this problem by using rules and the category systems to optimize the reliability and objectivity of the collection and analysis of children's statements. As described in the previous chapters, the existing category system is a learning system. By continually recording and adding kids' statements, that e.g. could not be categorized by the present category system as new examples, the evaluation for the next Coder is continuously facilitated.

The quantity of children's' statements may be influenced by the particular formulation used to form the question of the test conductor. Ross noted this factor as early as 1984. Depending on how the respective interviewer phrases his question during the interview variations in the quantitative and qualitative responses were found (Ross and Ross, 1984). At times, this took

place in the present study. By using standardized questions such as “Why does that hurt? What do you think, is the reason for this?” the children pain interview minimizes this effect.

When taking into account that we are living in a society that increasingly includes people with different sociocultural backgrounds, direct intercultural comparisons in respect to native language could contribute to a better understanding. Possible differences in the pain concepts of children with a migration background could then be taken into account to a greater extent when providing professional pain treatment. This would do justice to the fact that not only the cognitive developmental stages according to Piaget, but also other socio-cultural influencing factors are decisive for the development of pain concepts.

#### **4.4 Clinical Approach**

The children's' explanations about concepts of pain are influenced by various factors. Not only cognitive development, but also the physical level affects the attributions of pain. A multimodal pain model based on the theory of cognitive development by Piaget and the development of the anatomical features of the pain-forwarding systems contribute to better understanding the pain experience of the children.

On the one hand new ways to help children comprehend the causes of pain can be established. On the other hand, clinical doctors who talk to the children and their parents explaining the reason for the implementation of certain painful interventions that are necessary for the recovery and for pain relief can improve the compliance. They keep in mind, that there is a risk due to the not yet fully developed pain-inhibitions-systems to develop hyperalgesia and allodynia. Therefore, early diagnostic and therapeutic measures in infancy are strictly indicated (Anand, 1998; Porter et al., 1999; Schmelzle-Lubiecki et al., 2007; Abdulkader et al., 2008).

In addition, other stress factors such as a lack of knowledge should be minimized. Especially in the area of diseases, these deficits serve as an additional emotional burden (Lohaus and Ball 2006). For this reason, the focus should be on future treatment regimens. A development-specific and child-friendly guidance therefore seems advisable. Empirical findings about subjective lay theories of children in different developmental stages allow more specific physical and age-appropriate diagnosis and treatment procedures.

By referring to Article 12 of the UN Convention of the Rights of Children at the end of the discussion the rationale of this study shall be underlined. This Article stipulates that children have the right to state their opinion freely and that they are to be granted a right of say. This implementation accommodates an entirely new prospect of participation in which children are respected as subjects with their own experiences and point of view as well as with their competencies.

## 5. Summary

Disease representations are the summarized thoughts and causal relations attached to painful experiences or physical diseases. Causation as a fundamental category for human cognition is based on the universal idea, that nothing exists as a singular independent entity and everything arises with the dependency of causes. Although the human's perception of causal relations was defined by some philosophers as an illusion, causal attributing has an evolutionary advantage. It helps to explain what is going on and to plan future actions with more certainty in order to overcome randomness of behaviour. Everyday knowledge and profound scientific knowledge can be different or even contradictory. It is of high relevance in medical practice to know disease representations of the patients. Taking them into account will help to avoid misunderstandings and increase empathy between patient and physician. This study compiled empirical data for causal attributions of primary headache and functional abdominal pain in the ordinary population of fourth graders as a base for future comparisons with clinical subgroups.

Paediatric headache and abdominal pain have high prevalence and present an important health and social problem in children and adolescents. In this dissertation, the causal attributions of 167 fourth year school pupils suffering from this pain are exhaustively recorded by means of a purposely developed, partially structured pain interview. The reported intercoder reliabilities of both of the independent coders support the validity of the study analysis. 81.44% of the fourth graders believe that their abdominal pain is due to the wrong nutrition. This emphasizes the importance of preventive measures such as thematising of a healthy nutrition at school. In addition, parents should be supported in offering a healthier diet to their children. Fourth class pupils mainly attribute the causes of their headaches externally (accident 44.3%, environmental conditions 32.9%, behaviour-related trigger 17.9%). At an inference statistical level, no influences of 'gender', 'pain recurrence' and 'pain intensity' could be stated for global comparisons. It was possible to show that considerably more medical knowledge was used by girls to explain abdominal pain and headache. Environmental conditions as well as tension combined with emotional stress are statistically relevant for the explanation of headache. While the attributions of headache cause on environmental conditions increase significantly with age, second- and fourth graders do not differ statistically in the average number of generated causal attributions.

The empirical knowledge of the paediatric pain concepts and causal attributions promotes a better understanding and increases the empathy towards the child. This reduces fear and ameliorates the compliance so that the child can be more easily motivated to participate in necessary diagnosis and treatment measures.

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## **7. Annex**

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### 7.3 Lists of Abbreviations and Symbols

Abs.	Absolute
AP	Abdominal Pain
RP	Recurrent pain
noRP	No recurrent pain
CI	Confidence Interval
EPI	Epidemiological Study
et al.	And others
EXPI	Experimental Study
FSEKB	Fragebogen zur simultanen Erfassung von Kopf- Bauchschmerzsymptomen (Questionnaire for the simultaneous detection of head and abdominal pain symptoms)
IHS	International Headache Society
Cat.	Category
H	Headache
K-S	Kolmogorov-Smirnov-Test
L1	Longitudinal, measurement time1
L2	Longitudinal, measurement time 2
L3	Longitudinal, measurement time 3
L4	Longitudinal, measurement time 4
L5	Longitudinal, measurement time 5
N	Total Numbers
n	Number in a group
PASW	Predictive Analysis Software
Tab.	Table
VAS	Visual Analogue scale
♀	Female
♂	Male

## 7.4 Rules and Instructions for the analysis of the Essener pain Interview

Seite 1 des Regelsystems, Stand 06.11.2015

### Regelsystem und Anleitung zur Auswertung der Schmerzinterviews

erstellt durch

Basevic, Nadja; Brüggemann, Lotta; Erbes, Elena; Danappel (geb. Cizmowski) Tanja; Hachemi Houyem; Kamberg Jenny; Tolic (geb. Kelava) Ivana; Jennifer Kamberg; Konik Anna; Rasheed, Muhammad; Nemet-Babilli, Nadja; Thewes Björn; Wiegemann Eva; Youn Do Ae; Petersen Petra; Rosenbaum, Sandra; Zöller, Maria; Ostkirchen Gabriele;

Die Ausführungen im Regelsystem sind dreigeteilt. Zunächst einmal wird (A.) die generelle Vorgehensweise beschrieben, (B.) es folgen die Besonderheiten in den einzelnen Interviewbereichen im Überblick (C.) schließlich die allgemeinen Regeln des Regelsystems. Wiederholungen sollen der Klarstellung dienen.

#### A. Vorgehensweise

Rater (Coder, Auswerter) müssen ihre ausgewerteten Bögen immer mit seinem jeweiligen Kennzeichen versehen. Dieses wird rechts oben auf das Auswertungsblatt geschrieben (siehe Beispielblatt im Anhang).

#### Doktorand: Rater Kennzeichen

Björn	Thewes	Rater 1
Ivana	Tolic	Rater 2
Houyem	Hachemi	Rater 3
DoAe	Youn	Rater 4
Eva	Wiegemann	Rater 5
Anna	Konik	Rater 6
Tanja	Danappel	Rater 7
Jenny	Kamberg	Rater 8
Ina	Czerwinski	Rater 9
Maria	Zöller	Rater 10
Sandra	Rosenbaum	Rater 11
Hildegard	Lüdecke	Rater 12
Muhammad	Rasheed	Rater 13
Emina	Basevic	Rater 14
Caroline	Elkamp	Rater 15
Nadja	Nemet-Babilli	Rater 16
Laura	Kasten	Rater 17
Elena	Erbes	Rater 18
Mali	Mews	Rater 19
Jeany	Gansäuer	Rater 20

→ Außerdem kennzeichnet jeder Rater am Kopf jedes Interviewblattes ob er / sie Erst- oder Zweitrat ist (siehe auch Beispielblatt im Anhang).

→ Folgende **Schmerzsituationen** werden dem Kind durch ein Bild vorgegeben:

1. „Kind hat einen Fahrradunfall“ <geschlechtsspezifisch>

d.h. ein Bild für Jungen, eines für Mädchen, die anderen Bilder zu den weiteren vier Schmerzsituationen sind geschlechtsneutral:

2. „Kind hat Bauchschmerzen“

3. „Kind hat Kopfschmerzen“

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(Beispiel: siehe Beispielblatt im Anhang)

#### Beispiele für das Aussuchen und Einkreisen der zu analysierenden Einheiten:

Linker Seitenrand

Beispiele:

I. 2 Kind sagt: „Das tut weh.“

Kind sagt: „Dann heult man.“

→ Die Anzahl der aufsummierten Analyseseinheiten zu einem Fragebereich (hier 2) wird zusammen mit dem römischen Kürzel für den Frage-/Schmerzsbereich an den linken Textrand des entsprechenden Fragen-/Schmerzblockes: (I.=Schmerzbeschreibung, III.=Schmerzursache, IV.=Bewältigungsstrategien, V.=menschliche Bindungen) geschrieben.

→ Als nächstes wird die entsprechende Kategorisierung für die Äußerung/Analyseseinheit herausgesucht und der Einheit entsprechend zugeordnet, diese Vorgehensweise wird im folgenden näher beschrieben.

#### Merke!!!

→ Erst kategorisieren, wenn die Situation eindeutig klar ist.  
→ Dann die entsprechende Kategorie unter der jeweiligen Einheit im Text vermerken und dazu einen Eintrag am rechten Textrand machen. **Die Aufsummierung aller Einheiten steht am linken Textrand, die Kategorisierung der einzelnen Einheiten steht am rechten Textrand.** Das Einhalten dieser Vorgehensweise ist besonders wichtig, weil die Daten dann klarer für die SPSS-Eingabe gegliedert sind und diese schneller von der Hand geht..

#### Beispiel für das Festlegen der Kategorien nach den im Anhang befindlichen Kategoriensystemen für die einzelnen Schmerzbereiche (I., III., IV., V.)

Beispiele

Rechter Textrand

I. 2 Kind sagt: „das tut weh“

⇒ = 2 Einheiten Kind sagt: „dann heult man“

#### Erklärungen zum rechten Textrand

„I.2“ = „I.“ für Bereich Schmerzbeschreibung  
„2“ für Kategorie 2 „allgemeine Beschreibung ohne genauere Spezifizierung“

„I.11“ = „I.“ für Bereich Schmerzbeschreibung  
„11“ für Kategorie 11 „Beschreibung dessen, was das Kind bei Schmerz tut, Reaktion auf den Schmerz.“

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#### 4. „Arzt gibt Kind eine Spritze“

#### 5. „Kind hat Rheumaschmerzen“ fakultativ für Kinder mit Rheumaschmerzen

Der Rater beginnt damit, die Äußerungen zur Situation zu lesen, dann die Äußerungen in Analyseeinheiten aufzuteilen und den entsprechenden Frage-/Schmerzsbereichen (I. Schmerzbeschreibung, II. Schmerzursache, III. Coping bei Schmerzen, IV. Bindungsverhalten in Schmerzsituationen) zuzuordnen.

#### Definition der Analyseeinheit:

Jede sinnvolle vom Kind getätigte Aussage zu den vier Leitthemen

#### I. Schmerzbeschreibung

< II. Schmerzintensität (VAS-Skala 0 – 10 cm) >

#### III. Schmerzursache

#### IV. Schmerzbewältigung

#### V. Bindung in Schmerzsituationen

ist eine Äußerung = Analyseeinheit.

Diese kann aus einem Satz, einem prädikativen Zentrum, einem Halbsatz oder einem Stichwort bestehen.

→ Links an dem Textrand wird neben die Situationsbeschreibung ein „ja“ auf das getippte Interview geschrieben, wenn das Kind diese Schmerzsituation aus eigenem Erleben kennt und ein „nein“ wenn es diese Situation nicht aus eigenem Erleben kennt (siehe hierzu Regel 16).

→ Die Einheiten werden farblich umkreist und zwar passend zu den einzelnen Themen.

Zu I. „Schmerzbeschreibung“: alle Einheiten mit **ROT** umkreisen.

Zu II. „Schmerzintensität“: lediglich die cm/mm der Analogskala (0 – 10 cm) eintragen: Beispiel: 5,5 cm = 55mm; in der SPSS- Datei werden mm eingegeben

Zu III. „Ursachenbeschreibung“: alle Einheiten mit **GELB** umkreisen.

Zu IV. „Bewältigungsstrategien“: alle Einheiten mit **GRÜN** umkreisen.

Zu V. „menschliche Bindungen“: alle Einheiten mit **BLAU** umkreisen.

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#### Kurzzusammenfassung:

→ Die Ergebnisse der Zuordnung der einzelnen Einheiten zu den Kategorien eines Schmerzsbereiches werden also ordentlich rechts an den Textrand geschrieben, damit die Auswerter es leichter haben, die einzelnen Ergebnisse zu den Schmerzsbereichs- und Kategorieneinordnungen numerisch in die Ergebnisdatei einzutragen

(siehe hierzu oben die Beispiele am rechten Textrand „I.2“ und „I.11“) <am rechten Textrand bedeuten die 2 und die 11 neben der römischen I., dass eine Einheit der Kategorie 2 zugeordnet ist (Eintrag zu dieser Variable in der SPSS-Datei=1) und eine der Kategorie 11 (=1 Eintrag zu dieser Variable in der SPSS-Datei= 1) im Fragebereich „Schmerzbeschreibung“>.

→ Am rechten Rand stehen demnach die einzelnen Kategorien - in der Reihenfolge des Auftretens im Text - zusammen mit und in der gleichen Farbe der römischen Schmerzsbereichs-Nummer, auf die sie sich beziehen, Und am linken Textrand wird die römische Zahl des Schmerzsbereiches eingetragen, auf den sich die Frage des Interviewers bezieht zu der die zu kategorisierende Äußerung generiert wurde und die arabische Zahl, die die aufsummierte Anzahl der Einheiten insgesamt für diesen Frage-/Schmerzsbereich bedeutet

→ (siehe hierzu oben das Beispiel am linken Textrand „I.2“ )

hier steht die 2 für insgesamt 2 zu kategorisierende Analyseseinheiten im Bereich „Schmerzbeschreibung“ (I.)

**B. Besonderheiten in den einzelnen Interviewbereichen:****XO. Fall: Ein Interviewer hat die vom Kind gemachten Aussagen mitgeschrieben und nicht auf Band aufgenommen:**

Es werden nur wortwörtliche Aussagen, die vom Interviewer mitgeschrieben oder aufgenommen wurden, ausgewertet.

Ist der Rater/Coder/Auswerter **nicht sicher**, das dies tatsächlich vom Interviewer gemacht wurde (z.B. weil das Diktiergerät defekt war und es nicht vermerkt wurde, ob die Mitschrift wortwörtlich vorgenommen wurde) werden diese Aussagen vom Auswerter **nicht gewertet**. In Konsequenz aus dieser Regel werden Aussagen des Kindes, die **stichpunktartig festgehalten** wurden, auch **nicht gewertet**.

**O. Situationsbeschreibung:**

- Die reine Situationsbeschreibung dient der Einstimmung des Kindes und wird nicht kategorisiert!
- Das heißt: keine Kategorisierung bei den Punkten (1) <Fahrradunfall>; (7) <Bauchschmerzen>; (13) <Kopfschmerzen>; (19) <Spritze vom Arzt bekommen>; (25) <Rheumaschmerzen> der vorbereiteten Untersuchungsvorlagen für die Durchführung der Schmerzinterviews.

**Ausnahme!**

Stehen unter „O. Situationsbeschreibung“ Aussagen, die nicht eindeutig der Situationsbeschreibung entsprechen (wenn die Kinder einmal die Abfolge der Fragen kennen, antworten sie schon während der Festlegung der Situationsbeschreibung auf die antizipierten Fragen für die neue Schmerzsituation), können diese - falls sie den vier Schmerzbereichen zuzuordnen sind - trotzdem den definierten Schmerzbereichen (I.-V., siehe dazu auch Regel Nr. 2) zugerechnet werden.

**Beispiele: unter Situationsbeschreibung:**

a) Kind sagt: „Da hat ein Junge zuviel Eis gegessen und dann hat der Bauchschmerzen.“

→ Die gelb eingekreiste Einheit passt zum Thema „III. Ursachenbeschreibung“ sie wird der Kategorie III.11 zugeordnet

III.1 Diese Analyseeinheit wird also mit einem gelben Kreis gekennzeichnet, am linken Seitenrand wird im Schmerzbereich III „Ursachenbeschreibung“ die insgesamt für diese Schmerzsituation aufsummierte Einheitenzahl um eine Einheit heraufgesetzt und am rechten Seitenrand wird III.11 notiert, das bedeutet, dass diese Einheit der Kategorie 11 des Bereiches „Schmerzursache“ zuzuordnen ist.

b) Kind sagt: „wenn ich auftrete,

I.2 kommt so ein Schmerz“

III.4 „wenn ich so sitze

III.13

I.1

III.13

**Untereinheit B:** bezieht sich auf Aussagen über andere Personen, die helfen konnten, bzw. Strategien, die anderen geholfen haben. Antworten auf die Frage: „Was macht Mama, Papa, der Arzt in der Situation?“

**Beispiele:**

Kind antwortet: „Der Arzt gibt mir Tabletten“ oder „Mama macht mir ein Pflaster drauf“, „Meine Mama bringt mir ein Kühlpack“ oder „Meine Mama legt sich hin.“

**V. Menschliche Bindungen (blau):**

16 Kategorien und die „Z“- Kategorie, gemäß Kategoriensystem (siehe Anhang), weitere Beispiele siehe dort und im Regelsystem.

→ In diesem Interviewbereich werden die Einheiten unterteilt, in „A“, „B“ und „C“:

<b>Untereinheit A:</b>	für Aussagen, die sich auf Bindungspersonen für das Kind auf dem Bild beziehen.  Antworten auf die Frage: „Wen könnte das Kind auf dem Bild um Hilfe bitten?“
<b>Untereinheit B:</b>	für Aussagen, die sich auf Bindungspersonen beziehen, die das Kind für sich benennt.  Antworten auf die Frage: „Wen könntest du um Hilfe bitten?“
<b>Untereinheit C:</b>	für Aussagen, die nicht den Untereinheiten „A“ oder „B“ zugeordnet werden können, weil z.B. nicht deutlich wird, ob das Kind von sich selbst oder dem Kind auf dem Bild spricht  Beispiel: Kind antwortet nur: „Mutter und Vater“

oder das Bein so angewinkelt habe, III.13

dann spür ich das gar nicht! I.16

„beim Bewegen tut es weher“ III.13

→ Diese Einheiten passen – obwohl nach der Frage zur „Situationsbeschreibung“ als Antwort gegeben – zu den Themen „I. Schmerzbewältigung“ und „III. Ursachenbeschreibung“:

→ Zwei Analyseeinheiten werden folglich den Kategorien I.1 und I.16 des Bereiches „Schmerzbeschreibung“ und 4 Analyseeinheiten werden dem Fragebereich „Schmerzursache“ und der Kategorie III.13 „als Ursache werden verhaltensbedingte Auslöser genannt“ zugeordnet.

→ Also werden diese Einheiten mit einem roten bzw. gelben Kreis gekennzeichnet (siehe Vorgehensweise) und an den rechten Rand wird - wie weiter oben besprochen - die Kategorien-Nummerierung eingetragen.

**4 Kategoriensysteme für die 4 Fragen-/Schmerzbereiche (I., II., III., IV.)****I. Schmerzbeschreibung (rot):**

17 Kategorien und die „Z“- Kategorie, gemäß Kategoriensystem (siehe Anhang), weitere Beispiele siehe dort und im Regelsystem.

**III. Ursachenbeschreibung (gelb):**

19 Kategorien und die „Z“- Kategorie, gemäß Kategoriensystem (siehe Anhang), weitere Beispiele siehe dort und im Regelsystem.

**IV. Bewältigungsstrategien (grün):**

22 Kategorien und die „Z“- Kategorie, gemäß Kategoriensystem (siehe Anhang), weitere Beispiele siehe dort und im Regelsystem.

→ Alle Bewältigungsstrategien, die das Kind nennen kann, werden kategorisiert.

→ Die Anzahl der Einheiten wird jedoch danach in die Untereinheiten „A“ und „B“ aufgeteilt

→ (vgl. hierzu Regel Nr. 21: Besonderheiten zum Fragebereich „Schmerzbewältigung“)

**Untereinheit A:**

bezieht sich auf Aussagen über das Kind auf dem Bild oder auf Aussagen des interviewten Kindes, sowie auf Aussagen, die andere Personen tätigen in Bezug darauf, was das Kind selbst machen kann.

Antworten auf die Frage: „Was kann dieses Kind auf dem Bild wohl tun; was kannst du selbst tun, damit es nicht mehr so wehtut?“ Was schlägt dir jemand anderes vor, was du selber machen kannst?

**Beispiele:**

Kind antwortet: „Das Kind auf dem Bild kann sich hinlegen.“, „Ich lege mich dann auch hin.“, „Meine Mama sagt, das ich mich ausruhen soll.“

**C. Allgemeine Regeln - Regelsystem****O. Regel: Darstellung**

Die Anzahl der Einheiten wird am linken Textrand für die einzelnen Schmerzbereiche (I.; III.; IV.; V.) eingetragen (z. B. III.3 bedeutet 3 akzeptierte Analyseeinheiten für den Fragebereich III. Schmerzursachen).

Also immer alle Einheiten pro Schmerzbereich eintragen:

I = Schmerzbeschreibung

II = Schmerzintensität

III = Schmerzursache

IV = Schmerzbewältigung

V = Bindung

aufsummieren, unabhängig davon, wo im laufenden Text sie stehen und hinter die römische Zahl des Schmerzbereiches mit arabischen Ziffern am linken Textrand eintragen (Beispiel: III.5).

Am rechten Textrand werden für jede Analyseeinheit der Schmerzbereich und die Kategoriennummer eingetragen

(z. B. III.2 bedeutet: III. = Schmerzbereich = „Schmerzursache“;

2 = Kategoriennummer laut Kategoriensystem im Schmerzbereich „Schmerzursache“ = 2 = „Kind nennt als Ursache einen Unfall, einen schmerzhaften Vorgang“, siehe Kategoriensystem für Schmerzursachen).

→ Die Einträge am rechten Textrand werden immer genau rechts an die Stelle geschrieben, an der im laufenden Text die zu analysierende Einheit steht, damit exakt nachvollzogen werden kann, um welches Rating zu welcher Einheit es sich handelt.

**Beispiel:**

Kind sagt: „Ich habe mir den Kopf gestoßen“ III.2  
Schmerzbereich III „Schmerzursache“  
Kategorie „2“ „nennt als Ursache einen Unfall, einen schmerzhaften Vorgang“

**1. Regel: Nicht transkribieren bei inhaltlichen Abschweifungen vom Schmerzthema**

Es werden nur die Kinderaussagen zu den vier Frage-/Schmerzbereichen mit den vier Leitfragen (I. Schmerzbeschreibung, III. Schmerzursachen, IV. Schmerzbewältigung, V. Bindung in der Schmerzsituation) pro Schmerzsituation ausgewertet. Schweift ein Kind vom Thema ab (z.B.: Wenn das Kind zu dem Bild der ersten Schmerzsituation „Fahrradunfall“ erzählt, das es mit seinem neuen roten Fahrrad, dass 3 Gänge hat, gefahren ist usw.), werden die zu dem selbst gewählten Thema formulierten Aussagen nicht analysiert. In Klammern deutet der Transkribierer auf die Auslassung weiterer, nicht zu analysierender Inhalte hin. Geschrieben werden dann wieder die nächsten Aussagen zum

Schmerzthema. Auch Beschreibungen von Abläufen/Prozessen anderer Themenbereiche sind als Abschweifungen zu werten.

Kind sagt:	<b>Beispiel 1:</b> „Ich koche mir einen Tee und um den Tee zu kochen, mache ich erst das Wasser heiß, dann kommt der Beutel in die Tasse, dann kommt da das heiße Wasser drauf und dann muss das erstmal ziehen, danach ruhe ich mich aus...“
Geschrieben wird:	„Ich koche mir einen Tee und um den Tee zu kochen...[Kind schweift vom Thema ab], danach ruhe ich mich aus...“
Kind sagt:	<b>Beispiel 1:</b> „Ich lege mir ein Körnerkissen drauf und zwar packt man das Körnerkissen dann in die Mikrowelle um das warm zu machen und wenn das dann heiß ist, kann man das dann da drauf legen.“
Geschrieben wird:	„Ich lege mir ein Körnerkissen drauf, [Kind schweift ab].“

- Anstatt Beispiel 1 und 2 wortwörtlich abzutippen, schreibt der Transkribierer **[Kind schweift vom Thema ab]** (siehe oben) und tippt erst wieder die für die „Schmerzsituation“ themenrelevanten Aussagen des Kindes wortwörtlich ab. Grundsätzlich werden **relevante Aussagen zu den Interviewbereichen aber i m m e r wortwörtlich abgetippt.**

## 2. Regel 0. Situations-/Bildbeschreibungen

Das, was auf dem Bild tatsächlich zu sehen ist, und vom Kind beschrieben wird - ohne weitere Interpretation des Kindes - wird **nicht kategorisiert**. Es dient der Einstimmung des Kindes auf die Situation und dem Interviewer als Nachweis, dass das Kind die Bedeutung der Situation erkannt hat.

### Beispiel 1

Kind sagt: „Das Kind ist vom Fahrrad gefallen und das Knie blutet“.

→ **Keine** gültige Analyseeinheit; es erfolgt **keine Kategorisierung**.

Das Kind beschreibt, was es auf dem Bild sieht, dort ist eben auch das blutende Knie eines Kindes zu sehen.

**Sobald aber spezifische oder wertende Aussagen zu den vier Fragebereichen geäußert werden, werden diese als Analyseeinheiten gezählt und ausgewertet:**

### Beispiel 2:

Kind sagt: „Das Kind ist vom Fahrrad gefallen, das tut aber sehr weh.“

- I.1  
→ 1 Analyseeinheit im Fragebereich **1. Schmerzbeschreibung** mit 1 Einheit für den Bereich I., diese ist zu kategorisieren in Kategorie 3 „**allgemeine Beschreibung mit intensivierenden Beiwörtern zur Qualität/Intensität bzw. intensiven Beschreibung der Qualität**“.

### Beispiel 3:

Kind sagt: „Vielleicht ist das Kind vor den Tisch gerannt“ III.2

## 5. Regel Kategorie Y- Widersprüche

Sobald ein Kind sich widerspricht und es sagt, es habe zum Beispiel keine Schmerzen, aber in weiteren Fragestellungen seine Schmerzen plötzlich detaillierter beschreibt, wird am rechten Seitenrand dieser Widerspruch mit „Y“ gekennzeichnet. Anschließend werden alle Widersprüche für jede Schmerzsituation (Fahrrad, Bauchschmerzen, Kopfschmerzen, Spritze und Rheuma) und für jeden Schmerzbereich (Beschreibung, Ursache, Bewältigung, Bindung) gezählt und in die SPSS- Spalte „Y“ am Ende eines Interviews eingetragen.

### Beispiel:

Kind sagt in Fragestellung „Schmerzbeschreibung“:



Die Aussageeinheit „Ich habe keine Schmerzen“ wird nicht im Kategoriensystem eingeordnet und bei der Anzahl der Einheiten nicht mit gezählt. Diese Aussage wird nur bei der Anzahl der Widersprüche, Kategorie „Y“, mitgezählt.

## 6. Regel Unsicherheiten auf Seiten des Kindes

Wenn ein Kind seine Unsicherheit zum Ausdruck bringt: „Ich weiß nicht. Ich bin mir nicht sicher. Vielleicht..., ich glaube...“ und dann doch noch eine Aussage zur Fragestellung äußert, wird in diesen Fällen „**weiß nicht, vielleicht...**“ nicht als Unsicherheit gewertet, bzw. die Aussage **„Weiß ich nicht“ wird nicht als Einheit gezählt, wenn an diese Äußerung anschließend noch eine konkrete Aussage vom Kind zu der Fragestellung gemacht wird.**

### Beispiel:

Kind sagt: „Nö, weiß ich nicht, ne lange Hose anziehen“

IV.1

Schmerzbereich IV. „Bewältigungsstrategien“  
Anzahl der Einheiten: 1 <linker Textrand>  
in der Kategorie 1 <rechter Textrand>

## 7. Regel Verhalten bei Vorgaben seitens der Testleiter

Aussagen, bei denen der Testleiter Vorgaben gemacht hat, die das Kind wiederholt, werden **nicht ausgewertet**! Bei Ermutigungen, noch etwas zu sagen, **ohne** dass

oder hat sich gestoßen.

III. 2

- 2 Analyseeinheiten im Fragebereich **III. Schmerzsachen**, diese sind beide zu kategorisieren in Kategorie 2, „**Kind nennt als Ursache einen Unfall oder einen schmerzhaften Vorgang**.“

## 3. Regel: Analyseeinheiten

Analyseeinheiten <Definition siehe S. 2 des Regel- und Anleitungssystems zur Auswertung der Schmerzinterviews dieses Regelsystems> müssen immer zuerst in die Kategorien der Frage-/Schmerzbereiche (I., III. IV., V.) eingeordnet werden, unter denen sie stehen. Erst wenn keine Kategorie dafür zur Verfügung steht, wird nach einer Kategorie unter einem anderen Frage-/Schmerzbereich gesucht.

**Jede Analyseeinheit darf nur e i n m a l einem Bereich und nur e i n m a l einer Kategorie zugeordnet werden.**

### Beispiel 1:

Schmerzbereich IV. „Schmerzbewältigung“

Kind sagt: „Mama hat mir eine Geschichte erzählt und dadurch hab ich nicht mehr gemerkt, dass es wehtut. Das war dann nur noch so ein bisschen unangenehm.“ IV.6  
IV.16  
I.15

## 4. Regel Kategorie Z „nicht einzuordnen“

In jedem Fragebereich gibt es eine „**Kategorie Z**“, die dann gewählt wird, wenn die Aussage in keine andere Kategorie des aktuellen Schmerzbereiches eingeordnet werden kann und auch nicht in eine andere Kategorie der verbliebenen 3 Schmerzbereiche.

Es soll aber **immer** erst versucht werden, die Aussage passend einzuordnen, bevor man die Kategorie Z verwendet, da diese nur für solche Aussagen gedacht ist, für die auch nach reichlicher Überlegung keine passende Kategorie gefunden werden kann. Einheiten für Kategorie Z werden nur ganz restriktiv vergeben, dann pro Fragebereich gesammelt und später wird gemeinsam mit allen Ratern über die Einteilung in eine bestimmte Kategorie eines Frage-/Schmerzbereiches entschieden. Nach vorliegender Entscheidung des Gesamt-Rater-Teams werden diese Äußerungen als Beispiele in die gewählte Kategorie des Kategoriensystems aufgenommen und damit für jeden Rater eindeutig zugeordnet. Kann keine Entscheidung getroffen werden, verbleibt die Analyseeinheit in der Kategorie „Z“ als nicht zuordenbar.

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eine direkte Vorgabe gemacht wird, werden die Aussagen des Kindes immer gewertet.

### Beispiel 1:

Testleiter fragt: „Also wie fühlt sich das an? Piekst es, brennt es, sticht es?“  
Kind antwortet: „Es piekst.“

- Die Aussage des Kindes wird wegen der Vorgabe des Testleiters **nicht** gewertet!

### Beispiel 2:

Testleiter fragt: „Fällt dir denn noch etwas ein?“

Kind antwortet: „Es piekst.“

I.6

Die Aussage des Kindes wird nun gewertet!

Einordnung  
Schmerzbereich I. „Schmerzbeschreibung“  
Kategorie I. 6 „spezifische komplexe Kennzeichnung der Schmerzqualität“

## 8. Regel Geschlossene Fragen

Antworten des Kindes auf geschlossene Fragen durch den Testleiter werden **nicht kategorisiert**, da sie keine selbstständige Formulationsleistung darstellen. Sie sind daher wie eine Vorgabe des Testleiters (vgl. Regel 7) zu bewerten.

### Beispiel:

Testleiter fragt: „Und die Wärmeflasche hat dann auch geholfen?“  
Kind sagt: „Ja“

In diesem Falle erfolgt **keine** Kategorisierung nach IV.16 (Kind sagt, dass eine Bewältigungsstrategie erfolgreich ist)

## 9. Regel Zuordnung von Analyseeinheiten zu den vier Frage-/Schmerzbereichen

Gibt das Kind ungefragt z. B. auf die erste Frage zur **Schmerzbeschreibung (I.)** schon eine Antwort zur Beschreibung von **Schmerzbewältigungsmechanismen (IV.)**, so werden die aus diesem Themenkreis stammenden Analyseeinheiten denen des Schmerzbereiches **IV. „Bewältigungsmechanismen“** zugeordnet und dort gezählt.

### Beispiel:

Bei der Schmerzbeschreibung (I.) sagt das Kind:

I.1

IV.1

„Das tut weh, aber da kann man auch Eis drauf tun“

I.2

IV.9



Die Analyseeinheit „Eis drauf tun.“ wird automatisch den Bewältigungsstrategien (IV.) zugeordnet. Beim Aufsummieren der einzelnen Analyseeinheiten des Schmerzbereiches IV. „Bewältigungsstrategien“ ist diese Einheit mitzuzählen, bevor die Gesamtsumme (IV. „grüner Kreise“) am linken Textrand notiert wird.

### 10. Regel: Wiederholungen und Aufzählungen

Auch wenn in einer Aussage wortwörtlich nochmals das Gesagte wiederholt wird (z.B. gleiche Wörter), wird für jede Wiederholung eine Einheit gezählt, weil davon ausgegangen wird, dass es größere subjektive Relevanz besitzt, wenn eine geschilderte Tatsache durch Wiederholungen hervorgehoben wird.

#### Beispiel:

#### Bei Schmerzbeschreibung (I.):

#### rechter Seitenrand

Kind sagt: „..... und dann kann man dann kriegt man z.B.

Kopfschmerztabletten oder ja ne

IV.10

Wärmflasche kann man sich oder nen Kühlakku drauf legen.

IV.9

IV.9

#### Bei Bewältigungsstrategien (IV.):

Das Kind sagt wieder: „... und da kann man ne Kopfschmerztablette nehmen

IV.10

oder ne Wärmflasche kann man sich,

IV.9

oder nen Kühlakku drauf tun.“

IV.9

#### linker Seitenrand:

IV.6

A = 6

B = 0

Insgesamt werden dann 6 Analyseeinheiten zum Schmerzbereich IV. „Bewältigung“ gezählt und 6 Bewältigungsstrategien kategorisiert (am linken Seitenrand notiert man die Anzahl der Einheiten insgesamt (IV.6), dann wird die Einteilung der Analyseeinheiten in die Untergruppen „A“ (beziehen sich auf das Kind selbst oder auf dem Bild) bzw. „B“ (beziehen sich auf Aussagen über andere Personen) vorgenommen <komplette Eintragung linker Textrand: IV.6; A=6; B=0> und am rechten Seitenrand werden die einzelnen Kategorien - wie in den Beispielen oben notiert - mit ihrer römischen Ziffer für den Schmerzbereich und ihrer arabischen Ziffer für die Kategorie innerhalb des Schmerzbereiches eingegeben.

Auch Analyseeinheiten, die vom Sinn her das Gleiche meinen, aber mit anderen Worten formuliert werden, werden als getrennte Einheiten analysiert und gezählt (siehe das Beispiel auf der Folgeseite!).

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„-9“ eingetragen, d.h. im SPSS-Programm werden alle Unterkategorien zu dem fehlenden Schmerzbereich mit „missing values“ eingegeben.

Das gleiche gilt für die Fragestellung II, wenn die Frage vergessen wurde zu stellen, wird eine „-9“ bzw. -9,00 eingegeben.

#### Beispiel:

Bei Frage IV. (wurde vom Interviewer nicht gestellt):

IV.-9

A: -9

B: -9

Alle anderen Kategorien: -9

Bei Frage II (Wie stark waren bei dir die Schmerzen?) wurde vom Interviewer nicht gestellt: -9,00 wird nun in die SPSS eingetragen und auf dem auszuwertenden Interviewblatt notiert.

### Besonderheit!

Hat ein Interviewer die Frage II gestellt, hat das Kind aber nicht geantwortet bzw. nichts auf der Skala eingestellt, vergibt man eine „0“ bzw. 0,00 und unterstellt, das Kind hat dazu nichts sagen wollen.

### 12. Regel: Antworten unter einer anderen Fragestellung

Wenn der Interviewer eine vorgesehene Frage nicht stellt und das Kind aber auf die nicht gestellte Frage unter einer anderen Fragestellung von sich aus spontan eine Aussage dazu macht, werden die Aussagen zu der nicht gestellten Frage genauso gewertet als wäre die Frage gestellt worden. Dass eine Aussage vom Kind zu diesem Schmerzbereich generiert wurde, steht im Vordergrund, nicht die vergessene Frage des Interviewers.

#### Beispiel:

Bei Ursachenbeschreibung (III.):

I.1

Kind sagt: Das tut weh, weil die Haut auf ist

I.2

III.1

III.17

IV.1

und dann können andere die Wunde reinigen.“

IV.1

Bei Bewältigungsstrategien (IV.) hat der Interviewer vergessen, die Frage zu stellen, aber das Kind hat eine Aussage dazu unter III. generiert.

→ Dann gibt man das im Schmerzbereich IV wie folgt in die SPSS - Datei ein:

IV.1

A: 0

B: 1

Für Kategorie 11 eine „1“ eingeben

Für alle anderen Kategorien eine „0“ eingeben

#### Beispiel:

Bei Schmerzursache (III.):

I.1

Kind sagt: „Phh- das sind manchmal... ja ähm, dass die Haut dann weg ist

III.17

III.3

und dann ähm stößt man auf das Fleisch und

III.18

wenn das Fleisch angegriffen wird

III.18

das tut dann schon weh.

I.2

→ Anzahl der Einheiten: für die Ursachen:

III.3

Linker Textrand!

für die Beschreibung:

I.1

Unabhängig davon, ob für gleiche Sachverhalte sich wiederholende oder gleiche Aussagen verwendet werden,

**es wird immer für jeden sinnvolle Äußerung eine Einheit vergeben und jeweils jede Einheit neu kategorisiert!!**

Auch bei Aufzählungen wird jede Aussage einzeln gezählt, d.h. wenn ein „und“ oder ein „oder“ zwischen den Aussagen steht, wird jede Aussage als eine Einheit gewertet. Hier wird formal vorgegangen, auch wenn sich das Gefühl einstellt, es handele sich um nur eine Einheit!

#### Beispiel:

Bei Bewältigungsstrategien (IV.):

Kind sagt:

„Dann spiel ich mit Mona und Tim

IV.6

IV.6

mit mir alleine

IV.6

IV.6

oder mit anderen Freunden.

IV.6

Und dann gehe ich zu meiner Mama und sage es ihr.“

IV.20

IV.14

### 11. Regel

### Vergabe der „-9“ in der SPSS-Datei

Wurde vom Interviewer eine Frage vergessen und konnte das Kind deswegen nicht auf diese Frage antworten, so wird zu jeder Kategorie dieses Schmerzbereiches eine Seite 16 des Regelsystems, Stand 06.11.2015

### 13. Regel

### Unklarheiten seitens der Rater

Bei Unklarheiten des Raters, bitte immer zur Vergewisserung in das Originalinterview hören, um sicherzustellen, ob z.B. der Interviewer oder das Kind die Aussage wirklich so getätigt hat (also Kontrolle der Transkription).

Beispiel: „Zwei hast du ja schon gesagt: man muss zur Toilette und hat zu viel Eis gegessen. Fällt dir noch eine Ursache ein?“ „Weil das ja jemand vorgeschlagen hat“

In dem abgetippten Interview ist nur „zu viel Eis gegessen“ in der Situationsbeschreibung als Ursache vom Kind abgetippt worden. Nun weiß der Rater nicht, ob das Kind „man muss zur Toilette“ wirklich gesagt hat, weil das nirgendwo steht. Also immer bei Unklarheiten nochmals ins Interview reinhören und sich vergewissern. Erst dann kann die Aussagen des Kindes werten.

### 14. Regel:

### Beurteilung im Satzgefüge

Die Einheiten bei der Kategorisierung immer im ganzen Satz / Kontext beurteilen, d.h. Beiwörter beachten.

#### Beispiel:

I.1

„Als hätte jemand rein geschlagen“

I.7

→ Schmerzbereich I, Beschreibung  
Anzahl Einheiten: 1

„Als“ zeigt, dass die Einheit in die Kategorie 7 gehört (Metapher)

„Jemand hat reingeschlagen“ → hier würde die Einheit in die Kategorie 8 eingestuft

### 15. Regel

### Auswertung bei „dasselbe“, „das gleiche“ oder „auch“

Wenn ein Kind auf die Frage: „Und was machst du ?/ Wen bittest du um Hilfe?“ mit „dasselbe“, „das gleiche“ oder „auch“ antwortet, dann wird diese Aussage auf die zuvor getätigten Aussagen bezogen und ebenfalls als so viele Einheiten gezählt und kategorisiert; und zwar mit der/ den entsprechenden Kategorien wie zuvor.

#### 1. Beispiel:

Bei Schmerzbewältigung IV.:

Kind antwortet: eine Wärmflasche drauf machen

IV.2

A = 2

B = 0

Und was machst Du? „dasselbe“

IV.9

IV.9



**2. Beispiel:**  
Bei Schmerzbindung V.:

Interviewer fragt: „Wen könnte das Kind in der Situation um Hilfe bitten?“

Kind antwortet: „Die Mutter.“ V1

Interviewer fragt: „Wen könntest du um Hilfe bitten?“

Kind antwortet: „Ja auch, oder den Vater.“ V1 V2

Insgesamt:  
V: 3  
A: 1  
B: 2  
C: 0

**16. Regel Schmerzsituation aus eigenem Erleben kennen (Kind)**

Bei der Fragestellung „Situationsbeschreibung“ wird am linken Seitenrand mit „Ja“ oder „Nein“ gekennzeichnet, ob das Kind die Schmerzen aus eigenem Erleben kennt oder nicht. Bei der Entscheidung für ein „Ja“ (Kind kennt die Schmerzen) bzw. „Nein“ (Kind kennt die Schmerzen nicht) wird wie folgt vorgegangen:

- a.) Hat der Interviewer die Frage gestellt: „Und kennst du die Schmerzen?“;  
Kind sagt: „Ja“ ->  
**Es wird ein „Ja“ links neben der Situationsbeschreibung eingetragen und in der SPSS-Datei eine 1 für die Variable „Kind kennt den Schmerz aus eigenem Erleben“ vergeben.**

- b.) **Beschreibt** das Kind die Schmerzen, die es **hat** oder die es sich **vorstellt**, **wird ebenfalls ein „Ja“ links neben der Situationsbeschreibung eingetragen und in der SPSS-Datei eine 1 vergeben.**

- c.) Gibt das Kind auf der **VAS eine Zahl für die Schmerzintensität an -> wird auch ein „Ja“ links neben der Situationsbeschreibung eingetragen und in der SPSS-Datei eine 1 vergeben.**

**Erst wenn das Kind EXPLIZIT äußert, die Art der Schmerzen NOCH NIE empfunden zu haben -> vergibt man eine „0“ für die Variable „Kind kennt den Schmerz nicht aus eigenem Erleben“.**

Es wird nur dann eine „9“ vergeben, wenn aus dem Antwortkontext nicht zu entnehmen ist, ob das Kind die Schmerzen aus eigenem Erleben kennt oder nicht.

**Beispiele:**

Interviewer: „Kennst du die Schmerzen?“

Kind: „Ja“

Es wird in die entsprechende SPSS-Spalte **eine „1“** bzw. auf dem Interviewblatt links neben der Situationsbeschreibung ein **„Ja“** eingetragen.

**Unter Fragestellung I „Schmerzbeschreibung“:**

Kind sagt: „Das drückt und schmerzt“ ->

Es wird in die entsprechende SPSS-Spalte **eine „1“** bzw. auf dem Interviewblatt links neben der Situationsbeschreibung ein **„Ja“** eingetragen.

**Unter Fragestellung II:**

Kind gibt eine Zahl von 1-10 bei der VAS an ->

Es wird in die entsprechende SPSS-Spalte **eine „1“** bzw. auf dem Interviewblatt links neben der Situationsbeschreibung ein **„Ja“** eingetragen.

**Im ganzen Interview:**

Kind: „Ich weiß nicht wie das ist. Bin noch nie vom Fahrrad gefallen“ ->

Es wird in die entsprechende SPSS-Spalte **eine „0“** bzw. auf dem Interviewblatt links neben der Situationsbeschreibung ein **„Nein“** eingetragen.

Wenn sich das Kind zu den erfragten Schmerzen zwar äußert und dann doch noch sagt, das es die Schmerzen **nicht aus eigenem Erleben kennt**, steht die konkrete Aussage, dass es die Schmerzen **nicht kennt im Vordergrund, also wird in die entsprechende SPSS-Spalte eine „0“ bzw. auf dem Interviewblatt links neben der Situationsbeschreibung ein „Nein“ eingetragen.**

**17. Regel**

**Besonderheiten bei Schmerzbeschreibungen I. (rot)**

- a.) Wenn ein Kind eine Aussage macht zum **Frage-/Schmerzbereich I., Kategorie 6 (Spezifische komplexe Kennzeichnung der Schmerzqualität) und gleichzeitig abgeschwächte (Kategorie 15) oder intensivierende Beiwörter (Kategorie 3)** hinzugefügt, **steht die spezifische komplexe Kennzeichnung der Schmerzqualität (Kategorie 6) immer im Vordergrund.**

Die Einheit „es drückt ein bisschen“ darf nicht zweimal bzw. getrennt kategorisiert werden, siehe Regel Nr.3. Es handelt sich um eine Einheit und sie wird einmal kategorisiert.

**Beispiel:**

I.3 Bei Schmerzbeschreibung (I.):

Kind sagt: „Das drückt ein bisschen“ I.6

Kind sagt: „Das sticht am Bein.“ I.6

Kind sagt: „Das zieht sehr stark.“ I.6

Die Aussagen „drückt, sticht, zieht“ stehen hier im Vordergrund und werden in Kategorie I. 6 einsortiert

- b.) Wenn ein Kind eine unspezifische Schmerzaussage macht („Das tut weh, das schmerzt.“ (Kategorie 1) und diese mit abschwächenden (Kategorie 15) oder intensivierenden Beiwörtern (Kategorie 3) kombiniert, stehen die Beiwörter jeweils im Vordergrund.

**Beispiel:**

Bei Schmerzbeschreibung (I.)

I.1 Kind sagt: „Da fühlt man ein klein bisschen Schmerz!“ I.15

Bei „klein bisschen Schmerz“ steht nun das „klein bisschen“ im Vordergrund und wird in Kategorie I.15 einsortiert

- c.) Wenn ein Kind durch Adverbien zwei Kategorien anspricht („dann schmerzt das manchmal ein bisschen“) muss eine Entscheidung getroffen werden. Im Falle des Wortes „manchmal“ tritt dieses in den Hintergrund und die eigentliche Aussage (es schmerzt ein bisschen) in den Vordergrund

**Beispiel:**

Bei Schmerzbeschreibung (I.)

I.2 Kind sagt: „manchmal tut es gar nicht weh“ I.16

„und manchmal ein bisschen!“ I.15

„tut es gar nicht weh“ steht im Vordergrund deshalb Kategorie I.16 „manchmal“ darf nicht dazu veranlassen in Kategorie I.15 einzuordnen, da nicht der Wechsel des Schmerzes im Vordergrund steht

„und manchmal ein bisschen“ hier steht die Abschwächung im Vordergrund (daher in Kategorie I.15 einsortieren), der Wechsel (evtl. angedeutet durch „manchmal“) wird nicht kategorisiert

- d.) Bei **ungenauen Aussagen** zu den **Lokalisationen der Schmerzen** steht der **Schmerz im Vordergrund**

**Beispiel:**

Bei Schmerzbeschreibung (I.):

I.2 Kind sagt: „Da tut der Bauch weh“ I.2

Kind sagt: „Da schmerzt der Kopf“ I.1

- e.) Sobald aber **genaue und spezifische Angaben** zur **Lokalisation der Schmerzen** gemacht werden, steht die **Lokalisation** der Schmerzen **im Vordergrund**

**Beispiel:**

Bei Schmerzbeschreibung (I.)

I.1 Kind sagt: „Das tut so um dem Bauchnabel herum weh.“ I.9

**18. Regel**

**Einsortieren „Mama fragen“, „Mama gehen“**

Nennt ein Kind die Aussage „Mama fragen“, „zu Mama gehen“ unter den anderen Fragestellungen **I. – III. steht die Fragestellung IV.** für die Einteilung **immer im Vordergrund!**

**Beispiel:**

Bei Schmerzbeschreibung (I.)

I.1 Kind sagt: „Das tut weh“ I.2

und dann frage ich meine Mama.“ IV.14

Bei Schmerzursache (III.)

III.1 Kind sagt: „Weil ich mir den Kopf gestoßen habe“ III.2

IV.2 und dann gehe ich zu meiner Mama“ IV.20

Ansonsten wird unter Fragestellung IV und V immer nach Regel 3 vorgegangen.

**Beispiel:**

**Bei Fragestellung IV:**

Kind sagt: „das sage ich der Mama“ IV.14

**Bei Fragestellung V:**

„Das sage ich der Mama“ V.1

**19. Regel**

**Aussagen zu anderen Personen**

Macht das **Kind Angaben zu anderen Personen Aussagen**, z.B. wie diese Personen den Schmerz empfinden oder was sie in der Situation machen, damit der Schmerz besser wird, werden alle Einheiten, die es zu den Fragestellungen I. / IV. macht, jeweils unter I.12 (Beschreibung, wie eine andere Person des Umfeldes

Schmerzen hat) bzw. unter IV.15 (Beschreibung von Bewältigungsstrategien anderer) eingeordnet.

<Regel 3: Analyseeinheiten müssen immer zuerst in die Kategorien der Frage-/Schmerzgebiete (I., III, IV., V.) eingeordnet werden, unter denen sie stehen. Erst wenn keine Kategorie dafür zur Verfügung steht, wird nach einer Kategorie unter einem anderen Frage-/Schmerzgebiet gesucht.

### Jede einzelne Analyseeinheit darf nur einmal einem Frage-/Schmerzgebiet

Und innerhalb dieses Bereiches nur einmal einer Kategorie zugeordnet werden.

#### Beispiel:

in Frage-/Schmerzgebiet I. Schmerzbeschreibung:

I.3

Kind sagt: „meine Tante hat Rheuma

I.12

und kann ihre Finger nicht bewegen

I.12

und hat ganz geschwollene Gelenke.“

I.12

#### In Frage-/Schmerzgebiet IV:

Kind sagt: „Meine Mama legt sich dann hin

IV.15

holt sich eine Kopfschmerztablette

IV.15

Und legt sich ein Kühlpack auf die Stirn.“

IV.15

IV.3  
A=0  
B=3

### Achtung!

Sobald das Kind aber beschreibt, was die anderen Personen für das Kind selbst oder für das Kind auf dem Bild machen, werden die Einheiten wie gehabt in das Kategoriensystem einsortiert.

#### Beispiel:

In Frage-/Schmerzgebiet IV. Schmerzbewältigung:

Kind sagt: „Meine Mama bringt mir eine Kopfschmerztablette

IV.10

und legt mir ein Kühlpack auf die Stirn

IV.9

und dann wird alles besser.“

IV.16

IV.3  
A=1  
B=2

### Ergänzung:

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### Beispielblatt: Essener Kinder-Schmerz-Interview:

Code-Nr. 1001		Vorname des Kindes: Maria		Erstrating	Rater 5
Geschlecht: <input type="radio"/> männl. <input checked="" type="radio"/> weibl.		Alter: 10			
Vorschule / Schulklasse: 4. Klasse					
Schmerzsituation: Fahrradunfall		Kategorien-einteilung			
<p>1. <b>Situationsbeschreibung:</b> „Was siehst Du da auf dem Bild? Beschreibe mir einmal, was da passiert ist.“ Ein Kind ist vom Fahrrad gefallen, es ist ein Mädchen und sie weint.</p>					
<p>2. <b>Schmerzbeschreibung:</b> „Die Familie Aralamos kennt keine Schmerzen. Könntest Du ihnen einmal erzählen wie sich diese Schmerzen anfühlen? Beschreibe das einmal ganz genau.“ Es brennt der Schmerz, weil man alles aufgerascht hat.</p>					
<p>3. <b>Einschätzung der Schmerzintensität:</b> a) Wie stark sind die Schmerzen wohl bei dem Kind? 73 mm b) Wie stark waren die Schmerzen bei Dir? 79 mm</p>					
<p>4. <b>Ursachenbeschreibung:</b> „Wieso tut das weh? Was glaubst Du, welches die Ursache dafür ist?“ Weil das sehr dölle blutet, weil es sich eben verletzt hat.</p>					
<p>5. <b>Beschreibung der Bewältigungsstrategien:</b> „Was kann dieses Kind wohl tun, damit es nicht mehr so wehtut?“ Vielleicht erst mal kühlen „Was hast Du getan, damit der Schmerz weniger wurde?“ Ich habe das erstmal ruhig gestellt und habe es gekühlt.</p>					
<p>6. <b>Frage nach menschlichen Bindungen:</b> „Wen könnte das Kind in der Situation um Hilfe bitten?“ Irgendwelche, die gerade in der Nähe sind oder ihre Eltern anrufen „Wen könntest Du in dieser Situation um Hilfe bitten?“ Irgendjemand, der vorbei kommt oder meine Eltern</p>					

Beachte hier Regel 3 und 18!

Die Einheit: „Und dann wird alles besser“ bezieht sich auf das **Kind selbst** oder auf das **Kind auf dem Bild** und wird deshalb zu den Aussagen des Kindes gezählt, also IV.3; A=1, B=2.

### 20. Regel

### Verneinende Aussagen

Macht das Kind Angaben bei der Fragestellung I. Schmerzbeschreibung, wie die Schmerzen nicht sind, werden diese Einheiten **nicht gewertet**.

#### Beispiel:

in Frage-/Schmerzgebiet I:

Kind sagt: „Das ist kein stechender Schmerz, es drückt

I.6

→ Insgesamt 1 Einheit

Kind sagt: „Das ist nicht wirklich drückend.

→ Insgesamt 0 Einheiten

Kind sagt: „Die sind nicht wie Zahnschmerzen.“

→ Insgesamt 0 Einheiten.

### 21. Regel

### Besonderheiten zur Schmerzbewältigung (IV.)

Unter dem Schmerzgebiet IV werden alle Aussagen unter IV.A eingeordnet, die sich auf das **Kind auf dem Bild** und auf **das interviewte Kind selbst** beziehen. Ebenso wird verfahren mit zitierten Aussagen **anderer Personen in Bezug darauf, was das Kind selbst machen kann**

#### Beispiel:

Kind sagt: „Mama sagt ich soll mich ausruhen“

IV.2

IV.1  
A=1  
B=0

Unter IV. B werden alle Aussagen eingeordnet, die eine andere Person selbst macht oder die eine andere Person für das Kind macht.

#### Beispiel:

Interviewer fragt: „Was fällt der Mama noch so ein?“

Kind sagt: „Ich soll mich hinlegen

IV.2

IV.2  
A=1  
B=1

und sie bringt mir ein Kühlpack.“

IV.9



## 7.5

## Error analysis between first and second Coder for abdominal pain

Kat-Nr.	Kategorien		Kindliche Äußerung	Erst-rater	Zweit-rater	Resultat	Fehlerkommentar	Bewertung des Fehlers und Konsequenz darauf
1.	1. Fehler	6584	"vom Essen..."	III.11	III.1	III.1	Zweittrater falsche Kategorie gewählt	Regelverstoß korrigieren
2.			kein Fehleintrag					
3.			Kind sieht Ursache der Bauchschmerzen in Gewalteinwirkung von außen (Menschen)					
	1. Fehler	1016	"kloppen sich dann ganz doll"	(-)	III.3	III.3	sinngemäß zusammengehören	Regelverstoß korrigieren
	4. Fehler	6093	"wenn die sich jetzt auf den Bauch drücken wenn die sich auf den Bauch drücken"	III.3	III.2	III.3	falsche Kategorienzuordnung durch Zweittrater	Regelverstoß korrigieren
		6228	"wenn man zu viel isst"	III.11	III.11	III.11	richtig	Regelverstoß korrigieren
	5. Fehler	6228	"zuerst Salat isst und dann hinterher ganz schnell Süßigkeiten"	III.11	III.11	III.11	beide Aussgen zusammen ergeben eine sinnvolle Einheit, Fokus liegt auf dem schnell hinterheressen	in Kategorie 11 bei Erstrater 3 durch 2 ersetzen
4.			Kind sieht Ursache der Bauchschmerzen in Gewalteinwirkung von außen (medizinische Instrumente, Gegenstände)					
4.	2. Fehler	2012	"wenn man eine ganz enge Hose anhat"	III.4	III.12	III.4	falsche Kategorienzuordnung durch Zweittrater	Regelverstoß korrigieren
	3. Fehler	6097	"wenn die Hose drückt"	(-)	III.12	III.4	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
	4. Fehler	6368	"wenn man auf dem harten Sofa liegt"	III.12	III.4	III.4	falsche Kategorienzuordnung durch Erstrater	Regelverstoß korrigieren
5.			Kind sieht Ursache der Bauchschmerzen durch eine medizinische Behandlung bedingt					
			keine Fehleintrag					
6.			Kind sieht die Bauchschmerzen bedingt durch eine Erkrankung / Medikament					
	1. Fehler	1013	"da hab ich den ganzen Teller sauber gemacht <leer gegessen>"	(-)	III.6	III.11	Erstrater sinnvolle einheit nicht gewertet	Regelverstoß korrigieren
	3. Fehler	1080	"wenn man sich schlecht fühlt"	III.6	III.9	III.6	Zweittrater falsche Kategorie gewählt wird gedeutet im Sinn von krank fühlen	Regelverstoß korrigieren (siehe Beispiel Kategoriensystem)
	4. Fehler	6350	"weil die Blase dann so weh tut"	III.6	(-)	III.6	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
7.			Kind sieht die Bauchschmerzen durch Angst (z.B. vor Erkrankungen / Medikamenten) bedingt					
7.	1. Fehler	6052	"weil sie Angst hat..."	III.9	III.7	III.7	siehe Kategoriensystem Beispiel	Regelverstoß korrigieren
8.			Kind sieht die Bauchschmerzen bedingt durch kognitive Beanspruchung					
			kein Fehleintrag					
9.			Kind sieht die Bauchschmerzen durch emotionalen Stress verursacht					
			kein Fehleintrag	0	1	0		1 durch 0 ersetzen
10.			Kind sieht die Bauchschmerzen durch körperliche Überanstrengung verursacht					
	1. Fehler	1070	"wenn man immer läuft ..."	(-)	III.10	III.10	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
	5. Fehler	6533	"dann ist die gerannt und dann tut der Bauch ja auch ein bißchen weh"	III.13	III.10	III.10	zu werten im Sinne von körperlicher Überanstrengung	Regelverstoß korrigieren
11.			Kind sieht Ursache der Bauchschmerzen durch Ernährung bedingt					
	1. Fehler	1011	"was trinken und kurz darauf ein Eis essen"	III.11	III.11	III.11	Erstrater wertet eine Einheit, weil beide Aussagen sinngemäß zusammengehören	Einheitenfrage
	2. Fehler	1018	"immer wenn ich trinke"	(-)	III.11	III.11	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
	4. Fehler	1074	wenn man zu viel gegessen hat oder zu viel trinken	III.11	III.11	III.11	richtig	
	5. Fehler			(-)	(-)	III.11	Erst- und Zweittrater nicht gewertet	Regelverstoß korrigieren
	9. Fehler	1080	"wenn ich viel durcheinandergegessen hab z. B. Pudding und dann"	III.11	III.11	III.11	richtig	
			habe ich hinterher noch Tomaten gegessen	III.11	III.11	III.11	Pudding und Tomaten gehören zusammen in eine Sinneinheit, deshalb nur 1 Einheit zu werten	3 bei Erstrater ersetzen durch 2
	11. Fehler	1084	"eine Nachbarin hatte eine ganze Schachtel Nüsse mit Schokolade gegessen"	III.15	(-)	III.15	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
	14. Fehler	6011	"zu viel Mittagessen, zum Beispiel Spagethi"	III.11	III.11	III.11	nur eine Einheit zu werten, Beispiel ergänzt Aussage	4 durch 3 ersetzen
				(-)	III.11	(-)		
	15. Fehler	6067	"da hab ich Zwieback gegessen"	III.11	(-)	III.11	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
	16. Fehler	6067	"... ganz viel gegessen"	III.11	(-)	III.11	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
	17. Fehler	6100	"da waren so ein paar Sachen unreif und ich habe die dann gegessen"	III.11	III.11	III.11	unreife Sachen essen macht Bauchschmerzen zusammen eine sinnvolle Einheit	Regelverstoß korrigieren
				III.11	(-)	(-)		
	18. Fehler	6239	vielleicht hat ich das übergegessen	III.11	III.11	III.11	richtig	
			zu viel ..	III.11	(-)	III.11	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
			zu schnell	III.11	(-)	III.11	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
	19. Fehler	6240	"zu hastig getrunken"	III.11	III.13	III.11	siehe Kategoriensystem Beispiel	Regelverstoß korrigieren
	20. Fehler	6313	"ein Mädchen hat gerade gegessen und deswegen Bauchschmerzen"	(-)	III.11	III.11	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
23. Fehler	6584	"vom Essen..."	III.11	III.1	III.11	Zweittrater falsche Kategorie gewählt	Regelverstoß korrigieren	
12.			Kind sieht die Bauchschmerzen durch Umgebungsbedingungen verursacht					
			kein Fehleintrag					
13.			Kind sieht Ursache der Bauchschmerzen in verhaltensbedingten Auslösern					
			kein Fehleintrag					
14.			Kind sieht die Bauchschmerzen durch Verstöße gegen Normen und Werte verursacht					
			kein Fehleintrag					
15.			Kind nennt beschreibt die Ursache der Kopfschmerzen mit dem Erleben und Verhalten anderer Personen					
			kein Fehleintrag					
16.			Kind nennt keine spezifische Ursache für die Bauchschmerzen					
	1. Fehler	1082	Tippfehler in Zweittraterdatei	0	1	0		1 durch 0 ersetzen
	2. Fehler	2004	"weiß ich nicht" (wann tut das weh?)	III.16	(-)	III.16	die Ursachenfrage steht im Vordergrund	nur eine Einheit unter
			irgendwann	(-)	III.1		irgendwann wird vom Kind gesagt aufgrund von spezifischer Nachfrage (wann?) und gehört zur Schmerzbeschreibung	Ursache zu werten Zufälligkeit des Auftretens ist eher Schmerzbeschreibung
17.			Kind beschreibt eine sichtbare Reaktion des Körpers als Ursache für die Bauchschmerzen					
			kein Fehleintrag					
18.			Kind formuliert als Ursache für Bauchschmerzen medizinisches Wissen / Beschreibung von Körpervorgängen					
	4. Fehler	1087	"wenn man jetzt trinkt und ganz viel Luft dabei schluckt"	(-)	III.11	(-)	der Vorgang des Trinkens und des dabei Luft-schnappens ist gemeint, nicht Ernährungsaspekt	Regelverstoß korrigieren
	5. Fehler	6067	"und das dann in den Kopf gekommen ist <Wasser>"	III.18	(-)	III.18	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
	6. Fehler	6093	"dass das so'n bißchen rumfliegt <Luft im Bauch>"	(-)	III.18	III.18	sinnvolle Einheit von Erstrater nicht geratet	Regelverstoß korrigieren
	7. Fehler	6362	"...und dann platzen die..." (Blasen im Bauch)	III.18	(-)	III.18	sinnvolle Einheit vom Zweittrater nicht gewertet	Regelverstoß korrigieren
	8. Fehler	6575	"Dreck reinigt den Magen"	III.18	(-)	III.18	sinnvolle Einheit vom Zweittrater nicht gewertet	Regelverstoß korrigieren
	9. Fehler	6601	"der Magen kann nicht richtig verdauen"	III.19	III.18	III.18	falsche Kategorienzuordnung durch Erstrater	Regelverstoß korrigieren
	10. Fehler	6633	"weil das verstopft ist im Bauch"	III.19	III.18	III.18	falsche Kategorienzuordnung durch Erstrater	Regelverstoß korrigieren
				Kind nennt physiologische Grundbedürfnisse / Körpervorgänge als Ursache für Bauchschmerzen				
19.	1. Fehler	1075	"wenn man mal A-A muss dann muss man auch öfter A-A"	III.19	III.19	III.19	richtig	
2. Fehler	6054	"vielleicht hat es noch nichts gegessen"	III.11	III.19	III.19	falsche Kategorienzuordnung durch Zweittrater	Regelverstoß korrigieren	
3. Fehler	6235	"wenn man nichts gegessen hat"	III.11	III.19	III.19	falsche Kategorienzuordnung durch Zweittrater	Regelverstoß korrigieren	
Z.			Aussage des Kindes ist nicht einzuordnen					
			kein Eintrag					



## 7.6 Error analysis between first and the second Coder for headache

Kat-Nr.	Kategorien	VPNR	Kindliche Äußerung	Erst-rater	Zweit-rater	Resultat	Fehlerkommentar	Bewertung des Fehlers und Konsequenz darauf
<b>Kind sieht Ursache der Kopfschmerzen durch Zufall bedingt</b>								
1.	1. Fehler	8048	Tippfehler in Erstraterdatei	K1:1	K1:0	0	Tippfehler	Korrigieren
		8247	wenn man mit dem Kopf hinfällt	K2:0	K2	K2	Tippfehler	Korrigieren
	2. Fehler	8706	die können auch ganz plötzlich kommen	K1	J.	K1	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
<b>Kind sieht Ursache der Kopfschmerzen durch einen Unfall bedingt</b>								
2.	1. Fehler	1038	Ein gegen den Kopf gekriegt	K2	J.	K2	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	2. Fehler	8066	wenn man irgendwo mit dem Kopf gegengehauen ist	K4	K2	K2	keine Gewalteinwirkung durch Instrumente	Korrigieren
		8066	z. B. so gegen einen Schrank oder so	K4	K2	K2	keine Gewalteinwirkung durch Instrumente	Korrigieren
		8067	man kann gegen einen Baum gelaufen sein	K4	K2	K2	keine Gewalteinwirkung durch Instrumente	Korrigieren
		8067	oder gegen eine Laterne gelaufen sein	K4	K2	K2	keine Gewalteinwirkung durch Instrumente	Korrigieren
		8144	wenn man den Kopf so hin und her bewegt	K2	K13	K2	schmerzhafter Vorgang wird beschrieben	Korrigieren
	3. Fehler	8511	wenn man irgendwo vorgelaufen ist	K2	K12	K2	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
		8548	auf den Kopf gefallen	J.	K2	K2	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	4. Fehler	8667	auf den Kopf geschlagen wurde	K2	K3	K2	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
3.	1. Fehler	8706	so wie der Junge, der hingefallen ist	K2	J.	K2	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
		8728	einen davor gekriegt	K2	K3	K3	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	<b>Kind sieht Ursache der Kopfschmerzen in Gewalteinwirkung von außen (Menschen)</b>							
	1. Fehler	8540	Wenn man Schläge	K4	K3	K3	Gewalteinwirkung von außen durch Menschen	Falsche Kategorie gewählt
		8540	so Schläge auf den Kopf bekommen hat	K4	K3	K3	Gewalteinwirkung von außen durch Menschen	Falsche Kategorie gewählt
4.	2. Fehler	8706	auch wenn man da dransfasst	K3	K12	K3	falsche Kategorie, keine Umgebungsbedingung	Korrigieren
	3. Fehler	8706	so am Hinterkopf haut	K3	J.	K3	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	4. Fehler	8601	einen Stein am Kopf gekriegt	K3	J.	K3	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	<b>Kind sieht Ursache der Kopfschmerzen in Gewaltwirkung von außen (medizinische Instrumente, Gegenstände)</b>							
	1. Fehler	8103	oder was gegen den Kopf bekommen	K4	K2	K4	falsche Kategorie: Gewalteinwirkung von außen	Korrigieren
5.	2. Fehler	8305	wenn man mit dem Kopf gegen Laterne	K4	K2	K4	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	3. Fehler	8313	Einer Steinschlicht gemacht	J.	K4	K4	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	4. Fehler	8313	Gegen Wand hingefallen sein	K4	J.	K4	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	5. Fehler	8538	so ein Ruck geworden (Gegenstände)	K2	K2	K4	Einwirkung von außen gegenstände	Falsche Kategorie gewählt
		8538	irgendwo gegengestossen	K4	K2	K4	Einwirkung von außen gegenstände	Falsche Kategorie gewählt
6.		8538	Wahrscheinlich irgendwo gegengestossen	K4	K2	K4	Einwirkung von außen gegenstände	Falsche Kategorie gewählt
	<b>Kind sieht Ursache der Kopfschmerzen durch eine medizinische Behandlung bedingt</b>							
	<b>In dieser Kategorie gab es keine Fehler</b>							
	<b>Kind sieht die Kopfschmerzen durch Erkrankung / Medikamente bzw. deren Nebenwirkungen bedingt</b>							
	1. Fehler	8374	Wenn man Fieber hat	K19	K6	K6	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
7.	2. Fehler	8667	weil er krank	K6	K19	K6	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	3. Fehler	8667	weil man krank ist	K6	K19	K6	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	4. Fehler	8667	wenn ich krank bin	K6	K19	K6	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	5. Fehler	8719	hat die ja auch Fieber	K19	K6	K6	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
8.	<b>Kind sieht die Kopfschmerzen durch die Angst vor Erkrankungen / Medikamenten bedingt</b>							
	<b>In dieser Kategorie gab es keine Fehler</b>							
	<b>Kind sieht die Kopfschmerzen bedingt durch kognitive Beanspruchung</b>							
	1. Fehler	8109	weil man zu lange auf eine Stelle geguckt	K8	K10	K8	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	2. Fehler	8109	Ganz lange auf ein Blatt gucken	K8	K10	K8	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
9.	3. Fehler	8109	wenn ich das nicht rausfinde	K8	J.	K8	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	4. Fehler	8109	wenn es zu lange auf eine Stelle geguckt	K8	J.	K8	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	5. Fehler	8109	wenn man zu lange Gameboy spielt	K13	J.	K13	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	<b>Kind sieht die Kopfschmerzen durch emotionalen Stress verursacht</b>							
	1. Fehler	8247	wenn man heult kommt das meistens	L11	L11	III.9	in erster Priorität da raten, wo es steht	Regelverstoss korrigieren
10.	<b>Kind sieht die Kopfschmerzen durch körperliche Überanstrengung verursacht</b>							
	1. Fehler	8093	Hat man den ganzen Tag nur gearbeitet	K8	K10	K10	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	2. Fehler	8093	Vielleicht die ganze Zeit nur geschrieben	K8	K10	K10	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	3. Fehler	8093	mit dem Kopf nur nach unten gehangen	K10	J.	K10	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	4. Fehler	8706	die kriegt man durch Durchschüttel	J.	K10	K10	sinnvolle Einheit nicht gewertet	Korrigieren
11.	5. Fehler	8300	Wenn man zuviel schreit	K13	K10	K10	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	6. Fehler	8300	Wenn man zuviel tobt	K13	K10	K10	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	7. Fehler	8707	wenn man zuviel tobt	K13	K10	K10	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	<b>Kind sieht die Ursache der Kopfschmerzen durch Ernährung bedingt</b>							
	<b>In dieser Kategorie gab es keine Fehler</b>							
12.	<b>Kind sieht die Kopfschmerzen durch Umgebungsbedingungen verursacht</b>							
	1. Fehler	8152	wenn es zu kalt ist	K6	K12	K12	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	2. Fehler	8152	wenn man den Schnupfen hochzieht	K6	K13	K6	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	3. Fehler	8317	Es war so laut	J.	K12	K12	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	4. Fehler	8350	Wenn Jemand laut geschrieben hat	K12	J.	K12	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
13.	5. Fehler	8526	Wenn das immer so Warm	K12	J.	K12	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	6. Fehler	8581	weil alle so laut	K12	J.	K12	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	7. Fehler	8720	In der heissen Sonne	K12	J.	K12	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	8. Fehler	8738	zu laut	K12	J.	K12	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	<b>Kind sieht Ursache der Kopfschmerzen in verhaltensbedingten Auslösern</b>							
14.	1 Fehler	8706	Tippfehler in Erstraterdatei	K13:1	K13:0	0	kein Eintrag	Tippfehler korrigieren
	2. Fehler	8350	Dann kommt die Kälte ja an den Kopf	K13	J.	K13	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	3. Fehler	8548	hat wohl blinde Kuh gespielt	K13	J.	K13	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	4. Fehler	8738	zuviel Musil gehört	K13	K12	K13	sinnvolle Einheit nicht gewertet	Falsche Kategorie gewählt
	<b>Kind sieht die Kopfschmerzen durch Verstöße gegen Normen und Werte verursacht</b>							
15.	<b>In dieser Kategorie gab es keine Fehler</b>							
	<b>Kind nennt beschreibt die Ursache der Kopfschmerzen mit dem Erleben und Verhalten anderer Personen</b>							
	<b>In dieser Kategorie gab es keine Fehler</b>							
	<b>Kind nennt keine spezifische Ursache für die Kopfschmerzen</b>							
	1. Fehler	8348	Das weiss ich nicht	K16	J.	K16	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
16.	2. Fehler	8658	Weiss ich nicht	K16	J.	K16	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	<b>Kind beschreibt eine sichtbare Reaktion des Körpers als Ursache für die Kopfschmerzen</b>							
	<b>In dieser Kategorie gab es keine Fehler</b>							
	<b>Kind formuliert als Ursache für Kopfschmerzen medizinisches Wissen / Beschreibung von Körpervorgängen</b>							
	1. Fehler	8374	Gehirnerschütterung	K18	K2	K18	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
17.	2. Fehler	8706	wenn an die Wunde Luft dran kommt	K18	J.	K18	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	3. Fehler	8548	Kleine Platzwunde geholt	K18	J.	K18	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
	<b>Kind nennt physiologische Grundbedürfnisse / Körpervorgänge als Ursache für Kopfschmerzen</b>							
	1. Fehler	8581	weil er Fieber hat	K19	J.	K19	sinnvolle Einheit nicht gewertet	Regelverstoss korrigieren
18.	<b>Aussage des Kindes ist nicht einzuordnen</b>							
	<b>In dieser Kategorie gab es keine Fehler</b>							
	<b>In dieser Kategorie gab es keine Fehler</b>							
	<b>In dieser Kategorie gab es keine Fehler</b>							
	<b>In dieser Kategorie gab es keine Fehler</b>							
19.	<b>In dieser Kategorie gab es keine Fehler</b>							
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Z.	<b>In dieser Kategorie gab es keine Fehler</b>							
	<b>In dieser Kategorie gab es keine Fehler</b>							
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	<b>In dieser Kategorie gab es keine Fehler</b>							

## **8. Acknowledgments**

I would like to thank Professor Dr. H. C. Diener from the depth of my heart for giving me the opportunity to conduct my doctoral thesis in the clinic of Neurology at University hospital Essen of the University of Duisburg-Essen.

Furthermore, I am thankful to Dr. G. G. Ostkirchen for supporting me during the experimental part of the thesis and especially for her moral and excellent technical support during the whole period of my thesis.

I remain thankful to PD Dr. Christian Von Bodman and Prof. Dr. Joachim Noldus for entire support and encouragement.

I appreciate and thank to all the children involved in this research work and I appreciate their parents as well for their wonderful management during Essen children pain interview.

I also thank to my wife and my children specially Emir-Luckmann and Kadir-Iqbal for supporting me to complete my Doctoral Thesis. I extend my thank to my mother, my whole family and friends for their prayer and moral support.

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