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ARTICLE

Building social capital through sport engagement: evidence for adults aged 50 years and older

José Manuel Sánchez-Santos[1], Paolo Rungo[1] and Fernando Lera-López[2]*

[1]Department of Economics, University of A Coruña, A Coruña, Spain and [2]Institute for Advanced Research in Business and Economics, Public University of Navarra, Pamplona, Spain
*Corresponding author. Email: lera@unavarra.es

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Abstract

Involvement in sports is considered a powerful way to generate social capital. However, the role of sport engagement in the development of social relationships of older adults has not received much attention. Remarkably, there is a lack of empirical evidence on the quality and diversity of social relations built through active sport participation and spectatorship. This paper attempts to assess the relationship between sport engagement and various measures of network social capital, including the extension and quality of social networks and the heterogeneity of personal relationships. Also, it proposes new and more informative measurements of an individual's quantity and quality of social ties. By analysing data from a survey in Spain (N = 600) and applying logistic regressions, the results show that sport participation and attendance at sporting events are closely related to different dimensions of network social capital. Concerning people who are not actively engaged in sports, more extensive social networks characterise those who frequently attend sporting events. In contrast, active sport participation is associated with the extensity and quality measures of social connectedness, the level of satisfaction with friends and the opportunity to enjoy close relationships. Therefore, this paper provides new evidence on how sport engagement may result in tighter and extensive networks for older adults and serve as support for emphasising sports, physical activity and leisure as strategies for maintaining and boosting older people's social and psychological health.

Keywords: older adults; individual social capital; social networks; personal relationships; relational goods; social trust; sport engagement

Introduction

This paper examines how sport participation is associated with the extension and quality of social networks of Spanish adults aged 50–70. Population ageing is a global phenomenon that will continue to affect all regions of the world. In particular, Europe's demographic structure is predicted to age rapidly and substantially (World

Health Organization, 2019). Within such a context, maintaining physical and mental health among older adults for as long as possible has become a challenge for policy makers who are searching for initiatives to reduce the provision and financing of long-term health and social care (Codogno *et al.*, 2020).

Here, we focus on the role of sport engagement and social networks because, from a positive ageing view, sport participation has been recognised as an effective strategy for maintaining and boosting older people's social and psychological health (Gilleard and Higgs, 2002; Faß and Schlesinger, 2021). In this sense, sport participation might contribute to the maintenance of social relations, a key factor for successful ageing. Indeed, sport participation, as a type of leisure-time physical activity, has received increasing attention from scholars in the ageing research field (Jenkin *et al.*, 2017; Lee *et al.*, 2020). Most of this literature argues that sports play a role in promoting active and healthy ageing (Collinet and Delalandre, 2017) and older adults' wellbeing (Kim *et al.*, 2021).

The value of social relationships for older adults has been extensively underlined in the academic research on ageing in sociology and gerontology. Social disengagement theory holds that older adults' isolation results from a gradual and irreversible abandonment of social roles, narrowing role sets and weakening existing social bonds (Cumming and Henry, 1961). Therefore, ageing is frequently accompanied by reduced social interactions. For example, older adults are more likely to live alone, and social isolation may be particularly harmful to them (Cornwell and Waite, 2009). Moreover, older adults who experience isolation are at higher risk for all-cause mortality, increased morbidity, depression and cognitive decline (Tomaka *et al.*, 2006).

However, a positive ageing view recognises that individuals can age successfully by remaining active and continuing to engage in social interactions. Along these lines, activity theory predicts that engagement in organisational activities and social relations supports wellbeing in older people (Havighurst, 1961). From this perspective, many studies have been conducted on promoting later life as a period of enjoyment, growth, creativity, independence and development, rather than merely focusing on loneliness, disengagement and decline (Gergen and Gergen, 2001; Tornstam, 2005).

To address the relationship between sport participation and the extension and quality of individual social networks, the concept of social capital provides a suitable framework for studying the role social networks play in being sources of affective, emotional and instrumental resources for individuals. In particular, we use the concept of individual social capital, as defined by Nan Lin (2001), who states that social capital is the set of social ties that make it easier for individuals to achieve market and non-market objectives through interactions with other individuals. Social capital thus refers to the ability of individuals to obtain scarce resources through membership in a particular social network, namely to extract value from the connections that can be mobilised (Lin, 2001). To the extent that the sustainability of these resources is vital for successful ageing and given the demographic developments and changes in the population age structure, especially in developed countries, addressing the above-mentioned relationship is of particular interest. However, on the one hand, there is no explicit treatment of age or ageing in the social capital literature, and on the other hand,

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the research on ageing has not fully explored the consequences of improving social capital for older adults.

Sport participation has been traditionally associated with social capital, mainly because involvement in sports is considered a powerful way to develop social networks and, consequently, to generate social capital at both the individual and community levels (Putnam, 1995; Sherry *et al*., 2011; Peachey *et al*., 2015). Despite the growing body of literature that addresses the potential of sports to support the accumulation of social capital (Pawlowski and Schüttoff, 2019), the research on sport participation and individual social capital, particularly regarding the quantity and quality of the social relationships of older adults, has received much less attention. Remarkably, there is a lack of empirical evidence on the quality and diversity of social relations built and developed through sport participation and spectatorship.

We attempt to fill these gaps, providing new evidence on the extent to which sport participation may result in closer and extensive networks of personal relationships for older adults. This issue is critical because it can serve as support for the health promotion movement by governments, non-profit organisations and business corporations worldwide, reflecting a cultural emphasis on sports, physical activity, exercise, recreation and leisure as strategies for maintaining and boosting the social and psychological health of older people (Allain, 2020; Lee *et al*., 2020). This paper also contributes to the current literature by offering new and more informative measurements of an individual's quantity and quality of social ties.

When analysing sports, at least two different forms of engagement can be considered (Nicholson and Hoye, 2008*a*; Lera-López *et al*., 2012). One is direct participation in a sport activity (active participation) and the other is attending a sporting event (passive participation). Indeed, active and passive participation in sports are different modes of leisure participation (Shamir and Ruskin, 1984; Lera-López and Rapún-Gárate, 2011) that create opportunities for individuals to fulfil physical, social and personal needs (Funk, 2008). The desire for social interaction is one of the motives for individual sport participation that applies to both the active engagement of sport participants and the passive participation of sport spectators (Downward and Riordan, 2007; Downward *et al*., 2014). Essentially, both playing and attending sporting events might imply social interactions within groups and communities. In fact, there is growing evidence that sport participation provides opportunities for the development of social networks and social trust, which benefit both individuals and communities (Nicholson and Hoye, 2008*b*).

The causal relationship between sports participation and social capital formation may run in both directions. In other words, it is not evident whether sports participation promotes social capital formation or whether people with a relatively higher stock of social capital have a higher probability of participating in sport. However, a few studies provide evidence for a causal relationship running from sports participation to several measures of social capital. For example, Downward *et al*. (2014), Felfe *et al*. (2016), Pawlowski *et al*. (2018) and Schüttoff *et al*. (2017) provide robust causal analyses suggesting that participation in sports has positive impacts on social capital for children, adolescents and adults.

From a theoretical point of view, social network studies identify some mechanisms that help explain why sports foster social relations. Three of these mechanisms

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deserve to be mentioned for our purpose because they justify the existence of a causal relationship running from sports participation to social capital (Dalen and Seippel, 2021). First, according to contact theory, people have to meet physically in space and time to develop social networks. Sports provide a social environment conducive to such contact and developing social relations. Second, contagion is a social mechanism that indicates that people meeting through specific networks will become more similar to each other. Third, the so-called homophily mechanism implies that, on the one hand, people, regardless of having met previously, will be attracted to each other when they meet in sports. On the other hand, people who have participated in sport will tend to seek each other out in different social contexts because they are similar in this shared previous experience.

Against this background, we are interested in analysing whether sport participation (active and passive) is associated with more satisfying social relations and more frequent contact in social relationships. To examine the role of active and passive sport participation in the development of social capital, we use a sample of Spanish adults aged 50–70 years. In particular, to quantify the relevant dimensions of social relations, we have developed a 'position generator' (Lin and Dumin, 1986) that permits us to capture the different sets of resources that older adults may need.

The rest of the paper is organised as follows. In the next section, we discuss the concept of individual social capital and the relationship between sport participation, social capital and older adults. Then we present the data and variables used in the empirical part of the study, followed by the results section. Finally, the last section concludes with a set of implications and conclusions.

Literature review

Ageing and social capital

The research on ageing in the sociology and gerontology fields has extensively investigated age-related changes in social relationships. As mentioned in the introductory overview, disengagement theory explains the decline in social interaction among ageing adults (Cumming and Henry, 1961). According to this perspective, older adults' isolation results from a gradual and irreversible abandonment of social roles, narrowing role sets and a weakening of existing social bonds (Smith and Victor, 2019). Older adults are less integrated than younger adults because they are marginalised by modernisation, are forced out of social roles by younger generations, seek solitude or are more selective about their social contacts.

In contrast to the disengagement theory, the social gerontological research has established a rational basis for emphasising older adults' network connectedness and social integration through social networks. Some authors use the lifecourse perspective (*e.g.* George, 1993) to underscore the implications of later-life challenges for older adults' social integration. Such an approach portrays older adults as resilient to potentially isolating events such as retirement and bereavement. This line of research is rooted in one of the founding theories of ageing, *i.e.* the so-called activity theory. According to this perspective, engagement in organisational activities and social relations supports wellbeing in older people (Havighurst, 1961); older adults who adjust to later-life transitions by remaining socially active are happier and healthier (Lemon *et al.*, 1972). This positive ageing view, which was developed

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by Havighurst (1961) and is based on activity theory, has been behind the promotion of a physically active lifestyle as a critical factor for maintaining and developing the social and psychological health of older people (Gilleard and Higgs, 2002).

More recently, socio-emotional selectivity theory has provided a compelling explanation for how social relationships change with advancing age (Carstensen, 1992). This theory suggests that ageing adults deliberately allow for reductions of certain types of social ties while striving to maintain others (Baltes and Carstensen, 1999). This replacement of social ties over the lifecourse is consistent with Kahn and Antonucci's (1981) social convoy model and Baltes's (1997) proposal of a successful ageing theory, which is known as the selection, optimisation and compensation theory.

Most of the literature emphasises the critical importance of network ties and social support in older adults' lives (Barrenetxea *et al.*, in press). Although some of these studies implicitly consider individual-level social capital, they do not formally use such a concept. In this work, we take as a reference the concept of individual social capital, defined as the network of relations owned by a specific person, and we assume that its value lies in all of the resources, material or not, that can be drawn from those relations (Lin and Dumin, 1986). This definition is in line with Bordieu's perspective, which focuses on the resources that people accrue due to their participation in social networks (Bourdieu, 1986). As Flap (1999: 10) notes, 'The constituents of social capital are the number of persons in an individual's network, their resources, and the extent to which they are prepared or obliged to help him when called upon to do so.' Social capital, thus, is embedded in social networks and resides within individuals (Bourdieu, 1986; Lin, 2001; Woolcock, 2001; Stauder, 2014).

Along these lines and according to Uslaner's (2008) hypothesis, networks of strong ties form a critical safety net that guarantees the coverage of personal needs, and they influence how individuals perceive their general environment. Thus, the existence of a consolidated network of strong ties, that is, of close-knit members with frequent interactions, helps individuals, including older adults, manage social risks and circumstances involving dramatic change and uncertainty. Indeed, frequent social relations can provide social support, social influence, opportunities for social engagement and meaningful social roles, as well as access to resources and intimate one-on-one contact (Berkman and Glass, 2000). Therefore, social relations provide resources that are especially valuable to older adults, and they have been identified as essential to successful ageing (Bowling *et al.*, 2003).

The concept of social capital that we employ provides an analytical framework to explain the mechanisms through which social relations may produce results at the micro or individual level. Although most of the literature emphasises the positive effects of increases in social capital, the reality is more nuanced, and the evidence is mixed. In this sense, it is also necessary to point out some potential adverse outcomes of social capital (*e.g.* peer effects regarding risky health behaviour, solidification of age-specific stereotypes, *etc.*). Authors such as Portes (1998) suggest a number of reasons why social capital effects are not always positive. This author includes the following reasons: (a) higher social capital can involve excessive demands being placed on group members to provide support to others, (b) higher

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social capital can entail a restriction of freedom as a result of excessive informal control, (c) strong bonding capital can be used to exclude out-group members, and (d) social capital can lead to a 'down-levelling' of norms, in which the demand for group conformity can pull down the achievement of individuals trying to break free from the group (which is especially relevant in some educational settings). Villalonga-Olives and Kawachi (2017), in their review of the recent public health literature, also identify additional 'downsides' of social capital.

Sport participation, social capital and older adults

The link between sport participation and social capital has attracted the attention of a growing body of research. Nicholson and Hoye (2008*b*) provide a comprehensive review of the debate on the theoretical connections between sport and social capital. Sport participation has traditionally been associated with social capital, mainly because active participation in sports is considered a powerful way to develop social networks and, consequently, to generate social capital at both the individual and community levels (Sherry *et al.*, 2011; Peachey *et al.*, 2015; Pawlowski and Schüttoff, 2019). In particular, some empirical evidence suggests that sport participants enjoy a greater ability than non-participants to develop extended social networks, to relate to family or friends, and to obtain support in times of crisis (Australian Bureau of Statistics, 2009). Regarding older adults, Litwin (2003) determined that physically active older adults were more socially connected; along these lines, Gray (2009) and Kim *et al.* (2020) suggest that the likelihood of taking part in physical activity was associated with a higher diversity of networks. Similar results have been found when considering marginalised or socially excluded groups (Collins, 2004; Skinner *et al.*, 2008; Sherry, 2010).

One of the main strands of the literature exploring the relationship between sports and social capital focuses on the development of social capital within sporting organisations (Coalter, 2007; Tonts and Atherley, 2010; Darcy *et al.*, 2014). However, sport participation may exert a positive effect by other means. For example, a related but different line of research analyses the role that the organisation of sporting events plays as a driver of social capital accumulation. For instance, Wann *et al.* (2001) stress the possibility of sport fandom contributing to social capital, mainly because fans are aware of each other through sporting events and share a 'quasi-intimacy' and social connectedness. Furthermore, voluntary participation in the organisation of such events may be an additional channel through which sports enhance social capital (*see e.g.* Peachey *et al.*, 2015). Sherry *et al.* (2011) postulate that an increase in positive perception among spectators of sporting events is associated with enhanced social capital. According to this line of research, sporting events boost social capital by creating a sense of community among attendants (Wicker and Downward, 2019).

Sport participation by older adults is associated with several psychosocial effects. Gayman *et al.* (2017), through a systematic review, conclude that some of the psychosocial consequences experienced by people who participate in sports are strongly affected by one's stage of life. More specifically, these authors report evidence suggesting that older adults' active engagement in sports has several positive effects on cognition, perception, emotions and opportunities to socialise. All

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these cognitive, emotional and social aspects may shape the relationship between sport participation and the generation of social capital for our target population.

Most of the above-mentioned considerations are typically applicable to active sport participation. However, a specific relationship between some forms of passive sport participation and individual social capital may exist. For instance, among the different forms of passive sports, participation in sporting events, as with other cultural activities, is an excellent context for the production and consumption of relational goods. Becchetti *et al.* (2008) define relational goods as the affective/expressive, non-instrumental side of interpersonal relationships. This definition includes companionship, emotional support, social approval, solidarity, a sense of belonging, experiencing one's history, and the desire to be loved or recognised by others. In short, relational goods are (potentially) associated with repeated interaction in any field of social life, such as family, friends, peer groups, associations, sport activities, the workplace and other various events. From this perspective, it is worth noting that relational goods are a component of the broader concept of social capital. Indeed, the concept of relational good refers specifically to the relationships among people who lack an instrumental character but have an expressive or affective character.

An essential feature of relational goods is that they cannot be produced or enjoyed by an isolated individual but can be shared with others; that is, the production and consumption of this type of good temporarily coincide. Indeed, 'consumers' and 'producers' are the same agents, but social participation 'produces' relational goods, while it puts participants in the condition to 'consume' (enjoy) them (Sacco *et al.*, 2004). Some sporting events involve the presence of many spectators who are generally prompted to participate by an intrinsic motivation of social interaction (Trail and James, 2001; O'Sullivan, 2009). In particular, attending a sporting event is an occasion in which the company of others is enjoyed, and bonds with friends, relatives and acquaintances are strengthened, especially when interactions are sufficiently frequent. For instance, Wicker and Downward (2019) argued that spectators attending sporting events often interact by sharing their experiences. Therefore, the shared consumption of leisure experiences associated with both active and passive sport participation is an occasion in which the company of others is enjoyed and bonds with friends, relatives and acquaintances are strengthened. Therefore, when considering the role of relational goods, sport participation may contribute to building and sustaining meaningful and closer ties between individuals which, in turn, might be even more satisfying. In fact, previous research has provided empirical evidence suggesting a robust correlation between relational goods and subjective wellbeing (*i.e.* Bartolini *et al.*, 2013).

The previous discussion of the literature addressing the interrelations between ageing, social capital and sport participation leads us to the following hypotheses:

- Hypothesis 1: For older adults, active and passive sport participation are associated with more extensive social networks. The sizes of these associations increase with the frequency of participation and interactions.
- Hypothesis 2: For older adults, active and passive sport participation are associated with closer and more satisfying relations. The sizes of these associations increase with the frequency of participation and interactions.

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Data and variables

This paper's dataset is based on an *ad hoc* survey specifically designed by the authors of this paper and their respective research teams. The fieldwork was conducted in May 2015 by Estudio Indaga, a Spanish survey firm, using computer-assisted telephone interviewing (CATI system), and the sample is representative of individuals aged 50–70 living in Spain. A pretest was developed to check the validity of the questionnaire and the reliability of the survey. The final sample included 600 people; the sampling error, for a 95 per cent confidence interval, was ±4.00 per cent. The sample is based on a stratified sampling of municipalities (with four different population size categories), with the gender and age proportions reflecting the national population. The survey was designed to gather data about social capital and social connectedness, sport participation and personal characteristics. The variables used in this study are defined in Table 1.

Social capital has been measured along its dimensions of quantity and quality. The quantity information was obtained by employing a 'position generator' (Lin *et al.*, 2001; Van Der Gaag and Snijders, 2008). In practice, people were asked whether they knew relatives, friends or acquaintances who had jobs from a list of 11 occupations. A position generator, by definition, is socially and culturally determined. The list of occupations and their relative weights, as well as the resources or favours that are asked of friends and relations, tend to vary across cultures. It is, thus, necessary to develop specific instruments for each study and socio-economic context. In our case, we designed a position generator to capture the diversity of Spanish society and the different set of resources that older adults may need in this context. In practice, starting from the original instrument by Lin (2001), we selected occupations that are salient in Spanish society in various social domains. As a result, the respondents were asked whether they knew anyone among their circle of family, friends and acquaintances who worked (a) as a university professor, (b) in the administration of the education system, (c) in the justice system, (d) in the National Revenue Agency, (e) in the local public administration (without being a politician), (f) in the banking system, (g) as a general practitioner (GP), (h) in the health-care system (not a GP), (i) in a local or national police department, (j) as political official, and (k) as a journalist or has influence in the media.

We applied the standard approach to the position generator's measurement, based on Lin and Dumin (1986), as discussed in depth in Van Der Gaag and Snijders (2008). In particular, we measure the 'extensity' of network positions (*network extensity*, see Table 1), an operationalisation of the concept of diversity constructed by adding the number of positive responses to all items in the position generator.

Regarding the dimension of quality, we considered two variables that, though closely related, capture different aspects of social ties. The first (*close friends*) is related to social support and is a binary variable that takes the value 1 when a person has at least a close friend with whom he or she can talk with about his or her worries or ask for help. The second variable (*satisfied with friends*), also binary, is related to a general feeling of satisfaction.

The main group of explicative variables includes different measures of sport participation. We distinguish active and passive participation in sports. Active sport

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Table 1. Variables and descriptive statistics

Variables	Definition	Mean (SD)	Percentage
Individual social capital:			
Network extensity	Number of occupational positions for which the respondent declares to know at least one social tie (sum of ties declared in the position generator)	4.64 (3.13)	
Close friends	1 = the respondent has at least one close friend; 0 = otherwise		83.16
Satisfied with friends	1 = the respondent is satisfied with his or her relationships with friends; 0 = otherwise		90.76
Sport engagement:			
Sport frequency:			
Never	1 = the respondent has never done sport during the last 12 months; 0 = otherwise		68.38
Low	1 = the respondent has done sport less than once per week during the last 12 months; 0 = otherwise		2.00
Medium	1 = the respondent has never done sport once or twice per week during the last 12 months; 0 = otherwise		10.65
High	1 = the respondent has never done three or more times per week during the last 12 months; 0 = otherwise		18.97
Sport modality:			
Individual	1 = The respondent has done sport alone during the last 12 months; 0 = otherwise		9.65
Group	1 = The respondent has done sport with other people during the last 12 months; 0 = otherwise		21.96
Sport organisation:			
Un-organised	1 = During the last 12 months, the respondent has done sport but not as an activity of a club, association, organisation or federation; 0 = otherwise		22.13
Organised	1 = During the last 12 months, the respondent has done sport as an activity of a club, association, organisation or federation; 0 = otherwise		9.48

(*Continued*)

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Table 1. (*Continued.*)

Variables	Definition	Mean (SD)	Percentage
Attendance frequency:			
Never	1 = The respondent has never attended a sporting event during the last 12 months; 0 = otherwise		83.02
Low	1 = The respondent has attended a sporting event once per month or less during the last 12 months; 0 = otherwise		12.1
High	1 = The respondent has attended a sporting event several times per month or more during the last 12 months; 0 = otherwise		4.83
Personal characteristics and attributes:			
Education:			
Primary or none	1 = The maximum level of education of the respondent is primary education; 0 = otherwise		39.93
Secondary	1 = The maximum level of education of the respondent is secondary education; 0 = otherwise		31.95
University	1 = The maximum level of education of the respondent is university education; 0 = otherwise		28.12
Female	1 = The respondent declares to be female; 0 = otherwise		51.75
Age	Age in years	59.35 (6.12)	
Coupled	1 = The respondent lives in a married or unmarried couple; 0 = otherwise		81.17
Retired	1 = The respondent is retired; 0 = otherwise		34.78

Note: SD: standard deviation.

participation is defined as practising organised sports, as well as any form of physical activity that is developed in a sport context or sport-related setting, such as training in a fitness centre or sport club or swimming, during the last 12 months, following the framework developed by Eurostat and the European Commission (2018) for measuring sport engagement in the European Union. Concerning this active participation in sports, we consider three indicators. The first (*sport frequency*) measures the frequency with which people participate in a sport. 'Low frequency' is defined as participating in a sport less than once per week; 'medium frequency' refers to participating in a sport once or twice per week; 'high frequency' indicates a frequency of three times per week or more. The reference category is not participating in a sport activity. In addition to this measure, we also considered

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whether a person participates in a sport individually or with friends, co-workers or family members (*sport modality*: individual or group). Finally, the variable *sport organisation* measures whether people participate in a sport within a formal organisation (club/centre or association).

Regarding passive sport participation, people were asked about their frequency of attendance at sporting events (*attendance frequency*). High frequency is defined as attendance several times per month or more, while low frequency indicates a lower rate. The reference category is never attending sporting events.

The model also controls for personal characteristics, selected following the previous empirical evidence (*i.e.* Downward *et al.*, 2014). Additionally, we considered being retired and health status among the other controls. *Being retired* may be a crucial determinant of social capital because colleagues and commercial partners constitute a significant source of connections. *Health status* may be a critical confounder because it may affect both the ability to engage in sport activities and enjoy social ties. In particular, this variable identifies the self-assessed health status through a visual analogue scale (EQ-VAS) obtained by applying the EuroQol EQ-5D-5L, a standardised health-related quality-of-life questionnaire. The variable assesses an individual's subjective health status on a scale ranging from 0 (worst imaginable health state) to 100 (best imaginable health state). This evaluation has been widely applied in the health state valuation field, promoting comparability for valuation studies, and it is one the most recommended instruments throughout European countries (*i.e.* Grochtdreis *et al.*, 2019; Stolk *et al.*, 2019).

Results

In this section, we assess the relationship between sport participation and individual social capital. The results presented in Table 2 consider *network extensity* as the dependent variable and, hence, are related to the discussion of Hypothesis 1. From a methodological point of view, the dependent variable consists of non-negative integers, *i.e.* it is a 'count variable'. Additionally, it exhibits overdispersion, *i.e.* its variance (9.818) more than doubles its mean (4.639). Therefore, we consider negative binomial models to accommodate the excess variation. In particular, Table 2 presents the average marginal effects of four negative binomial regressions. Each model employs a different measure of sport participation, as follows: *sport frequency* (Model 1), *sport modality* (Model 2), *sport organisation* (Model 3) and *attendance frequency* (Model 4).

As a general rule, for older adults, we observe a positive relationship between all forms of sport engagement and the number of social ties. The size of the effect varies with frequency; with respect to not participating in a sport, participating in a sport three times per week or more is associated with an average increase of approximately one social tie in the position generator (out of a total of 11 positions). The average marginal effect of medium frequency is slightly lower, *i.e.* 0.639. In contrast, a low frequency of engagement in sport activities, compared to not participating in a sport, does not appear to be associated with improved social capital. This result seems to be in line with the theory of relational goods discussed in the literature review, which emphasises the importance of frequent interactions for developing interpersonal relationships. Sport, in fact, may function as a

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Table 2. Sport engagement and network extensity

	Model 1		Model 2		Model 3		Model 4	
	Average marginal effects							
Sport frequency (Ref. Not participating in a sport activity):								
Low	−0.795							
Medium	0.639	**						
High	0.931	**						
Sport modality (Ref. Not participating in a sport activity):								
Individual			0.712	**				
Group			0.719	**				
Sport organisation (Ref. Not participating in a sport activity):								
Un-organised					0.489			
Organised					1.064	**		
Attendance frequency (Ref. Never):								
Low							−0.066	
High							0.630	*
Education:								
Secondary	1.409	**	1.395	**	1.374	**	1.413	**
University	3.246	**	3.260	**	3.295	**	3.408	**
Female	−0.232		−0.216		−0.203		−0.212	
Age	−0.065	*	−0.062	*	−0.064	*	−0.065	*
Coupled	−0.538		−0.506		−0.452		−0.451	

Retired	−0.188	−0.18	−0.132	−0.130
N	600	600	600	600
Wald χ^2	198.54	192.47	196.06	194.71
Prob > χ^2	0.000	0.000	0.000	0.000
Cragg & Uhler's R^2	0.222	0.216	0.219	0.209

Notes: Negative binomial models. Dependent variable: network extensity. Ref.: reference category. d*y*/d*x* for factor levels is the discrete change from the base level.
Significance levels: * Significant at 0.05 level, ** significant at 0.01 level.

means to increase social interactions. The other two variables of active sport participation offer a more in-depth view of social capital formation.

The results presented in Table 2, Model 2, suggest that participating in a sport is associated with more extensive social networks, independent of its modality. With respect to not participating in a sport, both individual and group engagement in sport activities is associated with approximately 0.7 additional social ties in a personal network. This result may appear puzzling at first. In fact, it could be argued that participating in a sport alone is unlikely to increase social interactions and, through this channel, individual social capital. However, the results of Model 3 (Table 2) point to a possible explanation. With respect to not participating in a sport, the significance and size of the effect of participating in a sport vary according to the form of organisation. On average, with respect to not participating, participating in a sport independently, that is, not within a formal organisation, is not associated with additional contacts in the position generator. However, participating in a sport as an activity of a club, association or other organisation is associated with an increase of one additional social tie. This result stresses the value of associationism in the formation of social networks for older adults, in accordance with the social capital literature. Sport participation exerts a social impact for older adults primarily when it is organised and provides a favourable environment for social interactions.

We find a positive association between a high frequency of attendance and network extensity. In other words, with respect to not attending at all, frequently attending sporting events may be related to increased social ties.

Among the control variables, education emerges as the most relevant determinant of social network extensity. Notably, the attainment of university education (compared to primary or no education) is associated with an average increase of approximately 3.2 social ties in the position generator. Higher education enhances access to a broader range of social positions, especially in society's higher strata, as reflected in our measure of network extensity. However, the level of education might also capture (and control for) an income effect, *i.e.* university education is associated with higher income, which, in turn, is related to improved social capital (Pena-López and Sánchez-Santos, 2017; Rungo and Pena-López, 2019).

The results presented in Table 2 are compatible with Hypothesis 1 and suggest an association between sport participation and the quantitative dimension of individual social capital. Tables 3 and 4 present the results regarding the qualitative dimension of individual social capital (*see* Hypothesis 2). In particular, Models 5–8 attempt to assess the relationship between sport participation and the probability of having at least one close friend. On average, as can be observed, participating in sport activities with high frequency is associated with an increase in the probability of having a close friend of 9.5 percentage points. However, we do not find a positive association for lower frequencies. Therefore, with respect to not participating in a sport, participating in a sport three times per week or more increases the number of social ties and the probability of having a close friendship. Participating in a sport less than three times per week is equivalent to not participating in a sport in terms of social capital quality.

Regarding modality (individual *versus* group), participating in a sport with other people is associated, on average, with an increase of 10.6 percentage points in the

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Table 3. Sport engagement and close friends

	Model 5		Model 6		Model 7		Model 8	
	Average marginal effects							
Sport frequency (Ref. Not participating in a sport activity):								
Low	−0.037							
Medium	0.075							
High	0.095	**						
Sport modality (Ref. Not participating in a sport activity):								
Individual			0.024					
Group			0.106	**				
Sport organisation (Ref. Not participating in a sport activity):								
Un-organised					0.069	*		
Organised					0.107	**		
Attendance frequency (Ref. Never):								
Low							0.073	
High							0.128	*
Education:								
Secondary	0.109	**	0.111	**	0.109	**	0.112	**
University	0.187	**	0.187	**	0.188	**	0.195	**
Female	−0.034		−0.036		−0.035		−0.013	
Age	−0.001		−0.001		−0.001		−0.001	
Coupled	−0.048		−0.045		−0.047		−0.040	

(*Continued*)

Table 3. (*Continued.*)

	Model 5	Model 6	Model 7	Model 8
Retired	−0.050	−0.048	−0.047	−0.042
N	575	575	575	575
Wald χ^2	37.23	37.99	35.47	39.35
Prob > χ^2	0.000	0.000	0.000	0.000
Cragg & Uhler's R^2	0.135	0.137	0.133	0.127

Notes: Logit models. Dependent variable: close friends. Ref.: reference category. d*y*/d*x* for factor levels is the discrete change from the base level.
Significance levels: * Significant at 0.05 level, ** significant at 0.01 level.

Table 4. Sport engagement and satisfaction with friends

	Model 9		Model 10		Model 11		Model 12	
	Average marginal effects							
Sport frequency (Ref. Not participating in a sport activity):								
Low	−0.173							
Medium	0.095	**						
High	0.076	**						
Sport modality (Ref. Not participating in a sport activity):								
Individual			0.041					
Group			0.087	**				
Sport organisation (Ref. Not participating in a sport activity):								
Un-organised					0.064	*		
Organised					0.092	**		
Attendance frequency (Ref. Never):								
Low							−0.020	
High							0.041	
Education:								
Secondary	0.082	**	0.079	**	0.078	**	0.088	**
University	0.080	**	0.079	**	0.079	**	0.095	**
Female	0.003		0.002		0.003		0.004	
Age	−0.001		−0.001		−0.001		−0.001	
Coupled	−0.071	**	−0.070	**	−0.071	**	−0.069	**

(*Continued*)

Table 4. (*Continued.*)

	Model 9	Model 10	Model 11	Model 12
Retired	−0.041	−0.039	−0.038	−0.035
N	595	595	595	595
Wald χ^2	34.40	27.32	28.17	23.19
Prob > χ^2	0.000	0.000	0.000	0.000
Cragg & Uhler's R^2	0.147	0.132	0.129	0.099

Notes: Logit models. Dependent variable: satisfied with friends. Ref.: reference category. d*y*/d*x* for factor levels is the discrete change from the base level.
Significance levels: * Significant at 0.05 level, ** significant at 0.01 level.

probability of having close friends. Participation in a sport alone, however, does not appear to be related to improved support. Finally, concerning active sport participation, organised sport activities are also associated with a higher probability of having a close friendship. When we discussed network extensity, we found that sport modality was not relevant *per se*. Therefore, in terms of the quantity of social ties, participating in a sport within a formal organisation is more relevant than the specific modality. However, when considering this indicator of social tie quality, that is, close friendship, our findings suggest that both participating in a sport with other people and the organisational structure may be significant factors.

The results concerning the association between close friendship and attendance at sporting events indicate that attending events several times per month or more is related to an average increased probability of having close friends of 12.8 percentage points. Hence, passive sport participation appears to be related to both the extensity and the quality of networks, although a very high frequency of attendance is required.

The results become nuanced when we consider the second indicator of social ties quality, *i.e.* satisfaction with friends. Models 9–12 in Table 4 consider *satisfaction with friends* as the dependent variable. A higher probability of satisfaction with friends is associated with doing sports more often, doing it with other people and within a formal organisation. Unorganised sports, with respect to not participating in a sport, still present some advantages, as indicated by the average marginal effect, *i.e.* they are associated with an increased probability of being satisfied with friends of 6.4 percentage points (compared to 9.2 for organised sports). However, when considering attending sporting events, we do not find any significant association with this social tie quality indicator. Accordingly, our findings do not fully support Hypothesis 2 when considering passive sport participation.

The relevance of improved education is also apparent when studying support and satisfaction with friends. The effect is especially evident for close friendship, *i.e.* university education is associated with a 19 percentage-point increase in the probability of having close friends.

Discussion and conclusions

This study examines the relationship between sport participation and individual social capital. Notably, our measures of extensity (based on a position generator) and closeness of social networks allow us to account for the potential differences between the quantity and quality of the social ties engendered by active and passive sport participation. To the best of our knowledge, this issue has not been previously addressed in the literature.

Our main findings point to a positive association between high-frequency sport participation and social network extensity for a sample of Spanish older adults. Indeed, these results also hold true for sports spectatorship, in line with Wann *et al.* (2001), O'Sullivan (2009) and Trail and James (2001), among others. In terms of statistical significance and the association's size, organised sports seem critical for older adults' individual social capital. Active sport participation is also crucial for the quality of social ties. Our results are compatible with a prominent role of a sport practised with other people and within a formal organisation.

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The findings regarding passive sport participation, *i.e.* attending sporting events, are more nuanced for the quality of social ties. On the one hand, we find a positive association of high-frequency attendance with having at least a close friend. On the other hand, there is no statistically significant association with being generally satisfied with friends. Attending sporting events may not offer the meaningful interactions and strong personal involvement that drive support and personal satisfaction.

In other words, active sport participation is related to increasingly better relationships with friends, which emphasises the socialisation process that sports foster. Nevertheless, this relationship is not directly recognised by people engaged in sports in Spain. For example, only 15 per cent of Spanish people involved in sports argue that social interaction is the first motivation to participate in sports, compared to 59 per cent of people who recognise the improvement of health as the main reason (European Commission, 2018).

Our findings are also compatible with the idea that sport participation can avoid, at least partially, the loss of social contacts generally associated with ageing (Cornwell *et al.*, 2008). Given the importance of the sustainability of resources embedded in older adults' social networks, as emphasised by most ageing theories, our results support the role that sport participation might play as a counterbalancing factor of potential age-related disengagement. In particular, sport participation would allow older adults to adjust to later-life transitions by remaining socially active. According to activity theory, this contributes to maintaining and developing social and psychological health (Gilleard and Higgs, 2002) and eventually contributes to successful ageing.

According to our evidence, the difference between the two forms of sport participation should be emphasised. Attending sporting events may generate more superficial contact with other individuals. Consequently, the impact of attendance on individual social capital is less relevant. In fact, these differences are also highlighted when examining the relationship between the two forms of sport engagement and network diversity. Thus, while it is true that attending sporting events may allow people to meet people at a higher frequency, in comparison with active participation, this activity may be less related to close relationships, satisfaction with friends, or the opportunity to meet people from different backgrounds and occupations. This result is especially relevant for older adults. As noted previously, the quality of relations matters most for older adults' wellbeing. Along these lines, proponents of the socio-emotional selectivity theory consider that short-term rather than long-term goals become increasingly important as individuals age. As emotional wellbeing is one of the most salient short-term goals, maintaining intimate social ties appears to offer the best opportunities for satisfying this particular goal (Baltes and Carstensen, 1999).

Although passive sport participation is also linked with building social ties, it cannot be viewed as a perfect substitute for active sport participation as a source of social connectedness because although it appears associated with the extensity of social networks, it is not so closely related with the quality of individual social capital. However, as there are barriers to older adults playing sports (facilities, cost, physical limitations, organisational), the role of this type of leisure-time activity as a driver of wellbeing for this age group should not be neglected.

Our results can also be viewed in light of social capital theory, to the extent that our investigation provides some evidence suggesting that both active sport participation and attendance at sporting events contribute to generating individual social capital. Overall, the results derived from this research for the Spanish context fit into the vast body of research that already exists on sport and social capital. However, our study provides additional evidence about the relational motivations and benefits of sport engagement for older adults. This is consistent with the empirical literature that addressed the role of social relations as a facilitator of resources that are especially valuable to this group of the population within the framework of the study of the determinants of participation in sports for older adults (*i.e.* Bowling *et al.*, 2003; Jenkin *et al.*, 2017, 2018).

The results are also consistent with the literature that holds that leisure is a context in which individuals obtain psychosocial resources, such as friendships and companionship (Caldwell, 2005). Along these lines, our research entails an in-depth study of some significant differences in the production of these resources (quantity and quality) through sport participation (active) and attendance at sporting events (passive). Particularly, our estimates are also aligned with the literature that shows that engaging older adults in sports may positively affect their social health beyond the best known positive effects on this population group's physical and mental health (Gayman *et al.*, 2017).

In summary, the results suggest that any increase in older adults' sport participation might be associated with their endowment of individual social capital. Consequently, this link might have some interesting policy implications that are highly relevant for the age group under study. This population segment is becoming increasingly relevant in many countries, as policies have been developed to ensure active and healthy ageing in our society. The positive contribution of sport engagement and social capital to this group's wellbeing should simultaneously be promoted. More specifically, given the association between ageing and loss of social contacts, the prevention of social isolation becomes a priority in ageing populations because it might improve the quality of life of older people and reduce public expenditure on medical costs for this age group. For this reason, it is important to provide older people with maximum opportunities to maintain a good quality of life (Toepoel, 2013).

When considering the Spanish context, where 61 per cent of the older population is not involved in any sporting activity (European Commission, 2018) and only 29 per cent of the ageing population attended a sporting event in 2015 (National Sports Council, 2015), promoting social capital through sport policy could be especially efficient from a public health perspective. In fact, the promotion of sports as a viable leisure-time physical activity option for older adults may be key in maintaining or improving physical health and social health (Jenkin *et al.*, 2018). Along these lines, some authors have argued that engaging in sports with other people tends to be an effective tool for promoting positive social and psychological outcomes due to the social nature of participation (Berg *et al.*, 2015). Overall, in ageing societies, policy makers should include a focus on older adults in their political agendas to derive the social health benefits that are especially important for this age group due to their higher risk of social isolation. In particular, sport policy often prioritises younger people's participation, while there is a lack of specific age-appropriate opportunities for older adults to participate in most sports (Grenade and Boldy, 2008).

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This study is cross-sectional in design due to data availability, and it does not allow us to draw any definitive causal conclusions. In particular, although we have previously mentioned the existence of empirical evidence suggesting that causality runs from sports participation to social capital, there are also compelling reasons to justify that sport participation benefits from a broader and more diverse social network. Authors such as Widdop *et al.* (2016) illustrate how more extensive, diverse networks and the strength of ties play a crucial role as determinants of sport participation. Specifically, these authors underline the importance of family and friendship networks. In particular, the findings of these authors evidence that people who do not participate in sporting activities have a much more restricted network, which reinforces their disengagement in this kind of activity. In a similar vein, Gemar (2021) shows social capital as a primary predictor in the patterning of both sports spectatorship and participation. By taking a social network approach, this author evaluates how density, cohesion and formation of the individuals' network can influence whether they participate in sporting activities. In this sense, although age and gender are the most predictive variables for sports participation, results suggest that network size and network variety, along with economic capital, are also significant capital predictors for sport participation patterns, both active and passive.

For this reason, we have emphasised the associational character of the link between sport participation and individual social capital. Future research should assess the possibility of inverse causation and endogeneity.

The approach adopted in this work allows us to incorporate explicitly the concept of individual social capital in the literature on ageing. While this paper makes a relevant contribution to the debate on how sport engagement relates to social capital, certain aspects might receive more attention in future research. A significant limitation is that we do not know what types of sporting events the respondents attended or what types of sporting activities they practised. Future research should pay attention to sporting activities' specific characteristics, particularly in terms of professional *versus* amateur sporting events and formal *versus* informal sport participation. Furthermore, it would be interesting to compare these relationships for different age groups and test how the associations of social relations and social trust with sport participation vary according to age. Finally, given that our findings present features specific to the Spanish context, further research is needed to make a comparative discussion that allows testing to what extent the results differ across countries.

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