SPORTS AND CHILD DEVELOPMENT:

EMPIRICAL EVIDENCES FROM COCON AND RTP ETHIOPIA

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Sports and Child Development:

Empirical Evidences from COCON and RTP Ethiopia

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ABSTRACT

The effects of sports on physical well-being has been thoroughly researched, however much less is known about the psychological dimension of physical activity. This thesis studies the relationship between sports and the psychological dimension of child and adolescent development. The investigations are based on a literature review, descriptive statistics including a meta-analysis, and statistical analyses. First, the literature review offers insights into various areas of psychology as well as on development programs. The focus of the literature review is put on three life skills which are expected to support the well-being of children and adolescents. The three life skills are self-esteem, self-efficacy and sense of belonging. They are taken over from a project of Right to Play (RTP) conducted in Dollo Ado`s refugee camps in Ethiopia. Second, descriptive statistics including a meta-analysis of scientific papers specifically looks at the relation between sports and self-esteem. Third, the main statistical analyses are based on OLS regressions using data from the Swiss Longitudinal Competence and Context survey (COCON). The effect of sports can be measured with the help of the survey question about having or not having additional sports classes. Like that the relationship between physical activity and each of the three selected target life skills can be assessed. The results of the OLS regressions show a positive correlation between sports and self-esteem, self-efficacy, as well as the sense of belonging of children. For the adolescents the outcomes however show a negative relation between sports and self-esteem and the sense of belonging, both on a significant level. This finding is more thoroughly analysed in order to find a possible cause of this negative effect.

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ABBREVIATIONS

COCON	Swiss Longitudinal Competence and Context Study
CA	California, U.S.
Ctry.	Country
FORS	Schweizer Kompetenzzentrum Sozialwissenschaften
PSDQ	Physical Self-Description Questionnaire (Marsh et al., 1994)
PYD	Positive Youth Development
NELS	National Education Longitudinal Study
NGO	Non-governmental Organization
NLSAH	National Longitudinal Study of Adolescent Health
RTP	Right to Play
S4D	Sport for Development
UN	United Nations
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNHCR	United Nations High Commissioner for Refugees
UNICEF	United Nations International Children`s Emergency Fund
U.S.	United States

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1. INTRODUCTION

The first stages of child development have long-term consequences on their future well-being. There are several factors to consider and the role of sports and physical activity build one of many topics for possible researches. It can be observed that many non-governmental organizations (NGO) and others put great effort into promoting physical activity and offering access to sports for children. Furthermore, the incorporation of sports into various institutions introduced by the government presents another indicator of the importance of physical activity in the context of child development. For example, in Switzerland the government introduced sports into the educational system declaring it as a mandatory class in school. Additionally, through the existence of Sports-for-Development organizations like Right to Play (RTP) it can be assumed that there is a belief about the impacts of sports and physical activity supporting children especially growing up under harsh conditions. RTP claims that through the implementation of different types of playing methods they want to achieve positive long-lasting impacts and strengthen children and adolescents with knowledge and skills to handle the numerous challenges in their environment. Besides those examples underlining the assumptions of possible effects of sports on child development, it is additionally worth to mention the charter from the United Nations Educational, Scientific and Cultural Organization`s (UNESCO). Their International Charter of Physical Education, Physical Activity and Sport reviews ethical and quality standards in this area and presents values and benefits of physical activity. Its aim is to serve as a universal reference and commitment for international sports communities as well as supporting policy decisions in that context.

It is believed that sports beneficially support child development in areas like health, education or child protection. The United Nations International Children`s Emergency Fund (UNICEF) underlines relevant aspects for better understanding evidence for child-focused sport for development in one of their reports analysing over 300 sport for development programs (S4D) all over the world. Next to recommendations for practitioners, researchers and policymakers, they present achieved results in the area of health, education and social inclusion. They point out that potential benefits of sports include an enhancement in health, a better preparation for learning, a reduction of stress and depression, an improvement of confidence and self-esteem, a better academic performance and improved learning, a reduction of the likelihood to smoke and illicit use of drug and a reduction of children involved in crime. Nevertheless, until today there was limited evidence found in regard to the impact on long-term child development, only

offering an insight into short-term impact (UNICEF, 2019). Other literature found that through sport settings such as in schools and communities positive youth-adult partnerships with involved coaches, peers and other adults can be created (Jones et al., 2017). Next to that, this also offers an opportunity for a presence of positive role models for the children (Schulenkorf et al., 2016). The role of sport settings was separately analysed as well and found to create safe spaces for the individuals supporting a beneficial environment during their development (Webb and Richelieu, 2015). Besides that, sports were found to enhance problem-solving skills and the creation of a sense of belonging through positive peer interactions (Hermens et al., 2017). Positive psychological outcomes could also be examined through the engagement in team sports especially in a non-competitive setting and in a greater hour of participation (Evans et al., 2017) underlining the connection between sports and a child`s well-being.

Several sources have examined the interdependence between sports and a child`s future well-being, but it was noticeable that less have specifically focused on integrating the psychological dimensions in their empirical analysis. Yet, the author would argue, that this field should be carefully considered while conducting methods in sports for child development and analysed through qualitative and quantitative techniques as well. Considering the importance of psychological areas regarding life skills[1], this thesis was designed to give more insights regarding this area on a quantitative level. The first strategy is based on data from a four-year project of RTP analysing refugee children in Dollo Ado, Ethiopia. Thanks to their cooperation data could be accessed and relevant documents are reviewed enabling a before versus after comparison. Besides this, additional ideas from their project on the impact of sports on child development are taken for the second strategy to further elaborate on the topic. The second strategy analyses the relationship between sports and similar psychological dimensions like RTP did but now based on a different dataset. Given the rather small sample sizes collected in the refugee camps of Dollo Ado by RTP, the main statistical analyses in this study are based on the Swiss Longitudinal Competence and Context study (COCON). COCON, supported by the Swiss National Science Foundation, is a Swiss children and adolescent survey with the aim to examine the process of growing up. Through isolation of sports in the survey question about this extra class it was possible to consider outcomes on skills supporting the individual`s development. The indicator variables were collected, and the final pool is chosen based on the

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[1] Life skills are defined by the United Nations International Children`s Emergency Fund (UNICEF) as psychosocial abilities for an adaptive and positive behaviour enabling to deal with every day demands and challenges (UNICEF, 2003). This definition is also used in the paper.

approaches of RTP. The target life skills are self-esteem, self-efficacy and sense of belonging and are formed through different survey questions from the data representing the indicator variables.

Assuming a relationship between sports and child development, the before versus after analysis with the data of RTP presents an increase in the analysed life skills for both children and adolescents (except for self-efficacy for children and sense of belonging for male adolescents). As there was a lack for matching the individuals of the time before and after the intervention as well as other restrictions, no causal claims about the effects of sports in this context can be made. The analyses with COCON data for cohort 1 presents a positive relation of sports for each of the life skills. On the other hand, for cohort 2 sports have a negative association with life skills (except for self-efficacy). This negative association is further analysed through a comparison of what other additional school classes the subjects have taken, splitting them into attendees and non-attendees of extra sports classes. In order to deal with reversed causality in the analyses with the COCON data, the sport variable is measured in the first period and the outcomes on life skills in the second period of the survey. However, omitted variable bias is nevertheless prevalent and there`s still a lack of making causal claims about the association between sports and specific life skills in child development.

To begin this analysis an overview will be given on the literature dissecting different aspects of outcomes of sports on a child`s development integrating effects of distinct conditions and subject groups. Based on the structure of RTP`s project, a meta-analysis of different studies about the relation of sports and self-esteem will be presented. Then constructed on an own analysis on mean values, the first strategy on the outcomes of the four-year project in Dollo Ado is summarized and presented. This is followed by the second strategy for analysing the relationship between sports and development using COCON data for constructing the main analysis of this Bachelor thesis. It assesses the relation between sports and the three-target life skills self-esteem, self-efficacy and sense of belonging which are constructed through taking averages of the belonging indicator variables. The last part of the thesis gives a conclusion about the results and compares and assesses the findings of the different approaches.

2. LITERATURE REVIEW

There are many programs with the aim to support children in their daily life. A special focus now in relation to RTP`s project can be put on individuals growing up in disadvantaged areas under harsh conditions. The situation is particularly grave for young people growing up in refugee camps, facing disruption in many parts of life as well as being confronted with unsafe living conditions (UNHCR, 2018). Children are especially exposed to those risks and their experience of conflicts has an impact on multiple factors including their development and well-being. Displacement to refugee camps for instance can disrupt relations to friends and families and rearranges family structures putting pressure to take over responsibilities resulting in an extra stress factor to the young individuals. Impoverishment may lead children to work and in general they are exposed to a constant risk of violation (Whitley and Gould, 2011). Next to many foundations in the area of promoting sports and physical activity as well as Sports-for-Development programs like RTP one is, there also exist Sport for Development and Peace projects. Analyses on the last-mentioned organizations found that as a result of the power of sport interventions such projects can contribute to peace-building and conflict resolutions as well and thus indirectly support the affected children (Sudgen, 2006; Lyras and Peachey, 2011).

It is argued that many core values delivered through sports come hand in hand with the necessary principles needed for a healthy development of young people in general (Bailey et al., 2013). RTP as well as many researchers claim that this assists in establishing important traits for a child`s development. Positive youth development and other beneficial skills are claimed to be based on factors like competence, confidence, connection, character and caring (Five C`s) which were thoroughly analysed by Lerner et al. (2005). They identified that through the interaction of the Five C`s a basis of a healthy and positive development can be created which is favoured by sport as well. In regard to the influence of physical it has to be stated however that it does not automatically teach children and youth beneficial life skills.

The participation in sports does not automatically lead to beneficial habits. Favourable dispositions and the involved program leaders like teachers or coaches need to be aware of appropriate implementation techniques which, if implemented in a certain way, can contribute to positive youth development. Furthermore, specific combinations of multiple activities in which youths participate along with sports have to be considered to determine positive effects

(Marsh and Kleitman, 2003; Zarrett et al., 2009). Depending on different variables they need to be aware about the special needs each child has and that this may also lead to different, positive as well as negative, outcomes. Besides physical injuries also negative psychological development like the pressure to win or aggressive behaviour through a tense competition atmosphere could be generated through sporting activities. Holt et al. (2012) identified some negative outcomes in the participants behaviour including the inability of coping with loss or aggressive behaviour. In their concluding remark the authors claimed that it is essential to create a supportive developmental environment with the creation of specific goals, programming and pedagogical strategies to be able to cause a positive influence on individuals. Other negative effects have been found for adolescents participating in standard physical education classes. It was claimed that those classes are not effective for a beneficial development of the student's well-being and could even be detrimental. In addition, one observed a decrease in school attendance rates which possibly concerns a dislike for the sports classes (Packham and Street, 2019).

Sports does not only offer physical health benefits, but additionally a variety of literature discusses other psychological and social health benefits through participation in physical activity which contribute to support life skills. Besides enhanced social skills a positive effect on self-esteem could be shown as well (Eime et al., 2013). Bowker (2006) was also able to present the link between participating in sports and its indirect influence on self-esteem. The analysis on children from a Canadian school showed that sports does not have a direct link on general self-esteem. Through sport participation perceived physical competence and satisfaction of physical appearance arises which in turn had a relation to self-esteem. Furthermore, sports could lead to developing physical competence and instrumentality relating to a positive body image which could have a possible beneficial impact on psychological health (Greenleaf et al., 2009). Interestingly, resilience[2] to daily life challenges, as a result of the development of the ability to better perform in stress management, can be enhanced through sport and physical activity as well (Whitley and Gould, 2010).

Another aspect which also needs to be considered is an individual`s living environment. In the context of RTP`s project for example, comparing it to the situation of the children and adolescents from COCON, it is important to consider traits of the environments the participants

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[2] Resilience is used here as the capability to handle crucial situations while being more confident and optimistic building an important trait in regard to a child`s development (Cambridge Dictionary, 2014).

are living in. On the one hand schools can stand as protective factors creating safe surroundings for children and adolescents. On the other hand, school classes can yield a sense of belonging and bring out friendships offering another supportive factor (Schulenkorf et al., 2016; Jones et al., 2017). Additionally, teachers not only take on the role as knowledge-deliverers but can also take over a part as role models and empower children`s autonomy and motivation. This could have an influence on the school class and thus on each individual separately, which presents a view of how a stable and good school environment combined with sports can lead to positive child development (Pieloch et al., 2016).

Sports activities can have different outcomes on individuals participating in it. One additional difference can be found in the discussion about gender differences. There are several points to consider and other interesting distinctions can be made through the analysis of the disparities in risk exposure. This difference is dissected in one of the working paper series supported by the University of Oxford`s Refugee Studies Centre (Boyden et al., 2012). Girls growing up in refugee camps face many disadvantages. Death or other incapacities of the parents for example, brings up special pressure on girls to take over more responsibilities in their homes. Next to this, early marriages and pregnancies have negative effects on a girl`s development and reduce the participation in education and other activities. This in turn weakens the positive impact of sport in school on their development (Boyden et al., 2002). Besides the aspect of risk exposure leading to weaken beneficial effects of physical activities for girls, sport nevertheless stands for a tool of integration. Implementing it in school and education, like RTP did in some of Dollo Ado`s refugee camps, created opportunities for social interactions and life skill building for all of the children (Daniels and Leaper, 2006; Kay, 2009; Ullrich-French et al., 2012; Hermens et al., 2017). Next to that, it allowed them to take over leader positions in physical activity supporting an enhancement of self-confidence and self-esteem standing for important variables contributing to positive child development.

Self-esteem and occurring gender differences were analysed by Kling et al. (1999). They documented that boys scored slightly higher on standard measures of global self-esteem than girls do. Various variables like age or ethnicity could be proven to have a potential influence on the gender gap which could be interesting for further researches. Another important aspect taken into consideration while measuring self-esteem was psychological permeability[3]. The

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[3] Measured via focusing on the question of what extent one is vulnerable to circumstances and relationships that threaten the self (Quatman and Watson, 2001).

authors Quatman and Watson (2001) claim that this had slightly stronger effects on girl's self-esteem rather than on the male participants. Additionally, the paper of Klomsten et al. (2004) found that boys scored significantly higher in their defined subdomains of physical self-concept, like sports competence or physical activity, contributing to the prevailing gender gap as well. Physical appearance in general was the subdomain most strongly predicting global self-esteem for boys in this paper, which should be considered while using sport as a tool for positive child development. Another analysis on self-esteem analysed girls who were at high risk for overweight. The authors Schmalz et al. presented results that sports participation is positively related to the girl's self-esteem but occurring in a lagged effect. Pre-adolescent girls` self-esteem seems to be generally more affected through sports interventions if they already have a low self-esteem and physical self-concept beforehand (Boyd, 1994; Haugen et al., 2011). Important to consider in the discussion of sex differences is that through society gender stereotypes occur (Klomsten et al., 2004). Sport could for instance represent a chance for boys to prove their masculinity and thus being more accepted by their peers, leading to higher self-esteem and physical self-concept and thus creating a sense of belonging. This is another factor contributing to the differences between the genders and should also be regarded while constructing gender appropriate interventions for achieving a beneficial development through sports for both female and male children and adolescents.

All the above-mentioned aspects are important in regard to the outcome of sports on child development and have to be considered carefully. To further support the claims about life skills, the next section will be focusing on a meta-analysis of physical activity and self-esteem based on a selection of different studies.

3. DESCRIPTIVE STATISTICS

Sport as a tool for developing children and adolescent behaviour promoting positive life skill traits can be analysed from different perspectives. Next to the achieved outcomes of RTP`s project (Table 2 et seqq.) and the statistical evaluation based on COCON in the next section, a variety of scientific papers analysing the outcome of physical activity on life skills can be found. A meta-analysis of different psychological aspects is included as psychology seems to play a major role in this relationship. This chapter now enables a more comprehensive and

supplementary overview about health aspects of sports on young individuals focusing especially on the relation to self-esteem.

3.1. SELECTION OF STUDIES TO BE SUMMARIZED: CRITERIA

Interesting to consider before the quantitative analysis in the next section are the outcomes on any life skill from a more psychological point of view. Given that there is a lot of research conducted in this area, it is important to follow a strategic paper searching procedure to be able to achieve a qualitative and thorough statement supportive to the analysis about the relation between sports and a child`s development. Besides searching on scientific databases and university online libraries the significance of a paper in this study is assessed with the help of Google Scholar`s citation index. The number of citations hopes to give an additional indication about the quality of a paper. The authors and the providers of the final versions are as vital information about a study. Only relevant and often cited studies are being included to secure a systematic and representative sample of published and unpublished studies. The collection process is done without any restriction of publication type, publication date nor specific study methods, ethnicities of the participating individuals nor favoured outcomes. The age range of individuals ranges and gender proportion of the participants, as well as the kind of activity being implemented, and the outcome measures are also part of the inclusion criteria. The great number of published studies which included children and adolescents with physical and psychological disabilities are not included in the collection of candidates because none of them are represented in RTP and COCON.

First there is a pool of potential papers created based on computerized databases and scanning reference lists of articles. Various platforms are searched for analyses up to the end of March 2019. General terms like *children adolescents gender development sports physical activity relation education* are used to be able to reach as many different research papers as possible. There are only general terms used and no specific combinations including terms like *significant impact negative positive* are implemented because it is assumed that these combinations would have favoured suggestions made by the electronic databases offering papers only having found a significant impact, thus being avoided to not court a biased paper pool.

3.2. SELECTED STUDIES

Out of many papers, there are 55 considered as potential candidates and further dissected. Through analysing hypotheses, methods, subject pools and outcome measures for each of the studies, there are 10 papers considered to be included into the meta-analysis (Table 1). All of them enabling the analysis about the relationship between sports and the life skill self-esteem. The following criteria are collected and summarized on an Excel sheet: the authors, the year and the country in which the study was conducted, as well as the database of the data pool, the number of participants and their age range as well as the gender proportion, the kind of physical activity, the methods implemented and the measurements of the outcome of sport on self-esteem as well as their findings.

Most of the data from the final paper pool are from the United States and Canada with the exception of one paper from Norway using data from their own experiments conducted in Norwegian schools. The American data of the National Longitudinal Study of Adolescent health (NLSAH) is used three times in the final paper collection. As there are slightly different hypothesis tested and different individual groups analysed, they all remain in the final collection. In the final pool two studies are conducted by the same authors using NLSAH for their analyses as well. As they each included different subjects from different nationalities they are both considered to remain in the meta-analysis.

The age range of all the subjects in the papers is 10 to 21-year olds, which is also covered by the range of the subjects in RTP and COCON. As a matter of accuracy, the studies mentioning grade levels are taken over in the fifth column of the table below and not converted into age ranges.

From the remaining 10 papers each are studying the outcome of sports participation, either in school sports, out of school sports or other physical activity programs. All of them analyse its relation to self-esteem. The measures of self-esteem differed slightly from each of the studies but all of them are considered to be acceptable and comparable. One of them is the Rosenberg self-esteem scale that has been tested by Martín-Albo et al. (2007) and confirmed to be reasonable as a measurement. The method of the physical self-description questionnaire (PSDQ) of Marsh et al. (1994) has often been analysed in psychology and social sciences and considered as a good concept for measuring self-esteem like as it is the case in the study of Schipke and Freund (2012). In the end all the measures of the life skill have proofed to be

appropriate through all the final studies. Next to the main mediating variables relating to the outcome of sport on self-esteem, the key findings can be found in the last column of Table 1.

3.3 META-ANALYSIS

In the meta-analysis below the results give additional insights on the relationship between physical activity and self-esteem. Supportive to the statements in the literature review, an association between sports and life skills can be found. Even though most of the statistics in the final papers are only slightly significant, various relations and interactions can be assessed and offer future outlooks and ideas for further investigations.

One of the mediators of sports participation and self-esteem presented in Table 1 is peer acceptance. Daniels and Leaper (2006) found a partially mediation for peer acceptance on a significant level for both girls and boys whose data is based on the NLSAH. A modest relation of sports and self-esteem was found to be mediated by social connection constructs among older participants presenting outcomes of a PYD program in the US among low-income students (Ullrich-French et al., 2012). The differences in the influence of specific types of sports showed that most of the outcomes could be achieved through extramural and team sports (Marsh and Kleitman, 2003), all the statistics being based on a specific data pool of NELS. Next to this, gender role orientation of an individual has been found to influence the outcome on self-esteem as well (Bowker et al., 2003). Similarly, the authors Gadbois and Bowker (2007) documented that depending on one`s self-description more in a masculine or feminine way (via self-description surveys) this each has a different outcome on the relation between sports and self-esteem. Physical well-being in general is also often analysed as mediator of physical activity and self-esteem. Physical appearance and physical competence are studied in two of the studies, both having found its mediating role on self-esteem for both genders (Bowker, 2006; Haugen et al., 2011). Additionally, next to the role of physical well-being, a mediating role of school attachment in the association school sports and self-esteem can be shown. This is analysed in the study of Ekrut and Tracy (2002a) which was conducted in the United States based on the Latin American children pool from NLSAH. A general outcome of sports on different psychological and environmental factors comparing it to non-sport groups on self-esteem is presented by Harrison and Narayan (2003) in which a physical activity based PYD program was implemented in a summer camp for low-income students in the US.

Table 1. Meta-analysis of the studies investigating the relationship between sports and child development through different mediators.

Study (year)	Ctry.	Data	N	Cohort	Sport(s)	Mediator(s)	Description	Key finding(s)
Daniels, Leaper (2006)	US	NLSAH	10500	12 to 21	General sports participation[4]	Peer acceptance	Relation sports and self-esteem mediated by peer acceptance	Peer acceptance partially mediated the relationship between sports and self-esteem for girls and boys
Marsh, Kleitman (2003)	US	NELS	4250	Grade 8, 10, 12	School sports (intramural, extramural and individual or team sports)	Identification/ Commitment with school[5]	Higher grades, self-esteem and educational aspirations related to school-based athletics	Extramural and team sports had a stronger relation to self-esteem than intramural and individual sports for both genders
Erkut, Tracy (2002a)	CA	NLSAH	4642	Ø 15	School sports	School attachment[6], physical well-being	Relation sports and self-esteem mediated by school attachment and physical well-being	Relation sports and self-esteem found through the mediators for Mexican boys and girls, Puerto Rican girls and Cuban boys only
Erkut, Tracy (2002b)	US	NLSAH	43831	Ø 15	School sports	School attachment, physical well-being	Relation sports and self-esteem mediated by school attachment and physical well-being	Sense of physical well-being was the only one mediating the relation sports and self-esteem for Caucasian and African American girls and boys
Bowker (2006)	CA	Students (Eastern Ontario, CA)	382	11 to 14	General sports participation[7]	Physical self-esteem (physical competence and appearance)	Relation sports and self-esteem mediated by physical self-esteem	Physical competence through sports particularly mediated self-esteem for boys whereas did physical appearance for girls
Ullrich-French, McDonough Smith (2012)	US	Low-income students (summer camp, US)	197	9 to 16	Physical activity based PYD program (including sports and other physical activities)	Physical competence[8], social connection[9]	Outcome of the PYD program on global self-esteem by changes in perceived physical competence and social connection	Modest relation of sports and self-esteem through perceived social connection constructs for older participants

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[4] Through survey questions like "How many times did you do sports in the last year?".
[5] Based on the Identification/ Commitment Model of Marsh (1993).
[6] Participating in a high school sports leads to identification with the school (Marsh, 1993).
[7] Survey questions about the amount of sports and since when the subject has been doing sports.
[8] Example item of the survey to measure perceived physical competence: "Some kids wish they could be a lot better at sports and physical activities.", "Other kids feel they are good enough at sports and physical activities".
[9] Social connection variables including social competence and leader support.

Harrison, Narayan (2003)	US	Minnesota study survey	50169	Grade 9	School sports	Variety of psychological and environmental factors[10]	Relation sports and physical and mental health benefits associated to self-esteem	Positive self-esteem having highest relation to sports participants compared to groups involved in other or no activities[11]
Gadbois, Bowker (2007)	CA	Students (school in Manitoba, CA)	134	Ø 16	Competitive, recreational and non-athletic sports	Masculine self-description[12]	Extracurricular activities relating to self-esteem mediated by positive self-perception	Positive association of a masculine self-description and greater participation in non-athletic activities and self-esteem for both genders
Bowker, Gadbois, Cornock (2003)	CA	Students (school in Manitoba, CA)	100	Ø 16	General sports participation[13]	Gender role orientation[14]	Moderating role of gender orientation and type of sports in the relation of sport and self-esteem	Association of feminine gender role orientation and experience in recreational activities to general self-esteem for girls and boys
Haugen, Säfvenbom, Ommundsen (2011)	NO	Students (different Norwegian schools)	2055	13 to 18	General sports participation[15]	Physical appearance, athletic competence, body areas satisfaction	Relation of sports and self-esteem mediated by body areas satisfaction and appearance evaluation[16] and perceived athletic competence[17]	Mediating role of physical appearance through sports on self-esteem stronger for female than male adolescents

[10] From 13 different behaviours: meeting exercise guidelines, total amount of fruits/ vegetables eaten yesterday, glasses of milk yesterday, hours of homework/ studies done, hours of hanging out, cigarette use, alcohol use, binge drinking, marijuana use, truancy, physical fight, vandalism, sexual intercourse.

[11] Students classified into four groups (based on participation in sport or other activities): neither, both, other activities only, sports only.

[12] Proportion of masculine attributes (e.g. the total amount of descriptive attributes used for self-description). *Here not as a mediator but as a factor for differences in the relationship between sports and self-esteem.*

[13] Questions about years of experience and level of sports participation.

[14] Individuals with a female gender orientation might inhibit behaviours that are stereotyped as masculine. *Here not as a mediator but as a factor for differences in the relationship between sports and self-esteem.*

[15] Through survey questions about participating in structured/ organized sports or in unstructured/ unorganized sports.

[16] Via the Body Areas Satisfaction Scale (BASS) and Appearance Evaluation (AppEv) subscale of the Multidimensional Body-Self Relation Questionnaire from the revised Norwegian version of Loland (2000).

[17] Via the Athletic Competence (ATComp) subscale of the Harter`s Self-Perception Profile for Adolescents from the revised Norwegian version of Wichstrøm (1999).

Overall there are many factors mediating the relationship between physical activity and sports and self-esteem and those possibilities have to be further considered. In this meta-analysis only a part of possible mediators are presented. Next to more different types of physical activity, additional mediators should be assessed as well. Likewise, characteristics of the participants as well as their environments and differences in measuring methods or implementations can lead to different outcomes and insights. Of course, there are many more aspects which can lead to mediate the role of sports on self-esteem and this section shows just a little part on the outcome of physical activity on children`s and adolescent`s self-esteem.

The next section contains the statistical analysis which is drawn upon the COCON data. Next to self-esteem the life skills self-efficacy and sense of belonging is integrated as well, based on the ideas of RTP`s project in Dollo Ado.

4. RTP LIFE SKILLS

This section starts with the analysis of a before versus after comparison based on the project of RTP in Dollo Ado. Dollo Ado is one of the biggest refugee camps in the world. Due to insecurity, famines and drought conditions populations fled mostly from Somalia to seek asylum in Dollo Ado. The part of RTP as an international humanitarian organization seeks to foster a healthy and physical, emotional and social development of individuals and aims to build up safe and strong communities. In the camp of Dollo Ado they conducted a four-year treatment (2013 to 2017) and analysed the outcomes on young people`s life skills and academic performance through sports and play activity methods. They designed the project to provide refuge and support children and adolescents as well as to reach a feasible outcome on positive development and social support structures in the refugee camp.

4.1. DATA

The data for the baseline was gathered from one camp (Hilaweyn) out of the five camps from Dollo Ado and is based on interviews with 179 refugee children (6 to 13 years old) and 157 adolescents (12 to 18 years old). For the endline they were able to access two of the five camps, Hilaweyn and Kobe, collecting data from 110 different children and 109 different adolescents.

The data both from SPSS and Excel are imported to Stata where the calculations are conducted. The outcomes of physical activity methods on the participating children and adolescents from the camps are presented in Table 2.1 and Table 2.2 and are based on mean calculations. First of all, the mean values for each of the indicator variables are created. Secondly, a mean value for each of the three life skills based on the belonging indicator variables are calculated separately, each rounded to the third decimal place. Also, each value is standardized so they are comparable within the two time points. The ranges ranging from 1 to 3 standing for *no* if it is 3 and 1 if the answer of the respondent was *yes*. *Sometimes* is presented by the value 2. The nearer to 3 the stronger the positive self-interpretation about the appropriate life skill.

4.2. BEFORE VS. AFTER

Overall, the means of the life skills from the children and adolescents seem to have evolved in a positive direction through time (except for children`s self-efficacy and the sense of belonging of the adolescents). Having implemented RTP`s activity methods this could, next to many other factors which could have changed over time, have had an influence on their development.

Displayed in Table 2.1 the means of the children`s sense of belonging and self-esteem turned out to be higher in the endline. For the outcome on the life skill sense of belonging there is a stronger effect for boys (see Appendix 1.1 and 1.2 as a comparison). Many points could have influenced this, one of them was mentioned in the literature review in the beginning of the paper. Gender differences can occur through gender stereotypes which is the case of sports as well. Boys participating in physical activity can feel more masculine, which can be related to a feeling of social acceptance through fitting into the stereotype of male individuals. This in turn creates a sense of belonging within the community which may be more extreme for male rather than female children (Klomsten, Skaalcik and Espnes, 2004). The life skill self-efficacy in turn decreased over time. Even after checking for the genders separately there is no increase found in the mean values of self-efficacy (Appendix 1.1 and 1.2).

Table 2.1. RTP mean values of the life skills by children (male and females). *Iterated* indicators are occurring in the endline only.

Life Skill 6-13 years old	Indicator variables	Mean baseline N = 179	Mean endline N = 110
Self-esteem	OppResp, EmotControl, *knowhelp, conflictwhurt, eagerwell*	2.200	2.642
Self-efficacy	CompAct, TriesHard,	2.650	1.845
Sense of belonging	EaseFrend, FairTre, FamCare, FrnCare, *support, fitgood,*	2.584	2.745

The mean values for adolescents seem to increase for self-esteem and self-efficacy and to have decreased in sense of belonging for the average of the individuals. The biggest outcome can be found in self-esteem. Noteworthy, if looking at the gender separately for the decrease in sense of belonging, there is a decrease in the mean value for male adolescents only (see Appendix 2.1 and 2.2). For females there is a higher mean for sense of belonging in the endline comparing it to the baseline value. Girls could be more affected by the implemented methods because in the beginning their mean comparing it to the male adolescents is smaller. This can indicate that they were more sensitive to the changes in physical activity as they started lower and it is harder to increase the sense of belonging if it is already on a higher level in the beginning. Someone has to be aware, that this sensitivity statement holds only for the adolescents as for the group of children the females, even though having a higher mean value in self-esteem in the beginning, the results display bigger differences between the base- and the endline.

Table 2.2. RTP mean values of the life skills by adolescents (male and females). *Iterated* indicators are occurring in the endline only.

Life Skill 12-18 years old	Indicator variables	Baseline N = 157	Endline N = 109
Self-esteem	FearLkDum, *feelgoodfuture, callyourselfleader*	1.051	2.642
Self-efficacy	CompAct, TriesHard	2.602	2.656
Sense of belonging	EaseFrend, FairTre, FamCare, FrnCare,	2.523	2.456

Moreover, if linking the life skills of the females to the males there are higher values for both the age ranges in the baseline for self-esteem. This can be an indication that before the intervention of RTP the females had overall a higher self-esteem which seems counterintuitive

to the stated facts about them being more vulnerable and suppressed by different manifested traditions and other facts often claimed in literature.

4.3. LIMITATIONS

The above results should be treated very cautiously and not taken into consideration if wanting to make general statements about the outcome of sports on development. It is important that someone has to be aware that claims cannot be made about causal relations of the impact of physical activity through sport and play methods on specific life skills here. Measures are taken within two time points, but the data is not gathered for the same subjects. Also considering the rather small sample sizes it is hard to make any assumptions on the effect of sports on child development. Of course, it is probable that some effects could be achieved through RTP`s approaches as each time different means resulted. Like stated in their *Final Evaluation Report* many people in the refugee camps considered the project to have contributed not only to physical, but to emotional fitness of the younger population as well. This in turn is believed to have had an impact on the development of self-confidence, positive attitudes towards education and social skills. "By participating in play and sport activities, teachers indicated that children have improved their physical and emotional fitness; become healthier; and developed self-confidence, positive thinking and good behaviour as well as time management skills", which quote can be found in RTP`s final report from 2018.

Nevertheless, to enhance interpretations on the changes in mean differences bigger sample sizes as well as using measures on matching individuals before and after the treatment would offer more precise insights on this issue being interesting for further explanations about the impact of sports. Lastly, there is scope for more work to be done on testing potential effects of sports on child development and elaborating on further methods for analysing the different mechanisms. Another possible strategy using a different dataset is presented in the next section taking advantage of OLS regressions for achieving a more thorough view on possible modifications of life skills through sports.

5. COCON PROJECT

Next, the dataset assembled by the Jacob Centre for Productive Youth Development is analysed. COCON is a Swiss longitudinal Competence and Context study surveying Swiss children and youths via interviews and pencil questionnaires which could be assessed through FORSbase. It examines the process of growing up including over 3000 individuals from the German and French speaking part of Switzerland presumed to represent a part of the country`s young population. COCON offers a deeper view on the complex interaction between social contexts, competence development and the coping with early life course transitions like school entry.

5.1. DATA

The dataset consists of three cohorts, each representing a specific stage of growing up. Due to the fact of age ranges, two of the cohorts were taken for this analysis (cohort 1 following the six-year olds and cohort 2 the 15- year olds until their 21 birthday). Children and young adults were surveyed at three time points starting each at 2006 followed by a session in 2009. Finally, the last survey for cohort 1 was conducted in 2011 and for cohort 2 in 2012. Through some questions about general classes and additional school subjects taken by the children, the factor sports is integrated via the group of survey questions about extra school classes as well. This enables the data to be created around the relationship between sports and child development. As in the last time points only a small number of children and adolescents participated in the survey the focus in this analysis is put on the years 2006 and 2009. A remarkable note is that for both of cohort 1 and 2 there were each more children participating in sports classes in the year 2006. Additionally, if comparing the pool of the children with the adolescents there is an obvious difference in attendees of the extra class. Much more children participated in sports and only a small number of adolescents went to extra sports classes. The descriptive table of cohort 1 and cohort 2 from the two time points can be found in the Appendix 3.1 and 3.2.

Before starting with the regression analyses in Stata there is a need to clean and sort as well as merge the datasets of cohort 1 and cohort 2. In the beginning all the surveys from the different time points for both of the cohorts are merged to have a better view on the whole data. The variables are renamed to be able to distinguish them within and between the cohorts. Then missing variables as well as strange values are dropped offering a complete working data set to

work with. Because there are not many identical survey questions for the year 2006 and 2009, the first idea of working with panel shaped data is abandoned. Instead the author will base the regression on wide shaped data using OLS for estimating the coefficients of the multiple regression model. The descriptive variables about the canton of residence, its urbanity level, the size as well as the language spoken in the area the individual is living in were only examined in the year 2006 for both cohorts in COCON. Consequentially there is assumed that they are not changing within the two time points and thus set as being the same for 2009. After merging and cleansing of the data the remaining pool of the subjects consists of 344 individuals for cohort 1 and 244 individuals for cohort 2.

5.2. REGRESSION ANALYSES

The motivation of the regression is to examine the relationship between sports and the life skill self-esteem, self-efficacy and sense of belonging. They are all measured in the second time period (three years after the first time point) and each constructed via three different indicator variables based on comparing them to the approaches of RTP as well as on general definitions (Appendix 4). All the indicator variables of RTP which are used as a guideline can be found in Appendix 5. The constellation of the three life skills based on COCON data is attached in Appendix 6.1 after having renamed and sorted the survey questions by cohorts and target variables. Like already mentioned before, all of the measured life skills are part of the second time point which is in 2009 whereas the sports variable is measured in 2006. In the beginning the regressions are conducted for each indicator separately and only at the end is an average value created to represent the life skill.

Next to the three target variables and the variable of interest sports, the dummy variable gender is considered to be used as a control variable. Many literatures argue to find differences within life skills among the gender thus it is regarded as an important factor to be include into the regression. If the gender variable (in the table presented by *male*) is 1 it indicates a male individual and 0 for female children or adolescents otherwise. The interaction term *sport*male* is considered to be interesting as well. It is integrated into the regression allowing an additional view on the relation between sports and the dependent variable to be dependent on the specific gender.[18] Besides gender there is a control variable controlling for the geographical region

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[18] As the coefficients of the interaction term never seem to be on a significant level, the author does not further elaborate on this term while commenting the tables. In any of the models, the null hypothesis for *sport*male* can never be rejected.

reflecting the French speaking or German speaking part of Switzerland, assuming differences in mentality among the inhabitants. Another control variable represents the supportive structure the child or adolescent is surrounded with and which it is facing during its development. Those structures are defined to relate to changes in the individual`s well-being including variables about the climate in the class, their own wishes for their educational career and the expectations of their care givers on school grades. Through questions about self-perceptions on social skills (how good to get along with others, level of having friends or if the subject finds it hard to make friends) there is in contrast also controlled for psychological burdens. Those burdens include assessments about having fears, sorrows or being unhappy. On the one hand there are several indicators about character traits implemented, like the level of being messy and negligent as well as a self-assessment about having good character traits in general. On the other hand, the fortitude of decision-making as well as the strength of feeling confident and the adaption to new situations are assumed to belong to the pool of relevant control variables relating to one of the life skills as well. Further explanations of the control variables can be found in Appendix 6.2. Overall, the controls are assumed to relate to the child and adolescent`s self-esteem, self-efficacy or other life skill traits and are thus integrated into OLS regressions. Whether a regressor is a good predictor for the value of the life skill in the sample or not, the adjusted R squared is taken into consideration. Still someone has to be aware that through this measure of fit the significance of a regressor cannot be fully assessed. As well, even after having a high adjusted R squared this does not mean to have no omitted variable bias. Also, it does not mean that all the appropriate regressors causing movements in the dependent variable are implemented even if the adjusted R squared is reflecting a high value.

The following regression is now tested and taken as a main pattern for building four different models for each of the specific life skill:

$$Y_{i,t} = \beta_0 + \beta_1 X_{1i,t-1} + \beta_2 X_{2i,t-1} + \beta_3 X_{1i,t-1} * X_{2i,t-1} + \Sigma \beta_k X_{ki,t-1} + u_{it}$$

The dependent variable Y is measured in the year 2009 whereas the $_{t-1}$ indicates that the variable is measured in 2006. The regressor β_1 controls for sports in the first period and β_2 incorporates the gender effect followed by the interaction term. The rest of the controls are reflected via de last term $\Sigma \beta_k X_{ki,t-1}$ and the error term is represented by u_{it}.

5.3. RESULTS

To be able to have a better overview on the regression, each of the different constructions using different variables are saved separately in Stata for creating four different regression models at a later stage. The first model includes the variable of interest only (*sport*) and the second one adds controls for gender (*male*, *sport*male*). In the next two models all the control variables are added except that in model 3 the *male* and the interaction term *sport*male* are excluded. Through the command "estout" all the different regression models are stored and then through "esttab" the stored values are applied to compose a combined regression which is all presented in the tables below. Important to note is that for offering a better view on the different levels of significance the values are adjusted so that in the end they include the 10% level as well. The indicators controlling for the socio-economic status as well as for the geographical region are replaced by *yes/ no* because they are not of main interest. As well to offer a clearer view on the regression tables, the values of the control variables being not significant in any of the four models are substituted by *yes* if it is occurring in the model and *no* if not. Even though it is not further elaborated on any of the control variables being significant, it is considered to not replace them as they can be interesting for other approaches. The gender and the interaction term are also displayed in each of the models, independent of their level of significance.

5.3.1. Cohort 1

Four different regressions for each life skill are conducted. In the first model for self-esteem (1 indicating very low and 2 high self-esteem) there is only the sports variable included followed by the second model where the control variables for gender and the interaction term are added (Table 3.1). For both, the sports coefficient is not significant but has a positive value indicating an insignificant positive effect of sports and being male. The same shows the correlation matrix in Appendix 7.1 and remarkably it displays a significant relationship of the two variables self-esteem and *male*, however on a small level only. Interesting is that if excluding the sports variable in the regression model *male* increases its level of significance (see Appendix 7.1.1). In this model, the male gender seems to be positively related to self-esteem. Overall, sports is still a weak predictor of self-esteem and explains only a small fraction of the variation in this life-skill. Adding more variables to the model but leaving out the gender and interaction term nothing noticeable changes except that the adjusted R squared increases. After controlling for all variables that are suggested to relate to the life skill (model 4) the relation of sports and self-

esteem turns out to be the smallest. Also, very little of the coefficients are on a significant level and maximal 9% can be explained by the fourth model (adj. $R^2 = 0.090$). Further investigations should be conducted, and new control variables should be added because if comparing it to the next regressions for self-efficacy and sense of belonging, it is the only life skill where the null hypothesis cannot be rejected. As many literatures detected a positive relation between sports and self-esteem, the below results call for further research.

Table 3.1. OLS regressions on the dependent variable self-esteem in cohort 1.

Self-esteem	(1)	(2)	(3)	(4)
Sport	0.0465	0.0241	0.0334	0.0154
	(0.0352)	(0.0413)	(0.0343)	(0.0409)
Male		0.0635		0.0368
		(0.0762)		(0.0735)
Sport*male		0.0143		0.0189
		(0.0834)		(0.0806)
Feel-good	no	no	yes	yes
Adaption			0.0141**	0.0120*
			(0.00593)	(0.00646)
Fear			-0.00891	-0.00585
Sorrows			0.00530	0.00528
Unhappy			-0.0208	-0.0231*
			(0.0132)	(0.0132)
Get along well			-0.00111	0.000358
Friend intensity			0.0325	0.0333
Hard friends			0.0791**	0.0747**
			(0.0310)	(0.0308)
Linguisitc reg.	no	no	yes	yes
Occupation c.g.	no	no	yes	yes
Future wish	no	no	yes	yes
Constant	1.287***	1.270***	1.075***	1.078***
	(0.0307)	(0.0335)	(0.142)	(0.143)
N	343	343	343	343
adj. R²	0.002	0.014	0.087	0.090

The variable of interest *sport* indicates the participation in sports classes in the previous time point. The geographical region is indicated by *linguistic region*. *C.g.* is the abbreviation for care giver and *reg.* region. Heteroskedastic-robust standard errors are given in parentheses under the coefficients. Level of significance adjusted as following: * p<0.10, ** p<0.05, *** p<0.01.

The next regression analysis addresses the life skill self-efficacy (Table 3.2). All of the four models of the regression on self-efficacy show positive coefficients for the sports variable. A small but significant relation shows the correlation matrix as well (Appendix 7.2). Even after controlling for all control variables including for gender sports still seems to be significant at the 1% level. In model 4, increasing one unit of sports is indicated by a possible increase in self-efficacy for 0.35 point holding constant for the other control variables. The magnitude of

self-efficacy ranges from 1 to 6 indicating maximal self-efficacy for the value 6. A child who has no self-efficacy shows a value of 1.

Over the models, the adjusted R squared can be increased until a maximum level of explaining 12% of the model through the regressors (adj. $R^2 = 0.121$ for model 3). In Table 3.2 it can be observed that a lot of coefficients are on a significant level and show negative relations on self-efficacy. This is also suggested in many of the previous analysed literature and not causing serious suspicions. The separate regression without the control variable sport can be found in the Appendix 7.2.1 which neither shows a significant effect of gender on this life skill. As well the correlation matrix in Appendix 7.2 does not show a significant relation between the two variables, however, still on a positive level.

Table 3.2. OLS regressions on the dependent variable self-efficacy in cohort 1.

Self-efficacy	(1)	(2)	(3)	(4)
Sport	0.291***	0.301**	0.330***	0.349***
	(0.0931)	(0.119)	(0.0909)	(0.114)
Male		0.126		0.0601
		(0.173)		(0.173)
Sport*male		-0.0775		-0.0641
		(0.194)		(0.189)
Feel-good			0.103***	0.103***
			(0.0179)	(0.0180)
Adaption			0.120***	0.120***
			(0.0177)	(0.0184)
Fear			-0.0628**	-0.0625**
			(0.0308)	(0.0311)
Sorrows			0.0688*	0.0687*
			(0.0370)	(0.0371)
Unhappy			-0.00990	-0.00982
			(0.0364)	(0.0364)
Get along well			-0.0677***	-0.0679***
			(0.0182)	(0.0183)
Friend intensity	no	no	yes	yes
Hard friends			0.163**	0.162**
			(0.0781)	(0.0794)
Linguistic reg.	no	no	yes	yes
Occupation c.g.	no	no	yes	yes
Future wish c.g.	no	no	yes	yes
Constant	4.172***	4.138***	3.365***	3.351***
	(0.0820)	(0.0997)	(0.290)	(0.290)
N	344	344	344	344
adj. R^2	0.027	0.024	0.121	0.116

The variable of interest *sport* indicates the participation in sports classes in the previous time point. The geographical region is indicated by *linguistic region*. *C.g.* is the abbreviation for care giver and *reg.* region. Heteroskedastic-robust standard errors are given in parentheses under the coefficients. Level of significance adjusted as following: * p<0.10, ** p<0.05, *** p<0.01.

The next regressions are run on sense of belonging. Table 3.3 shows a positive relationship between sports and the life skill on a 5% level of significance for model 1 and 3 (for magnitude assessments, please find the correlation matrix in Table 3.3.1). The gender indicator for male children in the regressions below has a negative sign indicating a negative effect on the sense of belonging if the subject is male. This can mean that females have a higher sense of belonging. As there is no asterisk the null hypothesis about the coefficient being different from zero cannot be rejected and thus the previous claim should be treated carefully. Through the outcome of model 3 it can be said that if increasing one unit of sports the feeling for sense of belonging increases for 7 percent points on a significant level. The range of this life skill goes from 0 to 1 indicating that the nearer to 1 the higher the sense to feel included and to be accepted by other children.

Table 3.3. OLS regressions on the dependent variable sense of belonging in cohort 1.

Sense of belonging	(1)	(2)	(3)	(4)
Sport	0.0765**	0.0516	0.0678**	0.0413
	(0.0347)	(0.0406)	(0.0339)	(0.0401)
Male		-0.0332		-0.0521
		(0.0822)		(0.0797)
Sport*male		0.0670		0.0801
		(0.0887)		(0.0859)
Feel-good			-0.000688	-0.000653
			(0.00702)	(0.00711)
Adaption			-0.0393***	-0.0405***
			(0.00527)	(0.00536)
Fear			0.00907	0.0100
Sorrows			-0.0112	-0.0106
Unhappy			0.0520***	0.0507***
			(0.0133)	(0.0133)
Get along well			0.0195**	0.0201**
			(0.00838)	(0.00846)
Friends scale	no	no	yes	yes
Hard friends	no	no	yes	yes
Linguistic region	no	no	yes	yes
Occupation c.g.	no	no	yes	yes
Future wish c.g.	no	no	yes	yes
Constant	0.544***	0.552***	0.315***	0.327***
	(0.0304)	(0.0323)	(0.117)	(0.117)
N	321	321	321	321
adj. R²	0.012	0.010	0.096	0.094

The variable of interest *sport* indicates the participation in sports classes in the previous time point. The geographical region is indicated by *linguistic region*. *C.g.* is the abbreviation for care giver and *reg.* region. Heteroskedastic-robust standard errors are given in parentheses under the coefficients. Level of significance adjusted as following: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

A remarkable aspect is that if adding the controls for gender, the sport coefficient for model 2 and 3 are not significant anymore. Other factors should be additionally examined for investigating this effect and it would be interesting to run a regression using other control variables to see if it has anything to do with the controls for gender. When isolating the variable for sport in the regression no increase in the gender`s level of significance can be achieved. Rather, there is found a positive but non-significant relation of boys on the sense of belonging in general (Appendix 7.3) calling for further suspicions. One possible explanation can be that this happens due to collinearity. In Table 3.3.1 the correlation for *male* and *sport* shows to be significant at the 5% level. This indicates that the null hypothesis can be rejected and thus that the two

variables in this dataset do relate to each other. In the regression this can cause a decrease in the power of explanation for sports on the life skill sense of belonging (losing its level of significance) as soon as we implement the variable *male*. Possibly due to collinearity.

Table 3.3.1. Pairwise correlation matrix on sense of belonging, sports and gender for cohort 1.

Correlations	(1)	(2)
(1) sense of belonging	1.000	
(2) Sport	0.124* 0.027	1.000
(3) Male	0.067 0.232	**0.230*** 0.000

Level of significance: * $p<0.05$

5.3.2. Cohort 2

In this subject pool individuals in their adolescence are surveyed and analysed. An aspect to mention beforehand is that less than 20% of the adolescents of cohort 2 are attending physical activity classes comparing it to the number of children in cohort 1. For this section, no separate regressions without the sports variable are conducted. No remarkable effects and insights can be found thus it is considered redundant adding it to the appendix (like the author does for cohort 1). To assess whether relationships in between the life skill variables and sports as well as gender are prevalent and to quantify the strength of the associations each of the correlation matrices are attached in Appendix 8.1 to 8.3.

The first regressions analyse self-esteem. In Table 4.1 one thing to be noticed is that if adding additional control variables (model 4) the relationship between sports and self-esteem is nearly cut in half showing that sports itself has probably a lesser effect on self-esteem as its coefficient shows in model 1. In the models 1 to 3 all the coefficients of sports are on a significant level. Against many hypotheses, the association between sports and self-esteem seems to be negative for all the regressions which concern will be further elaborated on in the next chapter. Adding the variable male into the regression (model 2) decreases the sport coefficient slightly. This can be again an indication that sport might probably have a smaller explanation power for self-esteem in that case. To be a boy in this model indicates on a 10% level of significance that self-esteem is increased, and that sport has a negative relation to it. At the same time if comparing the adjusted R squared for model 1 and 2 they indicate that the regressors are not that good in predicting self-esteem for adolescents. With adding more control variables (model 3 and 4) this power of explanation can probably be increased. Attending extra sports classes in model 3 shows a decrease of 0.18 point holding constant for all of the variables except the ones on gender, happening on a 10% level of significance. This time, the range of the target variable goes from 1 to 6. The nearer to 6 the higher the self-esteem of the adolescent and vice versa.

Table 4.1. OLS regressions on the dependent variable self-esteem in cohort 2.

Self-esteem	(1)	(2)	(3)	(4)
Sport	-0.337**	-0.304*	-0.178*	-0.162
	(0.151)	(0.178)	(0.104)	(0.117)
Male		0.193*		0.121
		(0.106)		(0.0890)
Sport*male		0.0622		0.0516
		(0.306)		(0.235)
Messy			yes	yes
Negligent			-0.0931**	-0.0964**
			(0.0432)	(0.0432)
Good traits			0.569***	0.563***
			(0.0538)	(0.0546)
Class climate			0.0125	0.00950
			(0.0439)	(0.0436)
Often alone			-0.0488*	-0.0570*
			(0.0292)	(0.0294)
Decision-making			-0.145***	-0.142***
			(0.0304)	(0.0305)
Feeling confident	no	no	yes	yes
Future wish	no	no	yes	yes
Expectation math	no	no	yes	yes

Linguistic region	no	no	yes	yes
Occupation dad	no	no	yes	yes
Occupation mum	no	no	yes	yes
Constant	4.797***	4.715***	2.516***	2.561***
	(0.0522)	(0.0676)	(0.562)	(0.568)
N	242	242	242	242
adj. R²	0.021	0.028	0.460	0.461

The variable of interest *sport* indicates the participation in sports classes in the previous time point. The geographical region is indicated by *linguistic region*. The variable *expectation math* is standing for the expectation the care givers have on their child. *Mum/ dad* standing for the mother/ father of the child. Heteroskedastic-robust standard errors are given in parentheses under the coefficients. Level of significance adjusted as following: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

For the OLS regression on self-efficacy (again with a range of 1 to 6) sports seems to have a positive but non-significant effect in all of the models and to have a correlation of 0.029 (see Appendix 8.2). Beyond, the gender of the adolescent has a significant relation to the dependent variable. On a significant level of 5% the null hypothesis can be rejected for two of the models indicating that gender can possibly be associated to the level of self-efficacy in this regression. This result suggests that female adolescents have a higher self-efficacy than male ones. Observing the values of the measure of fit in the multiple regressions demonstrate how the model can be more precisely predicted through controlling for child, socioeconomic and geographical characteristics as well as supportive structures (maximal adj. $R^2 = 0.308$ for model 4). Nevertheless, the variable of interest is never significant and thus sports is not assumed to be able to explain variations in self-efficacy.

Table 4.2. OLS regressions on the dependent variable self-efficacy in cohort 2.

Self-efficacy	(1)	(2)	(3)	(4)
Sport	0.0870	0.128	0.171	0.158
	(0.194)	(0.196)	(0.168)	(0.175)
Male		-0.379**		-0.332**
		(0.162)		(0.149)
Sport*male		-0.678		-0.307
		(0.525)		(0.486)
Messy	no	no	yes	yes
Negligent	no	no	-0.383***	-0.374***
			(0.0665)	(0.0685)
Good traits			-0.150*	-0.132
			(0.0873)	(0.0867)
Class climate			0.162**	0.168**
			(0.0657)	(0.0651)
Often alone	no	no	yes	yes
Decision-	no	no	yes	yes

making				
Feeling confident	no	no	yes	yes
Expectation math			0.0391*	0.0478**
			(0.0233)	(0.0225)
Future wish			0.0732***	0.0721***
			(0.0134)	(0.0131)
Linguistig region	no	no	yes	yes
Occupation dad	no	no	yes	yes
Occupation mum	no	no	yes	yes
Constant	4.246***	4.406***	4.531***	4.403***
	(0.0797)	(0.0992)	(0.775)	(0.782)
N	244	244	244	244
adj. R²	-0.003	0.032	0.291	0.308

The variable of interest *sport* indicates the participation in sports classes in the previous time point. The geographical region is indicated by *linguistic region*. The variable *expectation math* is standing for the expectation the care givers have on their child. *Mum/ dad* standing for the mother/ father of the child. Heteroskedastic-robust standard errors are given in parentheses under the coefficients. Level of significance adjusted as following: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

The outcome in Table 4.3 displays regressions on sense of belonging, whose range goes from 1 to 6. In every model sports seem to have negative relations to the target variable for this cohort, each of them on a significant level (expect for model 3). Additionally, it is important to point out that only one of the control variables seems to be significant. All of the controls with the exception of the character trait *messy* are not individually significant and their coefficients on the life skill is not rejected at any level of significance. It can be probable that the models show a need for implementing new control variables to be able to better assess a possible relation of sport on the life skill sense of belonging.

Table 4.3. OLS regression on the dependent variable sense of belonging in cohort 2.

Sense of belonging	(1)	(2)	(3)	(4)
Sport	-0.295*	-0.351*	-0.249	-0.311*
	(0.150)	(0.182)	(0.160)	(0.188)
Male		0.0124		-0.0176
		(0.128)		(0.131)
Sport*male		0.311		0.328
		(0.280)		(0.295)
Messy			0.0893**	0.0873*
			(0.0443)	(0.0451)
Negligent			-0.0935	-0.0924
			(0.0591)	(0.0599)
Good traits			0.0328	0.0340
			(0.0827)	(0.0833)
Class climate			0.0933	0.0974

			(0.0598)	(0.0603)
Decision-making			-0.0486	-0.0485
			(0.0499)	(0.0497)
Feeling confident			0.0178	0.0149
			(0.0687)	(0.0694)
Expectation math			-0.000683	-0.000311
			(0.0243)	(0.0244)
Future wish			-0.00694	-0.00600
			(0.0122)	(0.0124)
Linguistic region	no	no	yes	yes
Occupation dad	no	no	yes	yes
Occupation mum	no	no	yes	yes
Constant	3.223***	3.218***	2.351***	2.344***
	(0.0637)	(0.0870)	(0.691)	(0.695)
N	242	242	242	242
adj. R^2	0.010	0.005	0.011	0.006

The variable of interest *sport* indicates the participation in sports classes in the previous time point. The geographical region is indicated by *linguistic region*. The variable *expectation math* is standing for the expectation the care givers have on their child. *Mum/ dad* standing for the mother/ father of the child. Heteroskedastic-robust standard errors are given in parentheses under the coefficients. Level of significance adjusted as following: * $p<0.10$, ** $p<0.05$, *** $p<0.01$.

All in all, it can be said that for the life skill self-esteem (at least for cohort 1) no significant but positive effect of sports can be found. In cohort 2 the coefficients of sports on self-esteem are significant but negative. For self-efficacy, the relation between sports and the dependent variable in cohort 1 has a slightly lower positive significant coefficient comparing it to the non-significant relation between sports and self-efficacy for cohort 2. Remarkable in this regression is that for the older age group the effect of gender seems to be significant on a 1% level. Considering the life skill sense of belonging, a negative non-significant effect of the variable male in each of the model 4 is displayed in the tables. Both indicate a possible higher sense of belonging for female children and adolescents. For the two age groups, the variable of interest *sport* allows for rejecting the null hypothesis for most of the models showing a positive relationship between sports and sense of belonging for children and a negative significant effect for adolescents. These negative relations in cohort 2 arise attention comparing them to most of the results of different studies and will be further dissected in the next section. Looking at the control variables in Table 4.3, it is obvious that all except one control variable are not being significant. This calls into question the importance of their relation to the target life skill sense of belonging and probably demanding for different control variables.

5.3.3. Differences between and within the cohorts: additional school classes

In this section, further investigations on the negative relationship between sports and life skills in cohort 2 are conducted. One possible assumption can be that for children sports offers a great opportunity for making friends (Lever, 1978; Weiss, Smith and Theeboom, 1996; Weiss and Smith, 2002; Allen, 2003; Kay and Bradbury, 2009). Additionally, it could help them enhancing their feeling of self-esteem (Table 1) and their self-efficacy (Marsh, 1993; Annesi, 2006; Goudas and Giannoudis, 2007; Cronin et al., 2018). For older individuals, which are represented by the adolescents in cohort 2, one can assume that they have other ways for getting into contact with friends besides sports classes. Additionally, they can possibly use other opportunities for enhancing self-esteem and self-efficacy, which can explain why negative relationships can be found. Through attending additional sports classes, they are missing other opportunities for making friends which are possibly more effective in enhancing life skills in this age range. Packham and Street (2019) found that sports increased disciplinary incidents within the adolescents and decrease school attendance. In the end they did not find standard physical education classes to be effective in enhancing adolescent`s well-being.

The previous paragraph motivates the following analysis trying to find further evidences on the negative relation between sports and an adolescent`s life skills. The different distributions of attending additional school classes split by the groups of attendees and non-attendees of extra sports classes are created and plotted in Stata via "graph bar". The first group which is located on the left side in Figure 1 and 2 includes children/ adolescents who took sports as an extra class whereas the second group were those who did not (represented by the graph on the right side). Each of the other additional classes besides sports is showed via the different bars. In the survey of cohort 1 six different extra classes are assessed and displayed in Figure 1: attending music or singing classes; language classes; theatre, dance, or ballet classes; drawing classes as well as other additional lessons taken (except the one mentioned before). For cohort 2 five different extra classes including music or singing classes, language classes, taking tutoring lessons or attending instrument classes are shown (Figure 2).

The dotted lines in Figure 1 display the two biggest differences in the mean values of the number of attendees. Those are participating in music or singing classes or in theatre, dance or

ballet lessons (all of them having a range of 0 to 1).[19] The results can display that if a child attends an extra sports class in school it is more likely and enthusiastic to participate in another additional active school class. This can be a possible explanation for the difference. Overall one can see in COCON data that the children who attend additional sports classes participate more intensely in extra school classes (expect for language classes). Language classes are more passive and maybe attracting those who also do not want and do not like to be active and participate in additional sports classes. By combining the outcomes of the analysis on the additional school classes taken by the children one remarkable thing stands out: there can be a possible boost in the life skills through attending other active classes besides participating in sports.

Figure 1. Graphs for cohort 1 for children attending sports classes in 2006 (left) and those who did not (right).

Graphs by taking/ taking not additional sports classes for cohort 1.
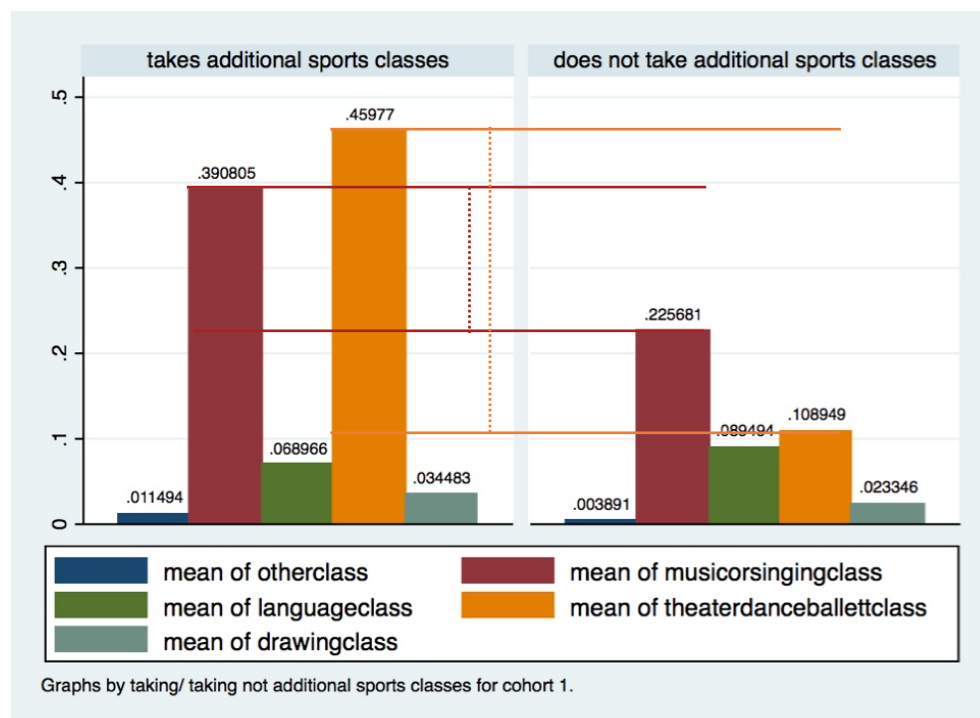
The biggest differences in the mean values of additional classes taken in between the two groups of sports class attendees versus non-attendees in cohort 2 are indicated by the dotted lines. Please be aware that the bar for additional classes is excluding the other six classes (including sports classes as well), which is showing the biggest difference among the two sports and non-

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[19] Please note that theatre, dance or ballet lessons were not included in the variable of interest extra sports class.

sports groups. This is followed by a smaller difference represented by music or singing lessons. All in all, those evidences indicate that the group which is not attending sports classes is more active which is the opposite case if looking at the groups of the children. For the rest of the classes represented by the bars in Figure 2, there is a slightly higher average of those adolescents attending sports classes (except for tutoring classes).

Figure 2. Graphs for cohort 2 for adolescents attending sports classes in 2006 (left) and those who did not (right).

Graphs by taking/ taking not additional sports classes for cohort 2.
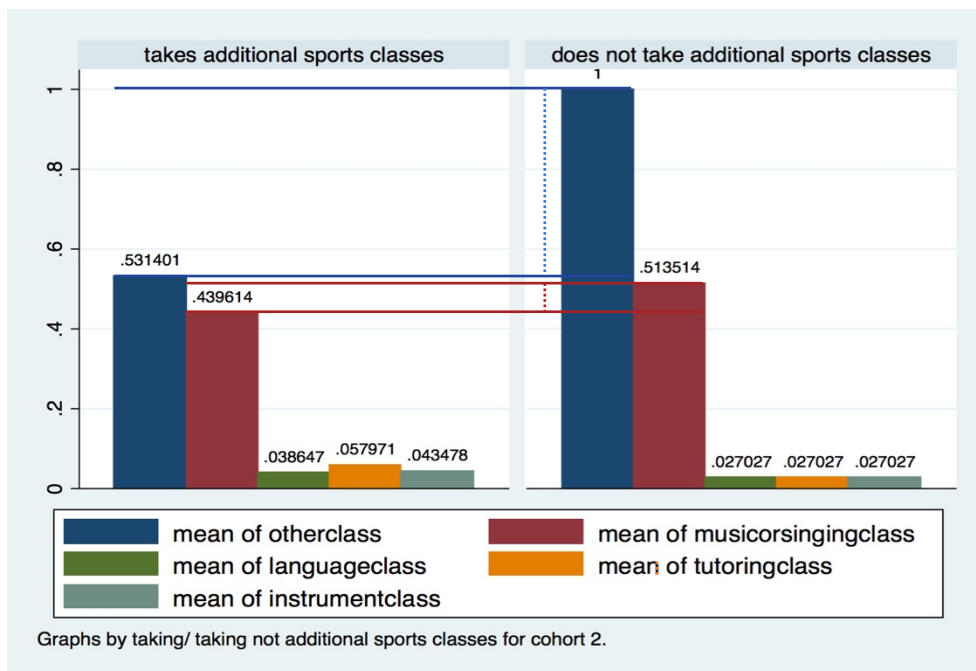
In the regression analyses on cohort 2 of the previous section (5.3.2), the variable *sport* has a negative association to each of the life skills. Further examinations still need to be done if keeping in mind the suggestions about possible more effective ways for adolescents enhancing their life skill development. One thought which can come to mind after graphing the rest of additional school classes is that there are possibly other activities outside of school which can positively impact an adolescent`s life skill. Through attending sports classes or other activities in the school setting the amount of leisure time can decrease. There is lesser time left for meeting friends outside the school or participating in other non-school activities. Possibly, this has a negative effect on enhancing life skills. Self-esteem, self-efficacy and sense of belonging can be stronger enhanced through the before mentioned activities and it would be interesting to further elaborate on that.

All in all, it can be that attending sports classes can lead to negative effects on the adolescent`s life skills. For the extra sports class attendees, the time for important leisure activities outside the school can possibly decrease. This in turn decreases the amount of other activities which can be more effective for improving the development of their life skills.

5.4. LIMITATIONS

Through using the survey question from 2006 about if the subject did take an additional sports class or not and measuring the target variables in 2009 it is hoped to better control for reversed causality. However, omitted variable bias is still prevalent and can lead to biased and inconsistent coefficient estimates in the regressions. All of them having impacted the life skill variables as well and thus questioning a correct estimate of the coefficients through the OLS regressions. Nevertheless, many literatures argue that sports can be positively associated to well-being and can be used for supporting beneficial child development if implemented correctly (Donnelly et al., 2007; Gould and Carson, 2008). Besides, there was an additional challenge in creating the target variables. None of the indicator variables for the life skill measures are the same for cohort 1 and cohort 2, which can be an additional reason for different values of the life skills among the two cohorts. Additionally, it is hard to create life skill averages based on the indicator variables as they all have to be standardized beforehand. Unfortunately, the extent of this thesis does not allow to go further into researching on how self-esteem, self-efficacy and sense of belonging should best be constructed in order to reflect least biased results. As a concluding remark it needs to be mentioned that considering all the limitations there is a need for collecting better data and research designs in order to make any proper statements.

6. DISCUSSION AND CONCLUDING REMARKS

This thesis analyses the relationship between sports and psychological child development on a qualitative as well as on a quantitative level. Using OLS regressions for analysing the children and adolescents participating in COCON the relationship between sports and life skills are presented. Although it was not possible to fully disentangle causal ordering among sports and

life skills, taking sports in the first period and the three life skills self-esteem, self-efficacy and sense of belonging in the second period it is hoped to partial out some of the effects.

Even though positive relations between sports and psychological child development are expected in literature, the coefficients show to be positive for one of the cohorts only. For cohort 2, which represents the adolescent part of the German and French speaking area in Switzerland, all the coefficients for sports are negative (except for self-efficacy where the sports variable is positive but non-significant). In an additional analysis on this negative relation, the graphs show noticeable differences in between the sports class groups within the two cohorts. On the one hand, in cohort 1 the group of the children who attended additional sports classes is much more active in other extra school classes than those not being involved in extra sports classes. On the other hand, the adolescents from cohort 2 who attended an additional sports class did participate less often in extra school classes. Adolescents use other ways for getting into contact with friends or that different activities enhance their self-esteem and self-efficacy. For example, activities out of school are much more efficient regarding the effects on their life skills and thus may be narrowed through spending time on extra sports classes. Packham and Street (2019) even claim that through standard physical education classes a decrease in school attendance could be found, which possibly concerns a dislike for those classes among the adolescents. The opposite could be the case for younger subjects. Children may be more affected by extra sports classes offered in school and use them for making new friends. Additionally, children are less independent in undertaking activities outside of the school setting than adolescents are. Thus, those classes create great opportunities for positively influence their sense of belonging, self-esteem and self-efficacy.

For the data of RTP one limitation is the inability to do a matching of the participating subjects. Even though the data was collected over two time points, the calculated mean values in Table 2.1 and 2.2 do not allow to be interpreted. Given that there was only a small sample collected from the camps, this all lead to the conclusion that the limitations are too big and that there is a need for a better dataset supporting this analysis. Also, a new research design should be implemented to be able to create a longitudinal study design enabling other methods for analysing the impacts.

Next to the limitations regarding quantitative measurements, the methods for analysing psychological traits of a child raises attention. Even after comparing different studies using

specific measurements for self-esteem and self-efficacy as well as using the methodologies from RTP`s project, it is hard to create average values for this rather psychological dimension. First of all, all the indicator variables used for a specific life skill have to be standardized. Secondly, as the survey questions for cohort 1 and cohort 2 mostly differed in between each other, there always is a need to again recreate and assess best possible survey questions to be able to construct the average target skill. It would be interesting to conduct further research on this topic and to further delve into the existing psychological measures for working on a more precise life skill constellation. However, the extent of this Bachelor thesis does not allow for further elaborating on that topic.

In the meta-analysis, several papers indicate the mechanisms of the influence of sports and physical activities on the life skill self-esteem. Overall, they show the existence of different mediators playing a role in this relationship. Besides the analysis of the relation between sports and self-esteem, some papers in the literature review do address different parts of child development. On the one hand, research on gender differences was done presenting differences in the effect of physical activity between male and female children. On the other, the need for evaluating specific types of sports methods as well as environmental structures in which a child is growing up are presented in some of the papers.

Overall bearing in mind all the limitations of each of the quantitative sections in this Bachelor thesis, it is important to note that these findings should not be considered if one wants to make general statements about the impact of sports on the well-being of children and adolescents. The crucial lesson of this thesis is that large and complete samples are needed to have adequate statistical power to analyse effects of sports on child development. Still, there are different research designs needed to be able to make causal claims regarding the two datasets. Nevertheless, this thesis hopes to motivate further research and to support ideas about the various interconnections on the relation of sports on child development.

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APPENDIX

Appendix 1.1. RTP mean values of the life skills by female children. *Iterated* indicators are occurring in the endline only.

Life Skill 6-13 years old	Indicator variables	Mean baseline N = 90	Mean endline N = 43
Self-esteem	OppResp, EmotControl, *knowhelp, conflictwhurt, eagerwell*	2.286	2.783
	Difference base- to endline		0.497
Self-efficacy	CompAct, TriesHard,	2.611	1.698
Sense of belonging	EaseFrend, FairTre, FamCare, FrnCare, *support, fitgood,*	2.645	2.686

Appendix 1.2. RTP mean values of the life skills by male children. *Iterated* indicators are occurring in the endline only.

Life Skill 6-13 years old	Indicator variables	Mean baseline N = 89	Mean endline N = 65
Self-esteem	OppResp, EmotControl, *knowhelp, conflictwhurt, eagerwell*	2.107	2.597
	Difference base- to endline		0.490
Self-efficacy	CompAct, TriesHard,	2.702	1.940
Sense of belonging	EaseFrend, FairTre, FamCare, FrnCare, *support, fitgood,*	2.521	2.784

Appendix 2.1. RTP mean value life skills by female adolescents. *Iterated* letters variables from the baseline.

Life Skill 12-18 years old	Indicator variables	Baseline (N = 68)	Endline (N = 44)
Self-esteem	FearLkDum, *feelgoodfuture, callyourselfleader*	1.059	2.574
	Difference base- to endline		1.515
Self-efficacy	TriesHard, CompAct,	2.613	2.667
Sense of belonging	EaseFrend, FairTre, FamCare, FrnCare,	2.459	2.463

Appendix 2.2. RTP mean value life skills by male adolescents. *Iterated* letters variables from the baseline.

Life Skill 12-18 years old	Indicator variables	Baseline (N = 89)	Endline (N = 45)
Self-esteem	FearLkDum, *feelgoodfuture, callyourselfleader*	1.045	2.709
		Difference base- to endline	1.664
Self-efficacy	TriesHard, CompAct,	2.606	2.645
Sense of belonging	EaseFrend, FairTre, FamCare, FrnCare,	2.573	2.450

Appendix 3.1. Descriptive table COCON cohort 1. Each value is rounded to the third decimal place.

Cohort 1	Indicators	SD	Min.	Max.
Number of individuals	344			
Female	190			
Males	154			
Birthyear	1999, 200			
Linguistic region				
German	274			
French	70			
Attendees extra sports class (2006)	264			
Intensity of attending sports class (2009)	*Mean: 0.73*	1.340	1	4
Feel-good	*Mean: 1.06*	0.566	1	2
Adaption	*Mean: 5.010*	1.150	1	6
Fear	*Mean: 2.855*	1.505	1	6
Sorrows	*Mean: 3.355*	1.280	1	6
Unhappy	*Mean: 2.799*	1.235	1	6
Get along well with others	*Mean: 5.667*	1.415	1	6
Hard time to find friends	*Mean: 1.500*	0.548	1	2

Appendix 3.2. Descriptive table COCON cohort 2

Cohort 1	Indicators	SD	Min.	Max.
Number of individuals	244			
Females	150			
Males	94			
birthyear	1999, 200			
share "Extra sports class" (2006)	274			
share "Extra sports class" (2009)	70			
Linguistic region	189			
German	55			
French				
Attendees extra sports class (2006)	37			
Attendees extra sports class (2009)	81			
Feel-good	*Mean: 4.746*	0.930	1	6
Adaption	*Mean: 5.340*	0.970	1	6
Fear	*Mean: 1.934*	1.639	1	6
Sorrows	*Mean: 3.05*	1.326	1	6
Unhappy	*Mean: 2.504*	1.235	1	6
Get along well with others	*Mean: 5.258*	0.843	1	6
Hard time to find friends	*Mean: 1.500*	0.548	1	2

Appendix 4. Definition of life skills by the online Cambridge Dictionary.

Life skill	Definition
Self-esteem	The belief and confidence in your own ability and value (Cambridge Dictionary).
Self-efficacy	The believe to be successful when carrying out a particular task (Cambridge Dictionary).
Sense of belonging	The feeling to be in the right place, to feel comfortable in a situation (Cambridge Dictionary).

Appendix 5. RTP life skills constellation by children, by adolescents.

Life skill RTP	Indicator variables baseline	Indicator variables endline
Children		
Self-esteem	OppResp, EmotControl	EmotControl, feelgoodfuture
Self-efficacy	CompAct , XTriesHard	CompAct , TriesHard, XTriesHard, knowhelp, finishactivity
Sense of belonging	EaseFrend, FamCare	support, fitgood, carefamily, carefriends
Adolescents		
Self-esteem	FearLkDm	feelgoodfuture, callyourselfleader
Self-efficacy	TriesHard, CompAct	TriesHard, CompAct, knowhelp
Sense of belonging	XNoSchFit, FairTre, EaseFrend, BelongSch, FairTre, FamCare, FrnCare	EaseFrend, FairTre, fitgood, care family, carefriends

Appendix 6.1.1. COCON self-esteem variables by cohort, by year (final version).

Life skill	Indicator variable	Renamed	Comments	Cohort (year)
COCON cohort 1				
Self-esteem	K11KV4	zählen2006	Gut zählen können	1 (2006)
	K11KV1a and 3a	freunde1/22006	Fragen zu Anzahl Freunde	1 (2006)
	K11KV4, 5, 50	zählen2006, wörterschreiben2006, wörterlesen2006	Kann zählen, Wörter lesen, Wörter schreiben	1 (2006)
	K13KV59	sorgen2009	Viele Sorgen haben	1 (2009)
	K13KV70	unglücklich2009	ist häufig unglücklich	1 (2009)
	K13KV82a	kindergenausoschlau2009	Zu glauben genau so schlau wie andere zu sein	1 (2009)
	K13KV84a	kinderzufrieden2009	Kinder die mit sich selbst zufrieden sind	1 (2009)
	K14KV11a	zufriedensein2011	Zufrieden mit sich selbst sein	1 (2011)
	K14KV16a	nichtvielwert2011	Gefühl nicht viel wert zu haben	1 (2011)
	K14KV21a	guteeigenschaften2011	Gute Eigenschaften haben	1 (2011)
	K14KV24a	seltenstolz2011	Selten stolz auf sich sein	1 (2011)
	K14KV59	sorgen2011	Viele Sorgen haben	1 (2011)
COCON cohort 2				
Self-esteem	K21KV11	zufriedensein20062	Zufrieden mit sich selbst sein	2 (2006)
	K21KV14	versager20062	Gefühl nicht viel Wert zu haben	2 (2006)
	K21KV16	nichtvielwert20062	Gefühl nicht viel Wert zu haben	2 (2006)
	K21KV21	guteeigenschaften2006 2	Gute Eigenschaften haben	2 (2006)
	K21KV22	beliebtsein20062	Bei Gleichaltrigen beliebt sein	2 (2006)
	K23KV11	zufriedensein20092	Zufrieden mit sich selbst sein	2 (2009)
	K23KV14	versager20092	Sich für einen Versager halten	2 (2009)
	K23KV16	nichtvielwert20092	Gefühl nicht viel Wert zu haben	2 (2009)
	K23KV21	guteeigenschaften20092	Gute Eigenschaften haben	2 (2009)
	K23KV24	stolzsein20092	Stolz auf sich sein	2 (2009)
	K24KV11	zufriedensein20092	Zufrieden mit sich selbst sein	2 (2009)
	K24KV128	guteeignschaften20092	Gute Eigenschaften haben	2 (2009)
	K24KV11	zufrieden20122	Zufrieden mit sich selbst sein	2 (2012)
	K24KV16	nichtvielwert20122	Gefühl nicht viel Wert zu haben	2 (2012)
	K24KV21	guteeigenschaften20122	Gute Eigenschaften haben	2 (2012)

Appendix 6.1.2. COCON self-efficacy variables by cohort, by year (final version).

Life skill	Indicator variable	Renamed	Comments	Cohort (year)
COCON cohort 1				
Self-efficacy	K13KV77, 78	bessermachen1, 22009	Es immer besser machen zu wollen	1 (2009)
	K13KV79	derbestesein2009	Der Beste zu sein wollen	1 (2009)
	K13KV100	anstrengenschule2009	Gut in der Schule sein wollen	1 (2009)
	K13KV101	hartnäckigbleiben2009	Persistenz in lösen einer Aufgabe	1 (2009)
	K13KV103	sauberbeenden2009	Etwas immer gut beenden zu wollen	1 (2009)
	K13KV107	mindestemachen2009	Nur das Minimum für Schule machen	1 (2009)
	K13KV108	fleissiglernen2009	Alles beim Lernen zu geben	1 (2009)
	K13KV110	durchhalten2009	Auch bei schweren Aufgaben nicht aufzugeben	1 (2009)
	K14KV77	bessermachen2011	Es immer besser machen zu wollen	1 (2011)
	K14KV79	derbestesein2011	Der Beste sein wollen	1 (2011)
	K14KV100	anstrengenschule2011	Immer das Beste geben	1 (2011)
	K14KV101	hartnäckigbleiben2011	Bei einer Aufgabe dran bleiben	1 (2011)
	K14KV103	sauberbeenden2011	Persistenz in lösen einer Aufgabe	1 (2011)
	K14KV107	mindestemachen2011	Nur das Minimum für Schule machen	1 (2011)
	K14KV108	fleissiglernen2011	Alles beim Lernen zu geben	1 (2011)
	K14KV110	durchhalten2011	Auch bei schweren Aufgaben nicht aufzugeben	1 (2011)
COCON cohort 2				
Self-efficacy	K21KV100	anstrengenschule20062	Sich in der Schule anstrengen	2 (2006)
	K21KV103	sauberbeenden20062	Etwas immer gut beenden zu wollen	2 (2006)
	K21KV107	mindestemachen20062	Nur das Minimum für Schule machen	2 (2006)
	K21KV108	fleissiglernen20062	Alles beim Lernen zu geben	2 (2006)
	K21KV110	durchhalten20062	Auch bei schweren Aufgaben nicht aufzugeben	2 (2006)
	K23KV120	willegutschule20092	Gut in der Schule sein wollen	2 (2009)
	K23KV127	mindestemachen20092	Nur das Minimum für Schule machen	2 (2009)
	K23KV128	fleissiglernen20092	So fleissig wie möglich lernen	2 (2009)
	K23KV130	durchhalten20092	Auch bei schweren Aufgaben nicht aufzugeben	2 (2009)
	K23KV133	hartnäckigbleiben20092	Persistenz in lösen einer Aufgabe	2 (2009)
	K24KV120	anstrengenschule20122	Gut in der Schule sein wollen	2 (2012)
	K24KV123	hartnäckigbleiben20122	Auch bei schweren Aufgaben nicht aufzugeben	2 (2012)
	K24KV127	mindestemachen20122	Nur das Minimum für Schule machen	2 (2012)
	K24KV128	fleissiglernen20122	Alles beim Lernen zu geben	2 (2012)
	K24KV130	durchhalten20122	Auch bei schweren Aufgaben nicht aufzugeben	2 (2012)
	K24KV133	hartnäckigbleiben20122	Persistenz in lösen einer Aufgabe	2 (2012)

Appendix 6.1.3. COCON sense of belonging variables by cohort, by year (final version).

Life skill	Indicator variable	Renamed	Comments	Cohort (year)
COCON cohort 1				
Sense of belonging	K11KV1a,3a	freunde1,22006	Immer viele Freunde haben	1 (2006)
	E11PV8	engefreunde2006	Enge Freunde	1 (2006)
	K11KV51	mitspielen2006	Wird gefragt ob mitspielen möchte	1 (2006)
	E13PV8	engefreunde2009	Enge Freunde haben	1 (2009)
	K13KV65	beliebt2009	Unter Gleichaltrigen beliebt sein	1 (2009)
	K13KV73	ausgeschlossenwerden2011	Von anderen Kindern ausgeschlossen werden	1 (2009)
	K13PV1	freunde2009	Immer viele Freunde haben	1 (2009)
	K14PV2b	engefreunde2011	Enge Freunde haben	1 (2011)
	K14KV22a	beliebt2011	Unter Gleichaltrigen beliebt sein	1 (2011)
	K14KV73	ausgeschlossenwerden2011	Von anderen Kindern ausgeschlossen werden	1 (2011)
COCON cohort 2				
Sense of belonging	K21KV18	oftalleine20062	Oft alleine sein	2 (2006)
	K21KV22	beliebt20062	Unter Gleichaltrigen beliebt sein	2 (2006)
	K23KV18	oftalleine20092	Oft alleine sein	2 (2009)
	K23KV21	beliebt20092	Unter Gleichaltrigen beliebt sein	2 (2009)
	K24KV18	oftalleine20122	Oft alleine sein	2 (2012)
	K24KV22	beliebt20122	Unter Gleichaltrigen beliebt sein	2 (2012)

Appendix 6.2. Further explanations for the index variables from the regression tables 3 and 4. All the values are given through the individual`s self-perception.

English	Comments
Sport	Extra sports class in 2006
Sport*male	Interaction term sports times male individuals
Feel-good	Intensity about how good he/ she feels
Adaption	Intensity about the ability fot adapting to new situations
Fear	Having fears
Sorrows	Having sorrows
Unhappy	Feeling unhappy
Messy	Being messy
Negligent	Being negligent
Good traits	Having good traits
Get along well	To get along well with other children/ adolescents
Friends scale	Intensity of the number of friends
Hard friends	Having a hard time to make friends
Often alone	Feeling often alone
Decision-making	Strength of decision-making
Feeling confident	To feel confident
Expectation math	Expectations of the care givers of having good math grades
Future wish	Own wish for educational career
Linguistic region	The language spoken in the area of residence
Occupation care giver	Intensity of the responsibility in a job
Future wish care giver	Future wish of the care giver for their children`s career path
Occupation father	The occupation of the father
Occupation mother	The occupation of the mother

Appendix 7.1. Pairwise correlation matrix on self-esteem, sports and gender for cohort 1.

Correlations	(1)	(2)
(1) Self-esteem	1.000	
(2) Sport	**0.062**	1.000
	0.267	
(3) Male	**0.119***	0.230*
	0.033	0.000

Level of significance: * p<0.05

Appendix 7.1.1 Regression on self-esteem without the variable of interest sport for cohort 1.

Self-esteem	(1)	(2)
Male	**0.0800*** **	**0.0556***
	(0.0301)	**(0.0300)**
skalafühlen		-0.0122
		(0.0104)
schulallangep		0.0123*
		(0.00642)
angst		-0.00578
		(0.00949)
sorgen		0.00504
		(0.0127)
unglücklich		-0.0229*
		(0.0132)
gutausko		-0.000503
		(0.0127)
gradfreundefi		0.0357
		(0.0318)
schwerfreundefi		0.0738**
		(0.0308)
sprachregio		0.158***
		(0.0367)
erwerbsst		0.00736
		(0.0293)
_cons	1.286***	1.085***
	(0.0195)	(0.141)
N	343	343
adj. R²	0.018	0.094

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Appendix 7.2. Pairwise correlation matrix on self-efficacy, sports and gender for cohort 1.

Correlations	(1)	(2)
1) Self-efficacy	1.000	
(2) Sport	**0.134***	1.000
	0.016	
(3) Male	**0.103**	0.230*
	0.065	0.000

Level of significance: * p<0.05

Appendix 7.2.1. Regression on self-efficacy without the variable of interest sport for cohort 1.

Self-efficacy	(1)	(2)
Male	**0.114**	**0.0673**
	(0.0785)	**(0.0787)**
skalafühlen		0.0972***
		(0.0186)
schulallangep		0.123***
		(0.0171)
angst		-0.0594**
		(0.0302)
sorgen		0.0661*
		(0.0380)
unglücklich		-0.0106
		(0.0367)
gutausko		-0.0792***
		(0.0183)
gradfreundefi		-0.00218
		(0.0911)
schwerfreundefinden		0.151*
		(0.0823)
sprachregio		-0.0576
		(0.0941)
erwerbsstatus		0.00372
		(0.0889)
		(0.0282)
_cons	4.339***	3.530***
	(0.0551)	(0.284)
N	344	344
adj. R²	0.003	0.084

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Appendix 7.3. Regression on sense of belonging without the variable of interest sport for cohort 1.

Sense of belonging	(1)	(2)
Male	**0.0355**	**0.0257**
	(0.0296)	**(0.0285)**
sport		-0.00211
		(0.00697)
skalafühlen		-0.0391***
		(0.00702)
schulallange		-0.0393***
		(0.00530)
angst		0.0100
		(0.00100)
sorgen		-0.0118
		(0.0141)
unglücklich		0.0519***
		(0.0133)
gutauskom		0.0181**
		(0.00838)
gradfreundefi		-0.0241
		(0.0322)
schwerfreunde		-0.0241
		(0.0290)
sprachregio		0.0870***
		(0.0336)
erwerbsst		-0.0478
		(0.0300)
_cons	0.587***	0.315***
	(0.0197)	(0.117)
N	321	321
adj. R²	0.001	0.096

Standard errors in parentheses
* p<0.10, ** p<0.05, *** p<0.01

Appendix 8.1. Pairwise correlation matrix on self-esteem, sports and gender for cohort 2.

Correlations	(1)	(2)
(1) Self-esteem	1.000	
(2) Sport	**-0.157***	1.000
	0.014	
(3) Male	**0.149***	-0.174*
	0.020	0.007

Level of significance: * p<0.05

Appendix 8.2. Pairwise correlation matrix on self-efficacy, sports and gender for cohort 2.

Correlations	(1)	(2)
(1) self-efficacy	**1.000**	
(2) Sport	**0.029**	1.000
	0.649	
(3) Male	**-0.189***	-0.174*
	0.003	0.007

Level of significance: * p<0.05

Appendix 8.3. Pairwise correlation matrix on sense of belonging, sports and gender for cohort 2.

Correlations	(1)	(2)
(1) Sense of belonging	1.000	
(2) Sport	**-0.118**	1.000
	0.068	
(3) Sex	**0.044**	-0.174*
	0.500	0.007

* shows significance at the .05 level