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Physical Self-Concept in Athletes with Congenital versus Acquired Disabilities

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Abstract: This cross-sectional and randomized block design (RBD) study examined differences in physical self-concept among athletes with congenital and acquired motor disabilities and assessed the influence of age of disability onset on physical self-concept perceptions. We recruited 201 athletes with acquired motor disabilities and 185 athletes with congenital motor disabilities. Ages ranged from 12-28 years, and athletes were both male and female. For RDB, we used a specific function of SPSS 21.0 to create and compare two random samples of 100 participants with congenital disabilities and 100 participants with acquired disabilities. All participants completed the Physical Self-Description Questionnaire (PSDQ-S; Scarpa, Gobbi, Paggiaro, & Carraro, 2010), on which we tested group differences with ANOVA. We also used Pearson correlation analysis to examine the relationships between both 'years without disability' and 'years of sports practice' and dimensions of physical self-concept. Participants with acquired disabilities had higher average physical self-concept scores, relative to those with congenital disabilities. Early onset of physical disability negatively affected self-esteem, and most dimensions of physical self-concept, while 'years of sports practice' positively influenced physical self-description and self-esteem.

Keywords: acquired disability, congenital disability, physical disability, physical self-description, sport practice.

Abstract: Questo studio di ricerca trasversale, eseguito attraverso un 'Randomized Block Design' (RBD), ha esaminato le differenze in merito all'autodescrizione del sè corporeo tra gli atleti con disabilità motorie congenite e acquisite e ha valutato l'influenza dell'età di insorgenza della disabilità sulle percezioni del sè fisico. Abbiamo reclutato 201 atleti con disabilità motorie acquisite e 185 atleti con disabilità motorie congenite. I partecipanti, sia maschi che femmine, avevano un'età compresa tra i 12 e 28 anni. A fondamento del RDB, abbiamo utilizzato una funzione specifica di SPSS 21.0 per creare e confrontare due campioni casuali di 100 partecipanti con disabilità congenite e 100 partecipanti con disabilità acquisite. Tutti i partecipanti hanno completato il Questionario sull'Auto-Descrizione del Sè Corporeo – Short (PSDQ-S, Scarpa, Gobbi, Paggiaro e Carraro, 2010), sul quale abbiamo testato le differenze tra gruppi attraverso l'ANOVA. Abbiamo anche utilizzato l'analisi di correlazione di Pearson per esaminare le relazioni tra le variabili "anni senza disabilità" e "anni di pratica sportiva" e le dimensioni del concetto di sé fisico. I partecipanti con disabilità acquisite hanno ottenuto punteggi medi più elevati rispetto ai partecipanti con disabità congenite in quasi tutte le sottoscale del PSDQ. L'insorgenza precoce della disabilità motoria sembra influenzare negativamente l'autostima e la maggior parte delle dimensioni del concetto di sé fisico, mentre "gli anni di pratica sportiva" influenzano positivamente le dimensioni dell'auto-descrizione del sè fisico e l'autostima.

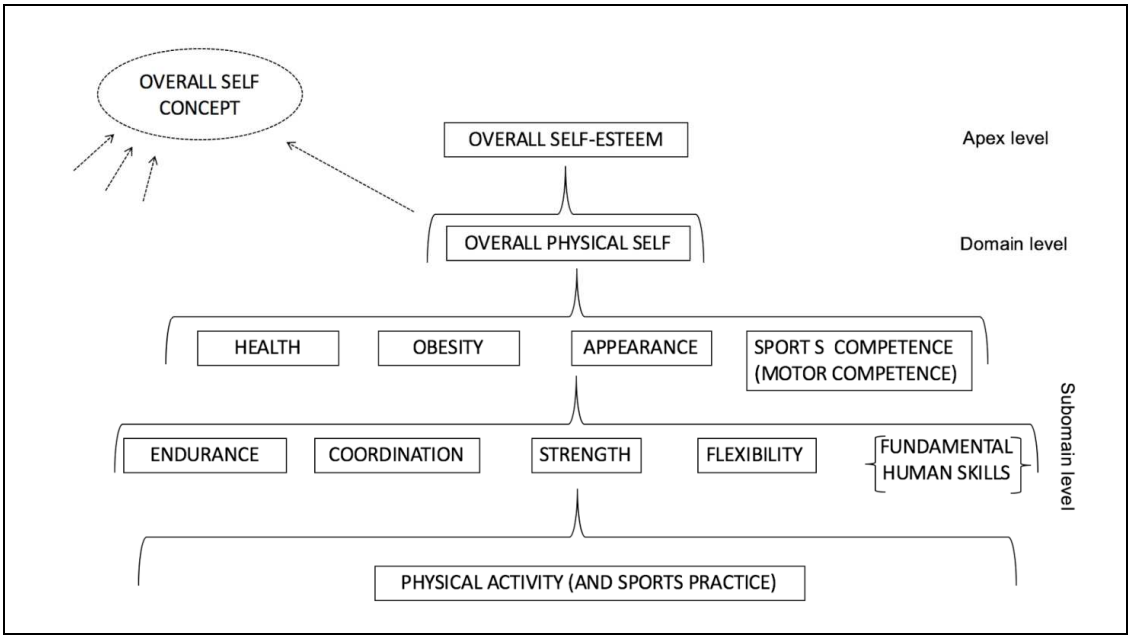
Parole chiave: autodescrizione del sè corporeo, disabilità acquisita, disabilità congenita, disabilità motoria, pratica sportiva.

1. Introduction

According to Fox (1990, 1998), the physical self-concept can be defined as a combination of knowledge, feelings, memories and experiences relating to one's body; it is a self-described profile based on the multitude of roles and attributes that we believe constitute our body-image, motor skills and abilities. The formation of a physical self-concept represents an important developmental task. Both cognitive processes and social experiences contribute to the development of one's body-image which is not exclusively influenced by either real data attesting to one's physical conformation or psychological, emotional and personal ideas, but, rather, by the close interaction of both of these components and other social factors. Thus, the construction of a physical self-concept is multidimensional and hierarchical (Marsh & Yeung, 1998; Marsh, Richards, Johnson, Roche, & Tremayne, 1994). Scarpa (2011) proposed a pyramid model of this multidimensional-hierarchical construction of the physical self. At the bottom are physical activity, endurance, coordination, strength and flexibility. At the second level are health, obesity, appearance and athletic ability. At the third and penultimate level lies the overall concept of the physical self, while overall self-esteem is placed at the highest point.

Figure 1 below graphically represents the multidimensional-hierarchical construction of the physical self, considering both the classic factors related to the physical self (Fox, & Corbin, 1989; Harter, 1982; Marsh, 1990; Marsh, et al, 1994) and more recently used concepts, such as 'motor competence' (Cattuzzo, et al., 2016; Henrique, Ré, & Stodden, 2015; Scarpa, 2011), assuming that: (a) the specific sub-domains of the physical self construct have been hierarchically organized on the basis of past literature; (b) lower level percepts affect all higher level constructs; (c) components of the same level affect each other alike; (d) components placed in brackets are mentioned in current literature but not measured by the Physical Self-Description Questionnaire (PSDQ-S; Scarpa, Gobbi, Paggiaro & Carraro, 2010) used in this study; and (e) the global self-concept inserted in dotted form is not measured by the PSDQ but is certainly influenced by the physical self-concept and other components of the self.

Fig. 1.
Graphical representation of the multidimensional-hierarchical construction of the physical self-description and self-esteem.



Research into the benefits of sport for people with disabilities has gained impetus in recent years, showing that engagement in sports led to both physiological and psychological benefits (Carless, Peacock, McKenna, & Cooke, 2013; Hanson, Nabavi, & Yuen, 2001; for a review see Martin Ginis, Jetha, Mack & Hetz, 2010). Some studies analyzed the effects of sport participation on self-perception, and, particularly, on body image and satisfaction with one's own body. Groff and Kleiber (2001) analyzed identity formation in young people involved in an adapted sports program. Identity is generally defined as the set of mental representations that one uses to relate to his/her personal and social characteristics. Groff and Kleiber verified, among adolescents with motor disabilities, that that adapted sport helps to improve self-perceptions of one's skills and abilities, emotional expression and social interaction and decrease self-perceptions of disability, seemingly facilitating the exploration and expression of alternative forms of identity. Ferreira and Fox (2008) analyzed multiple aspects of the physical self in male basketball players, with and without disabilities and found that wheelchair sport participation contributed to positive development of the physical self while also providing a unique opportunity to engage in a successful, complex sports performance. The athletic context was extremely important for people with disabilities, providing them opportunities to experience new challenges, positively evaluate their abilities and gain confidence and a positive body-image while also experiencing social successes. Athletes with motor disabilities (peripheral or central paraplegia) who engaged in sport gained confidence in their bodies, a greater sense of attractiveness and positive opinions with respect to their bodies' sports capacity. Shapiro and Martin (2010) described the multidimensional concept of the physical self in athletes with motor disabilities. Among their principal results, they emphasized that at least 50% of their participants' general self-esteem was determined by perception of the physical self. The other 50% was probably attributable to other dimensions of self (academic, emotional, social). The areas relating to flexibility, strength and endurance appeared to be extremely important and had a strong influence on general self-concept. This study highlighted that participants with a more positive conception of their physical self, of strength, of endurance and of flexibility, had higher self-esteem relative to those who obtained lower scores on these four variables.

To the best of our knowledge, no studies focused specifically on differences in physical self-concept among athletes with congenital versus acquired motor disabilities. Sport research has mainly investigated athletes with congenital or acquired disabilities in terms of self-esteem (Cambell, 1995), or have investigated athletes with disabilities without regard to whether they were acquired or congenital in terms of sport anxiety (Mastro & Frenchr, 1984), goal perspectives (Skafida, 2002), sport achievement orientation (Page, O'Connor, & Waydav, 2000; Skordilis, et al., 2006), or competitive orientation (O'Connor & Wayda, 2000). In our research we have been inspired by Cambell's study to contrast whether athletes with acquired versus congenital disabilities exhibited differences in self-esteem.

Campbell (1995) evaluated differences in psychological well-being among athletes in wheelchairs sport participants with both congenital and acquired disabilities. Psychological well-being was assessed using scores related to mood, trait anxiety, self-esteem and sense of mastery. The results evidenced that groups of individuals with acquired disabilities had a better mood, higher self-esteem and sense of mastery, and less trait anxiety than groups of individuals with congenital disabilities. Athletes in wheelchairs with disabilities acquired later in life had an overall higher sense of well-being than those with congenital disabilities. Campbell suggested that people with congenital disabilities are likely to be helped most by parents and other persons during their growth and development, but that they may generally demonstrate less independence and fewer personal skills to cope with stressful situations than is the case for people with acquired disabilities.

Based on psychosocial theory and Campbell's (1995) findings, a first goal of our study was to examine differences in physical self-perception and self-esteem between athletes in wheelchairs

with acquired versus congenital disabilities. We expected that athletes with an acquired motor disability would have a more favourable physical self-concept than athletes with congenital disabilities. As a second hypothesis, we expected a positive correlation between the number of years prior to disability onset and more positive perceptions of physical self. Hopper (1984) studied the influence of disability onset on self-esteem in athletes in wheelchairs, and found that an earlier onset of disability was associated with a lower self-esteem. Considering that the physical self is a relevant component of the global self-esteem, we expected similar results related to physical self-esteem. Our third and last hypothesis - based on Scarpa's (2011) study - was that we finally there would be positive relationships between years of sport participation and all dimensions measured by the PSDQ. In other words 'years of sports practice' would positively influence the development of a positive physical self-concept and self-esteem (see also O'Connor & Wayda, 2000).

2. Method

2.1. Participants

Thanks to the website 'www.superando.it' (a website about disability and inclusion) which advertised our research and thanks to the direct contact with the President of Paratetraplegic Italian Federation Associations (PPIFA), we created an online network enabling us to reach and make contact with most Italian sports associations for paraplegics and athletes wheelchairs, from which we recruited our participants. All participants or underage participants' parents signed an informed consent. The study was conducted in accordance with the Declaration of Helsinki, and was approved by the Ethical Committee of the "University of Salerno".

We recruited 201 athletes with acquired and 185 with congenital disabilities, between the ages of 12 and 28 years (n= 368; M= 19.98; SD= 6.45; gender: 191 females and 195 males). We adopted a randomized block research design (RDB) and used a function of SPSS 21.0 to randomly extract subsamples from this population. Thus, we randomly assigned 100 individuals each from our acquired and congenital disability samples into two equal-sized comparative groups. All participants engaged in sports activities with wheelchairs due to paraplegia (complete paralysis of the lower limbs) from either a central (spastic form) or a peripheral lesion (flaccid form). Those with latest disability onset were recruited at least two years after their trauma, after they were already able to practice sports.

2.2. Instruments/Procedure

Demographic information collected anonymously in a nearby secluded training facility before or after participants sports participation included gender, weight, height, type of disability, origin of disability, time of disability onset, and years of sports practice. Additionally, participants completed the Physical Self-Description Questionnaire - Short form (PSDQ-S) validated in the Italian language in a sample of 951 participants aged 11–36 years (Scarpa, Gobbi, Paggiaro, & Carraro, 2010). The questionnaire consists of 43 items derived from the Italian version (Meleddu, Scalas, & Guicciardi, 2002) of the 70-item Physical Self-Description Questionnaire (PSDQ; Marsh, et al., 1994), but items were chosen following the first short version validated by Peart, Marsh, and Richards (2005). The 43-item short form can be administered more quickly and ensures greater attention and accuracy in participants' responses, particularly for people with disabilities who generally experience attention and concentration difficulty. Each item is a simple declarative statement to which participants respond on a 6-point Likert scale ranging from 1 (false) to 6 (true). The PSDQ-S measures 11 factors related to self-ratings of one's body, motor abilities, and skills: Activity, Appearance, Obesity, Coordination, Endurance, Flexibility, Health, Athletic Ability, Strength, Overall Fitness, and Self-Esteem. Scarpa, et al. (2010) reported

acceptable internal scale consistency, with Cronbach's α ranging from .77 to .91. The relevance of existing indices revealed a good adjustment of the original model to the Italian population with RMSEA = .053, NFI = .965, NNFI = .972, CFI = .975, GFI = .874, AGFI = .852, PGFI = .744. The invariance cross gender and age was also tested. In a previous study with a sample of 143 adolescents and young people with physical disability (Scarpa, 2011), some items were adapted to fit disability characteristics. For example, the sentence "I can run a long way..." was changed into, "I can cover long distances..." Cronbach's α of the scales ranged from .76 to .92. The adapted items were used in the present study.

2.2. Data Analyses

Statistical data analysis was carried out with SPSS software (version 21.0).
Internal consistency and reliability of the PSDQ was tested using Cronbach's Alpha indexes for each variable in the entire sample of the present study. Descriptive statistics (means and standard deviations) were calculated for each of the 11 subscales of the PSDQ-S in order to describe the entire sample and the relative physical self-description scores of participants in the two groups. Score differences between groups were evaluated by one-way analysis of variance (ANOVA), and effect size was calculated using Cohen's *d* for two independent means (Rosnow & Rosenthal, 2009). We also calculated Pearson correlations between both PSDQ components of the dimensions of physical self-concept and the variables 'years without disability' and 'years of sports practice.' Finally, linear regression analysis was carried out on significant correlations to evaluate the influence of 'years without disability' on the components of physical self-description.

3. Results

Descriptive statistics of age, weight (kg), height (m), and gender are presented below for each group of participants. For athletes with acquired disability (n=100), data were as follows: age mean=19.01(standard deviation=4.54); weight mean=61.65 (standard deviation=13.49); height mean=1.70 (standard deviation=.132); gender (female n=43; male=57). For athletes with congenital disability data were as follows: age mean=20.03 (standard deviations=6.71); weight mean=65.77 (standard deviation=15.23); height mean=1.61 (standard deviation=.173); gender (female n=46; male=54). Table 1 presents the descriptive statistics for PSDQ-S scales of all participants, the high internal consistency of the 11 PSDQ-S scales (Cronbach alpha coefficients ranging from .75 to .91; mean=.83), and the ANOVA results comparing participant groups with acquired and congenital disabilities. Athletes with acquired disabilities obtained higher mean scores in all the dimensions of the physical self, with the exception of the health and appearance subscales.

Table 2 shows correlations among PSDQ-S variables, partially confirming the relationships presented in the graphical representation of the multidimensional and hierarchical physical self-concept described in the Introduction to this paper (see Fig. 1).

Table 3 shows the results of the Pearson correlations (r and p-value) between the variables 'years without disability' and 'years of sports practice' and the multiple components of the physical self as measured by the PSDQ-S. Significant values have been identified with an asterisk. There were significant correlations between BMI and body fat scale in athletes with acquired disability ($r = .768$ and $p < .001$) and in athletes with congenital disability ($r = .852$ and $p < .0001$).

The regression results, conducted for all positive correlations to evaluate the influence of the 'moment' of onset time period before the onset of the disability on the dimensions of the physical self and self-esteem, are reported in Table 4.

Table1. Scale description, analysis of variance with p-values and effect sizes, Cronbach's Alpha Coefficients.

PDSQ-S Scales	Whole Sample N=200	Athetes with Congenital Disability n=100	Athetes with Acquired Disability n=100			
	Means (SD)	Means (SD)	Means (SD)	p-values	Effect Sizes Cohen's *d*	CAC
Activity	3.83 (1.36)	3.46 (1.35)	4.20 (1.33)	.014*	.55	.87
Endurance	4.34 (1.22)	3.83 (1.11)	4.84 (1.23)	.015*	.86	.85
Strength	4.21 (.85)	3.97 (1.34)	4.44 (.82)	.013*	.42	.81
Flexibility	4.36 (.98)	3.81 (1.11)	4.90 (.95)	.003*	1.05	.76
Coordination	4.18 (.97)	3.74 (1.7)	4.62 (.94)	.011*	.64	.82
Sport Ability	4.26 (.98)	4.4 (1,11)	4.47 (.93)	.043*	.42	.85
Health	5.01 (1.00)	5.05 (.83)	4.96 (1.05)	.621	.09	.83
Body Fat	4.02 (1.66)	3.56 (1.71)	4.47 (1.39)	.029*	.58	.91
Appearance	4.24 (.96)	4.22 (1.05)	4.26 (.94)	.832	.04	.75
Global Physical	4.50 (1.14)	4.14 (1.21)	4.86 (1.11)	.022*	.62	.87
Self-Esteem	5.22 (.73)	4.83 (.71)	5.60 (.74)	.019*	1.06	.85

Sign. *$p<.05$; SD = standard deviations

Table 2. Zero-order correlations among PSDQ variables.

PSDQ Variables	r									
	2	3	4	5	6	7	8	9	10	11
1. Activity	.717**	.536*	.512*	543*	.283	.157	.292	.184	.173	.234
2. Endurance		.379*	.367*	.424*	.393*	.345*	.401*	.321	.181	.257
3. Strength			.389*	.487*	.421*	.367*	.333*	.342*	.234	.215
4. Flexibility				.513*	.411*	.341*	.362*	.306*	.198	.203
5. Coordination					.532**	.322*	.354*	.312*	.143	.125
6. Sport Ability						.311*	.343*	.356*	.354*	234
7. Health							412*	354*	.387*	215
8. Body Fat								432*	.536**	253
9. Appearance									.585**	246
10. Global Physical										.683**
11. Self-Esteem										/

Sign. **p<.01; *p<.05

Table 3. Correlations between the variables: 'years without disability' – PSDQ components; 'years of sports practice' – PSDQ components.

Variables		*Activity*	*Endurance*	*Strength*	*Flexibility*	*Coordination*	*Sport Ability*	*Health*	*Body Fat*	*Appearance*	*Global Physical*	*Self-Esteem*
Years without disability	***r***	.424*	.523*	.394*	.567**	.527**	.398*	125	.486*	.09	.655**	.761**
	p-value	.021	.015	.042	.001	.001	.019	.503	.026	.768	<.0001	<.0001
Years of sports practice	***r***	.654**	.785**	.562*	.234	.498*	.637*	.197	.574*	.173	.731**	.803**
	p-value	<.0001	<.0001	.011	.541	.023	.002	.609	.009	.676	<.0001	<.0001

Table 4. Influence of 'years without disability' on PSDQ variables.

Variables	Coefficients *B*	Standard Errors	t	R^2	$F_{2,197}$	*p-values*
Activity	.354	.287	.6.89	.179	5.23	.029*
Endurance	.587	.281	4.7	.273	14.2	<.0001
Strength	.299	.378	.3.6	.155	7.1	.041*
Flexibility	.632	.201	5.8	.321	16.5	.001**
Coordination	.627	.234	3.6	.527	7.1	<.0001
Sport Ability	.401	.455	5.2	.277	7.7	.023*
Health	/	/	/	/	/	*NS*
Body Fat	.366	.234	6.02	.236	5.32	.035*
Appearance	/	/	/	/	/	*NS*
Global Physical	.671	.403	4.8	.429	18.5	.001**
Self-Esteem	.757	.536	6.3	.579	21.2	<.0001

Sign. *p<.05; **p<.01

4. Discussion

The main purpose of this study was to describe the physical self-description of a sample of young athletes with physical disabilities, evaluate differences in physical self-perceptions between groups with congenital or acquired disabilities, and examine the correlation between the self-reported variables of 'years without disability' and 'years of sport practice' and various aspects of physical self-perception. Based on work by Campbell (1995), we hypothesized that athletes with an acquired motor disability would have a more favourable physical self-concept than athletes with congenital disabilities, and our results confirmed this hypothesis. Significant differences emerged between groups in each physical self-concept domain except health and appearance. Of note, the items comprising those scales were not related to the type of disability experienced by participants in our sample. For example, items pertaining to 'health' primarily involved not getting sick often, and those related to 'appearance' related to having a nice face. Effect sizes measured with Cohen's *d* seemed to be adequate to our samples (Rosnow & Rosenthal, 2009).

Athletes with acquired disabilities obtained higher scores than athletes with congenital disabilities on all 'physical fitness' measures of the PSDQ-S and on the 'body fat' scale ("not being too fat"), suggesting more positive self-perceptions on variables that correspond to such past literature variables as physical fitness tests, BMI, and body composition (Carraro, Scarpa, & Ventura, 2010; Bassett, Martin Ginis, & Buchholz, 2009). Other new research has also demonstrated that perceived fitness impairment parallels the duration or history of the disability (Scarpa, 2017). The longer the period of growth and development experienced before a person's disability, the more likely it is that the individual will have developed better functional skills, sport competence and coping capacities with which to confront and accept their acquired disability. These data are also consistent with psycho-social theories suggesting that the development of physical self concept occurs in a social context (Li & Moore, 1998). Athletes with acquired disability also obtained higher scores than athletes with congenital disabilities on global self-concept within the PSDQ-S, suggesting that they may be associated better adjusted generally to their disability. Especially if we define self esteem as "the summation of positive self attitudes and competencies," we can expect a strong relationship between self-esteem and disability acceptance (Li & Moore, 1998)

It should be noted also that both groups of athletes with disabilities in our sample obtained good to high on all PSDQ-S scales, probably because they were self-selected from among athletes engaged in significant sport practice. While sport practice seems to play an important role in consolidating a positive sense of physical self and reducing potentially negative effects of disability on one's physical self-perception (Taleporos & McCabe, 2002), participants in our study were all heavily engaged in sports activities and practice and may have differed from a more general sample of persons with disabilities not only in their interests in sports but also in their abilities to participate in sports. Thus, while there are numerous psychosocial benefits to sport participation for people with disability, especially including physical competence, self-efficacy, and self-concept (Martin, Vitali & Whalen, 2015), there may also be a self-selection process such that individuals with disabilities who participate heavily in sports may be less disabled than peers who do not. Significant increases in the physical self-concept of person with disabilities tend to be due to motor skill development. Perhaps participation in sports not only allows people with disabilities the opportunity to develop or redefine their physical abilities, but it may also serve to mark or separate those who have already progressed in their physical abilities beyond non-participants in sports.

With regard to our second hypothesis, correlative data between physical self-perceptions and the period of time without a disability may be considered a proxy for addressing our assumption

that a late onset disability should be associated with a more positive self-perception. In fact, a positive correlation emerged between the number of years a person experienced prior to disability onset and higher evaluations of the physical self. We suspected that people whose motor disability resulted from trauma or injury later in life or at a more advanced age would have a more positive conception of their body, motor skills and abilities, and a higher self-esteem in line with Campbell's (1995) findings in which athletes in wheelchairs, with disabilities acquired later in life, had an improved state of well-being and a higher self-esteem than those with congenital disabilities. However, a study by Taleporos and McCabe (2002) finding that individuals with physical disabilities gradually adjust to their different bodies and increasingly accept their disabilities over time might suggest that those with congenital disabilities would have had more time to adjust and might show a more positive self-esteem as a result. Our results support Campbell's (1995) data and may be explained by considering the genesis and formation of the physical self an evolving self-perception formed over time through the influence and interdependence of its three main components: somatic, psychological and social. Thus, a self-description of one's body is not exclusively influenced by either real data describing one's physical conformation or psychological, emotional and personal ideas of one's physicality, but by the interaction of both of these components with social factors. To exemplify the fundamental importance of the interaction between the somatic, psychological and social dimensions in the development of the physical self, it is sufficient to think of a physically fit person who may have developed, on a psychological level, a 'distorted' conception of his physical self as a result of a negative and stigmatizing social experiences (Duncan, Al-Nakeeb, & Nevill, 2004). A prime example of this is the so-called "phantom fat" condition in which an individual continues to perceive the presence of fat, even after having lost weight, due to earlier social stigmatization from having been obese when younger. Taylor (1994) argued that this occurs because one's identity perception, including bodily considerations, is shaped by social recognition that happens in exchanges with 'others' (i.e., interpersonal relationships within the community to which one belongs, and within the relative cultural tradition). It is at least partly through recognition of the other that one's identity is formed (Galimberti, 2007), and a lack of social recognition, an absolute need for us, may lead to the fragmentation of personal identity, undermining the peaceful development of personal confidence in all facets and dimensions. Manifestations of non-recognition can be seen in bullying and victimization among peers, which are frequent sources of personal discomfort among children and adolescents worldwide (Cleave & Davis, 2006; Olweus, 2003). All that is experienced through the body is fundamental to the cognitive, affective and socio-relational development of every child and teenager. Weaker physical self-esteem of persons with congenital disabilities may also stem from their inability to have ever mastered physical skills, the memory of which might permit them to hang onto an earlier more positive physical self-perception that those with acquired disabilities can recall to insulate themselves against their later losses (Palumbo, 2016).

In light of the above considerations, it seems logical to assert that a person with a congenital disability undergoes, starting from birth, a series of stigmatizing negative social influences by significant others. Not only are most at risk of being bullied, but they are also potentially at risk of living in an overprotective family environment which, by underestimating the disabled child's potential, leads him to develop a distorted, negative self-conception. Conversely, a person who is not born disabled may have a greater opportunity to develop and consolidate a solid identity and a positive self-esteem, also thanks to the greater probability that he/she would receive positive social support from his/her parents, peers, teachers and all significant others. From the moment at which, over the course of life, one has to contend with a disabling trauma, albeit with difficulty, the person with a newly acquired disability – having had strong social experience and support previously – will often be helped to in accept the disability, able to integrate the disability into

his/her identity and process it more positively into a solid physical self-concept (Martin, 2010, 2007, 2006).

Taleporos and McCabe (2002) studied body image in people with physical disability in the frame of a social model of disability that considers feelings and attitudes towards the own body influenced also by social factors. They found that involvement in leisure activity, such as sport, provided mental and physical health benefits, enjoyment, and opportunity to develop self-concept and increase self-esteem, and occasions to build and enhance social relationships.

Furthermore, while several studies analysed the effects of the years post-injury on self-perception (e.g. Bailey, Gammage, van Ingen, & Ditor, 2015; Specht, King, Brown, & Foris, 2002), we found only few paper considering the time before the disability onset. Learning more about physical self-perception before the onset of a disability resulting in many physical changes to the body, and how individuals adjust to these changes may be useful information in sport and exercise settings.

Positive correlation emerged between the number of years of sport practice and better evaluation of the physical self (obviously there were no influences on flexibility due to the spastic or flaccid form of disability). Sport participation contributes to the development of a positive physical self in adolescents and children with motor disabilities. Likewise, as seen by data in our study regarding generally positive physical self perceptions among our participants, sport and adapted motor activities can be considered critically important inclusive opportunities for people with disabilities, helping them to improve the mental representation they have of their own bodies and thereby increase their level of self-esteem.

5. Conclusion

Biopsychosocial theory provided us a useful framework for understanding physical self-concept and self-esteem concerns of people with motor disability. The social model of disability infers that persons with identical motor impairments are likely to vary in their feelings and attitudes towards their own body because of social factors such as social support, education, unconditional acceptance from significative others (family, friends, boyfriend/girlfriend) and real and perceived social attitudes (Bailey, Gammage, van Ingen, & Ditor, 2015; Taleporos & McCabe, 2002).

On the basis of these premises, in our theoretical framework we posed three hypotheses, which have been confirmed by the statistical results and commented in the discussion on the basis of the data and of the existing rational.

In summary, we can thus argue that: (a) athletes with acquired disabilities generally have a significantly more positive physical self-concept and self-esteem than athletes with congenital disabilities; (b) the variable 'years without disabilities' positively affect physical self-concept and self-esteem in athletes with motor disability, or, in other words later trauma occurs in a person before disability, plus this person has acquired in the age of development the resources to adjust to the disability and begin to accept his/her body. Just in the initial period after the onset of disability we expect a negative physical self-concept, which parallels with acceptance of their disabilities: an acquired physical disability results in sudden changes to the body whereby adjustment occurs over time. For example, a spinal cord injury results in immediate physical impairments resulting in changes to appearance, functionality, and independence; but those variables improve with time following injury (Bassett, Martin Ginis, & Buchholz, 2009). While we expect a person with congenital motor disability to have a concept that is sufficiently stable over time - unless significant psychosocial events or severe events that affect his/her physical body intervene (e.g. Tasiemski, et al., 2004). Sports practice can be considered an important example of possibility to change positively one's body and the psychosocial context (Scarpa, 2011); (c) there are positive relationships between sport years of participation and all dimensions

of physical self-concept and self-esteem; moreover both groups of disabled athletes obtained scores from good to high on all scales of the PSDQ. Sport practice seems to play a crucial role in consolidating a positive sense of physical self and reduce potentially negative effects of disability on one's physical self-perception (Taleporos & McCabe, 2002). According to the psychosocial model of disability, sport can contribute to improve: personal skills, social support, unconditional acceptance from important people in their lives such as friends; and to overcome social discrimination, societal stigmatization and all the other negative elements described above, which would tend to be internalized by persons with disabilities (Anderson, 2009; Arbour, et al., 2007; Li & Moore, 1998; Blinde & McClung, 1997).

In our view, it must be attributed a crucial role to educational agencies. Sibilio (2014) proposes a new perspective of 'semplessity' (that is, the ability to see a complex system in a simple way) in didactic field, which allows to revalorise the body and its perceptions in order to improve the educational activity.

5. Limitations and future directions

From a theoretical and argumentative point of view this research was based on the biopsychosocial model of disability, while from an empirical point of view many variables envisaged in the model have not been statistically evaluated. In future studies, the impact of those variables (e.g., demographic characteristics; disability conditions; roles of education, family, friends; psychosocial factors like emotional support, perceived discrimination, unconditional acceptance; focus on some aspect of personal achievement, like sports, career, family, education) on the physical self-concept in people with motor disability is expected to be assessed. Moreover, it would be interested to test the relationships between PSDQ and Acceptance of Disability Scale (AD; adapted by Li & Moore, 1998).

Since there are controversial studies about the effect of the onset of physical trauma on acceptance of disability (or having positive physical self perceptions), we would suggest to do a randomized study, analyzing the influence of the time with disability physical self-concept, differentiating the two samples subdivided into congenital and acquired disabled.

In people with acquired physical disability, the time they need to adjust to the disability should also be evaluated after the onset of the injury. The influence of the years of sports practice both before and after the onset of disability should be examined.

We used the PSDQ after making a language adaptation for people with motor disabilities (see pilot study above). This has not been sufficient. There is a need to adapt the questionnaire conceptually, taking into account both the needs of the researchers and the instances of the population to be interviewed. Because for an athlete with motor disability it is important the appearance of the legs rather than of the face, as well as a 'cold' or 'flu' cannot identify their health status*.

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***Contribution of each author**

Stefano Scarpa is the first author of the research. He is the creator of the project and has developed, in particular, those parts of the research: the theoretical background, data analyses and statistics, results, discussion, conclusions, figure, tables. He collaborated in the final article revisions and his work has been significantly supported by the coordinator of the research. From a practical point of view he collected data in northern Italy. Carmen Palumbo is the second author and the scientific coordinator of the research. She has developed, in particular, the introduction; the method: participants, instruments, procedure; limitations and future directions; and care of bibliographic references. She has meticulously collaborated in the final article revisions. From a practical point of view she collected data in southern Italy.

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