Journal of Physical Education & Health, 2019, vol. 8 (14), 11-17

https://doi.org/10.5281/zenodo.3746115

PERCEIVED DIFFICULTIES IN SPORTS EXERCISES: TYPICAL ASSESSMENT OF SPECIFIC PHYSICAL ABILITIES

Chawki Derbali[1], Fathi Matoussi[2], Ali Elloumi[3]

[1] University of Jendouba, Tunisia
[2] Virtual University of Tunis, Tunisia
[3] Laboratory TEC, University of Paris Descartes, France

Abstract

We have investigated the relationship between performance in sports exercises and perceived difficulties in physical ability tasks for boys and girls. In order to assess physical abilities in sport, we conducted experiments concerning methods for self-evaluating the difficulty of physical ability required in sports exercises through implementation of creative vaulting tasks in addition to Eurofit and Evareg tests. Based on a hypothesis that specific physical abilities could predict performance in physical education for boys and girls, we distinguished the relationship between genders concerning perceived difficulty for varied ability tasks. Although sporting exercises performance was high among boys rather than girls, there was no significant difference in perceived difficulties of physical tasks between genders. We highlight how perceived difficulties among students appears to have resulted in higher student motivation levels, and increased desire to improve performance for more effective learning and teaching experience. We recommend that methods of perceiving difficulties in sport exercises need more exploration for better practices.

Key words: *perceived difficulty, assessment, physical abilities, performance*

Introduction

The effectiveness of sport exercises and difficulties of its practice are well-developed in literature. It is generally thought that young boys and girls develop differentiated representations about physical and sport activities. A didactic approach indicates that teaching mixed class is a subject of great interest [1] and it should be based on reflective and conceptual analysis of the neosphere's actors on teaching sport activities through a physical education program [2, 3]. In the domain of sport activities, several studies are interested in explaining the difficulties, risk of practices, body image perception and safety of learning encountered in the practical tasks involved in differences based on gender [4, 5]. As reported by Delignières [6], girls appreciate that the activity of climbing is harder than boys do. Furthermore, [7] it was found that learners perceived the activity of equilibrium as feminine, while those of throwing as masculine. It can be inferred that boys are attached to the practices of power whereas girls are more attracted to artistic activities. This is in line with the idea of Dilegnières and Famose [8] postulating that the differences between girls and boys at the level of perceived effort appear in adolescence and the testing of physical abilities [9, 10].

In addition, learners come from a wide variety of socio-cultural backgrounds and are oriented towards a sport that aims to provide them with guidance and support for their health, physical and psychological well-being and the development of various skills. However, in physical education and sport (PES), the curriculum of courses includes four research directions: performance, adaptability, achievement of actions and self-care. Moreover, a curriculum method grounded in didactic engineering to raise expertise in physical

education has to be reformed, requiring effective innovation in the program's proposal [11]. Indeed, in the practice of physical activities and sport (PAS), the educator can respect gender and perfect some aspects of overall educational, instructional and social integration.

Sports activities remain well adhered to gender. Let us take as an example the Olympic Games of Athens in 2004 [12]. The events in total were launched in competitions divided between female and male competitors. However, only three disciplines did not admit variants of either gender or mixed variant. Among the events freestyle wrestling is male, while synchronized swimming and rhythmic gymnastics are exclusively female. Thus, this distribution of gender specificity and activity exception symbolizes the irreducible contribution of the feminine and masculine disciplines around combat sport and dance, both of which remain symmetrical hinges of gender [13]. On the other hand, there are few sports where we find women and men participate together (horse riding and figure skating). Hence, this is a differentiation, and distribution of sports disciplines some of which are reserved for women and men and most are unisex. This evokes physiological and physical differences that are supposedly alleged as unsurpassable, serving as a justification for gender specificity.

The symbolism of each sport drawn in history promotes identification of people and gender. According to Davisse and Louveau [14], the behaviors, the values or the gestures implemented in the activity are factors of sexual identification which indoctrinate the practices. We can therefore think that, in general and in relation to the predominantly masculine representations that sport conveys, the physical education classes imposed at school offer potential for socialization which, according to the proposed activities, do not affect in a meaningful way equal treatment of boys and girls. Girls invest less in male activities, and the educator tries to adapt these male gender practices to the needs and specificity of girls and vice versa. However, why should girls' performances be obviously the same as boys?

In physical education culture, it is acknowledged that girls and boys share behaviors with respect to sport. It is essential to take into account the level of motivation for certain sports and artistic activities, which is sometimes very remote.

Finally, consider these differences in genetic and cultural traits. It is important to act logically in evolving these qualities while guaranteeing an identical requirement concerning strategic and tactical abilities. Pursuit of these skills may be different for most girls and most boys. Indeed, to observe these differences in the pole vault, two different tasks requiring the same motor abilities were set while students jumped in priority in terms of height or jump primarily in length or in different ways.

Hypothesis: We hypothesized that perceived difficulty of specific physical abilities could predict performance in physical education for boys and girls.

Aim

To investigate the relationship between performance in sport exercises and perceived difficulties of physical ability tasks for boys and girls.

Method

Participants

The experiment took place during a pole vault cycle for the assessment of physical abilities, organized by the authors of this article, which brought together about twenty regional athletes belonging to a sports-studies class. 12 boys and 13 girls were selected for the experiment, so that the two groups that were formed were equal in age, level and type of experience. The average age of participating subjects was (M = 16.5 years) and the standard deviation (SD = 1.4).

Experimental tasks measurements

We chose eight of the tasks in Table 1, of which two measures are the horizontal and vertical jump (tasks 1 and 2), two can be described as "masculine" (tasks 3 and 4), and two "feminine" (tasks 5 and 6). We added two pole vault events in height and length (tasks 7 and 8). This study was based on The Eurofit

Special Test, which is a battery of motor fitness tests [9, 10, 15].

Task 1:

Horizontal Jump (HJ). To evaluate the qualities of force-speed, in other words, power in the legs: Stand with feet at the same height, toes just behind the starting line. Flex your knees by placing your arms forward, horizontally. From a vigorous warm up, accompanied by a swinging of the arms, jump as far as possible. Land with your feet together without losing your balance. Perform the test twice, the best result being counted. The better of the two results obtained is recorded in centimeters [9].

Task 2:

Vertical Jump (VJ). Sergent Test [15]: Cover the fingertips with both hands. Standing in front of the board, hold your hands up over your head. Feet should be firmly on the floor. The body, arms and fingers must be fully stretched. Make a mark with the fingertips on the board. Place yourself next to the board, either on the left or right. Bend your knees, bring your arms back and jump as high as you can. At the maximum height, mark the board with the finger of the left hand or right hand. Perform the test twice, the best result being recorded.

Task 3:

Flexibility (F). The subject, standing on a crate, performs a slow bending of the torso forward and down, arms and legs extended. The device allows for measurement of the level of flexibility. This test belongs to the EUROFIT battery [9], and is intended to evaluate the ability of static flexibility.

Task 4:

Balance on one Leg (BL). The subject must hold a body balance posture on one leg, on a beam 3 cm wide. The free leg is held by the ipsilateral hand, at the level of the foot. A number of tests are required to maintain the posture for a minute. This test belongs to the EUROFIT battery [9], and is intended to evaluate overall body balance ability.

Task 5:

Explosive Force (EF). Sitting with his back to the wall, legs bent, feet flat on the floor, the subject must project a 3 kg medicine ball forward with their arms at an angle of approximately 45 ° to the floor. We note the best distance achieved over three attempts. This test belongs to the EVAREG battery [10]; it is intended to evaluate explosive force ability.

Task 6:

Trunk Strength (TS). The subject, lying on his back with legs bent at 90 °, performs straightening of the trunk to the thighs. The heels are held on the ground by a helper. We note the number of complete adjustments made in 30 seconds. This test belongs to the EUROFIT battery [9]; it is intended to evaluate trunk strength ability.

Task 7:

Long Pole Vault. This is a long jump with pole (LJ.P); run and jump with a pole; the subject must project his body forward with a pole on the sand. Note the best distance made on three attempts. This test is intended to evaluate the performance in long jump with a pole.

Task 8:

High Pole Vault. This is a high jump with a pole (HJ.P); to run and jump with the help of a pole, the subject must project his body using a pole and cross a maximum height. The subject lands on sand. We note the best height achieved over three attempts. This test is intended to evaluate the performance in high jumping with a pole.

Table 1. Experimental task measurements

Task 1	**Task 2**	**Task 3**	**Task 4**	**Task 5**	**Task 6**	**Task 7**	**Task 8**
Horizontal Jump	Vertical Jump	Flexibility	Balance on one Leg	Explosive Force	Trunk Strength	Long Pole Vault	High Pole Vault

The choice of these tasks was also guided by the concern that in each category (male or female), one of the tasks objectively privileges one sex in relation to the other, and the other is less affected by differences in gender. The analysis of the abilities required has highlighted the importance of trunk strength and ability of general body balance; we

think that the same level of expertise for boys and girls will have close performance scores in tests measuring these abilities. It is therefore assumed that there are no significant differences between girls and boys for tasks 4 (trunk strength) and 6 (overall body balance). On the other hand, flexibility and explosive force abilities are relatively less significant in pole vaulting, and the subjects' performance can be traced back to gender differences. Task 3 (explosive force) must be for boys, and task 5 (flexibility) for girls. It is further noted that Tasks 1 (horizontal jump) and 2 (vertical jump) could be highlighted for the specificity of the jump test; namely the horizontal and vertical jump qualities. Finally, the performance in pole vault length and height is evaluated and then the difficulty of tasks perceived for both gender (girls and boys) determine.

Experimental protocol

The subjects perform each task according to the conditions described above. They are not aware of their results, nor of those of other subjects. They are asked, after completing each task, to evaluate the difficulty according to a 7-point symmetrical category scale (Table 2). Perception of task difficulty was measured with the Perceived Difficulty Assessment Questionnaire (PDAQ) which basically used the question instructors ask students about the achievement of a given task, "How did it go?" by adapting the questionnaire of Ribeiro and Yarnal [16].

Table 2. Category scale used for difficulty assessment

extremely easy	very easy	easy	a little difficult	difficult	very difficult	extremely difficult
1	2	3	4	5	6	7

Results

The average performance achieved by the students corresponds to the predictions that led to the choice of tasks (Table 3). The boys attained better results in task 1, and the girls in task 3. However, there is no significant difference for the other tasks 2 and 4. The findings in Table 4 concerning perceived difficulty confirm the proposed hypothesis: girls find task 1 more difficult than boys who, on the other hand, assess task 3 as more difficult than girls. On the other hand, no significant difference is noted in the evaluations concerning tasks 2 and 4.

Table 3 shows that performances are significantly different for pupils at the same level in the tasks of pole vaulting 7 (log jump) and 8 (high jump), largely due to differences in the impact of individual abilities on task scores, which are higher for boys and lower for girls. In these sports exercises, perceived difficulty did not present significant differences in same tasks 7 and 8 compared to test scores (performance).

Table 3. Averages and standard deviation of students' physical ability performance

Tasks			Horizontal Jump	Vertical Jump	Flexibility	Balance Leg	Explosive Force	Trunk Strength	Pole Vaulting	
									Long Jump	High Jump
Performance	Boys	M	2.25	4.97	12.67	4.99	4.55	24.13	5.79	1.67
		SD	0.31	1.55	5.33	1.77	0.73	3.65	1.25	0.81
	Girls	M	1.80	4.23	17.32	5.11	3.68	22.16	4.58	1.12
		SD	0.44	1.87	6.05	1.96	0.51	3.40	1.13	0.69
	t-test		4.35 **	4.36 **	2.41 *	0.49	5.80 **	1.23	2.29 *	3.52 **

Note. HJ-1 : Horizontal Jump ; VJ-2 : Vertical Jump ; S-3 : Flexibility ; BL-4 : Balance on one Leg ; EF-5 : Explosive Force ; TS-6 : Trunk Strength; LJ.P-7 : Long Jump with Pole ; HJ.P-8 High Jump with Pole; M = Mean; SD = Standard Deviation; signification of Student t - test: ** = p <.01; * = p <.05.

Table 4. Averages and standard deviation of the samples of students' perceived difficulty

Tasks			Horizontal Jump	Vertical Jump	Flexibility	Balance Leg	Explosive Force	Trunk Strength	Pole Vaulting	
									Long Jump	High Jump
Perceived Difficulty	Boys	M	3.22	3.16	3.35	4.94	3.29	3.21	5.22	5.31
		SD	1.02	.68	1.15	1.11	0.98	1.7	1.87	0.91
	Girls	M	3.35	3.79	2.31	5.09	4.07	3.42	5.30	5.52
		SD	1.15	1.57	0.95	1.68	1.02	1.13	2.28	1.22
	t-test		0.32	0.41	2.23 *	0.32	2.24 *	0.71	0.24	0.37

Note. HJ-1 : Horizontal Jump ; VJ-2 : Vertical Jump ; S-3 : Flexibility ; BL-4 : Balance on one Leg ; EF-5 : Explosive Force ; TS-6 : Trunk Strength; LJ.P-7 : Long Jump with Pole ; HJ.P-8 High Jump with Pole; M = Mean; *SD* = Standard Deviation; signification of Student *t* - test: ** = p <.01; * = p <.05.

Discussion

These results demonstrate the importance of the level of physical traits as an illustrative variable of gender differences in the perception of difficulty and physical limits of the individual. However, some elements must encourage caution. In line with this proposal, Legros and Rieu [17] note that women have inferior physical abilities to those of men, inequalities that training cannot remove. In addition, several studies highlight the crucial role of sport experience and perceived competences in PAS performance [18, 19]. From here, we note differences in the level of perceived effort between the two genders, which emphasizes the question of expertise in the accuracy of the assessment.

It can be deduced that gender roles and sporting experience respond to each other and are mutually attached.

The fact that a psychophysical approach is feasible for the study of a given phenomenon does not necessarily confer on the latter a status of dimension or even sensory modality. Thus, Thurston's method allows for the construction of scales of judgment, even in the absence of a stimulus continuum (e.g., judgements about relative importance; [20]. Our study analysis has shown that the scale thus constituted was very close to a scale constructed from the method proposed by [21]. These experiences study judgments, feelings, attitudes towards various items. The methods are used to quantify qualitative priori representations. Obviously, we cannot speak at this level of sensation, but rather an effort to transform into magnitudes judgments of values. What about the difficulty? At the end of this presentation, we think we have helped to shed light on the mechanisms of its perception. Our main results can be summarized as follows:

- The perception of difficulty is based on the importance of investment in ability resources that the subject has committed in carrying out the task. On the other hand, the perceived difficulty seems independent of the actual performance achieved. The perception of difficulty appears to be a transversal process, independent of information processing operations solicited by the task. The difficulty of the task could be related to certain personality traits, such as anxiety, which could not be clearly established. The perception of difficulty can certainly not be observed as purely sensory, like laser radius or sound. Nevertheless, we believe that we have shown that, like the perception of effort, the perception of difficulty obeys laws, has invariants, and seems to be related to a measurable stimulus, even if we can conclude level by inference alone. We highlight that students' perceived difficulties are associated to the need to learn [22] which appears to have resulted in higher

student self-determined motivation levels [23], and increased desire to improve performance for more effective learning and teaching experience. In line with study [24], there are influences of sex and gender on the motivation of practice and the case of motivational students profiles in pole vaulting performance [25] in the didactics of physical education. Finally, the study findings confirm our hypothesis that the perceived difficulty of specific physical abilities could predict performance in physical education for boys and girls.

Conclusion

In analyzing these results, we conclude that perceived difficulty is not a simple judgment of the subject based on the characteristics of the tasks, but an internal sensation. In other words, a subject who evaluates perceived difficulty according to the method of size estimation does not convert this number into a qualitative judgment; he transposes it on a quantitative scale and accords it a psychological significance. Meanwhile, to associate students' perceived difficulty with a motivational climate of learning and varied strategies of skills development in physical education, students could enhance physical behavior in an educational environment.

BIBLIOGRAPHY

1. Davisse A. Les mixités en EPS. Revue EPS 1986; 197: 56–57.
2. Derbali C., Matoussi F., Elloumi A. Teaching Strategies to Enhance Motor Skills Learning for Groups of Students: The Effects of Verbal and Visual Feedback on Performance in Pole Vault Practice. Journal of Physical Education & Health 2018c; 8(13): 1–10.
3. Derbali C., Matoussi F., Elloumi A. Motivational Climate and Skills Development in Physical Education: A Pilot Study Examining Physical Activity Behavior in an Educational Environment. Journal of Information Research and Review 2017c; 4(12): 4756–4763.
4. Derbali C., Matoussi F., Elloumi A. Physical Activity, Body Culture and Safety of Learning: A Systematic Review in Physical Education. International Journal of Innovative Studies in Sociology and Humanities 2019a; 4(7): 14–21.
5. Radwan H., Hasan H. A., Ismat H., Hakim H., Khalid H., Al-Fityani L., Mohammed R., Ayman A. Body Mass Index Perception, Body Image Dissatisfaction and Their Relations with Weight-Related Behaviors among University Students. International Journal of Environmental Research and Public Health 2019; 16: 1541.
6. Delignières D. La perception de la difficulté dans les tâches motrices. Thèse d'Habilitation à Diriger les Recherches, France: Université Montpellier, 1996.
7. Durand M. L'enfant et le sport. Paris: PUF, 1987.
8. Delignières D., Famose J. P. Estimation des exigences bioénergétiques des tâches motrices. Influence de l'âge et du sexe. STAPS 1991; 12(24): 63–72.
9. Eurofit. Eurofit Tests of Physical Fitness, 2nd Edition. Strasbourg: Sports Division Strasbourg, Council of Europe Publishing and Documentation Service, 1993.
10. Franks B. D. YMCA youth fitness test manual. Champaign, IL: Human Kinetics Publishers, 1989.
11. Derbali C., Matoussi F., Elloumi A. Curriculum Method Grounded on Didactic Engineering to Expertise Physical Education Program Proposal. Journal of Education and Practice 2018b; 9(31): 49–59.
12. Skarveli E., Zervos I. Official report of the XXVIII Olympiad. Athens: Organising Committee for the Olympic Games, 2005.
13. Chaponnière M. La mixité scolaire: débats d'hier et d'aujourd'hui. In : Dafflon Novelle A. (ed.) Filles-garçons: socialisation différenciée, PUG, 2006, pp.127–144.

14. Davisse A. Louveau C. Sports, école, société. La différence des sexes. Paris: L'Harmattan, 1998.
15. Grabowski H., Szopa J. Eurofit. European Test of Physical Fitness. Kraków: AWF, 1991.
16. Ribeiro N. F., Yarnal C. M. The Perceived Difficulty Assessment Questionnaire (PDAQ): Methodology and applications for leisure educators and practitioners. Schole: A Journal of Leisure Studies and Recreation Education 2010; 25: 111–115.
17. Legros P., Rieu M. Physical capacities in men versus women. Science & Sports 1990; 5(4): 203–2013.
18. Derbali C., Jannet Z., Elloumi A. Physical self-perception and sport's activity applied in physical education context: The self-efficacy of achievement performance. International Journal of Advanced Sport Sciences Research 2015a; 3(1): 482–497.
19. Wrisberg C. A., Pein R. L. Past running experience as a mediator of the attentional focus of male and female recreational runners. Perceptual and Motor Skills 1990; 70: 427–432.
20. Baird J. C., Noma E. Fundamentals of scaling and psychophysics. New York: Wiley, 1978.
21. Thurstone L. L. A law of comparative judgement. Psychological Review 1927; 34: 273–286.
22. Derbali C., Elloumi A., Matoussi F. Reflections and Conceptions Analysis of the Neosphere's Actors on Teaching Pole Vault Activity throw Physical Education Program. International Research Journal of Curriculum and Pedagogy 2017a; 3(2): 52–58.
23. Ryan R. M., Deci E. L. Brick by brick: The origins, development, and future of self-determination theory. In: Elliot A. J. (ed.) Advances In motivation science. Cambridge, MA: Elsevier Inc., 2019; 6: 111–156.
24. Fontayne P. Motivation et activités physiques et sportives : influence du sexe et du genre sur la pratique du sport et de l'éducation physique. Thèse de doctorat: sciences biologiques fondamentales et appliquées: psychologie. France, Université Paris, 1999.
25. Derbali C., Elloumi A., Matoussi F. Didactics of Physical Education: The Case of Motivational students Profiles in Pole Vaulting Performance. Creative Education 2015b; 6 (12): 1349–1359.

Received: August 2019
Accepted: October 2019
Published: March 2020

CORRESPONDENCE

Chawki Derbali
University of Jendouba
Tunisia
E-mail: derbali_chawki@yahoo.fr