From supercrip to techno-supercrip

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ORIGINAL ARTICLE

ABSTRACT

Many ability-based theoretical concepts have been developed within the disability rights community and the fields of disability studies, ability studies, studies in ableism, and critical studies of ableism to engage with the societal reality of ability-based judgments, norms, and conflicts in general and in relation to body and mind abilities, body ability enhancement beyond the species-typical and the role of body-linked technologies. Ability-based judgments of disabled and so-called non-disabled people are prevalent in sports in general, physical activity, leisure and recreation, and the fields of sports pedagogy, kinesiology, and physical education (from now on referred to as *sport in all areas*). Therefore, the first aim of this study was to obtain numbers of the prevalence of use in the academic literature focusing on sport in all areas in general and in relation to disabled people of a) ability-based theoretical concepts and b) terms linked to human ability enhancement and body linked technologies by themselves and in conjunction with ability-based concepts. Disabled people face many barriers to participation in sport in all areas due to ability-based judgments, irrelevant norms, and conflicts. Therefore, the second aim was to ascertain how often ability-based theoretical concepts and terms linked to human ability enhancement and body-linked technologies were mentioned in the academic literature that covered participation barriers of disabled people in the sport in all areas. To fulfill the two aims, a review of academic abstracts and full texts employing Scopus and the 70 databases of EBSCOhost was performed, reporting hit count frequencies of over 35 ability-based theoretical concepts, eight human-enhancement related terms, and seven technology-related terms. For both aims, the results were similar. Ability-based theoretical concepts (ableism and disablism were mentioned the most) and human-enhancement linked terms were rarely to not at all mentioned in the full text and abstracts. Although the generic term technolog* had substantial hits, followed by assistive technolog*, techno-focused ability theoretical concepts were also rarely to not at all present. The results suggest many opportunities to use the terms searched for to engage with ability-based judgment, norm, and conflict challenges, including the techno-linked abilities and human ability enhancement challenges faced by

the sport in all areas. This study was, to my knowledge, the first one to record the visibility of ability-based theoretical concepts in academic literature focusing on specific topics. This approach might be useful also to investigate other topics as ability-based judgments, norms, and conflicts are evident in the discussions of many other topics beyond sport in all areas.

Introduction

Ability-based judgments, norms, and conflicts are a general cultural reality. One study found that students believed that different social groups select different abilities as abilities needed for a good life (Wolbring & Gill, 2023), suggesting ability-based conflicts between different groups. Judgments of abilities of the body are central to sports on all levels, physical activity, leisure, and recreation, and the fields of sports pedagogy, kinesiology, and physical education (from now on called sport in all areas; Giese & Ruin, 2018; Gilchrist et al., 2021; Miah, 2017) and could be seen to be linked to the ability to have a good life. Existing, appearing, and envisioned technologies shape discourses around body ability normativity and what abilities are expected from the body, whereby discussions move increasingly to the vision of enhancing the abilities of the body beyond the species-typical (Roco & Bainbridge, 2003), (see also discussions linked to the term transhumanism; Grue, 2023; Jotterand, 2010; Lopez Frías, 2018; McNamee, 2013; Wolbring & Tynedal, 2013). This move sets the stage for a hierarchy of bodies that favors the body with the latest ability-enabling upgrades on top. This hierarchy of bodies is mirrored by the appearance of a hierarchy of assistive devices, such as bionic legs versus wheelchair (Panesar & Wolbring, 2014) or exoskeleton versus wheelchair (Strickland, 2012). The use of the term techno-doping is one indicator of the influence of technologies on competitive sports (Willwacher et al., 2023; Y. Yang & Zhu, 2014) and was also applied to the bionic legs of the para-athlete Pistorius (Wolbring & Tynedal, 2013).

Many ability-based concepts such as supercrip, techno-supercrip, ableism, disablism, internalized ableism, internalized disablism, enhancement version of ableism and disablism, techno-poor disabled, techno-poor impaired, and technoableism were developed and are used within disability rights discussions, disability studies, ability studies (short for ability expectation and ableism studies; Wolbring, 2008b, 2008c, 2023), studies in ableism (Campbell, 2008b, 2009, 2012) and critical studies of ableism (Goodley, 2016; Goodley et al., 2019) to engage with ability-based judgments norms and conflicts especially body- and mind-linked ability judgments, norms, and conflicts. Ability-based concepts are also used to discuss body enhancements beyond the species-typical and the role of technologies in body- and mind-linked ability judgments, norms, and conflicts. Ability-based concepts are therefore useful to engage with ability-based judgments, norms, and conflicts in sport in all areas, including

body ability hierarchies, techno-enabled changes in body ability expectations such as the expectation of beyond species-typical and ability-based judgments, and the role of technologies in these issues. Therefore, the first research question of this study is 1) How often are the ability-focused concepts, terms linked to moving human abilities beyond the species-typical mentioned and terms discussing the role of technologies in shaping ability expectations used in the academic literature focusing on sports on all levels, physical activity, leisure and recreation and the fields of sports pedagogy, kinesiology, and physical education?

Disabled people face many problems in their daily lives, as evidenced by the many issues flagged as action items in the United Nations Convention on the Rights of Persons with Disabilities (CRPD; United Nations, 2015). Participation in sports and physical activity is one of them, as evidenced by Article 30: Participation in cultural life, recreation, leisure, and sport of the CRPD. Participation in all forms of sports and physical activity is seen as important for the quality of life, self-esteem, independence, and social integration of disabled people (United Nations, 2023; United Nations Educational, Scientific and Cultural Organization, 2015). At the same time it is noted that "as low as 3% of these individuals may be participating in regular organized physical activity" due to "barriers such as costs for specialized equipment and transportation, a lack of specialized coaches and information regarding the sport opportunities that do exist" (Standing Senate Committee on Human Rights Canada, 2012, p. 1) and that "barriers to sports participation are inextricably linked to wider societal views and expectations of disabled people" (Fitzgerald, 2018, p. 55). Many problems with the sports participation of disabled people on all levels (Arora & Wolbring, 2022) and the participation of disabled students in school-based physical activities (Arora & Wolbring, 2022; Haegele, 2019) are noted in the academic literature. Questions are raised about the lack of trickle-down from high-performance sports (Morris, 2010), the "hierarchies within disabled sport, the impact of commodification on the disabled body and the (perceived) barriers to physical activity

for disabled participants" (Bush & Silk, 2012, p. 471). It is argued that the Special Olympic movement appearance was "a reaction to a twofold exclusion of persons with intellectual disabilities from other areas of sport: as an exclusion from mainstream sport and second, as an exclusion from elite Paralympic sport" (Giese et al., 2022, p. 2178). However, the same article outlines various ability expectations that limit the utility of the Special Olympics, leading to the same problem of lack of trickle-down and utility of the event to increase sports participation of people with intellectual disabilities (Giese et al., 2022). It is recommended that "mega sporting events are not used as a policy intervention to increase sport participation of people with disabilities, as this does not account for constraining social and systemic barriers to sports participation" (Brown & Pappous, 2021, p. 18). Given the noted problems, the following second research question was investigated: 2) How often does the academic literature focusing on sport in all areas use the ability-focused concepts, the issue of enhancement beyond the species-typical and the role of technologies in shaping abilities to discuss barriers to sport and physical activities disabled people face?

Ableism and other ability-based concepts

Disabled activists and academics coined the term ableism to flag the cultural reality of ability-based expectations, judgments, norms, and conflicts and the power dynamic around setting ability norms and the ability privilege so the ability to access certain other abilities if one fits ability norms (Wolbring, 2014). They also coined the term disablism (Miller et al., 2004), to flag the negative use of irrelevant ability norms to disable the ones who do not fit the norm so as to highlight the discriminations experienced by disabled people labeled as ability-deficient due to the use of irrelevant ability norms (Wolbring, 2021a).

Ableism and disablism and other ability-based concepts are theoretical constructs to engage with systemic ability-based expectations, judgments, norms, and conflicts and are the theoretical foundation of this article. There are three main ability-based strands of

studies, all with a different focus, namely ability studies (short for ability expectation and ableism studies; Wolbring, 2008b, 2008c, 2023), studies in ableism (Campbell, 2008b, 2009, 2012) and critical studies of ableism (Goodley, 2016; Goodley et al., 2019). Although most focus on the ability-judgment-relationship between disabled people-non and disabled people, it is also used to engage with ability judgments between humans in general (Wolbring, 2008b, 2008c, 2023), humans and nature, humans and animals, and humans and machines (Wolbring, 2008b, 2008c, 2023). There are the concepts of eco-ability and eco-ableism, concepts used to cover specifically humans-animal and humans-nature relationships some focusing on disabled people and the relationship to animals and nature, some looking at the ability judgments and conflicts between humans and animals and humans and animals in general (Nocella, 2017; Wolbring, 2008b, 2012b, 2014). Furthermore, ability-based studies are also engaged to query humans-post/transhumans and humans-cyborg humans relationships and the issue of human enhancement beyond the species-typical (Goodley et al., 2014; Wolbring, 2008b, 2008c, 2014). Finally, within some ability-based studies, the premise is that the "exhibition of ability expectations or ableism's can have positive (enablement/enablism) and negative (disablement/disablism) consequences" (Wolbring & Yumakulov, 2015, para. 2). For example, equity, diversity, and inclusion are seen as enabling ability expectations (expectation to live in an equitable, diverse, and inclusive society; Wolbring & Lillywhite, 2021). The capability approach is a list of abilities one should be able to experience, so it is about enabling ability expectations. The capability approach is about the ability to be and to do and various ability-to-do-and-to-be lists exist within the capability approach (Wolbring & Burke, 2013). Many theories have been engaged in conjunction with ability-based studies, such as critical race theory (Campbell, 2008a), colonial theory (Wolbring & Ghai, 2015), social dominance theory and social learning theory (Kattari, 2015), and ethics theories (Wolbring, 2012a). Various ability-based concepts have been generated such as internalized ableism (Campbell, 2008a), internalized disablism

(Bantjes et al., 2019; Grenier et al., 2023), ability security (one is able to live a decent life with whatever set of abilities one has), ability identity security (to be able to be at ease with one's abilities) and ability inequity, an unjust or unfair a) distribution of access to and protection from abilities generated through human interventions, or b) judgment of abilities intrinsic to biological structures such as the human body (Wolbring, 2023) to name a few. The intersectionality of ableism and disablism with other forms of oppression is noted (Balderston, 2013; Frederick & Shifrer, 2019; Liasidou, 2013; Whitesel, 2017) as that abilities are often used to justify negative "ism's" such as racism or sexism (Balderston, 2013; Campbell, 2008a; Frederick & Shifrer, 2019; Liasidou, 2013; Whitesel, 2017; Wolbring, 2008b, 2008c, 2021b).

The concepts of ableism and disablism are also used to query the problematic lived reality of disabled people's participation in sport on all levels, physical activity, leisure, and recreation, and how the fields of sports pedagogy, kinesiology, and physical education engage with disabled people. A recent study by Arora & Wolbring (2022) cited many studies covering the engagement with various aspects of ableism such as structural ableism, the intersectionality of ableism with other "isms", ableism's influence on body image, internalized ableism, within the kinesiology, sport, physical education and physical activity focused academic literature. Ableism has also been used as a lens to call out the negative reality disabled students experience in physical education (Alfrey & Jeanes, 2023), kinesiology (Narasaki-Jara et al., 2021), and sports pedagogy (Giese & Ruin, 2018). Ableism has been applied to different Olympics, such as the Special Olympics (Giese et al., 2022) and the Paralympics (Wolbring, 2012b).

Supercrip

The *supercrip* is a concept used to question one disabling use of ability judgments namely the expectation to perform beyond ability expectations set by the disabling judgment of a non-normative body. The supercrip narrative is used to question the coverage of high-performance disabled athletes and disability

sports (Bantjes et al., 2019; De Oliveira et al., 2019; Hardin & Hardin, 2004; Hodges et al., 2015; Kim et al., 2023; Maika & Danylchuk, 2016; McGillivray et al., 2021; Peers, 2015; Wolbring & Martin, 2018; L. Yang & Lin, 2023) but also as a negative narrative within discussions around physical activity (Williams et al., 2022). The term *surviving crip* is put forward as an alternative to supercrip (Bailey, 2019). One study using the Motivation Scale for Disability Sport Consumption (MSDSC) found that the disability sport motives include inspiration, supercrip image, and disability cultural education. Significant motives included physical attraction, drama, escape, inspiration, physical skill, social interaction, violence, and supercrip image (Cottingham et al., 2014). Supercrip and superhuman are commonly used themes whereby both are seen to negatively impact the disability community (Rees et al., 2019). Crow (2015) questioned the use of the advertising campaign "Meet the superhumans", which became the London 2012 Paralympic mantra (see also Crow, 2014; Kearney et al., 2019). The imagery of the supercrip is also applied to highlight other overachieving disabled people outside the sport theme (Lourens, 2020).

Moving to the enhancement and techno-version of ableism and disablism

Increasingly technologies linked to the body are part of the ability judgment of the body (Wolbring, 2010b), a development which could influence the already existing ability judgment of the body in sport in all areas (Giese & Ruin, 2018; Gilchrist et al., 2021; Miah, 2017). Moving beyond species-typical abilities of the body is enabled by technologies added into or linked to the body. Fitting with the concepts of the cyborg and the techno supercrip (Wolbring, 2010b), are the transhumanized version of ableism which is a set of beliefs, processes, and practices that perceive the improvement of human body abilities beyond homo sapiens typical boundaries as essential (Wolbring, 2008b, 2008c), the concepts of *techno-poor disabled* (being discriminated because one cannot or does not want to upgrade beyond the species-typical; Wolbring,

2006, 2008a, 2023) could also be called *techno-disablism*, *techno-poor impaired* (seeing oneself and/or being seen by other as ability-impaired due to not having the latest upgrade to the body/mind; Wolbring, 2023) and *techno-ableism* ("a rhetoric of disability that at once talks about empowering disabled people through technologies while at the same time reinforcing ableist tropes about what body-minds are good", Shew, 2020, p. 43, 2022). All these are useful terms to discuss techno-driven ability expectations including the increasing possibility to move beyond species-typical abilities. Techno-washing, described by some as excessive optimism around technology (Ribeiro & Soromenho-Marques, 2022), used in non-disability-related discussions might also be a useful term for ability-based discussions to critically analyze body-ability promises.

Moving towards the cyborg and the techno-supercrip

Cyborg is a term linked to the techno-enhancement of the body and, with that, is linked to ability judgments of the body. The cyborg as a concept has been discussed for a long time (Haraway, 1990) including through a disability rights perspective (Weise, 2018). The phrase cyborg athlete has been in use for some time, often within the framework of transhuman and posthuman athletes (Butryn, 2003; Butryn & Masucci, 2009; Lopez Frias, 2016; Lopez Frías, 2018; Miah, 2017), for example in the term cyborg gym. The cyborg is also linked to disabled people specifically such as in 2016, the first Cybathlon labeled itself as the Cyborg Olympics for physically disabled athletes (Wolbring, 2018). The 2024 version has the arm prosthetic race, assistance robot race, vision assistance race, brain-computer interface race, exoskeleton race, wheelchair race, leg prosthetics race, and exoskeleton race (Cybathlon Organizers, 2023). The supercrip is often mentioned in conjunction with technology (Goh, 2020). Cyborg is seen as another word for supercrip; "the Paralympic athletes' self-presentation as cyborgs or supercrips" (Beldame et al., 2023, p. 194); the cyborg is the supercrip (Olsen, 2013). One theme

around the Cyborg Olympics was that existing sports setups, such as the Olympics and Paralympics hinder techno-sport advancements (Wolbring, 2018). It is argued that the increase in visibility of the Paralympic movement is due to technologies that have helped to create a legion of cyborg bodies that is manifest in the image of the contemporary sporting supercrip (Howe, 2011; Howe & Silva, 2017). Interestingly some seem to see the supercrip as one step below the technology-enhanced body when they write "today the media-speeches tell stories of Paralympic athletes that go beyond the stereotype of the 'Supercrip', offering on the cultural market the exploits of new heroes: athletes, super-human, testimonials of bodies that can be improved and upgraded thanks to new technologies" (Russo, 2020, p. 104). The term techno-supercrip (Wolbring, 2010b) was coined to engage with the emerging danger "that the enhancement of a few people we label as impaired people will increase the negative image of the rest of the non-enhanced sub-species-typical people" (Wolbring, 2010b, p. 76). As used in Wolbring (2010b), the techno-supercrip was conceptualized to fit with the supercrip, which is, in essence, about a sub-species-typical to excel, which in this case is a term linked to disabled people. Of course, given the trajectory that the species-typical will be seen as impaired in relation to the beyond species-typical enhancement model of ableism (transhumanization of ableism; Wolbring, 2010a), the techno-supercrip could be used to flag any non-enhanced person as all the non-enhanced now are potential disabled people as in impaired people.

Barriers to sport, recreation and leisure, physical activity and physical education for disabled people

One of the main barriers mentioned is the accessibility (Amberkar et al., 2019; Maurer et al., 2019; Rusalem et al., 1965), and many tools to measure accessibility are employed (Butzer et al., 2021; Calder & Mulligan, 2014). Other main barriers noted are:

- transportation (French & Hainsworth, 2001; Jaarsma et al., 2014)
- social barriers (Menzies et al., 2021) such as for women with disabilities (Rolfe et al., 2012) and girls with disabilities (Anderson et al., 2005)
- social stigma and negative view of disabled people (Eminovic et al., 2009; Sahlin & Lexell, 2015)
- lack of trained staff (Gossett & Tingstrom, 2017; Patel & Greydanus, 2002)
- lack of knowledge about disabled people in general (Lieberman & Wilson, 2005)
- "lack of financial support for sport and physical education in schools" (Patel & Greydanus, 2002, p. 803)
- disliking help (Van Der Linden et al., 2022)
- lack of relevant opportunities (Shields & Synnot, 2014; Townsend & Van Puymbroeck, 2012)
- costs (Smith et al., 2016)
- no "provision of physical education to the disabled" (Özkara, 2018, p. 31)
- "lack of facilities" (Özkara, 2018, p. 31)
- "belief that the disabled have no place in the field of sports hence leading to poor financing of the special needs education by the government" (Özkara, 2018, p. 31)
- communication (Arndt et al., 2004)

Self-consciousness was noted as a barrier to performing physical activity in public (Newitt et al., 2016; Rimmer & Marques, 2012). Some barriers faced by the athletes are "structural (facilities, equipment, funding) and the negative attitude from the government, public and media" (Wilson & Khoo, 2013, p. 1132) and "lack of appropriate sporting competitions" (Nettleton et al., 2017, p. 206). "Barriers to participation were encountered in school and work environments, physical and built environments, within institutional and govern-

ment policies, services and assistance, and attitudes and social support" (Law et al., 2007, p. 1363). One article outlined ten categories of barriers (Rimmer et al., 2004).

Within the teaching system barriers noted were the "absence of curricular adaptations" (Costa & Van Munster, 2017, p. 361), unprepared teaching professionals (Dixon et al., 2022), "the attitude of students without disabilities" (Gaintza & Castro, 2020, p. 214) and that disabled students are "defined as malfunctioning and lacking ability" (Svendby & Dowling, 2013, p. 361). One study found 652 barriers with the barriers having been categorized in Table 2 under environment (50), equipment (74), personal (90), policy (14), program-related (161), social (43), and teacher (223; Haegele et al., 2018; see also Haegele, Wilson, et al., 2021 for barriers).

Technology-based barriers to participation for disabled people are "lack of appropriate assistive technologies" (Berardi et al., 2021, p. 1), equipment barriers (Rimmer et al., 2004) such as inaccessibility, lack of availability (Lieberman et al., 2023), and costs (Berardi et al., 2021; Nettleton et al., 2017).

Methods

The first aim of this study was to obtain numbers of the prevalence of use in the academic literature focusing on sport in all areas in general and in relation to disabled people of a) ability-based theoretical concepts and b) terms linked to human ability enhancement and body-linked technologies by themselves and in conjunction with ability-based concepts. The second aim was to ascertain how often ability-based theoretical concepts and terms linked to human ability enhancement and body-linked technologies were mentioned in the academic literature that covered participation barriers of disabled people in sport in all areas. To achieve the aim two research questions were asked.

1. How often are the ability-focused concepts and terms linked to moving human abilities

beyond the species-typical mentioned and terms discussing the role of technologies in shaping abilities used in the academic literature focusing on sports on all levels, physical activity, leisure and recreation and the fields of sports pedagogy, kinesiology, and physical education?

2. How often does the academic literature focusing on sport, physical activity, leisure, recreation, sports pedagogy, kinesiology, and physical education use the ability-focused concepts, the issue of enhancement beyond the species-typical and the role of technologies in shaping ability expectations to discuss barriers to sport in all areas disabled people face?

To answer the research questions, the author performed a hit count frequency analysis of abstracts and full text using the online search options of the academic databases (strategies 1-3) and a hit count frequency analysis of downloaded abstracts (strategies 4a-d) using Adobe Acrobat software (Adobe Acrobat Pro DC). The data used for the analysis was obtained by searching with no time restrictions on 21st March 2021, and again 11th May 2023 (strategy 4) and 10th June 2023 (strategies 1-3), the abstracts (strategies 1 and 4) and full text (strategies 1-3) of the academic databases EBSCOhost (an umbrella database that includes over 70 other databases including sport related databases such as SPORTDiscus) and Scopus using various search strategies (Table 1). To meet the inclusion criteria, all sources had to be in English, and scholarly peer-reviewed journals were included in the EBSCOhost search and reviews, peer-reviewed articles, conference papers, and editorials in Scopus. Every data found through the search strategies not covering the content mentioned under inclusion criteria is excluded from the content analysis.

Table 1
Search strategies used

Strategy	Sources	Search terms	Hits and research question
Keyword strategies for frequency hits obtained from online searches (percentage or frequencies of hits in result section)			
Strategy 1a	Scopus/EBSCO-HOST	Abstract OR full text ("sport*") and terms in the table	Research question 1
Strategy 1b	Scopus/EBSCO-HOST	Abstract OR full text ("physical activit*") and terms in the table	Research question 1
Strategy 1c	Scopus/EBSCO-HOST	Abstract OR full text ("recreation" or "leisure") and terms in the table and terms in the table	Research question 1
Strategy 1d	Scopus/EBSCO-HOST	Abstract OR full text ("physical education*") and terms in the table	Research question 1
Strategy 1e	Scopus/EBSCO-HOST	Abstract OR full text ("kinesiology") and terms in the table	Research question 1
Strategy 1f	Scopus/EBSCO-HOST	Abstract OR full text ("sport pedagog*") and terms in the table	Research question 1
Strategy 2a	Scopus/EBSCO-HOST	Full text ("sport*") AND full text ("disab*" OR "impair*" OR "deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy") and terms in the table	Research question 1
Strategy 2b	Scopus/EBSCO-HOST	Full text ("physical activit*") AND full text ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*") and terms in the table	Research question 1
Strategy 2c	Scopus/EBSCO-HOST	Full text ("recreation" or "leisure") AND full text ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*") and terms in the table	Research question 1
Strategy 2d	Scopus/EBSCO-HOST	Full text ("physical education*") AND full Text ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*")	Research question 1
Strategy 2e	Scopus/EBSCO-HOST	Full Text (kinesiology) AND full text ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*") and terms in the table	Research question 1
Strategy 2f	Scopus/EBSCO-HOST	Full text ("sport pedagog*") AND full text ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*") and terms in the table	Research question 1
Strategy 3a	Scopus/EBSCO-HOST	Full text (barrier* AND "sport*") AND full text ("disab*" OR "impair*" OR "deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy") and terms in the table	Research question 2
Strategy 3b	Scopus/EBSCO-HOST	Full text ("barrier*" AND "physical activit*") AND full text ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*") and terms in the table	Research question 2
Strategy 3c	Scopus/EBSCO-HOST	Full text ("barrier*" AND "recreation" or "leisure") AND full text ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*") and terms in the table	Research question 2

Strategy	Sources	Search terms	Hits and research question
Keyword strategies for frequency hits obtained from online searches (percentage or frequencies of hits in result section)			
Strategy 3d	Scopus/EBSCO-HOST	Full text ("barrier*" AND "physical education*") AND full text ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*") and terms in the table	Research question 2
Strategy 3e	Scopus/EBSCO-HOST	Full text ("barrier*" AND "kinesiology") AND full text ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*") and terms in the table	Research question 2
Strategy 3f	Scopus/EBSCO-HOST	Full text ("barrier*" AND "sport pedagog*") AND full text ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*") and terms in the table	Research question 2
Strategies to obtain data for downloading abstracts for research question 2			
Strategy 4a	Scopus/EBSCO-HOST	ABS ("barrier*" AND "physical activit*") AND ABS ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*")	2021 = 721 2023 = 227 Downloaded Research question 2
Strategy 4b	Scopus/EBSCO-HOST	ABS ("barrier*" AND "physical education*") AND ABS ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*")	2021 = 79 2023 = 37 Downloaded Research question 2
Strategy 4c	Scopus/EBSCO-HOST	ABS ("barrier*" AND "sport*") AND ABS ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*")	2021 = 307 2023 = 105 Downloaded Research question 2
Strategy 4d	Scopus/EBSCO-HOST	ABS ("barrier*") AND ABS ("recreation*" OR "leisure") AND ABS ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*")	2021 = 424 2023 = 81 Downloaded Research question 2
Strategy 4e	Scopus/EBSCO-HOST	(ABS ("kinesiology" AND "barrier*") AND ABS ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*")	3 abstracts not downloaded Research question 2
Strategy 4f	Scopus/EBSCO-HOST	(ABS ("sport pedagog*" AND "barrier*") AND ABS ("deaf*" OR "autism" OR "ASD" OR "ADHD" OR "neurodiver*" OR "palsy" OR "impair*" OR "disab*")	0 Research question 2

As to the search strategies, strategies 1a-f cover abstracts and full text containing sport-related terms to be used with the terms in the tables. Strategies 2a-f covered full text containing sport-related terms and disability-related terms to be used with the terms in the tables. Strategies 3a-f covered the full text containing the term barrier together with the sport-related terms and the disability terms to be used with the terms in the tables. Strategies 4a-f covered the abstracts containing the term barrier together with the sport-related terms and the disability terms. To obtain the abstracts for download (strategy 4), the citations (which also contained the abstracts) were downloaded from the two databases into the EndNote software (EndNote X9, Clarivate) for each of the strategies 4a-d (Table 1) generating four endnote files. Strategies 4e and 4f did not generate any relevant hits for download. After using EndNote to eliminate duplicates of abstracts between the databases obtained for each of the endnote files the four EndNote files were exported as four Microsoft Word (Microsoft Word for Office 365) documents. Each Microsoft Word document was then converted into a PDF and the advanced search function in Adobe Acrobat was used to generate hit counts for the abstracts obtained from strategies 4a-d.

Results

The result section follows the order of the two research questions. Each of the tables is divided into three parts. In the first part frequency hit count results obtained for 35 ability-based concepts are reported. In the first part the hits for the term identity by itself and together with ableism or disablism are also recorded. In the second part the results for eight human enhancement related terms some alone and some in conjunction with ableism/disablism are recorded. Finally in the third part of each table the results for seven techno related terms including the phrase "assistive technolog*" are shown. For some full text hits of some terms, it was checked whether they were relevant (noted in the tables). Table 2 and Table 3 are in the result section. Table 4, Table 5 and Table 6 are in the Appendix.

Quantitative hits related to research question 1

Table 2 covering the hits of online searches, shows that hits were higher for the full text versus abstract online searches. Hits were highest for the term technolog* followed by identity, and assistive technolog*. Performance enhancement had 10 times more hits than human enhancement. The term transhuman* generated much less hits. Of the ability-based concepts, except for ableism and disablism most were not present at all or had very little hits. Interestingly although doping is a well-known topic in, for example, sport, the term techno-doping was rarely found. Table 4 (Appendix) covering the frequency of ability, human enhancement and technology related conceptual terms present in online searches of abstracts and full text containing the terms kinesiology or sports pedagogy shows similar results found in Table 2 but in general more zero hits.

Table 4 (Appendix) reports on the frequencies of ability, human enhancement and technology related conceptual terms found in conjunction with disability terms and sport or physical activity or recreation or leisure or physical education or kinesiology or sports pedagogy using online full text searches and shows in principle similar results to the full text hits found in Table 2 just less hits for the conceptual terms.

Quantitative hits related to research question 2

Table 3 covering the hits of online searches shows in principle similar results to the one found in Table 6 just with a few more hits. Transhuman was not mentioned once together with ableism or disablism. As the full texts were not downloaded, one cannot judge whether terms linked to enhancement are used to look at enhancement beyond the species-typical.

Table 2

Frequency of ability, human enhancement and technology related conceptual terms present in online searches of abstracts and full texts containing the terms sport* or "physical activity" or "recreation" or "leisure" or "physical education"

Conceptual terms	Strategy 1a "Sport*" Abstracts 639,876	Strategy 1a "Sport*" Full texts 3,539,183	Strategy 1b "Physical activit*" Abstracts 552,562	Strategy 1b "Physical activit*" Full texts 1,668,869	Strategy 1c "Recreation" OR "Leisure" Abstracts 249,474	Strategy 1c "Recreation" OR "Leisure" Full texts 1,524,899	Strategy 1d "Physical education" Abstracts 86,042	Strategy 1d "Physical education" Full texts 623,677
35 ability-based concepts								
"ableism"	154	2,177	27	1,025	20	1,509	21	732
"internalized ableism"	1	110	0	47	0	0	0	36
"ability security" OR "ability insecurity" OR "ableism security" OR "ableism insecurity"	0	2	0	1	0	0	0	1
"ability equity" OR "ability inequity" OR "ability equality" OR "ability inequality" OR "ableism inequity" OR "ableism equity" OR "ableism equality" OR "ableism inequality"	0	13 (all but 1 false positive)	0	5 (all but one false positive)	0	8 (all but 1 false positive	0	7 (all but 2 false positive)
"ability privilege"	0	19	0	3	0	10	0	7
"ability discrimination" OR "ableism discrimination"	0	6	0	3	0	1	0	2
"ability oppression" OR "ableism oppression"	0	1 (false positive)	0	0	0	0	0	0
"ability apartheid" OR "ableism apartheid"	0	1	0	0	0	0	0	0

Conceptual terms	Strategy 1a "Sport*" Abstracts 639,876	Strategy 1a "Sport*" Full texts 3,539,183	Strategy 1b "Physical activit*" Abstracts 552,562	Strategy 1b "Physical activit*" Full texts 1,668,869	Strategy 1c "Recreation" OR "Leisure" Abstracts 249,474	Strategy 1c "Recreation" OR "Leisure" Full texts 1,524,899	Strategy 1d "Physical education" Abstracts 86,042	Strategy 1d "Physical education" Full texts 623,677
"ability obsolescence" OR "ableism obsolescence"	0	1	0	1	0	1	0	1
"ability consumerism" OR "ableism consumerism" OR "ability commodification" OR "ableism commodification"	0	0	0	0	0	0	0	0
"ability foresight" OR "ableism foresight"	0	0	0	0	0	0	0	0
"ability governance" OR "ableism governance"	0	6	0	2	0	6	0	2
"disablism"	8	531	1	299	6	468	0	146
"internalized disablism"	0	2	0	2	0	1	0	0
"disability burnout" OR "disablism burnout"	0	0	0	0	0	0	0	0
"identity"	19,231	379,189	3,269	104,970	8,029	298,299	2,270	5,334
"identity" AND "ableism"	10	1,562	0	646	5	1,170	1	465
"identity" AND "disablism"	7	404	0	205	0	322	0	120
8 human enhancement linked concepts								
"cyborg"	89	4,265	2	1,072	7	3,285	1	513
"human enhancement"	38	1,176	1	193	0	333	0	79

Conceptual terms	Strategy 1a "Sport*" Abstracts 639,876	Strategy 1a "Sport*" Full texts 3,539,183	Strategy 1b "Physical activit*" Abstracts 552,562	Strategy 1b "Physical activit*" Full texts 1,668,869	Strategy 1c "Recreation" OR "Leisure" Abstracts 249,474	Strategy 1c "Recreation" OR "Leisure" Full texts 1,524,899	Strategy 1d "Physical education" Abstracts 86,042	Strategy 1d "Physical education" Full texts 623,677
"human enhancement technolog*"	6	161	0	22	0	39	0	8
"performance enhancement"	1,927	11,325	38	6,667	20	3,860	15	5,448
"human enhancement" AND "ableism" OR "disablism"	0	14	0	11	0	13	0	14
"performance enhancement" AND "ableism" OR "disablism"	0	12	0	18	0	18	0	16
"posthuman"	10	2,166	0	451	17	1,866	0	239
"supercrip"	119	740	3	369	0	342	0	217
"superhuman"	44	2,475	11	188	0	1,930	0	210
"transhuman*"	10	2,166	0	451	17	1,866	0	239
"transhuman*" AND "ableism" OR "disablism"	119	740	3	369	0	342	0	217
7 technology related terms								
"assistive technolog*"	191	13,868	125	8,779	324	9,794	12	1,969
"technolog*"	29,224	889,345	14,307	366,072	12,803	456,920	5,300	129,540
"technoableism" OR "techno-ableism"	0	3	0	4	0	2	0	0
"technodoping" OR "techno-doping"	9	38	0	15	0	2	1	13
"ttechno-poor"	0	9	0	1	0	1	0	3

Conceptual terms	Strategy 1a "Sport*" Abstracts 639,876	Strategy 1a "Sport*" Full texts 3,539,183	Strategy 1b "Physical activit*" Abstracts 552,562	Strategy 1b "Physical activit*" Full texts 1,668,869	Strategy 1c "Recreation" OR "Leisure" Abstracts 249,474	Strategy 1c "Recreation" OR "Leisure" Full texts 1,524,899	Strategy 1d "Physical education" Abstracts 86,042	Strategy 1d "Physical education" Full texts 623,677
"techno-supercrip"	0	0	0	0	0	0	0	0
"technowashing" OR "techno-washing"	0	0	0	0	0	0	0	0

Table 3

Frequencies of the ability, human enhancement and technology related conceptual terms found in online full texts searches that included the terms "barrier*" and different disability terms and "sport*" or "physical activity" or "recreation" or "leisure" or "physical education" or "kinesiology" or "sports pedagogy"

Conceptual terms	"Sport*" strategy 3a 110,341	"Physical activit*" strategy 3b 101,718	"Recreation" OR "Leisure" strategy 3c 73,358	"Physical education" strategy 3d 17,899	"Kinesiology" strategy 3e 9,721	"Sports pedagog*" strategy 3f 1,321
35 ability-based concepts						
"ableism"	1,014	583	865	345	148	64
"internalized ableism"	54	31	36	23	8	5
"ability security" OR "ability insecurity" OR "ableism security" OR "ableism insecurity"	3	3	6	1	1	1
"ability equity" OR "ability inequity" OR "ability equality" OR "ability inequality" OR "ableism inequity" OR "ableism equity" OR "ableism equality" OR "ableism inequality"	6	3	10	3	2	1
"ability privilege"	12	2	14	2	2	2
"ability discrimination" OR "ableism discrimination"	8	12	24	5	0	2
"ability oppression" OR "ableism oppression"	0	1	2	0	0	0

From supercrip to techno-supercrip

Conceptual terms	"Sport*" strategy 3a 110,341	"Physical activit*" strategy 3b 101,718	"Recreation" OR "Leisure" strategy 3c 73,358	"Physical education" strategy 3d 17,899	"Kinesiology" strategy 3e 9,721	"Sports pedagog*" strategy 3f 1,321
"ability apartheid" OR "ableism apartheid"	0	0	0	0	0	0
"ability obsolescence" OR "ableism obsolescence"	1	1	1	1	1	1
"ability consumerism" OR "ableism consumerism" OR "ability commodification" OR "ableism commodification"	0	0	0	0	0	0
"ability foresight" OR "ableism foresight"	0	0	0	0	0	0
"ability governance" OR "ableism governance"	5	2	4	3	2	1
"disablism"	337	194	312	102	31	8
"internalized disablism"	1	1	1	0	0	0
"disability burnout" OR "disablism burnout"	0	0	0	0	0	0
"identity"	27,529	16,451	23,908	5,036	1,974	540
"identity" and "ableism" OR "disablism"	951	162	903	273	37	63
8 human enhancement linked concepts						
"cyborg"	416	187	303	48	25	5
"human enhancement"	111	16	32	8	5	2
"human enhancement technolog*"	11	0	4	1	1	0
"performance enhancement"	926	6,091	435	371	299	18
"human enhancement" AND "ableism" OR "disablism"	14	3	9	6	3	2
"performance enhancement" AND "ableism" OR "disablism"	15	7	15	8	7	3
"posthuman"	163	39	109	24	7	7
"supercrip"	262	168	168	100	48	13

Conceptual terms	"Sport*" strategy 3a 110,341	"Physical activit*" strategy 3b 101,718	"Recreation" OR "Leisure" strategy 3c 73,358	"Physical education" strategy 3d 17,899	"Kinesiology" strategy 3e 9,721	"Sports pedagog*" strategy 3f 1,321
"superhuman"	230	69	142	18	11	4
7 technology related terms						
"assistive technolog*"	4,142	3,593	4,599	462	975	24
"technolog*"	46,471	38,673	32,454	7,161	3,642	535
"technoableism" OR "techno-ableism"	0	1	0	0	0	0
"technodoping" OR "techno-doping"	7	4	2	0	2	1
"techno-poor"	1	0	2	0	0	0
"techno-supercrip"	0	0	0	0	0	0
"technowashing"	0	0	0	0	0	0
"transhuman*"	118	32	77	18	8	0
"transhuman*" AND "ableism" OR "disablism"	0	0	0	0	0	0

Discussion

There are many aspects to ability-based judgments, conflicts, and norms impacting disabled and non-disabled people in sports, physical activity, leisure, recreation, sports pedagogy, kinesiology, physical education, kinesiology, and sports pedagogy (sport in all areas) in general and in relation to the ever more prevalent techno-body and beyond species-typical abilities. Therefore, the first aim of the study was to obtain a sense of how often the academic literature focusing on sport in all areas in relation to disabled people and non-disabled people uses a) ability-based theoretical concepts and b) terms linked to human ability enhancement and body linked technologies by themselves and in conjunction with ability-based concepts. The second aim was to ascertain how often ability-based theoretical concepts and terms linked to human ability enhancement and body-linked technologies were mentioned in the academic literature that covered participation barriers of disabled people in sport in all areas. The study found an uneven use of ability-based theoretical concepts and little use of concepts linked to human ability enhancement and body-linked technologies. The findings of the study are discussed in relation to a) the ability-based judgment in sport in all areas in general, b) ability-based judgments linked to emerging techno-bodies and beyond species-typical abilities and c) barriers disabled people experience in sport in all areas.

Utility of the ability-based theoretical concepts to make visible and discuss the impact of ability-based judgments for disabled and non-disabled people in the sport in all areas in general

Given that the abilities of the body are central to all sport in all areas (Giese & Ruin, 2018; Gilchrist et al., 2021; Miah, 2017) the study findings suggest vast opportunities to discuss in a differentiated way ability-based judgments, norms and conflicts evident in sport in all areas using the ability-based theoretical concept.

People often use ableism and disablism interchangeably and use ableism as a term to simply say discrimination against disabled people. This takes away the power from interrogating the cultural reality of ability-based judgments, norms, and conflicts and leaves the impression that ability judgments, norms, and conflicts are only a problem for disabled people, an impression which puts disabled people and others linked to disabled people with their ability judgment critique in a silo as if their ability judgment critique is of no relevance to society at large. Employing more specific ability-based theoretical frameworks to hone in on different aspects of the problem and making the linkage that a given ability-based judgment problem is not a disability problem only, might decrease the othering of disabled people and the siloing of disabled people and others linked to disabled people who question the negative and arbitrary use of ability-based judgments and norms.

A few examples of the usefulness of ability-based theoretical concepts are provided in the following, starting with the concepts of ability identity security and ability identity insecurity. A substantial body of literature on sport in all areas criticizes that the body of disabled people is seen as deviant, questioning the negative ability judgments and pathologization of disabled people (Giese et al., 2022; Giese & Ruin, 2018; Tanure Alves et al., 2022; Van Amsterdam et al., 2015) and with that, they question in essence that disabled people have to live in constant ability identity insecurity so they cannot build a positive identity around their set of abilities. This critique includes the negative imagery of the Paralympics and Para-athletes, such as that the term abled bodied athlete is often juxtapositioned with the Para-athlete, which means the Para-athlete is not able (Wolbring & Martin, 2018). The very premise of the classification of a Paralympic athlete is that they are impaired (International Paralympic Committee, n.d., 2017; Wolbring et al., 2010). The IPC states: "In Para sports, athletes are grouped by the degree of activity limitation resulting from the impairment. This, to a certain extent, is similar to grouping athletes by age, gender or weight" (International Par-

alympic Committee, n.d.). However, if this is similar to other criteria such as gender, why do many of the high-performance Para-athletes say they are not disabled (Barbash, 2014; Hills, 2017)? One has to assume that this means they do not see themselves as impaired. Furthermore, if this is just another form of classification, why do Para-athletes want to compete against the non-para athlete (Wolbring & Martin, 2018)? So, should we merge the men's and women's events of the Olympics? It is noted that the Special Olympics also has been criticized for a long time for relying on the concept of impairment (Giese et al., 2022).

However, the negative treatment of one's identity based on negative ability judgments of the body/mind is not limited to disabled people but is experienced by many marginalized groups (Wolbring, 2023), as is the pathologization of the abilities of one's body/mind through ability judgments in order to question/belittle one's identity (Greensmith, 2012; Mitchell, 2023; Rogers, 2021; Williamson, 1999; Wolbring, 2023), or in order to classify one group/individual as ability inferior to another group/individual (Buechler, 1990; Clark, 2006, p. 203; Gil, 2007; Herrnstein & Murray, 1996; Toffel, 1996; Wolbring, 2008c; Wolbring & Diep, 2016). As such many marginalized groups experience ability identity insecurity.

Negative identity judgments are also questioned in sport in all areas beyond disabled people (Herrick et al., 2023; Liberti, 2017; Metcalfe & Lindsey, 2020; Plaza & Boiché, 2017; Simon & Azzarito, 2019; Symons et al., 2017; White et al., 2023) which is also linked to ability judgments (Goodrum, 2012; Scraton, 2018). Therefore, ability identity insecurity is also an issue in sport in all areas for athletes, but also teachers, beyond disabled people.

Now on to the concepts of internalizing ableism and disablism. Living in a state of ability identity insecurity could lead to low self-esteem, which in turn could lead to internalizing this negative judgment (internalizing disablism) and that one judges others in the same way (internalized ableism). The internalized ableism (Campbell, 2008a) and internalized disablism (Bantjes et al., 2019; Grenier et al., 2023) are extensively used

in conjunction with disabled people. However, if one digs deeper into the internalization of oppression (Akbar, 1984), classism (Russell, 1996), sexism and heterosexism (Bearman et al., 2009; Szymanski, 2005) and racism (Harper, 2007; Hipolito-Delgado, 2010; Pyke & Dang, 2003) these internalizations are also often linked to that one accepts a negative ability judgment of oneself (Wolbring, 2023).

One can link concepts such as different forms of privilege used in discussions in sport in all areas to highlight problems faced by other marginalized groups to the ability-based theoretical concept of ability privilege. The terms white privilege (Burdsey, 2009; Joseph et al., 2022; Nachman et al., 2022; Richards et al., 2020; Simon & Azzarito, 2019), male privilege (Villalon & Weiller-Abels, 2019) and racialized class privilege (Allison, 2021) are used in sport in all areas focused literature. One article focusing on kinesiology used the following privilege list "privilege white, heteronormative, lean, and able bodies" (Sullivan & Ali, 2023, p. 1). Having certain abilities opens the doors for experiencing other abilities a reality not limited to disabled people, but many settings and group dynamics. For example, the ability to afford to participate in sports on all levels is not only an issue for disabled people but many others who simply do not have the money. Many of the privilege terms used are linked to ability privilege. White privilege allows for experiencing certain positive abilities non-white would not have for example. As such it makes sense to use the term ability privilege to discuss the privileges that come with having already certain abilities.

Equity and inequity are covered extensively in sport in all areas (Arora & Wolbring, 2022). Reading abstracts around equity and inequity in sport in all areas suggests that many of the inequities are linked to ability judgments. To cover that aspect ability inequity and ability inequality are useful. For example, ability inequity and ability inequality can be used to question the othering use of the term accommodation. Accommodation is used to flag special efforts for a given group such as a wheelchair washroom. But the very term accommodation as instrumentalized is based on

ability privilege and ability inequity and ability inequality. Washrooms are an accommodation for the human body. But many people with a leg-normative body do take the availability of the washroom for granted. Based on one's background, people take different abilities for granted and would not see them as an accommodation to their body/mind or to their ability expectations of what a good life entails. There are many terms, such as accommodation, that allow for the establishment of a social hierarchy of abilities whereby social hierarchies impact many of the social ability goals sport in all areas ought to have.

Finally, articles focusing on sport in all areas that use ableism as a theoretical lens cover many different ability-based judgments, norms, and conflict problems (Arora & Wolbring, 2022; Giese et al., 2022) suggesting the usefulness of the ability-based concepts to give a term to these different ability-based problems.

Utility of the ability-based theoretical concepts to make visible and discuss the impact of ability-based judgments for disabled and non-disabled people in relation to the emerging techno-body and beyond species-typical abilities

The ever-increasing availability of technologies that can be added into and onto the body enables to an ever greater extent the cyborgization of the body and the transhuman vision of moving the body beyond species-typical abilities which entails a shift in which abilities might be seen as needed or obsolete (Wolbring, 2010b). Therefore, ability-based judgments play themselves out on the interface of the people who are ability-enhanced beyond the species-typical norms and the ones who aren't and at the interface of the cyborg humans and non-cyborg humans.

Crow (2014) commented on the slogan meet the superhumans used during the 2012 Paralympic Games arguing that it set the tone for a hierarchy of impairment and that foremost are amputees with high technology prostheses. For spectators, the transformative powers of technology mark the apotheosis of superhu-

man (Crow, 2014). The hierarchy is also evident in the hierarchy of technologies for example the wheelchair against the bionic leg (Panesar & Wolbring, 2014). As it is stated "Pistorius would have been wheelchair-bound without the amputation and prosthetics" (Ting Chowning & Solomon, 2009, p. 62), which disempowers the ones that do not want or cannot access the cool legs. This might very well also be true for the average disabled person who wants to go into a gym who would be self-conscious because their legs or their wheelchair for example cannot compete with the cool devices (see cyborg gym; Lopez Frias, 2016). This could feed into the self-consciousness many disabled people already report having when going to the gym (Rimmer & Marques, 2012). According to the American Psychological Association's definition of anxiety, people might avoid doing certain things due to feeling worried and concerned, whereby the worried thoughts and concerns are future-oriented and a long-acting response (Association, 2023). The cyborg gym found that people avoid the gym due to anxiety about being worried and concerned that one's ability is judged. Indeed, if one lives in a constant state of ability and identity insecurity, the danger of anxiety could be one outcome, as could be a disablism burnout (Wolbring & Lillywhite, 2023).

According to Dyer (2015) there was a declining level of athlete participation in the Paralympics events involving prosthetics technology, and Dyer (2015) found that the ratio of athletes to nations entering the 100 m at the Paralympic Games declined, which Dyer suggests is due to a change in prosthetics technology since 1988 (Dyer, 2015) and the affordability of such technologies. And the ability to afford plays itself also out in the gym.

Using the ability-based theoretical concepts allows for a seamless expansion to engage with a vision that moves the ability expectations of the body beyond the species-typical. The ability-focused concepts are uniquely situated and ideal for discussing ability-based expectations, judgments, norms, and conflicts in all settings including the beyond species-typical ones (Goodley, 2016; Wolbring, 2008b, 2008c, 2014) and

with that the ability expectation creep to ever-increasing abilities linked to a transhuman and posthuman visions.

The cyborg as a concept has been discussed for a long time (Haraway, 1990), including through a disability right as in ability-based critique perspective (for a review of some work see also Hamraie, 2015). The disabled writer and performance artist Jillian Weise who identifies themselves as a cyborg, for example, questions the vision and arguments evident in Haraway's Cyborg manifesto (Weise, 2018, para. 2), stating "When I tell people I am a cyborg, they often ask if I have read Donna Haraway's "A Cyborg Manifesto". Of course, I have read it. And I disagree with it" and "The manifesto coopts cyborg identity while eliminating reference to disabled people on which the notion of the cyborg is premised". Weise (2018) criticizes the use of cyborg technology for the purpose of disabled people fitting body ability expectations. Young (2021) argues that cyborgism is used to support ability normativity, and others argue that cyborgism is used to objectify disabled people and that cyborgism relies on medical imagery (normative ability expectation) of disabled people decreasing the usefulness of the cyborg concept for disabled people (Kafer, 2005). The ability-focused concepts could enrich these discussions.

The phrase cyborg athlete is also used for some time including within the framework of transhuman athletes and posthuman athletes (Butryn, 2003; Butryn & Masucci, 2009; Lopez Frias, 2016; Lopez Frías, 2018; Miah, 2001) used for example the term cyborg gym. Given the disability rights and ability-based critique of the cyborg narrative all ability-based concepts such as internalized ableism (Campbell, 2008a) and internalized disablism (Bantjes et al., 2019; Grenier et al., 2023) and transhuman/techno linked terms such as the transhumanized version of ableism (Wolbring, 2008b, 2008c), the concepts of techno-poor disabled (Wolbring, 2006, 2008a, 2023), techno-poor impaired (Wolbring, 2023), techno-supercrip (Wolbring, 2010b) techno-ableism (Shew, 2020, 2022) and techno-washing (Ribeiro & Soromenho-Marques, 2022) could be used to discuss the cyborg further.

As to enhancement a survey of rehabilitation educators revealed that between 30-50% believed that enhancing the human body beyond the normal would have positive and negative impacts on the participation of people with disabilities in recreational sports, participation of people with disabilities in competitive sports, the Olympics, the Paralympics and the self-identity of athletes with disabilities (Table 1; Wolbring, 2012). Many of these enhancement sports might develop outside of the Paralympic field with the involvement of Paralympic athletes under lifestyle sports, see the Cybathlon for example (Cybathlon Organizers, 2023; Wolbring, 2018). What does an event such as the Cybathlon do to the low-tech disabled person? Does it increase ability identity insecurity (so low self-esteem, due to a lack of recognition) or ability insecurity (due to only being able to make a living as a cyber-athlete)? An assessment of the Cybathlon and the enhancement discourses on the future of the Paralympics are needed. All the ability-based concepts could be used to interrogate the impact of existing and emerging technologies on the discussions around the ability of the body in general and the impact of enhancement beyond the species-typical on sport in all areas.

Barriers to sport, recreation, leisure, physical activity and physical education faced by disabled people

The data of the study suggests a lack of use of the ability-focused concepts to engage with the participation barriers disabled people face in relation to sports on all levels, recreation and leisure, physical activity and physical education. The data also suggest a lack of engagement with the impact of human enhancement beyond the species-typical and linked concepts such as transhuman*, posthuman*, superhuman, and cyborg on these barriers and the impact of body-enhancing technologies on these barriers.

Many of the ability-focused concepts could have been used to engage with the barriers described in the literature, such as accessibility (Amberkar et al., 2019; Butzer et al., 2021; Calder & Mulligan, 2014; Rusalem

et al., 1965). For example, using the concept of ability privilege, one could question the lack of accessibility by highlighting that ability privileges exhibited by the people who set the ability norms assume that they can access other abilities. For example, if one has legs one assumes one can access a washroom period. A washroom as part of buildings, which is mandatory in many countries and is part of the building code, is seen as a given. It is not labeled as an accommodation for people with legs because the building code is set for the ability normative. For a wheelchair user, the wheelchair washroom is labeled as an accommodation, as something special. The lack of accessibility could also be interrogated using the concepts of ability inequity (unjust or unfair distribution) or ability inequality (uneven distribution) of access to and protection from abilities generated through human interventions (Wolbring, 2011). Transportation is another barrier mentioned (French & Hainsworth, 2001; Jaarsma et al., 2014) and still exhibits ability inequity/ability inequality in many places. Disliking help (Van Der Linden et al., 2022) could be discussed through the lens of the supercrip, internalized disablism, and internalized ableism because disliking help often comes from an internalized ability expectation that one has to be able to do things oneself or that one experiences disabling aspects of help such as having to be grateful. Social stigma and negative views of disabled people (Eminovic et al., 2009) and the negative attitude of students without disabilities in physical education classes (Gaintza & Castro, 2020) and that the "disabled student is defined as malfunctioning and lacking ability" (Svendby & Dowling, 2013, p. 361) could be questioned with most ability focused ability based concepts. Self-consciousness, which was noted as a barrier to physical activity in the public (Newitt et al., 2016; Rimmer & Marques, 2012), and which could be seen as a consequence of social stigma and being negatively judged by others, could be interrogated using concepts such as internalized ableism, internalized disablism, and ability identity insecurity. If one's identity based on one's abilities is constantly questioned, one can not experience ability identity security (being at ease with one's abilities). This can

lead to behaviours such as internalizing ableism and disablism, where one sees the negative judgment of oneself as justified. Ability identity insecurity can also lead to damaging consequences. Various studies on autistic burnout suggest that camouflaging, so behaving in a way that negates who one is, to fit in, is one main cause of permanent stress leading to burnout in autistic persons (Wolbring & Lillywhite, 2023). One study covering the effect of youth participation in a wheelchair tennis program engaged with internalized disablism and internalized ableism where the authors argued that participants responses "demonstrates the relationship of structural disablism to internalized disablism across aspects of daily life" (Grenier et al., 2023, p. 279). It has been stated that "internalized disablism has been linked to lower self-efficacy, optimism, and social support, as well as an increased expectation of rejection" (Savage & McConnell, 2016, p. 300) which fits with the self-consciousness as a barrier noted (Newitt et al., 2016; Rimmer & Marques, 2012). This dynamic could be interrogated using various other ability-based concepts.

Technologies are one barrier to sport, recreation, leisure, physical activity, and physical education faced by disabled people already identified (Berardi et al., 2021; Haegele et al., 2018; Haegele, Zhu, et al., 2021; Rimmer et al., 2004). However, reading the abstracts enhancement technologies were not mentioned as a barrier. Transhumanism also was not at all mentioned in the abstracts and rarely in the full text. Given that transhumanism is all about ability expectations, studies could use all the ability-based concepts and the techno-based concept linked to ability expectations to investigate the impact of a transhuman vision on barriers to sport and physical activity participation of disabled people.

Limitations

This study only covered English language literature and only the academic databases Scopus and the databases accessible through EBSCOhost. Furthermore, this study did not cover grey literature. As such this

data can not be generalized to other language, grey literature or the academic literature. Also in this study a selection of disability related terms are chosen to obtain as many abstracts as possible. The terms did not reflect the same understanding of 'disabilities. For example, the terms autism, attention deficit hyperactivity disorder or autism spectrum disorder are often used with a different connotation than neurodiv* related terms. With the term disab* (* being a wildcard) one finds people with disabilities and disabled people and other terms containing disab* whereby the terms again often are used with different connotations. Furthermore, one could use many more terms that are linked to disabled people, especially with a medical connotation which this study did not do. In this study, some conceptual terms linked to disability rights, disability studies, ability studies, terms linked to enhancement beyond the species-typical, and technology-linked terms were searched. More terms could have been used. Despite the limitations of search terms and sources the findings, however, allow for conclusions to be made within the parameters of the searches.

Conclusion

The study's findings suggest a lack of use of most ability-based theoretical concepts, lack of engagement with the issue of human ability enhancement beyond the species-typical and lack of engagement with the role of technologies in shaping ability expectations in the literature covered. The study findings suggest many opportunities to strengthen the analysis of and teaching about ability-based judgments, norms and conflicts present in sports on all levels, physical activity, leisure and recreation and the fields of sports pedagogy, kinesiology, and physical education (sport in all areas) in general but in particular in the context of ever-increasing ability enhancement visions of the human body and the body linked technologies that are seen to enable that vision.

Strengthening the analysis of and teaching about ability-based judgments, norms and conflicts that make

use of all the available ability-based concepts have at least three benefits in relation to sport in all areas; a) it might decrease the silo treatment of ability judgment concerns of disabled people and others linked to disabled people; b) it allows for a continuous engagement with new and emerging ability based judgments, norms and conflicts such as the issues of constantly expecting improvement of the abilities of the human body/mind (ability creep) and c) it allows for a continuous engagement with the constant impact of existing, emerging and envisioned technologies on ability based judgments norms and conflicts.

As to the silo problem, ability-based judgments, norms, and conflicts are often treated as if these are only problems faced by disabled people, with one consequence being that disabled people and others involved in questioning the disabling use of ability-based judgments and norms against disabled people work in the disability silo. Every time the term ableism is used with the meaning of discrimination against disabled people it adds to the silo problem and that others do not realize that ability-based judgments, norms, and conflicts are one defining systemic, societal reality influencing nearly every aspect of society including sport in all areas as different groups and different individuals do not necessarily cherish the same abilities (Wolbring & Gill, 2023).

Using the different ability-based concepts and applying them to different social groups could enable a differentiated engagement with ability-based judgments, norms, and conflicts that allows for the realization that everyone is affected by ability-based judgments, norms, and conflicts and as such might be a strategy to de-siloing disabled people and others that question ability based judgments and irrelevant norms in relation to disabled people in sport in all areas. DePauw (2022) argued that "three narratives reflect upon the ways in which kinesiology and adapted physical activity have disrupted - and must continue to disrupt - the status quo to progress toward a socially just society: reflections of marginality, sport, and social constructs of body and ability; ableism and evolution of adapted physical activity; kinesiology and its responsi-

bility for a sustainable future and socially just society" (DePauw, 2022, p. 104). Using the ability-based concepts enhances the ability to disrupt the status quo to progress toward a socially just society DePauw outlines as they are perfectly suited to engage with ability-based judgments, norms, and conflicts in a socially just society.

Having a repertoire of ability-based concepts beyond the generic term ableism, a strategy that shows that disabled people are not the only ones that are ability judged and a strategy that specifically engages with ability-based conflicts between groups should benefit the critical engagement with ability-based judgments, norms and conflicts and the disabling use of ability judgments in sport in all areas. Having a differentiated engagement with ability-based judgments, norms, and conflicts allows one to apply this knowledge without problems to any changes in ability judgments, norms, and conflicts. For example, a critical analysis of the increasing push for beyond species-typical body/mind abilities which is increasingly enabled by body-linked technologies (cyborgization) is one area of importance to sport in all areas and could benefit from the differentiated engagement with ability-based judgments, norms, and conflicts as these move towards beyond species-typical abilities and the technologies that enable them will challenge many abilities seen as a positive of sport in all areas.

Educating students in kinesiology, physical education, and sports pedagogy about ability-based judgments, norms, and conflicts and decreasing the silo that sees ability judgments only as a problem for disabled people would allow teaching about social hierarchies supported by ability judgments and norms set by the ones higher in the social hierarchy and the unmasking of many ability judgment based problems in general, such as ability expectation conflicts between different social groups and individuals. It also allows for understanding better the conflict between different ability expectations put forward by different groups in sport in all areas. It would also allow for education about ability visions of the future, many of which are linked to cyborgs and human ability enhancements.

To close, the BIAS FREE Framework (Building an Integrative Analytical System For Recognizing and Eliminating InEquities; Eichler & Burke, 2006) is a framework that poses 20 analytical questions with the aim to make visible biases that help maintain social hierarchies in three main sections: H-Maintaining and Existing Hierarchy; F-Failing to Examine Differences; and D-Using Double Standards. This framework could be applied to unmasking ability-based social hierarchies and to flag ability-based judgments, and norms that maintain social hierarchies and, with that, ability-based conflicts between social groups, including in sport in all areas.

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A   Appendix

Table 4 covering the hits of online searches terms shows in principle similar results to the ones found in Table 2 but in general more 0 hits.

Table 4

Frequency of the ability, human enhancement and technology related conceptual terms present in online searches of abstracts and full texts containing the terms kinesiology or "sports pedagogy"

Conceptual terms	Strategy 1e "Kinesiology" Abstracts 5,723	Strategy 1e "Kinesiology" Full texts 343,647	Strategy 1f "sports pedagog*" Abstract 1,026	Strategy 1f "sports pedagog*" Full texts 23,874
35 ability-based concepts				
"ableism"	5	292	0	137
"internalized ableism"	0	13	0	7
"ability security" OR "ability insecurity" OR "ableism security" OR "ableism insecurity"	0	1	0	1
"ability equity" OR"ability inequity" OR "ability equality" OR "ability inequality" OR "ableism inequity" OR "ableism equity" OR "ableism equality" OR "ableism inequality"	0	1	0	1
"ability privilege"	0	1	0	1
"ability discrimination" OR "ableism discrimination"	0	0	0	2
"ability oppression" OR "ableism oppression"	0	0	0	0
"ability apartheid" OR "ableism apartheid"	0	0	0	0
"ability obsolescence" OR "ableism obsolescence"	0	1	0	1
"ability consumerism" OR "ableism consumerism" OR "ability commodification" OR "ableism commodification"	0	0	0	0
"ability foresight" OR "ableism foresight"	0	0	0	0
"ability governance" OR "ableism governance"	0	2	0	1
"disablism"	0	60	0	15
"internalized disablism"	0	0	0	0
"disability burnout" OR "disablism burnout"	0	0	0	0
"identity"	103	15,859	33	5,802
"identity" AND "ableism"	0	173	0	90

Conceptual terms	Strategy 1e "Kinesiology" Abstracts 5,723	Strategy 1e "Kinesiology" Full texts 343,647	Strategy 1f "sports pedagog*" Abstract 1,026	Strategy 1f "sports pedagog*" Full texts 23,874
"identity" AND "ableism"	0	38	0	13
8 human enhancement related terms				
"cyborg"	0	238	0	35
"human enhancement"	1	28	0	12
"human enhancement technolog*"	0	7	0	0
"performance enhancement"	9	3,143	0	266
"human enhancement" AND "ableism" OR "disab-lism"	0	7	0	4
"performance enhancement" AND "ableism" OR "disablism"	0	10	0	4
"posthuman"	1	28	0	12
"supercrip"	0	7	0	0
"superhuman"	9	3,143	0	266
"transhuman*"	0	41	0	10
"transhuman*" AND "ableism" OR "disablism"	0	6	0	0
7 technology related terms				
"assistive technolog*"	0	2,588	0	50
"technolog*"	237	62,069	27	6,595
"technoableism" OR "techno-ableism"	0	0	0	0
"technodoping" OR "techno-doping"	0	6	0	0
"techno-poor"	0	0	0	0
"techno-supercrip"	0	0	0	0
"technowashing" OR "techno-washing"	0	0	0	0

Table 5 covering the abstracts downloaded shows that most of the ability focused conceptual terms were not present at all. Enhancement had some hits but reading the abstracts only once was enhancement used with the meaning of body enhancement. The term "technolog*" had some hits although only two in the physical education abstracts. However reading the abstracts the technologies were not used with the focus on body enhancement.

Table 5

Frequencies of the ability, human enhancement and technology related conceptual terms found in conjunction with disability terms and "sport" or "physical activity" or "recreation" or "leisure" or "physical education" or "kinesiology" or "sports pedagogy" using online full texts searches

Conceptual terms	"Sport*" strategy 2a 731,700	"Physical activit*" strategy 2b 548,465	"Recreation" OR "Leisure" strategy 2c 298,866	"Physical education" strategy 2d 110,581	"Kinesio-logy" strategy 2e 91,828	"Sports pedagog*" strategy 2f 4,368
35 ability-based concepts						
"ableism"	1,915	1,005	1,426	660	462	118
"internalized ableism"	110	44	58	35	13	7
"ability security" OR "ability insecurity" OR "ableism security" OR "ableism insecurity"	3	2	5	1	1	1
"ability equity" OR "ability inequity" OR "ability equality" OR "ability inequality" OR "ableism inequity" OR "ableism equity" OR "ableism equality" OR "ableism inequality"	13	8	10	9	4	2
"ability privilege"	16	3	10	6	1	1
"ability discrimination" OR "ableism discrimination"	12	9	17 (many disability not ability)	3	0	1
"ability oppression" OR "ableism oppression"	2	1	0	0	0	0
"ability apartheid" OR "ableism apartheid"	1	0	0	0	0	0
"ability obsolescence" OR "ableism obsolescence"	1	1	1	1	0	0
"ability consumerism" OR "ableism consumerism" OR "ability commodification" OR "ableism commodification"	0	0	0	0	0	0
"ability foresight" OR "ableism foresight"	0	0	0	0	0	0

Conceptual terms	"Sport*" strategy 2a 731,700	"Physical activit*" strategy 2b 548,465	"Recreation" OR "Leisure" strategy 2c 298,866	"Physical education" strategy 2d 110,581	"Kinesio-logy" strategy 2e 91,828	"Sports pedagog*" strategy 2f 4,368
"ability governance" OR "ableism governance"	6	1	5	2	1	1
"disablism"	531	299	468	146	50	15
"internalized disablism"	0	0	0	0	0	0
"disability burnout" OR "disablism burnout"	0	0	0	0	0	0
"identity"	24,610	32,128	62,896	13,709	4,646	1,321
"identity" and "ableism"	1,397	601	1,045	426	157	80
"identity" and "disablism"	404	205	322	120	38	13
8 human enhancement related terms						
"cyborg"	1,870	540	847	231	93	18
"human enhancement"	531	29	147	38	15	9
"human enhancement technolog*"	96	9	22	7	6	0
"performance enhancement"	3,497	4,421	1,327	1,459	1,050	70
"human enhancement" AND "ableism" OR "disablism"	39	9	13	14	7	4
"performance enhancement" AND "ableism" OR "disablism"	34	18	17	16	10	4
"posthuman"	801	211	477	131	26	16
"supercrip"	727	365	456	176	121	17
"superhuman"	742	161	169	72	23	5
"transhuman*"	455	112	236	455	29	4
"transhuman*" AND "ableism" OR "disablism"	49	18	19	16	10	0
7 technology related terms						
"assistive technolog*"	11,725	12,383	9,234	1,693	12,159	43
"technolog*"	209,701	141,873	97,267	30,145	22,498	1,479

Conceptual terms	"Sport*" strategy 2a 731,700	"Physical activit*" strategy 2b 548,465	"Recreation" OR "Leisure" strategy 2c 298,866	"Physical education" strategy 2d 110,581	"Kinesio-logy" strategy 2e 91,828	"Sports pedagog*" strategy 2f 4,368
"technoableism" OR "techno-ableism"	3	3	1	0	0	0
"technodoping" OR "techno-doping"	27	13	4	0	0	5
"techno-poor"	9	1	3	3	0	0
"techno-supercrip"	0	0	0	0	0	0
"technowashing" OR "techno-washing"	0	0	0	0	0	0

Table 6 displays the frequencies for the ability, human enhancement and technology related conceptual terms found in downloaded abstracts obtained that include the terms "barrier*" and different disability terms and "sport" or "physical activity" or "recreation" or "leisure" or "physical education" (two numbers means there were hits for abstracts from the 2021 and 2023 searches; one number (not 0) means no hit for the 2023 search). 0 means no hits in both sets of abstracts. Only three abstracts were found for "kinesiology" (strategy 4e) and as such not downloaded, and none were found for "sports pedagogy" (strategy 4f). Table 6 also used the term "enhancement" to cover the phrases "human enhancement" and "performance enhancement" used in the other tables. Table 5 covering the abstracts downloaded shows that most of the ability focused conceptual terms were not present at all. Enhancement had some hits but reading the abstracts only once was enhancement used with the meaning of body enhancement. The term "technolog*" had some hits although only two in the physical education abstracts. However reading the abstracts the technologies were not used with the focus on body enhancement.

Table 6

Frequencies of the ability, human enhancement and technology related conceptual terms found in downloaded abstracts obtained abstract online searches that include the terms "barrier*" and different disability terms and "sport" or "physical activity" or "recreation" or "leisure" or "physical education"

Conceptual terms	"Sport*" n = 307/105 abstracts strategy 4c	"Physical activity" n = 721/227 abstracts strategy 4a	"Recreation" and "leisure" n = 424/81 abstracts strategy 4d	"Physical education" n = 79/37 abstracts strategy 4b
35 ability-based concepts				
"ableism"	2/6	5/8	1	3/6
"internalized ableism"	0	0	0	0
"ability security" OR "ability insecurity" OR "ableism security" OR "ableism insecurity"	0	0	0	0
"ability equity" OR "ability inequity" OR "ability equality" OR "ability inequality" OR "ableism inequity" OR "ableism equity" OR "ableism equality" OR "ableism inequality"	0	0	0	0
"ability privilege"	0	0	0	0
"ability discrimination" OR "ableism discrimination"	0	0	0	0
"ability oppression" OR "ableism oppression"	0	0	0	0
"ability apartheid" OR "ableism apartheid"	0	0	0	0
"ability obsolescence" OR "ableism obsolescence"	0	0	0	0
"ability consumerism" OR "ableism consumerism" OR "ability commodification" OR "ableism commodification"	0	0	0	0
"ability foresight" OR "ableism foresight"	0	0	0	0
"ability governance" OR "ableism governance"	0	0	0	0
"disablism"	0/2	0	1	0
"internalized disablism"	0	0	0	0
"disability burnout" OR "disablism burnout"	0	0	0	0
"identity"	11/34	8/14	4	2/4
"identity" AND "ableism" OR "disablism"	0	0	0	0

Conceptual terms	"Sport*" *n* = 307/105 abstracts strategy 4c	"Physical activity" *n* = 721/227 abstracts strategy 4a	"Recreation" and "leisure" *n* = 424/81 abstracts strategy 4d	"Physical education" *n* = 79/37 abstracts strategy 4b
8 human enhancement linked concepts				
"cyborg"	0	0	0	0
"enhancement"	2	3/10	4/2	2
"enhancement" AND "ableism" OR "disablism"	0	0	0	0
"posthuman"	1	0	0	0
"supercrip"	1	0	0	0
"superhuman"	2	0	0	0
"transhuman*"	0	0	0	0
"transhuman" AND "ableism" OR "disablism"	0	0	0	0
7 technology linked concepts				
"assistive technolog*"	30	12/20	29/6	0
"technolog*"	59/10	81/107	131/44	2
"technoableism"	0	0	0	0
"technodoping" OR "techno-doping"	0	0	0	0
"techno-poor"	0	0	0	0
"techno-supercrip"	0	0	0	0
"technowashing"	0	0	0	0

Two numbers means there were hits for abstracts from the 2021 and 2023 searches; one number (not 0) means no hit for the 2023 search. 0 means no hits in both sets of abstracts. Only three abstracts were found for "kinesiology" (strategy 4e) and as such not downloaded, and none were found for "sports pedagogy" (strategy 4f). For Table 5 we used the term enhancement covering human enhancement and performance enhancement used in other tables