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Motor skills in context of popularity in a group of school classes in children

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Abstract

Self-concepts of very young children are consistently high but that with increasing life experience, and children learn their relative strengths and weaknesses, so that mean levels of self-concept decline, multiple dimensions of self-concept become more differentiated. Self-concepts become more highly correlated with external indicators of competence (skills and accomplishments). Well-developed motor abilities lead to positive feedback from significant others (teachers, parents, peers) which are related to positive emotions and motivation for physical activity. The data were measured by Piers–Harris questionnaire, and the level of motor skills was monitored by TGMD – two tests within the project IGA_PdF_2017_002. The research group consisted of 300 pupils (149 boys and 151 girls) in the middle school age (9–11 years). Based on the research results, we can say that the level of gross motor skills contributes on child's adaptation in the group of school classes. It is necessary to examine this area further, support physical activity of children in young school age and intentionally develop children's motor skills.

Keywords: Primary school, children, school class, gross motor skills.

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1. Introduction

Perceived popularity, ability of making friendships and feeling of being part of the class activities like games and sports are the keywords which are hidden under the term popularity in our case. According to Piers and Herzberg (2009), popularity is one part of the self-concept. There are many definitions of self-concepts, but we pick up just a few. 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). Hierarchical model of self-concept is a multidimensional construct made up of specific domains related to academic school subjects (Mathematics and German) and non-academic domains (social, emotional and physical); therefore, self-concept is a person's perceptions of himself or herself, namely, what a person thinks about himself (Shavelson, Hubner & Stanton, 1976). 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 view postulates that self-concepts are seen as such appraisals because they imply the abilities that are necessary to exert control over one's learning and behaviour (Lohbeck, Tietjens & Bund, 2016). According to Piaget (Philips, 1981), children from age 6 to 7 till age 11 to 12 are in the concrete operational thought stage of cognitive development. Children at this stage tend to use concrete materials to facilitate their abstract cognitive operations. Pure verbal or written descriptions of abstract concepts may be difficult to comprehend for young children. This could be a reason why most of the self-concept scales are designed for children older than 8 years old (Butler & Gasson, 2005). The Piers–Harris Children's Self-Concept Scale 2 (Piers-Harris 2) was chosen for this study because of its multi-faceted and hierarchical characteristics as well as descriptive and evaluative dimensions (Gang, 2005; Piers & Herzberg, 2002) and its design seems to match younger children's cognitive and developmental abilities.

Children have the ability of describing and evaluating themselves from very young age (Marsh, Ellis & Craven, 2002). But according to Butler and 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. Harter (1999) suggested that children at a very young age, usually from three to four years old, typically describe themselves in concrete and observable terms and lack cohesive self-representations. With cognitive and language development, children aged 5 to 7 can elaborate taxonomic attributes and competencies and link the opposites. Children in middle to late childhood (ages from 8 to 11) can label their abilities and inter-personal characteristics, have comparative assessment with peers and integrate opposing attributes. One way of gaining peer acceptance is to be competent in an activity that is valued highly by children of the same age (Evans & Roberts, 1987). Therefore, participation in sports can be a context in which children can satisfy their need for affiliation, acceptance and popularity among their peers. Previous research has shown that children's physical activity, and their perceived and actual motor competence, is associated with perceived social acceptance (Daniels & Leaper, 2006). Literature suggests that physical activity can improve mental health (Hassmen, Koivula & Uutela, 2000; Penedo & Dahn, 2005), including depression, anxiety, self-esteem, self-concept, anger, stress, executive function and so on (Alpert, Field, Goldstein & Perry, 1990; Holley, Crone, Tyson & Lovell, 2011).

Basic motor skills present an important part of physical education programs in pre-primary and primary education (Akbari et al., 2009; Payne & Isaacs, 2011). Successful development of motor skills allows mastering of complex motor skills, but also improves nerve-muscular coordination and development of interpersonal, cognitive and emotional abilities (Pang & Fong, 2009). There is also the evidence that gross motor coordination influences the success rate of school achievement, but it differs according to school subjects (Cheng, Chen, Tsai, Shen & Cherng, 2011; Wocaldo & Rieger, 2008). The benefits of physical activity on cognitive skills is also evident in Huang et al. (2015) and Tomporowski, Davis, Miller and Naglieri (2008) who state that children with higher physical fitness gain better results in cognitive tests than children with lower physical fitness. Some researchers have highlighted the physical and psychological benefits of physical activity for health, well-being and active

lifestyles in young children (Goodway et al., 2014; Vedul-Kjelsís, Sigmundsson, Stensdotter & Haga, 2012). Physical activity reduces the feeling of boredom and leads to increased concentration and attention (Shephard, 1996) and also increases the feeling of satisfaction and self-confidence (Taras, 2005). The majority of children report regularly taking part in sports during their leisure time and physical activity often reaches a peak during the transition into adolescence, about 11–14 years of age in boys and 10–12 years of age in girls (Malina & Little, 2008). Children who actively participate in many types of sports and activities see benefits to their movement skill performance and psychological outlook, compared to children who have experienced a less diverse range of sporting activities (Cote & Fraser-Thomas, 2007; Wall & Cote, 2007). During PE, lessons regularly occur in self-assessment 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 and will directly affect children's self-concept and its development (Gehris, Kress & Swalm, 2010; Goodwin, 1999). This agrees with the study of Schmidt, Blum, Valkanover and Conzelmann (2014) who state that being rejected or disliked by peers can also lower self-esteem. This all means that also their perceived popularity and social skills could be affected.

There is striking evidence that being good at sports and being physically skillful are important factors, primarily for male popularity (Chase & Dummer, 1992; Evans & Roberts, 1987). Boys usually reach higher achievement in most physical domains as they often hold a higher muscular body than girls (Krombholz, 2015). Boys tend more often to play in large groups, whereas girls engage more in dyadic interactions and maintain more intimate relationships (Rose & Rudolph, 2006). Also, the score of gross motor skills significantly correlates with written performance in boys (Chagas, Leporace & Batista, 2016). Girls are often stereotyped as weak, graceful, emotional and dissatisfied with their body, whereas boys are more equated with characteristics such as strong, forceful, dominating, brave and competitive (Chase & Machida, 2011).

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 & Nevill, 2005). Children with stronger beliefs about their physical characteristics are more likely to engage in physical activity than those who report lower levels of physical self-concept (Barnett, Morgan, van Beurden & Beard, 2008; Eccles & Harold, 1991). Researches have demonstrated that physical activity may provide physiological and psychological benefits (Brown, Pearson, Braithwaite, Brown & Biddle, 2013; Dishman et al., 2006). Participation in physical activity may improve psychological health and help prevent and treat the development of mental health disorders such as depression and anxiety (Strohle, 2009).

2. The aim of the research

The aim of the research was to evaluate the relationship between pupils' level of gross motor skills and level of popularity in the social group – at the school-class. The following are the two research questions that were solved during the research:

1. Does higher level of gross motor skills predict higher level of popularity in children?
2. Is there any difference in gross motor performance between boys and girls?

3. Methods

3.1. Research group

The research group consisted of 110 pupils from lower level of primary school (64 girls and 46 boys). Average age of the probands was 9.67 ± 0.91 years (girls 9.77 ± 0.96 and boys 9.54 ± 0.84). Height and weight were normal according to WHO child-growth standards (http://www.who.int/childgrowth/standards/Technical_report.pdf). No child was handicapped. The project was realised from March to May 2017 on primary schools in the Czech Republic. The research was approved by

Ethical Committee of author's authorities. Legal representatives (children's parents) were informed about aims, methods and process of research before the start of the research. Also, the anonymity of obtained data was declared. All questions about research were answered by researchers. After that legal representatives confirmed the agreement about the participation of their children in the research. Obtained data were 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 pupils could interrupt or leave their participation during the research anytime. Data were obtained within the project IGA_PdF_2017_002.

3.2. Research methods and techniques

Data about the perceived popularity were collected by the standardised questionnaire Piers-Harris Children's Self-Concept Scale 2 (Piers & Herzberg, 2009). In the mentioned category – Popularity – are probands divided based on their T-score into the following categories: above average range (≥ 56 T), average range (40–55 T) and low range (≤ 39 T). The level of gross motor skills was monitored by Test of Gross Motor Development-2 (Ulrich, 2000). The test consists of two subtests: locomotor skills and manipulative skills. Obtained standard scores are converted on percentile and motor quotient [Gross motor quotient (GMQ)]. Based on GMQ, the level of motor skills is assessed in the 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) and very poor (<70 points).

3.3. Statistical processing

Basic statistic values about research group (number of girls and boys, average, height, weight and age of probands) are expressed by average number and standard derivation number. Score of popularity, standard score and GMQ was assessed based on current methodology (Piers & Herzberg, 2009; Ulrich, 2000). The relationship between the level of gross motor skills and the perceived popularity was found by Spearman correlation coefficient. The differences in the level of gross motor skills between boys and girls were detected by Mann–Whitney U-test. The level of significant importance was declared on $p < 0.05$. Data were processed by software STATISTICA, version 13.0 (StatSoft).

4. Results and discussion

Physical activities influence cognitive functions in children, which could lead to improved school achievement (Donnelly & Lambourne, 2011; Hillman, Kamijo & Scudder, 2011). This statement is confirmed by Ericsson and Karlsson (2014) who postulate that everyday school physical education and training of motor skills during the compulsory school attendance lead to increased motors skills and also increased school achievement. There is the research group divided into categories according to GMQ in Table 1. The highest number of pupil is in the average category and surprisingly high number of children scored below average or poor (Table 1). This could be caused by the fact that in the Czech Republic children are not exposed to everyday physical education lessons but only to two school lessons per week (together hour and half per week). The unsatisfying knowledge from this research is that only eight pupils have above average motor skills. This could be the result of their attendance in sport clubs. But also these children should report at least superior or very superior motor skills, because in sport clubs they should experience more complex exercise and physical activity.

Table 1. Children divided into categories according to GMQ standard score

GMQ standard score	Descriptive rating	Number of pupils
>130	Very superior	0
121–130	Superior	0
111–120	Above average	8
90–110	Average	64
80–89	Below average	24
70–79	Poor	14
<70	Very poor	0

The children based on their GMQ scores are also divided into four categories according to T-score (Table 2). From the table, it can be seen that the most children are in the average GMQ category and also in category 2, which is the average range for perceived popularity. No relationship was found between the level of gross motor skills and the level of children’s perceived popularity. The 13 children in the first category who are in the above average range have the feeling of satisfying relationship with their peers. Those children state satisfaction with the number and qualities of their friendships. They feel popular and they are not exposed to mockery and insults from their schoolmates. On the other hand, children from the third and fourth category are in the area of their social functioning and are unhappy. These children are unsatisfied with their friendships and could have feeling that they have no friend at all. They usually feel socially isolated, feels that they are ignored by classmates or that they are the target of mockery. The low scores indicate shyness, lack of interpersonal skills or personality attributes which lead to child’s isolation. In this group could also be children with learning difficulties or physical problems. There is also a possibility of mental disorder in the lowest range (category 4). Those children could benefit from interventions aimed on enhancement of social competencies and abilities.

Table 2. Comparison according to GMQ and T-score ranges

	Category 1 (≥ 56 T)	Category 2 (40 T-55 T)	Category 3 (≤ 39 T)	Category 4 (≤ 29 T)
GMQ above average	1	3	3	1
GMQ average	7	40	13	4
GMQ below average	3	11	7	3
GMQ poor	2	6	3	3

The research found significant differences between boys and girls in the level of gross motor skills. 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 are usually more physically and cognitively developed than boys. Although in the Czech Republic, there are usually common sport competitions until the age of 13 because the genders should be on the same physical level. But probably because the average age was under 10 years, this could mean that girls at this age are more physically developed and show higher level of gross motor skills.

The research was limited by the low number of children in the research group. Also, the research was not operating with representative sample, because researchers were dependent on written agreement of children’s legal representatives.

5. Conclusions

Further research should continue on larger number of children and focus on representativeness of research sample. The research showed that perceived popularity, ability of making friendships and feeling of being part of the class activities like games and sports of children were mostly in average

range score. Also, the largest group of pupils belonged to the average according to GMQ. This means that pupils are rather satisfied with their social competencies and social performance but also state certain difficulties in interaction with their peers. Thus balanced self-evaluation is normal. The research also indicates that girls at this age had significantly higher level of gross motor skills than boys from the research sample. No relationship was found between the level of gross motor skills and perceived popularity in children from the lower level of primary schools.

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