The Role of Extra-Curricular Sport Practice as a Potential Buffer against Social Anxiety Symptoms in Children

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Annemarie Schumacher Dimech
Malta
Matrikel-Nr.: 09-130-881

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Bern, den 14. Oktober 2010 Der Dekan: Prof. Dr. Roland Seiler

Foreword

The possible influence of sport involvement on children's social anxiety symptoms is a scarcely researched issue. This project allowed me to delve into a topic that has long intrigued and interested me. This study was carried out with the objective of shedding some light on the potential relationship between extra-curricular sport and social anxiety as well as to stimulate further investigations in this area of study. I feel fortunate for having been given the opportunity to investigate this topic and of receiving the help and resources necessary for this project to be conducted.

It is a pleasure to thank those who helped make this dissertation possible. First and foremost, I would like to express my gratitude and appreciation to my tutor, Prof. Dr. Roland Seiler, for his constant support and guidance, invaluable advice as well as for his vital encouragement during the difficult phases of this project. A word of thanks also goes to the Eidgenössische Sportkommission (ESK) for supporting this project as well as to Prof. Dr. Franz Caspar, this dissertation's co-referent.

I am also indebted to the professors and colleagues at the University of Berne's Institute of Sport Science, for their words of support and inspiration, and especially for contributing to a pleasant and friendly working atmosphere, making my work and study experience a very positive one. I would like to mention here two persons in particular: Prof. Dr. Achim Conzelmann and Dr. Jürg Schmid, whose knowledge and assistance have been of great value.

I would also like to thank Dr. Vladeta Ajdacic-Gross from the Psychiatric Clinic of the University of Zurich for taking interest in my project and for his valuable advice.

The cooperation and interest shown by the children and parents and teachers, as well as the school authorities and heads of school, who took part in this study, need also be mentioned. This study would not have been possible without their participation and my deep gratitude goes to them.

A word of appreciation goes to my parents who instilled in me a thirst for knowledge and encouraged me throughout my studies and career.

Last, but definitely not least, my heartfelt thanks and appreciation go to my husband, Thomas Schumacher, for his unfailing support and continuous encouragement throughout the whole process. Thomas, this work is dedicated to you.

Gattikon (Switzerland), 7th July 2010 Annemarie Schumacher Dimech

Abstract

Social anxiety (SA) is characterized by high anxiety in social situations and can be significantly debilitating in its long-term duration. In children's case it additionally has a negative impact on the child's social and cognitive development. As reported in Wipfli, Rethorst and Landers' (2008) meta-analysis, exercise does have an anxiolytic effect. In this study, the role of sport as a mediating variable in the onset or development of SA symptoms is investigated, where a similar effect on this specific anxiety-type is expected. This repeated-measures cohort study includes two data collections. The first data collection was carried out in 2007. Two hundred and eight 7- to 8-year old Swiss primary school children participated in structured interviews. Parents and teachers completed questionnaires regarding children's SA symptoms and classroom behaviour respectively. Parents also provided information about their children's extra-curricular sport activities. The same information was gathered a year to 18 months later. Although most differences were not statistically significant a pattern emerged: Children practising sport scored consistently lower on all instruments at both time 1 and 2. MANCOVA indicated a reduction in later social anxiety in children practising a team sport than their individual sport counterparts. These results are interpreted in reference to a potential positive effect of team sport on a child's experience of anxiety in social situations based on the salutogenesis model and the social learning theory.

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1. Introduction

The 10-year old James[1] looks at himself in the mirror while combing his hair. He looks pale and beads of sweat are gathering on his forehead. His hands are shaking and he feels an uncomfortable sensation in his stomach which is usually the prelude to him being sick. He had slept badly that night and just could not stop worrying about today's event. He wonders whether he will be able to stay as long as the other children for once. He will try to stay on at least until his friend Matthew[1] blows out the candles on his birthday cake and hopes he won't make a fool of himself in front of the other children.

This is a typical description of a child suffering from social anxiety disorder or social phobia. The terms social anxiety disorder and social phobia are used interchangeably in the *Diagnostic and Statistical Manual of Mental Disorders* (4th edition, text revision; *DSM-IV-TR*; American Psychiatric Association, APA, 2000) and will hence be used accordingly in this study. Social anxiety disorder is not as well-known as depression or other similar major psychological disturbances. However, this specific anxiety disorder is more prevalent than one may believe and has often devastating effects on not only an individual's life but also on his/her close family and friends' quality of life. Social anxiety disorder or social phobia involves a fear of negative judgment and public embarrassment related to social and performance situations, which in turn leads to avoidance and fear of social situations (*DSM-IV-TR*; APA, 2000). This same fear of scrutiny and social interactions frequently keeps socially anxious individuals from seeking professional help, thus creating a vicious circle for the sufferer. Montgomery (1998, p. S17) states that social phobia "is thought to be the commonest anxiety disorder". Furthermore, this disorder has also been claimed to be "among the most common of childhood psychiatric disorders" (Alfano, Beidel & Turner, 2006).

Various risk factors for social anxiety disorder have been identified and investigated. The most frequently mentioned risk factors besides the hereditary ones, are behavioural inhibition and shyness in childhood, as well as traumatic social experiences amongst others. Variables that could act as a buffer/protective factor against social anxiety have also been examined even though to a lesser extent. In the present study, the potential influence of sport participation on social anxiety symptoms shall be explored using a longitudinal research design. Further to findings documenting the beneficial influence of sport and exercise on various psychological factors, this investigation aims to examine the potential buffering effect of extra-curricular sport participation with regards to symptoms of social anxiety in primary school children. Furthermore, sex differences and the possible differences in influence of team and individual sport shall be looked into as well.

1.1. Physical Activity and Mental Health Promotion

Early intervention aimed at preventing mental illness in addition to promoting good health and quality of life is prominent in all health policies across cultures (World Health Organisation (WHO; 2003). Evidence of a positive relationship between physical activity and mental health has been reported by various studies. Likewise the relationship between physical activity and healthy living is now widely recognized (WHO, 2003). Indeed, the WHO recommends at least 30 minutes of daily moderate physical activity to enhance and maintain good physical health. Similar findings have been observed in studies focusing on particular psychological complaints, such as depression and anxiety, where exercise has also

[1] Names are fictitious

been promoted as a potential intervention in clinical populations (e.g. Brown, Welsh, Labbé, Vitulli and Kulkarni, 1992; Daley, 2002). Literature looking into the association between physical activity and social anxiety is however, still as yet scarce. For this reason it is of interest in the present study whether sport's beneficial effects could also be extended to specific anxiety disorders, in this case, social anxiety in children.

1.2. Changes in Childhood and Psychological Consequences

Brinkhoff and Sack (1999) argue that children nowadays face more psychosocial stressors than in the past and this leads to more stress and stress-related pathologies. They maintain that children's conditions for growing and developing have changed. Consequently children need to handle and sort out these rapid changes with the help of various social agents, which are not always consistent in their messages. All this is experienced by children together with the social pressure to adapt as quickly as possible as well as to achieve adequate qualifications for a successful adult life. Apart from creating opportunities for today's children, these changes and new challenges however, also generate new stressors in their daily life. Indeed, Brinkhoff and Sack state "Kindersein ist kein Kinderspiel mehr [Being a child is no longer child's play]" (p.10). In line with Brinkhoff and Sack's observations, the WHO (2003) promotes the benefits of play and sports to counteract the "risks and harm caused by the demanding, competitive, stressful and sedentary way of life that is so common in young people's lives today" (p.4). Indeed, the European Union's working group "Sport and Health"'s (2008) guidelines of physical activity points out that daily habits and trends in childhood are changing and 40% to 60% of the EU population now lead a sedentary lifestyle.

Brinkhoff and Sack (1999) also mention new trends in childhood that emerged in these last decades, such as, new consumption trends leading to more social inequality and an increased exposure to the ever-growing media. They argue that these new trends lead to an over-stimulation where children reach adulthood and/or are exposed to adult situations and information at an early age. The authors report statistics of an increase in physical symptoms among children in Germany, such as headaches and abdominal pain as well as psychosomatic symptoms such as nervousness and sleep disturbances. They link this increase in physical and psychosomatic complaints to the changes in childhood trends. Brinkhoff and Sack also mention new factors that children back in the 1960s did not have to deal with so frequently; for instance, many more children in Germany do not have siblings nowadays, an increased number of children experience their parents' separation and/or divorce, more children grow up with a single parent, etc. Any one of these leads to an increase in responsibilities or even psychological burdens for the children. These phenomena are not only found in Germany but appear to be the current trends in modern, Western cultures.

Unfortunately, the more 'modern' a country becomes the less physical activity is required. In an analysis using the European Health and Behaviour Survey data, a low prevalence of leisure time physical exercise in young adults was observed (Steptoe et al., 1997). In another survey carried out with 1000 German adolescents aged between 14 and 18 years about 50% of the sample reported to have never or seldom participated in a sports activity (Kirkcaldy, Shephard & Siefen, 2002). This is reflected in children's play time activities where an increasing number of children as well as adults spend most of their free time on the internet or playing video games. Interestingly, Yang (2001) investigated the relationship between computer use and socio-psychiatric characteristics in adolescents. Excessive users were found to experience deterioration in their social relationships as well as physical symptoms, conflict with family members, less sleeping hours and a drop in school performance. This may provide one

possible reason for the higher prevalence of social anxiety found in younger people by Furmark (2002).

Brinkhoff and Stack (1999) claim that studies involving adolescents tend to overshadow scientific investigations including children. Similarly in to the field of sport science, few studies in the past have dealt with sport scientific questions in early and middle childhood apart from those studies focusing on motor skills and development. Adolescents tend to be given more attention in sport science and reasons for this may differ. It could be due to practical, methodological reasons, since adolescents are able to provide more reliable information and can usually complete questionnaires, inventories and other tests independently. Furthermore, many social phenomena such as aggression and delinquency, dropping out from sport clubs/teams, are closely related to the adolescent phase. Still, investigating such themes at an earlier age may very well shed light and provide useful information about such phenomena and their development.

1.3. Physical activity, Exercise and Sport: Definitions and Differentiations

Physical activity is a general term defined in terms of physical movement resulting in energy expenditure above resting level (Biddle & Mutrie, 2001). Physical activity is associated with physical fitness and the activities falling under this definition are many. Biddle and Mutrie find the differentiation between physical activity and exercise to be a rather difficult task since these two concepts overlap. They define exercise as"more structured leisure-time physical activity" (p. 7) such as recreational sport participation. Hence, the main difference between exercise and physical activity appears to be in its structure and repetitive movements. Salmon (2001) also distinguishes between physical exercise and physical activity where physical exercise involves a regular, structured leisure-time pursuit while physical activity can happen in various situations even during domestic or occupational tasks.

Various definitions of sport have been presented. Biddle and Mutrie (2001) view sport as a subcomponent of exercise, which includes rules, structure, gross motor movements based on strategy and also has a competitive element. However, this definition excludes the relatively new concept of "health sport", such as Pilates, which is also structured and regulated but usually lacks the competitive aspect. This type of sport shares most of the characteristics of the traditional sport activities; however, the focus or purpose of the participants differs. Health sport has emerged in recent years further to an increased awareness of positive health behaviours as well as the inclusion of sport in rehabilitation, for example, after cardiac surgery.

The World Health Organisation (2003) provides a visual representation to illustrate the differentiation between these different types of activity. A distinction is made between four major types of physical activity: active living, activity for health, exercise for fitness and training for sport. These categories are not completely separate from each other and some overlap does exist depending on the specific type of activity as well as the individual's objectives and motivation.

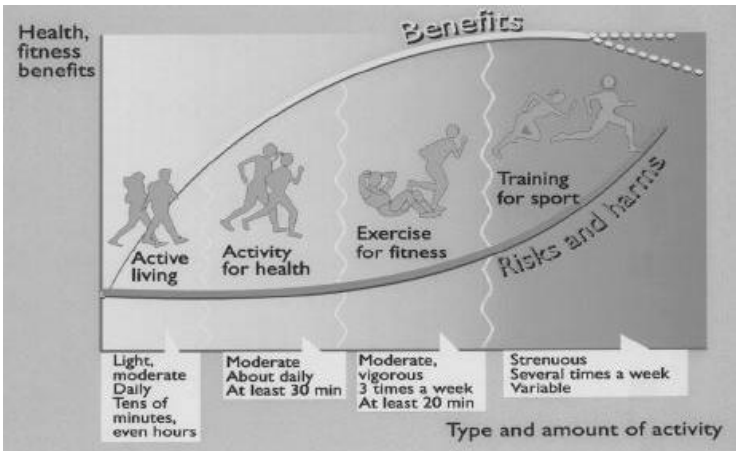

Figure 1.1. Different types of physical activity. Adapted from "*Health and Development through Physical Activity and Sport*," by World Health Organisation, 2003, p.3. Copyright by the World Health Organisation 2003.

Competitive sport falls under a category of its own, especially in conjunction with mental health. The psychological benefits of competitive sport also depend on the experience of success, thus, this area of sports shall not be explored any further due to its little relevance to the present study. This study focuses on the organised extra-curricular sport activities for children, which also include an element of adult supervision.

1.4. Social Anxiety Disorder: A Definition

Social phobia is also known as social anxiety disorder and refers to a "marked and persistent fear of social or performance situations in which embarrassment may occur" (*DSM-IV-TR*; APA, 2000, p.450). Social performance does not only include intentional actions, such as reading in class, but also performing tasks during which there is the possibility of being observed like, for instance eating in a restaurant. An individual suffering from this disorder actively avoids particular social situations where s/he may be evaluated or criticized by others or where the risk of public embarrassment exists. A main characteristic of social anxiety disorder is a marked fear of being judged negatively resulting in public embarrassment or humiliation (Davison & Neale, 1998). It is usually accompanied by physical symptoms such as sweating, blushing, trembling, etc. (Fehm, Pelissolo, Furmark & Wittchen, 2005). The DSM-IV-TR (APA, 2000) also mentions an element of anticipatory anxiety, which may occur far in advance of the upcoming social event. The physical symptoms themselves could lead to increased distress and may even escalate into a panic attack (Keller, 2003). For example, Crozier (2010) explains how the awareness of blushing can induce or intensify feelings of anxiety. The prevalence rate of social phobia varies between 2% to 15% and tends to be higher in younger adults (Furmark, Tillfors, Everz, Marteinsdottir, Gefvert & Fredrikson, 1999; Keller, 2003). However, prevalence figures rely on the definition of social anxiety, the identification or diagnostic criteria used and cultural differences.

A more detailed definition and description of social anxiety disorder will be presented in the next chapter along with related issues, including this disorder's epidemiology and aetiology with particular focus on children.

1.5. Aim of this Study

This study's main purpose is to explore the potentially positive influence of extra-curricular sport practice on social anxiety symptoms in primary schoolchildren. Since sport has been reported to have positive effects on various mental and physical aspects a similar beneficial influence of sport practice on social anxiety symptoms is anticipated. This effect is hypothesised to occur via two pathways: Firstly, there is the documented beneficial influence of sport on both mental health and general anxiety in adults as well as younger populations (e.g. Raglin, 1997; Steptoe & Butler, 1996; Wipfli, Rethorst & Landers, 2008). Sufficient evidence has been presented indicating the positive effects of sport and exercise on our general mental health, besides, as particularly relevant in this study, the anxiolytic effect of sport. Thus, a similar effect is expected with regards to social anxiety. And secondly, further to the widely reported social benefits of sport (e.g. Findlay & Coplan, 2008; Goudas & Magotsiou, 2009), sport participation is expected to protect and/or reduce social anxiety symptoms in children by providing a positive environment for interaction and helping them develop social skills. These hypotheses, which are presented in further detail in chapter 4.3, are tested using a longitudinal design with a sample of primary school children. The following illustration summarises the current study's general argumentation on how sport practice could function as a potential protective factor against social anxiety symptoms in children.

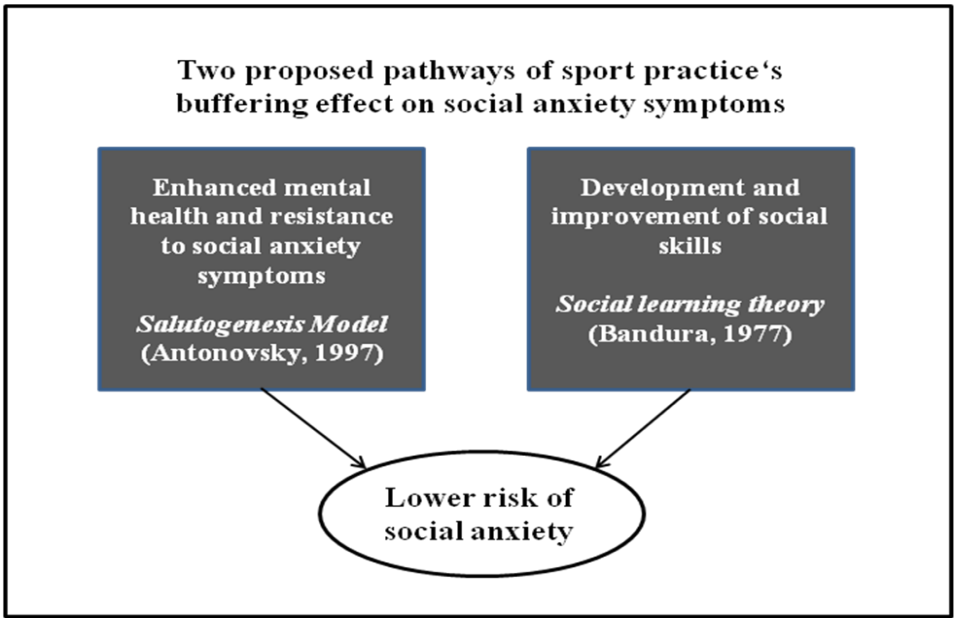

Figure 1.2. A graphical presentation of this study's basic argumentation relating to the potential buffering effect of sport practice on social anxiety symptoms in children.

This dissertation is thus structured. Following a general introduction presenting the topic of study as well as the aims of the research, there will be a chapter describing social anxiety disorder and its main aspects. In this chapter various viewpoints related to the emergence and maintenance of social anxiety shall be expounded with special attention to factors related to this study's research question, such as the cognitive, behavioural and social learning perspectives of social phobia. The next chapter, Chapter 3, goes into the various findings and theories related to the influence of sport on mental health. Particular focus shall be set on the anxiolytic effects of sport since these findings provide a starting point for this study's hypotheses and expectations. After that, Chapter 4 presents the main research question of this study as well as the four hypotheses that were investigated. In Chapter 5, the method and

design of this study as well as other methodological considerations are described. This includes information about the instruments used for this study's data collection as well as the various steps of the data collection process. The results of which, shall be presented in detail in Chapter 6 followed by a discussion of the findings in the light of existing theory and literature as well as a more detailed interpretation of results and related theoretical implications in Chapter 7. The strengths and limitations of study are also put forward in this chapter as well as a conclusion summing up the main findings of this study and proposing recommendations for future research.

2. Social Anxiety Disorder: Epidemiology, Aetiology and Risk Factors

This chapter provides a comprehensive description of social anxiety disorder with particular focus on social anxiety in childhood. Various aspects of this disorder are presented including its manifestation, epidemiology and aetiology, as well as its main predisposing and/or contributing factors.

2.1. Social Anxiety Disorder and its Subtypes

Buss (1980) identified four varieties of social anxiety that share common causes but also have their own specific instigators. The central aspect of these different forms of social anxiety is acute public self-awareness where an individual is particularly conscious of how s/he appears to others. Different instigators can then lead to any one of the four types of social anxiety illustrated in Figure 2.1, where some types are less severe than others. For example, praise can cause embarrassment but not shame while inhibition can cause feelings of shyness. Both shyness and embarrassment are described by Buss to be less severe than audience anxiety and shame.

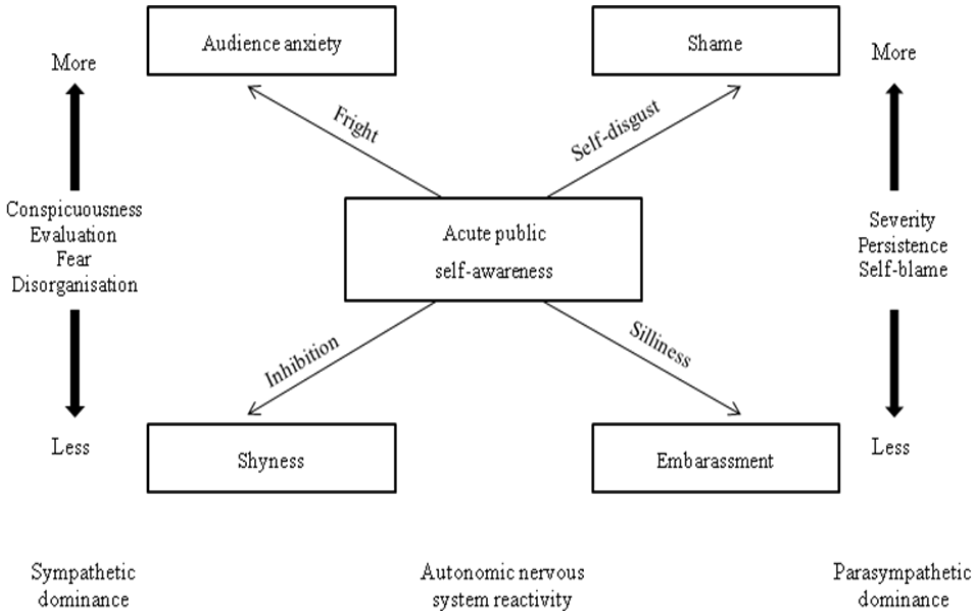

Figure 2.1. Buss's distinction of the varieties of social anxiety in relation to public self-awareness. Adapted from "*Self-consciousness and social anxiety*," by A. H. Buss, 1980, p.212. Copyright 1980 by W. H. Freeman and Company.

Since Buss's (1980) distinction between the various types of social anxiety, the understanding of social anxiety and related factors has been further developed. Like, for instance, the clear distinction between shyness and social anxiety as two separate factors (see chapter 2.5.2) or the now established diagnostic criteria for social anxiety indicating two main types of this disorder.

Social phobia is nowadays distinguished into two subtypes: generalized and specific social phobia. The generalized type tends to have an earlier age of onset, reportedly between 12 and

16.6 years, and usually lasts 10 or more years (Fehm et al., 2005). Indeed, social phobia has been described by Keller (2003, p. 85) to follow a "chronic, unremitting course, leading to long-term disability". It can however also be specific to a situation, the most common being speaking in public (Furmark et al., 1999; Furmark, 2002). It is noted that the quality of life in persons with social phobia is greatly impaired since it tends to lead to social isolation. Additionally, social phobia is also found to be comorbid with other psychological problems, such as depression and alcohol disorders. Thus, "early intervention in social phobia might prevent the onset of a secondary disorder, such as alcohol abuse and depression" (Bögels & Tarrier, 2004, p. 734).

Turner, Beidel and Townsley (1992) investigated the validity of social phobia subtypes by looking into symptomatic differences between the two as well as the relation between generalized social phobia and avoidant personality disorder. The two subtypes differed significantly from each other where individuals with the specific subtype reported both lower general distress as well as less severe symptoms of social anxiety and social functioning. Thus, further to their findings, Turner and colleagues concluded that the difference between these two types is in the degree of severity rather than a qualitative difference.

2.2. A Distinction between Social Anxiety and Avoidant Personality Disorder (APD)

The avoidant personality disorder has been identified as the most common Axis II correlate of social anxiety disorder (Turner, Beidel, Borden, Stanley, & Jacob, 1991). It tends to be linked to the generalised type of social anxiety disorder. When describing the avoidant personality pattern it is important to highlight the distinction between passive and active detachment (Millon, 1996). Passive detachment involves under-arousal while active detachment is best characterised by a person's excessive reactivity to stimuli.

According to the DSM-IV-TR (APA, 2000) criteria, the general characteristics of the avoidant personality are social inhibition, feelings of inadequacy and oversensitivity to negative evaluations. Persons suffering from this disorder also tend to avoid activities involving social contact due to fears of criticism or rejection. This description is very similar to that of social anxiety disorder. The Millon Polarity Model (Millon, 1996) provides a visual overview of the features of the avoidant personality (presented on the following page, Figure 2.2).

The focus in this model is the over-awareness of the possibility of a negative experience. The first polarity level in the model illustrates the focus on preserving oneself and giving less attention to positive stimuli in the environment. The second level demonstrates an excessive effort to adapt and modify the surrounding environment so as to avoid unpleasant experiences, such as embarrassment. The third and final polarity level - in this case given less attention – is where the main features of the avoidant personality are identified by the hyper-alertness and reactivity to possible psychological distress.

Individuals with an avoidant personality tend to be fretful and keep their emotions under control thus exerting great restraint. Their interpersonal behaviour is averse and they tend to distance themselves from others, keeping on the alert for potential threats at the same time. Millon (1996) describes the avoidant personality's interpersonal behaviour as follows: "Interpersonally, avoidants are best characterized as actively detached personalities; they are guided by the need to put distance between themselves and others – to minimize involvements that can reactivate or duplicate past humiliations" (p. 262).

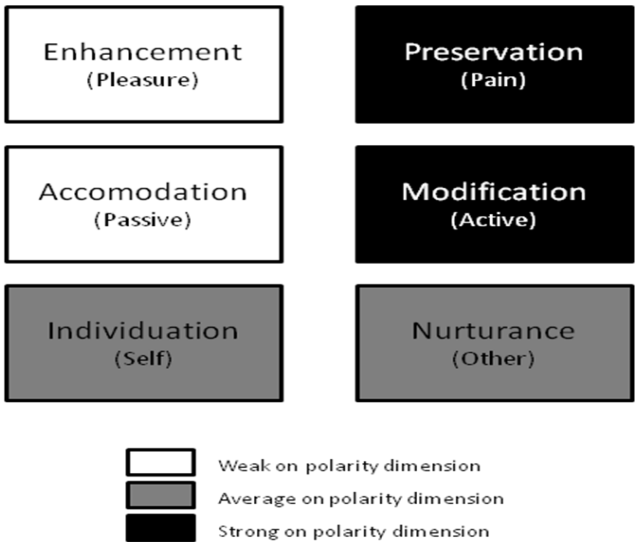

Figure 2.2. Status of the avoidant personality prototype in accord with the Millon Polarity Model. Adapted from "*Disorders of Personality DSM-IV and Beyond*," by T. Millon, 1996, p. 260. Copyright 1996 by John Wiley & Sons Inc.

The cognitive characteristic of the avoidant personality is distractedness and hypervigilance which also tends to be present in people suffering from social anxiety. Avoidants observe their environment for potential threats and are also very sensitive to the feelings and intentions of others. However, this hyper-vigilance for negative stimuli floods the individual with numerous stimuli which in turn distract him/her from the task at hand. This focus on potential threats does not only disrupt the said task being carried out but also causes emotional distress. This description from Millon (1996) coincides with the explanation presented by the Cognitive Model of Social Anxiety (Rapee & Heimberg, 1997) which will be illustrated later on in the following chapter. The usual temperament of persons with an avoidant personality is tense and confused where their view of the world is a negative one.

The description of an avoidant personality disorder in childhood is included with that of the adult personality disorder in the DSM-IV (Millon, 1996). However, specific diagnostic criteria for children are outlined in the case of social anxiety disorder. The criteria for diagnosis will be presented in more detail in section 2.3.

There are various comorbid disorders and syndromes related to the avoidant personality (Millon, 1996). The most common of their symptoms is the Generalized Anxiety Disorder (GAD) which is typically experienced over a long period of time and consists of a moderately intense anxiety that is generalized to various situations and objects. Phobic syndromes are also a common symptom of this personality type. Social phobia is a "crystallized" form of anxiety where individuals experience intense anxiety in specific and identifiable situations which they can actively avoid.

Holt, Heimberg, and Hope (1992) examined social anxiety disorder, including the differentiation between both its' subtypes, and APD using the *Diagnostic Statistical Manual of Mental Disorders* (3rd edition, revised; *DSM-III-R;* APA, 1991) criteria. The authors identified three groups from their sample of young adults diagnosed with social phobia. The first group was diagnosed with non-generalised social anxiety without APD. The second

group received a diagnosis of generalized social anxiety without APD while the third group had generalized social anxiety as well as APD. Holt et al. noted that the APD and non-APD group could be best distinguished from the timidity towards new or ambiguous situations exhibited by the APD patients. Moreover, patients with generalized social anxiety and APD also had a higher chance of suffering from a comorbid depressive mood disorder.

2.3. Social Anxiety Disorder in Childhood

Although less frequent, social anxiety disorder can also emerge during childhood. Shy and withdrawn children are often encountered; however, most of these children tend to lose their inhibitions once they familiarise themselves with the new persons and/or the novel situation. Extremely shy children may even refuse to speak in particular situations; known as elective mutism. Other children are constantly shy and withdrawn; however, none of these characteristics are sufficient for the diagnosis of social anxiety disorder.

Shyness is often associated with social anxiety where many people describe themselves or others as being shy. Indeed shy people were found to have many similarities with individuals suffering from social anxiety, both in their cognitions as well as in the experience of physical symptoms such as blushing and trembling (Heckelman & Schneier, 1995). Shyness has been identified as a possible risk factor for social anxiety disorder and will be discussed in more detail in the aetiology section (Chapter 2.5). A clear dividing line indicating where shyness ends and social anxiety commences has not as yet been agreed upon.

Social phobia tends to develop during early adolescence. However, a heightened self-consciousness does not necessarily lead to social phobia thus indicating the interplay of various factors leading to the emergence of pathology. Social anxiety in children may escalate into a more serious problem in adolescence or adulthood but it also has immediate secondary consequences.

It is agreed by many that the onset of social phobia rarely occurs before early adolescence (Velting & Albano, 2001). The main explanation suggested for this is that young children do not view themselves as a social object before the age of 5 or 6. Furthermore, they are unable to take other people's point of view until about age 8. Indeed, the DSM-IV-TR (2000) puts forward certain provisions for the diagnosis of social phobia in children:

1. Children should be capable of social interactions. This would, however act as a discriminatory factor between children avoiding interaction because of fear and those not interacting due to other developmental disorders, such as autism.
2. The child exhibits normal social behaviour with familiar people and furthermore, anxious behaviour would also occur with both unfamiliar peers as well as adults.
3. Children may express social anxiety by crying, throwing tantrums, etc. These reactions differ from those of socially anxious adults.
4. Beidel and Turner (1998) add that in some rare cases, social anxiety can be manifested as selective mutism, where a child refuses to speak in particular social situations.
5. Another provision refers to the recognition of the social anxiety being excessive or unreasonable. This is, however, only applicable to adults and is not expected from children due to their age-related cognitive and perceptual limitations.
6. The symptoms of social anxiety are required to be present for at least 6 months in those younger than 18 years.

Beidel (1991) listed the most frequently feared situations in children with social anxiety disorder. The worst one reported was public speaking (89%), followed by eating in front of others and writing on the blackboard. In another study including social phobic children, public speaking and attending parties were rated as the most-anxiety-provoking situations by both the children and their parents (DiBartolo, Albano, Barlow & Heimberg, 1998). Beidel and Turner (1998) add that since children spend a lot of time in school, it is understandable that most distressing events at this age occur in the school setting. They also mention that the most frequently reported anxiety-provoking situation in both children and adults is reading or speaking in front of a group of people.

In their study of social anxiety disorder in childhood, Beidel, Turner and Morris (1999) summed up their findings as follows:

> …these children suffer substantial emotional distress and impairment in their daily social, academic and family functioning. They have few if any friends, are extremely lonely and avoid extracurricular activities…In extreme cases school refusal or selective mutism is present. (p. 649)

2.4. Prevalence of Social Anxiety Disorder

Various epidemiological studies as well as reviews claim that social anxiety is the most common anxiety disorder in the general population (Lecrubier et al., 2000). An epidemiological study carried out by the European Study of the Epidemiology of Mental Disorders (ESEMeD) project (ESEMeD/MEHEDEA 2000 Investigators, 2004) explored the prevalence of mental disorders in Europe where mood (14%) and anxiety (13.6%) disorders were found to have the highest lifetime prevalence with social phobia accounting for 2.4%. In agreement with other studies, the highest rate of mental disorders was observed in young adults. Similar prevalence rates were also documented in a large-scale epidemiological survey in the United States based on the DSM-IV diagnostic criteria: Kessler et al. (2005) reported that social phobia was amongst the most prevalent disorders with a lifetime prevalence of 12.1% and a median age of onset of 13 years. They also found that women had a higher risk of suffering from an anxiety disorder than men.

Fewer epidemiological studies have focused on social phobia and related factors. Most of these studies indicate a gender difference in the prevalence of social anxiety disorder. It is, in fact more common in women, particularly those who are young, poorly educated, of low socioeconomic status and/or unmarried (Schneier, Johnson, Hornig, Liebowitz & Weissman, 1992). One such study was conducted by Schneier, et al. (1992) in the United States with over 13,000 participants. Schneier and his colleagues collected data regarding social phobia, information about comorbid disorders, morbidity, suicidal ideation and attempts as well as treatment. The lifetime prevalence rate of social phobia was found to be 2.4 per 100 and almost 70% of the participants with social phobia were female. The mean age of onset reported in this study was 15.5, however, two peaks of incidence were noted: one at 0 to 5 years and another at 11 to 15 years. Onset after the age of 25 was found to be uncommon. In a prevalence study carried out in Germany with adolescents and adults, Wittchen, Stein and Kessler (1999) reported that 4.9% of males and 9.5% of females aged 14 to 24 years met the lifetime DSM-IV criteria for social phobia. In concordance with other epidemiological studies, females were yet again found to have higher lifetime and cross-sectional rates. Also generalised social phobia was found to be more persistent than the isolated subtype. Cottraux (2005) also identified two peaks of incidence of social phobia in his review: 11 to 15 and 18 to 25 years. In another review of European epidemiological studies, Lecrubier et al. (2000)

reported that the mean age of onset is in mid-adolescence with the peak onset occurring at about 15 years. They also add that all cases of social phobia would have emerged by the age of 24 and that a late onset of social anxiety disorder is usually in the form of a secondary condition preceded by others. Wittchen et al. (1999) also report that onset was more likely to occur between the ages of 10 and 21 years with the generalised subtype having a lower median age of onset (11.5 years for males and 12.5 years for females). Non-specific social phobia was found to appear later in adolescence.

In a review of the prevalence of social phobia in European countries, Fehm and her colleagues (2005) also ascertained that women appear to be more frequently affected than men. It is also nearly always the case for a comorbid disorder to follow the onset of social phobia, the most common being depression and alcohol abuse or dependence (Crum & Pratt, 2001; Merikangas, Avenevoli, Acharyya, Zhang & Angst, 2002). Alcohol may be perceived as self-medication by socially anxious individuals, helping them overcome inhibitions in social situations. This has been a consistent finding in various studies which implies the role of social phobia as a risk factor for substance abuse and disorders (Zimmermann, Wittchen, Höfler, Pfister, Kessler & Lieb, 2003). Other outcomes included a reduced everyday functioning in the social, educational and occupational domains as well as a lower quality of life for social phobics. For instance, DiBartolo et al. (1998) reported that 25% of the socially anxious children in their sample refused to attend school and reported consistent problems with going to and/or staying at school.

A higher risk of suicide has also been linked to social phobia. In his overview of community surveys, Furmark (2002) noted that socially anxious individuals had the tendency to be unmarried, poorly educated, underpaid and/or lacking social support. He also observed higher lifetime prevalence in younger people and suggested that this may be the effect of the increasing societal demands together with the importance of establishing good social networks. Schneier et al. (1992) also looked into suicidal ideation and attempts in their investigation. Subjects suffering from uncomplicated or comorbid social phobia had a significantly higher rate of suicidal ideation when compared to subjects with no disorder. Subjects suffering from social phobia along with a comorbid disorder also reported a higher rate of suicide attempts. Velting and Albano (2001) also report a higher risk of suicide attempt in shy young people and adults suffering from social phobia.

With regards to the local situation, Merikangas et al. (2002) report findings from the Zurich Cohort Study where over four thousand young adults were assessed five times over a period of 21 years. Participants were between the age of 19 (men) and 20 (women) at the first assessment point. About 6% of the sample met the full diagnostic criteria for social phobia, 12% were found to be at the subthreshold level and 24% at the symptom level. These amounts are quite in line with the estimated lifetime prevalence in Western countries reported to be between 7 to 13% (Furmark, 2002). Results from the Zurich study also reflect findings from previous studies where participants suffering from social phobia had the tendency to experience the initial symptoms in early adolescence. Social impairment was found to be high and symptoms were likely to remain stable over time. In this study, social phobia was strongly linked to anxious temperament in childhood. Mood disorders were also directly related to social phobia together with alcohol abuse/dependence. Similar rates were observed in a neighbouring country in that same period: Dell'Osso et al. (2002) investigated gender differences in relation to social anxiety disorder, mood, anxiety and eating behaviour symptoms in over 500 high school students in Italy. Female students were found to have consistently higher scores in the social anxiety spectrum. These young women also scored

higher on hypersensitivity to criticism and judgment, which is a core symptom of social phobia. Additionally, they reported a higher awareness of their body image, expressing feelings and taking an oral examination.

2.4.1. Comorbid disorders

Social anxiety disorder may occur on its own but is more often than not accompanied by other disorders. Indeed, Lecrubier et al. (2000) claim that "co-morbidity is the rule rather than the exception in social anxiety disorder" (p.10). In their epidemiological study, Schneier et al. (1992) identified agoraphobia and simple phobia as the most common comorbid disorders reported by the participants suffering from social phobia. Social phobia usually preceded the accompanying disorder, thus implying that it could be a risk factor for additional psychological disorders.

Turner and colleagues (1991) looked into the prevalence of other Axis I and II disorders in a sample of 71 young adults with social phobia. 43% of the participants received one or more secondary Axis I diagnoses with Generalised Anxiety Disorder (GAD) being the most common. The most frequently diagnosed Axis II comorbid disorders were Avoidant Personality Disorder (APD) and Obsessive Compulsive Disorder (OCD). Over half of the participants exhibited symptoms of APD. Turner et al. ascertained that social phobics with an additional Axis I diagnosis were significantly more distressed and disturbed than those without such a concurrent diagnosis. In their review of European epidemiological surveys, Lecrubier et al. (2000) concluded that are major depression, phobic disorders and alcohol and substance abuse disorders are the most frequently reported comorbid disorders with social phobia in adulthood. These findings concurred with Wittchen et al.'s (1999) results from a German sample where they mention substance use disorders, depressive disorders and other anxiety disorders as the most frequent comorbidities.

In their literature review of the epidemiology of social phobia in childhood, Weiss and Last (2001) concluded that most children with a social phobia diagnosis were also found to suffer from comorbid disorders such as separation anxiety and avoidant disorder as well as other concurrent affective disorders. Beidel et al. (1999) also examined social phobia in childhood. They interviewed children between 7 and 13 years who were diagnosed with social phobia together with a control group. Data was also collected from parents and teachers. Participants suffering from social phobia were found to have the following concurrent diagnoses: anxiety disorders (30%), generalized anxiety disorder (10%), attention deficit/hyperactivity disorder (10%), specific phobia (10%), and selective mutism (8%). Children diagnosed with social phobia also scored significantly on depression when compared to the non-social phobic group.

2.4.2. Cognitive processes in social anxiety

The cognitive processes involved with social anxiety are mainly related to the self. For this reason, it is important to commence with a concise description of the self and its link with social anxiety symptoms.

Buss (1980) distinguishes between a sensory and a cognitive self. The sensory self is made up of sensory stimulation, awareness of body boundaries and mirror-image recognition. This sense of self is shared by humans and higher primates. The cognitive self, on the other hand is more advanced and is not found in infants or animals. Indicators of the development of the

cognitive self are the emergence of self-esteem, covertness (awareness of thoughts and feelings that are not shared with others) and the realization that other people have a different perspective than oneself. Buss summarises the main differences between the primitive, sensory self and the more advanced, cognitive self in the following table:

Table 2.1
An Overview of the Main Differences between the Primitive, Sensory Self and the Advanced, Cognitive Self

	Sensory	**Cognitive**
Occurs in:	Higher animals	Older children
	Human infants	Adults
Bases:	Double stimulation	Self-esteem
	Body boundary	Shared versus unshared feelings
	Mirror image self-recognition	Knowing others have different perspectives

Note. Adapted from "Self-Consciousness and Social Anxiety," by A. H. Buss, 1980, p. 4. Copyright 1980 by W. H. Freeman and Company.

Buss (1980) goes on to point out a further distinction between a private and a public self, where the latter is of particular relevance to social anxiety disorder. The private self cannot be observed by others for only the individual is aware of his/her experiences, such as a particular taste or a memory that springs to mind. The public self, however, is observable and entirely overt. This includes an individual's behaviour, facial expression, physical characteristics, and so on. So basically, public self-awareness is our own perception of how we are seen by others. Buss describes this as our perception of us as a social object.

Buss (1980) describes different domains of the public self the most obvious being one's appearance. Our appearance and our assessment of it rely on our society's norms and values and these norms and values are taught from childhood. For example, one should not go to school or work looking untidy and unkempt. On the other hand, ideas about certain other aspects of appearance such as weight differ from culture to culture. Another dimension mentioned by Buss is style, that is, the way we present ourselves. This includes our posture, the way we move and speak and how we behave in social situations. Individuals who feel conspicuous or who are overly conscious of themselves may put on a social mask, thus playing a social role as expected by the rules of society. An integral part of public self-awareness is assuming the role of others and perceiving oneself as others might. Buss maintains that the publicly self-focused person focuses on aspects that observers perceive such as appearance and behaviour.

A consistent finding regarding cognitive processes in socially anxious individuals is that they tend to focus on threatening stimuli while distracting themselves from the task at hand (Rapee & Heimberg, 1997). Thus, using Buss's (1980) terms, socially anxious individuals are extremely public self-focused. These cognitive biases have also become of interest in childhood psychopathology and various studies have examined this issue with socially

anxious children (e.g. Higa & Daleiden, 2008). This aspect of social anxiety's phenomenology shall be presented in further detail in chapter 2.5.6.

2.4.3. Social anxiety and substance abuse

Alcohol use has been associated with shyness and anxiety since it is claimed that alcohol helps people overcome their inhibitions and cope with their feelings of anxiety. This is also the case for social anxiety disorder where various studies identified a relationship between alcohol intake and social anxiety (e.g. Crum & Pratt, 2001). The typical age of onset of social phobia is in childhood or adolescence where it is often a precursor to alcoholism (Lépine & Pélissolo, 1998). Lépine and Pélissolo maintain that both epidemiological and clinical studies point towards a relationship between social phobia and alcoholism; nevertheless, no relationship appears to exist between childhood shyness and behavioural inhibition with alcohol problems later in life.

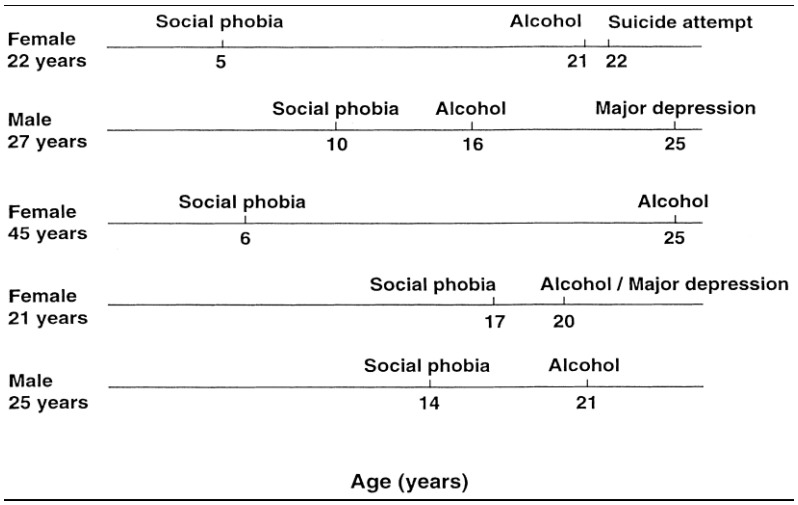

Figure 2.3. Five patients' life-charts from an out-patient psychiatric clinic indicating ages of onset of social phobia, alcoholism and comorbid disorders. Adapted from "Social phobia and alcoholism: a complex relationship," by J.-P. Lépine and A. Pélissolo, 1998, *Journal of Affective Disorders, 50*, p.S26. Copyright 1998 by the Elsevier Science B.V.

Five explanations for the association between social phobia and alcohol abuse have been put forward by Lépine and Pélissolo (1998):

1. The psychopharmacologic effect of alcohol: that is, alcohol reduces anxiety and is intentionally used by some individuals for this purpose. This is in line with Khantzian's (1985) self-medication hypothesis (SMH) suggesting that alcohol's psychotropic effect interacts with the individual's psychological complaints and mood. From a psychoanalytic perspective, Khantzian argues that addicts are actually trying to medicate themselves for psychological or emotional problems. This however leads to negative consequences but some short-term effects are often viewed as beneficial and may thus explain why socially anxious individuals would turn to alcohol or other substances. Indeed, in their review Kushner, Sher and Beitman (1990) found that in social phobia, alcohol problems tend to emerge following self-medication attempts.
2. The individual believes that alcohol reduces anxiety, thus leading to higher alcohol consumption regardless of the actual effects. In their review of literature regarding alcohol and social phobia, Carrigan and Randall (2003) conclude that there appears to

be satisfactory evidence that "individuals do drink alcohol to reduce social phobic anxiety" (p.280).

3. Lépine and Pelissolo (1998) mention epidemiological evidence indicating a modest association between social phobia and alcoholism. However, they claim that "this is not supported by a developmental relationship between childhood inhibitory behaviours or adolescent shyness or alcoholism" (p. S26)
4. Lépine and Pelissolo (1998) mention that social phobia may be under-diagnosed in persons with alcohol abuse or dependence since the phobic symptoms are very similar to withdrawal symptoms. Alcohol withdrawal symptoms can trigger off social anxiety seeing as the individual may misinterpret the withdrawal signs. Similarly, Schuckit and Hesselbrock (1994) suggest that some anxiety syndromes may be alcohol-induced.
5. Alcohol problems tend to accompany comorbid disorders of social phobia, such as depression. In view of this explanation, social anxiety is actually a precursor to the comorbid disorder and it is actually the latter that would lead to alcohol abuse.

Kidorf and Lang (1999) conducted a laboratory study with University students who were offered their preferred beverage under two conditions. The first one included no task whereas the second involved a speech task - about their most undesirable characteristic - which would be recorded and evaluated. As expected, students drank more in the second condition than in the first. The authors also found that the change in alcohol consumption between the first and the second condition correlated positively with the social anxiety measures. However, this correlation was only observed for the men in the sample. Himle et al. (1999) also investigated the effect of alcohol on social phobic anxiety during a speech task. Subjects were given a placebo drink or an alcohol beverage. No difference was noted between the placebo and alcohol groups.

Still, some studies observed an opposite effect in people with social anxiety, particularly in children and young adolescents. Lewis et al. (2008) investigated this association between social anxiety and alcohol related problems in 891 first-year University students with an average age of 18.5 years. The authors distinguished between alcohol consumption and alcohol-related problems and both were examined as two separate constructs. Findings indicated that social anxiety was associated with less alcohol consumption and experiencing more negative consequences. No gender differences were noted. Lewis et al.'s explanation for this finding is that socially anxious students were more likely to drink for conformity and coping reasons. They also add that students who do not consume alcohol on a regular basis may be more sensitive to its effects. Myers, Aarons, Tomlinson and Stein (2003) examined the relationship between social anxiety, negative affectivity and substance involvement in high school students aged 13 to 19 years. Female students in this study reported higher social anxiety. The authors observed an association between negative affectivity, social anxiety and substance use in this sample. However, the students experiencing higher social anxiety were usually the ones reporting less substance abuse. This relationship was still observed even after influence due to gender, ethnicity and grade-point average (GPA) were taken into account. The authors argue that social anxiety could actually hinder alcohol intake since socially anxious adolescents tend to avoid social events, hence reducing their opportunities of drinking alcohol as well as their exposure to peer modelling.

These different findings may be partly explained to how alcohol consumption is operationalised and by the influence of other confounding variables. In conclusion, more controlled studies need to be carried out in this area.

2.5. The Aetiology of Social Anxiety Disorder

Buss (1980) describes four varieties of social anxiety that share several causes. These causes can be grouped into two categories: social contexts and other people's behaviour. The type of social context is a decisive factor for a socially anxious individual. Factors impinging on the individual's distress are the number of persons present and the amount of attention the particular person receives. The familiarity of the social context is also an important aspect, as it has an influence not only on a person's level of anxiety but also on the potential of evaluation in particular social encounters such as in job interviews. For instance, in a sample of young adolescents who recently moved to a new school, higher social anxiety was found to be a predictor of less social interaction and fewer friends, even months later (Vernberg, Abwender, Ewell & Beery, 1992).

Table 2.2
Characteristics of Social Contexts Triggering Social Anxiety

Feature	Less social anxiety	More social anxiety
Size	Two-person	Group
Amount of attention	Give-and-take	On-stage
Familiarity with the people	Familiar	Novel
Formality	Informal	Formal
Extent of evaluation	Neutral	Evaluative

Note. Adapted from "*Self-Consciousness and Social Anxiety*," by A. H. Buss, 1980, p. 207. Copyright 1980 by W. H. Freeman and Company.

Other people's behaviour also plays a role in the experience of social anxiety (Buss, 1980). This does not only refer to receiving too much attention. Being ignored or shunned can also cause anxiety.

The DSM-IV-TR (APA, 2000) mentions a history of social inhibition or shyness in childhood as a potential precursor to social anxiety disorder. However, the possibility of an abrupt onset after a stressful or humiliating experience is also pointed out. Vasey and Dadds (2001) suggest two main pathways to the onset of anxiety disorders in childhood. The first comprises of clear, precipitating events which may be experienced in a direct or indirect manner. For example, the experience of a traumatic episode coupled with a predisposing temperament. In the second pathway, risk factors may lead to a gradual intensification of anxiety symptoms through repeated transactions over time. For instance, behaviourally inhibited children that are constantly 'protected' from social situations, may actually grow more anxious through this consistent of avoidance behaviour.

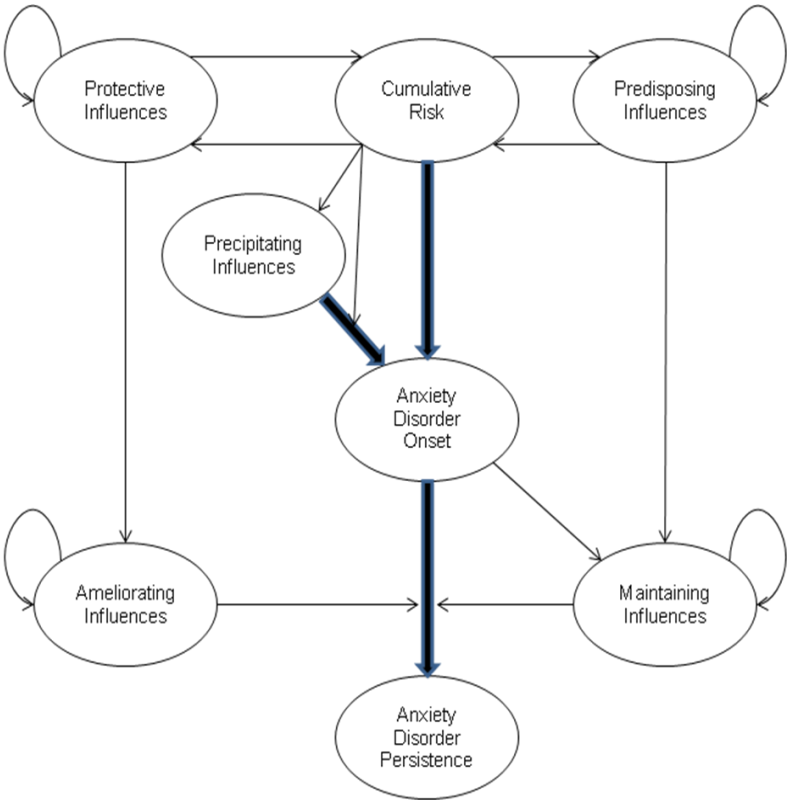

Figure 2.4. Vasey & Dadds's major categories of influence, their interplay and role in the onset and maintenance of social anxiety symptoms over time. Adapted from "An Introduction to the Developmental Psychopathology of Anxiety," by M. W. Vasey and M. R. Dadds, 2001, in M. W. Vasey and M. R. Dadds (Eds.), The Developmental Psychopathology of Anxiety, p. 13. Copyright 2001 by the Oxford University Press.

In their literature review, Vasey and Dadds (2001) illustrate various factors that may predispose to or protect against the development of an anxiety disorder. The main aspects being: genetic and neurobiological factors, temperament (e.g. negative affectivity, behavioural inhibition), emotion regulation skills, cognitive biases and distortions, early control experiences, parental style and feedback, experience with common condition stimuli for phobic anxiety and lastly the level of exposure to feared stimuli. They add that none of these predisposing factors seem to be essential for the onset of anxiety disorder; however, it also appears that one or more of these risk factors could be an instigator for the development of pathological anxiety in childhood. Beidel and Turner (1998) report that many interviewed social phobics recall a specific traumatic event in the past that they associate with the onset of social anxiety. They also mention the possibility of observational learning, which has not been explored with regards to social anxiety. Furthermore, they speculate that the higher risk of social anxiety disorder amongst individuals with parents having a history of anxiety disorders, may not only be at risk due to the genetic factor but also through the process of observational learning.

Vasey and Dadds (2001) also observed that since many predisposing factors increase the likelihood that other such factors occur, the process involving several risk factors tends to be the most frequent. Thus, they describe a synergetic relationship between risk factors leading to the onset of pathological anxiety concluding that childhood anxiety disorders tend to be consequences of multiple predisposing factors. For example, children with low-self-efficacy

may give up more easily on tasks than their peers thus exposing themselves to more frequent experiences of failure and/or punishment. This in turn could also bring about negative feedback from parents, teachers and peers.

Stemberger, Turner, Beidel and Calhoun (1995) investigated several factors that could be important in the etiology of social phobia. A group of 68 patients suffering from social anxiety were included in this study. The authors found that traumatic social conditioning experiences and a childhood history of shyness were both associated with social phobia. Still, the authors maintain that although shyness may be a predispositional factor it would only "lead" to social phobia in concomitance with other factors. Subjects reported at least one relative with symptoms of either social anxiety symptoms or other anxiety disorders. Childhood shyness appeared to be more common in patients with generalized social anxiety whereas traumatic social experiences were more common in patients with a specific subtype of social anxiety. Similar findings were reported in a later study by Dalrymple, Herbert and Gaudiano (2007) concerning the developmental factors in social anxiety disorder. These aspects were found to be related to the course and severity of the said disorder. Results showed that the group with an earlier onset of social phobia reported higher behaviour inhibition and shyness in childhood. Earlier onset and greater behaviour inhibition as a toddler were also linked to an increased symptom severity.

Erath, Flanagan and Bierman (2007) investigated cognitive and behavioural factors in early adolescence associated with social anxiety. They argued that an early identification and treatment can significantly reduce the negative impact of this disorder. This study included a sample of adolescents with an elevated but sub-clinical level of social anxiety. Results showed a link between social anxiety and expectations of a negative social performance. Children with better conversation skills were more likely to be accepted by their peers and had a lower chance of being victimized. Path analysis indicated an indirect relationship between social anxiety and low peer acceptance.

Apart from the predisposing factors leading to the onset of social anxiety disorder, the factors contributing to the maintenance and intensification of anxiety are also of importance in the study of pathological anxiety. Vasey and Dadds (2001) depict possible contributors and their interaction.

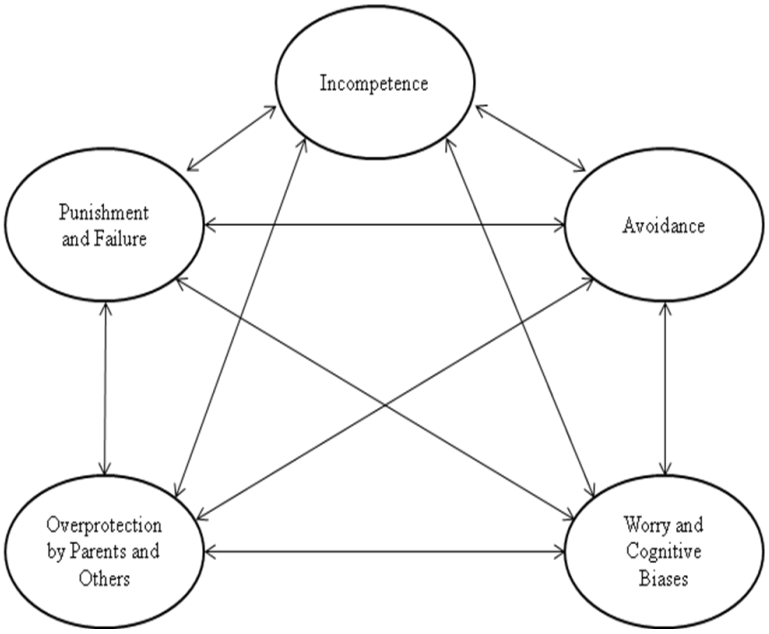

Figure 2.5. Possible contributors to the maintenance of anxiety disorders and potential interactions among them across time. Adapted from "An Introduction to the Developmental Psychopathology of Anxiety," by M. W. Vasey and M. R. Dadds, 2001, in M. W. Vasey and M. R. Dadds (Eds.), *The Developmental Psychopathology of Anxiety*, p. 19. Copyright 2001 by the Oxford University Press.

They identify five main contributors that interact with one another. These include: the excessive use of cognitive and/or behavioural avoidance as coping strategy, a lack of social, emotional-regulation and academic skills (termed as incompetence), cognitive biases and distortions, experiences of failure and punishment by parents and peers, and lastly overprotection by parents and others. Any or all of these would result in anxiety-related behaviour, such as avoidance.

2.5.1. Genetic influences of social anxiety

The genetic factor in anxieties and phobias also needs to be taken into account since an association has been observed amongst first-degree relatives in the case of social and specific phobias. This factor shall only be briefly discussed given its little relevance to the topic of the present study.

The few twin studies looking into the genetic component of social phobia are considered to be inconclusive (Velting & Albano, 2001) however in a twin study by Kendler, Neale, Kessler, Heath and Eaves (1992) an estimated heritability of between 30 to 40% was observed. Kendler et al. (1992) interviewed female twins where the element of heritability was ascertained. Nevertheless environmental experiences were also found to be important in the case of social phobia and agoraphobia indicating a combined effect of both genetic heritability and environmental influence in the emergence of these disorders. Social phobia (11.5%) was the second most commonly reported out of the four subtypes included in this study preceded only by situational phobia (12.3%). Age of onset differed significantly between the subtypes, the earliest being animal phobia while social phobia tended to emerge during teenage years. With regards to social phobia, no relation to zygosity was ascertained, as in, there were no significant differences between monozygotic and dizygotic twins. However, Kendler et al. did

find evidence of familial transmission of phobias. The proportion of variance in disease liability due to genetic factors was found to be 30% for social phobia. Moreover, evidence of environmental risk factors tended to vary according to subtype.

In his clinical review of social anxiety disorder, Keller (2003) mentions the possibility of a familial link where incidence of this complaint was found to be higher among first-degree relatives. In another family study, it was found that children of social phobic parents had a higher risk of developing a psychiatric disorder, especially from the anxiety spectrum (Mancini, Van Ameringen, Szatmari, Fugere, and Boyle, 1996). However, this may not just be a question of genetic properties but also of the influence relatives have on one another especially when living in the same house where the children primarily depend on their parents to learn social skills.

2.5.2. Childhood shyness

Shyness, especially in childhood, is a frequently quoted characteristic when discussing the aetiology of social anxiety disorder. Zimbardo and Radl (1981) defined shyness as "a mental attitude that predisposes people to be extremely concerned about the social evaluation of them by others" (p.9). They also add further characteristics of shy behaviour such as, avoiding people and situations where there is any risk of criticism as well as keeping a very low profile. Buss (1980, p.184) provides a perhaps too simplistic definition of shyness, namely "the relative absence of expected social behaviours". This definition hinges on the withdrawal and avoidant behaviour of a shy person, which may not always be necessarily the case. Buss goes on to distinguish between an instrumental and an affective component of shyness. The instrumental component is characterised by an absence or reduction in social behaviour, such as little or no eye contact. The affective component of shyness relates to the accompanying emotions and apprehensions. Most worries concern the future and the anticipation of negative experiences such as embarrassment.

Jones, Cheek and Briggs (1986) define shyness as "excessive and nervous attention to the self in social settings resulting in timid and often inappropriate overt behaviours (e.g. silence) as well as emotional and cognitive distress (e.g. anxiety)" (p. 4). This phenomenon can be considered through various approaches such as viewing shyness as a simple personality trait, as a self-handicapping strategy or as an individual problem. Jones et al. also mention that there are a number of processes related to shyness that could be examined like for instance the cognitive or developmental processes. Asendorpf (1986) suggests a definition for situational shyness:

> Situational shyness is an ambivalent, affective state during social encounters. The acutely shy child tries to both approach and to avoid interaction partners at the same time. Behaviorally, this approach-avoidance conflict leads to a mixture of wary and sociable behavior. Experientially, this conflict gives rise to mixed feelings of anxiety and interest. (p.93)

Buss (1986) describes fearful shyness, also known as stranger anxiety, as starting during the first year of life. This type of shyness can be observed across various mammalian species and tends to wane as a child develops. Still, fearful shyness does persist in some children and Buss describes this as a kind of social anxiety. Fearful shyness finds its source in other people and its reaction involves three components: a motor component (e.g. avoidance of the situation), physiological (activation of the parasympathetic system) and cognitive (e.g. acute self-awareness). Another type of shyness described by Buss (1986) is the self-conscious shyness

which involves the self as a social object. Individuals with an acute self-awareness may feel excessively exposed to other people's scrutiny. This experience of extreme self-consciousness can lead to feelings of embarrassment and inadequacy. Such cognitions recognizing the self as an individual, social object appear to develop by the 4th or 5th year of life. These two types of shyness are often not differentiated when measuring and discussing the topic.

Zimbardo and Radl (1981) claim that shyness is a social phobia, however a clear distinction has been made since then between shyness as a non-dysfunctional personality trait and social phobia. It is important to note that shyness should not be equated with social anxiety nor does it necessarily lead to social anxiety later in life. However, various studies identified an association between shyness in childhood and social phobia during adolescence and/or adulthood (e.g. Cox, McPherson & Enns, 2005). Thus, shyness should not be viewed as a pathology. Normal shyness actually acts as a protective strategy that allows us time to evaluate new situations and experiences before acting (Zimbardo & Radl, 1981). Children express their shyness more frequently since they often encounter new situations and persons. With time individuals develop strategies to help them overcome or hide their shyness, such as 'small talk'. Beidel and Turner (1998) also mention the association of shyness with low sociability. They maintain that shyness and low sociability are not one and the same since the latter involves no fear but rather a preference to solitude.

Jones and Carpenter (1986) point out that shyness is strongly related with other dimensions including social anxiety. They also indicate there is evidence that shy individuals fail to take advantage of social opportunities, are less intimate and less involved in their interactions with others as well. These results have placed shyness under the list of risk factors for social anxiety. The relationship between this characteristic and the disorder, however still needs to be clarified and investigated together with the mediating factors influencing this relationship. Shyness is a characteristic which tends to be a lifelong feature in a person's temperament. On the other hand, social phobia comprises a cluster of symptoms that could be independent of shyness. Another point of distinction between shyness and social anxiety disorder is that the latter may occur in specific situations whereas shyness is consistently experienced in all social situations (Lecrubier et al., 2000).

Jones and Carpenter (1986) reported studies where shy people were rated as less friendly and less assertive as well as lacking in talent. They also illustrate data suggesting that shy persons have smaller friendship and social support networks and are less satisfied with their relationships too. In a more recent study, Fordham and Stevenson-Hinde (1999) investigated the relationship between shyness, friendship and adjustment during middle childhood. In concurrence with other studies, shy and inhibited behaviour was found to be consistent over time. Findings even indicated different patterns of results between the 9-year old and the 10-year old children: the older children's results showed that shyness increases the risk of adjustment problems. But then again, "good-quality best friendship" could act as a buffer to this risk (p.766). Another study explored the possibility of a connection linking excessive childhood shyness with anxiety and/or mood disorders in adulthood. Using data from the US National Comorbidity Survey, Cox and colleagues (2005) established an association between excessive shyness and social phobia. The link connecting excessive shyness to anxiety and mood disorders was, however a weak one. Childhood shyness was found to be correlated with a history of social phobia in the survey participants. Still, one has to keep in mind that many participants reporting excessive shyness did not develop social phobia in adulthood. Cox et al. (2005) even found a substantial number of participants suffering from social phobia who also did not report an excessive shyness in childhood. However, it is important to point out that

shyness in childhood – deemed by many to be a multi-dimensional construct (e.g. Buss, 1980; Jones et al., 1986) – was assessed using only one question in this survey. Heiser, Turner and Beidel (2003) also explored the relationship between social phobia and shyness using a psychometric scale to measure the latter. Their findings indicated an association between shyness and social anxiety since the prevalence of social phobia among shy persons was found to be significantly higher. Still, these results also refuted their hypotheses that social anxiety and shyness are identical conditions and that social phobia is merely a severe shyness. Consequently, they concluded that excessive shyness may well be acknowledged as a risk factor but *not* as an antecedent of social phobia (Heiser, et al., 2003). Beidel and Turner (1998) also concluded that no predictors have as yet been identified to distinguish between children who will outgrow their shyness and those who develop social anxiety disorder.

A cause of shyness that can help distinguish it from social anxiety is the aspect of novelty (Buss, 1980). New situations, strange objects or unfamiliar persons can all lead to feelings of shyness, which in itself, is a normal reaction especially in children. This element of unfamiliarity is also an important aspect when discussing behavioural inhibition, which has also been identified as a potential risk factor for social anxiety disorder. Shyness could be considered an aspect of behavioural inhibition; this next risk factor shall be dealt with separately in the following chapter.

2.5.3. Behavioural inhibition

Temperament is one of the identified predisposing factors in the aetiology of anxiety disorders. No studies investigating social phobia in infants have been carried out as yet, however, aspects of temperament relating to this disorder – behavioural inhibition in particular - have been studied from an early age (Beidel & Turner, 1998). There is no agreement as yet about the specific dimensions pertaining to temperament and an excursion into the various theories would be beyond the scope of this chapter. For the sake of clarity, temperament, here, is understood as defined by Berk (1997), that is, "stable individual differences in quality and intensity of emotional reaction" (p. 397) and these "early traits are likely to be the foundation on which later personality traits are built" (Buss & Plomin, 1984, p. 84).

Lonigan and Phillips (2001) outline four models explaining the relationship between temperament and psychological disorders. The first is a model depicting temperament as a predisposition to a disorder. The second presents temperament as a moderator influencing the development or expression of anxiety in an indirect manner. The third on the other hand describes temperament as a complication which is altered or influenced by the pathology itself. And finally, in the fourth model temperament and psychopathology are illustrated as being on a continuum where the disorder would reflect the extreme of a specific dimension of temperament.

One particular aspect of temperament that has been linked with social anxiety is behavioural inhibition (BI) (Velting & Albano, 2001). BI is a natural and normal reaction when a child encounters a new situation, object or person. The level of inhibition a child exhibits differs from individual to individual. This difference in behaviour indicates interpersonal differences thus BI is not solely dependent on the familiarity or novelty of a stimulus. It only becomes problematic when reactions are extreme and hinder the child's normal functioning and development. Berk (1997) describes an inhibited child as a child who withdraws and expresses negative emotions when encountering new situations. Turner, Beidel and Wolff

(1996) mention that the BI construct includes various fear-related behaviours, such as, crying, distress and withdrawal. A number of psychophysiological factors have also been associated with BI, the most frequent being heart rate and heart rate variability as well as papillary dilation and higher salivary cortisol levels. Asendorpf (1990) describes highly inhibited children as experiencing an approach-avoidance conflict: they are motivated to approach a person or a situation but are hindered by their inhibition.

Asendorpf (1990) conducted a longitudinal study in Germany with the aim of exploring the situational specificity of individual differences in childhood BI. In his study, the participants were observed in multiple settings from pre-school age to Grade 1. Apart from using direct observation, the children's BI was also assessed by their parents and teachers. The correlations between the three different measures were very satisfactory. A decrease in BI over time was observed. Asendorpf found that the more a child was ignored or rejected by his/her classmates, the more inhibited s/he was. This association was revealed through both the behavioural observations as well as from the teachers' assessment. Furthermore, inhibition toward strangers was not related to children's play with familiar peers; and so it could be attributed to the unfamiliarity of the situation. This point does not concur with Buss's (1986) view of shyness. Asendorpf concludes his report by pointing out that children with strong BI tend to repeatedly experience difficulties. He also argues that these children need to be supported by the provision of stable environments in order to facilitate their development of positive relationships with others.

Kagan and Reznick (1986) argued that results relating to temperament do imply that some psychological characteristics in infancy affect the child's psychological profile later on in life. It appears that inhibition or a lack of it is a quality that remains stable over the first 5 years of life and possesses a pattern of psychological correlates that indicate the role of heredity and/or parental influences. In their review, Turner et al. (1996) reported a stability in BI - both in behaviour and in its physiological correlates - which does not correspond to Asendorpf's (1990) findings. However, BI appeared to remain stable in those children manifesting extreme symptoms and showing a high and stable heart rate. They also noted a genetic factor in BI especially in those individuals exhibiting extreme inhibition. Turner et al. point out that studies used different assessment protocols thus leading, at times, to different findings, making comparisons difficult. Still, a similar behaviour pattern for BI has been recorded across various studies using different designs. Indeed, findings from cross-national comparisons also point out at a genetic contribution to behavioural inhibition. For example Kagan et al. (1994) compared four-month-old infants from Boston (US), Dublin (Ireland) and Beijing (China) with regards to reactivity to stimulation. These three ethnic groups differed on most variables: American infants were observed to show the highest levels of arousal, followed by the Irish then the Chinese infants. These results concurred with other findings reporting lower reactivity in Asian children when compared with their Caucasian peers. Still, the genetic and environmental contribution to BI is closely linked as argued in Rickman and Davidson's study (1994). They based their investigation of personality characteristics and affectivity in parents of children with and without BI on the existing evidence of genetic and environmental influences. They hypothesized that if such influences contribute to BI, parents of inhibited children would be expected to show a different psychological profile than other parents. Findings indeed indicated associations between children's BI and specific personality characteristics in their parents such as extraversion, shyness and avoidance. Surprisingly however, this study did not report any differences on parent neuroticism and negative affectivity.

Various studies found evidence of a link between behavioural inhibition and an increased risk of developing high social anxiety. Turner et al. (1996) reported that children with BI tend to have two or more anxiety disorders when compared to their non-inhibited peers and are therefore more likely to suffer from phobias. They also point out that these fears tend to have a social or social-evaluative basis. Biederman, et al. (2001) conducted a cross-sectional study with three parent groups: one group suffering from panic disorder with or without depression, a second group with depression but without panic disorder or agoraphobia and a third control group. These individuals' children were assessed for behavioural inhibition. Results indicated a higher risk for social phobia and avoidant disorder in children with behavioural inhibition. This association was also mainly present in children whose parents suffered from panic disorder with or without major depression. In a follow up to this study, the same research group conducted a further wave of data collection five years after the first data gathering with the same sample of parents and children (Hirshfeld-Becker et al., 2007). An important finding was that behavioural inhibition predicted new onset of social phobia within the follow-up period of five years. Furthermore the risk appears to be specific for social phobia. However, it is important to note here that behavioural inhibition increased the risk of social phobia but not all children exhibiting it went on to develop said phobia. Thus, no causal relationship can be claimed. Turner et al. (1996) also reported that parents of children with BI were more likely to have suffered from one or more anxiety disorders including social phobia. They conclude that a family history of anxiety appears to have a significant role and question whether this factor, rather than BI, increases the risk of anxiety disorders in children.

In a 21-year longitudinal study Goodwin, Fergusson and Horwood (2004) examined the association between anxious or withdrawn behaviour in 8-year old children and the incidence of internalising disorders in adolescence and young adulthood. Results confirmed this link; children with early anxious or withdrawn behaviour appeared to be at risk for internalising disorders later on in life. Hayward, Killen, Kraemer and Taylor (1998) carried out a prospective study investigating the association between behavioural inhibition and development of social phobia and/or depression. Depression was included since it is often found to be a comorbid disorder with social phobia. Results showed that the fear component of behavioural inhibition was related to an increased risk for both social phobia and depression, whereas the social avoidance component was found to be a specific risk factor for just social phobia.

As mentioned in the general discussion of predisposing factors (Vasey & Dadds, 2001), Turner et al. (1996) also conclude that BI on its own is not sufficient for the development of an anxiety disorder, however, it is a predisposing factor and hence increases an individual's vulnerability.

2.5.4. Social skills deficit: Risk factor or consequence of social anxiety?

Teachman and Allen (2007) carried out a prospective, longitudinal study where adolescents were followed over a 6-year period starting at the age of 13. The aim of the study was to evaluate social factors that could predict social anxiety and fear of negative evaluation. The authors focused on the perceived acceptance, being so important in adolescence, the expectation that this would be a negative predictor of social anxiety and the fear of negative evaluation. Findings did actually identify some qualities of peer interaction at ages 13 to 16 as did predictors of social anxiety and fears of negative evaluation at ages 17 to 18. These included a lack of perceived social acceptance as well as fears of negative evaluation. The

intensity and dependence in peer interaction however, predicted an implicit fear of negative evaluation.

Avoidance of social situations results in a vicious circle where children do not develop their social skills due to a lack of social contact. Children with social anxiety have also been noted to have social skills impairment, thus interfering with the development of relationships. A pertinent question with regards to this issue is whether the social skills impairment existed before the onset of social anxiety, or whether this resulted as a consequence of the child's socially anxious behaviour. Vasey and Dadds (2001) argue that avoidance behaviour can lead to social skills impairment since the child would then fail to develop the necessary social skills when missing out on learning experiences in social contexts. Such avoidant behaviour could also lead to skills impairment in other areas such as poor academic performance due to school absenteeism (e.g. DiBartolo et al., 1998). Thus, avoidance is only a short-term solution hindering adaptation and leading to long-term consequences. Unfortunately, the immediate gratification ensuing avoidant behaviour makes this an attractive coping strategy for socially anxious individuals.

Buss and Plomin (1984) discuss the issue of sociability where they illustrate how this characteristic is based on the gratification and/or rewards following social interaction, since these then encourage further interaction in social contexts. However, not all social interaction is positive, some kinds of situations may lead to embarrassment, shame or other negative consequences. This may have the opposite effect in that further sociable behaviour is discouraged. Buss and Plomin assume that the more sociable people are motivated even further in seeking the rewards of social interaction making them more prepared to take the risk of negative experiences. As a result, due to this strong social motivation, sociable people are more likely to develop the appropriate social skills. And so Buss and Plomin approach the association of social skills in a different way, where, according to their argument, a lack of social skills would ensue due to:

- Not feeling ready to risk experiencing a negative social situation and,
- A lack of social motivation, thus less likely to develop adequate social skills.

Hymel, Rubin, Rowden and LeMare (2005) claimed that data relating to the link between social difficulties in early childhood and internalizing problems is lacking while early social withdrawal as a developmental risk factor has been given only a little attention as yet. In their longitudinal study involving primary school children, Hymel et al. examined the association early social difficulties have with indices of externalizing and internalizing problem in later childhood. It was expected that aggressive behaviour would predict externalizing problems while social withdrawal would be a predictor of internalizing problems. In Newcomb, Bukowski and Pattee's (1993) sociometric classification study, popularity was found to be positively linked with self-perception of social competence while a negative relation was ascertained to aggressive behaviour and externalizing difficulties. Social withdrawal in early childhood was found to predict the same thing three years later. In fact, children perceiving themselves as socially incompetent, reported to be unpopular and also socially isolated by their peers, expressed greater loneliness three years later. Thus, Hymel and her colleagues conclude that early social withdrawal could be a risk factor in a child's development.

2.5.5. Attachment and Parental Style

Some studies also investigated the possible link between aspects of parenting style and social anxiety symptoms. Rork and Morris (2009) focused on the aspects of warmth and control.

Their findings pointed at a link between parental control and anxiety in children whereas no association was observed between parental warmth and child anxiety. Rork and Morris found that social anxiety in children was related to the mother's overprotective behaviour and observed negative commands. Overprotection from the father's side was associated with the child's general anxiety. Greco and Morris (2002) only included fathers in their study. They compared the fathers' child-rearing style for a group of socially anxious children and a control group. Findings showed that the fathers of socially anxious children exhibited more controlling behaviour than the controls; however, children did not differ in their perception of their father's parenting style.

Cultural background and the related child-rearing style could also play a prominent role in childhood anxiety. Essau, Sakano, Ishikawa and Sasagawa (2004) dealt with this question where they compared anxiety symptoms in German and Japanese children. They hypothesized that Japanese children would be more anxious, especially in social situations. This is because in comparison to their Western counterparts their culture's values and upbringing place a lot of emphasis on being polite and accommodating. Surprisingly however, results exhibited more similarities than differences. The main disparities were that the German children had significantly higher scores on separation anxiety, social phobia, obsessive compulsive disorder and generalized anxiety disorder. In line with previous research, girls had once again significantly higher scores on all subscales.

Parenting style can also be influenced by the child's temperament and vice versa. On one hand, parents can adapt to their child's temperament, but on the other hand, they can also have a direct influence on the way temperament is expressed (Lonigan & Phillips, 2001). Indeed, Buss and Plomin (1984) also argue that it is the child's temperament that influences the mother-child relationship. As previously mentioned in the section dealing with the maintenance of social anxiety, over-adaptation to a child's temperament can be counterproductive in that it reinforces a child's anxiety-related behaviour, such as supporting a child's avoidance of social situations. Still, parents imposing particular behaviour on their inhibited children in a negative manner also leads to negative consequences. Lonigan and Phillips conclude that "a good balance between comforting and the teaching of coping skills seems to be what is most effective in moderating inhibited tendencies" (p.81).

2.5.6. Cognitive biases: Vigilance-avoidance hypothesis

The cognitive biases related to various psychopathologies have been discussed and studies have also sought to shed light on whether particular biases are associated with specific disorder. Most of these studies were carried out with adults and recent findings produced mixed results. Fewer studies have investigated this issue with children and most of these focused on a single cognitive modality.

Thompson (2001) points out that anxious children often exhibit this cognitive bias where they construct a more threatening and frightening environment through their biased interpretation of neutral or benign situations. In this way, anxious children tend to experience a more frightening environment than their non-anxious peers. Thompson also describes another cognitive aspect of anxiety: cognitive interference. This occurs when a child's preoccupation with the perceived threat influences his/her concentration on the task at hand and consequently his/her performance, leading to either a poor one or even an experience of failure. In the light of this phenomenon, Thompson argues that anxious children do not lack

skills but rather, those abilities and performance are hindered by their hypervigilance and uncontrollable cognitive biases.

Huppert, Pasupuleti, Foa and Mathews (2007) argued that the effect of multiple interpretations in vague situations has been neglected. They therefore, investigated the consequences of multiple interpretations of ambiguous social scenarios in socially anxious individuals using a sentence completion task and a self-report measure. They categorised participants into a high and a low social anxiety group and results revealed that in the sentence completion task, the high social anxiety group gave more negative or anxious responses than the low one. These differences however, became non-significant after depression was included as a covariate. Participants with higher social anxiety showed a lack of positive bias as well as a negative bias in their information processing. Still, it is important to keep in mind that depression – a common comorbid disorder in social anxiety - was found to be related to negative bias.

Reid, Salmon and Lovibond (2006) included all three modalities of information processing in their study with anxious, depressed and aggressive children between 8 and 14 years of age. Results indicated that all psychopathology measures were related to information processing biases. The only specific association was that of anxiety, where it was found to be linked with attention to threat. Consequently, the authors concluded "these findings suggest that a general negative cognitive schema may be associated with both internalizing and externalizing symptoms" (p.543).

Vasey, Daleiden, Williams and Brown (1995) included a sample of 9 to 14-year old clinically anxious children together with a control group. They hypothesized that anxious children would exhibit an attentional bias towards threat words whereas children in the control group would show the same *away* from such words. This attentional bias was assessed using the Probe Detection Task where children were presented with emotionally threatening words and neutral words. As expected, anxious children showed a tendency of attentional bias towards the emotionally threatening words even if only in the lower probe position. This tendency was found to increase with age and reading ability. The control group participants however, did not show any attentional bias away from the threatening stimuli. Ononaiye, Turpin and Reidy (2007) also used the visual dot probe task to examine pre-attentive and conscious attentional processing to different types of threatening words in a sample of University students. The sample was divided into high and low social avoidance groups. Findings pointed out an attentional bias towards physically threatening masked words in the high socially anxious group. This bias only emerged in the social evaluation condition. Unmasked trials failed to identify any differences in conscious attentional processing. Pineles and Mineka (2005) investigated attentional bias for cues of either internal or external sources of potential threat in students with high social anxiety scores. They found that subjects with high social anxiety tended to give attentional preference to internal physiological cues (heart rate).

Self-focused attention is a characteristic that is often observed in individuals suffering from social anxiety (e.g. Buss, 1980). This attentional bias could lead to an increased awareness of anxious arousal. These feelings tend to be unconsciously expressed through non-verbal behaviour thus exerting an influence on the social phobic's interactions within society and other people's reactions. Heerey and Kring (2007) examined dyadic interactions between non-socially anxious individuals and those with social anxiety. The sample in this study included undergraduate University students. Dyads including one socially anxious individual were compared with others where none of the participants suffered from social anxiety. Dyads with

a socially anxious participant had more silent pauses during their conversation whereas the socially anxious participants had more episodes of self-talk. They also exhibited more fidgeting behaviour which the socially anxious participants tended to initiate and which was then mirrored by their conversation partner. Non-socially anxious dyads reported a higher quality of interaction. Heerey and Kring concluded that internal states influence a person's verbal and non-verbal behaviour thus having an effect on social interactions. A negative social experience may discourage the individual from seeking further social contact thus reinforcing anxiety-related cognitions.

2.6. Theoretical Perspectives on Social Anxiety Disorder

Social anxiety and phobia can be understood from various theoretical perspectives. These theories propose the causes and processes leading to social anxiety and stem from adherents of different paradigms: psychoanalytic, behavioural, cognitive and biological. They also offer different explanations of the origin and development of this phenomenon in addition to providing a theoretical framework for its operationalisation and measurement. Particular attention shall be given to the behavioural, social and cognitive perspectives since these are the most relevant for the research questions of the present study.

2.6.1. Neurological perspective

Fear and other reactions related to this emotion can be traced to the amygdala. The amygdala is located in the anterior medial portion of each temporal lobe (Rosenzweig, Leiman & Breedlove, 1996). In experimental studies, lesions in the amygdala resulted in a restriction of the freezing behaviour - a typical response to fear - as well as a prevention of increases in blood pressure. This indicates that the amygdala plays an active role in the stimulation of such responses. This part of the brain has also been found to be involved in social cognition, such as recognizing emotions in facial expressions. It has been proposed that social phobics have hypersensitive amygdalas especially in the case of threats related to social situations (Velting & Albano, 2001).

2.6.2. Behavioural and social learning theory

Behaviourists maintain that behaviour is lawful and can therefore be predicted and controlled (Hall & Lindzey, 1985). They also maintain that even phobias are learned through association. One way of 'learning' a phobia is through the basic conditioning where a negative stimulus is paired with a neutral object or situation. In a well-known experiment with 'Little Albert' a fear of white fluffy or furry objects was induced using the concept of classical conditioning where a frightening sound was paired with the sight of a white rat (Ormrod, 1995). Of course, this kind of experiment is nowadays viewed as unethical but in truth this study has proven the strength and possible generalisation (in this case from fear of a white rat to that of various white furry/fluffy objects) of phobias. In fact, it is often reported by people suffering from a phobia that their fear developed following a negative or traumatic experience. For example, being laughed at in class could result in a fear of being with others. However this cannot be taken as an explanation to be applied to all cases.

Another manner of 'learning' a phobia is explained by the social learning theory (Bandura, 1977). Similar to the behaviourists' perspective, social learning theorists also believe that behaviour is mostly acquired or learned. According to this theory, new behaviour is learnt through modelling, that is, by observing other people's reactions. Emotional responses such

as fear can also be learnt through vicarious learning where for example people develop a phobia by witnessing someone else's phobic reaction.

Hong and Woody (2007) argue that culture exerts an important influence on the experience of social anxiety since one's social self is formed by cultural norms and expectations concerning appropriate and successful social behaviour. They examined cultural differences between East Asian and Euro-Canadian adults, focusing on self-construal, identity consistency and self-criticism, factors that tend to differ between these two cultures. As expected by the authors, the East Asian group scored higher on social anxiety, reported higher levels of interdependent self-construal (i.e. adapting one's identity to the context), more self-criticism as well as lower levels of independent self-construal than their Euro-Canadian counterparts. However, Essau et al. (2004) found more similarities than the expected differences between German and Japanese children. Moreover, they reported higher scores on social anxiety, separation anxiety and general anxiety for the German children. Thus, cross-cultural differences relating to social anxiety need to be studied further and perhaps more variables, such as individual parenting style and family history of mental illness need to be taken into consideration as well.

An alternative approach to social phobia related to social learning and the concept of personal and vicarious reinforcement states that people experiencing this problem actually lack social skills. Indeed, rather than the lack of such skills being a result of the social isolation imposed by social anxiety disorder, it is actually viewed as a precursor to this complaint. It has been widely assumed that socially anxious individuals lack adequate social skills and as a consequence, social skills training was frequently included in the treatment of this disorder (Beidel & Turner, 1998). This social skills deficit would, according to this view, lead to feelings of discomfort when in other people's company and to a greater chance of behaving inappropriately with the result of being laughed at or criticised. Consequently, people lacking in social skills would actively avoid social situations as they would make them feel anxious and inadequate. This explanation would lead to a simple solution, where socially anxious people could be offered social skills training as a way of decreasing their anxiety when in public situations (Beidel & Turner, 1998). Beidel, Turner and Morris (1999) indeed found social skills deficits in the socially anxious children participating in their study. However, their findings relied on observer ratings, thus discrepancies due to cognitive biases and interference or low performance due to nervousness and/or hypervigilance could not be looked into. In fact, Beidel et al. (1999) reported that socially anxious children were rated by the observers as more anxious during the two set tasks. This heightened anxiety could interfere with these children's performance notwithstanding their possibly good social skills.

In fact this view has been questioned; do persons suffering from social anxiety disorder actually lack the necessary social skills or does this observed deficiency stem from cognitive biases and interferences and a negative self-perception (Cartwright-Hatton, Hodges & Porter, 2003; Rapee & Heimberg, 1997)? Social phobics may believe they are unable to perform in the way they would like to and thus give an unfavourable impression of themselves (Rapee & Lim, 1992). Studies relying on self-report did find social skills deficits; however, these findings could have easily been biased by the participants' negative self-perception. Indeed, studies including both self and observer reports ascertained a discrepancy between these assessments. Cartwright-Hatton, Tschernitz and Gomersall (2005) suggest that inadequate social skills in adulthood may be a result of under-rehearsal due to avoidance of social situations. In other words, children who avoid social situations due to their anxiety would miss out on developing, observing and practising social skills – as put forward in the social learning theory – eventually suffer from social skills deficit later on in life.

In relation to this discussion about social skills deficit or avoidance of social interaction, Cartwright-Hatton et al. (2003) carried out an investigation comparing self- and observer-rated social skills in 8- to 11-year old children. Results indicated no link between lack of social skills and social anxiety. Self-reports were noted to be more negative and did not correlate with the observer reports. Cartwright-Hatton et al. state that the most salient feature of their findings was that socially anxious children were mostly concerned about appearing nervous. It therefore appears that individuals suffering from social anxiety disorder may very well be underestimating their social skills. In this case the provision of social skills training in treating social anxiety could actually reinforce this incorrect perception rather than help the individual (Cartwright-Hatton, et al., 2003). In a replication of the previous study Cartwright-Hatton et al. (2005) compared socially anxious children with others reporting low social anxiety. As expected, they found that the socially anxious children rated themselves lower on social skills, however independent observers' assessments did not distinguish between the two groups. Further analysis indicated that this discrepancy was related to nervous behaviours. Their results therefore echoed those of the 2003 study where children thought they appeared more nervous than they actually did to the observers. Cartwright-Hatton et al. (2005) observed no differences on social skills.

Alfano, Beidel and Turner (2006) reported similar findings from their study with children and adolescents diagnosed with social phobia. In their investigation, they found that the socially anxious children and adolescents were more likely to expect to perform badly, therefore evaluating their performance as inferior than that of their peers in anticipation of and following a social interaction. Still, these children's evaluations were accurate when compared to those of independent evaluators. This lower performance was explained by Alfano et al. as a consequence of negative self-thoughts and negative self-talk rather than an actual lack of social skills.

The issue of social skills and social phobia is also a matter that can be directly related to the classroom environment; a social context involving interaction and performance situations. Since people with social phobia fear negative evaluation as well as other situations involving either interaction and/or performance in front of a group, it is justifiable to conclude that a classroom situation would be a cause of great distress for social phobics and that this distress would in turn lead to various impairments in classroom performance. Bernstein, Bernat, Davis and Layne (2008) investigated this particular issue. They compared classroom behaviour in children with social phobia and anxious children without social phobia. They hypothesized that due to the social and evaluative nature of the classroom, social phobia would have a negative effect on the child's functioning in class. Nearly half of the children in this study reported experiencing difficulties in making and keeping friends, although most of the sample did report having a best friend. Results revealed that social phobic children feared a greater number of situations than the anxious children without social phobia. The latter also experienced less trouble with making friends than their social phobic counterparts. Authors found a negative correlation between severity of social phobia and both social and leadership skills, where higher severity was associated with lower social and leadership skills. An association between social phobia and school problems was also observed in the teachers' assessments: an increase in social phobia severity was linked to an increase in attention deficits and learning problems. These attention deficits can also be explained by the cognitive approach of social anxiety presented in chapter 2.6.3, where it is argued that the individual's worries and anxious thoughts act as a distraction from the task at hand thus negatively impacting attention and performance (e.g. Rapee & Heimberg, 1997).

Van Ameringen, Mancini and Farvolden (2003) argued that the problems in school caused by an anxiety disorder could lead to underachievement or even dropping out of school. They investigated this hypothesis by interviewing patients in an anxiety disorder clinic where participants were asked about their school experience. Of the sample of 201 patients, nearly half reported having left school prematurely. The main reasons given for this included feeling too nervous in school or in the classroom and problems with speaking in front of the class. The latter was also the most quoted reason by both the patients who claimed they did not enjoy school as well as by those participants who found school to be intimidating. Other reasons reported for finding school to be intimidating were likely to involve the social aspects of school, such as problems making friends and feeling intimidated by teachers and peers. Indeed, 61.2% of the participants who reported dropping out of school had been diagnosed with social phobia. The authors conclude that young people suffering from an anxiety disorder, especially those suffering from social anxiety disorder, are at a greater risk of dropping out of school.

To sum up, the social anxiety and avoidance behaviours characteristic of socially anxious individuals can create a vicious cycle, where avoidance would lead to a deficit in the development of age-appropriate social skills. This lack of social skills would in turn cause more anxiety and distress; perhaps even embarrassing social experiences; thus leading to increased avoidance behaviour. The behavioural and social learning perspectives explain the process of learning and maintaining behaviours - including fears and social behaviours - therefore being of particular relevance in the study and understanding of social anxiety.

2.6.3. Cognitive perspectives on social anxiety

This perspective is based on people's way of structuring experiences, making sense of them and relating the present experiences to past ones stored in memory (Davison & Neale, 1998). An explanation based on the cognitive theoretical framework views anxiety as a predisposition to focus on negative stimuli together with the belief that negative occurrences are more likely to happen. Such cognitive biases do not only appear in the aetiology of social anxiety as described in chapter 2.5.6 but are also a prominent feature in the maintenance of this disorder. Persons suffering from social anxiety also tend to interpret neutral or ambiguous stimuli as threatening or negative. Thus, people who suffer from social anxiety possess an increased awareness of what people may think of them and how they may be judged. This can be defined as a heightened self-consciousness that leads to increased anxiety and eventually extreme reactions such as panic attacks (Solomon, 1980). This approach has also led to the application of cognitive behavioural therapy for social phobic patients (Musa & Lépine, 2000).

An early theory from the cognitive perspective is that of Beck, Emery and Greenberg (1985). They describe socially anxious people as having dysfunctional beliefs about themselves regarding the way they should act in social situations. These beliefs tend to be triggered by a social situation and lead to feelings of social anxiety: the close monitoring of social anxiety symptoms, such as sweating, are interpreted as a lack of social skills by the individual and this in turn acts as a distraction in the processing and responding to social cues. Such behaviour is also noticed by others and influences their reactions to the socially anxious person thus fulfilling the social phobic's negative expectations.

Another major cognitive theory of social phobia was presented by Clark and Wells (1995) where the focus lies on the attentional shift to the threat of negative evaluation by others.

Clark and Wells's cognitive model of social phobia attempts to explain the persistence of social anxiety and what hinders a person suffering from it, from changing their negative beliefs about social situations. They explain that social phobics develop "a series of assumptions about themselves and their social world that makes them prone to believe that they are in danger in one or more social situations" (Clark & Wells, 1995, p.69). These individuals have a fear of behaving inadequately and that this would lead to them being rejected. The authors distinguish three categories of dysfunctional beliefs:

- Excessively high standards for social performance: these cause anxiety since they are often difficult, sometimes impossible, to achieve and this leads to further anxiety and concern about being unable to fulfil them. Example: "I must appear intelligent and witty".
- Conditional beliefs concerning social evaluation: These are often a consequence of the false assumption that what others think about me must be true or correct. Example: "If I disagree with someone, they will think I'm stupid".
- Unconditional beliefs about the self: Individuals suffering from social anxiety tend to have negative beliefs about themselves, such as "I'm stupid". However, such self-schemata are usually unstable in people with social anxiety since these negative beliefs are usually only related to social situations. Thus, even though people with social anxiety may have a negative view of themselves in social situations, they could then have a more positive view of themselves in other contexts, such as with family members or in situations where they are on their own.

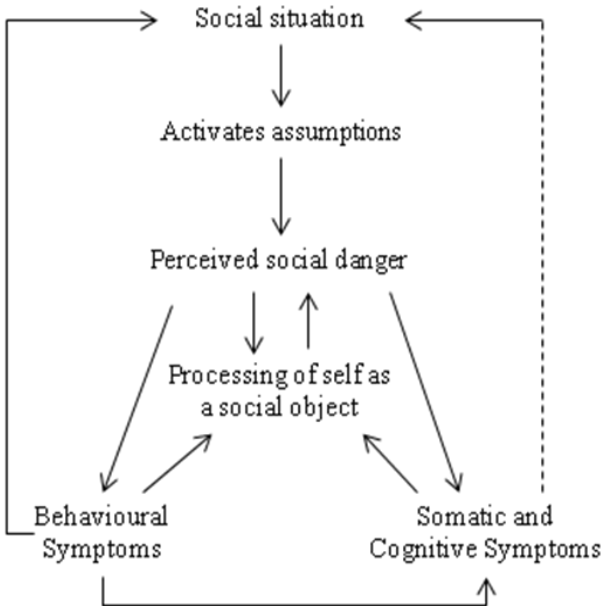

Figure 2.6. Clark and Wells's cognitive model of social anxiety. Adapted from "A Cognitive Model of Social Phobia," by D. M. Clark and A. Wells, 1995, in R. G. Heimberg, M. R. Liebowitz, D. A. Hope & Schneier, F. R. (Eds.), *Social Phobia: Diagnosis, Assessment and Treatment*, p.72. Copyright 1995 by The Guilford Press.

This biased perception activates an anxious reaction involving somatic, cognitive, affective and behavioural symptoms. Moreover, these symptoms tend to cause further distress, for instance, awareness of oneself blushing could cause anxiety about looking nervous or foolish to others. This also includes the assumption that others are aware of one's feelings and distress shall, as a consequence, lead to a negative evaluation. This shift of attentional focus is

a core concept in Clark and Wells's model where the socially anxious person monitors his/herself closely and becomes more aware of his/her anxious reaction. Additionally, this preoccupation with signs of anxiety distracts the individual from the ongoing social interaction and from processing social cues. This behaviour would also have an influence on the responses of others who may then act in a less friendly manner thus confirming the individuals' fears of negative evaluation. The crucial point in this model is that the social phobics negative beliefs stem from their "own impression of how they appear to others, rather than from the observation of others' responses" (p.71). This process is illustrated in Clark and Wells's graphical representation of their model (Figure 2.6).

Clark and Wells (1995) also observe that a socially anxious person would use various strategies to reduce the risk of a negative evaluation such as avoiding eye contact. However, these strategies or "safety behaviours" may at times exacerbate the experience of anxiety or increase the risk of the behaviour the person is trying to avoid, such as shaking.

Rapee and Heimberg (1997) put forward a cognitive-behavioural model of anxiety in social phobia. They described the process an individual goes through when facing a social situation where reaction and anxiety are mainly based on the person's self-perception and fear of negative evaluation by the audience.

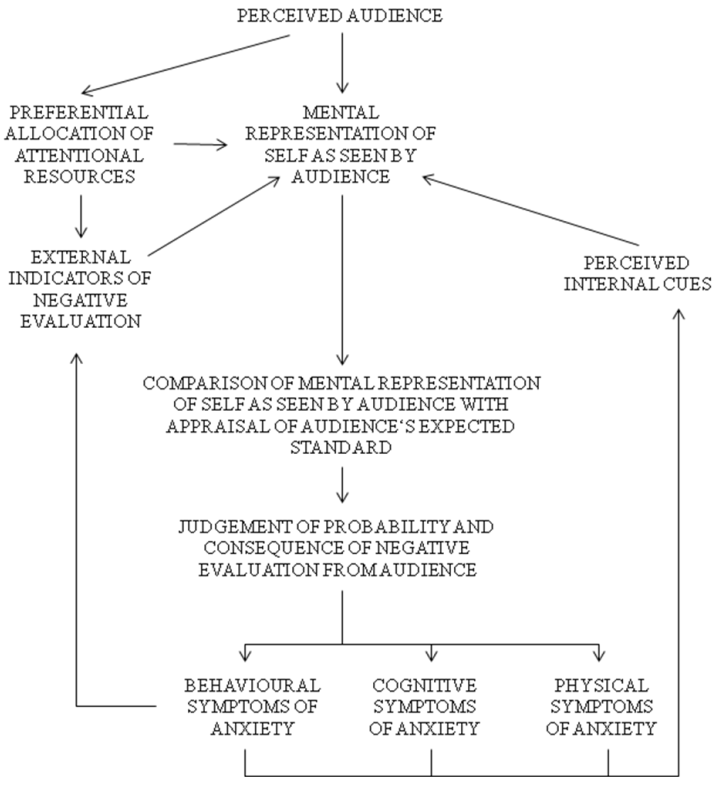

Figure 2.7. Rapee and Heimberg's Cognitive Behavioral Model of Anxiety in Social Phobia. Adapted from "A cognitive-behavioral model of anxiety in social phobia," by R. M. Rapee and R. G. Heimberg, 2007, *Behaviour Research and Therapy, 35*, p.743. Copyright 1997 by Elsevier B.V.

According to the authors, people with social phobia tend to have a more negative self-representation than what the audience actually perceives. This leads the social phobic to place

a lot of attention on detecting threatening or negative reactions in the audience, hence concentrating less on the task at hand. The socially anxious individual compares this self-representation - that s/he believes the others perceive – with their expectations. A discrepancy between these two factors would indicate the probability of a negative evaluation thus increasing the persons' symptoms of social anxiety. As argued in the previous chapter, this discrepancy, and not lack of social skills, may lead to poor performance. Thus cognitive-behavioural models such as Rapee & Heimberg's (1997) or Clark and Wells's (1995) emphasize that multiple cognitive biases interact to maintain and exacerbate anxiety symptoms. Various studies and experiments have investigated the cognitive-behavioural explanation of social anxiety. A selective bias has been observed in most studies thus confirming the socially anxious individual's bias in information processing.

Cloitre, Cancienne, Heimberg, Holt and Liebowitz (1995) applied the memory paradigm in their study of potential biases for threat information in social phobics. This study included two memory tasks: high speed recognition and free recall, which measure perceptual memory and semantic memory respectively. This same procedure had been used with persons suffering from panic disorder where a bias towards disorder-related material in both tasks was observed. However, results showed no differences between social phobics and controls on these same tasks. Cloitre et al. interpret these results as suggesting differences in the cognitive functioning between the specific anxiety disorders. Both the social phobic group as well as the control group showed memory biases for non-neutral words thus eliminating the possibility of the measurement being insensitive.

Wells and Papageorgiou (1999) tested the prediction in Clark and Wells' (1995) cognitive model of social phobia. They examined perspective-taking in social phobia, agoraphobia, blood/injury phobia and a control group. They expected social phobics to report a stronger observer perspective for images of anxiety-provoking social situations due - of course - to their information processing bias. Results confirmed these expectations. This perspective was also taken by agoraphobics. Well and Papageorgiou explanation for this is that observer perspective imagery tends to be specific to anxiety disorder involving concerns with social evaluation.

Lundh and Öst (1996) focused their experiment on facial recognition where they compared twenty socially anxious individuals with a control group. They hypothesized that the subjects suffering from social phobia would have a recognition bias for twenty faces encoded as 'critical' or 'accepting'. The social phobic participants showed a bias for the critical faces in the recognition task where this bias was evident both in recognition as well as in the rating (the recognized faces tended to have a higher rating in looking critical). The control group tended to have a bias in recognizing the accepting faces more. Still, the subjects diagnosed with social phobia did not rate the persons in the photographs as more critical than the control group thus implying that the difference does not lie in the social perception but rather in the individuals' beliefs and expectations.

Rapee and Lim (1992) examined the discrepancy between observer and self-rating of performance which is an issue mentioned in both Clark and Wells' (1995) model as well as in that presented by Rapee and Heimberg (1997). Social phobics were compared with a group of controls where all subjects were required to make a speech in front of a small group. Subjects were asked to rate their performance as well as that of some of the other subjects. A discrepancy between self-rating and observer-rating was found in all subjects, however, social

phobics showed a greater discrepancy. This difference was observed in the rating of the global features of the performance rather than that for specific behaviours.
Basing their study on Clark and Wells' (1995) cognitive model of social anxiety, Anderson, Goldin, Kurita and Gross (2008) examined autobiographical narratives of a "socially painful" situation. These comprised of descriptions of the particular situation by the participants themselves followed by a linguistic analysis of this verbal description. A group of participants diagnosed with social anxiety disorder was compared to a group of healthy controls. Anderson et al. found that participants in the social anxiety group used more self-referential and negative emotion words, hence using fewer words that referenced other people. The authors compared this finding with the cognitive model of social anxiety's claim that social phobics focus more on themselves than on other people or external stimuli. Indeed, Anderson and his colleagues also observed that participants with social anxiety made greater use of sensory and perceptual process words, particularly those related to physical sensations, thus concurring with the cognitive model's explanation of social phobics focusing on their physical symptoms of anxiety. No differences in negative self-beliefs were observed between the social anxiety and the control groups, however, socially anxious participants reported an elevated self-conscious emotion during the situation recall exercise as well as greater current avoidance of similar situations. This last observation is very important in understanding the maintenance of avoidance behaviours in individuals suffering from social anxiety.

Veljaca and Rapee (1998) investigated the detection of an audience's positive and negative evaluation indicators by subjects with low and high social anxiety. Subjects with higher social anxiety scores also rated higher on other measures including: social avoidance and distress, fear of negative evaluation, self-consciousness and state anxiety during their speech task. Participants in this study also needed to note the positive and negative responses of three persons in the audience, while giving their speech. Results indicated that individuals with higher social anxiety tended to detect negative responses better than the subjects with low social anxiety. They were also found to be worse at detecting negative social cues from the audience.

Another element in cognitive biases is the interpretive bias for ambiguous stimuli. Individuals suffering from social anxiety tend to give a negative interpretation when a situation is unclear. Constans, Penn, Ihen and Hope (1999) focused their investigation on this phenomenon where they observed interpretation biases in college students with an average age of twenty. These students were divided into a low and a high social anxiety group; however, no clinical cases of social anxiety were included. Participants were asked to read a description of a blind first date between two college students. This description included ambiguous statements regarding personal and non-personal evaluation. The participants' task was to interpret these ambiguous events as well as recall other details. The authors also included a priming task and predicted that the negative interpretive bias would be augmented in the high-social anxiety group due to exposure to social threat stimuli. The students in the high-social anxiety group did in fact rate more negative interpretations than the low-social anxiety group. However, this difference was limited to the interpretations of personal events; no differences were ascertained in the case of nonpersonal events or in the recall task. These findings therefore suggest that this negative bias is not generalized to all ambiguous events. The priming task was found to have no effect in this study.

These cognitive biases have been consistently observed in adults but what about children? Few studies of the cognitive features of social anxiety disorder have included children as yet. However, most studies carried out with children and/or adolescents have confirmed the

findings of adult studies: socially anxious children perceive and interpret information in a different manner from children without social anxiety. Children suffering from this disorder often perceive non-existent threats.

Spence, Donovan and Brechman-Toussaint (1999) investigated possible cognitive biases in children diagnosed with social phobia. The main aim of their study was to find out whether socially anxious children exhibit a similar pattern of information processing biases as their adult counterparts. Additionally, this study also explored whether social phobic children show any deficit in either social skills and competence or less successful social interactions. Spence et al. included the prompt procedure in their study where they hypothesized that children with social phobia would report more negative cognitive processes than nonanxious children. Data was collected from parents, observers and the children themselves. The general results indicated a similar pattern in cognitive biases as that found in adults with social anxiety. Social phobic children exhibited a pattern of cognitive negativity with regards to social-evaluative situations namely: the anticipation of a negative outcome, a more negative evaluation of one's own performance and an elevated level of negative thoughts. A difference in social skills was also noted, where socially anxious children scored lower than the controls. This was observed in both the parents' as well as the children's reports. Spence et al. claim that this social skills deficit may partially explain why children with social phobia have negative performance expectations. Still, it is interesting to note that no differences in reading performance were found between the social anxiety and the control group. The authors suggest that social phobia develops via various pathways until a vicious circle amongst the factors involved is established. However, no conclusions could be drawn here about which factor precedes the other since this study involved a cross-sectional design.

In a recent study, the interaction of threat interpretation bias and self-focused attention was investigated in non-referred socially anxious children (Higa & Daleiden, 2008). The goal of this investigation was to explore the causal role of self-focused attention on threat interpretation biases in socially anxious children. Higa and Daleiden found that social anxiety predicted a threat interpretation bias as well as a higher self-focused attention. This finding ties in with Buss's (1980) illustration of public self-awareness and anxious individuals (in Chapter 2.4.2).

3. The Role of Sport in Anxiety Reduction

The physical benefits of a physically active lifestyle are now well-documented: regular exercise not only improves physical fitness but also reduces the risk of various diseases such as coronary heart disease (CHD) and obesity (WHO, 2003). This improved physical condition can also have a positive impact on adults', younger persons' as well as children's emotional and mental health (Röthlisberger & Seiler, 1999; Salmon, 2001; Steptoe & Butler, 1996). Numerous studies have investigated the relationship between sport and exercise and mental well-being. Sport was found to enhance mental health in people suffering from depression and anxiety as well as improving mood (e.g. Craft & Perna, 2004; Fox, 1999; Salmon, 2001; Scully, Kremer, Meade, Graham & Dudgeon, 1998). Some studies even claimed that sport had a similar effect to anti-depressant medication (Dey, 1994) or psychotherapy and other traditional forms of treatment (Craft & Landers, 1998). These studies, therefore hailed physical exercise as a neglected intervention in the treatment of mental health problems (Callaghan, 2004). Still, most research investigations include adult samples, thus some questions relating to the effect of sport on the various dimensions of mental health in children remain open.

3.1. Theoretical Framework

This study is based on two theoretical perspectives: Antonovsky's (1997) salutogenesis model and the theory of social learning (Bandura, 1977). These two theories provide support for the hypothesised influence of sport practice via the two proposed pathways as illustrated in Figure 1.2. These two pathways shall be elucidated in this chapter with reference to related studies and their findings and shall provide a theoretical basis for this study's main hypotheses.

3.1.1. Sport as a General Resistance Resource against Social Anxiety

The salutogenesis model is based on the fundamental postulate that heterostasis, ageing and progressive entropy are core characteristics of all living organisms (Antonovsky, 1997). In contrast to the pathological approach, this model focuses on what helps a person maintain good health rather than concentrating on the aetiology of sickness. In the light of this health-focused approach, Antonovsky speaks of a health-sickness continuum instead of a dichotomy of health and sickness and focuses on what leads to and maintains health. Thus, the salutogenesis approach recognizes the existence of the various factors improving or maintaining good health.

Antonovsky (1997) put forward the idea of Generalised Resistance Resources (GRRs) that can be anything of help against stressors including money, social support, a positive self-concept, etc. This is followed by the concept of a sense of coherence where an individual feels confident that his/her internal and external environment is predictable and that things will develop in an expected manner. Antonovsky describes stressors as risk factors that are to be reduced or buffered through protective factors. Sport could be considered as a GRR since it is has been found to improve general mental health (e.g. Fox; 1999; Steptoe & Butler, 1996) as well as social skills (WHO, 2003), thus acting as a protective factor for our psychosocial wellbeing.

The process of how sport could act as a GRR could be explained through different hypotheses put forward by several authors. Various psycho-physiological explanations have been

dedicated to the effect of sport on anxiety. These theories, such as the endorphin hypothesis, shall only be looked into briefly at this point since the psychosocial – rather than the physiological – processes involved in sport are the focus of this investigation. This will be followed by a presentation of empirical studies in chapter 3.2 reporting about the influence of sport on the general as well as the specific aspects of mental health.

The thermogenic hypothesis for instance, claims that the increase in body temperature during exercise leads to muscle relaxation and thus to an improved affective state (de Vries, 1981). Nevertheless, some studies investigating the effect of exercise on anxiety disorders pointed out that the physiological changes during exercise mimic the signs of a panic attack, which may then lead to an actual panic reaction in the participant (Clark, 1986). For that reason, this explanation may not be ideal in the case of children suffering from social anxiety symptoms. Petruzzello, Landers, Hatfield, Kubitz and Salazar (1991) suggest that exercise works differently from passive body heating (e.g. a hot bath) in reducing anxiety since it dissipates body heat more easily. Still, they stated that the results of their meta-analysis did not support this hypothesis; notwithstanding that body temperature was not directly measured. Indeed, studies involving direct testing of this hypothesis have produced inconclusive results with some evidence even refuting this explanation (Koltyn, 1997). Koltyn calls for a multidisciplinary approach in investigating this hypothesis to identify better the role of body temperature increase through sport in anxiety reduction.

The endorphin hypothesis explains the effect of acute exercise on mood through the release of endorphins to the brain. This instigates a transient feeling of mood elevation or euphoria (Steinberg & Sykes, 1985). Steinberg and Sykes propose that the effects of physical exercise mimic those of acute or chronic opioid administration. They even add that exercise could be used as a substitute to drugs in some cases. Still, they also note that this mechanism is not as yet clear and remains to be studied further. Furthermore, Steinberg and Sykes point out that although exercise is found to improve mood, this does not necessarily involve opioid mechanisms, seeing as there are a variety of substances as well as environmental conditions that could lead to mood changes. This effect has been mainly investigated with animal subjects where direct evidence was found (Hoffmann, 1997). Nevertheless, in a more recent review, Hoffmann claims that both human and animal experimental data imply an activation of opioids by long-duration aerobic exercise.

Craft and Perna (2004) describe the monoamine hypothesis as the most promising to date. This hypothesis focuses on the changes in neurotransmitters as a consequence of exercise. It is mostly relevant for depression since this disorder is often related with a decrease in neurotransmitter, such as serotonin.

The Opponent Process Model describes the process of acquisition of motives as similar to the development of addictions rather than through association of conditioning (Solomon, 1980). Habitual activities, such as, sport, could lead to habituation which would then lead to even further activity. Petruzzello et al. (1991) explain that according to this model, a process and its associated affective state (in this case exercise and anxiety) remain constant, while the opponent process (relaxation) would become stronger. Their meta-analysis supported this model since they recorded a reduction in anxiety at different time intervals after exercise.

A psychological rather than physiological explanation of the effect of sport on our mental health claims that distraction is actually the reason for the positive influence of physical activity on our mental well-being. This hypothesis has actually been developed through a

study comparing the effect of various activities on state anxiety (Bahrke & Morgan, 1978). According to this hypothesis, an individual practising sport would be distracted from other cognitions, which could cause distress, for example the biased cognitions related to social anxiety. Even so, this effect cannot be exclusively ascribed to sport practice since there may well be other non-sportive activities, that could provide effective distraction.

Sonstroem (1997a) put forward an explanation based on the indirect positive influence sport has on an individual's self-esteem. In their Exercise and Self-esteem Model, Sonstroem and Morgan (1989) argue that exercise enhances components of the physical self and as a consequence self-esteem is improved. Sonstroem (1997a) reviewed research validating this model and findings showed that components of the physical self possess attributes that can be ascribed to the self-esteem. Furthermore, a positive perception of one's physical self is linked to positive emotional adjustment. In another review, Sonstroem (1997b) concludes that physical self-concept was more closely related to exercise than global self-esteem. He also points out that most self-esteem gains were found to occur in individuals with an initially low self-esteem or low physical fitness. Additional investigations based on Sonstroem's premise have highlighted a positive influence of exercise on a specific subdomain of self-esteem related to the physical self-concept, such as bodily strength and physical attraction (Scully et al., 1998).

Not one of these hypotheses and models however, has been successful in providing a comprehensive explanation of the process of sport's influence on mental well-being. Scully et al. (1998) suggest in their review that the diversity in results of studies exploring the association between exercise and the various aspects pertaining to mental health, such as mood, depression and anxiety, could indicate that "more than one underlying mechanism may be implicated" (p. 114).

From a salutogenesis perspective (Antonovsky, 1997), sport participation could be considered as a possible GRR boosting an individual's resources, such as self-esteem and mental well-being as well as improving social skills and support networks. In this way, sport participation would be acting as a buffer against social anxiety symptoms.

Still it is important to note here that sport can also be a cause of distress for socially anxious children. Indeed, Thompson (2001) mentions that protection and risks may transpire from the same source. Thus, sport can act as a protective factor through its beneficial effect on social skills, self-esteem and mental health. However, it can also be a cause of anxiety in the case of negative experiences, such as mobbing or incidents of failure and/or embarrassment in front of an audience. Additionally, it is also related to conditions such as exercise addiction. Indeed, Scully and colleagues (1998) put forward a word of caution and recommend that "enthusiasm must be tempered with an acknowledgement of the dangers associated with exercise" (p.117). Therefore, when talking about sport engagement as a protective factor against the development of social anxiety symptoms in the current study, the idea of sport here is that of a social, not a highly competitive and competently supervised activity.

3.1.2. Sport as a context for social learning

The social learning approach focuses on learning occurring in a social milieu (Bandura, 1977). It sheds light on the processes of how people learn from each other and includes concepts such as modelling, vicarious learning and imitation. Bandura argues that, except for elementary reflexes, behaviour must be learnt and these response patterns can be acquired

either by direct experiences or vicariously. Successful behaviours are selected through the process of differential reinforcement where the consequences of an action have three main functions. Firstly, they impart information, secondly, they serve as motivators through incentive value and thirdly, they have the capacity to strengthen responses automatically. However, Bandura notes that most behaviour is learnt through modelling, that is, through observation. Observation of a desired behaviour enables an individual to form an idea of how response components need to be combined and sequenced in order to produce this new behaviour. Modelling leads to the adoption of new behaviour in different ways: it instructs individuals in new behaviour styles through social, visual or verbal displays. Modeled benefits accelerate diffusion by weakening the restraints of more cautious or inhibited potential adopters. Still, social learning can also have a negative influence on a person's behaviour in the occurrence of negative consequences. This is especially significant in children with social anxiety who are particularly sensitive to criticism and negative feedback. Indeed, as Bandura elucidates:

> Aversive experiences, either of a personal or a vicarious sort, create expectations of injury that can activate both fear and defensive conduct. Defensive behaviour, in turn, is maintained by its success in forestalling or reducing the occurrence of aversive events. Once established, defensive behaviour is difficult to eliminate even when the hazards no longer exist. This is because consistent avoidance prevents the organism from learning that the real circumstances have changed. (p.62)

This aspect of social learning is of particular relevance to the aetiology and maintenance of social fears and inhibitions.

From a social learning theory perspective, participation in an organised sport, particularly in teams, can play an important role in a child's social development. Organised sport offers an unambiguous social context thanks to its rules of play, facilitating learning through peer modelling and relationships with other social agents (Smith, 2003). Larson (2000) claims that adolescents' positive development could be encouraged by "appealing images of adulthood" (p. 171) – organised sport is an ideal context that includes adult role models representing the ideals of sport, such as fairness and discipline. Since most behaviour is learnt through observation (Bandura, 1977) role models play a very important part in this case. Coaches and team mates may therefore be positive models for a child. In this way, s/he can learn new behaviours, in particular social behaviours, through the activity of sport such as cooperation, team work, taking turns, conflict resolution, etc. In vicarious learning of abstract concepts, such as cooperation, modelling helps the individual understand what this concept is about by providing concrete examples. Sport is an ideal context of putting such concepts into practice in an unambiguous and fun way. The actions of others can serve as cues for eliciting learned social behaviour and organised sport activities are ideal situations for using such cues to stimulate correct social responses. As Bandura explains, learned responses can then be facilitated where the modelled actions function as social prompts. Moreover, by relying on experienced models, novices can learn how to act appropriately in different settings without learning about adequate conduct through negative consequences.

The social aspect of a group activity is not solely limited to team sports but also to other non-sportive activities. Fletcher, Nickerson & Wright (2003) investigated the effect of structured activities on primary schoolchildren's adjustment including psychosocial behaviour. They included sport activities with other activities, such as church activities in their study. Children participating in sports activities were rated by their teachers as being more socially competent and as having a higher psychosocial maturity than the other children participating in the

study. Fletcher et al. therefore concluded that children participating in sport are more socially competent and higher in psychosocial development than those who are less involved in sports. This study supports the role of sport in children's psychosocial development even further.

The sport coach also plays a vital role in the children's social learning through sport. In fact, Brinkhoff and Sack (1999) describe the coach or trainer as a "Bezugsperson" that is, a significant other or a reference person (p. 117). In terms of the social learning theory, the coach is an important role model for children participating in a sport, where they can learn correct sportive and social behaviour by observation and imitation. The coach also provides feedback to reinforce correct behaviour. Brinkhoff and Sack claim that s/he plays a key role representing the child's interests and expectations as well as having regular, personal contact with the children. The coach is also the first person to introduce the children to sport in a formal context and thus, the children's view of sport is greatly influenced by these first encounters. Coaches also play a significant role in attracting new members and in maintaining the existing ones. Brinkhoff and Sack emphasise the importance of coaches in children's sport activities and point out that they do not solely teach sport-related skills, such as the somersault, but also promote other life skills like positive interaction, group cohesion and social integration: „Er ist aber nicht nur Vermittler des Sports, sondern ebenfalls, wenn bisher auch sehr verkannt, einer der bedeutenden Vermittler des Lebens..." [He [sic] is not only the sport teacher but also, albeit rather unrecognised as yet, one of the significant life teachers...] (p.121). Brinkhoff and Sack add however, that the coach's role is seldom investigated in studies relating to sport in childhood and/or in youth.

In their review of research investigating the potential benefits of structured, extracurricular activities, Gilman, Meyers and Perez (2004) also assert that interaction with competent non-parent adult figures in the context of structured extracurricular activities can lead to improved resilience and identity. They maintain that through such activities, goals can be achieved, social opportunities enhanced and skills developed as well as improved.

Further to the presentation of this study's theoretical framework, the arguments based on the salutogenesis model and the social learning theory shall be discussed further with reference to research findings in this field of investigation. The first argument is that of sport as a potential GRR against social anxiety. This shall be explained in chapter 3.2. The argument of sport as an optimal context for social learning shall then be expounded further in chapter 3.3.

3.2. Sport's Potential Role as a General Resistance Resource

Various studies including reviews and meta-analyses have indicated a beneficial effect of sport on specific anxiety symptoms (e.g. Raglin, 1997; Salmon, 2001; Wipfli, Rethorst & Landers, 2008). Indeed, the European Union's working group "Sport and Health" (2008) issued physical activity guidelines where the physical, psychological and social benefits of a physically active lifestyle are underlined. These guidelines recommend at least 60 minutes of daily physical activity for school age children and youth. In a recent meta-analysis, Wipfli and colleagues (2008) concluded that "exercise alone can be effective at reducing anxiety" (p. 401).

Physical exercise's contribution to mental health can be considered from four perspectives: as treatment of mental illness, as prevention, for the improvement of mental and physical well-being of persons suffering from a psychological disorder and lastly as improvement of the

general population's mental health (Fox, 1999). This is also applicable to specific aspects of mental health such as social anxiety in this case.

In her review, Daley (2002) examines the potential value of exercise therapy as a complementary treatment for psychological disorders. The reported findings relating to anxiety disorders show a significant reduction in symptoms, however, patients suffering from panic attacks did not benefit from long-term effects. Daley reported no change in social anxiety patients both at discharge as well as a year after treatment. Still, improvement in mood, increased self-esteem and anxiety reduction were amongst some of the effects reported in Daley's review. These benefits would be expected to improve a socially anxious person's state, however, it is also mentioned that some persons suffering from a mental disorder may resist to an exercise intervention due to bad experiences in the past.

A number of studies have investigated the relationship between sport and general well-being. Data from a cross-sectional survey in Germany revealed that physically active individuals with affective, anxiety, substance abuse or dependence disorders reported a better quality of life than their physically inactive counterparts (Schmitz, Kruse & Kugler, 2004). Kirkcaldy, Shephard and Siefen (2002) carried out a study with adolescents where sport also appeared to have similar benefits within this age group. They collected data from nearly a thousand secondary school students in West Germany and found that regular endurance sport training was associated with psychological well-being. Still, since this study employed a cross-sectional design, no cause-and-effect relationship could be inferred. In their review, Broocks and Sommer (2005) also confirmed the positive influence of endurance training on anxiety.

Sallis, Prochaska, Taylor, Hill and Geraci (1999) analysed physical activity correlates in a national sample of school children. The variables found to have a significant association with physical activity were: enjoyment of physical education, use of afternoon time and family support. This influence generalized across all age and gender subgroups. Thus, it appears that the experience of physical education in school impacts a child's sport participation outside school.

Schneider, Dunn and Cooper (2009) focused their investigation on the affective response to exercise in adolescents. They claim that such a response is not only beneficial to our psychosocial well-being but also to the encouragement of further sport participation. Findings of Schneider et al.'s study showed a higher rate of physical activity in boys. They also had lower body mass index (BMI), a lower percentage of body fat and higher cardiovascular fitness than girls. A significant association between positive affective change during moderate exercise and daily moderate-to-vigorous physical activity was ascertained.

3.2.1. Sport's potential anxiolytic effect

Reviews investigating the effect of exercise on anxiety point out associations of both acute and chronic physical activity with a small-to-moderate reduction in anxiety (Biddle & Mutrie, 2001; Byrne & Byrne, 1993; Petruzzello et al., 1991; Raglin, 1997). This was also reported in a comprehensive meta-analysis by Petruzzello et al. (1991) who concluded that "no matter how anxiety is assessed (i.e. state, trait or a psychophysiological measure), exercise is associated with a reduction in anxiety" (p.156). The only exception is excessive exercise, which has been found in some studies to lead to an opposite effect, that is, an increase in anxiety symptoms (e.g. Steptoe & Cox, 1988). A frequently observed phenomenon is a

reduction in state anxiety after moderate exercise (e.g. O'Connor, Petruzzello, Kubitz & Robinson, 1995; Raglin, 1997).

Notwithstanding the numerous studies reporting a positive influence of sport on anxiety, some reviews have also come to the conclusion that the anxiolytic effect of physical exercise is minimal or non-existent when studies include individuals with no mental health problems. It is thus important to distinguish between studies using a non-clinical and a clinical sample since this has a bearing on the results and their interpretation. Raglin (1997) does mention that the differing conclusions of review investigations could be due to the studies selected for review as well as the type of meta-analytic and coding techniques used. Other reasons for the different findings are the methodological weaknesses, the criteria for the selection of studies, the operationalisation of anxiety, physical activity and sport as well as the variation in the intensity of the physical exercise involved.

Many of the studies investigating the potential association between sport and anxiety focused on aerobic exercise (Byrne & Byrne, 1993; Raglin, 1997; Salmon, 2001) where most findings indicate that moderate intensity exercise leads to reductions in state anxiety. Salmon adds that aerobic exercise is best experienced at the individual's habitual level. A few studies also report reductions in trait anxiety after a physical exercise intervention. For instance, Asçi (2003) employed an experimental design to look into the effects a fitness programme would have on anxiety and physical self-concept in female University students. Results indicated a reduction in trait anxiety.

In contrast, studies investigating the effects of resistance exercise report mixed results. Some revealed no changes or even an increase in state anxiety (e.g. Raglin, Turner & Eksten, 1993), while a few reported a reduction (e.g. O'Connor, Bryant, Veltri & Gebhart, 1993). Koltyn, Raglin, O'Connor and Morgan (1995) argue that these studies involved an intervention with weight training which was imposed on the subjects. Therefore, they allowed the participants in their study to choose what type of work-out they wanted to do. Koltyn et al. observed no significant reduction in state anxiety further to 50 minutes of weight training activity. Still, Petruzzello et al. (1991) also reported differences between the reviewed studies using aerobic interventions and those conducting nonaerobic interventions. Aerobic exercise yielded an effect while nonaerobic treatment did not. No differences were observed between the different types of aerobic interventions. On the other hand, Stathopoulou, Powers, Berry, Smits and Otto (2006) concluded in their review that findings indicate an equally effective influence of anaerobic exercise on depressive symptoms, thus the questions remains, whether this effect could also be valid for anxiety.

Wipfli and colleagues (2008) conducted a meta-analysis investigating the anxiolytic effects of exercise. They also aimed to provide support for a dose-response relationship between exercise and better mental health using randomized, controlled studies including a self-report measure of anxiety. Wipfli et al. found that results from the 49 studies included in their meta-analysis pointed out a positive effect of exercise on anxiety, where a reduction in anxiety was ascertained. The authors emphasize that the groups in these studies did not include combined exercise with some other form of treatment (e.g. pharmacological, psychotherapy, etc.), thus the positive changes could solely be ascribed to the physical exercise. Results regarding the dose-response relationship between exercise and anxiety were unclear. It was observed that effect size increased up to a certain point and then began to decrease as the exercise dose increased further. Thus, when testing the dose-response hypothesis put forward by Wipfli and his colleagues, not a linear but a quadratic trend was observed.

De Moor, Beem, Stubbe, Boomsma and De Geus's (2006) study looked into this association where they found lower scores on anxiety and depression in people who exercise. Broocks et al. (1998) investigated the effect of aerobic exercise in the treatment of panic disorder. Exercise was associated with a clinical improvement when compared to the placebo group; however, clomipramine treatment remained more effective than exercise. Although sport cannot replace pharmacological therapy, it is still proven to have a positive effect that could help improve the outcome of an individual's treatment. In addition, chronic exercise was found to be more beneficial for reducing anxiety than acute exercise (Callaghan, 2004). In his review, Callaghan maintains that exercise must be of 20 minutes or more at a time in order to influence a reduction in anxiety.

As previously mentioned, various studies revealed an association between high-intensity exercise and higher post-exercise anxiety. However, this effect has not been a general finding which in turn, points towards the influence of other factors, such as the participants' fitness level. For example, Steptoe and Cox (1988) investigated mood responses to high and low-intensity exercise trials. Participants were grouped according to their fitness level and the possible effect of music played during the activity was also taken into consideration. Their sample included female medical students in good physical and mental health. Anxiety was one of the dimensions measured in this study and it appeared to increase after the high exercise session in both fitness groups. A slight reduction was observed after the low-intensity session in all participants. Still, larger differences in the participants' fitness levels may play a role in this effect of intensive exercise. Another possible mediator in exercise-anxiety association is the environment. McAuley, Mihalko and Bane (1996) tested the hypothesis that the environment would have an influence on the effect of exercise on state anxiety. They did not ascertain any differences between laboratory and field setting. However, their sample consisted of only 34 University students who reported normal levels of anxiety at baseline.

Most studies include individuals with no anxiety disorders, with only a few studies recruiting samples from a clinical population (e.g. Biddle & Mutrie, 2001; Byrne & Byrne, 1993). Some studies with individuals suffering from an anxiety disorder mentioned the possibility of intensive exercise leading to increased anxiety and at times even panic attacks (e.g. Biddle & Mutrie, 2001) as explained in Clark's (1986) Cognitive Model of Panic Attacks. Clark claims that panic attacks can be the result of a "catastrophic misinterpretation" of particular physiological responses similar to anxiety symptoms, such as increased heart rate and hyperventilation. The physical arousal caused by exercise may mimic the symptoms of such an attack thus causing distress to the participant. But then again, some studies point out that exercise may lead to a positive attribution to physiological arousal, hence preventing feelings of panic (Clark, 1986; Salmon, 2001). Indeed in the elucidation of his theory, Clark suggests that symptoms such as hyperventilation induce panic only when perceived as unpleasant and are interpreted in a catastrophic manner. Other studies claimed that the increase in anxiety after exercise was really due to the participant's poor fitness level. For example, O'Connor et al. (1995) compared findings from three studies including highly trained athletes, students with an average fitness level and students with a below average fitness level respectively. The highly trained athletes did not report any changes in anxiety after training whereas the group of average fit students experienced a decrease in state anxiety 2 and 10 minutes after the exercise intervention. The third group, on the other hand showed higher state anxiety 5 minutes after exercise but this returned to baseline level 15 minutes post-exercise. Thus, O'Connor et al. concluded that an increase in anxiety following high-intensive exercise depends on the person's fitness level and the increase in anxiety symptoms appears to be transitory. Another explanation for this possible negative effect of exercise on individuals

vulnerable to panic attacks focuses on elevated lactate levels as a consequence exercise. Still, studies investigating this explanation provide inconclusive results. For instance, Stein et al. (1992) studied this potential effect in panic patients and did not find any differences in lactate levels during exercise. They also observed that premature cessation of exercise was due to the low fitness level of the participants thus supporting O'Connor et al.'s conclusions.

Broocks et al. (1998) hypothesized that aerobic exercise could contribute positively to the treatment of two specific anxiety disorders: panic disorder and agoraphobia. This study was conducted with a group of patients who were assigned to three treatment groups: medication (clomipramine), placebo and exercise (walking and running) groups. The three treatment groups did not differ at baseline but changes were observed after treatment. The exercise group reported an improvement compared to the placebo group. The group using medication however showed the fastest and biggest improvement. This study does not support the argument that exercise may lead to further panic attacks, however it also does not back up the view that sport can replace drug treatment in the case of psychological disorders. The lack of studies including clinical samples however, does not allow the generalisation of the encouraging results found in non-clinical samples to individuals suffering from anxiety disorders. Thus, further research is necessary in this area.

A critical point brought up by Raglin (1997) is the necessity for longer post-exercise assessment so as to explore the potential long-term effects of sport with regards to anxiety. This issue was also brought up by Craft and Landers (1998) in their meta-analysis investigating the effect of exercise on depression where they draw attention to the paucity of lengthy exercise paradigms. Very few intervention studies included long-term post-intervention assessments such as in DiLorenzo et al. (1999), who did actually find maintenance of psychological benefits (including anxiety) at the 3-, 6- and 12-month follow-ups. It is also of interest whether these same effects found in studies with adult samples would be replicated in others including children and adolescents.

3.2.2. The effect of sport on anxiety in children

In a systematic review of intervention studies assessing the potential effect of exercise in the reduction and/or prevention of depression and anxiety in children as well as youths, Larun, Nordheim, Ekeland, Hagen and Heian (2006) compared a selection of eleven exercise interventions. Only their findings relating to anxiety shall be discussed here. Most of the reviewed studies included children and adolescents who did not report any psychological disorders. A few other studies however, included at-risk participants or children in treatment. All interventions included some type of aerobic exercise. Studies with non-anxious children showed a slight improvement in the experimental group after treatment. This small difference could be due to the fact that the participants were not suffering from anxiety in the first place, thus no large changes could be expected. Indeed, the studies with children at-risk reported a clear significant difference in favour of physical exercise. The only two studies that conducted a follow-up assessment did not report an enduring effect of exercise on anxiety. Larun et al. also report of studies with children comparing high and low intensity exercise. No dissimilarities were ascertained. Still, these studies were rated by the reviewers as methodologically of low-quality and thus, no definite conclusions relating to effects of exercise intensity in children can actually be drawn. Studies comparing vigorous exercise with psychosocial interventions (e.g. group counselling) also reported no differences. Due to the dearth of studies in this area, Larun et al. could not reach any conclusions with regards to the effect of physical exercise on anxiety in children and young people. They also point out

that there is a lack of rigorous, high-quality research and thus, further investigation is necessary. This is particularly the case for samples involving children, since most studies include University or college students. Allison et al. (2005) conducted a large-scale cross-sectional study with over two thousand adolescents. They found a positive correlation between vigorous physical activity (e.g. basketball, fast cycling, etc.), psychological distress as well as with better social functioning. However, when controlling for gender, age and socio-economic status, the association with reduced distress and lower depression/anxiety was not found, even if the link of vigorous exercise with enhanced social functioning remained.

In one of the few large population studies exploring this topic, De Moor et al. (2006) examined the link between anxiety, depression and personality over a time span of 10 years in a large population-based sample of nearly 20,000 adolescents and adults. Results also revealed that those who exercised scored lower on anxiety, depression and social problems than their non-active counterparts. These differences were consistent across gender and age. In their meta-analysis including studies with both adults and younger samples, Petruzzello et al. (1991) also reported a reduction in anxiety following an exercise intervention. This effect was found to be independent of age as well as health status. These results do not concur with Larun et al.'s (2006) conclusions; however, the participants in De Moor's study did not take part in an intervention but reported self-motivated physical activity. De Moor et al. also drew attention to the fact that a causal relationship between exercise and lower anxiety and depression cannot be claimed, nonetheless these findings reveal a consistent cross-sectional association influence of exercise across gender and age groups.

Since fear is an integral aspect of anxiety, Poulton and Milne's (2002) study is also of relevance here. They investigated child fearfulness and its association with sport performance. After controlling for gender, they noted that children with low levels of fearfulness were about twice as likely as those with high levels to represent their province in sport events from age 13 onwards. This highlights the possibility that fearful children may avoid sport participation which in turn could bias results of studies with children involved in sports.

Notwithstanding the social aspect of sport, little attention has been given to a possible link between sport and social anxiety and/or phobia. Indeed Raglin (1997) points out that the influence of physical activity on specific types of anxiety has not yet been investigated.

3.2.3. Sport as prevention and/or treatment of social anxiety

As illustrated by Fox (1999), the benefits of sport can be viewed from different perspectives, two of which are sport as a preventive factor or as treatment for individuals already suffering from a mental illness.

An indirect effect of sport on social anxiety or phobia is the improvement of physical ability leading to an enhanced self-esteem. Studies investigating socially anxious children's view of oneself with regards to social skills consistently found a discrepancy between self and observer reports, where children tended to evaluate themselves more negatively. Thus, an improvement of self-esteem could prevent or reduce this symptom of social anxiety. This idea was originally proposed by Sonstroem (1997b). Regular sport participation leads to a general physical fitness including an improvement in muscle tone and loss of fat. This results in an enhanced satisfaction with one's body and may also attract admiration from peers. Improved physical fitness also increases a person's physical competencies, such as running for longer distances, and thus promotes a feeling of self-confidence in one's physical abilities.

Unfortunately, sport is not yet perceived to be of importance in the treatment of social anxiety. In their review, Velting and Albano (2001) only considered Cognitive-Behavioural Therapy (CBT) and pharmacological intervention as treatments for social phobia in youth. In addition, Keller (2003) also mentioned prescription of benzodiazepines and CBT, as the possible treatment for social anxiety disorder with the optimal treatment being a combination of both. Sport could be included in the CBT programmes as part of the social skills training or as a means for interaction or even just for the indirect effects it has on an individual's physical and mental well-being. Indeed, Broman-Fulks, Berman, Rabian and Webster (2004) maintained that aerobic exercise possesses functional similarities with CBT where it produces many of the same bodily sensations eliciting anxiety reactions. Results from their study showed that both high and low-intensity exercise reduced overall anxiety sensitivity. Smits and Otto (2009) also recommend the inclusion of exercise in the treatment of mood and anxiety disorders. They describe exercise as an attractive option since it carries no social stigma and also requires the active participation of the person in treatment. Smits and Otto explain how anxiety can be reduced through the exposure to anxiety related symptoms (such as sweating) during moderate to vigorous exercise, thus decreasing anxiety sensitivity.

One of the few studies including an exercise intervention in psychiatric treatment reported encouraging results. Brown et al. (1992) conducted a three-day-per-week running/aerobic exercise program over a nine week period with adolescent patients in a psychiatric institution. All participants experienced a reduction in depression after four and a half weeks, however, beneficial effects were mainly observed in girls after the intervention. A decrease in depression, anxiety, exhaustion and anger together with an increase in self-efficacy were noted after treatment, especially in girls. Still, these improvements were not to be found in a 4-week follow-up indicating the need for longer interventions and underlining the transitory nature of these effects. This short-term effect could be due to the duration of the intervention. Petruzzello et al. (1991) reported in their meta-analysis that exercise interventions of *more* than 9 weeks were more effective; the strongest effects were observed in studies conducting programmes longer than 16 weeks. They conclude that exercise needs to be done for more than 10 weeks in order to achieve a change in trait anxiety. In a recent qualitative review, Stathopoulou and colleagues (2006) focused on intervention studies with clinical samples to ascertain the potential efficacy of exercise in the treatment of mental disorders. They conclude that there is "preliminary evidence"; exercise has a beneficial effect on anxiety as well as on other disorders but unfortunately very little acceptance exists for the inclusion of such an intervention in traditional treatment programs.

Indeed, there are still barriers to be overcome when introducing exercise in the treatment of mental disorders. In Faulkner and Biddle's (2001) study exploring clinical psychologists' attitude towards the inclusion of sport in interventions, they highlighted various obstacles, some of which were, the professionals' view that exercise is too simple a treatment, their dualistic notion of mental illness and health, or the insufficient awareness regarding the evidence available to date - particularly in the case of depression and general mental health. Faulkner and Biddle suggest that enhancing compatibility between exercise and the existing treatment strategies could help the dissemination of findings in the area of exercise and mental health.

3.3. The Social Benefits of Sport Participation

As previously described, there are various risk factors related to social anxiety. A genetic disposition and a history of behavioural inhibition have been found to increase the risk of the onset and maintenance of social anxiety (Hayward et al., 1998). A risk factor that is particularly relevant to this study is a self-perception of a lack of social skills, which is found to be of particular significance in children and adolescents (Rapee & Spence, 2004; Spence et al., 1999). Rapee and Spence maintain that this lack of social skills may determine whether a genetic predisposition would actually develop into social anxiety disorder. Avoidance of social situations in childhood causes an under-rehearsal of social skills, which could then result in an actual social skills deficit in adulthood (Cartwright-Hatton, et al., 2005).

Sport has been recognised as an important contributor to a child's social development where children learn to respect rules, cooperate with others and acquire other skills useful for everyday life in a sports setting (Smith, 2003). Social skills play an important role in the development and maintenance of social anxiety disorder, as seen in chapter 3.1.2. Thus, sport's beneficial effect on social skills development could also act, indirectly, on the prevention or reduction of social anxiety symptoms.

Social skills were one of the first-order themes identified by Jones and Lavallee (2009) in their focus groups involving adolescent athletes and coaches. Indeed, social and communication skills were identified by these participants as "crucial life skills" (p. 164) which can be learnt through sport and transferred to everyday life. Bernstein et al. (2008) reported a negative correlation between severity of social anxiety and both social and leadership skills. They also noted an association between social anxiety and school problems reported in the teachers' assessments.

Another study including middle-school children reported lower levels of shyness/withdrawal and better social skills in participants involved in sport. Participation in organised sports was also found to play a protective role for shy children and was associated with a reduction in anxiety as well (Findlay & Coplan, 2008). The authors argued that the sport context offers good opportunities for peer interaction and provides a safe environment fostering social support and self-esteem. Findlay and Coplan found that sport participation at the first data collection point was significantly and negatively associated with shyness. They also suggest that sport provides children with opportunities for mastery which improves well-being. The social importance of team sport has also been documented in various studies, such as team sports' association with increased self-esteem in elementary school children (Slutzky & Simpkins, 2009).

Most research studying children's integration in society through sports relied on parents' or teachers' reports. Kremer-Sadlik and Kim (2007) based their study on ethnographic video-recorded dating where they recorded various sport-related events and situations experienced by the families taking part in their investigation. Their data analysis showed that sport participation was the most popular extra-curricular activity in the sample and that parents actively supported their children's sport activities, by, for example driving them to and from training, supporting them during games, etc. From the parent interviews, Kremer-Sadlik and Kim noted that parents valued sport participation for the acquisition of various traits and life skills, such as self-confidence. It is also important to point out that all parents in this study played a prominent role in reinforcing the potential benefits of sport by praising good performance or helping solve conflicts, for instance. Thus, Kremer-Sadlik and Kim conclude that parents hold an active role in sports' socialisation process.

Mcgee, Williams, Howden-Chapman, Martin and Kawachi's (2006) investigation was specifically based on this premise. The authors used data from the sample of young people chosen for a national longitudinal study. Their findings included an association between participation in sports and self-reported strengths and higher levels of attachment to parents, peers and school during adolescence. In addition to increased attachment, an increase in self-perceived competencies was ascertained. A general observation was that sport participation tended to decrease with age, however it was noted that if it existed childhood it was bound to be present in adolescence and adulthood. Thus, this research suggests that patterns in sport involvement can be instilled at an early age hence increasing the probability of sport participation later on in life.

One aspect of social behaviour, cooperation, has been associated with sport and various intervention studies have indicated the potential of sport situations to help children develop cooperative behaviour. Back in 1981, Orlick (1981) conducted an investigation with the aim of exploring the effects of a cooperative games programme in 5-year old children attending kindergarten. Their willingness to share together with feelings of happiness were measured before and after the intervention in two schools. Orlick reports no change in one school and an increase in willingness to share in the second school when compared to control groups after the games intervention. The two control groups actually showed a decline on this measure. All groups in the study reported an increase in happiness. Orlick explains this latter effect as probably resulting from the experience of different, enjoyable physical activities with peers. Polvi and Telama (2000) explored the influence cooperative work in physical education had on 11-year old schoolgirls' helping behaviour and social relationships. The duration of their intervention was one school year. The experimental group with systematic changes of partner showed significantly better helping behaviour than the other groups. Children in this group also estimated themselves to have more friends. The experimental group with self-selected partners showed fewer tendencies to help after the intervention. This learning effect supports the social learning theory's claim that social skills can be learnt (Bandura, 1977). Polvi and Telama's study also shows that social learning can take place in a sport context. Still, they also point out that teaching style appears to have an influence on the outcome too, since goal-oriented teaching appeared to be the most successful approach in their study.

In a more recent study, Goudas and Magotsiou (2009) investigated the effect of a cooperative learning physical education programme on schoolchildren's social skills. They developed and evaluated a physical education programme that specifically focused on the enhancement of social skills. The authors selected five skills as learning objectives for their programme: peer interaction, cooperative problem solution, helping peers and receiving help for goal achievement, meeting personal goals through cooperative play and following or leading a group. These skills were then transmitted through three sport types: volleyball, basketball and traditional Greek dancing. Following the intervention, children in the experimental group scored higher on cooperation skills and lower on being quick-tempered when compared to the control group. These differences were ascertained in both the self-reports as well as the peer assessments. Students who participated in the cooperative learning physical education programme also reported a stronger preference to working in groups. Goudas and Magotsiou thus claim that their findings support the idea that the aims of the physical education curriculum should also include the children's social-emotional development. Still, skills retention and transfer of the acquired ones was not assessed further.

Significant others are an important factor that influences a young person's experiences related to physical activity. Various researchers came to the conclusion that social interaction and

feedback from significant others play an important role in the formation of self-perception. Coplan, Findlay and Nelson (2004) explored this issue in their study where they anticipated that children with lower self-perceptions would report poorer relations with their parents and peers. Since young children tend to report unrealistically positive self-perceptions, Coplan and his colleagues sought to identify children with less positive perceptions of themselves. They found that these children were reported by their teachers to be more socially anxious, withdrawn and excluded by their peers. These children also reported more feelings of loneliness and tended to have mothers with an authoritarian or permissive parenting style. Thus, exclusion by peers together with loneliness indicated an elevated risk of internalizing problems and social difficulties.

Findlay and Coplan (2008) went on to examine organized sport participation as a moderator of the links between shyness and psychosocial maladjustment in children. The authors hypothesized sport participation as a protective factor in psychosocial outcomes of shy children. This was explored in a 1-year longitudinal study where children's sport activity, social behaviour and socio-emotional adjustment were observed. Data was collected from both parents and children with a measure for social anxiety amongst others. Sport participation was found to correlate negatively with shyness and positively with psychosocial outcomes, including higher positive affect, and better social skills. Interestingly enough, shy and aggressive children who were active in sport reported a higher self-esteem. An important finding most relevant for the present study was that shy children participating in sport exhibited a trend where social anxiety decreased over time. Findlay and Coplan maintain that further to the beneficial impact of sport reported by numerous studies, it is now of particular interest to investigate the effect of sport participation in specific subgroups of children. These authors' findings point at a buffering effect of sport on shyness and related factors including social anxiety.

McHale, Vinden, Bush, Richer, Shaw and Smith (2005) examined patterns of personal and social adjustment among sport-involved and non-involved 12 to 13-year old children. They collected information relating to sports involvement, self-esteem, social behaviour, substance use and delinquency. Children participating in organised team sports reported higher self-esteem than their non-involved counterparts. The former were also rated as more socially competent and less shy and withdrawn by their P.E. teachers. Even after controlling for the teachers' perception of the child's athletic skill, results still indicated lower levels of shyness and withdrawal as well as better social skills in the children involved in a sport activity.

Goudas, Dermitzaki, Leondari & Danish (2006) highlight the transition taking place towards an education through exercise with general education as the primary goal, rather than exercise with the sole objective of improving physical fitness. The teaching of life skills has been recognized as essential for the child's proper development and Goudas et al. identify school physical education as an appropriate context for teaching these skills. This is due to the transferability of the various skills learnt in sport, its practical aspect as well as its familiarity. The authors evaluated two programmes developed for teaching life skills through sport with school children. Students who took part in the programme reported improved knowledge about life skills and higher self-beliefs for personal settings. These changes were retained one month after intervention. Moreover, sport skills were also improved.

Peers have a prominent role in a child's and adolescent's general development. Developmental psychologists maintain that sport contexts provide peer interaction opportunities and are therefore important for a young person's development. Kirkcaldy et al.

(2002) argued that sport's improvement of one's physical appearance, fitness and performance can lead to more positive feedback from peer groups, thus enhancing one's self-image. In his review, Smith (2003) focused on peer relationships in the context of physical activity and found that such relationships have been identified as a key element in the study of motives in sport. He identified two main aspects of peer relationships that have been widely explored: friendship and peer acceptance.

A common finding relating to peer acceptance is that popular children tend to possess better social skills than their less popular companions (Newcomb, Bukwoski & Pattee, 1993). Popularity has been linked to sport practice where sport competence was related to higher social status amongst other things (Buhrmann & Bratton, 1977). Other studies found that physical competence was associated with social competence or acceptance (Chase & Dummer, 1992; Weiss & Duncan, 1992). In Chase and Dummer's study, athletic competence and good physical appearance were rated as the most important determinants of popularity in children aged 8 to 13 years. Peer relationships, in particular peer acceptance, is an important factor in social anxiety. One major characteristic of socially anxious individuals is to avoid criticism and negative evaluation. Thus, sport may be a means of improving a child's chances for social acceptance. Indeed, Smith (2003) concludes that physical activity is a good medium for enhancing peer relationships.

3.3.1. Specific effects related to sport type

Studies involving sport and one or more aspects of mental health often employ a general definition of sport or exercise. As a result, the specific sport modes – that is team or individual sport – or the sport disciplines and their possible influence on the psyche are not differentiated.

Some studies focused on the potential effects of team sport, particularly in relation to social aspects of behaviour. The beneficial influence of team sport on the development of children's social skills was identified in the WHO (2003) report on 'Health and Development through Sport'. Eccles and Barber (1999) investigated adolescents' extra-curricular involvement, and including in their study various types of activities amongst them team sport. Their longitudinal study hinges on the hypothesis that the productive use of leisure time can benefit adolescents' development. Furthermore, they examine the potential benefits as well as the risks associated with extracurricular participation. The five kinds of involvement considered by Eccles and Barber are prosocial (e.g. church activities), team sport (school teams), school involvement (e.g. student council), performing arts (e.g. marching band) and academic clubs (e.g. science club). The majority of the sample was involved in an extra-curricular activity; the greater part of this sample - both males and females - was involved in team sports. The authors found that adolescents participating in any of the five types of extra-curricular activities did better at school and were more likely to attend college later. Adolescents involved in a school team sport were also found to be more attached to their school than their peers. However, team sport participation was also linked to an increased consumption of alcohol. Eccles and Barber came to the conclusion that all the extracurricular activities included in this study contributed to the adolescents' development, however a simple correlational pattern could not be identified.

Steptoe and Butler (1996) explored the association between emotional well-being and sport participation in over five thousand 16-year olds. They reported a relationship linking vigorous sports and activities to an enhanced emotional well-being. Less vigorous activities such as

snooker, fishing and darts were actually associated with higher rates of somatic and psychological symptoms.

Thus it may be necessary for studies exploring the social benefits of sport to include other non-sportive social activities. In this way, the influence of participating in a group activity could be better distinguished from that of participating in a team sport.

To sum up, apart from the positive social influence of sport – which may also be experienced in other non-sportive activities – physical exercise has been found to have a mild anxiolytic effect as well as a beneficial effect on general well-being, hence improving individual resources. This combination of sport's positive effect on both mental well-being as well as social skills could imply an important positive influence on social anxiety symptoms. In this study, organised sport outside school hours is hypothesized to act as a General Resistance Resource as described in Antonovsky's (1997) salutogenesis model, thus acting as a buffer against social anxiety symptoms in primary school children. Sport, in particular team sport, is also expected to exert a positive influence on children's social anxiety symptoms based on the social learning theory's postulates (Bandura, 1977) since sport involves an increased amount of interaction in a group apart from various other group tasks. Thus, possible differences between team and individual sport participants are also examined where a stronger effect in team sport is anticipated. Teachers' assessments are also referred to in this study where they are expected to shed light on the children's behaviour in the social milieu of the school and classroom. The potential influence of sport practice on the children's observed behaviour in school shall also be analysed. Further to the studies about dose and response (such as Wipfli et al. 2008), the possible effect of the frequency of sport practice shall also be explored. Children spending more time every week participating in a sports activity are compared to those spending less or no time at all. The specific hypotheses are presented in further detail in Chapter 4.

4. Research Question and Hypotheses

The main purpose of this study is to investigate the potential buffering effect extra-curricular sport practice has on primary school children's social anxiety symptoms and related social behaviour in school. An effect of sport on social anxiety symptoms over time is expected based on previous findings reporting a general positive influence of sport on anxiety (De Moor et al., 2006; Wipfli et al., 2008) as well as on social behaviour (Goudas & Magotsiou, 2009; Polvi & Telama, 2000; Smith, 2003). Furthermore, differences related to sport mode and hours of sport practice per week shall be investigated. Past research findings in combination with a theoretical framework based on the salutogenesis model (Antonovsky, 1997) and the social learning theory (Bandura, 1977) have led to the following hypotheses:

H_1: Children practising an extra-curricular sport report less social anxiety symptoms a year later than children practising no sport.

This hypothesis needs to be qualified in two respects. Firstly, in addition to the various physical and mental health benefits related to sport practice as expounded in Chapter 3, it is also expected that sport practice leads to similar benefits with regards to social anxiety symptoms. Physical exercise was reported to reduce general anxiety in both general and clinical populations (e.g. Biddle & Mutrie, 2001; Raglin, 1997; Wipfli et al., 2008) and thus a similar effect with this specific type of anxiety is hypothesized. Secondly, sport practice could be considered as a General Resistance Resource (GRR) as described in Antonovsky's (1997) salutogenesis model. This model describes amongst other things factors that reduce risk and/or improve one's resilience against a particular stressor as a GRR. Further to the documented benefits of sport and exercise on numerous physical and mental factors, such as quality of life (Schmitz et al., 2004), self-esteem (Slutzky & Simpkins, 2009; Sonstroem, 1997a, 1997b), depression (Craft & Landers, 1998; De Moor et al., 2006; Salmon, 2001) and general anxiety (e.g. Raglin, 1997; Wipfli, et al., 2008), extra-curricular sport is hypothesized to act as a GRR against social anxiety symptoms in children leading to a reduction of these symptoms after a year. Social anxiety symptoms are measured through children's structured interviews using the German version of the Social Phobia and Anxiety Inventory for Children (SPAIK; Melfsen, Florin & Warnke, 2001) as well as the parents' questionnaire "Elternfragebogen zu Sozialen Ängsten im Kindes- und Jugendalter" (ESAK) (Parent Questionnaire for Social Anxiety in Childhood and Youth) developed by Weinbrenner (2005). These instruments shall be described in further detail in Chapter 5.2.

H_2: Children spending more hours a week practising an extra-curricular sport show less anxiety symptoms a year later.

The association between sport and/or exercise intensity and its relative effect on psychological factors have also been investigated, however, sufficient evidence for a dose-response hypothesis as suggested by Wipfli and colleagues (2008) has not been found. Still, most studies conclude that the optimal exercise intensity for a beneficial effect is moderate intensity on a daily basis (e.g. O'Connor, Petruzzello, Kubitz & Robinson, 1995; Raglin, 1997) as also recommended by the World Health Organisation (WHO; 2003). The intensity level of the children's physical activity was not measured in this study, since this did not only depend on the type of sport but also on the child's level of involvement which is difficult to

control in a field study. Thus, this hypothesis focuses on the frequency of sport practice and it is expected that children practising an extra-curricular sport on a more frequent basis, would show reduced social anxiety symptoms a year later.

H_3: Children practising an extra-curricular *team* sport manifest a reduction in social anxiety symptoms a year later.

The basis for this hypothesis is the social learning theory (Bandura, 1977) together with other studies demonstrating the positive social effect of sport participation (e.g. Fletcher et al., 2003; Smith, 2003). Particularly in the case of social anxiety disorder, social skills and positive interaction play an important role in the emergence and maintenance of social anxiety (Hymel et al., 2005; Vasey & Dadds, 2001). Hence, this potential social effect of extra-curricular sport is expected to have a positive impact leading to a reduction in these children's social anxiety symptoms at the second data collection point.

H_4: Children involved in an extra-curricular *team* sport show improved scores in their social behaviour in class.

The argument for this hypothesis is related to the previous one (H_3). The teachers' assessments in this study do not directly measure social anxiety but rather observable behavioural factors related to this fear. These assessments are carried out using three scales from the German version of the Teacher Report Form (TRF; Döpfner, Berner & Lehmkuhl, 1994), described in more detail in Chapter 5.2.3. Sport participation in a team is expected to enhance a child's social skills over time and this improvement would be discernible in the child's social behaviour in class. Such findings have already been documented in various studies (e.g. McHale et al., 2005), including intervention studies where children involved in a team sport were found to exhibit better social skills, such as better cooperative skills (e.g. Goudas & Magotsiou, 2009; Polvi & Telama, 2000).

5. Method

5.1. Sample and procedure

The school authorities and/or inspectorates of cantons in the German-speaking region of Switzerland were contacted and provided with information about this project. The authorities from the cantons Bern, Solothurn, Aargau, Zurich, Schaffhausen, St. Gallen, Thurgau, Appenzell AR, Appenzell IR, Graubünden, Wallis, Obwalden, Niedwalden and Uri were contacted and a positive reply was received from Bern, Aargau, Zürich, Schaffhausen, Appenzell AR, Obwalden, Uri and Solothurn. Further to the permission granted from the aforementioned cantons, the heads of the schools in these areas were also contacted and invited to participate in the study. Unfortunately, only twenty-eight schools in these eight cantonal districts expressed interest in taking part. All other schools declined due to participation in other research projects and to avoid overloading the staff with further work.

In addition to the positive feedback from the heads of these schools, the first and second-grade teachers were also contacted. The parents, on the other hand were sent a letter, including a description of the study, an invitation to take part in it and a questionnaire to be completed. These letters were sent via the schools since the children's home addresses could not be provided due to obvious privacy issues. All parties were informed of the longitudinal design of this study. The first data collection was carried out in spring/summer 2007 where 759 parents were contacted. Parental permission to interview 208 children was received (R = 27.4%). Seven cases were excluded due to extreme outliers or missing data, thus 201 cases were included in the analysis after the first data collection.

Table 5.1
Number of Participants by Canton

Canton	**Children (N)**	**% of Total**
Not known	1	0.5
Bern	78	37.5
Uri	53	25.5
Obwalden	22	10.6
Schaffhausen	17	8.2
Solothurn	17	8.2
Schwyz	10	4.8
Appenzell AR	6	2.9
Zurich	4	1.9
TOTAL	208	100

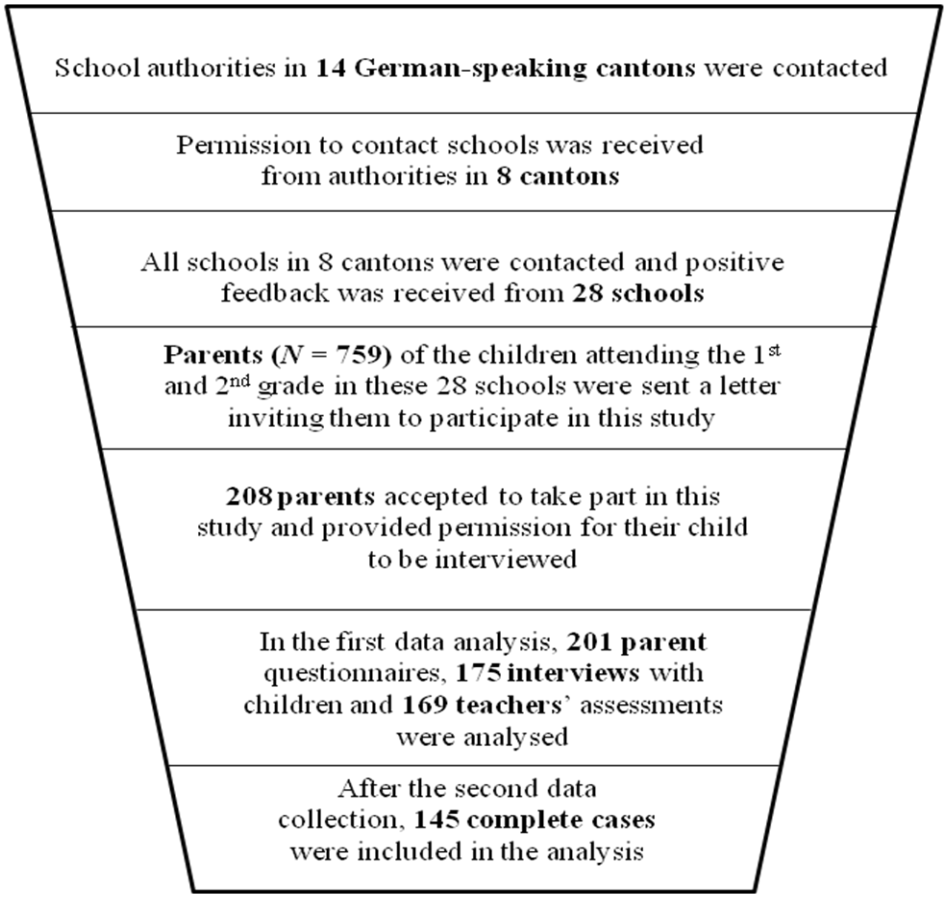

Figure 5.1. An overview of the sample selection process including attrition.

Self and observer-report data was collected in two waves, 12 to 18 months apart. All children in the sample at the first data collection point (N = 201) attended the first and second grades in Swiss primary schools (Mean age = 7.72 years, SD = 0.67) in the German region of Switzerland. The sample included a roughly equal number of girls (n = 102) and boys (n = 99) at the first point of data collection.

Out of these 201 children, only 175 could be interviewed in schools due to limitations posed by the school authorities (not more than 6 children per class could be interviewed). Teachers returned 169 assessments out of the required 175. Interviews were conducted on school premises by the author or an assistant. Assessments to be completed by parents and teachers were sent by post along with a self-addressed and stamped envelope.

This sample is relatively homogenous: the majority of the participants (88.6%) were Swiss nationals or possessed dual citizenships (5.5%). Nearly all children in this sample (95.5%) lived in a household with both parents. Most of the children (81.6%) practiced an extra-curricular sport apart from the compulsory physical education lessons (see Table 4.1). Of those children involved in an extra-curricular sport, 19.5% practiced football, 17.1% gymnastics and 10.4% swimming. Most children (54.7%) spent between 1 to 2 hours per week practising an extra-curricular sport and the majority participated in an individual sport (62.2%). An equal number of children took part in team sports (18.9%) or practiced no extra-curricular sport at all (18.9%).

Table 5.2
Group Sizes in Sport Mode by Gender at the First Data Collection Point (2007)

		Sport mode			
		None	Individual	Team	Total
Sex	Male	13	51	35	99
	Female	25	74	3	102
	Total	38	125	38	201

One hundred seventy-six children and their parents took part in the second data collection a year later in spring/autumn 2008. 75% of this sample participated in an extra-curricular sport. From the 32 participants that dropped out of the study, 3 changed schools, 1 child passed away and the parents of the remaining 29 withdrew consent. As in the previous year, football was the most practiced sport, followed by gymnastics and swimming. A good amount of children in the second data collection (51.4%) spent between one to two hours per week on extra-curricular sports. Comparisons were made between the baseline and the follow-up sample to test for differences on relevant variables. Further to data screening, 145 complete cases including the children, parents and teachers who participated at both data collections were retained for longitudinal analysis.

5.2. Measuring Social Anxiety[2]

There are various methods available for measuring social anxiety symptoms and diagnosing the disorder. One possible method is direct observation where a child is monitored in his/her natural setting or at a given task. Direct observation enables the measurement of behavioural and physiological manifestations of social anxiety as well as related factors such as social skills. However, the cognitive aspect of social anxiety tends to be overlooked when using this method. Moreover, from a practical point of view, direct observation is very time consuming and the standardisation of observations has often been criticised. Interviews are also a widely used method especially for the diagnosis of social anxiety disorder. Usually, the child together with a parent is interviewed. This method includes the collection of qualitative data but, similarly to direct observation, is rather time consuming hence limiting the size of the sample. Self-reports are a widely used method for collecting data about social anxiety especially with larger samples. Standardisation, normative data together with the availability of valid and reliable inventories and questionnaires are advantages of using this method. It is also time and cost effective to employ self-report questionnaires.

Weinbrenner (2005) identified two self-report diagnostic tools as being the most frequently used in German-speaking regions: the *Sozialphobie- und Angstinventar für Kinder* (SPAIK; Melfsen, Florin & Warnke, 2001) which is the German version of the Social Phobia and Anxiety Inventory for Children (SPAI-C; Beidel, Turner & Morris, 1995; Beidel, Turner & Fink, 1996) the Social Anxiety Scale for Children Revised (SASC-R-D; Melfsen, 1998; Melfsen & Florin, 1997). Weinbrenner (2005) reports the German versions of these two inventories to possess a good internal consistency and high reliability. The SPAIK was used in this study for two main reasons. Firstly, in a study comparing the Finnish versions of the

[2] Copies of the instruments used in this study are included in Appendix B

SPAI-C and the SASC-R, Kuusikko et al. (2008) found the former to be more sensitive in identifying young people suffering from social phobia. Since this study did not use a clinical sample with pronounced social anxiety symptoms, the test's sensitivity was of great importance. Secondly, the SPAIK includes scales differentiating between fear of interaction and performance situations. This characteristic was deemed most relevant for this study since possible fears related to performance while not related to general social situations could be distinguished through this test. The SASC-R-D includes the scales such as Fear of Negative Evaluation From Peers, Social Avoidance and Distress Specific to New Situations, and Generalized Social Avoidance and Distress, which are also characteristic of social anxiety disorder but do not provide the specific information required for this study's hypotheses. Thirdly, the SPAIK specifically deals with social phobia rather than the more general social fears as measured by the SASC-R-D, such as shyness, and is also based on the international diagnostic criteria for social anxiety disorder (Melfsen, 1999).

Three data collection instruments were employed in this study. All of them focused on the child's social anxiety and social behaviour and were completed by three different informants. The children themselves completed the German version of the Social Phobia and Anxiety Inventory for Children (SPAIK; Melfsen, et al., 2001). Their parents completed Weinbrenner's (2005) Eltern Fragebogen zu sozialen Ängsten im Kindes- und Jugendalter/Parent Questionnaire for Social Anxiety in Childhood and Youth (ESAK) while the teachers provided information regarding the child's social behaviour in class using a selection of three scales from the Teacher Report Form (TRF; Döpfner, Berner & Lehmkuhl, 1994). The reason for involving these three sources in the data collection was to obtain a comprehensive picture of the child's social anxiety and behaviour since observer reports provide a different perspective. Renk (2005) points out that a child's problematic behaviour may be situation-specific and furthermore, different informants may observe different behaviour. She claims that using multiple informants for collecting data about children's and/or adolescents' behaviour has now become "the golden standard" (p.464). Observer assessments are collected from important persons in the child's life, such as parents, teachers and peers since only they could provide such useful information (e.g. Federer, Stüber, Margraf, Schneider & Herrle, 2001). Some studies reported a discrepancy between self and observer reports originating from different sources (e.g. Döpfner et al., 1994) and this was an additional reason for using these three instruments.

Details regarding sport practice outside of school as well as other demographic information were provided by the parents. In their study about the significance of sport in childhood and adolescence, Brinkhoff and Sack (1999) reported some difficulties in gathering information about sport practice from children. This was due to various factors such as the young children's limited reading abilities, their understanding (or lack) of structures and institutions, their concept of time, etc. In Brinkhoff and Sack's case, the questionnaire had to be adapted for the younger participants in their study. In consideration of such limitations, it was decided that information regarding sport practice for the present study would be gleaned from the parents rather than from the children. In this way, difficulties regarding correct responses to the questions were hopefully avoided. Parents were asked whether their child was involved in an organised sport outside of school - an extra-curricular sport - and if yes, they were asked to give further information about this activity. This included the type of sport(s) as well as the number of hours of practice per week. Other demographic data, such as parents' occupation, was also supplied by the parents.

5.2.1. The Social Phobia and Anxiety Inventory for Children (SPAIK)

The SPAIK is the German version of the Social Phobia and Anxiety Inventory for Children (SPAI-C) which was constructed in the United States by Beidel et al. (1995) and Beidel et al. (1996). The SPAI-C has been used in numerous studies investigating social anxiety in children (e.g. Higa & Daleiden, 2008). This inventory was developed as a diagnostic tool for children 8 years and older as well as for the background examination of social anxiety disorder. The SPAI-C contains 26 items covering somatic and behavioural symptoms as well as cognitions related to various situations that tend to be distressing for children and youths suffering from social anxiety. Every item describes a situation that could trigger social anxiety and respondents would need to rate how often they experience anxiety in such a situation. Answers are scored on a three-point Likert scale with the following categories: never or seldom, sometimes, and often or always. Some of these items require three responses to the same situation presented in the question. Respondents need to answer how they would feel in the presence of peers they know, those they do not know and adults. This distinction between children known and children unknown to the respondent is made so as to comply with the DSM-IV diagnostic criteria for social anxiety where diagnosis requires that anxiety is also triggered by peers and not solely by adults. The three answers on the scale are scored 0, 1 and 2 respectively, thus the maximum score for all 26 items would be 52. Ratings for the categories of cognition, somatic and behavioural symptoms can be calculated so as to obtain 3 separate scores apart from the total score.

The authors of the German version included all items of the original version thus international comparisons are possible (Melfsen et al., 2001). This inventory contains 26 items dealing with various symptoms of social anxiety: cognitions, physical symptoms and avoidant behaviour as in the original version. The use of this inventory is recommended for children from the age of 8 upwards. Melfsen and colleagues mention that even though use with younger children is also possible; there would be limitations due to their basic reading skills. Therefore, for this study, the SPAIK was completed in the form of a structured interview since some respondents were actually seven years old at the time of the first data collection. The interviewer read the situations out to the child and then marked the child's response. The interviews took about 20 to 30 minutes.

Validation studies carried out by Melfsen et al. (2001) indicate that the SPAIK can reliably distinguish between children with a social anxiety diagnosis, those exhibiting symptoms at a sub-clinical level and children with no significant social anxiety. In Melfsen et al.'s (1997) validation studies, young schoolchildren (8- to 11-year olds) were found to report higher social anxiety than older ones. Moreover, girls tended to score higher than boys. Cronbach's alpha reliability ranged from .92 to .95 and test-retest reliability was r_{tt}=.85 (after 2 weeks) and r_{tt}=.84 (after 4 weeks). Construct validity was reported to be satisfactory when compared to other measurements related to social anxiety and internal consistency was reported to be high. No correlation was observed between SPAIK scores and teachers' assessments (Melfsen, Florin & Walter, 1999; Melfsen et al., 1997).

5.2.2. Parents' Questionnaire: Elternfragebogen zu Sozialen Ängsten im Kindes- und Jugendalter (ESAK)

The questionnaire sent to parents was the "Elternfragebogen zu Sozialen Ängsten im Kindes- und Jugendalter" (ESAK) (Parent Questionnaire for Social Anxiety in Childhood and Youth) developed by Weinbrenner (2005). No specific diagnostic tool for parent assessment of social anxiety in children was available in the German language previous to the development of this

questionnaire. The ESAK was created with the aim of collecting information about social anxiety in children and youth. It is however also meant as an external diagnostic tool. Its structure is based on the cognitive-behavioural model of social anxiety by Rapee and Heimberg (1997). The ESAK consists of 18 items to be completed by a parent and its reported alpha value is .90. Three scales, reflecting the four components in Rapee and Heimberg's model, can be calculated: the Cognitive Symptoms, Behaviour Symptoms and Physical Symptoms Scale. Their alpha values are .90, .72 and .83 respectively. The two cognitive components in Rapee and Heimberg's model were incorporated in the ESAK's Cognitive Scale. Weinbrenner noted that factor analyses pointed at a three-factor solution thus reflecting the author's theoretical considerations. Results of validation studies conducted by Weinbrenner (2005) indicate that the ESAK is able to discriminate between normal and clinical populations. Additionally, it is also reported to have good criterion validity as well as a good internal consistency.

The parent reports in this study were mostly completed by mothers (81.3% in 2007, 88.6% in 2008) or by both parents (10.1% in 2007, 6.3% in 2008).

5.2.3. The Teacher Report Form (TRF)

Three scales were used from the German version of the Teacher Report Form (TRF): The Depressed/Anxious scale, the Social Problems and the Social Withdrawal scale (Döpfner et al., 1994). These scales were chosen for their relevance to the topic under investigation in this study as well as to minimise the teachers' workload since they were required to fill out one questionnaire per child.

The German Version of the TRF is a translation from the original TRF constructed by Achenbach (1991), which was part of the Child Behaviour Checklist. This questionnaire includes the teacher's evaluation of a child's competencies, behavioural and emotional difficulties and can be employed for children aged between 5 and 18 years. The authors of both the original and German version of the TRF point out that various studies found low to average correlation amongst the children's self-reports, the parents' reports and the teachers' reports of behavioural difficulties in children.

Döpfner et al. (1994) emphasise the relevance of the teacher's evaluation with regards to social behaviour. This is because the school provides an important socialization context for children and adolescents, where particular problems may be observed unlike in other situations. Teachers also possess an educational background that enables them to assess a child's competences in an effective manner. Moreover, they are often important significant others for children. Thus, the TRF allows for a teacher's assessment of a child's skills and behaviour.

The first part of this questionnaire includes both multiple choice and open-ended questions regarding the teacher's evaluation of a child's competencies. The questions focus mainly on skills related to school tasks and particularly on performance in school subjects. Since academic performance was not included in this study, the first part of the TRF was not used.

The second part deals with behavioural and emotional features as well as physical complaints. Teachers are asked to assess the items in this part of the questionnaire on a 3-point Likert scale where "0" stands for "*not applicable*", "1" stands for "*somewhat or sometimes applicable*" and "2" stands for "*exactly or often applicable*". Eight scales can be calculated

from the items in the second part of the TRF. These are: Anxiety/Depression, Social Withdrawal, Somatic Complaints, Social Problems, Schizoid/Obsessive, Delinquent Behaviour, Aggressive Behaviour and Attentional Problems. All scales, with the exception of Schizoid/Obsessive were found to achieve a satisfactory level of reliability (r_{tt}>=.70). The same formation of scales as in the original questionnaire was confirmed by the factor analysis carried out with the German translation of the TRF (Döpfner et al., 1994).

The inter-correlation between the scales was found to be less than r=.50, however the scales that were related to each other with regards to content tended to reach a higher level of intercorrelation. This was observed with the three scales selected for this study: Anxiety/Depression, Social Withdrawal and Social Problems. The higher correlation values were observed between Anxiety/Depression and Social Withdrawal (r = .58) as well as between Anxiety/Depression and Social Problems (r = .71). This implies that these scales share some similarities with regards to their content. The same pattern of intercorrelations also emerged in the American studies using the original version of the TRF (Döpfner et al., 1994). The scales were reported to be sufficiently independent of each other and their factorial validity was also confirmed for the German version. The Social Problems and the Anxiety/Depression scales were found to have a good reliability while the Social Withdrawal scale's reliability was found to be satisfactory.

The TRF is part of a multiple Behavioural and Psychological diagnostic method which not only measures the various levels of a psychological disorder, that is the emotional, cognitive, physical and behavioural, but also relies on various sources to glean sufficient information about a child. Döpfner et al. (1994) illustrate various studies reporting a low correlation between parent, teacher and self-reports to emphasize the importance of using multiple diagnostic tools.

In the case of this study, other instruments than those accompanying the TRF were used for collecting information from the parents and the children. The reason for this choice was that this study focuses on one type of psychological disorder, namely social anxiety, and more specific instruments of data collection were necessary for the structured interviews with the children as well as for the parents' questionnaire.

5.3. Plan of Analysis

All data analyses were conducted using Predictive Analytic Software (PASW) Statistics Version 18. Data screening included various steps, the first one being the Missing Variables Analysis (MVA). Missing variables were analyzed using the MVA procedure in PASW as recommended by Tabachnick and Fidell (2001). Standardized scores and box plots were employed to detect univariate outliers while multivariate outliers were identified using Mahalanobis distances (Tabachnick & Fidell, 2001). The normality of distribution was also investigated and logarithm transformations were calculated for non-normal distributions.

Possible gender differences were tested in the cross-sectional analyses of both first and second data collections. Most epidemiological studies as well as other studies investigating social anxiety symptoms found that females tended to show a higher prevalence than males (e.g. Fehm et al., 2005; Kessler et al., 2005). This gender difference was observed in adults, adolescents (e.g. Wittchen et al., 1999) and children (e.g. Dell'Osso et al., 2002). Thus, this same difference is expected in the present study's sample which consists of approximately the same number of primary school girls and boys. These gender variations are also expected to

be found across the three informants involved in this study, namely, the children, parents and teachers. In case of the anticipated gender differences, gender would need to be included as a covariate in the analyses.

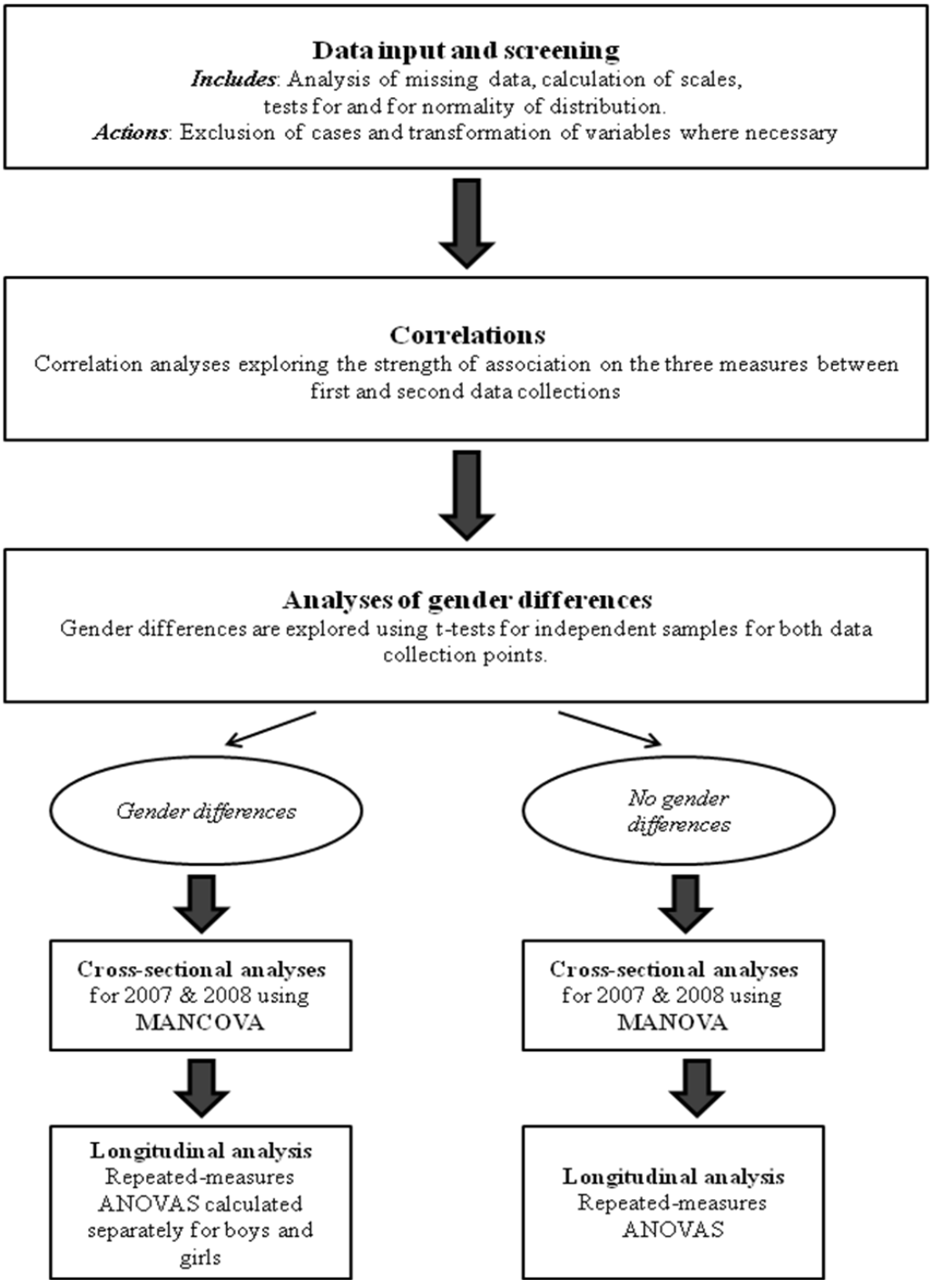

Figure 5.2. A flow chart illustrating this study's plan of analysis.

The association between sport practice and social anxiety shall be investigated in cross-sectional analyses where a series of MANCOVAs are performed. This type of analysis would not only control for correlations among the outcome variables but also adjust the linear

combination of dependent variables for the differences that are expected between girls and boys (Tabachnik & Fidell, 2001). Thus, gender would be included as a covariate in these calculations. The MANOVA calculation focuses on the mean differences and their statistical significance among groups which is precisely what this study aims to investigate. The measure of strength of association referred to in the interpretation of the cross-sectional analyses is the partial η^2. This was chosen over the η^2 since the sum of η^2 for all effects in a MANOVA may be greater than 1.0 thus hindering interpretation (Tabachnik & Fidell, 2001). The η^2 also tends to be larger in multivariate analyses as opposed to univariate analyses, thus the partial η^2 was deemed to be the most adequate measure of strength of association for these analyses.

It is of interest to find out whether involvement in individual and/or team sports contributed towards a reduction in social anxiety symptoms in children as put forward in H_1 to H_4. Repeated measures analyses of variance (ANOVAs) shall be calculated to test this hypothesis. A repeated measures ANOVA is to be calculated for each scale of the three instruments used. Sport mode and time as well as sport intensity and time shall be included as independent factors since the sport practice dichotomous variable does not differentiate between sport modes. These analyses shall be conducted using the whole sample and then repeated separately for both girls and boys, in case gender differences are observed in the cross-sectional analyses.

6. Results

6.1. Data Screening and Analysis of Missing Variables

Missing variables were analyzed using the Missing Variables Analysis (MVA) procedure. Only the data collected from the teachers had more than 3% missing values. However, following Little's MCAR test, the assumption of values missing completely at random could be used (χ^2 (8, N=145) = 10.85, p=.21).

Further to analysis using box plots and Mahalanobis distance, it was observed that the same few cases tended to score extreme values on different scales. This pattern was expected thus reflecting existing literature reporting prevalence rates amongst non-clinical samples (e.g. ESEMeD/MEHEDEA 2000 Investigators, 2004; Roza, Hofstra, van der Ende & Verhulst, 2003). Abnormal distributions were mainly due to outliers; this was rectified by transforming these distributions using the logarithmus. Mahalanobis distance was used with split file in place to identify possible multivariate outliers in the groups (cells) included in the MANCOVA. With df = 5 and a criterion $\alpha = .001$, critical $\chi^2 = 20.515$, no multivariate outliers were observed.

Out of the 201 children who took part in the first data collection, 145 complete cases were retained for longitudinal analysis. The omitted cases were mainly due to drop-out, missing teacher's questionnaires or missing interviews. The number of girls and boys in this sample remained balanced with 71 boys and 74 girls. Since not all participants could be interviewed, differences on the parent reports were checked using independent samples *t*-tests - between children interviewed and those not - for both data collection points. No significant results were observed. This analysis was also carried out for possible differences between participants and drop-outs; no significant results were ascertained on social anxiety measurements at the first data collection. Tables A1 to A3[3] including the values of these analyses are included in Appendix A.

6.2. Reliability and Validity

Correlations between the social anxiety measures indicated a good internal validity. Correlations between the first and second data collection were examined on all variables. The sample consisting of 145 complete cases was used for these analyses. All social anxiety and social behaviour variables from 2007 and 2008 correlated positively with each other.

On the SPAIK total scores and scales, all correlations were significant, positive and showed a weak to medium strength (Table 6.1). Stronger, but still of medium strength, correlations were found on the ESAK scales, implying that parents tend to provide more reliable information over time than children (Table 6.2). On the other hand, this could also indicate that parents may not detect visible changes in their children's social anxiety symptoms. On the TRF scales, correlation scores were also positive and significant (Table 6.3) albeit of weak to medium strength. This could be related to the classroom situation, where the teacher would seldom observe a child individually. Additionally, some children moved to a different teacher a year later, thus leading to further discrepancies between informants from one data collection to the other. However, all correlations on the measures were significant and hence reliability was deemed to be satisfactory.

[3] In order to maintain a clear and easy-to-read presentation of results, tables with data related to non-signficant findings are included in Appendix A.

Table 6.1
Correlation values of SPAIK Total score and its scales in 2007 and 2008 (N = 145)

2008	Total Score	Interaction	Performance	Cognitive and Somatic Symptoms
2007				
Total score	.354**	.358**	.318**	.327**
Interaction	.279**	.286**	.217**	.258**
Performance	.333**	.362**	.358**	.254**
Cognitive and Somatic Symptoms	.336**	.329**	.294**	.357**

**$p < .01$ (two-tailed)

Table 6.2
Correlation values of ESAK Total Mean score and ESAK Scales in 2007 and 2008 (N = 145)

2008	Total Mean	Cognitive	Behaviour	Physical
2007				
Total Mean	.667**	.556**	.592**	.556**
Cognitive Symptoms	.577**	.611**	.407**	.384**
Behaviour Symptoms	.469**	.252**	.693**	.397**
Physical Symptoms	.595**	.416**	.495**	.615**

**$p < .01$ (two-tailed)

Table 6.3
Correlation values of the TRF scores (N = 132) in 2007 and 2008

2008	Social Withdrawal	Anxious/Depressed	Social Problems
2007			
Withdrawn	.363**	.321**	.291**
Anxious/Depressed	.238**	.554**	.340**
Social Problems	.261**	.414**	.592**

**$p < .01$ (two-tailed)

The reliability of the covariate is also a basic requirement when using MANCOVA; in the case of variables such as gender, this assumption of reliability can be justified.

The association between sport participation in 2007 and 2008 was also analysed. The Phi Coefficient was calculated for sport practice since sport practice was coded as a dichotomous, nominal variable. Sport practice in 2007 was found to be significantly correlated to sport

practice in 2008. However, the strength of this association was medium (ϕ = .447, p < .000) thus implying some change in sport involvement over time. The type of sport engagement (no sport, individual or team sport) also showed a positive correlation over time (V = .481, p < .000), where in this case a Cramer's V was calculated for the 3 X 3 matrix. The hours of sport per week also showed a satisfactory consistency over time with V = .347, p < .000.

6.3. Gender differences on Social Anxiety Variables

Gender differences were tested using *t*-tests for independent groups. A significant difference between girls and boys was identified on the SPAIK's total score as well as on its scales (Table 6.4) at both first and second data collection points. In all cases, girls obtained higher scores than boys. These results concur with other studies' findings - including those using the same instrument (e.g., La Greca & Lopez, 1998; Melfsen et al., 1997) - and indicate that girls tend to experience more anxiety in the different types of social situations including both interaction and performance situations already at a young age.

Table 6.4
Gender differences on the SPAIK Total Scores and its Scales for 2007 and 2008

	boys (n=71)		*girls (n=74)*		
	M	*SD*	*M*	*SD*	*t* (df=143)
SPAIK Total Score 2007	11.12	8.21	15.62	8.04	-3.34**
Interaction 2007	6.21	4.32	8.72	4.25	-3.52**
Performance 2007[a]	0.42	2.29	0.54	0.26	-2.73**
Cognitive and Somatic Symp. 2007[a]	0.38	0.24	0.51	0.23	-3.45**
SPAIK Total Score 2008[a]	1.00	0.33	1.18	0.23	-3.76**
Interaction 2008	6.67	4.07	9.01	3.53	-3.70**
Performance 2008[a]	0.43	0.29	0.57	0.26	-3.17**
Cognitive and Somatic Symp. 2008[a]	0.37	0.24	0.49	0.24	-2.95**

**p<.01; [a]transformed variables

With regards to the parents' questionnaire (ESAK), girls were assessed as more anxious on most scales at both data collection waves. However, these differences did not reach statistical significance, except for that on the Physical Symptoms scale from the first data collection, which was very close to statistical significance (t(143) = -1.96, p = .05). No significant gender differences were observed on the TRF scales.

6.4. Trends of Sport Practice in this Sample

Of the 201 children who took part in the first data collection, 81.6% practised an extracurricular sport with the majority spending one to two hours weekly on this activity. Most children (62.2%) took part in an individual sport. Of those children involved in an extra-curricular sport at the first point of data collection, 19.5% practised football followed by 17.1% involved in gymnastics and 10.4% in swimming.

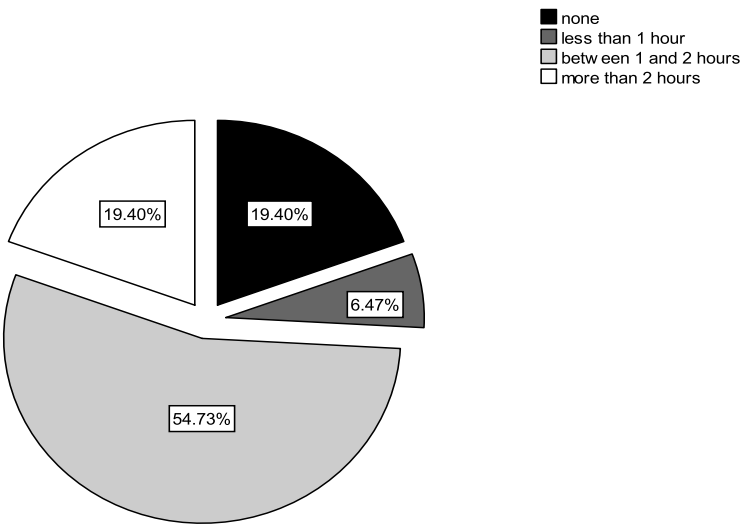

Figure 6.1. Hours of extra-curricular sport practice per week at the first data collection point in 2007.

At the second point of data collection (N = 145), 85.5% of the children were involved in an extra-curricular sport. Most of them practised an individual sport (65.5%) and spent one to two hours per week (61.7%) practising.

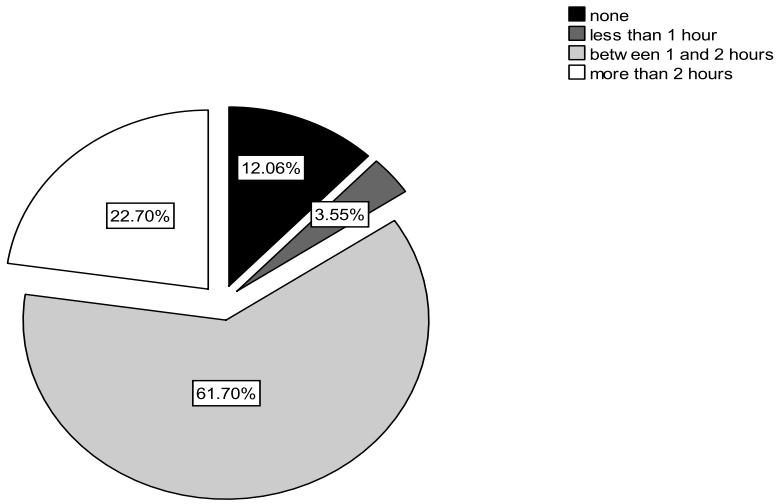

Figure 6.2. Hours of extra-curricular sport practice per week at the second data collection point in 2008.

The number of children participating in extra-curricular sports also differed in gender. As ascertained in other studies (e.g. Lamprecht, Fischer & Stamm, 2008; Steptoe & Butler, 1996), more boys were reported to be involved in this activity ($\chi^2(1, N = 210) = 5.13$, p (exact) = .03). Gender differences were also observed in relation to sport mode as illustrated

in Figures 6.3 and 6.4. Significantly more boys practised a team sport, while most girls practised an individual sport. This difference was observed in both 2007 ($\chi^2(2, N = 201) = 34.93, p < .001$) as well as in 2008 ($\chi^2(2, N = 145) = 16.91, p < .001$).

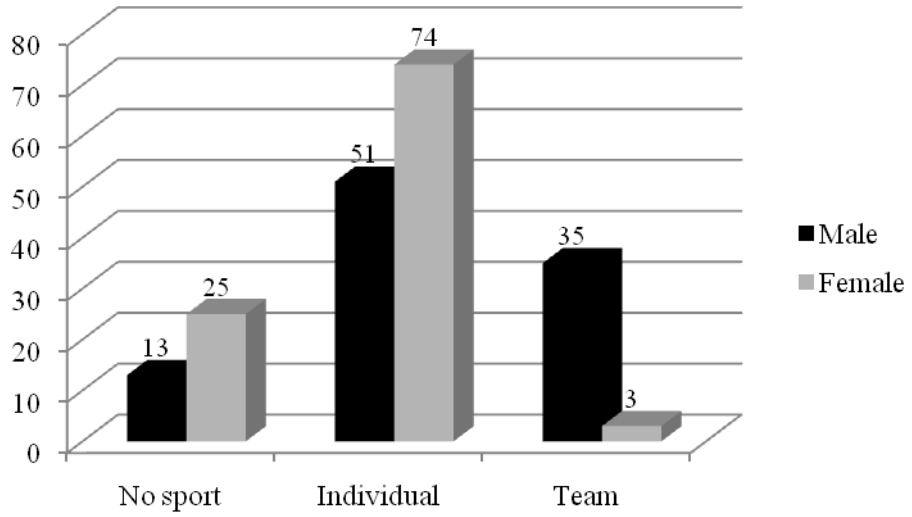

Figure 6.3. Distribution of sport mode by gender in 2007.

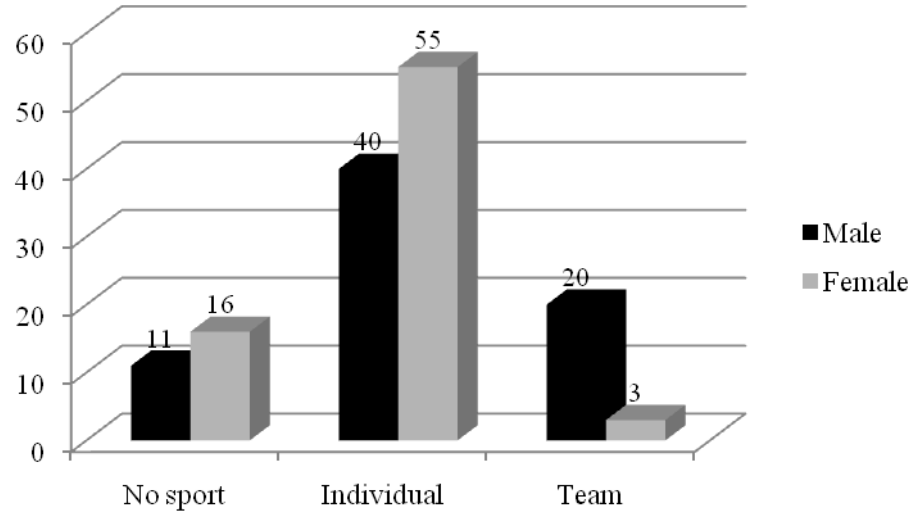

Figure 6.4. Distribution of sport mode by gender in 2008.

6.5. Correlations between Cross-Informant Ratings

Discrepancies were observed between self and observer ratings on social anxiety. Patterns of correlations among the dependent variables are presented in Tables 6.5 and 6.6. Overall patterns of positive correlations imply that the variables are measuring related constructs. However, not all correlations are significant suggesting some discrepancies between self, parent and teacher reports. As noted earlier, such discrepancies have been reported in other studies. It is also important to point out that the teachers' scales did not specifically measure social anxiety but rather aspects of behaviour related to social anxiety, such as social

withdrawal and general anxiety. Indeed, the teachers' scales proved to be the exception to the otherwise general correlation pattern. These discrepancies remained consistent over both data collection points and thus separate analyses were carried out with data gleaned from these three sources.

Table 6.5
Intercorrelations among Dependent Variables in 2007

Variable	*1*	*2*	*3*	*4*	*5*
1. ESAK Mean of total score	-				
2. SPAIK Total Score	.23**	-			
3. TRF Withdrawn	.32**	-.06	-		
4. TRF Anxious/Depressed	.31**	-.02	.65**	-	
5. TRF Social Problems	.21*	-.08	.56**	.67**	-

*p<.05, **p<.01; ESAK and SPAIK N=145, TRF scales N=136

Table 6.6
Intercorrelations among Dependent Variables in 2008

Variable	*1*	*2*	*3*	*4*	*5*
1. ESAK Mean of total score	-				
2. SPAIK Total Score	.25**	-			
3. TRF Withdrawn	.24**	.08	-		
4. TRF Anxious/Depressed	.21*	-.04	.57**	-	
5. TRF Social Problems	.27**	-.06	.49**	.49**	-

*p<.05, **p<.01; ESAK and SPAIK N=145, TRF scales N=136

6.6. Cross-Sectional Analyses of the First Data Collection (2007)[4]

The cross-sectional analyses of the first data collection included an initial sample of N = 201. Of these 201 children, 168 could be interviewed following restrictions set by the school authorities. Due to gender differences observed on both social anxiety scores as well as sport practice, a multiple analysis of variance controlled for gender (MANCOVA) was calculated. When using this calculation, the linear combination of the dependent variables is adjusted for the differences in the covariate (Tabachnik & Fidell, 2001).

Three separate MANCOVAs were computed for the data collected from the children, parents and teachers with *sport practice* (Yes/No) as a dichotomous independent variable. In the first MANCOVA including the SPAIK Total score as well as the scores for its individual scales, no main or interaction effects of sport practice were ascertained notwithstanding the fact, that

[4] An article reporting results from the cross-sectional analyses of the first data collection has been published in the September 2010 issue of the *Journal of Clinical Sport Psychology*. A copy of this manuscript is included in Appendix C.

in two of the three scales, children practising no sport scored higher on those specific aspects of social anxiety (Table A4, Appendix A). Still these differences were not pronounced and did not reach statistical significance. As anticipated, a main effect of the covariate gender was found $F(4, 162) = 3.195$, $p = 0.15$, partial $\eta^2 = .073$. Between-subject effects of the covariate on the SPAIK Total Score and the Interaction and Performance Scales (Table 6.7) were also found. This result concurs with the *t*-tests investigating gender differences, calculated for each of the scales as described in Chapter 6.3.

Table 6.7
Between-Subject Effects of the Covariate Gender on SPAIK Total and Scales in 2007

	F(4,162)	df	*P*	partial η^2
SPAIK Total Score	11.427	1	0.001	0.065
Interaction	11.874	1	0.001	0.067
Performance	7.009	1	0.009	0.041
Cognitive and Somatic Symptoms	8.988	1	0.003	0.052

The second and third MANCOVAs including the ESAK and TRF scales also showed no significant effect related to sport practice. A main outcome of the covariate gender was ascertained on ESAK, $F(4, 194) = 2.917$, $p = .023$, partial $\eta^2 = .057$, in addition to a between-subjects effect on the ESAK Physical Symptoms Scale $F(4, 194) = 4.765$, $p = .030$, partial $\eta^2 = .024$. Indeed *t*-tests investigating gender differences on the 2007 ESAK scales also indicated a close to significant difference on the ESAK's Physical Symptoms Scale (see Chapter 6.3) where girls scored higher than boys.

Another set of three MANCOVAs was carried out using *hours of sport per week* as an independent factor. The analysis including the SPAIK scales revealed a main effect of the covariate gender – $F(4, 160) = 3.860$, $p = .005$, partial $\eta^2 = .088$ – together with gender between-subjects effects on all SPAIK scales. This gender effect was anticipated since gender differences were found on all SPAIK social anxiety scores.

Still, a main effect of sport hours was indicated by the Roy's gcr statistic, $F(4, 162) = 2.703$, $p = .032$, partial $\eta^2 = .063$. Tabachnik and Fidell (2001, p. 348) recommend Pillai's criterion in situations where the design is "less than ideal" as this statistic is the most robust criterion of statistical inference. Since the cells in these analyses differed in size, the Pillai's criterion was taken into account and was found to be non-significant. Mean scores showed that children practising less than one hour a week scored consistently higher on the self-reported social anxiety symptoms. A between-subjects effect for sport hours was indeed observed, but only on the SPAIK Performance scale, $F(12, 486) = 2.992$, $p = .033$, partial $\eta^2 = .052$. This effect was analysed further with t-tests for every group. T-tests did not reveal any significant differences on the Performance Scale but rather on the Interaction Scale, where children practising a sport for less than an hour per week scored higher than those practising between one to two hours a week, $t(101) = 1.996$, $p = .049$.

Table 6.8
Mean scores on the 2007 SPAIK Total Score and Scales for Weekly Hours of Sport Practice

	Hours of sport/week	*M*	*SD*	*N*
SPAIK Total Score	none	13.71	8.74	32
	less than 1 hour	17.87	10.85	13
	between 1 and 2 hours	12.99	8.50	90
	more than 2 hours	13.49	6.98	33
	Total	13.60	8.49	168
Interaction	none	7.94	4.65	32
	less than 1 hour	9.85	5.25	13
	between 1 and 2 hours	7.20	4.34	90
	more than 2 hours	7.51	4.18	33
	Total	7.61	4.46	168
Performance*	none	1.31	0.84	32
	less than 1 hour	1.83	0.88	13
	between 1 and 2 hours	1.38	0.78	90
	more than 2 hours	1.53	0.69	33
	Total	1.43	0.79	168
Cognitive and Somatic Symptoms	none	2.41	1.75	32
	less than 1 hour	2.41	1.78	13
	between 1 and 2 hours	2.23	1.83	90
	more than 2 hours	2.30	1.54	33
	Total	2.29	1.74	168

*transformed

Table 6.9
Mean Scores on the 2007 ESAK Total Mean and Cognitive Scale for Weekly Hours of Sport Practice

	Hours of sport per week 2007	*M*	*SD*	*N*
ESAK Total Mean*	None	0.76	0.26	38
	less than 1 hour	0.60	0.16	13
	between 1 and 2 hours	0.74	0.28	110
	more than 2 hours	0.76	0.26	39
	Total	0.74	0.27	200
Cognitive Symptoms*	None	0.86	0.39	38
	less than 1 hour	0.50	0.32	13
	between 1 and 2 hours	0.79	0.43	110
	more than 2 hours	0.82	0.41	39
	Total	0.79	0.42	200

*transformed

A MANCOVA including the ESAK scales revealed a main effect of sport hours, $F(12, 582) = 1.782$, $p = .048$, partial $\eta^2 = .035$, but no between-subjects effects. Post-hoc *t*-tests revealed a number of significant differences between the groups. Children not practising an extra-curricular sport and those practising a sport for less than an hour a week were found to differ on the ESAK's Cognitive Scale $t(49) = 2.924$, $p = .005$, as well as on its Total Mean Score, $t(49) = 2.095$, $p = .041$. In both cases the No Sport group was found to score higher indicating that children not practising any sport outside of school tended to experience more cognitive symptoms of social anxiety (e.g. negative thoughts) than those practising for less than one hour a week (Table 6.9; means for all scales can be found in Table A7 in Appendix A). Still, since the ESAK Total Mean Score is made up of the three separate scales, the outcome observed here is probably due to the main effect found on the Cognitive Scale. Another difference on the ESAK's Cognitive Scale was noted between those practising for less than an hour a week and those children practising for 1 to 2 hours every week, $t(121) = 2.322$, $p = .022$ as well as those children spending over 2 hours a week on an extra-curricular sport, $t(50) = 2.55$, $p = .014$. Children practising for less than an hour had lower scores than the other two groups on this scale. Thus, it appears that children practising more than an hour of sport per week were judged by their parents to manifest more cognitive symptoms of social anxiety.

The MANCOVA including the TRF scales revealed no main or between-subjects effects. Mean scores (Table A8, Appendix A) were in fact fairly homogenous for all groups. Still an interesting point is that children practising sport for more than two hours per week achieved lower scores on both Social Withdrawal as well as Social Problems. Nonetheless, post-hoc tests did not reveal significant differences between any of these groups.

When MANCOVAs using *sport mode* (no sport, individual and team sport) as an independent factor were calculated, a main effect of gender on SPAIK was observed – $F(4, 161) = 3.123$, $p = .017$, partial $\eta^2 = .072$ - as was a between-subject effects on the individual SPAIK Scales (Table 6.10). No effect of sport mode was ascertained for the children's self-reports although mean scores indicated that children practising a team sport tended to score lower on social anxiety symptoms (Table A9, Appendix A). Nevertheless, most of the children involved in a team sport were boys, thus these differences could probably be ascribed to gender differences and in fact the MANCOVA does not report any significant effects related to sport mode.

Table 6.10
Between-Subject Effects of the Covariate Gender on SPAIK Total and Scales in 2007

	$F(4,161)$	df	p	partial η^2
SPAIK Total Score	9.982	1	0.002	0.057
Interaction	11.411	1	0.001	0.065
Performance	6.688	1	0.011	0.039
Cognitive and Somatic Symptoms	7.184	1	0.008	0.042

A main effect of sport mode emerged on the parents' assessments (ESAK), $F(4, 194) = 3.063$, $p = .018$, partial $\eta^2 = .059$ indicated by Roy's gcr. Still, the Pillai's criterion statistic did not point out any significant effect. Since post-hoc tests cannot be calculated when including a covariate in PASW, separate *t*-tests were used to investigate this difference further.

Table 6.11
Mean Scores on the 2007 ESAK Total Score and Scales for Sport Mode

	Sport Mode 2007	*M*	*SD*	*N*
ESAK Total Mean	None	0.78	0.27	37
	Individual	0.74	0.27	125
	Team	0.69	0.25	38
	Total	0.74	0.27	200
Cognitive Symptoms	None	0.87	0.40	37
	Individual	0.80	0.40	125
	Team	0.66	0.46	38
	Total	0.79	0.42	200
Behavioural Symptoms*	None	0.39	0.40	37
	Individual	0.33	0.36	125
	Team	0.43	0.35	38
	Total	0.36	0.37	200
Physical Symptoms	None	0.82	0.52	37
	Individual	0.84	0.49	125
	Team	0.66	0.44	38
	Total	0.80	0.49	200

*transformed

Results highlighted differences between children practising a team sport and those participating in an individual sport, $t(161) = 2.044$, $p = .043$. The team sport group had lower mean scores than the individual sport group on the ESAK's Physical Symptoms Scale. This result implies that children practising an individual sport exhibited physical symptoms of social anxiety, such as trembling, sweating, etc. more often than children participating in a team sport. Another difference was observed between the team sport group and the no sport group on the ESAK's Cognitive Symptoms Scale, $t(73) = 2.063$, $p = .043$; once again, the team sport participants scored significantly lower on this scale indicating that they appear to experience less cognitive symptoms, such as anxious thoughts, than those children who are not involved in an extra-curricular sport. No significant results were obtained on the teachers' assessments (TRF scores).

6.7. Cross-Sectional Analyses of the Second Data Collection (2008)

One hundred and forty-five cases were found to be complete further to the data screening of the second data collection. Since significant gender differences were also noted in this data set, MANCOVAs were calculated with gender as covariate.

MANCOVAs were first calculated using a dichotomous independent variable, *sport practice*. When analysing the SPAIK scales, no main effect of sport practice was observed but rather a main effect of the covariant gender $F(4, 138) = 3.26$, $p = .014$, partial $\eta^2 = .086$. No interaction effects were found on the SPAIK scales, however, an interaction effect of gender was found on all scales as presented in Table 6.13. Children practising an extra-curricular sport tended to score lower on their self-reported social anxiety symptoms. Indeed, a closer investigation of these differences using post-hoc tests, revealed significant differences

between the groups. Children who did not practice an extra-curricular sport, scored significantly higher on the SPAIK Total Score $t(36.74) = 3.375$, $p = .002$ (Table 6.12; Means for all SPAIK scales can be found in Table A11). No differences emerged between those children who did not provide information about their sport practice in 2008 and the other two groups.

Table 6.12
Mean Scores on the 2008 SPAIK Total Score for Sport Practice

	Sport Practice 2008	*M*	*SD*	*N*
SPAIK Total Score*	Yes	1.07	0.31	124
	No	1.23	0.16	17
	No reply	1.07	0.32	4
	Total	1.09	0.30	145

*transformed

Table 6.13
Interaction effects of gender on SPAIK scores in 2008

	F(4,138)	df	*p*3	partial η^2
SPAIK Total Score*	12.80	1	< 0.001	0.08
Interaction	12.53	1	0.001	0.082
Performance*	9.04	1	0.003	0.060
Cognitive and Somatic Symptoms*	8.25	1	0.005	0.055

*transformed

No main or interaction effects of sport practice were noted on the ESAK scores. Indeed, perusal of the mean scores on all ESAK scales and the total mean score shows a rather homogenous pattern of scores (Table A12, Appendix A).

Nevertheless, a main effect of sport practice was found on the teachers' assessments. This was only observable, however, when referring to Roy's gcr criterion, $F(131, 3) = 3.32$, $p = .022$, partial $\eta^2 = .071$. The recommended Pillai's criterion was found to be non-significant. Thus, this effect was not investigated any further. The mean scores for the children who did not provide information about their sport activities appear rather different on the Social Withdrawal and Social Problems scale (Table 6.14). However, post-hoc tests exploring this difference did not reveal any significant results.

Table 6.14
Mean Scores on the 2008 TRF Scales for Sport Practice

	Sport Practice 2008	*M*	*SD*	*N*
Social Withdrawal*	Yes	.41	.32	118
	No	.31	.39	14
	No reply	.57	.20	4
	Total	.40	.32	136
Anxious/Depressed*	Yes	.59	.39	118
	No	.61	.39	14
	No reply	.62	.47	4
	Total	.59	.39	136
Social Problems*	Yes	.40	.37	118
	No	.52	.45	14
	No reply	.19	.24	4
	Total	.41	.37	136

*transformed

MANCOVAs were carried out using *hours of sport per week* as an independent variable. Analyses using the SPAIK scales showed a main effect of sport hours on the SPAIK scores, $F(16, 556) = 1.879$, $p = .02$, partial $\eta^2 = .051$. Between-subject effects on all SPAIK Scales were observed for gender. Also sport hours showed between subject effects on the SPAIK's Total Score and the Interaction and Performance Scales (Table 6.15)

Table 6.15
Between-Subject Effects of Sport Hours on the 2008 SPAIK Scales

	F(16,556)	df	*p*	partial η^2
SPAIK Total Score*	5.351	4	< .001	.133
Interaction*	3.916	4	.005	.101
Performance*	5.368	4	< .001	.134
Cognitive and Somatic Symptoms*	1.841	4	.124	.050

*transformed

Post-hoc *t*-tests revealed significant differences between children practising one to two hours of sport a week and those practising for more than two hours a week on all SPAIK scales. Children practising an extra-curricular sport for more than two hours a week scored lower on self-reported social anxiety.

Table 6.16
Post-hoc t-tests on 2008 SPAIK Scales and Total Score for 1-2 Hours and > 2 Hours Groups

		n	*M*	*SD*	Df	T	*p*
Total Score	1 -2 hours	87	1.15	0.26	46.97	4.173	< .001
	> 2 hours	32	0.89	0.32			
Interaction	1 -2 hours	87	8.54	3.86	117	4.134	< .001
	> 2 hours	32	5.32	3.51			
Performance	1 -2 hours	87	0.55	0.26	117	4.701	< .001
	> 2 hours	32	0.30	0.27			
Cognitive and Somatic Symptoms	1 -2 hours	87	0.47	0.24	117	2.860	0.005
	> 2 hours	32	0.33	0.24			

Similar differences were also observed between children who did not practice any extra-curricular sport and those spending more than two hours a week on sport practice. In all cases, the children who were not involved in sport achieved higher scores on all the SPAIK scales as presented in Table 6.17.

Table 6.17
Post-hoc t-tests on 2008 SPAIK Scales and Total Score for No Sport and > 2 Hours Groups

		n	*M*	*SD*	df	T	*P*
Total Score	no sport	17	1.23	0.16	46.82	5.078	< .001
	> 2 hours	32	0.89	0.32			
Interaction	no sport	17	9.47	2.85	47	4.199	< .001
	> 2 hours	32	5.32	3.51			
Performance	no sport	17	0.62	0.24	47	4.06	< .001
	> 2 hours	32	0.30	0.27			
Cognitive and Somatic Symptoms	no sport	17	0.47	0.19	47	2.179	0.034
	> 2 hours	32	0.33	0.24			

MANCOVAs were also carried out for the ESAK scales. However no main or between-subjects effects of sport hours were ascertained. Indeed, these groups' mean scores were observed to be very similar across all scales (Table A13, Appendix A).

The MANCOVAs including the teachers' assessments on the TRF scales indicated a main effect of sport hours, $F(3, 390) = 1.949$, $p = .028$, partial $\eta^2 = .057$. A between-subjects effect was also observed on the TRF Social Withdrawal Scale, $F(3, 390) = 2.804$, $p = .028$, partial $\eta^2 = .079$. Post-hoc *t*-tests showed that differences were only to be found on the TRF Social Withdrawal Scale. Children practising no sport were found to exhibit less withdrawn behaviour than those practising sport for less than an hour a week, $t(17) = 2.695$, $p = .015$. Additionally, the latter were found to have higher scores on the Social Withdrawal Scale than those practising for 1 to 2 hours a week – $t(84) = 3.136$, $p = .002$ – as well as those practising over two hours every week, $t(35) = 2.738$, $p = .010$.

Table 6.18
Mean Scores on the 2008 TRF Social Withdrawal Scale for Sport Hours per Week

	Hours of sport/week 2008	*M*	*SD*	*N*
Social Withdrawal*	None	.31	.39	14
	less than 1 hour	.82	.22	5
	between 1 and 2 hours	.38	.30	81
	more than 2 hours	.40	.32	32
	No reply	.57	.20	4
	Total	.40	.32	136

*transformed

MANCOVAs using *sport mode* as an independent variable were also calculated. The sport mode variable consists of three groups: no sport, individual sport and team sport. Possible effects were investigated across all three informants. Analysis of the SPAIK total score and scales revealed a main effect of sport mode when referring to Roy's gcr, $F(4, 139) = 5.101$, $p = .001$, partial $\eta^2 = .128$. The Pillai's criterion did not reach statistical significance. Various interaction effects were observed on the SPAIK scales. Firstly, the covariant, gender, showed significant effects on all scales as displayed in Table 6.19.

Table 6.19
Between-Subject Effects of the Covariant Gender on the 2008 SPAIK Scales

	F(4,137)	df	*p*	partial η^2
SPAIK Total Score*	6.37	1	0.013	0.044
Interaction	6.63	1	0.011	0.045
Performance*	4.57	1	0.034	0.032
Cognitive and Somatic Symptoms*	6.05	1	0.015	0.041

*transformed

Secondly, sport mode resulted in significant interaction effects on SPAIK's Total Score, $F(12, 417) = 3.86$, $p = .011$, partial $\eta^2 = .076$ and on the SPAIK Interaction scale, $F(12, 417) = 2.92$, $p = .036$, partial $\eta^2 = .059$. Post-hoc t-tests revealed differences between the team sport group and the other two groups on the SPAIK Total Score as well as on the Interaction and

Performance Scales (Table 6.20 and 6.21). Since the SPAIK Total Score comprises of the scores on all of the SPAIK Scales, the effect on the Total Score could be ascribed to the significant differences found on the Interaction and Performance scales.

Table 6.20
Post-hoc t-tests revealing Differences between No Sport and Team Sport Groups on the SPAIK (2008) Total Score and Interaction and Performance Scales

		n	*M*	*SD*	df	T	*P*
Total Score	No Sport	17	1.23	0.16	40.49	4.183	< .001
	Team Sport	29	0.90	0.38			
Interaction	No Sport	17	9.47	2.85	44	3.927	< .001
	Team Sport	29	5.49	3.56			
Performance	No Sport	17	0.62	0.24	44	3.301	0.002
	Team Sport	29	0.34	0.29			
Cognitive and Somatic	No Sport	17	0.47	0.19	44	1.634	0.109
	Team Sport	29	0.36	0.23			

Table 6.21
Post-hoc t-tests revealing Differences between Individual Sport and Team Sport Groups on the SPAIK (2008) Total Score and Interaction and Performance Scales

		n	*M*	*SD*	df	T	*P*
Total Score	Individual Sport	95	1.13	0.26	36.64	3.049	0.004
	Team Sport	29	0.90	0.38			
Interaction	Individual Sport	95	8.32	3.95	122	3.45	0.001
	Team Sport	29	5.49	3.56			
Performance	Individual Sport	95	0.53	0.28	122	3.069	0.003
	Team Sport	29	0.34	0.23			
Cognitive and Somatic	Individual Sport	95	0.45	0.25	122	1.584	0.116
	Team Sport	29	0.36	0.23			

The MANCOVA analysing possible effects of sport mode on ESAK scores provided no significant results. Mean scores also showed a uniform pattern (Table A15; Appendix A).

When analysing the teachers' TRF scores by sport mode, a main effect was highlighted by Roy's gcr, $F(3, 131) = 3.381$, $p = .020$, partial $\eta^2 = .072$, however Pillai's criterion was not significant. No interaction effects were observed and post-hoc tests revealed no significant differences on the three TRF scales. The mean scores also showed a rather homogenous pattern (Table 6.22).

Table 6.22
Mean Scores on the 2008 TRF Scales for Sport Mode

	Sport mode 2008	*M*	*SD*	*N*
Social Withdrawal*	None	0.31	0.39	14
	Individual	0.41	0.32	91
	Team	0.39	0.31	27
	No reply	0.57	0.20	4
	Total	0.40	0.32	136
Anxious/Depressed*	None	0.61	0.39	14
	Individual	0.57	0.38	91
	Team	0.65	0.43	27
	No reply	0.62	0.47	4
	Total	0.59	0.39	136
Social Problems*	None	0.52	0.45	14
	Individual	0.40	0.36	91
	Team	0.41	0.39	27
	No reply	0.19	0.24	4
	Total	0.41	0.37	136

*transformed

6.8. Longitudinal Analyses

6.8.1. Effects of time and sport mode on social anxiety symptoms[5]

The change in social anxiety symptoms was tested using a repeated measures analysis of variance (ANOVA) with sport mode as the independent variable and time 1 versus time 2 as the repeated measure. The reason sport mode was selected as the independent variable was because cross-sectional analyses indicated a possible effect related to sport mode, rather than general sport participation. Mauchly's test of sphericity could not be computed since this analysis only included two levels and sphericity is thus met.

An interaction effect of sport mode and time was observed on the SPAIK Total Score, $F(2, 142) = 4.494$, $p = .013$, partial $\eta^2 = .060$. A between-subjects effect of sport mode was also revealed with $F(2, 142) = 3.555$, $p = .031$, partial $\eta^2 = .048$. The Tukey-HSD post-hoc tests indicated differences between team and individual sport ($p = .033$) where team sport participants had lower scores.

[5] An article reporting a selection of results from the longitudinal analyses has been accepted for publication pending revision by the peer-reviewed journal *Psychology of Sport and Exercise* and is to be re-submitted by September 2010. A copy of the unrevised manuscript is included in Appendix D.

Table 6.23
Mean Scores of the SPAIK Total Score in 2007 and 2008 for Sport Mode

	Sport mode	*M*	*SD*	*n*
SPAIK Total Score 2007	None	14.008	8.817	27
	Individual	13.444	8.400	95
	Team	12.632	8.220	23
	Total *N*	13.420	8.402	145
SPAIK Total Score 2008	None	15.185	7.928	27
	Individual	14.920	7.566	95
	Team	7.970	6.169	23
	Total *N*	13.867	7.819	145

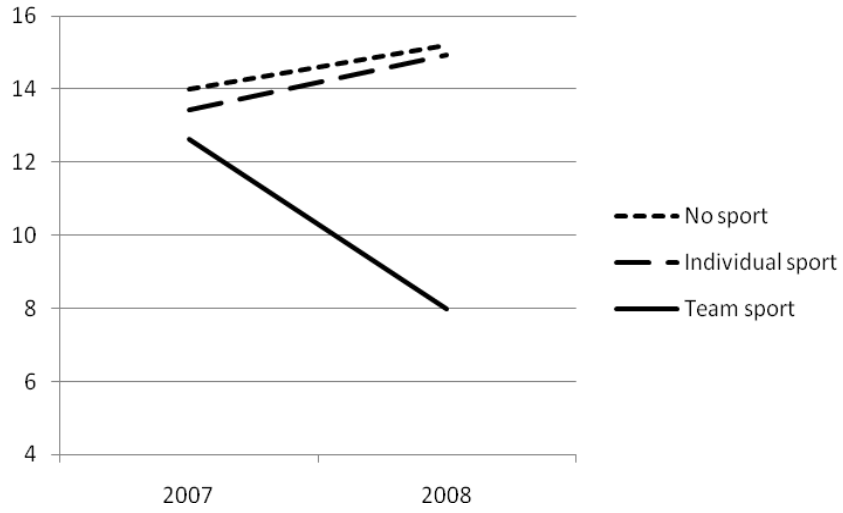

Figure 6.5. Profile plot for SPAIK Total Score illustrating changes over time by sport mode.

This interaction effect of sport mode and time was also observed on the SPAIK Interaction Scale, $F(2, 142) = 4.542$, $p = .012$, partial $\eta^2 = .060$ as was a between subjects effect of sport mode, $F(2,142) = 4.032$, $p = .02$, partial $\eta^2 = .054$. Post-hoc tests using Tukey's HSD once again showed that the team sport group distinguished itself from both the individual sport group ($p = .034$) and the no sport group ($p = .024$) since the team sport group's scores were significantly lower especially at the second data collection point, as can be seen in Table 6.24 and Figure 6.6.

Table 6.24
Mean Scores of the SPAIK Interaction Scale in 2007 and 2008 for Sport Mode

	Sport mode	*M*	*SD*	*n*
SPAIK Interaction 2007	None	8.185	4.759	27
	Individual	7.372	4.370	95
	Team	7.159	4.520	23
	Total *N*	7.490	4.449	145
SPAIK Interaction 2008	None	8.679	4.008	27
	Individual	8.389	3.760	95
	Team	4.732	3.375	23
	Total *N*	7.863	3.968	145

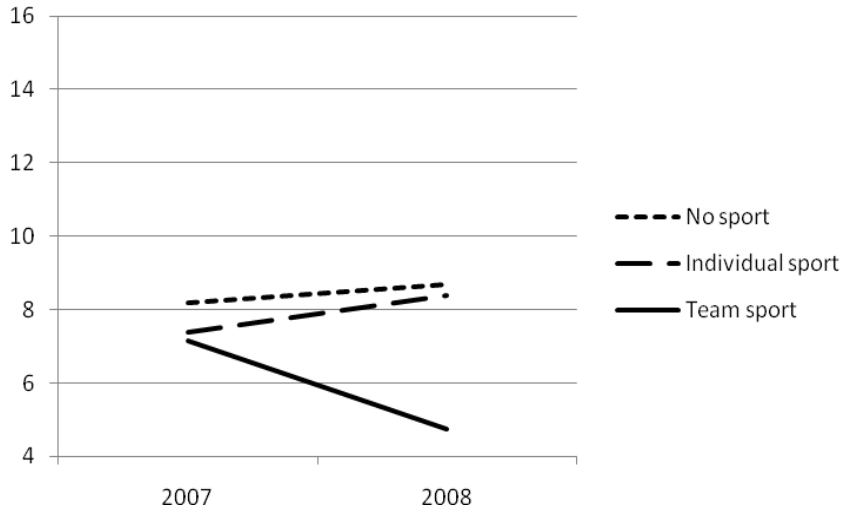

Figure 6.6. Profile plot for SPAIK Interaction Scale displaying changes over time by sport mode.

This interaction effect of sport mode and time was also ascertained on the SPAIK Performance Scale, $F(2, 142) = 5.433$, $p = .005$, partial $\eta^2 = .071$. No between subjects effect of sport mode were observed on this scale. Post-hoc results did not reach statistical significance on the Performance Scale although the trend of change over time was similar to the other scales as can be observed in Table 6.25 and Figure 6.7.

Table 6.25
Mean Scores of the SPAIK Performance Scale in 2007 and 2008 for Sport Mode

	Sport mode	*M*	*SD*	*N*
SPAIK Performance 2007	None	.451	.285	27
	Individual	.487	.276	95
	Team	.489	.294	23
	Total *N*	.480	.279	145
SPAIK Performance 2008	None	.511	.296	27
	Individual	.543	.262	95
	Team	.314	.305	23
	Total *N*	.501	.285	145

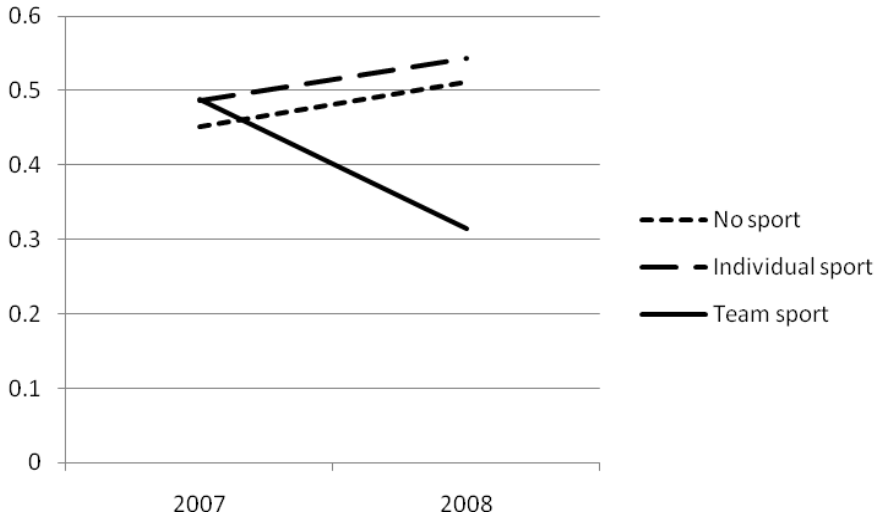

Figure 6.7. Profile plot for SPAIK Performance Scale displaying changes over time across sport mode.

The repeated measures ANOVA did not reveal any significant results on the SPAIK's Cognitive and Somatic Symptoms scale, although it was close to statistical significance (p = .056). Still, the values and the profile plot indicate a similar pattern as observed on all the other SPAIK scales (Table 6.26 and Figure 6.8).

Table 6.26
Mean Scores of the SPAIK Cognitive and Somatic Symptoms Scale in 2007 and 2008 for Sport Mode

	Sport mode	*M*	*SD*	*N*
SPAIK Cognitive and Somatic Symptoms 2007	None	.477	.241	27
	Individual	.443	.254	95
	Team	.425	.215	23
	Total N	.447	.245	145
SPAIK Cognitive and Somatic Symptoms 2008	None	.489	.220	27
	Individual	.454	.244	95
	Team	.286	.212	23
	Total N	.434	.243	145

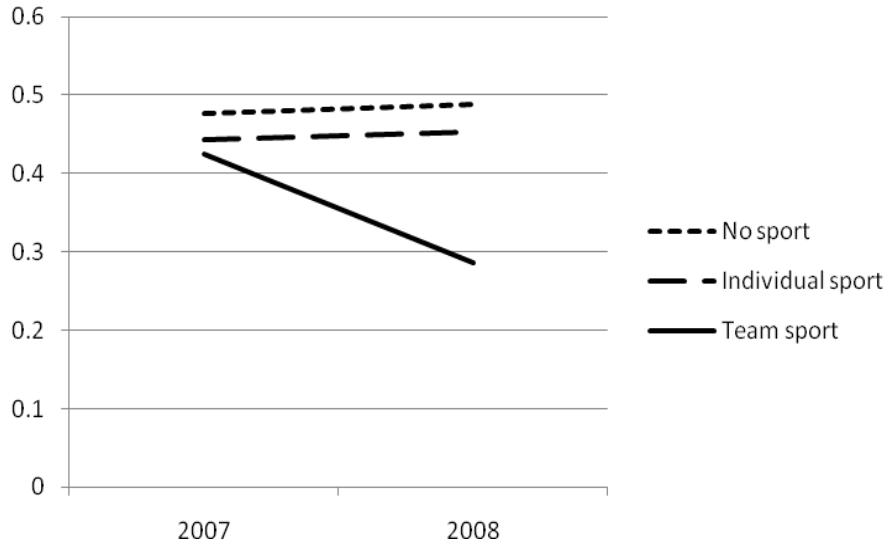

Figure 6.8. Profile plot for SPAIK Cognitive and Somatic Symptoms Scale displaying changes over time across sport mode.

Due to the gender differences observed in the cross-sectional analyses, the repeated measures ANOVAs were re-calculated separately for both boys and girls. Results indicated further distinctions between the genders.

Repeated measures ANOVAs including *boys'* scores revealed similar trends and effects as in the previous analyses using the whole sample. An interaction effect of time and sport mode was noted on the SPAIK Total score and all its scales (see Table 6.27), however no between subject effects of sport mode was observed on any of the scales.

Table 6.27
Boys' Mean Scores of SPAIK Scales in 2007 and 2008 for Sport Mode

			SPAIK Total		Interaction		Performance		Cognitive and Somatic	
	Sport mode	*n*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
2007	None	11	10.333	9.530	6.000	5.145	0.323	0.296	0.361	0.265
	Individual	40	11.159	8.512	6.092	4.308	0.417	0.288	0.372	0.257
	Team	20	11.484	7.146	6.567	4.051	0.470	0.279	0.399	0.214
	Total *N*	71	11.123	8.206	6.211	4.316	0.417	0.286	0.378	0.244
2008	None	11	12.615	7.614	7.000	3.953	0.441	0.328	0.421	0.213
	Individual	40	13.700	7.695	7.842	3.990	0.503	0.246	0.421	0.239
	Team	20	6.953	5.945	4.142	3.209	0.266	0.298	0.257	0.209
	Total *N*	71	11.631	7.728	6.669	4.065	0.427	0.290	0.375	0.236

Table 6.28
Interaction effects of time by sport mode on SPAIK Total Score and its scales for boys.

	n	df	*F*	*p*	partial η^2
SPAIK Total Score	71	(2, 68)	3.968	0.023	0.105
Interaction scale	71	(2, 68)	4.414	0.016	0.115
Performance scale	71	(2, 68)	5.726	0.005	0.144
Cognitive and Somatic Symptoms scale	71	(2, 68)	3.353	0.041	0.090

Post-hoc tests indicated lower scores for those boys practising a team sport, however, these differences did not reach statistical significance. In both the SPAIK Total score and its three scales, the profile was similar to that achieved by the general sample (e.g. Table 6.9). However, considering the low number of girls practising a team sport, the results relating to the whole sample are probably influenced by the boys' scores.

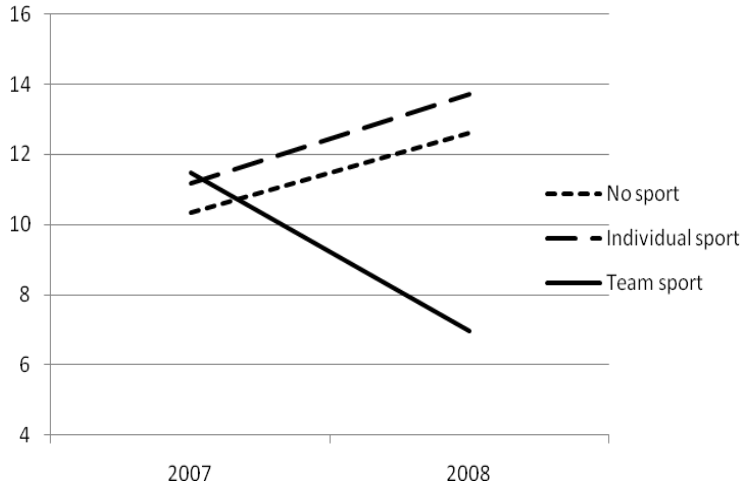

Figure 6.9. Profile plot for SPAIK Total Score displaying changes over time across sport mode for the boys in this sample (n = 71).

Repeated measure ANOVAs for *girls'* scores (*n* = 74) revealed different results from those of the boys in this sample. No significant effects were ascertained on any of the SPAIK scales or total score. Furthermore, the consistent pattern of lower scores for team sport participants was not to be seen in this group. Still, it is important to point out that only 3 girls took part in a team sport in comparison to a much larger number of boys. This small group size could have influenced the results.

Thus, the effects observed for the whole sample appear to be mainly related to the boys who took part in this study. Girls did not show the same changes over time as the boys did.

The same repeated measures ANOVAs using the ESAK scales did not reveal any influence of time or sport mode. No pattern similar to that found on the SPAIK scores could be observed. These analyses were also calculated separately for boys and girls. Boys' results showed no

significant main or interaction effects. However, team sport participants were shown to have lower scores on all scales except for the ESAK Behaviour scale. These lower scores were present at both data collection points and thus no time effect of sport mode can be inferred as can be seen for example, in Figure 6.10.

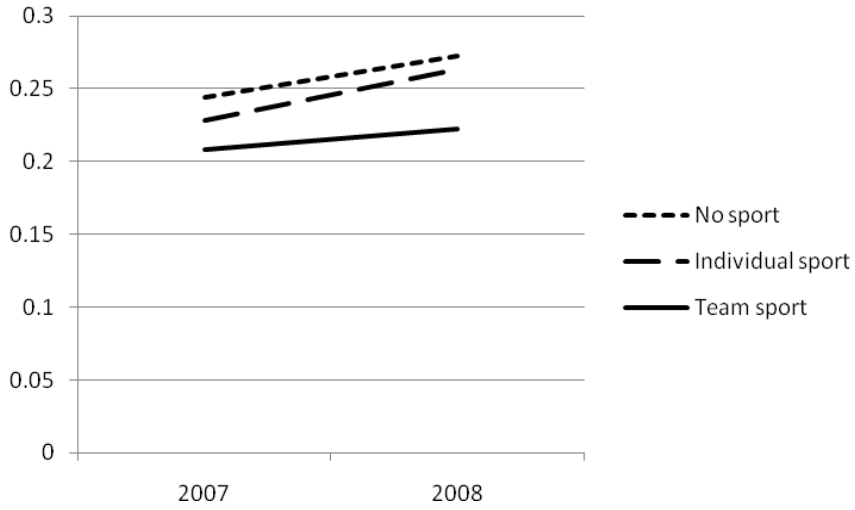

Figure 6.10. Profile plot for ESAK Cognitive Symptoms Scale displaying changes over time across sport mode for the boys in this sample (n = 71).

This lack of significant results was also observed on the TRF scales. Separate analyses for boys and girls did not show any significant changes over time related to sport mode. Boys results' on the TRF scales showed a pattern similar to the ESAK scales where team participants scored lower at both data collection time points. Girls' results showed no consistent pattern at all with only the TRF Withdrawn scale revealing a time-sport mode interaction effect very close to significance, $F(2, 64) = 3.149$, $p = .050$, partial $\eta^2 = .09$. Still, as pointed out earlier, the number of girls involved in an extra-curricular team sport was very low ($n = 3$), thus no inferences can be made.

6.8.2 Effects of time and sport frequency on social anxiety symptoms

Various studies have highlighted a possible association between sport intensity and its effect on a number of psychological variables (e.g. Biddle & Mutrie, 2001; Raglin, 1997). Therefore, repeated measures ANOVAs were calculated using sport frequency and time as independent factors.

Repeated measures ANOVAs calculated for all scales of the three instruments used in this study revealed no significant effect of sport frequency over time. A general observation was that children practising more than 2 hours of sport per week tended show a reduction of self-reported social anxiety symptoms over time (e.g. Figure 6.11). Still, no statistical significance was attained thus preventing any inferences related to these results.

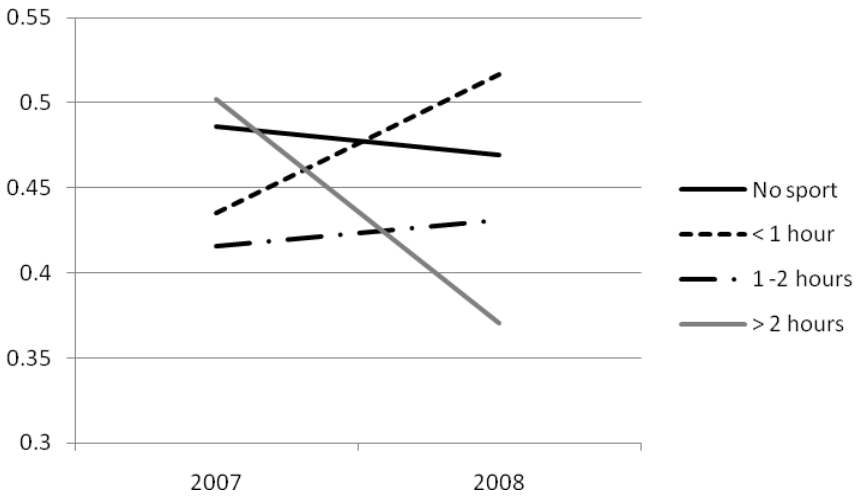

Figure 6.11. Profile plot for SPAIK Cognitive and Somatic Symptoms Scale displaying changes over time across hours of sport per week.

7. Discussion

A number of research efforts have investigated the influence of sport participation on various aspects of mental health. Most findings reported a positive effect of physical exercise on either a person's general psychological well-being or on specific areas of mental health, such as depression and anxiety (e.g. Fox, 1999; Salmon, 2001). Physical exercise was specifically found to have a beneficial effect on state anxiety (e.g. O'Connor et al., 1995; Raglin, 1997) and some studies even reported improvements in trait anxiety (e.g. Asçi, 2003). However, these effects are influenced by various factors such as the type of physical activity, exercise duration, participants' fitness level and exercise intensity (e.g. Callaghan, 2004; Salmon, 2001). Such findings thus lead to the enquiries in this study, where not only the effect of sport on a particular psychological condition is investigated but also the role of sport as a buffer against social anxiety disorder starting from a young age.

This longitudinal study focused on social anxiety symptoms. Swiss primary school children were assessed in relation to their participation in extra-curricular sport activities. Further to the aforementioned findings reporting an anxiolytic effect of sport as well as other studies highlighting the psychosocial benefits of sport participation, a reduction in social anxiety symptoms in those children practising an extra-curricular sport was anticipated. Furthermore, the possible influence of the sport mode, that is, team or individual sport, together with the number of hours of sport practice per week was also explored. This study's hypotheses were based on Antonovsky's (1997) salutogenesis model and on the social learning theory (Bandura, 1977).

7.1. Theoretical Implications of Results

7.1.1. Gender differences in sport practice and social anxiety symptoms.

Analyses looking into possible gender differences on social anxiety indicated clear differences between the boys and girls participating in this investigation. Girls were found to report higher social anxiety symptoms at both data collection points thus concurring with previous findings in European (e.g. Fehm et al., 2005; Wittchen et al., 1999) and other international epidemiological studies (e.g. Schneier et al., 1992). Indeed, most large-scale epidemiological studies report higher social anxiety prevalence rates in women (e.g. Kessler et al., 2005; Schneier et al., 1992; Wittchen et al., 1999). Most of the investigations examining the prevalence of social phobia were carried out with adolescent and/or adult samples; however, results of the present study reveal a gender difference is also present at a young age. This distinction was also noted in this study's parent assessments where girls were judged to manifest more symptoms of social phobia than boys. Nonetheless, the difference on the parent assessments did not reach statistical significance. This may imply that the children's symptoms were not so pronounced especially since no children in this sample reached the cut-off point for clinical social anxiety on any of the two diagnostic instruments. Hence, differences here refer to higher or lower social anxiety scores within the sub-clinical range. Moreover, the parents' assessments of social anxiety symptoms hinges on observable manifestations, thus some emotions or thoughts related to social phobia in children could pass unobserved by the parents. Teachers rated children on three aspects related to social anxiety: social withdrawal, social problems and anxious/depressed. With regards to social behaviour in school, no gender differences were observed by the teachers.

One in five children in Brinkhoff and Sack's (1999) study did not practice sport on a regular basis whereas 10.7% of the 988 West German students participating in Kirkcaldy et al.'s (2002) investigation reported never taking part in sport activities. In a more recent study, Lamprecht et al. (2008) explored sport engagement trends in Swiss children and youth. They found that 86% of the survey's 1530 10- to 15-year old participants practised an extra-curricular sport for more than three hours a week. Fourteen per cent did not practice any other sport apart from the obligatory school sport. These findings are similar to the sport engagement trends in the current study's sample, where 81.6% of the children practised an extra-curricular sport at the first data collection point and increases to 85.5% at the second data collection point. Lamprecht et al. (2008) noted that sport involvement tended to increase till late adolescence. Thus, the sport trends in the current study do not contradict Lamprecht et al.'s (2008) report.

In Brinkhoff and Sack's (1999) German study, 42.9% of the younger children in the sample were reported to be members of a sport club. Most of these sport club members (26%) belonged to a football club followed by a swimming club (16%). More boys (50.2%) than girls (35.5%) were found to be sport club members. Children living in a city were found to be less involved in clubs (36%) than those living in a rural area (51%). In Lamprecht et al.'s (2008) survey, cycling, swimming and football were the most popular sport types. This study's findings regarding to the most frequently practised sport types are similar to both Brinkhoff and Sack's (1999) as well as Lamprecht et al.'s (2008) observations. Indeed football was the most frequently reported extra-curricular sport at both data collection points followed by gymnastics and swimming.

Gender differences were also observed in the sport participation trends as reported by the parents. Boys were found to be more involved in extra-curricular sport than girls; this is consistent with other reports about children's involvement in sport activities (e.g. Steptoe & Butler, 1996). In this study, boys were also found to participate more in team sports whereas most girls took part in an individual sport. Similarly, in Lamprecht et al.'s (2008) Swiss survey, males were observed to practice more sport and to be more frequently involved in a sports club

7.1.2. Aspects of sport practice related to lower social anxiety symptoms

Initial findings from the cross-sectional analyses of the present study indicate that children practising an extracurricular sport report less feelings of anxiety in social situations. This same pattern was also reflected in the parents' assessment. Teachers also reported less behavioural problems in class in these children's case. Still, these differences between the "sport" and "no sport" group did not reach statistical significance, thus it is not possible to make any inferences based on these results. A similar pattern was observed at the second wave of data collection a year later: once again, participants not practicing an extra-curricular sport scored higher on most measures but differences did not achieve statistical significance.

Even longitudinal analyses did not reveal any effect of sport practice over time. Hence, the *first hypothesis* stating that children practising an extra-curricular sport would show a reduction in social anxiety symptoms a year later is refuted. In the first hypothesis, extra-curricular sport is proposed as a General Resistance Resource (GRR) against social anxiety symptoms, based on Antonovsky's (1997) salutogenesis model. Antonovsky described those resources that decrease a risk factor or enhance a protective factor as GRRs. However, due to the lack of significant results, this hypothesis cannot be upheld.

Notwithstanding this lack of statistical significance and the refutation of the first hypothesis, the consistent pattern identified in the results may well enough indicate a possible relationship between sport and social anxiety symptoms which needs to be investigated further. The lack of statistically significance may be influenced by the fact that no child fulfilled the diagnostic criteria for clinical social anxiety, meaning all socially anxious children in the sample were at the sub-clinical level. This signifies that the dissimilarities between the non-socially anxious children and those experiencing social anxiety were not as pronounced hence reducing the chance of a statistically significant difference.

This study's *second hypothesis* anticipated an influence the hours of sport practice per week have on social anxiety symptoms, as claimed by those investigating the dose-response hypothesis, or the effect sport intensity has on aspects of mental health (e.g. Wipfli et al., 2008). Between-subject effects were noted on the SPAIK's Performance Scale at the first data collection, however, post-hoc *t*-tests revealed no differences among the sub-groups. Nevertheless, post-hoc tests highlighted differences in anxiety symptoms related to social interaction on the children's self-report measure. Children practising less than an hour a week reported more symptoms than those practising one to two hours a week. These symptoms included feelings of anxiety in situations involving social interaction, such as, attending a party. A main effect of sport hours was also noted in the parents' assessment at the first data collection point. Children practising no sport were also assessed higher on cognitive symptoms by their parents than those practising less than an hour a week. On the other hand, children practising less than an hour a week scored lower on cognitive symptoms than those practising one to two hours or more every week. In the second data collection point, an effect of sport hours was detected on the children's self-reports as well as between subject effects on the interaction and performance scales and the total score.

Nonetheless, longitudinal analyses did not reveal any effect in this study of weekly hours of sport on social anxiety symptoms over time. Thus the second hypothesis could not be confirmed. It also important to point out that most children in this study practised an extra-curricular sport for one to two hours per week, thus the sample was relatively homogeneous with regards to hours of weekly sport practice. An effect related to sport frequency could have been difficult to ascertain due to the fact that none of the children practised their sport at a high intensity.

The *third hypothesis* expected an influence of team sport on social anxiety in children. This effect was anticipated following various studies documenting the social benefits of sport participation (e.g. Polvi & Telama, 2000; Smith, 2003) as well as the social learning theory's explanation of modelling (Bandura, 1977). Bandura and other proponents of the social learning theory put forward the concept of modelling amongst other things. Thus it is here argued that children could learn and practice social skills through modelling, that is by watching other children as well as their coach and then imitating these behaviours. Sport mode was indeed found to have an effect on the social anxiety scores ensuing from the children's interviews at the first point of data collection. Parents of team sport participants also reported less social anxiety symptoms when compared to those of children practising an individual sport. This association was observed on the physical symptoms and the cognitive symptoms scale. Children practising a team sport were reported to manifest less physical symptoms of social anxiety, such as sweating and trembling, than those practising an individual sport. Children involved in no extra-curricular sport at all were reported to show even more cognitive symptoms of social anxiety, such as negative thoughts, worries, etc. Interestingly enough, no differences were observed between those children practising an

individual sport and those practising no sport at all, thus implying an influence of sport type and organisation rather than the physical aspect of sport per se.

Differences related to sport mode were also revealed at the second data collection point, this time, however, on the children's self-reports. Team sport participants scored less on the Interaction and Performance Scales as well as on the Total Score than those children practising an individual or no sport at all. This means that in 2008, children practising a team sport reported experiencing less anxiety in social interaction situations such as eating in a restaurant, asking a question in class, and so on. They also reported experiencing less anxiety in performance situations such as reading in class or taking part in a school play. Longitudinal analysis confirmed this association as well as a time effect on the Interaction and Performance scales of the children's self-reports meaning that children practising a team sport experienced a decrease in anxiety in both interaction and performance situations a year later. Thus, the third hypothesis was confirmed since children practising a team sport showed a reduction of social anxiety symptoms over time. This finding highlights the social aspect of team sport and its benefits, not only in developing social skills as reported in previous studies but also, in this case, in acting as a buffer against social anxiety symptoms. Still, since the activities focussed on in this study are all sport-related, it would be incorrect to claim a direct or causal link between team sport and a reduction in social anxiety. This is due to the fact that other social and team activities, such as choir or band practice, could also have a similar effect on a child's feelings of anxiety in social situations and thus need to be investigated further (e.g. Fletcher et al., 2003), for instance by including such non-sportive social activities as control groups in similar studies.

Separate analyses for girls and boys indicated that this team sport effect was only valid for the boys in this sample. However, since the number of girls participating in a team sport was very low, no conclusions can be drawn at this point. This potential difference needs to be investigated further and should not be excluded as yet. Small cell sizes reduce power in MANOVA and this could be the cause of the insufficient findings for this sub-group.

Data revealed little with regards to the expected benefits of sport on the children's social behaviour in school as proposed in the *fourth hypothesis*. Cross-sectional analyses of the teachers' assessments at the first data collection showed no association between these two variables. Data from the second data collection, however, only indicated an effect of sport intensity on the children's withdrawn behaviour. Still, this effect provided mixed results, where on the one hand, children practising no sport were judged to show less withdrawn behaviour in class than those practising for less than an hour a week. And on the other hand, teachers assessed children practising an extra-curricular sport for an hour or more every week as less withdrawn than those involved for less than an hour a week. Still, longitudinal analyses did not reveal any effect of sport on social behaviour over time thus refuting this study's fourth hypothesis.

In a nutshell, the main finding of this investigation revolves around the effect of team sport practice on social anxiety symptoms over time. Extra-curricular team sport appeared to act as a buffer against social anxiety symptoms in a non-clinical sample of primary school children. Individual sport did not reveal any similar effects and no differences could be ascertained between children involved in an extra-curricular individual sport and those practising no sport at all. This finding highlights the importance of the social aspect of sport and its potential benefits in socially anxious children, which could be explained through Bandura's (1977) social learning theory: children who have an increased opportunity of observing and

modelling social skills in a team setting, tended to display a reduction in social anxiety symptoms a year later.

7.2. On the Discrepancies between Self and Observer Ratings

Discrepancies were observed between self- and observer ratings on social anxiety which remained consistent over the two points of data collection. Teachers' ratings did not correlate with the children's self-report and or the parents' evaluation of their child's social anxiety symptoms in this study. This phenomenon has been observed in various investigations involving a number of psychological dimensions.

In a study carried out using the SPAIK, no correlation was found with the teacher's report (Melfsen et al. 1999). Döpfner et al. (1994) also reported low to average correlations between child, parent and teacher reports in their study. In the Dresden Child Anxiety Study (Federer et al., 2001), the interrater agreement between children, parents and teachers was also very small (between r = .08 to r = .15). DiBartolo et al. (1998) investigated parent-child correlations on social phobia measures. They maintained that the inclusion of multiple informants is especially important when dealing with social phobia since the individuals under study are particularly concerned with how they present themselves and fear negative evaluation. Thus, observer reports can improve validity and control for bias due to social desirability. DiBartolo et al. found a significant correlation between the children's and parents' ranking of anxiety provoking situations: both placed public speaking and parties in the first and second place respectively.

Weinbrenner (2005) also discusses this issue of concurrence between assessments from different observers. She reports mixed results relating to this issue and mentions various factors that could influence these discrepancies. Weinbrenner concludes that parent reports tended to correlate better with children's self-reports when compared to the teachers' assessments. This was also the case in the present study.

Indeed, Asendorpf (1986) states that studies investigating shyness frequently report parents' and teachers' ratings of situations that make children feel shy. He also adds that these ratings often differ substantially (e.g. Zimbardo & Radl, 1981, p.121). Furthermore, he suggests the explanation that teachers observe children in more interactive situations than their parents, without the feeling of security that a child experiences in the parents' presence. This rater bias may also be context-specific where situations eliciting shyness occur more frequently at school than at home. Fordham and Stevenson-Hinde (1999) measured shyness in children using mothers' and teachers' assessments. The data from these two sources showed a moderately strong and significant correlation.

In a meta-analysis of ratings from different informants, Achenbach, MacConaughy & Howell (1987) included studies investigating child and/or adolescent behaviour through various assessments, such as, parents, teachers, peers, self-assessments, etc. They found significant correlations between ratings, particularly between raters playing similar roles with respect to the children. Epkins and Meyers (1994) also investigated cross-informant discrepancies using measures from primary schoolchildren together with their parents, teachers and peers on various traits including anxiety. Teachers taking part in this study completed the TRF, which is the same instrument used in the present study. Epkins and Meyers reported poor agreements between informants on anxiety scores. Some gender differences were also

observed: there was more agreement with girls' reports in internalising symptoms while informants converged better with the boys' self-reports regarding externalising symptoms.

In another review focusing on anxiety disorders in children, Klein (1991) reports poor levels of agreement between the children and the parent reports. Rapee, Barrett, Dadds and Evans (1994) reported similar findings with regards to parent-child agreement diagnostic categories based on DSM-III-R.

Various factors can influence the magnitude of discrepancy between observer and self-report. One such factor is age, where findings show that parents' reports correlate better with children's self-reports the younger the children are (e.g. Rapee et al., 1994). With regards to the parent reports, the child's gender was also found to be an influencing factor. Gender differences were observed in connection with the manifestation and observation of symptoms (e.g. Epkins & Meyers, 1994). Then again, a number of studies also reported no difference (e.g. Federer et al., 2001). Achenbach and his colleagues (1987) maintain that discrepancies between ratings do not necessarily indicate a lack of reliability or methodological flaws. The nature of the disorder is also to be taken into consideration. Findings show higher cross-informant correlations when assessing externalising disorders rather than internalising ones (Renk, 2005). This could be because symptoms of externalising disorders are easier to observe. Anxiety is also an issue especially in the case of social anxiety. Socially anxious individuals are especially fearful of negative evaluation and they may thus adapt their responses so as to avoid negative judgement (Dadds, Perrin & Yule, 1998). In this way, observer reports could help control for this social desirability effect. These differences could also mean that the children do not exhibit the problematic behaviour across the various contexts. As previously mentioned, no children reached the clinical cut-off point for social anxiety disorder in the present study; thus, their symptoms may not have been sufficiently severe for the parents or teachers to observe.

The standardised scores from the three informants in this present study were compared to check for any significant differences. Socially anxious individuals have been found to underestimate their ability to perform in social situations and thus rate themselves lower than their observers (Rapee & Lim, 1992). Consequently, it was expected that children would rate themselves higher on anxiety than their parents and teachers. However, no significant differences were observed. Parent and teacher reports were also not significantly different; although the child was observed in the two different contexts, the school being a place where a child must interact in a social situation in the absence of his/her parents. Still, an important point to consider is that this was a non-clinical sample, that is, no children fulfilled the diagnostic criteria for social phobia. Thus, the cognitive biases usually present in socially anxious individuals were either non-existent or negligible here.

7.3. Strengths of this Study

The strengths of this study include the number of children interviewed as well as the three different sources of data collection. The information collected from the children themselves as well as from their parents and teachers provided a more complete picture of the individual and so helping to confirm the children's self-assessment due to the positive correlations obtained between their scores and the parents' reports. This cross-informant design is now being recommended, especially when assessing children, so as to increase reliability and obtain a more comprehensive understanding of the subject being studied. Although the children were relatively young, particularly at the time of the first data collection, their self-evaluation was

confirmed by that of their parents through the positively moderate to high correlations between scores. The latter is another strong point of this investigation since most studies involving sport have been carried out with adolescents and/or adults. This study however contributes to the area of research focussing on the effect of sport involvement on children.

Many longitudinal studies include a short gap between data collections or a short-term follow-up after an intervention which has been mentioned as a disadvantage in some reviews or meta-analyses (e.g. Craft & Landers, 1998; Raglin, 1997). This study includes a period of 12 months between the two data collections thus allowing time for the potential influences of extra-curricular sport practice on a child's development as well as for any other changes to occur.

Results of this study indicate a qualitative effect of sport practice where research should differentiate more between sport modes and types rather than placing various kinds of sport practice into one category.

7.4. Shortcomings and limitations of this study

Sport in this study only refers to the organised, extra-curricular sport type. This excludes physical activities such as walking or cycling to school, which could also positively contribute to a child's mental health. Still, the organised sport context was in this case taken into account due to its additional social aspect. Moreover, organised sport includes adult supervision as well as a clear structure which could contribute to this study's hypothesis based on the social learning theory. For this reason, informal, non-organised physical activities were not included in this investigation.

Other non-sportive extra-curricular activities, such as choir or band practice, were also not included in this study. Thus, it cannot be excluded that such activities would have a similar effect as team sport in this study. All these activities share the characteristics of being a social, organised and supervised setting, thus a similar effect to team sport may be possible.

Social conformity may also exert an influence on the participants' responses. Gender differences were noted on the children's self-reports where girls scored higher than boys. The traditional gender roles and related expectations need to be kept in mind since it may be more acceptable for girls to admit experiencing fear than it is for boys. They may feel the expectation of presenting a tough exterior. Moreover, social anxiety is just about the fear of negative judgement, thus, socially anxious children may also adapt their responses so as to give a positive impression of themselves to the interviewer.

Short-term effects of sport were not measured in this study thus excluding the possibility of identifying them with regards to social anxiety, as with the anxiolytic effects of sport on state anxiety reported in some studies (e.g. O'Connor et al., 1993; Salmon, 2001). Still, the transitory effect of sport practice was not the focus of this study since a more long-lasting effect was investigated: that of sport as a preventive or buffering factor against social anxiety symptoms. This may explain the lack of results related to individual sport practice, since the physical activity involved in all kinds of sport modes would probably have a momentary anxiety-reducing effect that would not be observable over a long period of time. The effects of team sport may have lasted over time due to the additional social benefits of this type of sport. Nevertheless, this distinction between effects of team and individual sport needs to be investigated further so as to provide a better understanding of the role of team sport in social anxiety.

This study's main shortcoming is the low response rate thus reducing sample size from the very start. The majority of schools contacted declined participation due to ongoing involvement in one or more research projects. Sample attrition is also a common problem in microsocial, prospective studies. In this study's case, attrition rate was kept low but could not be completely avoided. Due to both the sample size as well as sample attrition, generalisability of these findings is not possible. Nevertheless it is to be emphasized that no indications of selective attrition were identified and drop-out rate did not exceed 15%. Generalisation is also not possible to this sample's characteristics making it non-representative of the population in the German-speaking region of Switzerland. For example, 94.1% of the children were Swiss nationals thus failing to reflect the high rate of non-Swiss nationals residing in Switzerland. Lack of participation of children of immigrant families could be related to the language barriers since some parents may have been unable to read and/or understand the letter sent to all potential participants.

The lack of significant results in this study could also be a consequence of this medium-sized sample, especially since the group of children who were reported not to practice any sport outside school was relatively small. Moreover, the cell sizes in the MANCOVA as well as in other analyses were not equally sized; in some instances the cell contained a rather small number of cases (as in the case of girls practising a team sport). This may have negatively influenced the statistical power of the analysis leading to a non-significant result.

Children participating in an extra-curricular sport may have been less socially anxious prior to engaging in this activity, while pre-existing social anxiety symptoms may have influenced a child's participation or lack thereof in both this study as well as in an extra-curricular activity. This limitation was anticipated and it was the main reason for the selection of a young age-group for this study's sample. The age onset of social anxiety disorder usually occurs during early adolescence with a reported peak at 15 years of age (Lecrubier et al., 2000). Indeed, no children in this sample fulfilled the diagnostic criteria for social anxiety disorder.

7.5. Recommendations for Future Research

This study is the one of the first investigations focusing on the potential effect of sport practice on social anxiety symptoms. Indeed, most studies documenting the anxiolytic effect of sport and/or exercise refer to general anxiety or state/trait anxiety. Therefore these results may be considered as a basis for further investigations.

Outcomes of this study provide important information about the role of sport as a preventive factor against social anxiety which needs to be elaborated further. First, the possible effect of general sport practice on social anxiety symptoms should not be discarded. Indeed, the differences noted in these results did not reach statistical significance, however, the consistent pattern suggests a possible effect that needs to be explored using larger and more equally divided samples so as to increase power and reduce statistical error. The measurement of sport practice may also be done more comprehensively and precisely so as to eliminate some of the interfering variables, such as daily physical exercise through non-organised play.

Secondly the role of team sport on the acquisition of general social skills also needs to be investigated further, not only in relation to the emergence of social anxiety but also as a possible part of treatment in clinical samples through intervention studies. The distinction between team and individual sport identified in this report draws attention to the benefits of team sport in the normal social development of children. Still, further research needs to

include and contrast the possible effects of other extra-curricular activities that do not involve physical exercise, such as choir practice, art classes, etc. The inclusion of these activities in the research design of a study would be able to answer the question of whether the benefits of team sport brought to light in this study are due to the combination of physical activity in a team setting or are solely due to participation in a social activity.

Thirdly the aspect of competitive sport has not been explored in this study. Competitive sport differs from organised, leisure sport in various ways, such as in its intensity, commitment, etc. Thus, the influence of this kind of sport practice on social anxiety may follow a separate path and may also have a different outcome than that of non-competitive sport participation. It is therefore interesting to explore the possible effects of this type sport on children's social anxiety in order to identify and distinguish the different effects of the various sport modes and types.

Finally, the influence of sport intensity and/or frequency on social anxiety needs to be addressed in more detail. This study mainly focused on the type of sport practised and the selected sample was quite homogenous with regards to hours of weekly sport practice where the majority of children in this sample spent 1 to 2 hours a week at sport practice. The intensity or frequency of sport practice needs to be explored further perhaps through an intervention study where the amount of sport involvement can be controlled/manipulated by the researchers.

7.6. Conclusion

The present study investigated the association between extra-curricular sport participation and social anxiety symptoms among primary school children. Results indicated no differences between children involved in an extra-curricular sport and those not engaged in sport participation. Overall, girls and boys differed on social anxiety scores, as girls reported experiencing more anxiety in social situations. Gender differences emerged on sport type trends as well, as boys were found to be more active in extra-curricular sports than their female counterparts. Finally, children practicing a team sport were reported to manifest fewer symptoms of social anxiety than those practicing an individual sport. Further investigation is warranted to develop a greater understanding of the relationship between social anxiety and sport activity trends. The current study's findings provide two major points to be considered and explored in more detail.

The first is the effect of the type of sport rather than the intensity of sport practice in relation to social anxiety symptoms, hence challenging Wipfli et al.'s (2008) dose-response hypothesis. Sport practice appears to help socially anxious children when carried out in a social context, namely a team, with other same-aged children. This finding implies that team sport could be considered as a General Resistance Resource (Antonovsky, 1997) in relation to social anxiety symptoms, rather than sport engagement in general. By revealing the association of team sport practice and reduced social anxiety symptoms over time, the inclusion of team sport in programmes for children experiencing social anxiety is supported. In their reviews, both Ballenger (1999) and Velting and Albano (2001) only consider Cognitive-Behavioural Therapy (CBT) and pharmacological intervention as treatments for social phobia in youth. Keller (2003) also mentioned prescription of benzodiazepines and CBT as the possible treatment for social anxiety disorder with the optimal treatment being a combination of both. In addition, Ballenger (1999) noted that CBT had a lower rate of relapse when compared to medication. Team sport could be included in CBT programmes as part of

the social interaction aspect of this therapy as well as for the indirect effects it has been reported to have on an individual's physical and mental well-being. For instance, Smits and Otto (2009) promoted moderate to vigorous exercise for the reduction of anxiety sensitivity.

The second point to be kept in mind is the consistent pattern of lower social anxiety scores, both self-reported as well as the observer reports between children practising an extra-curricular sport and those who do not. Although these differences did not achieve statistical significance, a more in-depth study including a clinical sample or a study with a larger representative sample could elaborate these potential differences further.

To conclude, this longitudinal study underlines the positive effect of sport practice as buffer against social anxiety symptoms in children, but only in the case of team sport. Findings suggest a possible interaction between the mental and social effects of sport on social anxiety. This is due to the differing results relating to team and individual sport modes. Sport engagement in general remains nonetheless a positive factor in a child's physical and mental development, as has been documented in various studies and reports. Furthermore, this study contributes additional - and specific - knowledge about the beneficial influence of team sport participation against social anxiety symptoms in children. It is augured that this investigation provides inspiration and interest for further studies about this topic.

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Appendix A

Tables including supplementary information related to the results presented in Chapter 6.

Table A1
Analysis of Differences between Interviewed and Non-interviewed Children in 2007

		N	*M*	*SD*	*t*	df	*p*
ESAK Total Mean*	interview	167	0.737	0.273	-0.303	198	0.763
	no interview	33	0.753	0.234			
Cognitive Symptoms*	interview	167	0.796	0.422	0.578	198	0.564
	no interview	33	0.750	0.386			
Behaviour Symptoms*	interview	167	0.349	0.360	-0.905	198	0.366
	no interview	33	0.412	0.394			
Physical Symptoms	interview	167	0.794	0.500	-0.369	198	0.712
	no interview	33	0.828	0.432			

*transformed

Table A2
Analysis of Differences between Interviewed and Non-interviewed Children in 2008

		N	*M*	*SD*	*t*	Df	*p*
ESAK Total Mean*	Interview	164	3.255	1.24	1.708	170	0.090
	no interview	8	2.483	1.45			
Cognitive Symptoms*	Interview	164	0.769	0.292	1.722	170	0.087
	no interview	8	0.585	0.341			
Behaviour Symptoms*	Interview	164	0.367	0.381	0.738	170	0.462
	no interview	8	0.264	0.398			
Physical Symptoms*	interview	164	0.863	0.339	1.689	170	0.093
	no interview	8	0.657	0.358			

*transformed

Table A3
Analysis of Difference between Participants in 2008 and Drop-Outs

		N	*M*	*SD*	*t*	Df	*p*
ESAK Total Mean*	interview	175	0.742	0.269	0.254	198	0.800
	no interview	25	0.727	0.253			
Cognitive Symptoms*	interview	175	0.785	0.424	-0.332	198	0.74
	no interview	25	0.814	0.359			
Behaviour Symptoms*	interview	175	0.360	0.365	0.062	198	0.950
	no interview	25	0.355	0.377			
Physical Symptoms	interview	175	0.811	0.498	0.869	198	0.386
	no interview	25	0.720	0.416			

*transformed

Table A4
Descriptive Statistics on the 2007 SPAIK Total Score and Scales for Sport Practice Groups

	Sport Practice 2007	*M*	*SD*	*N*
SPAIK Total Score	Yes	13.52	8.46	137
	No	13.98	8.75	31
	Total	13.60	8.49	168
Interaction	Yes	7.51	4.42	137
	No	8.04	4.69	31
	Total	7.61	4.46	168
Performance*	Yes	1.45	0.78	137
	No	1.35	0.81	31
	Total	1.43	0.79	168
Cognitive and Somatic Symptoms	Yes	2.25	1.75	137
	No	2.46	1.75	31
	Total	2.29	1.74	168

*transformed

Table A5
Descriptive Statistics on the 2007 ESAK Total Mean Score and Scales for Sport Practice

	Sport Practice 2007	*M*	*SD*	*N*
ESAK Total Mean*	Yes	0.73	0.27	164
	No	0.78	0.26	36
	Total	0.74	0.27	200
Cognitive Symptoms*	Yes	0.77	0.42	164
	No	0.87	0.40	36
	Total	0.79	0.42	200
Behavioural Symptoms*	Yes	0.36	0.37	164
	No	0.37	0.37	36
	Total	0.36	0.37	200
Physical Symptoms	Yes	0.80	0.49	164
	No	0.79	0.49	36
	Total	0.80	0.49	200

*transformed

Table A6
Descriptive Statistics on the 2007 TRF Scales for Sport Practice Groups

	Sport practice 2007	*M*	*SD*	*N*
Withdrawn*	Yes	1.09	0.94	132
	No	1.10	1.04	30
	Total	1.09	0.95	162
Anxious/Depressed*	Yes	1.72	1.25	132
	No	1.94	1.13	30
	Total	1.76	1.23	162
Social Problems*	Yes	1.13	1.09	132
	No	1.18	1.14	30
	Total	1.14	1.09	162

*transformed

Table A7

Mean Scores on the 2007 ESAK Total Mean and Scales for Weekly Hours of Sport Practice

	Hours of sport per week 2007	*M*	*SD*	*N*
ESAK Total Mean*	None	0.76	0.26	38
	less than 1 hour	0.60	0.16	13
	between 1 and 2 hours	0.74	0.28	110
	more than 2 hours	0.76	0.26	39
	Total	0.74	0.27	200
Cognitive Symptoms*	None	0.86	0.39	38
	less than 1 hour	0.50	0.32	13
	between 1 and 2 hours	0.79	0.43	110
	more than 2 hours	0.82	0.41	39
	Total	0.79	0.42	200
Behavioural Symptoms*	None	0.35	0.37	38
	less than 1 hour	0.34	0.29	13
	between 1 and 2 hours	0.33	0.36	110
	more than 2 hours	0.46	0.38	39
	Total	0.36	0.37	200
Physical Symptoms	None	0.79	0.49	38
	less than 1 hour	0.62	0.46	13
	between 1 and 2 hours	0.85	0.50	110
	more than 2 hours	0.72	0.44	39
	Total	0.80	0.49	200

*transformed

Table A8
Mean Scores on the 2007 TRF Scales for Hours of Sport Practice per Week

	Hours of sport per week 2007	*M*	*SD*	*N*
Social Withdrawal*	None	1.10	1.03	31
	less than 1 hour	1.02	0.98	12
	between 1 and 2 hours	1.16	0.96	87
	more than 2 hours	0.92	0.88	32
	Total	1.09	0.95	162
Anxious/Depressed*	None	1.96	1.11	31
	less than 1 hour	1.43	1.27	12
	between 1 and 2 hours	1.74	1.31	87
	more than 2 hours	1.75	1.08	32
	Total	1.76	1.23	162
Social Problems*	None	1.17	1.12	31
	less than 1 hour	1.03	0.87	12
	between 1 and 2 hours	1.19	1.16	87
	more than 2 hours	0.99	0.96	32
	Total	1.14	1.09	162

*transformed

Table A9
Mean Scores on the 2007 SPAIK Total Score and Scales for Sport Mode

	Sport mode 2007	*M*	*SD*	*N*
SPAIK Total Score	None	13.54	8.95	32
	Individual	14.09	8.57	107
	Team	11.85	7.70	29
	Total	13.60	8.49	168
Interaction	None	7.79	4.83	32
	Individual	7.74	4.42	107
	Team	6.90	4.27	29
	Total	7.61	4.46	168
Performance*	None	1.31	0.84	32
	Individual	1.49	0.77	107
	Team	1.37	0.79	29
	Total	1.43	0.79	168
Cognitive and Somatic Symptoms	None	2.38	1.77	32
	Individual	2.38	1.84	107
	Team	1.85	1.24	29
	Total	2.29	1.74	168

*transformed

Table A10
Mean Scores on the 2007 TRF Scales for Sport Mode

	Sport mode 2007	*M*	*SD*	*N*
Withdrawn*	None	1.12	1.03	31
	Individual	1.08	0.93	103
	Team	1.08	0.99	28
	Total	1.09	0.95	162
Anxious/Depressed*	None	1.93	1.11	31
	Individual	1.68	1.25	103
	Team	1.85	1.29	28
	Total	1.76	1.23	162
Social Problems*	None	1.14	1.14	31
	Individual	1.17	1.09	103
	Team	1.02	1.07	28
	Total	1.14	1.09	162

*transformed

Table A11
Mean Scores on the 2008 SPAIK Total Score and Scales for Sport Practice

	Sport Practice 2008	*M*	*SD*	*N*
SPAIK Total Score*	Yes	1.07	0.31	124
	No	1.23	0.16	17
	No reply	1.07	0.32	4
	Total	1.09	0.30	145
Interaction	Yes	7.66	4.04	124
	No	9.47	2.85	17
	No reply	7.42	5.29	4
	Total	7.86	3.97	145
Performance*	Yes	.48	0.29	124
	No	.62	0.24	17
	No reply	.56	0.32	4
	Total	.50	0.29	145
Cognitive and Somatic Symptoms*	Yes	.43	0.25	124
	No	.47	0.19	17
	No reply	.43	0.19	4
	Total	.43	0.24	145

*transformed

Table A12
Mean Scores on the 2008 ESAK Total Mean and Scales for Sport Practice

	Sport Practice 2008	M	SD	N
ESAK Total Mean*	Yes	0.21	0.12	124
	No	0.24	0.09	17
	No reply	0.23	0.00	4
	Total	0.21	0.11	145
Cognitive Symptoms*	Yes	0.25	0.16	124
	No	0.32	0.14	17
	No reply	0.28	0.00	4
	Total	0.26	0.15	145
Behavioural Symptoms*	Yes	0.09	0.12	124
	No	0.06	0.07	17
	No reply	0.11	0.00	4
	Total	0.09	0.11	145
Physical Symptoms*	Yes	0.25	0.13	124
	No	0.28	0.11	17
	No reply	0.27	0.01	4
	Total	0.25	0.13	145

*transformed

Table A13

Mean Scores on the 2008 ESAK Total Mean and Scales for Sport Hours per Week

	Hours of sport/week 2008	M	SD	N
ESAK Total Mean*	None	.24	.09	17
	less than 1 hour	.16	.08	5
	between 1 and 2 hours	.21	.11	87
	more than 2 hours	.22	.15	32
	No reply	.23	.00	4
	Total	.21	.11	145
Cognitive Symptoms*	None	.32	.14	17
	less than 1 hour	.20	.13	5
	between 1 and 2 hours	.24	.15	87
	more than 2 hours	.26	.19	32
	No reply	.28	.00	4
	Total	.26	.15	145
Behaviour Symptoms*	None	.06	.07	17
	less than 1 hour	.08	.05	5
	between 1 and 2 hours	.09	.11	87
	more than 2 hours	.11	.14	32
	No reply	.11	.00	4
	Total	.09	.11	145
Physical Symptoms*	None	.28	.11	17
	less than 1 hour	.20	.10	5
	between 1 and 2 hours	.25	.12	87
	more than 2 hours	.25	.16	32
	No reply	.27	.01	4
	Total	.25	.13	145

*transformed

Table A14
Mean Scores on the 2008 TRF Scales for Sport Hours per Week

	Hours of sport/week 2008	*M*	*SD*	*N*
Social Withdrawal*	none	.31	.39	14
	less than 1 hour	.82	.22	5
	between 1 and 2 hours	.38	.30	81
	more than 2 hours	.40	.32	32
	No reply	.57	.20	4
	Total	.40	.32	136
Anxious/Depressed*	none	.61	.39	14
	less than 1 hour	.74	.36	5
	between 1 and 2 hours	.59	.38	81
	more than 2 hours	.58	.43	32
	No reply	.62	.47	4
	Total	.59	.39	136
Social Problems*	none	.52	.45	14
	less than 1 hour	.35	.47	5
	between 1 and 2 hours	.39	.36	81
	more than 2 hours	.44	.37	32
	No reply	.19	.24	4
	Total	.41	.37	136

*transformed

Table A15
Mean Scores on the 2008 ESAK Total Mean and Scales for Sport Mode

	Sport mode 2008	*M*	*SD*	*N*
ESAK Total Mean*	None	0.24	0.09	17
	Individual	0.21	0.12	95
	Team	0.20	0.12	29
	No reply	0.23	0.00	4
	Total	0.21	0.11	145
Cognitive Symptoms*	None	0.32	0.14	17
	Individual	0.25	0.16	95
	Team	0.24	0.16	29
	No reply	0.28	0.00	4
	Total	0.26	0.15	145
Behavioural Symptoms*	None	0.06	0.07	17
	Individual	0.09	0.12	95
	Team	0.10	0.13	29
	No reply	0.11	0.00	4
	Total	0.09	0.11	145
Physical Symptoms*	None	0.28	0.11	17
	Individual	0.25	0.13	95
	Team	0.24	0.14	29
	No reply	0.27	0.01	4
	Total	0.25	0.13	145

*transformed

Appendix B

Instruments used in this study

ESAK

Datum: _____ ausgefüllt durch ☐ Mutter / ☐ Vater

Geburtsdatum des Kindes: ___/___/___ Klasse: _____

Geschlecht: ☐ weiblich ☐ männlich

In diesem Fragebogen finden Sie eine Reihe von Aussagen, die mehr oder weniger auf Ihr Kind zutreffen. Sie beziehen sich auf Verhaltensweisen Ihres Kindes in **sozialen Situationen**. Dazu zählen Situationen, in denen es mit anderen Menschen zusammen ist, von ihnen beobachtet oder bewertet wird. Das kann im schulischen Bereich sein oder auch in der Familie sowie im Freundeskreis. In dem Fragebogen geht es um Ihre Einschätzung als Mutter oder Vater.

Bitte geben Sie an, **inwieweit** diese Aussagen auf das **Verhalten Ihres Kindes** in den letzten **sechs Monaten zutreffend** sind**.**

Bitte kreuzen Sie so an:
☐ gar nicht zutreffend ☐ etwas zutreffend ☐ eher zutreffend ☐ sehr zutreffend

Mein Kind ...

1. ist aufgeregt, wenn es im Mittelpunkt steht	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
2. befürchtet, sich vor Gleichaltrigen zu blamieren	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
3. vermeidet es, an Schulaufführungen teilzunehmen	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
4. wirkt nervös, wenn es mit Fremden spricht	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
5. umgeht Geburtstagsfeiern und Parties mit Gleichaltrigen	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
6. ist unruhig, wenn es von anderen beobachtet wird	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
7. weicht Aktivitäten mit fremden Gleichaltrigen aus	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
8. befürchtet, von Mitschülern nicht gemocht zu werden	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
9. vermeidet, mit Gleichaltrigen des anderen Geschlechts zu sprechen	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
10. fürchtet, etwas Peinliches zu tun	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
11. wirkt angespannt, wenn es die Blicke anderer auf sich zieht	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
12. befürchtet, vor der Klasse dumm dazustehen	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
13. wirkt nervös, wenn es die Aufmerksamkeit anderer auf sich zieht	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
14. vermeidet es, vor einer Gruppe Gleichaltriger zu sprechen	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
15. befürchtet, sich vor der Klasse lächerlich zu machen	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
16. umgeht Aktivitäten in einer Gruppe Gleichaltriger	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
17. fürchtet, ausgelacht zu werden	☐ gar nicht ☐ etwas ☐ eher ☐ sehr
18. wirkt angespannt, wenn es sich ungeschickt verhalten hat	☐ gar nicht ☐ etwas ☐ eher ☐ sehr

SPAIK Fragebogen (Melfsen, Florin & Warnke, 2001)

Kinder werden diese Gelegenheiten zugestellt und sie müssen eingeben, wie oft sie bei diesen Gelegenheiten aufgeregt sind oder Angst haben:

1. Ich habe Angst, wenn ich zu einer grossen Gruppe von mehr als 6 anderen Jungen und Mädchen hinkommen muss.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

2. Ich habe Angst, wenn ich mit anderen Jungen und Mädchen oder Erwachsenen zusammen bin und mich alle anschauen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

3. Ich habe Angst, wenn ich mit anderen Jungen und Mädchen oder Erwachsenen zusammen bin und etwas tun muss, wobei die anderen zuschauen, zum Beispiel laut vorlesen, ein Spiel spielen oder Sport machen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

4. Ich habe Angst, wenn ich vor einer Gruppe von Menschen sprechen oder vorlesen muss.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

5. Ich habe Angst, wenn ich vor der Klasse oder vor einer Gruppe Fragen beantworten muss, selbst wenn ich die Antwort kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

6. Auf Parties oder bei Feiern habe ich solche Angst, dass ich früh nach Hause gehe.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

7. Ich habe Angst, wenn ich neue Jungen oder Mädchen treffe.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

8. Ich habe zu viel Angst, um in der Klasse Fragen zu stellen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

9. Ich habe Angst im Schülercafé…

a. …wenn ich mit Jungen und Mädchen in meinem Alter zusammen bin, die ich kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …wenn ich mit Jungen und Mädchen in meinem Alter zusammen bin, die ich **nicht** kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …wenn ich mit Erwachsenen zusammen bin.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

10. Wenn jemand Streit mit mir anfängt, habe ich Angst und weiss nicht, was ich tun soll…

a. …wenn es jemand in meinem Alter ist, den ich kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …wenn es jemand in meinem Alter ist, den ich **nicht** kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …wenn es ein erwachsener Mensch ist.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

11. Wenn mich jemand bittet, etwas zu tun, was ich nicht machen möchte, habe ich Angst und weiss nicht, was ich sagen soll…

a. …wenn es jemand in meinem Alter ist, den ich kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …wenn es jemand in meinem Alter ist, den ich **nicht** kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …wenn es ein erwachsener Mensch ist.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

12. Ich habe Angst und weiss nicht, was ich tun soll, wenn ich in einer peinlichen Situation…

a. …mit jemandem in meinem Alter, den ich kenne, zusammen bin.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …mit jemandem in meinem Alter, den ich **nicht** kenne, zusammen bin.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …mit einem erwachsenen Mensch zusammen bin.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

13. Wenn jemand etwas sagt, von dem ich denke, dass es falsch oder schlecht ist, traue ich mich nicht zu sagen, was **ich** denke,…

a. … wenn es jemand in meinem Alter ist, den ich kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …wenn es jemand in meinem Alter ist, den ich **nicht** kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …wenn es ein erwachsener Mensch ist.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

14. Ich habe Angst jemanden anzusprechen, …

a. …wenn es jemand in meinem Alter ist, den ich kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …wenn es jemand in meinem Alter ist, den ich **nicht** kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …wenn es ein erwachsener Mensch ist.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

15. Ich habe Angst, wenn ich länger als einige Minuten…

a. …mit jemandem in meinem Alter, den ich kenne, sprechen muss.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …mit jemandem in meinem Alter, den ich **nicht** kenne, sprechen muss.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …mit einem erwachsenen Mensch sprechen muss.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

16. Ich habe Angst, vor jemandem zu sprechen, zum Beispiel eine Zusammenfassung geben oder etwas vorlesen…

a. …wenn es Jungen oder Mädchen in meinem Alter sind, die ich kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …wenn es Jungen oder Mädchen in meinem Alter sind, die ich **nicht** kenne.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …wenn es Erwachsene sind.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

17. Ich habe Angst, wenn ich bei einer Schulaufführung mitmache…

a. …bei der Jungen oder Mädchen in meinem Alter, die ich kenne, zuschauen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …bei der Jungen oder Mädchen in meinem Alter, die ich **nicht** kenne, zuschauen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …bei der Erwachsene zuschauen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

18. Ich habe Angst…

a. …wenn Jungen oder Mädchen in meinem Alter, die ich kenne, mich nicht beachten oder sich über mich lustig machen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …wenn Jungen oder Mädchen in meinem Alter, die ich nicht kenne, mich nicht beachten oder sich über mich lustig machen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …wenn Erwachsene mich nicht beachten oder sich über mich lustig machen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

19. Ich versuche das Zusammensein mit anderen auf Parties, in der Schule oder beim Spiel zu vermeiden…

a. …wenn Jungen oder Mädchen in meinem Alter, die ich kenne, da sind.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …wenn Junge oder Mädchen in meinem Alter, die ich nicht kenne, da sind.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …wenn Erwachsene da sind.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

20. Ich gehe weg…

a. …wenn ich auf Parties, in der Schule oder beim Spiel mit Jungen oder Mädchen in meinem Alter, die ich kenne, zusammenkomme.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …wenn ich auf Parties, in der Schule oder beim Spiel mit Jungen oder Mädchen in meinem Alter, die ich **nicht** kenne, zusammenkomme.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …wenn ich auf Parties, in der Schule oder beim Spiel mit Erwachsene zusammenkomme.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

21. Bevor ich zu einer Party oder sonstwo mit anderen hingehe, überlege ich, was alles schief gehen könnte.

a. Ich denke: Werde ich einen Fehler machen und dann dumm dastehen?

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. Ich denke: Was wird sein, wenn niemand mit mir spricht?

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. Ich denke: Was wird sein, wenn jemand mit mir spricht und ich nicht weiss, was ich antworten soll?

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

d. Ich denke: Was wird sein, wenn sie sehen, wie ängstlich ich bin?

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

22. Meine Stimme bleibt weg oder klingt komisch, wenn ich mit anderen spreche.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

23. Gewöhnlich spreche ich mit niemandem, bis mich jemand anspricht.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

24. Wenn ich mit anderen Menschen zusammen bin, habe ich ängstliche Gedanken:

a. Ich denke: Wenn ich mich tollpatschig benehme, werde ich mich richtig schlecht fühlen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. Ich denke: Was denken die über mich?

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. Ich denke: Was immer ich auch sage, es wird sich dumm anhören.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

25. Bevor ich irgendwo hingehe, auf eine Party, zur Schule, zum Fussballspiel oder irgendwohin, wo ich mit anderen zusammen bin…

a. …schwitze ich.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …habe ich das Gefühl, als müsste ich zur Toilette.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …klopft mein Herz schnell.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

d. …bekomme ich Kopfschmerzen oder Magenschmerzen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

e. …habe ich ein komisches Gefühl im Magen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

26. Während ich irgendwo bin, auf einer Party, in der Schule, beim Fussballspiel oder irgendwo, wo ich mit anderen zusammen bin, …

a. …schwitze ich.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

b. …zittere ich.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

c. …habe ich das Gefühl, als müsste ich zur Toilette.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

d. …klopft mein Herz stark.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

e. …habe ich Kopfschmerzen oder Bauchschmerzen.

☐ Nie oder selten ☐ manchmal ☐ meistens oder immer

Vielen Dank!

Lehrerfragebogen über das Verhalten von Kindern und Jugendlichen (TRF)

Name des Kindes: _____

Schule: _____ Klasse: _____

Datum heute: ___/___/___

Es folgt eine Liste von Eigenschaften und Verhaltensweisen, die bei Kindern und Jugendlichen auftreten können. Nach jeder Eigenschaft finden Sie die Ziffern 0, 1, 2. Beantworten Sie bitte für jede Eigenschaft, ob Sie *jetzt oder innerhalb der letzten 2 Monate* bei diesem Schüler zu beobachten war. Wenn diese Eigenschaft *genauso oder häufig* zu beobachten war, kreuzen Sie die Ziffer 2 an, wenn die Eigenschaft *etwas oder manchmal* auftrat, die Ziffer 1, wenn sie für diesen Schüler *nicht zutrifft*, die Ziffer 0. Beantworten Sie bitte alle Fragen so gut Sie können, auch wenn Ihnen für diesen Schüler unpassend erscheinen.

0 = nicht zutreffend 1 = etwas oder manchmal zutreffend 2 = genau oder häufig zutreffend
(soweit bekannt)

1.	Verhält sich zu jung für sein/ihr Alter	0	1	2
2.	Klammert sich an Erwachsene oder ist zu abhängig	0	1	2
3.	Klagt über Einsamkeit	0	1	2
4.	Weint viel	0	1	2
5.	Kommt mit anderen Schülern nicht aus	0	1	2
6.	Hat Angst, etwas Schlimmes zu denken oder zu tun	0	1	2
7.	Glaubt, perfekt sein zu müssen	0	1	2
8.	Fühlt oder beklagt sich, dass niemand ihn/sie liebt	0	1	2
9.	Glaubt, andere wollen ihm/ihr etwas antun	0	1	2
10.	Fühlt sich wertlos oder unterlegen	0	1	2
11.	Verletzt sich häufig ungewollt, neigt zu Unfällen	0	1	2
12.	Wird viel gehänselt	0	1	2
13.	Ist lieber allein als mit anderen zusammen	0	1	2
14.	Ist nervös, reizbar oder angespannt	0	1	2
15.	Ist überangepasst	0	1	2
16.	Wird von anderen Schülern nicht gemocht	0	1	2
17.	Ist zu furchtsam oder ängstlich	0	1	2
18.	Hat zu starke Schuldgefühle	0	1	2
19.	Ist körperlich unbeholfen oder ungeschickt	0	1	2
20.	Ist lieber mit Jüngeren als mit Gleichaltrigen zusammen	0	1	2
21.	Weigert sich zu sprechen	0	1	2

0 = nicht zutreffend 1 = etwas oder manchmal zutreffend 2 = genau oder häufig zutreffend
(soweit bekannt)

22.	Ist verschlossen, behält Dinge für sich	0	1	2
23.	Ist befangen oder wird leicht verlegen	0	1	2
24.	Ist schüchtern oder zaghaft	0	1	2
25.	Starrt ins Leere	0	1	2
26.	Ist bei Kritik schnell verletzt	0	1	2
27.	Schmollt viel oder ist leicht eingeschnappt	0	1	2
28.	Ist misstrauisch	0	1	2
29.	Zeigt zu wenig Aktivität, ist zu langsam oder träge	0	1	2
30.	Ist unglücklich, traurig oder niedergeschlagen	0	1	2
31.	Versucht zu sehr, anderen zu gefallen	0	1	2
32.	Hat Angst, Fehler zu machen	0	1	2
33.	Zieht sich zurück, nimmt keinen Kontakt zu anderen auf	0	1	2
34.	Macht sich zu viel Sorgen	0	1	2

Vielen Dank!

Appendix C

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The association between extra-curricular sport and social anxiety symptoms in children

Annemarie Schumacher Dimech and Roland Seiler

University of Berne

Author Note

Correspondence concerning this article should be addressed to Annemarie Schumacher Dimech, Institute of Sport Science, University of Berne, Alpeneggstrasse 22 3012, Berne. Phone: +41 31 631 5114. Fax: +41 31 631 4631. Email: anne.schumacher@ispw.unibe.ch

Abstract

Social anxiety is a common psychological complaint that can have a significant and long-term negative impact on a child's social and cognitive development. In the current study, the relationship between sport participation and social anxiety symptoms was investigated. Swiss primary school children (*N*=201), parents and teachers provided information about children's symptoms of social anxiety, classroom behaviour and sport involvement. Gender differences were observed on social anxiety scores, where girls tended to report higher social anxiety symptoms, as well on sport activity, where boys engaged more in sport involvement. MANCOVAs with gender as covariant showed no differences in social anxiety symptoms between children involved in extracurricular sport and those not engaged in sport participation. Finally, children engaged in team sport displayed fewer physical social anxiety symptoms than children involved in individual sports.

Keywords: social anxiety, children, sport, well-being

The Association between Extra-Curricular Sport and Social Anxiety in Children

Social anxiety disorder refers to a "marked and persistent fear of social or performance situations in which embarrassment may occur" (American Psychiatric Association, APA, 2000, p.450) elements of anticipatory anxiety may be present far in advance of the social situation. Social anxiety is usually accompanied by numerous physical symptoms such as sweating, blushing, and trembling, and the associated physical symptoms may even escalate into a panic attack (Keller, 2003). Moreover, the individual recognizes that this fear is extreme or unreasonable. Reported prevalence rate typically vary between 2% to 15% although rates tend to be higher among younger adults (Furmark, Tillfors, Everz, Marteinsdottir, Gefvert, & Fredrikson , 1999; Keller, 2003).

An epidemiological study carried out by the European Study of the Epidemiology of Mental Disorders (ESEMeD) project (ESEMeD/MEHEDEA 2000 Investigators, 2004) explored the prevalence of mental disorders in Europe and found that mood (14%) and anxiety (13.6%) disorders were found to have the highest lifetime prevalence with social anxiety accounting for 2.4%. This is quite low when compared to Furmark's (2002) estimate of social phobia's lifetime prevalence of 7 to 13% observed in recent surveys. However, he does add that the rates reported in the studies included in his comprehensive review ranged from 0% to 52.7%! In a review of the prevalence of social anxiety in European countries, Fehm, Pelissolo, Furmark, and Wittchen (2005) ascertained that women appear to be more frequently affected than men. In agreement with other studies, the highest rate of mental disorders was found in young adults. This disorder usually appears during adolescence, which is a time of heightened self-consciousness and social awareness; however this type of fear can also occur in children. Similar prevalence rates were documented in a large-scale epidemiological survey in the United States based on diagnostic criteria included in the *Diagnostic and Statistical Manual of Mental Disorders* (4th edition, text revision; *DSM-IV-*

TR; APA, 2000). Kessler et al. (2005) reported that social phobia was amongst the most prevalent disorders with a lifetime prevalence of 12.1% and a median age of onset of 13 years. They also found that women had a higher risk of suffering from an anxiety disorder than men.

Social anxiety disorder is distinguished by two subtypes: generalized and specific. The generalized type tends to have an earlier age of onset, reportedly between 12 and 16.6 years, and typically lasts 10 or more years (Fehm et al., 2005). Indeed, social anxiety has been described by Keller (2003, p.85) to follow a "chronic, unremitting course, leading to long-term disability". Social phobia can also be specific to a situation, the most common being speaking in public (Furmark et al., 1999; Furmark, 2002). It is noted that the quality of life in persons with social phobia is greatly impaired, as it tends to lead to social isolation. Social anxiety is also found to be comorbid with other disorders, such as depression and alcohol disorders (Crum & Pratt, 2001; Merikangas, Avenevoli, Acharyya, Zhang, & Angst, 2002). Thus, "early intervention in social phobia might prevent the onset of a secondary disorder, such as alcohol abuse and depression" (Bögels & Tarrier, 2004, p.734).

It is generally believed that social phobia does not develop before early adolescence (Velting & Albano, 2001). The main reason for this contention is that young children do not view themselves as a social object before the age of 5 or 6 and they are unable to take other people's point of view until about age 8. Indeed, DSM-IV-TR (APA, 2000) puts forward four provisions for the diagnosis of social phobia in children. The first provision requires that the child exhibits normal social behaviour with familiar people and that the anxious behaviour would also occur amongst peers. Secondly, evidence of social anxiety may be in the form of tantrums, etc. A third provision refers to the recognition of the social anxiety being excessive or unreasonable and negatively impacting family, social or educational activities. This is not

expected from children due to their age-related cognitive and perceptual limitations. The last provision requires the symptoms of social fear to be present for at least 6 months.

Examining the disorder in childhood, Beidel, Turner and Morris (1999) interviewed children between 7 and 13 years diagnosed with social anxiety and also collected data from their parents and teachers. Participants were found to have the following concurrent diagnoses: anxiety disorders (30%), generalized anxiety disorder (10%), attention deficit/hyperactivity disorder (10%), specific phobia (10%), and selective mutism (8%). Children diagnosed with social phobia also scored higher on depression when compared to nonsocially anxious children. Indeed, it is found that anxiety disorders are the most common psychological disturbances encountered in children (In-Albon & Schneider, 2006). Children with social anxiety have also been noted to have social skills impairment, thus interfering with the development of relationships. A higher risk of suicide attempt has also been observed in shy young people and adults suffering from social phobia (Velting & Albano, 2001). Moreover, the potential consequences of social phobia later on in life include a negative influence on academic and occupational performance, a lower overall quality of life and impaired social functioning.

Theoretical Perspectives on Social Anxiety and Phobia

Social anxiety and phobia can be understood from various theoretical perspectives. These theories offer an explanation of the origin and development of this phenomenon and also provide a theoretical framework for its operationalisation and measurement. This study specifically refers to the Cognitive-Behavioural Model (Rapee & Heimberg, 1997). According to this model, when individuals with social anxiety face a social-evaluative situation, the experience of anxiety is fundamentally based upon a fear of negative evaluation and the formation of a biased self-perception of how others are likely to see them. This latter component is often referred to as a *mental representation*. According to Rapee and Heimberg,

social phobics tend to have a greater negative self-representation than what is actually perceived by others, which in turn results in excessive attention toward detecting possibly visible signs of anxiety and detecting threatening or negative reactions from the audience. Hence, fewer attentional resources are available for the task at hand. The process of self- as opposed to task-related attention is referred to as *self-focused attention* and is a core feature of social anxiety. Indeed, a consistent finding regarding cognitive processes in socially anxious individuals is that these individuals typically attend to threatening stimuli thus distracting themselves from the task at hand (Rapee & Heimberg, 1997; Thompson, 2001). Thus, using Buss's (1980) terms, socially anxious individuals are extremely public self-focused. This may in turn lead in turn to poor performance.

While the current study uses the aforementioned cognitive behavioural model for understanding social anxiety, an alternative approach to understanding social phobia posits that such individuals actually lack social skills. Rather than the lack of social skills being a result of the social isolation imposed by social anxiety disorder, social skills deficit can instead be viewed as a precursor to this clinical syndrome. It has been suggested that this social skills deficit leads to feelings of discomfort when in the company of others and to a greater chance of behaving in a manner that may result being laughed at or criticised. Consequently, people lacking in social skills would actively avoid social situations and would feel anxious and inadequate in such settings. In fact, a social skills training was frequently included in the treatment of this disorder (Beidel & Turner, 1998). This social skills deficit leads to feelings of discomfort when in other people's company and to a greater chance of behaving inappropriately with the result of being laughed at or criticised. Consequently, people lacking in social skills would actively avoid social situations and would feel anxious and inadequate in such settings. In fact, a study by Beidel et al. (1999) noted that social skills deficits in socially anxious children. They reported that the socially anxious children were

rated as more anxious during the two set tasks by the observers, and thus, heightened anxiety may have interfered with these children's social performance, notwithstanding their levels of social skills. The social skills deficit explanation suggests the need for a psychological intervention in which socially anxious individuals are offered social skills training as a means of decreasing their anxiety when in public situations (Beidel & Turner, 1998). Social skills training is, therefore, frequently included in the treatment of this disorder (Beidel & Turner).

This hypothesis linking social skills deficit to social anxiety has led to further investigation. Some studies have suggested that it is the subjective perception of lacking social skills rather than the *actual* shortfall of these skills that leads to a feeling of anxiety and inadequacy in public situations as indeed maintained in Rapee and Heimberg's (1997) Cognitive-Behavioural Model (e.g. Alfano, Beidel & Turner, 2006; Cartwright-Hatton, Hodges & Porter, 2003; Rapee & Lim, 1992). Social phobics may believe they are unable to perform up to the expectations of others and thus may give an unfavourable impression of themselves (Rapee & Lim, 1992). In line with this view, Cartwright-Hatton, Hodges & Porter (2003) carried out an investigation comparing self- and observer-rated social skills in children. Results indicated no link between lack of social skills and social anxiety. As such, it is possible that persons suffering from social anxiety may be underestimating their social skills and thus providing social skills training could actually reinforce this incorrect perception rather than helping the individuals reduce their anxiety level. In summation, recent investigations have refuted the hypothesis of social skills deficits as causative of social anxiety disorder and suggest that social skills problems may instead be due to the cognitive biases and interferences that accompany social anxiety disorder.

Sport Participation and Social Anxiety

A number of studies have investigated the relationship between sport and mental well-being. Data from a cross-sectional survey in Germany revealed that physically active people

with affective, anxiety, substance abuse or dependence disorders reported a better quality of life than their physically inactive counterparts (Schmitz, Kruse & Kugler, 2004). Moreover, it was noted that physically inactive people suffering from affective or anxiety disorders had a remarkably reduced level of functioning. Sport was found to enhance mental health in people suffering from depression and anxiety as well as improving mood (e.g. Craft & Perna, 2004; Fox, 1999; Salmon, 2001; Scully, Kremer, Meade, Graham & Dudgeon, 1998). Some studies even claimed that sport had a similar effect as anti-depressant medication (Dey, 1994) or psychotherapy and other traditional forms of treatment (Craft & Landers, 1998) and hailed physical exercise as a neglected intervention in the treatment of mental health problems (Callaghan, 2004). The reported anxiolytic effects of sport (e.g. Raglin, 1997; Smits & Otto, 2009; Wipfli, Rethorst & Landers, 2008) as well as its benefit on one's self-concept and self-esteem (Sonstroem, 1997a, 1997b) could have a positive influence on social anxiety symptoms, such as reducing cognitive bias through improved self-esteem and alleviating feelings of anxiety. Notwithstanding these potential benefits of sport, however, little attention has been given to a possible link between sport and social anxiety and/or phobia.

De Moor, Beem, Stubbe, Boomsma and De Geus's (2006) study explored this association and found lower scores on anxiety and depression in people who exercise. Wipfli et al. (2008) conducted a meta-analysis investigating the anxiolytic effects and found that results from the 49 studies included in their review indicated a positive effect of exercise on anxiety, where a reduction in anxiety was ascertained. Broocks. et al. (1998) investigated the effect of aerobic exercise in the treatment of panic disorder. Exercise was associated with a clinical improvement when compared to the placebo group; however, clomipramine treatment remained more effective than exercise. In addition, chronic exercise was found to be more beneficial for reducing anxiety than acute exercise (Callaghan, 2004). In his review, Callaghan maintains that exercise must be of 20 minutes or more at a time in order to

influence a reduction in anxiety. Although the data suggest that sport participation should not be seen as a credible alternative to pharmacological therapy, it nevertheless appears to have positive effects that may improve treatment outcomes. Smits and Otto (2009) also suggest a mechanism by which anxiety related symptoms (such as sweating) during moderate or vigorous exercise my decrease anxiety sensitivity.

Various explanations have been dedicated to the effect of sport on anxiety. Biological models base their explanations on the body changes caused by physical exercise, such as, the endorphin hypothesis. This hypothesis proposes that exercise leads to an increase in endorphin secretion (Daley, 2002). This hormone creates a feeling of euphoria thus improving mood state. Other explanations focus on the psychosocial effects of sport, such as the indirect relationship of sport and self-esteem as maintained in Sonstroem's (1978) psychological model for physical activity. Regular sport participation leads to a general physical fitness including an improvement in muscle tone and loss of fat. This results in an enhanced satisfaction with one's body and may also attract admiration from peers. Improved physical fitness also increases a person's physical competencies, such as running for longer distances, and thus promotes a feeling of self-confidence in one's physical abilities. Sonstroem (1997a) reviewed research validating this model and findings showed that components of the physical self possess attributes that can be ascribed to the self-esteem. Furthermore, a positive perception of one's physical self is linked to positive emotional adjustment. In yet another review, Sonstroem (1997b) concluded that physical self-concept was more closely related to exercise than was global self-esteem while noting that most self-esteem gains from exercise were found to occur in individuals with an initially low self-esteem or low physical fitness.

Sport participation has also been recognised as contributing to a child's social development where children learn to respect rules, cooperate with others and acquire other skills useful for everyday life (Smith, 2003). Mcgee, Williams, Howden-Chapman, Martin

and Kawachi's (2006) investigation was specifically based on this premise. Their findings included an association between participation in sports and self-reported strengths and higher levels of attachment to parents, peers and school during adolescence. In addition to increased attachment, an increase in self-perceived competencies was ascertained. In a study focussing on structured leisure activities, Fletcher et al. (2003) observed a positive effect of sports activities on children's psychosocial maturity and social competence. Another study including middle-school children reported lower levels of shyness/withdrawal and better social skills in participants involved in sport. Sport participation in organised sports was also found to play a protective role for shy children and was also associated with a reduction in anxiety (Findlay & Coplan, 2008). The authors argued that the sport context offers good opportunities for peer interaction and provides a safe environment fostering social support and self-esteem.

The concept for this study was inspired by the various literature and studies hailing the physical as well as psychological benefits of sport. Sport has been found to reduce depression symptoms and anxiety, improve mood and self-esteem as well as decrease feelings of anger (e.g. Fox, 1999; Salmon, 2001). It has even been suggested to have similar effects as anti-depressive agents (Dey, 1994; Phillips, Kiernan & King, 2003; Smits & Otto, 2009). The most popular psychological disturbances included in studies investigating the advantageous effect of sport were depression and general levels of anxiety with fewer enquiries looking into more specific conditions. As such, the aim of this study was to explore the psychosocial benefit of sport in relation to social anxiety symptoms in primary school children.

In the current study, sport is hypothesized to be associated with lower social anxiety symptoms and hence, this investigation aims to clarify the role of sport with regard to such symptom presentations. This could then implicate the importance of sport in existing treatment programmes for inhibited or socially anxious children as well as adults suffering from social phobia.

Method

Participants

Parents (N=759) were contacted via the schools and they received information about this study as well as a questionnaire to be completed. Permission to interview 208 children was received (R = 27.4%). Seven cases were excluded due to extreme outliers or missing data. All children in this sample attended the first and second grades in Swiss primary schools (Mean age = 7.72 years, *SD* = 0.67) in the German region of Switzerland. The sample included a roughly equal number of girls (*n*=102) and boys (*n*=99). In the present study, complete data from 201 children, parents and teachers are examined. This sample is relatively homogenous: the majority of the participants (88.6%) were Swiss nationals or possessed dual citizenships, one of which was Swiss (5.5%). Nearly all children in this sample (95.5%) lived in a household with both parents.

Most of the children (81.6%) in this sample practiced a sport apart from the compulsory physical education lessons (see Table 1). Of those children involved in an extra-curricular sport, 19.5% practiced football followed by 17.1% gymnastics and 10.4% swimming. Most children (54.7%) spent between 1 to 2 hours per week practicing an extra-curricular sport and the majority participated in an individual sport (62.2%). An equal number of children participated in team sports (18.9%) or practiced no extra-curricular sport at all (18.9%).

Table 1

Group Sizes in Sport Mode by Gender

		Sport mode			
		None	Individual	Team	Total
Gender	Male	13	51	35	99
	Female	25	74	3	102
Total		38	125	38	201

Procedure

Following the approval from the School Authority, the heads of school in various German-speaking cantons in Switzerland were contacted. The schools interested in participating in this study were then passed on letters for the parents of the children in the first and second grade. The letter included information about the study as well as a description of the questionnaires used and the type of questions asked. The parents, who accepted to participate, completed the enclosed questionnaire and returned this in a provided self-addressed envelope. Once the parents' consent was received, interviews were organised at the school. During the school visit, teachers were given a questionnaire to be completed for every child that was interviewed. The aim of the interview was also explained to the children individually at the beginning of the interview. Emphasis was made on confidentiality and children were also informed they were free to stop the interview or not answer any questions should they feel uncomfortable.

Instruments

The German Version (SPAIK) of the Social Phobia and Anxiety Inventory for Children (SPAI-C) was utilised (Melfsen, Florin & Warnke, 1997). This test was constructed for children between 8 to 16 years of age where they would complete 26 items by marking their answer on a 3-point Likert Scale ranging from 0 (*never* or *seldom*) to 2 (*most* or *always*). It was suggested that it could be used with younger children where it would be in the form of a structured interview rather than a self-completion test. Thus, structured interviews using the SPAIK were conducted with the children. These interviews were carried out by the first author or an assistant. The interviewer read the situations out loud to the child and then marked the child's response. The interviews took about 20 to 30 minutes. Validation studies carried out by the same authors indicate that the SPAIK can reliably distinguish between children with a social anxiety diagnosis, children exhibiting symptoms at a sub-clinical level

and children with no significant social anxiety. In Melfsen et al.'s (1997) validation studies, young schoolchildren (8- to 11-year olds) were found to report higher social anxiety than older schoolchildren and girls tended to score higher than boys. Cronbach's alpha reliability ranged from .92 to .95 and test-retest reliability was r_{tt}=.85 (after 2 weeks) and r_{tt}=.84 (after 4 weeks). Construct validity was reported to be satisfactory when compared to other measurements related to social anxiety and internal consistency was reported to be high. No correlation was observed between SPAIK scores and teachers' assessments (Melfsen, Florin & Walter, 1999; Melfsen et al., 1997).

Teachers were asked to provide information about the children's behaviour pertaining to anxiety and general behaviour in class. The German version of the Teacher's Report Form (TRF) was employed in this study (Döpfner et al, 1994). Teachers rated the child's behaviour on a 3-point Likert scale ranging from 0 (*not true*) to 2 (*very true* or *often true*). Three specific subtests from the TRF were used and evaluated, including the Anxious/Depressed, Social Problems and Withdrawn subtests. The complete test was not used because the full test comprising of 118 items would take approximately 15 to 20 minutes to be completed. This would be rather time-consuming for a teacher who would have multiple students on which to report. Thus, only the subtests most relevant for our study were employed so as to minimise the teachers' workload and to encourage participation.

Eight scales can be calculated from the items on the TRF: Anxiety/Depression, Social Withdrawal, Physical Complaints, Social Problems, Schizoid/Obsessive and Attentional Disorders. All scales, with the exception of Schizoid/Obsessive were found to achieve a satisfactory level of reliability (r_{tt}>=.70). The same formation of scales as in the original questionnaire was confirmed by the factor analysis carried out with the German translation of the TRF (Döpfner et al., 1994). The intercorrelation between the Scales was found to be less than r=.50, however the scales that were related to each other with regards to content tended

to reach a higher level of intercorrelation. This was observed with the three scales selected for this study: Anxiety/Depression, Social Withdrawal and Social Problems. The higher correlation values were observed between Anxiety/Depression and Social Withdrawal (r = .58) and between Anxiety/Depression and Social Problems (r = .71). These higher correlations imply that these scales share some commonalities with regards to their content. The same pattern of intercorrelations also emerged in the American studies using the original version of the TRF (Döpfner et al., 1994). The authors of the German translation (Döpfner et al., 1994) conclude that the German version's internal consistency is comparable to the results attained with American samples. The Social Problems and the Anxiety/Depression scales were found to have a good reliability while the Social Withdrawal scale's reliability was found to be satisfactory. All scales were assessed to be independent of each other.

Parents completed an assessment of their child's social behaviour. The Elternfragebogen zu Sozialen Ängsten bei Kindern und Jugendlichen/ Parents'Questionnaire for Social Anxiety in Children and Youth (ESAK) was developed by Weinbrenner (2005) with the aim of collecting information about social anxiety in children and youth from their parents. The ESAK is also meant to be used as an external diagnostic tool. The ESAK was created and developed through four validation studies (Weinbrenner, 2005) and its structure was based on the cognitive-behavioural model of social anxiety by Rapee and Heimberg (1997). The ESAK consists of 18 items to be completed by a parent and its reported alpha value is .90. Three scales, reflecting the four components in Rapee and Heimberg's model, can be calculated: the Cognitive Scale, Behaviour Scale and Physical Scale. The scales' alpha values are .90, .72 and .83 respectively. The two cognitive components in Rapee and Heimberg's model were incorporated in the ESAK's Cognitive Scale. Results of validation studies conducted by Weinbrenner (2005) indicate that the ESAK is able to discriminate between normal and clinical populations and is reported to have good criterion validity as

well as a good internal consistency. The parent reports in this study were mostly completed by mothers (81.3%) or by both parents (10.1%).

Finally, demographic data were also collected from the parents. This included gender, age, nationality, as well as information regarding sport participation. Parents were asked to record if their child participates in a sport activity outside school, and if yes, the number of hours per week as well as the type of sport activity.

Results

Gender Differences

A significant difference between girls and boys was identified on the SPAIK's total score as well as on its scales (Table 2). In all cases, girls obtained higher scores than boys did, suggesting that girls tend to experience more anxiety in the different types of social situations including both interaction and performance situations.

Table 2

Gender Differences on the SPAIK Total Score and its Scales

	Males (n = 81)	Females (n = 87)	
	M (SD)	*M(SD)*	*t*
SPAIK Total Score	11.37(8.05)	15.68(8.41)	-3.39**
Interaction Situations	6.40(4.22)	8.74(4.40)	-3.51**
Performance Situations	2.25(2.19)	3.06(2.28)	-2.34*
Cognitive and Somatic Symptoms	1.87(1.61)	2.68(0.41)	-3.07**

**p < .01, two-tailed; *p < .05, two-tailed; df = 166

With regards to the parents' questionnaire (ESAK), girls were assessed as more anxious on the Physical Symptoms Scale (t (198) = 2.136, p = .03). No significant gender differences were observed on the TRF scales. The number of children participating in extra-

curricular sports differed by gender. More boys were reported to be involved in this activity ($\chi^2(1, N = 210) = 5.13$, p (exact)= .03). Gender differences were also observed in relation to sport mode. Significantly more boys practised a team sport, while most girls practised an individual sport ($\chi^2(2, N = 201) = 34.93$, $p < .001$).

The Association of Sport with Social Anxiety

Due to the gender differences observed on both social anxiety scores as well as sport practice, a multiple analysis of variance controlled for gender (MANCOVA) was calculated. Three separate MANCOVAs were calculated for the data collected from the children, parents and teachers with sport practice (Yes/No) as an independent variable.

In the first MANCOVA, including the SPAIK Total score as well as the scores for the individual scales, no main effect of sport practice or interaction was found. MANCOVAs including the ESAK and TRF scales also showed no significant effect of sport practice. However, when MANCOVAs using sport mode (no sport, individual sport and team sport) were calculated, a main effect of sport mode was found on the parents' assessments (ESAK) with $F(8, 388) = 2.37$, $p = .02$, partial $\eta^2 = .05$. The Scheffé post-hoc criterion indicated a difference between individual and team sport on the Physical Symptoms scale, where individual sport participants ($M = .84$, $SD = .49$) scored significantly higher ($p < .05$) than their team sport counterparts ($M = .66$, $SD = .44$). MANCOVAs were also calculated separately for boys and girls, however, no significant results were obtained.

Discussion

Various studies have investigated the effects of physical exercise or sport on mental health. Results are encouraging, with most studies reporting a positive effect of sport involvement on a person's general mental health or on specific areas pertaining to mental health, such depression and anxiety. Such findings lead to other enquiries where not only the

effect of sport on particular conditions is investigated, but also the role of sport as a potential buffer is explored.

The results of this study indicate no differences in social anxiety symptoms between children involved in an extra-curricular sport and those not engaged in sport participation. According to analyses including sport type, data indicate differences related to the type of sport practised. Children practising a team sport scored lower on physical symptoms on the parents' assessment compared to children in individual sports. This may imply a beneficial element of sport related to its social aspect, where children can interact and practice social skills in a supervised environment.

Sport activity has not yet been shown to be of clinical importance in the buffering of social anxiety symptoms. In their reviews, both Ballenger (1999) and Velting and Albano (2001) only considered Cognitive-Behavioural Therapy (CBT) and pharmacological intervention as treatments for social phobia in youth. Keller (2003) also mentioned prescription of benzodiazepines and CBT as the possible treatment for social anxiety disorder with the optimal treatment being a combination of both. In addition, Ballenger (1999) noted that CBT had a lower rate of relapse when compared to medication. Sport could be included in the CBT programmes as part of social interaction as well as for the indirect effects it has on an individual's physical and mental well-being. Sport can also be included in the treatment of social anxiety with the aim of reducing anxiety sensitivity (e.g. Smits & Otto, 2009).

Limitations

The main shortcoming in this study is the low rate of response, which could suggest a self-selected sample. Nevertheless, the obtained sample size was certainly satisfactory. The majority of schools contacted declined participation due to current participation in one or more studies. It is understandable that heads of school seek to minimize disruption and extra-work as much as possible. To encourage participation, no more than six children per class

were interviewed, thus one teacher was required to complete a maximum of six questionnaires. Nevertheless, this measure led to a further reduction in the sample. The lack of significant results in this study could also be a consequence of a relatively small number of children who reported no sport involvement outside the school context. In addition, socially anxious children may actively avoid extracurricular sport activity, thus resulting in a flawed sample that in turn could conceivably bias results. This question needs to be investigated further using a longitudinal design. Finally, due to the cross-sectional design of this study, it was also not possible to evaluate the direction of a possible relationship between social anxiety symptoms and sport involvement.

Conclusion

The present study investigated the association between extracurricular sport participation and social anxiety symptoms among primary school children. Results indicated no differences in social anxiety symptoms between children involved in an extracurricular sport and those not engaged in sport participation. Overall, girls and boys differed on social anxiety scores, as girls reported experiencing more anxiety in social situations. Gender differences emerged on sport type trends as well, as boys were found to be more active in extracurricular sports than their female counterparts. Finally, children practicing a team sport were reported to manifest fewer physical symptoms of social anxiety than children practising an individual sport. Further investigation is warranted to develop a greater understanding of the relationship between social anxiety and sport activity trends.

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A**ppendix D**

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Extra-curricular sport participation: a potential buffer against social anxiety symptoms in primary school children.

Annemarie Schumacher Dimech & Roland Seiler

Institute of Sport Science, University of Berne

Abstract

Objectives: Social anxiety (SA) is characterized by high anxiety in social situations and can be significantly debilitating in its long-term duration. In children's case it additionally has a negative impact on the child's social and cognitive development. As reported in Wipfli, Rethorst and Landers' (2008) meta-analysis, exercise does have an anxiolytic effect. In this study, the role of sport as a mediating variable in the onset or development of SA symptoms is investigated, where a similar effect on this specific anxiety-type is expected. **Design**: This repeated-measures cohort study includes two data collections. The first data collection was carried out in 2007. **Method**: 208 7- to 8-year old Swiss primary school children participated in structured interviews. Parents and teachers completed questionnaires regarding children's SA symptoms and classroom behaviour respectively. Parents also provided information about their children's extra-curricular sport activities. The same information was gathered a year to 18 months later. **Results**: Although most differences were not statistically significant a pattern emerged: Children practising sport scored consistently lower on all instruments at both time 1 and 2. MANCOVA indicated a reduction in later social anxiety in children practising a team sport than their individual sport counterparts. **Conclusion**: These results are interpreted in reference to a potential positive effect of team sport on a child's experience of anxiety in social situations based on the salutogenesis model and the social learning theory.

*Keywords***:** social anxiety, social behavior, extracurricular sport, team sport, children.

Abbreviations: SPAIK (Sozialphobie und –Angst Inventar für Kinder/Social phobia and anxiety inventory for children); ESAK (Parents' Questionnaire for Social Anxiety in Children and Youth); TRF (Teacher Report Form).

Extra-curricular sport participation: a potential buffer against social anxiety symptoms in primary school children.

A Definition of Social Anxiety

Social anxiety disorder refers to a "marked and persistent fear of social or performance situations in which embarrassment may occur" (DSM-IV; APA, 1994, p. 411). It is usually accompanied by physical symptoms such as sweating, trembling, etc. which may escalate into a panic attack (Keller, 2003). This disorder typically appears during adolescence with a peak onset at about 15 years of age (Lecrubier et al., 2000). An epidemiological study (ESEMeD/MEHEDEA 2000 Investigators, 2004) reported the prevalence of mental disorders in Europe where mood (14%) and anxiety (13.6%) disorders were found to have the highest lifetime prevalence with social anxiety accounting for 2.4%. In a review of social anxiety prevalence in European countries, Fehm, Pelissolo, Furmark and Wittchen (2005) ascertained that women appear to be more frequently affected than men and the highest rate of mental disorders was found in young adults. This gender difference has also been observed in children and adolescents (Essau, Sakano, Ishigawa & Sasakawa, 2004; La Greca & Lopez, 1998; Rapee & Spence, 2004).

Social anxiety is often accompanied by other disorders. Comorbid disorders reported by studies on social anxiety in childhood included other anxiety disorders, specific phobia and selective mutism (Beidel, Turner & Morris, 1999; see also Bernstein, Bernat, Davies & Layne, 2008). Lecrubier et al. (2000) observed that an early onset was linked to a higher risk of developing depression and alcohol abuse or dependence.

Social anxiety symptoms including avoidance of social situations are often detrimental to a child's normal functioning (Bernstein et al., 2008; Kasper, 1998). Indeed, socially anxious children often exhibit impaired social skills, thus interfering with the development and maintenance of friendships and other relationships (Bernstein et al., 2008). Moreover,

potential consequences of social anxiety later on in life include a negative influence on academic and occupational performance, a lower quality of life and impaired social functioning (Lecrubier et al., 2000). Early identification and treatment can significantly reduce this disorder's negative consequences and thus, research involving children and adolescents is of great importance (Erath, Flanagan & Bierman, 2007).

Aim of this study

This study was inspired by various research efforts hailing the psychological benefits of sport in adults as well as in children and adolescents. Sport has been observed to reduce depression (e.g., Boone & Leadbeater, 2006) and anxiety symptoms (Wipfli, Rethorst & Landers, 2008), improve mood and self-esteem (McHale et al., 2005; Sonstroem, 1997) and enhance mental well-being in general (e.g., Fox, 1999; Röthlisberger & Seiler, 1999; Salmon, 2001). Physical exercise has even been claimed to have similar effects as anti-depressive agents (Dey, 1994; Phillips, Kiernan & King, 2003). Research findings have also shed light on the social benefits of children's participation in a sport (Findlay & Coplan, 2008; Fletcher, Nickerson & Wright, 2003). The most commonly investigated psychological disturbances included in studies examining sport's beneficial effect were depression and anxiety with fewer enquiries looking into more specific conditions. The purpose of this study is to explore the potential psychosocial benefit of extracurricular sport in relation to social anxiety symptoms in Swiss primary school children.

Theoretical Framework

This study is based on two theoretical perspectives: Antonovsky's (1987) salutogenesis model and the theory of social learning (Bandura, 1977).

Sport as a General Resistance Resource against Social Anxiety

The salutogenesis model is based on the fundamental postulate that heterostasis, ageing and progressive entropy are core characteristics of all living organisms (Antonovsky,

1987). In contrast to the pathological approach, this model focuses on what makes a person maintain good health rather than concentrating on the aetiology of sickness. In the light of this health-focused approach, Antonovsky speaks of a health-sickness continuum instead of a dichotomy of health and sickness and focuses on what leads to and maintains health. Thus, the salutogenesis approach recognizes the existence of the various factors improving health.

Antonovsky (1987) put forward the idea of Generalised Resistance Resources (GRRs) that can be anything of help against stressors including money, social support, a positive self-concept, etc. This is followed by the concept of a sense of coherence where an individual feels confident that his/her internal and external environment is predictable and that things will develop in an expected manner. Antonovsky describes stressors as risk factors that are to be reduced or buffered through protective factors. Sport could be considered as a GRR since it is has been found to improve general mental health as well as social skills, thus acting as a protective factor for our psychosocial wellbeing.

Numerous studies have investigated the relationship between sport and general well-being. Data from a cross-sectional survey in Germany revealed that physically active individuals with affective, anxiety, substance abuse or dependence disorders reported a better quality of life than their physically inactive counterparts (Schmitz, Kruse & Kugler, 2004). Kirkcaldy, Shephard and Siefen (2002) carried out a study including adolescents where sport also appeared to have similar benefits within this age group. Indeed, in a recent meta-analysis, Wipfli and colleagues (2008) concluded that “exercise alone can be effective at reducing anxiety” (p. 401).

Various physiological explanations have been dedicated to the effect of sport on anxiety. These theories, such as the endorphin hypothesis, shall not be discussed at this point since the psychosocial – rather than the physiological – processes involved in sport are the focus of this investigation. From a salutogenesis perspective (Antonovsky, 1987), sport

participation could be considered as a GRR boosting an individual's resources, such as self-esteem and mental well-being and improving social skills and support networks, and in this way, acting as a buffer against social anxiety.

Sport as a Context for Social Learning

The social learning approach focuses on learning occurring in a social milieu (Bandura, 1977). It sheds light on the processes of how people learn from each other and includes concepts such as modelling, vicarious learning and imitation. From a social learning theory perspective, participation in an organised sport, particularly in teams, can play an important role in a child's social development. Organised sport offers an unambiguous social context thanks to its rules of play and facilitates learning through peer modelling and relationships with other social agents (Smith, 2003). Larson (2000) claims that adolescents' positive development could be encouraged by "appealing images of adulthood" (p. 171) – organised sport is an ideal context that includes adult role models representing the ideals of sport, such as fairness and discipline.

There are three main aetiological factors related to social anxiety. A genetic disposition and a history of behavioural inhibition have been found to increase the risk of the onset and maintenance of social anxiety (Hayward, Killen, Kraemer & Taylor, 1998). The third risk factor – particularly relevant for this study - is a lack of social skills, which is found to be of particular significance in children and adolescents (Rapee & Spence, 2004; Spence, Donovan & Brechman-Toussaint, 1999). Rapee and Spence maintain that this lack of social skills may determine whether a genetic predisposition would actually develop into social anxiety disorder.

Social skills were one of the first-order themes identified by Jones and Lavallee (2009) in their focus groups involving adolescent athletes and coaches. Indeed, social and communication skills were identified by the study's participants as "crucial life skills" (p.

164) that can be learnt through sport and transferred to everyday life. Bernstein et al. (2008) found a negative correlation between severity of social anxiety and both social and leadership skills. They also noted an association between social anxiety and school problems reported in the teachers' assessments.

Sport is recognised as contributing to a child's social development where children learn to interact with peers, respect rules, cooperate with others and acquire other skills useful for everyday life (Smith, 2003). McGee, Williams, Howden-Chapman, Martin and Kawachi's (2006) investigation was specifically based on this premise. Their findings included an association between participation in sports and self-reported strengths and higher levels of attachment to parents, peers and school during adolescence. In addition to increased attachment, an increase in self-perceived competencies was ascertained. In a study focussing on structured leisure activities, Fletcher et al. (2003) observed a positive effect of sports activities on children's psychosocial maturity and social competence.

Another study including middle-school children reported lower levels of shyness/withdrawal and better social skills in participants involved in sport. Sport participation in organised sports was also found to play a protective role for shy children and was also associated with a reduction in anxiety (Findlay & Coplan, 2008). The social importance of team sport has also been documented in various studies, such as team sports' association with increased self-esteem in elementary school children (Slutzky & Simpkins, 2009).

To sum up, apart from the social aspect of sport – which can also be experienced in other non-sportive activities – physical exercise has been found to have a mild anxiolytic effect and a beneficial effect on general well-being, hence improving individual resources. The combination of sport's positive effect on both mental well-being as well as social skills could imply an important positive influence on social anxiety symptoms. In this study,

organised sport outside school hours is hypothesized to act as a General Resistance Resource as described in Antonovsky's (1987) salutogenesis model thus acting as a buffer against social anxiety symptoms in primary school children. Sport, in particular team sport, is also expected to exert a positive influence on children's social anxiety symptoms based on the social learning theory's postulates (Bandura, 1977). Thus, possible differences between team and individual sport participants are also examined where a stronger effect in team sport is hypothesized.

Method

Sample and Procedure

Self-report and observer-report data were collected in two waves, 12 to 18 months apart. The first data collection was carried out in spring/summer 2007 where 759 parents were contacted via schools. Parents received information about the study as well as a questionnaire to be completed. The schools as well as parents were informed of the longitudinal design of this study. Parental permission to interview 208 7- to 9-year old children (mean age = 7.86 years, SD = 1.01) was received (R = 27.4%). The sample included an equal number of boys and girls at the first data collection point. Out of these 208 children, 175 could be interviewed in schools due to limitations posed by the school authorities (not more than 6 children per class could be interviewed). Teachers returned 169 assessments out of the required 175.

Interviews were conducted on school premises by the first author or an assistant. Assessments to be completed by the parents and teachers were sent by post along with a self-addressed and stamped envelope. All children in this sample attended first and second grades in Swiss primary schools at the time of the first data collection. Most children (87%) were Swiss nationals and 82.2% of the children in this sample practiced a sport apart from compulsory physical education lessons. Of the children practicing sport, most were reported by their parents to play football (19.9%) followed by gymnastics (17.0%) and swimming

(9.9%). Most of these children (66.7%) spent between one and two hours a week practising an extracurricular sport with the majority involved in an individual sport (76%).

176 children and their parents took part in the second data collection in spring/autumn 2008. 75% of the sample participated in an extra-curricular sport. From the 32 participants that dropped out of the study, 3 changed schools, 1 child passed away and the parents of the remaining 29 withdrew consent. As in the previous year, football was the most practiced sport, followed by gymnastics and swimming. Most children in the second data collection wave (55.6%) spent between one and two hours per week on extra-curricular sports.

Further to data screening, involving exclusion of drop-outs and extreme outliers and transformation of non-normal distributions, 145 complete cases were retained for analysis.

Measures

The German Version (SPAIK) of the Social Phobia and Anxiety Inventory for Children (SPAI-C) was utilised (Melfsen, Florin & Warnke, 2001). This test was constructed for children between 8 to 16 years of age and includes 26 items to be answered on a Likert Scale. This inventory, as well as the original English version, is widely used to measure social anxiety. Following Melfsen et al.'s recommendation, this inventory was used with children in the sample in the form of a structured interview rather than a self-completion test. The interviews took about 20 to 30 minutes. Validation studies carried out by the same authors indicate that the SPAIK can reliably distinguish between children with a social anxiety diagnosis, children exhibiting symptoms at a sub-clinical level and children with no significant social anxiety. In Melfsen, Florin & Walter's (1999) validation studies, young schoolchildren (8- to 11-year olds) were found to report higher social anxiety than older schoolchildren and girls tended to score higher than boys. Cronbach's alpha reliability ranged from .92 to .95 and test-retest reliability was r_{tt}=.85 (after 2 weeks) and r_{tt}=.84 (after 4 weeks). Construct validity was reported to be satisfactory when compared to other measurements

related to social anxiety and internal consistency was reported to be high. No correlation was observed between SPAIK scores and teachers' assessments of the child's social behaviour in school (Melfsen, et al., 1999; Melfsen et al., 2001). These validation studies also confirmed the adequacy of this instrument for use in German-speaking countries.

Parents completed an assessment of their child's social anxiety symptoms. The Elternfragebogen zu Sozialen Ängsten bei Kindern und Jugendlichen/ Parents' Questionnaire for Social Anxiety in Children and Youth (ESAK) was developed by Weinbrenner (2005) with the aim of collecting information about social anxiety in children and youth. The ESAK is also meant as an external diagnostic tool. Its structure is based on the cognitive-behavioural model of social anxiety by Rapee and Heimberg (1997). The ESAK consists of 18 items to be completed by a parent and its reported alpha value is .90. Three scales, reflecting the four components in Rapee and Heimberg's model, can be calculated: the Cognitive Scale, Behaviour Scale and Physical Scale. The scales' Cronbach's alpha values are .90, .72 and .83 respectively. The two cognitive components in Rapee and Heimberg's model were incorporated in the ESAK's Cognitive Scale. Weinbrenner noted that factor analyses pointed at a three-factor solution thus reflecting the author's theoretical considerations. The parent reports in this study were mostly completed by mothers (81.3% in 2007, 88.6% in 2008) or by both parents (10.1% in 2007, 6.3% in 2008).

Teachers were asked to provide information about children's behaviour relating to anxiety and general behaviour in class. Three from the eight subtests of the German version of the Teacher's Report Form were employed (Döpfner et al., 1994). Teachers rated their pupils' behaviour in the last two months on a three-point Likert scale. The subtests used in this study are the Anxious/Depressed, Social Problems and Withdrawn scales, which measure factors identified as predominant symptoms/predictors of social anxiety (Roza, Hofstra, van der Ende & Verhulst, 2003). The items are independent of the child's gender and age. Only

the most relevant scales for the study were employed so as to minimise the teachers' workload and encourage participation. The Withdrawn scale describes children who prefer to be alone, are rather shy, less active and frequently feel sad. The Anxious/Depressed scale includes symptoms of general anxiety as well as loneliness, social rejection, feelings of inferiority and guilt, and depressed mood. The Social Problems scale includes items referring to peer rejection, immature and adult-dependent social behaviour and feelings of inferiority. The original TRF version was standardized in the US, however, studies using the German version observed only slight differences in scores. The authors report alpha scores of .85 (Anxious/Depressed scale), .77 (Withdrawn scale) and .81 (Social Problems scale) (Döpfner, et al., 1994). The teachers' assessment is of significance since first of all the child is observed in a different context than at home. Secondly, the school is an important context for socialisation where problems may be observed, which may be less prominent at home (Döpfner & Lehmkuhl, 1994).

Additional demographic data was collected from the parents. This included gender, age, nationality, parents' professions as well as information relating to organised sport participation outside of school. Parents were asked to record if their child participated in an organised sport activity outside school, the number of hours per week as well as the type of sport.

Data Analysis

Frequencies and cross-tabulations were carried out for a descriptive overview of the collected data. Delta variables were created by subtracting the 2008 scores from the 2007 scores for every scale. Normality of distribution was checked using skewness and kurtosis statistics, visual evaluations of histograms and Q-Q plots. In addition, an analysis of missing data was conducted. Changes over time were investigated with a MANCOVA using SPSS 17.0.

Results

Data Screening and Descriptive Analysis

Missing variables were analyzed using the MVA procedure. Only the data collected from the teachers had more than 3% missing values. However, following Little's MCAR test the assumption of values missing completely at random could be used (χ^2 (8, N=145) = 10.85, p=.21).

Standardized scores and box plots were employed to detect univariate outliers while multivariate outliers were identified using Mahalanobis distances (Tabachnick & Fidell, 2001). It was observed that the same few cases tended to score extreme values on different scales. This pattern was expected thus reflecting existing literature reporting prevalence rates amongst non-clinical samples (e.g., ESEMeD/MEHEDEA 2000 Investigators, 2004; Roza, et al., 2003). Non-normal distributions were mainly due to outliers; this was rectified by transforming these distributions using the logarithmic transformation. Mahalanobis distance was used with split file in place to identify possible multivariate outliers in the groups (cells) included in the MANCOVA. With df=5 and a criterion α=.001, critical χ^2=20.515, no multivariate outliers where observed.

Since not all participants could be interviewed, differences on the parent reports were checked between interviewed and non-interviewed children. No significant results were observed. This analysis was also carried out for possible differences between participants and drop-outs; no significant results were ascertained here.

Discrepancies were observed between self-ratings and observer ratings. Parent and teacher reports were positively correlated, however, no correlation at all was to be found between self-reports and teachers' assessments (See Tables 1 and 2). In Melfsen et al.'s (1999) study, no correlation was reported between teacher reports and self-reports using

SPAIK. Other studies assessing psychosocial constructs have also reported such discrepancies (such as in Fletcher et al., 2003)

Associations among Variables

Patterns of correlations among the dependent variables are presented in Tables 1 and 2. Overall patterns of positive correlations imply that the variables are measuring related constructs. However, not all correlations are significant suggesting some discrepancies between self, parent and teacher report. As noted earlier, such discrepancies have been reported in other studies. It is also important to point out that the teachers' scales did not specifically measure social anxiety but rather behaviour related to social anxiety, such as withdrawal and general anxiety. Indeed, the teachers' scales proved to be the exceptions to the otherwise general correlation pattern. These discrepancies remained consistent over time.

Table 1

Intercorrelations among Variables in 2007

Variable	*1*	*2*	*3*	*4*	*5*
1. ESAK Mean of total score	-				
2. SPAIK Total Score	.23**	-			
3. TRF Withdrawn	.32**	-.06	-		
4. TRF Anxious/Depressed	.31**	-.02	.65**	-	
5. TRF Social Problems	.21*	-.08	.56**	.67**	-

*p<.05, **p<.01; ESAK and SPAIK N=145, TRF scales N=136

Table 2

Intercorrelations among Variables in 2008

Variable	*1*	*2*	*3*	*4*	*5*
1. ESAK Mean of total score	-				
2. SPAIK Total Score	.25**	-			
3. TRF Withdrawn	.24**	.08	-		
4. TRF Anxious/Depressed	.21*	-.04	.57**	-	
5. TRF Social Problems	.27**	-.06	.49**	.49**	-

*p<.05, **p<.01; ESAK and SPAIK N=145, TRF scales N=136

Gender Differences

A significant difference between girls and boys was identified on the SPAIK's total score as well as on its scales (Table 3) at both data collection waves. In all cases, girls obtained higher scores than boys. This implies that girls tend to experience more anxiety in various social situations including both interaction and performance situations. These findings concur with other studies (e.g., LaGreca & Lopez, 1998). Boys were reported to practice more hours of extra-curricular sport than girls in 2007, χ^2 (3, N=145) = 13.36, *p*=.004. However, this difference was not to be found a year later. No differences emerged on the delta variables.

Table 3

Gender differences on SPAIK Total scores and scales for 2007 and 2008

	boys (n=71)		*girls (n=74)*		
	M	*SD*	*M*	*SD*	t (df=143)
SPAIK Total Score 2007	11.12	8.21	15.62	8.04	-3.34**
Interaction 2007	6.21	4.32	8.72	4.25	-3.52**
Performance 2007	2.23	2.28	3.08	2.25	-2.22*
Cognitive and Somatic Symptoms 2007	1.78	1.59	2.68	1.72	-3.26**
SPAIK Total Score 2008	11.63	7.73	16.01	7.34	-3.50**
Interaction 2008	6.67	4.07	9.01	3.53	-3.70**
Performance 2008	2.29	2.13	3.36	2.20	-2.98**
Cognitive and Somatic Symptoms 2008	1.73	1.47	2.53	1.74	-3.01**

*p<.05, **p<.01

Main Analysis

Analyses of differences between children practising an extra-curricular sport and those who did not showed a consistent pattern: Children reported not to practice any sport outside of school scored higher on most scales at both data collection waves. Still, these differences did not reach statistical significance.

A MANCOVA was carried out using sport mode (i.e. no sport, individual sport and team sport) and sport intensity (hours per week) as group variables. Due to the aforementioned gender differences on the social anxiety score, gender was included as a covariate in this analysis. The differences (2007 – 2008 = Δ) on the scales pertaining to the children's self-report, as well as the parents' and teachers' questionnaires were the dependent variables in this analysis. Thus, a higher positive score would signify a decrease in 2008, while a negative Δ score would mean an increase in social anxiety.

Results showed a main effect of sport mode, involving a decrease in social anxiety symptoms a year later for children practising a team sport. This difference reached significance on the SPAIK's total score $F(20,228) = 3.79$, p=.03, partial η^2=.06. Post-hoc comparisons using Tukey's HSD test indicated that team sport participants reported a greater reduction in social anxiety symptoms compared to individual sport participants a year later as illustrated in Figure 1.

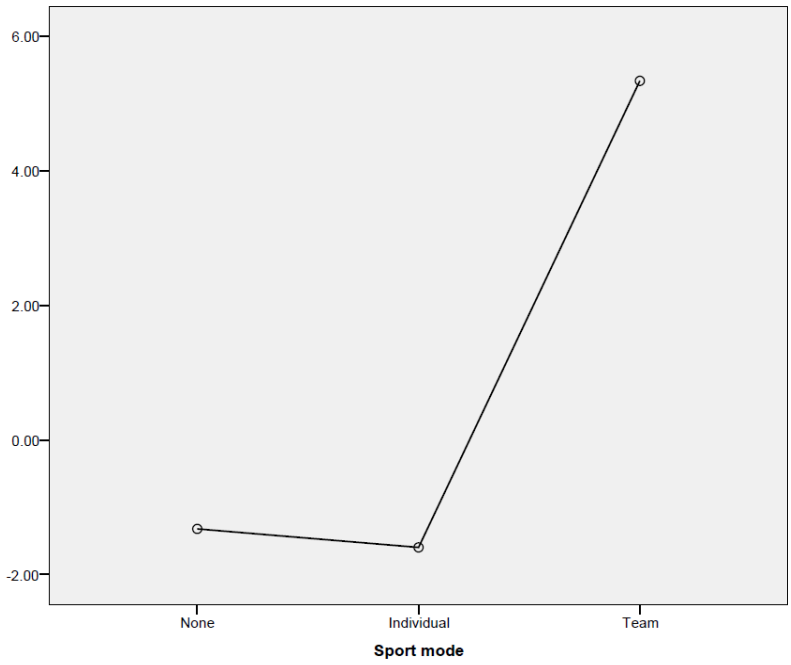

Figure 1. The Estimated Means of the SPAIK Total Score's Δ-scores.

Further analysis including the individual scales of the SPAIK, highlighted a difference on the social interaction scale $F(20,228) = 4.42$, $p=.01$, partial $\eta^2=.07$. Tukey's HSD test indicated a difference between team and individual sport groups, where team sport participants scored lower in social anxiety a year later (Figure 2). This implies that children practicing a team sport experienced a significant reduction in anxiety in situations involving social interactions than their peers participating in an individual sport.

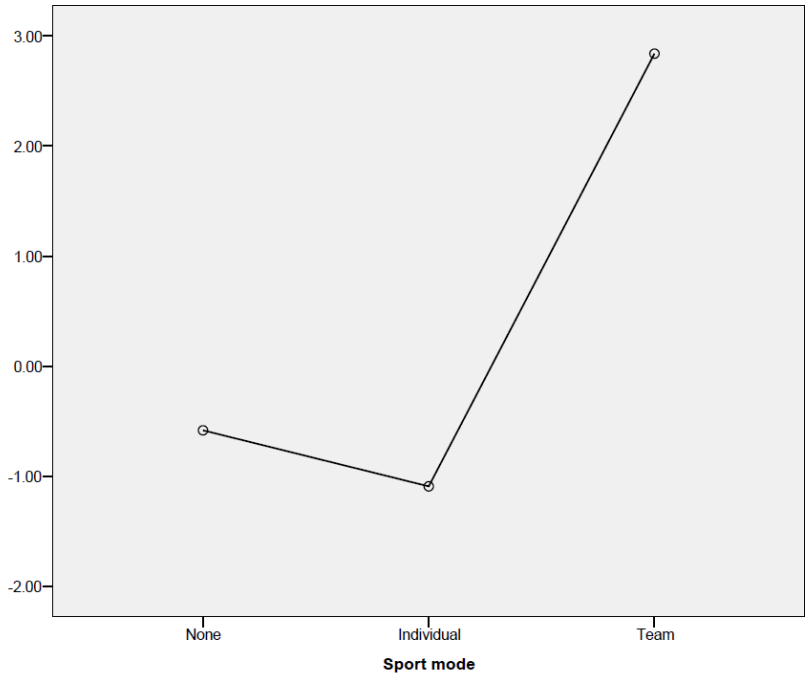

Figure 2. The Estimated Means of the SPAIK Interaction Score's Δ-scores.

The number of hours of sport per week was not found to have any effect on social anxiety symptoms and no interaction effects were ascertained.

Discussion

Various research efforts have investigated the influence of sport participation on mental health. Most findings reported a positive effect of physical exercise on a person's general psychological well-being or on specific areas of mental health, such as depression and anxiety. Such findings lead to further enquiries, where not only the effect of sport on

particular conditions is investigated but also the role of sport as a buffer starting from a young age is explored. Social anxiety symptoms were the focus of this study where Swiss primary school children were assessed in relation to their participation in extra-curricular sport activities.

Findings indicate that children practising an extracurricular sport report less feelings of anxiety in social situations. This same pattern was also reflected in the parents' assessment. Teachers also reported less behavioural problems in class in these children's case. These differences between the "sport" and "no sport" group were however not significant, thus it is not possible to make any inferences based on these results. A similar pattern was observed in the second wave of data collection: once again, participants not practicing an extra-curricular sport scored higher on most measures but differences did not achieve statistical significance. Still, the consistent pattern identified in the results may indicate a possible relationship between sport and social anxiety symptoms which needs to be investigated further.

Sport mode was found to have an effect on the social anxiety scores from the children's interviews. Team sport participants were found to report a reduction in social anxiety symptoms when compared to those children practising an individual sport. Moreover, sport intensity was not found to have any effect on social anxiety in this study, thus indicating an issue of quality rather than quantity. Thus, the type of sport appears to be of more consequence than the amount of hours spent practising this sport. This finding highlights the social aspect of team sport and its benefits, not only in developing social skills as reported in previous studies but also in acting as a buffer against social anxiety symptoms. Still, since the activities focussed on in this study are all sport-related, it would be incorrect to claim a direct link between team sport and a reduction in social anxiety. Other social and team activities, such as choir or band practice, could have a similar effect on a child's feelings of anxiety in social situations. It also important to point out that most children in this study practised an

extra-curricular sport for one to two hours per week. An effect related to sport intensity could have been difficult to ascertain since none of the children practised their sport at a high intensity.

The strengths of this study are the number of children interviewed as well as the three different sources of data collection. The information collected from the children themselves as well as from their parents and teachers provided a more complete picture of the individual and helped confirm the children's self-assessment due to the positive correlations observed between their scores and the parents' reports. Although the children were relatively young, particularly at the time of the first data collection, their self-evaluation matched that of their parents. However, some methodological limitations need to be taken into consideration. This study's main shortcoming is the low response rate thus reducing sample size from the very start. The majority of schools contacted declined participation due to current participation in one or more research projects. Sample attrition is also a common problem in microsocial, prospective studies. In this study's case, attrition rate was kept low but could not be completely avoided. Due to the sample size as well as sample attrition, generalisability of these findings is not possible. Still it is to be emphasized that no indications of selective attrition were identified and drop-out rate did not exceed 15%. The lack of significant results in this study could also be a consequence of this small sample size, especially since the group of children who were reported not to practice any sport outside school were relatively few. Children participating in an extra-curricular sport may have been less socially anxious prior to engaging in this activity. This was the main reason for the choice of a young age-group for this study's sample. The age onset of social anxiety disorder usually occurs during early adolescence with a reported peak at 15 years of age (Lecrubier et al., 2000). Indeed, no children in this sample fulfilled the diagnostic criteria for social anxiety disorder.

Conclusion

Notwithstanding these shortcomings, this study provides two important points to be considered and to be explored in more detail. The first is the effect of the type of sport rather than the intensity of sport practice in relation to social anxiety symptoms, hence challenging Wipfli et al.'s (2008) dose-response hypothesis. Sport practice appears to help socially anxious children when practised in a social context with other same-aged children. This finding could support the inclusion of team sport in programmes for children experiencing social anxiety. In their reviews, both Ballenger (1999) and Velting and Albano (2001) only consider Cognitive-Behavioural Therapy (CBT) and pharmacological intervention as treatments for social phobia in youth. Keller (2003) also mentioned prescription of benzodiazepines and CBT as the possible treatment for social anxiety disorder with the optimal treatment being a combination of both. In addition, Ballenger (1999) noted that CBT had a lower rate of relapse when compared to medication. Team sport could be included in CBT programmes as part of the social skills training as well as for the indirect effects it has been reported to have on an individual's physical and mental well-being.

The second point is the consistent pattern of lower social anxiety scores, both self-reported as well as the observer reports between children practising an extra-curricular sport and those who did not. Although these differences did not achieve statistical significance, a more in-depth study including a clinical sample or a study with a larger representative sample could elaborate these differences further.

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