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A DIDACTIC MODEL FOR THE PHYSICAL, PSYCHOLOGICAL AND SOCIAL IMPACT OF SPORT

Sven Schneider

Medical Faculty Mannheim, Heidelberg University, Center for Preventive Medicine and Digital Health (CPD), Germany

Professional paper

Abstract
Due to its multifaceted effects, sport is referred to as a "polypill" and compared with pleiotropic drugs. This article summarises the biopsychosocial effects of sport. Particular attention is given to the psychological and social effects of physical activity on children and adolescents. Firstly, sport is defined according to its various forms of organisation followed by a description of the individual effects on physical, psychological and social resources. These range from motor performance abilities (conditioning and coordinative abilities) as well as from cognitive, emotional and motivational aspects to social skills. Although sport – particularly regular physical exercise – can strengthen physical, psychological and social resources, it is also true that non-physiological stresses, inadequate supervision and normative structures still have the potential to induce harm at an individual level. Furthermore, socialisation and enculturation processes relevant to children and adolescents are integrated in the model. The skills learned through sport, particularly psychological and social skills, can thus become important in other areas of life too. The model proposed here can be used in both university and non-university teaching as well as for planning specific studies and training approaches.
Keywords: physical activity, athletes, child, adolescent, sport psychology, sport sociology

SPORT AS A POLYPILL

Physical activity has a complex range of effects. Extensive review articles have convincingly proven the manifold effects of exercise on individual physical health (Fiuza-Luces, Garatachea, Berger, & Lucia, 2013). Recent articles refer to sport as a "polypill", comparing it with drugs (Fiuza-Luces et al., 2013; Vina, Sanchis-Gomar, Martinez-Bello, & Gomez-Cabrera, 2012). This article aims to draw upon and further develop the current discussion of sport as a polypill. Physical activity not only has a somatic effect on different organ systems (skeleton, cartilage, tendons, ligaments, growth plates, spine, musculature and cardiovascular system), it also has both psychological and social effects. Understanding sport as a biopsychosocial *polypill* is both theoretically and empirically compatible with preliminary interdisciplinary studies. In terms of theoretical background, this concept draws upon the biopsychosocial etiology model, the theory of psychomotricity and the sociology of participation in sport. Empirically, this approach builds upon comprehensive systematic reviews that have summarised the current state of research with regard to sport's psychological and social effects in particular (Eime, Young, Harvey, Charity, & Payne, 2013). In light of the complex developmental tasks and socialisation processes that occur during childhood and adolescence, sport-related biopsychosocial effects are not only relevant for young athletes, but also for doctors, teachers, athletic trainers and parents. The key elements of this model are explained in further detail below (Figure 1).

SPORT

According to the current definition, the term "sport" is split into four categories: state-organised sport (e.g. sport at school), commercial sport (e.g. professional leagues) and the diverse range of clubs and informal, self-organised recreational sport.

RESOURCES

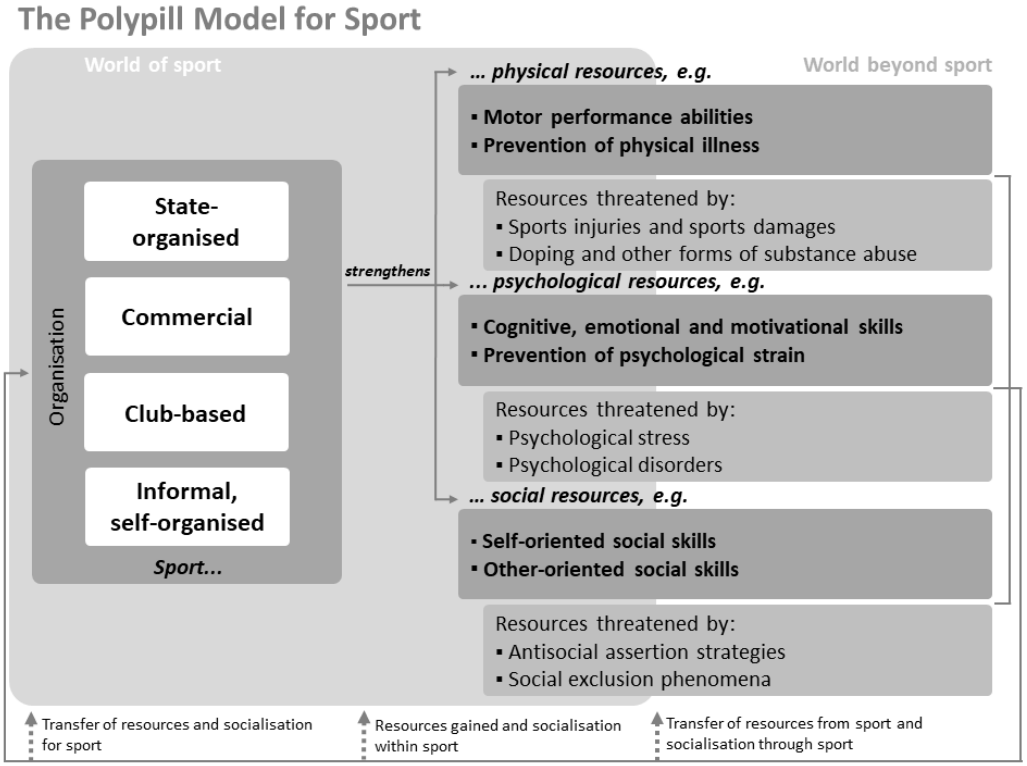
The term "resources" refers to characteristics and behavioural repertoires that allow athletes to handle the typical demands placed upon them in training, competition and other situations (Sygusch, 2005).

Physical resources

Sport improves children's and adolescents' physical resources. In the short and medium term, this refers to typical motor skills such as endurance, strength, speed, and coordination (Sygusch, 2005). In addition to the short and medium term development of resources in the form of motor performance abilities, physical activity can also have long-term effects that protect against numerous different diseases. Sport also influences the subjective health of (not only) children and adolescents. In our model, a backwards arrow indicates that these physical resources, in turn, have an effect on sporting activity. This results in a cycle of positive reinforcement – physical activity helps to improve motor skills, which in turn allows young athletes to train more and achieve their exercise-related goals.

In addition to these positive effects, sport also carries a risk of injury, damage from overuse, and overtraining syndromes (Brenner, American Academy of Pediatrics Council on Sports, & Fitness, 2007).

Figure 1: The polypill model for sport (Author's own design; expanded and revised model developed from draft Schneider & Diehl 2012.)



Psychological resources

The polypill model for sport proposed herewith also asserts that physical activity likewise supports the development of *psychological resources* that help athletes to not only cope with tasks related to sport itself, but also to handle non-sport-related tasks in their everyday lives, as well as contributing to the development of their overall personality. In this context, we draw upon the classifications typically used in psychology and educational theory: cognition, emotion and motivation (Malti, Perren, Brown, & Prinstein, 2011).

Physical activity influences *cognitive resources* in particular (Sonstroem & Morgan, 1989): sport-related experiences can have a positive effect on an individual's self-concept . Physical activity can also lead to an improvement in an individual's perception of their own physical attributes. These two factors are reflected in Sonstroem and Morgan's Exercise and Self-Esteem Model (Sonstroem & Morgan, 1989). Furthermore, physical exercise can also have a positive effect on executive functions such as attentional control, cognitive inhibition, inhibitory control, and cognitive flexibility as further cognitive resources. In addition to this, sport is also considered to be a specific form of learning – sport-induced learning processes have positive effects on both short and long-term cognitive performance for all age groups. It is therefore no surprise that reading and language skills are better among school pupils who participate in sport compared with those who do not (Dyke, 2013).

Sport can also influence *emotional resources* as it teaches athletes to cope with both positive and negative events – joy, frustration, anger and fear can all be experienced first-hand in sport. Sport therefore prompts athletes to regulate their emotions and utilise coping strategies. Studies report that athletes not only display better values for coping, but also for other emotional aspects such as optimism, empathy and happiness (Zamanian, Haghighi, Forouzandeh, Sedighi, & Salehian, 2011).

Lastly, both recreational and elite training require *motivational resources*. Athlete's motivational-volitional qualities cover aspects such as boldness, courage, resoluteness, perseverance, initiative, and purposefulness discipline (Vysochina, Vorobiova, Vasylenko, & Vysochin, 2018). These resources enable athletes to perform physically-demanding tasks in a targeted and organised

manner, in spite of internal and external difficulties. Ultimately, all of these abilities can have a preventive influence on an individual's psychological health.

However, it cannot be ruled out that sport can also have a negative effect on psychological resources. Studies have reported on stress, burnout, drug abuse and doping practices, particularly within the field of high-performance youth sport (Schneider, Sauer, Berrsche, Löbel, & Schmitt, 2019). Body dysmorphic disorders are also reported, particularly among female athletes: According to Sygusch (Sygusch, 2005), anorexia and bulimia are reported for young female athletes. The causal effects of specific types of sport in which having a slim body is a requirement for high achievement, i.e. sports such as gymnastics, rhythmic gymnastics and dancing, but also ski jumping, is subject to controversial discussion (Schneider et al., 2013; Sygusch, 2005). Recently, there have also been increasing reports of other psychological disorders such as muscle dysmorphia ('bigorexia', Muise, Stein, & Arbess, 2003) and sport addiction (Hausenblas & Downs, 2002), particularly among younger male athletes.

Social resources

Social behaviour is often discussed in terms of egocentric and allocentric behaviour – e.g. in Malti and Perren's abovementioned three-level model (Malti et al., 2011). Self-oriented social skills are typically aimed at achieving one's own goals and asserting oneself within social interactions, while other-oriented social skills instead focus on considering the needs of other people. Sport teaches individuals to achieve the necessary balance between self-assertion and social adaptation.

For example, by participating in sport, children learn to assert themselves in a fair way within a certain social context, to make their own demands and to differentiate themselves from others. Through sport, children are able to identify their own overall status within a group and their specific position within a team. Autonomy and self-assertion in this sporting context are to be distinguished from antisocial, inconsiderate assertion through physical or verbal aggression or damage to social relationships.

In addition to this, sport also encourages the development of other-oriented social skills – it teaches vital social resources such as cooperation, fair play, empathy and social integration. Sports clubs and training groups are social networks that promote social inclusion and friendships, thereby facilitating the acquisition of basic social skills such as reciprocal assistance and social support (Sygusch & Herrmann, 2010). The acquisition of other-oriented social skills is also accompanied and supported by the normative effect of the sport setting, which teaches individuals about formal and informal rules, co-determination and hierarchies. Learning shared norms and values is also reflected in the deterrence hypothesis (Leonard, 1998; Schafer, 1969), which states that participation in sport prevents antisocial behaviour by stipulating certain structures, resulting in the internalisation of shared norms and values (Begg, Langley, Moffitt, & Marshall, 1996; Eitle, Turner, & Eitle, 2003).

Self- and other-oriented social skills allow individuals to practice the skills of superordination, subordination and hierarchical ranking when taking on different roles and positions such as captain or substitute player (Reed et al., 2010). As a consequence of this, research has shown that athletes report less social tension and closer social networks than non-athletes (Armstrong & Oomen-Early, 2009).

As with both physical and psychological resources, sport does not always automatically have a positive effect on social resources (Fig. 1). Sport produces both winners and losers. Antisocial assertion strategies are often implicitly or explicitly encouraged and demanded, which involve uncooperative behaviour, aggression and selfishness. In this context, there is a discussion regarding whether or not, contrary to the abovementioned deterrence hypothesis, the sport setting tends to lead to more deviant behaviour (athletic delinquent hypothesis; Begg et al., 1996). According to this hypothesis, children and adolescents learn antisocial behaviour specifically through sport (Greve, 2013), e.g. deliberately fouling their opponent ("tactical foul"), denying rule violations, simulating and acting deceptively during matches (Segrave & Hastad, 1982, Schneider et al., 2019). This highlights the importance of coaches, trainers and teachers having appropriate pedagogical training in order to avoid an irresolvable discrepancy between requirements and capabilities, unfair communication and antisocial behavioural rules. Social exclusion phenomena in sport are also relevant for the field of sports sociology; such phenomena not only describe social inequalities in terms of access to certain types of sport (e.g. financial barriers to playing golf, tennis or participating in equestrian sport), but also exclusion from a group or team due to a lack of talent or deficits and absences from training.

ELITE YOUTH SPORT

Elite youth sport provides a clear example of the complex interplay between the potential negative effects of sport at a physical, psychological and social level. From an early age, young elite athletes work at the limit of human capability. On

the one hand, an individual's health is an essential prerequisite for producing top sporting achievements. However, on the other hand, health must deliberately be put at risk in training and in matches in order to mobilise crucial resources. Younger athletes thus often only draw attention to somatic complaints at a very late stage or try to conceal these (Dyke, 2013; Schneider et al., 2019; Thiel, Mayer, & Digel, 2010). This is also true of psychosocial problems, which are often treated as a taboo subject due to the strong focus that is placed on the physical aspects of sport, particularly at an elite level (Dyke, 2013; Thiel et al., 2010).

Adolescence represents a period in an individual's athletic development during which complex changes occur at a physical, psychological and social level. Behaviour patterns that put an individual's health at risk, such as ignoring physical and psychological complaints, malnutrition or poor diet, are therefore particularly dangerous for long-term performance development and, in extreme cases, can even cause irreversible damage. Case reports from coaches and athletes document examples of extreme diets, failure to comply with recommended regeneration and recovery times, drug abuse and doping practices. Such developments typically end in sport-specific conditions such as the female athlete triad – a combination of disordered eating, amenorrhea and osteoporosis – or burnout syndrome (Dyke, 2013; Thiel et al., 2010). Reports of such phenomena within the field of adolescent recreational sport are increasing, e.g. body dysmorphic disorders among female gymnasts and problematic weight reduction practices ("cutting weight") among wrestlers.

PROBLEMATISATION

The polypill model presented in this paper must be subject to constant critical review and continuous development. Firstly, it requires a schematic simplification of complex relationships. Secondly, ascribing positive or negative effects of physical activity is a normative procedure and the result of a subjective evaluation. Thirdly, several of the causal effects stated in sports science literature and referred to in this paper have not yet been backed up by sufficient longitudinal evidence.

SPORT SOCIALISATION

Socialisation refers to how individuals learn to behave in a way that is deemed acceptable within a certain society. Socialisation takes place in and through social interactions, whereby the participants refer to each other reciprocally in their behaviour. The socialisation process is multidimensional and is taught through a variety of primary socialisation entities such as family and peers, secondary socialisation entities such as kindergarten and school and tertiary socialisation entities such as a sports club or through individuals such as a person's father, mother, teacher or coach. Fundamental opportunities to use control and sanctioning mechanisms are conducive to achieving a particular socialisation objective. The polypill model is also compatible with socialisation theory.

In accordance with Größing (Größing, 2007), sport-specific socialisation processes are integrated in our model under the terms "socialisation for sport", "socialisation within sport" and "socialisation through sport". The backwards arrow mentioned previously depicts the relationship between an individual's physical and the psychological situation in particular and their participation in sport ("socialisation for sport"). Social context thus plays a significant role in an individual's choice to take up, maintain and end their sporting "career". This can mean, for example, family-based norms, support from relatives (e.g. providing transport to training locations) and the sporting activities of peers. It is assumed that there is a causal relationship between the parents' level of physical activity and the child's interest in exercise and movement. There is also a link between parenting style and children's sporting activity (Greendorfer, 1992). Likewise, a child's level of physical activity and thus their degree of socialisation for sport is also dependent upon the sporting activity of their elder siblings.

Socialisation within sport deals with the resources that are shaped or even created by involvement in sport. These resources are a key requirement in order to be successful within sport. Socialisation through sport refers to the transfer of skills learned within sport into other areas. This means that what is learned in a sports-specific setting can be applied in other everyday situations, which can be useful in handling developmental tasks. This shifts the focus away from physical condition and places greater emphasis on psychological strengths such as self-confidence, perseverance, discipline and patience as well as on social resources such as empathy and the ability to cooperate and interact socially, all of which are important for living a fulfilling life in the world beyond sport – at school, at work, with family and in a peer group.

Conflict of interest

The authors declare that they have no competing interests and no third-party funding was used.

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Correspondence to:
Prof. Dr. phil. Sven Schneider, M.A.,
Medical Faculty Mannheim, Heidelberg University,
Center for Preventive Medicine and Digital Health (CPD), Germany
Ludolf-Krehl-Straße 7-11, D-68167 Mannheim
Tel: +49 621 383 71815, Fax: +49 621 383 71801
E-mail: sven.schneider@medma.uni-heidelberg.de