

**6<sup>th</sup> icCSBs 2017**  
**The Annual International Conference on Cognitive - Social,  
and Behavioural Sciences**

**CORRELATION BETWEEN SELF-CONCEPT AND THE LEVEL  
OF MOTOR SKILLS IN CHILDREN**

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*Abstract*

The level of motor skills is an important indicator when evaluating children's readiness for school attendance. The deficit in the area of motor skills can lead to a decrease in children's activities. Is there a relationship between the level of motor skills and factors of self-concept in children attending lower levels of primary schools? The aim of this research is to analyze the relationship between the level of motor skills and factors of self-concept in children attending lower levels of primary schools, especially at the middle school age. The research sample consisted of 300 pupils (149 boys, 151 girls) of middle school age. The level of motor skills (locomotor and manipulative) was monitored by the TGMD-2 test (Ulrich, 2000). The self-concept factors were measured by using the Piers-Harris questionnaire (Piers & Herzberg, 2009). Based on the results, which were realized within the IGA\_PdF\_2017\_002 project, no significant relationship was detected between the levels of motor skills and self-concept. The importance of the research lies mainly in identifying targeted interventions in the area of children's motor skills and development of self-concept factors, which can support adaptive behaviour in the first years of compulsory school attendance.

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**Keywords:** Children, self-concept, gross motor skills.



## 1. Introduction

There is a limited body of research in the Czech Republic on the cognitive and motor skills in children in lower levels of primary schools. Hence, this research focuses on the relationship between self-concept, which is definitely a part of cognitive component, and gross motor skills. The self-concept construct is vital to psychological well-being and is the term used to describe an individual's awareness of their qualities and limitations (Craven & Marsh, 2008). Another definition is that self-concept is a psychological construct of how people perceive themselves and is "essentially phenomenological in nature" (Piers & Herzberg, 2002). Newer views postulate that self-concepts are seen as appraisals because they imply the abilities that are necessary to exert control over one's learning and behavior (Lohbeck, Tietjens & Bund, 2016). The Piers-Harris Children's Self-Concept Scale 2 (Piers-Harris 2) was chosen as a data collection instrument for this study because of its multifaceted and hierarchical characteristics as well as descriptive and evaluative dimensions (Piers & Herzberg, 2002; Gang, 2005). Furthermore, its design seems to match younger children's cognitive and developmental abilities.

According to the literature, children have the ability of describing and evaluating themselves from very young age (Marsh, Ellis & Craven, 2002). But, on the other hand, according to Butler & Gasson (2005) it is hard to draw a clear line between self-descriptions and self-evaluations. From the developmental point of view, self-concept becomes more abstract and integrated with age. Children in middle to late childhood (ages 8 to 11) can label their abilities and interpersonal characteristics, have comparative assessment with peers, and integrate opposing attributes (Evans & Roberts, 1987).

This study does not focus only on cognitive part, as a substantial body of research also focuses on physical activity and its benefits for young children. Literature suggests that physical activity can improve mental health (Penedo & Dahn, 2005; Hassmén, Koivula & Uutela, 2000), including depression, anxiety, self-esteem, self-concept, anger, stress, executive function and so on (Davis, Tomporowski, McDowell, Austin, Miller, Yanasak, et al., 2011; Holley, Crone, Tyson & Lovell, 2011; Alpert, Field, Goldstein & Perry, 1990). From a health perspective, higher levels of gross motor skills is associated with enhanced cognitive and social development and language skills (Best, 2010; Piek J, Dawson L, Smith L, et al., 2008; Leonard & Hill, 2014). This evidence supports the premise that physical activity and self-concept could be connected.

The importance of physical activity and development of motor skills has also been established extensively in the literature. The successful development of motor skills allows mastering of complex motor skills, but also improves nervo-muscular coordination and development of interpersonal, cognitive and emotional abilities (Pang & Fong, 2009). Children who actively participate in many types of sports and physical activities experience benefits to their movement skill performance and psychological outlook, compared to children who have experienced a less diverse range of sporting activities (Bridge & Toms, 2013; Côté & Fraser-Thomas, 2007; Wall & Côté, 2007). Such research findings support the potential of physical education at Czech schools. However, if the children and their teachers are limited to only two lessons of physical activity per week, then it would be a miracle if the children enjoy any benefits of the physical activities. Such a minimal duration for movement development usually does not even cover the basic motor skills. This is, for the researcher, a very serious issue, given the stated benefits physically as well as psychologically for the children. If the duration for physical education in schools

increases, children could engage in more physical activities and experience the wholesome benefits as mentioned in all the research undertaken in this area.

## **2. Problem Statement**

During physical education lessons, self-assessment regularly occurs because, as children try new skills, their physical skills are constantly on display to their peers. This can lead to feelings of both success and failure which will directly affect children's self-concept and its development (Gehris, Kress, & Swalm, 2010; Goodwin, 1999). This concurs with the study of Schmidt, Blum, Valkanover & Conzelmann (2014) who state that being rejected or disliked by peers can lower self-esteem. Jenni et al. (2013) found positive correlations between motor and intellectual functions. This paper focuses on correlations between motor skills and self-concept.

In general, those who regularly engage in some kind of physical activity tend to have a better self-concept, particularly as regards their physical ability and physical fitness, than those who do so less frequently (Biddle, Whitehead, O'Donovan, and Nevill, 2005; Contreras, Fernández, García, Palou, and Ponseti, 2010). Participation in physical activity may improve psychological health and help prevent and treat the development of mental health disorders such as depression and anxiety (Ströhle, 2009; Biddle & Asare, 2011; Brown, Pearson & Braithwaite, et al., 2013). Evans & Roberts (1987) state that children could gain peer acceptance by participating in an activity which is valued highly by children of the same age. This activity could be also some kind of physical activity. Conversely, Bierman (2004) suggests that peer rejection could cause long-term harm in terms of self-concept. Evidence is beginning to accumulate showing that in adolescence, self-concept might play a significant mediational role in how mastered motor skills influence social and emotional well-being, specifically anxiety and depression (Rigoli, Piek, & Kane, 2012).

## **3. Research Questions**

This research aims to answer two basic research questions:

- 3.1. Does self-concept correlate with the level of gross motor skills in children aged between 9 to 11 years?
- 3.2. Do boys have higher levels of gross motor skills than girls?

## **4. Purpose of the Study**

The purpose of the research was to identify the relationship between the level of primary school pupils' self-concepts and their motor skills. Further, the research focused on the differences between boys and girls in the level of their gross motor skills. Since in the Czech Republic, physical education is rather neglected, findings about the benefits of physical activity at schools could change this situation. Therefore, this study focused on the role of motor skills on self-concept of children. Self-concept is connected to cognitive skills and also with academic achievement; this means that improvement in this area could lead to higher academic achievements and other accrued benefits (Donnelly & Lambourne, 2011; Hillman, Kamijo & Scudder, 2011). International researchers have established the importance of

physical education, because Payne & Isaacs (2011) and Akbari et al. (2009) both say that basic motor skills represent an important part of physical education programs in pre-primary and primary education. In the Czech Republic, unfortunately, the political representatives do not share the same idea.

The literature in this area has already established that during physical education lessons self-assessment regularly occurs because, as children try new skills, their physical skills are constantly on display to their peers leading to a sense of accomplishment and the subsequent development of their self-concept. Of course, in failing to master certain physical skills, children may also feel dejected if they are rejected by their peers which can affect their self-concept. However, generally, at such young ages, this scenario is rare, with children mostly engaged in having fun and enjoying themselves while engaged in physical activities. It is very rare at this age for children to be extremely competitive.

#### **4.1. Gender difference in gross motor skills**

The physical education lessons in lower levels of primary schools in the Czech Republic are all co-educationally conducted, suggesting that the level of gross motor skills should be probably the same between boys and girls. Surprisingly, the literature states otherwise. Chase & Dummer (1992), Chase & Machida (2011), Evans & Roberts (1987) say that there is striking evidence that being good at sports and being physically skillful are important factors, primarily for male popularity. Boys usually achieve a higher performance in most physical domains as their physique is more muscular compared to girls' (Kromholz, 2015). This contention may be challenged in the case of children in lower levels of primary schools because, according to their natural physical growth, there are no significant differences in physique between genders until the children are roughly 13 years old. Based on this, this study aimed to identify the differences (if any) between genders at this age.

## **5. Research Methods**

### **5.1. Research group**

300 pupils from lower levels of primary schools (151 girls, 149 boys) formed the sample for the study. The average age of the sample was  $9.90 \pm 1.03$  years (girls  $9.67 \pm 1.00$ , boys  $9.71 \pm 1.05$ ). No child was handicapped. The study was conducted from March to May 2017 in primary schools in the Czech Republic. The research was approved by the Ethical Committee of author's institution (N 03/17). Legal representatives (children's parents) were informed about aims, methods and process of research before the onset of the research. The anonymity of obtained data was declared and all queries about the research were answered by the author. After that, the children's legal representatives confirmed their agreement about participation of their children in the research. Obtained data were then processed anonymously. Possible questions from children were answered adequately to their age. The participation in the research was voluntary, without reward and no benefits for participants. The sample could interrupt or stop their participation during the research anytime. Data was obtained within the project IGA\_PdF\_2017\_002.

## 5.2. Research methods and techniques

Data about Self-concept was collected through the use of the standardized questionnaire Piers-Harris Children 's Self-Concept Scale 2 (Piers & Herzberg, 2009). The sample was divided based on their T-score into categories. The category of high scores ( $\geq 60T$ ) are created by children who evaluate themselves strongly and positively. They are confident about their skills and as a result, they are likely participate in many activities and do not hesitate to try out new things. They are also highly motivated to achieve their aims. Children in the average score (40–59T) category usually have similar self-esteem with their peers, while children in the low score ( $\leq 39T$ ) category have serious doubts about themselves.

The level of gross motor skills was monitored through the Test of Gross Motor Development-2 (Ulrich, 2000). The test consists of two subtests: locomotor skills and manipulative skills. Obtained standard scores were converted on percentile and motor quotient (Gross motor quotient – GMQ). Based on the GMQ, the level of motor skills was assessed in following categories: very superior ( $>130$  points), superior (121–130 points), above average (111–120 points), average (90–110 points), below average (80–89 points), poor (70–79 points), very poor ( $< 70$  points).

## 5.3. Statistical analysis

Basic statistic values about the sample (number of girls and boys, average, height, weight, age) were expressed by obtaining the average and standard derivation. Self-concept score and GMQ were assessed based on current methodology (Piers & Herzberg, 2009; Ulrich, 2000). The independent variable was the level of motor skills while the dependent variable was the level of self-concept. The relationship between the level of gross motor and self-concept was detected through Spearman correlations. Differences in GMQ between girls and boys were detected through the Mann-Whitney U-test. The level of significant importance was set at  $p < 0.05$ . Data were processed using the software STATISTICA, version 13.0 (StatSoft).

## 6. Findings

The findings revealed no significant relationship between GMQ and self-concept as well as between GMQ and self-concept according to the gender of pupils.

### 6.1. Gender difference in gross motor skills

Mann-Whitney test indicates that level of GMQ between girls and boys are significantly different ( $U = 1016.50$ ;  $p = 0,006$ ). Girls showed significantly higher level of motor skills than boys ( $p < 0.05$ ). This could be caused by the fact that girls in this age group are generally more physically and cognitively developed than boys, according to developmental psychology. In the Czech Republic, mixed sport competitions are held until the age of 13 as it is understood that both genders should be on the same physical level. Not only are sport competitions mixed, but as mentioned earlier, the physical education lessons in primary schools are also mixed. But, probably because the average age was under 10 years, this could mean that girls at this age are more physically developed thus showing higher level of gross motor skills.

The research was limited by the fact that it was not conducted with a representative sample, because the researcher was dependent on the written agreement of children's legal representatives and the research focused only on one region of the Czech Republic.

**Table 01.** Children divided into categories according to GMQ Standard Score

GMQ Standard Score	Descriptive rating	Number of children
>130	Very Superior	2
121-130	Superior	10
111-120	Above Average	24
90-110	Average	161
80-89	Below Average	78
70-79	Poor	23
<70	Very Poor	2

The table above shows a normal decomposition in the research group. However, it is quite worrying that the top category has only two children, and altogether, only 36 children from the overall number of 300 pupils reached categories which are above average, which comprises only 12% of the total. On the other hand, the below average category has much more children (n=103) equivalent to 34% of the total, meaning that the average category has 54% of the total. Hence, the results concur with the earlier discussion, that limited time for physical education lessons, on top of huge number of pupils in classes and other related issues are displayed in these findings from only one region in the Czech Republic.

Table 02. shows the results about Self-concept. The largest group is in the second category, which could be compared to average score. According to the questionnaire manual those children usually have similar self-esteem with their peers. Based on the results, 14 children (7 girls, 7 boys) belong to the last category and should undergo a visit at the specialist (doctor).

**Table 02.** Research group according to Self-concept, n=300

Category of self-concept	All	Girls	Boys
1	9	3	6
2	213	97	116
3	64	41	23
4	14	7	7

## 7. Conclusion

Research has already established the relationship between cognitive skills, self-concept and physical activity. This study has clearly revealed that children in the Czech Republic are not receiving the wholesome value of physical education in their schools which is a deterrent to the development of their self-concept and cognitive skills. This, added to the fact that physical education is neglected in the Czech Republic, is a very worrying situation in terms of the potential development of children. The fact is that

physical education is an integral component in the development of children and their successful integration into school groups. This study, though limited to only one region in the Czech Republic, is proof that physical activity plays a vital role in the development of children's self-concept and cognitive skills. More extensive research should be conducted on a larger number of children covering a wider area in the Czech Republic would reveal the extent of the damage to children's development due to the school policies on physical education.

## Acknowledgments

I would like to thank all the representatives of schools without whose permission this study would not have been completed and also all teachers for their kind cooperation.

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