

How COVID-19 Pandemic Lockdown Has Affected Sports Practice

Barbara Mazza

How to cite

Mazza, B. (2021). How COVID-19 Pandemic Lockdown Has Affected Sports Practice. [Italian Sociological Review, 11 (5S), 607-633]

Retrieved from [<http://dx.doi.org/10.13136/isr.v11i5S.474>]

[DOI: 10.13136/isr.v11i5S.474]

1. Author information

Barbara Mazza

Department of Communication and Social Research, Sapienza,
University of Rome, Italy

2. Author e-mail address

Barbara Mazza

E-mail: barbara.mazza@uniroma1.it

3. Article accepted for publication

Date: April 2021

Additional information about

Italian Sociological Review

can be found at:

About ISR-Editorial Board-Manuscript submission

How COVID-19 Pandemic Lockdown Has Affected Sports Practice

Barbara Mazza*

Corresponding author:
Barbara Mazza
E-mail: barbara.mazza@uniroma1.it

Abstract

The recent pandemic generated by COVID-19 has changed how sports are habitually practised, necessitating a form of at-home sport to enable practitioners to continue exercising and training. This also touches upon how sports are 'delivered', with home-based consumers having control over the times, ways and spaces given to sport, as transmitted by digital means. During lockdown, opportunities to take advantage of apps and content and/or follow online lessons on social networks notably intensified. These changes in sports practice generate a series of research objectives, to determine: how digital media has created a new environment for socializing and sports practice; how digital devices are used to play home sports; and which players encourage people to exercise at home.

With these objectives in mind, a two-phase research was launched at the SapienzaSport centre. The first questioned a group of about 600 practitioners, with a relatively high cultural and socioeconomic level along with access to digital opportunities, to investigate their sports habits during lockdown. The goal was to focus on those not negatively affected by the digital divide. The second phase aimed at studying the subsequent implications, starting from September 2020 (when sports-related activities resumed in Italy), while understanding whether and in what way doing physical activity had changed. In this paper we report and analyse the main results.

Keywords: sports practice, digital experience, community of practice.

* Department of Communication and Social Research, Sapienza, University of Rome, Italy.

1. Introduction

The COVID-19 pandemic has upset how sports are practiced, necessitating a form of *at-home* sport by amateur athletes to carry on practising. During lockdown, they could follow online lessons and/or take advantage of apps and content on social networks. This, however, generates a series of questions on how sport has changed, involving health preventative care and online community relations. Digital devices may have determined the type of training done at home and this could change sports habits by the end of the epidemiological crisis.

Before the outbreak of the global pandemic, studies of the impact of technological innovation on sport mainly investigated whether, and in what ways a possibly more central role of technology was bringing about change in amateur sports training. This type of training goes beyond the boundaries of spaces – indoors or outdoors – usually dedicated to physical activity and includes cyberspace as a new place (or non-place) for sports practice. Only a few studies, however, have so far investigated whether sport in cyberspace is linked to a merely momentary need caused by lockdown or whether it has opened up new opportunities for sport. The study presented in this paper provides some limited insights on the question, by analysing how a group of amateur athletes with a high cultural level and good familiarity with technologies undertook their physical activity during lockdown. This study is only the first part of an on-going study aimed at collecting information, allowing any changes in normal habits of sports practice occurring during quarantine to be monitored.

The value of this study is to provide interpretative insights to lead to further research questions and to provide useful information to scholars who wish to carry out research in these areas.

2. Literature review

This review considered the present literature on the dynamics of sports communities and recent studies analysing the use of digital devices in *at-home* sport. In the medical area, some health articles illustrate the relationship between sports practice and a sedentary lifestyle, and the motivations and implications for mental-physical health and wellbeing. In contrast, only a few studies in the humanities and social sciences appear to examine the use of apps and social media, and their relationship to sports practice. As it is clearly still too early to find studies that specifically recount any changes in practice habits during lockdown, the review also considered pre-COVID-19 studies examining the use of digital technology in sports. The following review has been organized

around three fundamental aspects in view of the research objectives of analysing how lockdown has affected sports practice: (1) how digital media has created a new environment for socializing and sports practice; (2) how digital devices are used to play home sports; and (3) which players encourage people to exercise at home.

This three-fold division of the literature derives from three main areas of sociological theory drawn upon to read and interpret the results presented in this study. First, we focus on sociological studies dedicated to social networking, widely discussed from the 90s to today, and specifically applied to sports practice, especially with approaches centred on local communities and community of practice. In particular, the network is seen as a community platform whereby an augmented and participatory reality is created. The concept of digital proximity usefully justifies the choice of doing sports online to counteract physical distancing. Second, we consider the relationship between technology and corporeality, as interpreted by sociology of media and media studies, fundamental in justifying the choices of digital sports practice and, therefore, in framing the orientations of home training during the lockdown. Finally, the third area of studies relate to the human-technology interaction approach, which serves to examine the role of ‘influencers’ on the net. Specifically, we consider the patterns of influence of sportspersons on people who, potentially or effectively, play sports. Taken together in a systematic and holistic approach, these three theoretical areas enabled us to give a more reasoned interpretation of the phenomena observed, new dynamics created by the pandemic and the resulting lockdown, in an “anomalous” situation.

2.1 Digital proximity to counteract physical distancing

In many countries of the world, the strategy adopted to protect the population from the spread of COVID-19 has been to implement so-called ‘social distancing’ in a prolonged period of quarantine. In medicine (Dalton, Corbett, Katelaris, 2020; Amekran, Abdelkader, 2020), the term ‘social distancing’ means a period of physical distancing aimed at slowing or stopping, the spread of infection among people, without the use of pharmacies. This distancing leads to some psychological drawbacks concerning emotional stability, from the development of a sense of loneliness to states of depression, and problems related to a reduction in mobility, and so cardiovascular issues.

In the human and social sciences, social distancing can be considered an oxymoron as well as an unnatural condition for a ‘social animal’. Human beings have always tried to break down physical distance with methods and tools to guarantee contact between people. The history of communication technologies is a clear example of this commitment, from sending letters to the telegraph,

from telephone to digital, in its various evolutions. In his famous dissertation on hot and cold media, McLuhan (1967) discusses the participation of individuals and the ability of tools to generate information flows or foster dialogical exchanges.

During the pandemic, the current technological equipment has naturally favoured the digital proximity of people, activating forms of augmented and participatory reality (Jenkins, 2014).

Sport is known to have an aggregative and socializing function (Kenyon, McPherson, 1974; Coakley, 1993; McCormack, Chalip, 1988; Furst, 1989; Williams, 1994; Porro, 2006; Isidori, Fraile, 2008), and has proven to support sociability during the period of social distancing, through supportive communities. Parnell et al. (2020) recognized and confirmed the constructive role played by digital platforms in the field of sport and physical activity, as people can express themselves, overcoming problems such as physical distance, time lag or emotional-relational inhibition (Boccia Artieri, 2012). Though Turkle (2012), for example, highlights how mediated communications can cause social isolation, fear of loneliness and the desire to interact only offline, others like Lindgren (2017) and Hirdman (2019) argue that the network increases sociability provided there is an already existing network of social relations. Virtual communities are therefore intended as remote extensions of networks of *in-presence* relationships.

Since the 1990s, studies on online communities have highlighted the value of technologies in creating a place where relationships, symbolic exchanges and shared experiences can all be reproduced (Tönnies 2011: 1887; Rheingold, 1993, Ross et al., 2012; Mosconi et al., 2017; Anzera, Comunello, 2017; Bartoletti, Boccia Artieri (2019). Cyberspace is thus a place of communication and relationships in continuous convergence with the real environment. Furthermore, communities are consolidated around shared objectives and interests, pursued by any group (Karahanna et al., 2018). From the studies of Van Hilvoorde (2016) and Pedersen et al. (2020), it appears that group users share the same interests and passions, and this intensifies exchanges of opinions and ideas. Similarly, the theory of Wenger-Trayner, et al. on communities of practice can be applied to explain the relational dynamics within online sports communities. According to the authors, “groups of people who share a concern or passion for something they do and learn to do it better while interacting regularly through learning located” (Wenger-Trayner, et al., 2015: 1). The justification for social media to promote authentic experience within sports education stems from the ability of social media to reinforce and support interactions and practices within community of practices.

Often, they are also local communities, bringing together, for example, groups following the same courses in a gym or doing activities in the same open

spaces. When examining football fans, Martelli and Porro (2018) found the confluence of roles also plays a part in offline-online relation building. He speaks of three categories: sports practitioners, often amateurs; fans, supporters, and spectators; and lastly, consumers. He argues that technologies enable immersive experiences in presence, intense relationships on social media and apps, as well as the viewing of consumers on interactive and multimedia devices. Following Boccia Artieri (2017), Tirino and Castellano (2020) explain that this increases the production and dissemination of media content by fans, in terms of affordability and interconnection.

Another aspect concerns the use of digital devices in managing relations with corporeality. *At-home* sport has forced individuals to reorganize their way of taking care of their body. According to Hammami et al. (2020), home workouts have become the new norm due to the lack of other options, but also to minimize the spread of the disease.

Conversely, Amekran and Abdelkader (2020) examined those who chose a sedentary lifestyle during lockdown and found that these people 'avoided' regular physical activity under the excuse of the contingent situation. They used technologies to watch television, use mobile devices, browse social media, and play video games, without any physical commitment. On the other hand, people who chose *at-home* sports used digital and particularly telepresence, redefining corporeality, and its sensory perception in both in a real and virtual context. These results are in line with Levy's (1996: 1994), and together imply a change in how emotions are externalized collectively (D'Alessio, 2017). However, not everyone practises sports in telepresence, with others doing it remotely, using digital channels, such as Youtube, in what can be described as a 'passive mode'. Here, body management is personal and not determined by external requirements. On the other hand, telepresence activity with an instructor/coach or with a group in the 'active mode', implies a relationship with one's own body, and its social representation. A recent study (Honaryet al. 2019) clearly indicates that comparing the self with others can be demotivating and harmful when users perceive themselves unfavourably in comparison with others. This would also explain why some prefer not to interact in telepresence but limit themselves to enjoying sports content without direct exchange. The same study also examined the use of apps to exercise and regulate lifestyles and diets. It noted that people prefer apps that encourage users to engage and *passively* track their physical activities, to those requiring users to *actively* log data themselves (whether on exercise or food intake). Research suggests that perceived social norms can be a powerful motivator to modify eating and exercising habits, as individuals are more likely to behave in a certain way if they perceive others are doing the same. This equally applies to those who practise passively to improve their body management. The scholars also noted that most sports apps facilitate

user data sharing and participation on social media and concluded future apps should aim to facilitate community building and provide tools that encourage social connectivity. For example, apps should provide a space to reflect on social interactions or to find practical suggestions. This can be useful to stimulate users to use the technologies in telepresence, rather than only in remote form.

2.2 Home sport with digital platforms and mobile apps

Some scholars have examined how people use digital platforms and mobile apps to exercise, and some recent studies aim to see whether this has encouraged and improved physical activity during lockdown. For example, Maugeri et al. (2020) observed that during the COVID-19 quarantine, the percentage of underactive individuals increased to 39.62%, while 29.75% were moderately active and 30.63% highly active. They also noted that some people who had not been very active before lockdown did more physical exercise: women tended to be more active than men because, besides housework, they did more *at-home* training in the form of aerobics, dance, yoga, Pilates, or circuits, with push-ups, squats, plank and jumping jacks. The authors also showed that a reduction in physical activity was consistently related to a worst state of mental wellbeing. The more active people using digital devices to participate in online sports communities produced shared content, exchanged information, and were too able to express their personality. There are also studies that investigate the actual use of mobile apps due to their worldwide growth, especially in the last decade. There are currently around 2.8 million apps on the Google play store and around 2.2 million on the Apple App Store: experts estimate a 25% increase in global app downloads between 2018 and 2022. The average smartphone owner downloads 60 to 90 apps but uses only 30 a month. Most apps are games, but with a percentage of 53%, sports and health still have a high penetration rate on the Google play store. Sports-only content is as high as 30%. Though 75% of apps are only used once after downloading, those with sports content are among the most used categories for at least one in three users (34%; Buildfire 2020, <https://buildfire.com/app-statistics/>). These trends were also confirmed by Handel who conducted a study of 35 mobile apps for the promotion of sport, health, and wellness, extracted from the iTunes App Store (Stoyanov et al., 2015). Chih-Wei et al. (2020) noted that consumers are willing to pay more if the app's functions offer an excellent, fun, and playful experience, good quality and beautiful design, and above all user friendliness, and a high perceived usefulness. These features encourage word of mouth and the spread of the app itself among athletes. Some studies have investigated the implications of the use of apps. Schoeppe et al. (2017) noted how the use of sports apps

motivates greater physical activity, and changes lifestyles and routine behaviour. This is especially true if they are fun, involve a circle of friends and contacts, and offer technical aids that encourage greater physical activity. Therefore, sports apps try to satisfy the needs of users by offering different services: ad hoc training card, exercise illustrations, accompanying music, short video tutorials to see what to do, food diary, training history with scores and statistics, a reminder that tells when to drink or train, the support of the virtual coach who provides suggestions and indications, spaces for sharing with other athletes, notifications, or gamification systems.

Some studies highlight the close relationship between health and individualism in the organization of apps. For example, Ha (2016) and Lupton (2017) report how apps can monitor and transform physiological functioning's into numerical data that can be shared to map out personal goals. Likewise, Petersen et al. (2020) confirm that the use of apps is associated with a greater commitment to physical activity, with social support, self-efficacy, and autonomous motivation. These findings also show how sharing posts and receiving encouragement are linked to greater engagement in physical activity through positive associations with self-efficacy. Zhang et al. (2016), for example, report that the number of graduate students enrolling in gymnastics classes increased when participants were assigned to an online platform with interactive features. This number of students was higher than subscriptions for an app that only sent weekly promotional messages.

Another study (Mascarenhas et al., 2018) conducted on mothers reports a significant increase in physical activity with positive results on physical fitness and improvement of mood following the use of apps during the research. The most frequently used YouTube apps and videos included Sworkit, Yoga YouTube videos, Johnson and Johnson, and Nike +. The women were satisfied as the apps were cheap and flexible so that they could be used when most convenient for them, without having to alter their daily routines. In addition, the videoconferencing tools associated with the apps helped to create a social support group, which allowed women to carry out regular face-to-face checks and promoted continuity of engagement. The concurrent exercise sessions also led to a sense of solidarity among the participants, even when individual exercises were not coordinated within the groups.

2.3 Sports practice activators: trust in reference figures

Communicating online during the quarantine has highlighted the importance of trust in certain people or 'activators' who can raise awareness and stimulate physical activity. Trust is a fundamental element for the constitution of sports communities because it regulates the relationship

between the individual and the group and favours the functioning of the community itself. Trust is based on bonds based on similar motivations, experiences and common sense attributed to the same sporting activity or interest (Green, 2007).

During lockdown, the creation of trust in sport delivery was developed at different levels thanks to three types of figures: testimonial athletes, instructors / coaches, and peer groups. Hayes (2020) highlighted how a closer interaction between athlete-fan helps to spread positive messages and urge fans to practise sports. Trust is stimulated further when the other two categories – coaches and peer groups – interact.

It has long been known in the literature that athletes are *role models*, as defined by Wicker, Frick (2016), and later Kassing, Sanderson (2009) and Leng, Phua (2020). The proliferation of social media favours interaction between consumers and fans with their favourite athletes (or role models), and with each other. Some authors (Eagleman, 2013; Thompson et al., 2014; Chmait et al., 2020) believe that sports organizations should use social media to share quality and content, engage subscribers, and develop connections between them. This sharing can encourage practice, especially in young people. These authors anticipated a scenario accelerated by physical distancing, which forced instructors (for example, personal trainers, life coaches, physical education schoolteachers) to do their online lessons. In this regard, Weed, Dowse (2009) speak of the *cascade effect* and explain that sports participation inspires those who are already active in sports. It then stimulates a *maintenance effect* that can encourage those who already train to increase their levels of commitment and sensitize those who had abandoned or reduced physical activity to resume or intensify their training in the same sport or in other sports. Social media stimulate engagement and the practice of sports. For example, some authors (Soetens et al., 2014; Vandelanotte et al., 2015) have shown that video with sports content are more viewed, with people spending more time on the platform to replicate the exercises.

However, there are still no in-depth studies that examine whether interaction in telepresence with coaches and with peer groups encourages sports, perhaps due to the fact this was not widespread before the lockdown. For example, Kool et al. (2015) have only explained the role of the e-coach as a digital substitute for a human subject who directs, guides, motivates and instructs the user through a human-technology interaction. Only two studies appear to have concentrated on the use of vlogs: some interesting results were obtained on the ability to stimulate adults and adolescents to practise sports more on social networks than on mass media (Gao et al., 2010; Van Woudenberg et al. al., 2020). Notably, while mass media use standardized messages to increase knowledge, influence attitudes and beliefs, and change

behaviour, social media uses messages communicated by adolescents themselves (Valente, 2012; Wartella et al., 2016; Laverack, 2017; Beyens et al., 2018). Van Woudenberg et al. (2020) show that sports practice increases when messages come from known peers, rather than unknown peers. They therefore assume that the peer group with whom physical activity is shared has a greater positive effect on sports practice.

Considering the objectives of the study and the three areas of the literature reviewed, subsequent research hypotheses were formulated. In particular:

- The first objective concerned the investigation of how digital media have led to a new environment for socializing and sports practice, created through digital communities. According to the literature on digital communities (of place and practice), and the themes of corporeality on the net, digital proximity can help physical distancing to be overcome, but also leads to risks of isolation. Consequently, the hypotheses to be verified were:

H1. Digital proximity contains the risks of isolation and related harmful behaviours.

H2. People who use digital technology in isolation manage better the relationship with their physical body in relation to health and psycho-physical well-being.

- regarding the second objective aimed at verifying whether the use of digital platforms and apps effectively encourages sports practice in isolation as opposed to mere sharing (as indicated by the literature), this study speculates that:

H3. sharing with digital devices stimulates sports practice in situations of physical isolation.

H4 engagement in sports communities increases engagement in sport and social relations.

- regarding the third objective related to the role of 'influencers' in encouraging physical training during isolation, based on the theories previously discussed on role models, communities of practice and the dynamics of influence that stimulate activity physics, the research speculates that:

H5 Interaction in telepresence with coaches and with peer groups encourages sports practice.

3. Methodology

To verify these hypotheses, a two-phase research was launched at the SapienzaSport Centre. The goal of the first was to focus on those who were not negatively affected by the digital divide. The second studied what the results implied, starting from September 2020, when sports-related activities fully

resumed in Italy, and aimed at understanding if and how the ways of doing physical activity had changed.

In the first phase, a group of about 600 practitioners, with high cultural, socioeconomic, and digital opportunities was questioned, in order to investigate their sports habits during the lockdown. We used the technique of reasoned sampling, to avoid carrying out a 'random' study that would have prevented us from identifying cases with the desired characteristics. To select the respondents, students, teachers, administrative staff, including coaches attending 'La Sapienza', University of Rome, were chosen, and via institutional email addresses, were sent a request to fill in the questionnaire. As a filter, they were asked whether they had played sports before lockdown, to focus attention only on those who already practiced.

Out of an overall population of the University of almost 20,000 people including students and teaching and administrative staff, it has been estimated that there are no more than 4,000 active and continuous practitioners (equal to 20% of the population, the Coni-Istat data estimating 24%). The goal was to involve 15% or 800 people. The first filter question was answered by 732 people, but based on the characteristics described above, 558 respondents were then selected. These were classified into the three profiles highlighted in the literature: sedentary during lockdown; active in passive remote mode; and, active in telepresence. A fourth category was then added, identified among the respondents - practitioners in offline mode, that is, those had exercised following training schemes defined before quarantine during their sporting activity or those who decided to organize themselves into a 'do-it-yourself' manner, along the lines of the exercises they had done before.

The survey was carried out in April-May 2020 through a semi-structured questionnaire organized into 4 sections: the first collected structural data; the second served to define the profile of the pre-lockdown sports practitioner, at what level s/he practised, for how long and how often, where s/he did physical activity and with whom, and whether s/he had been doing sports since childhood, which sports s/he practiced and how s/he reconciled physical activity with other commitments, which physical skills were considered a priority and cultivated in training, and how much physical activity was linked to aspects of individualism/relationality; the third section of the questionnaire investigated the activities done at home to understand whether and how far the respondents did sports and what other activities they did, if they involved cohabitants and if and how they used digital devices to train and to have relationships with relatives, friends and colleagues. Furthermore, the relationship between sport and eating habits, and the motivations that stimulated to train was investigated; finally, the fourth and final section

concerned the use of digital devices – which ones were used, in what way, with what consistency, and for what purposes.

A descriptive data analysis was carried out, based on mono and bivariate analysis. An interpretative analysis was also done based on regressive multivariate techniques. To examine the evaluations reported by the interviewees on some items, such as the appreciation expressed for online video lessons, a grade from 1 (minimum) to 10 (maximum) was employed, which was calculated using the weighted average, dividing the sum of the products of the weighted votes ($\sum x_i w_i$) times the sum of the weights ($\sum w_i$).

Then, the *Intensity index of the Sport Commitment (SC)* was constructed and examined. For the categories examined, a synthetic index was carried out, which included the frequency of all the physical activities carried out in each, aiming to estimate whether the intensity is zero (activism with less than 20%), weak (activism between 21 and 60%), average (activism between 61 and 80%), or intense (activism in more than 80% of the activities). Similarly, the *Intensity index of Commitment in lockdown activities (CLA)* was built to understand: how far respondents engaged in *at-home* activities during the quarantine; the *Intensity index of Commitment to Corporeality (CC)* to estimate the engagement in comparisons of one's own body; the *Intensity index of the Relational Commitment (RC)* to estimate the degree of respondent commitment to the management of interpersonal relationships, so verifying the degree of respondent commitment to a perspective of digital proximity; and, finally, the *Intensity index of the Digital Device Commitment (DDC)* to estimate the use of technologies to support online sports. All indices were constructed using the same ranges indicated for SC. The indices were then related to each other to examine the link between proximity and the activities carried out, between proximity and relationality, between relationality and physical activity, between the relationality, and finally, physical activity and the type of online participation.

Measuring the intensity of the commitment means being able to understand how much the respondents invested in the different relationships and activities developed during lockdown, and to estimate how far social relationships stimulate certain activities, such as physical exercise or vice versa. For example, if this study confirmed a correlation between the intensity of commitment to physical activity and online relationality, this would mean that the conditions are created for activities and objectives to converge in a sort of one-to-one correspondence. *Activism* would in fact express the willingness and contribution of practitioners to physical activity which combines reality with the potential virtual interaction, and vice versa.

To verify the relationship between the indices, linear regression analysis was performed using the Pearson correlation coefficient (IR), between -1 and 1. Furthermore, to verify the degree of significance of the relationships between

the indices relating to each category of respondents - when deemed necessary - a further check was carried out using the Z-Score. The Z-Score test indicates significance when the value obtained is equal to or less than $p < 05$. In this paper, we report and analyse the main results.

4. Results

4.1 The profile of the respondents

The identikit of the 558 respondents to the first questionnaire shows that they are mainly women (60%), and mainly postdocs and PhD students (69.2%) and university staff (70.5%). The males are mainly students (40.7%) and professors (48.7%). The average age range of respondents is quite high but consistent with the characteristics of the Italian university system: over half (53%) are between 47 and 66 years old. The students, who are 36.5% of the sample, are aged between 18 and 26 (75.9%), research fellows and doctoral students (8.8%) are between 27 and 36 years old (61.5%), professors (25%), are over 47 years old (71.8%) and, they are mainly in the 47-66 range = 64.8%), and staff (29.7%), between 37 and 56 years (63.6%).

TABLE 1. The respondents.

	Female	Male	TOT.
18-26	15,8%	15,9%	15,8%
27-36	10,1%	16,9%	13,9%
37-46	15,7%	11,1%	16,4%
47-56	33,2%	18,2%	21,9%
57-66	20,6%	18,6%	20,5%
Oltre 66	4,6%	19,3%	11,5%
TOT. Respondents	335	223	558

Since the selected sample already played sports before social distancing, 92.2% of the respondents had been doing physical activity at an amateur level for more than five years (56.9%). Less than a fifth had been physically active for less than a year (18.3%). 13% of students, 8% of fellows and doctoral students, 7% of professors and 3% of staff do sport at a competitive level, with no gender differences, but with a higher concentration among students (18, 3%). 75% train once or more than three times a week, while 7% every day, and 9% just once a week. Finally, 9% only train at weekends.

During lockdown, respondents stated that isolation stimulated those who already trained regularly (58.1%) to practise, but, on the contrary, those who

had been training a small amount (61.5%), opted for a sedentary lifestyle. There is therefore a net polarization, in the orientation to physical activity at home. This trend is confirmed by looking at the time dedicated to training.

4.2 Home sports behaviour and digital proximity dynamics

Compared to the 4 typologies constructed, the respondents are distributed in the following way: the majority is made up of active in telepresence (AP = 37.2%), and sedentary (S = 30.6%), followed by active offline (AO = 29%), and a residual share of remote assets (AR = 3.2%).

TABLE 2. *The categories of practitioners and sedentary.*

	Female	Male	TOT.
Sedentary	17,6%	14,6%	30,6%
Active Offline	31,8%	43,8%	29,0%
Active Remotely	4,7%	4,2%	3,2%
Active Telepresence	45,9%	37,4%	37,2%
TOT. Respondents	63,9%	36,1%	558

The sedentary are equally distributed, with slightly more females, offline practitioners are mostly males, while in the other categories, there is a greater presence of females. There are no significant differences reported by age group, although AP are mainly concentrated under the age of 57 (83%), and, the youngest participants: 31% are under 37, while over half of sedentary people (54%) are aged between 47 and 56 years.

What did the respondents opting for a sedentary lifestyle do during the lockdown? They mostly lazed and slept (77.3%), cooked (40.9%), read (36.5%), and listened to music (22.7%). The Internet was also a valuable ally for surfing for information and entertainment purposes (36.3%), and for video games (18.2%).

What sports had they practised before? Mainly swimming disciplines (35%), fitness and weightlifting (20%), tennis (15%) and running (15%), and to a lesser extent athletics, volleyball, and cycling (overall 5%).

And the practitioners? They also cooked (50.8%), but they also did physical activity (48.4%). They also surfed the web (44.4%), watched TV (42.7%), read (38.7%) and listened to music (33.1%). Generally, according to the CLA index, it appears that the AP have a rate of engagement in the activities carried out during lockdown (IR: 0.98), slightly higher than the AO (IR: 0.97), but much higher than the AR (IR: 0.67), and the S (IR: 0.71).

TABLE 3. *Activities during the lockdown*

	Sedentary	Actvies	AO	AR	AP
Coked	43,1%	53,1%	33,3%	64,0%	42,6%
Talked on the phone with relatives and friends	37,3%	45,9%	33,3%	36,0%	61,0%
Surfed the net	45,1%	42,9%	16,7%	46,0%	43,6%
Watched tv	47,1%	40,8%	1,5%	16,0%	39,7%
sports	49,0%	35,7%	50,0%	52,0%	35,0%
Read	47,1%	33,7%	17,6%	32,0%	38,6%
Listened to music or painting	29,4%	32,7%	16,7%	32,0%	39,4%
Slept	27,5%	29,6%	0,0%	30,0%	34,6%
Conversed on social media	21,6%	26,5%	18,5%	46,0%	33,5%
Conversed with my cohabitants	25,5%	24,5%	1,5%	26,0%	24,0%
Lazed	13,7%	15,3%	18,0%	12,0%	18,8%
Videogames	9,8%	15,3%	16,0%	5,9%	13,0%
Played	5,9%	9,2%	1,0%	8,0%	13,8%
Played cards	5,9%	4,1%	0,0%	6,0%	2,0%
TOT. MR%	34,2%	65,8%	4,0%	33,6%	28,2%
CLA IR:	0.71	0.83	0.97	0.67	0.98
RC IR:	0.85	0.90	0.68	0.88	0.96

Observing the physical activity carried out at home and considering the Intensity index of the Sport (SC), it appears that, overall, 65.9% of practitioners trained intensely, with no differences between the three categories, even with a low correlation coefficient between the categories (see Table 4). For further confirmation, a Z-Score test was also carried out which confirms the significance of the relationship between AP and AR ($p < .00001$): those who followed online video lessons, without the support of sharing, also had less incentive to engage with as much constancy.

What physical activities did they do at home? Above all, free body activities, functional gymnastics, Pilates, and yoga, but also activities that require the use of tools. These activities include running around the building block, which was allowed by the government after the first month of total closure (see Tab. 5). According to the SC index, most of the activities are carried out averagely (43.3%). Above all, exercise bikes (7.2%) and yoga (5.8%) and moderately, treadmill (11.1%), and running close to home (11.2%) are practiced intensely,

explained by obvious reasons of limitations related to outdoor activities. It is interesting to note that a share, albeit residual (1.7%) already trained at home even before the quarantine. Few have chosen to (or have been able to) practise the same sport activity - 26% of those who did weightlifting before and during lockdown, and 25% of those who did athletics and running indoors before and during lockdown.

TABLE 4. Intensity index of the Sport Commitment (SC).

	Intense	Mediocre	Weak	TOT.	IR:	IR: RC X SC
Active Offline (AO)	64,9%	13,0%	22,1%	48,2%	0.68	0.76
Active Remotely (AR)	66,9%	33,1%	0,0%	5,4%	0.61	0.92
Active Telepresence (AP)	66,7%	14,5%	18,8%	46,4%	0.67	0.85
TOT. Respondents	65,9%	14,7%	19,4%	387	p is < .00001	

TABLE 5. Sports activities before and during the lockdown.

sports at home/ sports first	Fitness	Weightlifting	Athletics / running	Cycllette / spinning	Other sports	Treadmill and trampoline	TOT. MR%
Swimming	23,2%	14,8%	21,4%	37,5%	55,6%	16,7%	24,5%
athletics and running	21,1%	25,9%	25,0%	25,0%	0,0%	0,0%	21,2%
Weightlifting	17,7%	26,0%	14,3%	8,3%	11,1%	16,6%	17,0%
Fitness cycling/cycling/skating	17,0%	14,8%	10,8%	8,3%	22,2%	0,0%	14,9%
Team sports	6,1%	3,7%	7,1%	4,2%	0,0%	16,6%	5,8%
Other sports	2,7%	7,4%	10,7%	0,0%	11,1%	0,0%	4,1%
Tennis	4,1%	3,7%	0,0%	0,0%	0,0%	16,7%	3,3%
Home workout	2,0%	0,0%	0,0%	0,0%	0,0%	16,7%	1,7%
TOT. MR% answers	61,0%	11,2%	11,6%	10,0%	3,7%	2,5%	723

Legend: fitness: hit, aerobics, functional, rhythmic, yoga, pilates, crossfit, stretching, dance, athletics and running pentathlon/triathlon, running near home, swimming activities: water aerobics, swimming, water polo, synchronized swimming, sailing, canoeing, rowing (including indoor) other sports: boxing + martial arts + climbing, skiing, hiking, team sports: football, soccer, basketball, volleyball, rugby.

Part of the research also investigated how respondents managed their relationships to overcome physical distancing, using the RC index. Sedentary

people took greater care of interpersonal relationships, talking on the phone with friends and family, conversing with cohabitants, but also communicating online with friends and colleagues (see Table 3). RC shows an average relational commitment in all categories (55.7%), but the correlation coefficient between categories shows that it is very high between AP (IR: 0.98), high between AR (IR: 0.88) and between S (IR: 0.85), while it is low among AO (IR: 0.68), who show a lower commitment to sociability.

Lastly, the relationship with corporeality was considered.

TABLE 6. *Intensity index of the Commitment Corporeality (CC).*

	Intense	Mediocre	Weak	TOT.	IR:	IR: CC X SC
Sedentary (S)	0,0%	56,0%	44,0%	16,2%	0.29	
Active Offline (AO)	53,7%	33,3%	13,0%	35,1%	0.99	0.88
Active Remotely (AR)	66,7%	33,3%	0,0%	3,9%	0.94	1
Active Telepresence (AP)	61,0%	33,3%	5,7%	44,8%	0.96	0.90
TOT. Respondents	48,7%	37,0%	14,3%	558		p. < .00001

From the research it emerges that the commitment of sedentary people to their corporeality is low, with little attention to health (60% of males vs. 40% of females) and diet being given: 36% indulged in excesses and 14 % ate more without respecting the usual diet. On the contrary, the practitioners took great care of their body by looking after their health and their physical appearance (65.9% of males vs. 58.6% of females). Although many (mainly females 41.4%) indulged in some extravagance (34.9%) or ate much more than usual (5.4%), the majority (56.6%) respected the usual diet and even a minority has improved the organization of their diet (3.1%, above all three females 4.3%). The correlation coefficient between the categories shows a high commitment in all three categories, without distinctions (see Tab. 6). The relationship between the two SC and CC indices for each of the three categories of practitioners confirms the link between the commitment to physical activity and that in the body and explains the commitment to physical activity.

4.3 Sport delivery with digital devices

Compared to the total number of practitioners who used digital devices, it is interesting to note that just 7% used devices to do physical activity remotely, that is, in passive mode, while the clear majority did physical activity in telepresence. The Intensity of the Digital Device Commitment (DDC) confirms that the commitment of the APs is high, while that of the ARs is low (see Table

7). In the first category, 16% used mobile apps and above all shared physical activity with friends or with the gym group, together with the coach.

TABLE 7. *Intensity index of the Digital Device Commitment (DDC).*

	Intense	Mediocre	Weak	TOT.		IR: DDC X SC	IR: RC X DDC
ActiveRemotely (AR)	33,3%	50,0%	16,7%	8,0%	0.67	0.73	0.91
Active Telepresence (AP)	65,2%	21,7%	13,1%	93,0%	0.99	0.99	0.88
TOT. Respondents	62,7%	24,0%	13,3%	225		p.00018	<i>p.5485</i>

The DDC index was then related to SC for both categories of online practitioners. Although the correlation coefficient shows high levels (see Table 7), the link between the two variables is significant, but it is not significant within the two categories (respectively p.25014 and p.5552). Moreover, it has already been observed that the commitment of offline practitioners is also high, even without opportunities for sharing in presence.

The remotely active, who mainly attended lessons on YouTube, Facebook, and sports apps, were then asked to rate the video lessons they followed, and the average was 6.4, with a greater preference among women than men (women = 6.8 vs. men = 5.5). Among those active in telepresence, mainly using interactive platforms and apps, the rating is much higher (8.2), still more prevalent among females, albeit lower (women = 8.9 vs. men = 7.7, see Table 8).

TABLE 8. *Appreciation for online sport delivery.*

I liked it:	AR	AP
Accessibility and flexibility of schedules	38,7%	24,8%
Professionalism and competence of the instructors involvement / fun	29,0%	7,9%
	25,0%	6,4%
Variety, simplicity, and good organization offered opportunity to train together	7,3%	25,0%
	0,0%	35,9%
I didn't like:		
Lack of feedback from the instructor	34,8%	20,0%
Lack of sociability	26,1%	0,0%
Repetitiveness of the exercises	17,4%	5,0%
Lack of customization	0,0%	50,0%
Problems of connection, of spaces and suitable equipment	21,7%	25,0%
Total average rating	6.4	8.2

4.4 The ‘activators’ of physical activity

The study sought to examine whether practitioners are activating agents of sports practice and whether they consider coaches and peer groups with whom they interact online as “stimulators” of sports practice. First, 77% trained alone and the remaining share (23%) involved or was involved with cohabitants. Of these, telepresence encouraged greater involvement among cohabitants (61.5%). The value of relationships with coaches and peer groups was only examined in this category (AP): 54% stated that they continued to carry out the training program with their instructor, coach, or personal trainer. Of these, a third also shared the experience with fellow group members. If, therefore, their primary incentive was the relationship with the coach, the presence of the group is still an element that adds value to the online experience. Then there is a 17% who carried out activities in connection with friends or with the gym group or used apps to interact with communities to exchange information and train together. This cluster attributed a decisive role to the presence of the group as an incentive lever for sports practice. Finally, the remaining 29% downloaded apps that did not always guarantee a high level of interactivity and, therefore, the priority was to exercise, rather than interact with others. In this case, both the coach and the group have an integrative value, but the subject does not need stimuli because he is already very active and predisposed to practise, without the need for further stimuli. It is also interesting to note that males preferred the coach figure more (33%), while females preferred sharing with friends, gym group or even the search for new groups in sports communities (45%). Comparing the age groups, under the age of 30 the share that prefers the peer group is 60%, and the preference of the expert figure is 52%.

5. Discussion

This studied started out attempting to verify the validity of five hypotheses, each of which will be discussed in turn.

H1. Digital proximity contains the risks of isolation and related harmful behaviours.

The study confirmed the hypothesis. However, relational commitment records an average level in all categories, indicating that though the use of digital communication intensified during physical distancing, it runs little risk of leading to widespread forms of isolation, alienation, or a sense of loneliness, etc. All respondents showed that they managed relationships both within the home with cohabitants and nurtured contacts with friends and relatives. By favouring digital proximity, the Internet can be seen as an extension of reality, as already noted by several scholars. Furthermore, the CLA index highlighted those sports practitioners – and especially those most active online – were also more engaged

in various activities both offline and online than those pursuing a more sedentary lifestyle during lockdown. This means that doing physical activity helps offset any potential risks of techno-communication neurosis, due to better management of the different daily activities. Furthermore, by comparing the RC and SC indices, the category of offline practitioners is the least committed in terms of sociability. On the contrary, the correlation coefficient shows high values for AR and AO (see Table 3). Overall, these results confirm that all categories during physical distancing still exploit the opportunities available to communicate, so maintaining relationships, especially the closest ones. For AP, the significance value (IR: 0.85) is lower than RC but higher than SC, meaning the relational commitment affects the sporting commitment, confirming results reported in the literature.

H2. People who use digital technology in isolation manage better the relationship with their physical body in relation to health and psycho-physical well-being.

The research described the activities carried out by sedentary people and those doing physical activity before and during the quarantine. This allowed us to confirm previous findings in the literature on sedentary people who do many activities, but “avoid” regular physical activity and pay less attention to health and nutrition. The study of the three profiles of practitioners confirms the claims of Honary et al. (2019) regarding the role of telepresence in the “re-semanticizing” of body perception. The present study also confirms that remotely active people deliberately avoid direct online confrontation, though it could not be verified whether this was due to a fear of obtaining a negative perception of the ‘self’ in comparison with others. On the contrary, the active group in telepresence was very attentive to the care of their body and a high correlation between SC and CC was found. This means that physical commitment is linked to the commitment of taking care of one's body. Furthermore, the values relating to the commitment to physical wellbeing in all three categories of practitioners are higher than those for the commitment to sports, so confirming that attention to health and physical fitness encourages sports practice.

H3. sharing with digital devices stimulates sports practice in situations of physical isolation.

Unlike the findings of Maueri et al. (2020), the SC index showed that respondents exercise in a particularly intense manner. The study also confirmed that women tend to be more active than men, especially in the AP category. To better verify whether the use of digital devices has encouraged the practice of sports, DDC was examined which shows that the commitment of AP is high, while that of AR is low. This shows digital devices to be useful tools for physical activity, though this does not mean they necessarily encourage it. Therefore, the hypothesis is only partially confirmed and concerns only those who already did physical activity.

H4 engagement in sports communities increases engagement in sport and social relations.

Several studies discussed in the literature review have demonstrated this correlation, arguing that the use of interactive platforms and applications especially favour greater physical commitment. Scholars also stated that sharing and active participation in sports communities increases the continuity of commitment. The correlation between the DDC and SC index confirms this direct correlation (see Table 7), further indicated by the control test carried out to support this hypothesis. Given the values of SC are greater than RC, the commitment in sports practice can be said to encourage commitment in online relationships, but the opposite does not necessarily happen.

However, no significant correlation was found between RC and DDC indices (which indicate a link between online relational engagement in various activities and that aimed at physical activity, during physical distancing) (see Table 7). As expected, in the case of AP, although the correlation coefficient is high (IR: 0.91), the relationship is not significant (p.25014). Hence, the cultivation of relationships does not affect those who passively practice using digital devices. On the contrary, with telepresence the correlation coefficient is high (IR: 0.88) and the relationship between the two variables is significant (p. 00214). This means that this category of practitioners has been very busy cultivating relationships and doing physical activity (given the high values of both indices).

H5 Interaction in telepresence with coaches and with peer groups encourages sports practice.

From the literature review, no studies emerge that indicate a deepening of the online interaction between instructors and coaches over lockdown. Only a few studies emphasize the importance of the peer group as a stimulus to practice, but only when it comes to known peers – friends and/or sports colleagues. This first phase of the research was limited to only identifying the types of ‘activators’, but without further investigation - the subject of the second phase of the research. However, some interesting points have emerged. First, it was highlighted that, at home, cohabitants show little involvement in sports practice, but it is nevertheless interesting to note that when they do, they always tend to use telepresence and, in two thirds of cases, they are females. The role of athletes as role models was not examined, but the focus was on experts and peer groups. It emerged that most APs continued to train thanks to the lessons organized by instructors, coaches, and personal trainers with whom they trained before at centres, schools, and gyms. A third also stressed the importance of the peer group, especially when made up of friends and sports colleagues. These results therefore seem to confirm the hypothesis and above all the importance of the relationship with known people (both coaches and peer groups),

especially with the figure of an experienced professional, particularly if coinciding with one's own coach.

6. Conclusion

This study is only the first part of a diachronic study that aims to examine how social distancing has affected the habits of sports practice, as from lockdown, and then to observe the future repercussions when, we hope, a return to normality occurs. A new normality is likely, with changes for a “new” era, involving physical activity, as well. We intend studying these changes as soon as regularly sports activities in traditional places resume.

When studying these aspects, a couple of suggestions and research hypotheses provided by Evans et al. (2020) are useful: the first idea is to observe how digitalization of sport begun before COVID-19 extended to a greater share of sports practices. The second is to examine whether individual “sporting” participation, increasingly encouraged in the open air, could eclipse group sports. The authors say that individual outdoor sports have grown in popularity in Europe, yet it will be interesting to see whether this upward trend is further encouraged by the pandemic, and how it may affect sporting habits and the reorganization of sports, in the long term. In this study, *at home* training inevitably produced a reduction in group sports, but is this just a momentary phenomenon?

Further research will aim at developing the methods of use of sports apps and vlogs, to investigate in detail the services offered, user requests, uses and their ability to encourage adults and adolescents to practise sports. These may well be the new frontiers of online training. This does not necessarily imply an increase in home sports, but they can certainly become useful complementary tools to support sport.

References

- Amekran, Y., Abdelkader, J. (2020), Coronavirus disease (COVID-19) and the need to maintain regular physical activity, *The Journal of Sports Medicine and Physical Fitness*, 28. DOI: 10.23736/s0022-4707.20.11524-x.
- Anzera, G., Comunello, F. (2017), Toward Digital Inclusion, in ICI Global, *Information and Technology Literacy: Concepts, Methodologies, Tools, and Applications: Concepts, Methodologies, Tools, and Applications* (pp. 388-409), Hershey PA, USA.
- Bartoletti, R., Boccia Artieri, G. (2019), *La comunicazione come vocazione: tecnologie, promozione umana e valorizzazione sociale*, 7-26. Milano, FrancoAngeli.

- Beyens, I., Valkenburg, P. M., Piotrowski, J. T. (2018), Screen media use and ADHD-related behaviors: Four decades of research, *Proceedings of the National Academy of Sciences*, 115(40), 9875-9881.
- Boccia Artieri, G. (2017), *Fenomenologia dei social network*, Milano, Guerini.
- Boccia Artieri, G. (2012), *Stati di connessione. Pubblici, cittadini e consumatori nella (Social) Network Society* (Vol. 1097), Milano, FrancoAngeli.
- Chmait, N., Westerbeek, H., Heime, R., Robertson, S., Sellitto, C., Reid, M. (2020), Tennis influencers: the player effect on social media engagement and demand for tournament attendance, *Telematics and Informatics*, 101381. <https://doi.org/10.1016/j.tele.2020.101381>.
- Coakley, J. (1993), Sport and socialization, *Exercise and Sport Sciences Reviews*, 21(1), 169-200.
- D'Alessio, C. (2017), Epistemologia della corporeità ed educazione allo sport ed al movimento: un approccio storico, critico, euristico, *Formazione & Insegnamento. Rivista internazionale di Scienze dell'educazione e della formazione*, 14(3), 123-138: 125-127. ISSN1973-4778.
- Dalton, C. B., Corbett, S. J., Katelaris, A. L. (2020), Pre-emptive low cost social distancing and enhanced hygiene implemented before local COVID-19 transmission could decrease the number and severity of cases, *The Medical Journal of Australia*, 212(10), 1. Accessible at: https://www.mja.com.au/system/files/2020-03/FINAL%20Dalton%20preprint%20mja20.00300.pdf?fbclid=IwAR30bHTZYvN9VUkUrZTjtt8aBGruEFHQvbCGuPOO_S-GKfxrfzFBKX6gyrI.
- Eagleman, A. N. (2013), Acceptance, motivations, and usage of social media as a marketing communications tool amongst employees of sport national governing bodies, *Sport Management Review*, 16(4), 488-497. <https://doi.org/10.1016/j.smr.2013.03.004>.
- Evans, A. B., Blackwell, J., Dolan, P., Fahlén, J., Hoekman, R., Lenneis, V., Mc Narry, G., Smith, M., Wilcock, L. (2020), *Sport in the face of the COVID-19 pandemic: towards an agenda for research in the sociology of sport*. Taylor & Francis. <https://doi.org/10.1080/16138171.2020.1765100>.
- Furst, D. M. (1989), Sport role socialization: Initial entry into the subculture of officiating, *Journal of Sport Behavior*, 12(1), 41. Accessible at: <https://search.proquest.com/openview/edff09e74f5282b270d229eacb89b59/1?pq-origsite=gscholar&cbl=1819738>.
- Gao, W., Tian, Y., Huang, T., Yang, Q. (2010), Vlogging: A survey of videoblogging technology on the web, *ACM Computing Surveys (CSUR)*, 42(4), 1-57. <https://doi.org/10.1145/1749603.1749606>.

- Green, M. C. (2007), *Trust and social interaction on the Internet*, in Joinson, A., McKenna, K., Postmers, T., Reips U.d., *The Oxford handbook of Internet psychology*, 56 (pp.43-51), New York, Oxford University Press.
- Ha, D. C. (2016), Scripts and Re-scriptings of Self-Tracking Technologies: Health and Labor in an Age of Hyper-Connectivity, *Asia Pacific Journal of Health Law & Ethics*, 10, 67. Accesible at: <https://heinonline.org/HOL/LandingPage?handle=hein.journals/aspjhl10&div=25&id=&page=>.
- Hammami, A., Harrabi, B., Mohr, M., Krustrup, P. (2020), Physical activity and coronavirus disease 2019 (COVID-19): specific recommendations for home-based physical training, *Managing Sport and Leisure*, 1-6. <https://doi.org/10.1080/23750472.2020.1757494>
- Hayes, M. (2020), Social media and inspiring physical activity during COVID-19 and beyond, *Managing Sport and Leisure*, 1-8. <https://doi.org/10.1080/23750472.2020.1794939>.
- Hirdman, A. (2019), Digital Sociality, Groups and the Emotional Imprint of Algorithmic Patterns, in Carlsson, U. (Edited by), *Understanding Media and Information (MI) in the Digital Age. A Question of Democracy* (pp.99-102), Göteborg, JMG, University of Gothenburg.
- Honary, M., Bell, B. T., Clinch, S., Wild, S. E., McNaney, R. (2019), Understanding the role of healthy eating and fitness mobile apps in the formation of maladaptive eating and exercise behaviors in young people, *JMIR mHealth and uHealth*, 7(6), e14239. doi:10.2196/14239.
- Isidori, E., Fraile, A. (2008), *Educazione, sport e valori, Un approccio critico-riflessivo*, Roma, Aracne.
- Jenkins, H. (2014), Rethinking 'rethinking convergence/culture', *Cultural Studies*, 28(2), 267-297. <https://doi.org/10.1080/09502386.2013.801579>.
- Karahanna, E., Xu, S. X., Xu, Y., Zhang, N. A. (2018), The needs–affordances–features perspective for the use of social media, *Mis Quarterly*, 42(3), 737-756. <https://doi.org/10.25300/MISQ/2018/11492>.
- Kassing, J. W., & Sanderson, J. (2009), You're the kind of guy that we all want for a drinking buddy: Expressions of parasocial interaction on Floydlandis. Com, *Western Journal of Communication*, 73(2), 182-203. <https://doi.org/10.1080/10570310902856063>.
- Kenyon, G. S., McPherson, B. D. (1974), An approach to the study of sport socialization, *International Review of Sport Sociology*, 9(1), 127-139. <https://doi.org/10.1177/101269027400900109>.
- Kool, L., Timmer, J., van Est, R. (2015), *Sincere support: The rise of the e-coach*. Technology Assessment (TA), Rathenau Institute.

- Laverack, G. (2017), The A to Z about health promotion, *The Malaysian Journal of Social Administration*, 12(1), 56-75.
<https://doi.org/10.22452/mjsa.vol12no1.3>.
- Leng, H. K., Phua, Y. X. P. (2020), Athletes as role models during the COVID-19 pandemic, *Managing Sport and Leisure*, 1-5.
<https://doi.org/10.1080/23750472.2020.1762330>.
- Levy, P. (1996: 1994), *L'intelligenza collettiva. Per un'antropologia del cyberspazio*, Milano. Feltrinelli.
- Lin, C. W., Mao, T. Y., Huang, Y. C., Sia, W. Y., Yang, C. C. (2020), Exploring the Adoption of Nike+ Run Club App: An Application of the Theory of Reasoned Action, *Mathematical Problems in Engineering*, 2020.
<https://doi.org/10.1155/2020/8568629>.
- Lindgren, S. (2017), *Digital media and society*, London, Sage.
- Lupton, D. (2017), *Lively data, social fitness and biovalue: The intersections of health self-tracking and social media*, in Burgess, J., Marwick, A., Poell, T. (Edited by), *The Sage Handbook of Social Media*, SSRN. Electronic Journal, London, Sage.
- Martelli S., Porro, N. (2018), *Nuovo manuale di Sociologia dello sport e dell'attività fisica*, Milano, FrancoAngeli.
- Mascarenhas, M. N., Chan, J. M., Vittinghoff, E., Van Blarigan, E. L., Hecht, F. (2018), Increasing physical activity in mothers using video exercise groups and exercise mobile apps: Randomized controlled trial, *Journal of medical Internet research*, 20(5), e179. doi:10.2196/jmir.9310.
- Maugeri, G., Castrogiovanni, P., Battaglia, G., Pippi, R., D'Agata, V., Palma, A., Di Rosa, M., Musumeci, G. (2020), The impact of physical activity on psychological health during Covid-19 pandemic in Italy, *Heliyon*, e04315.
<https://doi.org/10.1016/j.heliyon.2020.e04315>.
- McCormack, J. B., Chalip, L. (1988), Sport as socialization: A critique of methodological premises, *The Social Science Journal*, 25(1), 83-92.
[https://doi.org/10.1016/0362-3319\(88\)90055-9](https://doi.org/10.1016/0362-3319(88)90055-9).
- McLuhan, M. (1967), *Gli strumenti del comunicare*, Milano, Il Saggiatore, 1967.
- Montgomery, S. C., Donnelly, M., Bhatnagar, P., Carlin, A., Kee, F., Hunter, R. F. (2020), Peer social network processes and adolescent health behaviors: a systematic review, *Preventive medicine*, 130, 105900.
<https://doi.org/10.1016/j.ypmed.2019.105900>.
- Mosconi, G., Korn, M., Reuter, C., Tolmie, P., Teli, M., Pipek, V. (2017), From facebook to the neighbourhood: Infrastructuring of hybrid community engagement, *Computer Supported Cooperative Work (CSCW)*, 26(4-6), 959-1003.
<https://doi.org/10.1007/s10606-017-9291-z>.
- Parnell, D., Widdop, P., Bond, A., Wilson, R. (2020), COVID-19, networks and sport, *Managing Sport and Leisure*, 1-7.
<https://doi.org/10.1080/23750472.2020.1750100>.

- Pedersen, P. M., Laucella, P., Geurin, A., Kian, E. (2020), *Strategic sport communication*, Champaign, Human Kinetics Publishers.
- Petersen, J. M., Kemps, E., Lewis, L. K., Prichard, I. (2020), Psychological mechanisms underlying the relationship between commercial physical activity app use and physical activity engagement, *Psychology of Sport and Exercise*, 101719. <https://doi.org/10.1016/j.psychsport.2020.101719>.
- Porro, N. (2006), *L'attore sportivo: azione collettiva, sport e cittadinanza*. Molfetta, Edizioni La Meridiana.
- Rheingold, H. (1993), *The virtual community: Finding connection in a computerized world*, Boston, Addison-Wesley Longman Publishing Co., Inc.
- Ross, C., Warwick, C., Terras, M., Nyhan, J. (2012), *Social media for digital humanities and community engagement* (pp. 23-46), in Warwick, C., Terras, M., Nyhan, J. (Edited by), *Digital humanities in practice*, 1.
- Schoeppe, S., Alley, S., Rebar, A. L., Hayman, M., Bray, N. A., Van Lippevelde, W., Gnam, J.P., Bachert P., Direito A., Vandelanotte, C. (2017), Apps to improve diet, physical activity and sedentary behaviour in children and adolescents: a review of quality, features and behaviour change techniques, *International Journal of Behavioral Nutrition and Physical Activity*, 14(1), 83. <https://doi.org/10.1186/s12966-017-0538-3>.
- Shaya, F. T., Chirikov, V. V., Howard, D., Foster, C., Costas, J., Snitker, S., Frimpter J., Kucharski, K. (2014), Effect of social networks intervention in type 2 diabetes: a partial randomised study, *J Epidemiol Community Health*, 68(4), 326-332. <http://dx.doi.org/10.1136/jech-2013-203274>.
- Smit, C. R., de Leeuw, R. N., Bevelander, K. E., Burk, W. J., Buijzen, M. (2016), A social network-based intervention stimulating peer influence on children's self-reported water consumption: A randomized control trial, *Appetite*, 103, 294-301. <https://doi.org/10.1016/j.appet.2016.04.011>.
- Soetens, K. C., Vandelanotte, C., de Vries, H., Mummery, K. W. (2014), Using online computer tailoring to promote physical activity: a randomized trial of text, video, and combined intervention delivery mode', *Journal of Health Communication*, 19(12), 1377-1392. <https://doi.org/10.1080/10810730.2014.894597>.
- Starkey, F., Audrey, S., Holliday, J., Moore, L., Campbell, R. (2009), Identifying influential young people to undertake effective peer-led health promotion: the example of A Stop Smoking In Schools Trial (ASSIST), *Health education research*, 24(6), 977-988. <https://doi.org/10.1093/her/cyp045>.
- Stoyanov, S. R., Hides, L., Kavanagh, D. J., Zelenko, O., Tjondronegoro, D., Mani, M. (2015), Mobile app rating scale: a new tool for assessing the quality of health mobile apps, *JMIR mHealth and uHealth*, 3(1), e27. [doi:10.2196/mhealth.3422](https://doi.org/10.2196/mhealth.3422).

- Thompson, A. J., Martin, A. J., Gee, S., Eagleman, A. N. (2014), Examining the Development of a Social Media Strategy for a National Sport Organisation”, *Journal of Applied Sport Management*, 6(2). Accessible at: <https://trace.tennessee.edu/jasm/vol6/iss2/15>.
- Tirino, M., Castellano, S. (2020), Football Re (me) mediation: i meme e l'estetizzazione dell'emozione calcistica nelle community social= Football Re (me) mediation: Memes and The Aestheticization of Football Emotions in Social Networks Communities, *H-ermes. Journal of Communication*, 2020(16), 49-80. DOI: 10.1285/i22840753n16p49.
- Tönnies, F. (2011: 1887), *Comunità e società*, Roma-Bari, Laterza.
- Turkle, S. (2012), *Alone Together: Why We Expect More from Technology and Less from Each Other* (2011), New York, Basic Books.
- Valente, T. W. (2012), Network interventions, *Science*, 337(6090), 49-53. DOI: 10.1126/science.1217330.
- van Hilvoorde I (2016) Sport and play in a digital world, *Sport, Ethics and Philosophy*, 10:1, 1-4, doi: 10.1080/17511321.2016.1171252
- Van Woudenberg, T. J., Bevelander, K. E., Burk, W. J., Smit, C. R., Buijs, L., Buijzen, M. (2020), Testing a social network intervention using vlogs to promote physical activity among adolescents: a randomized controlled trial, *Frontiers in psychology*, 10, 2913. doi: 10.3389/fpsyg.2019.02913.
- Vandelanotte, C., Short, C., Plotnikoff, R. C., Hooker, C., Canoy, D., Rebar, A., Alley, S., Schoeppe, S., Mummery, W.K., Duncan, M.J. (2015), TaylorActive—Examining the effectiveness of web-based personally-tailored videos to increase physical activity: a randomised controlled trial protocol, *BMC Public Health*, 15(1), 1020. <https://doi.org/10.1186/s12889-015-2363-4>.
- Wartella, E., Rideout, V., Montague, H., Beaudoin-Ryan, L., Lauricella, A. (2016), Teens, health and technology: A national survey, *Media and communication*, 4(3), 13-23. <http://dx.doi.org/10.17645/mac.v4i3.515>.
- Weed, M., Dowse, S. (2009), A missed opportunity waiting to happen? The social legacy potential of the London 2012 Paralympic Games, *Journal of Policy Research in Tourism, Leisure and Events*, 1(2), 170-174. <https://doi.org/10.1080/19407960902992241>.
- Wenger-Trayner, E., Fenton-O’Creevy, M., Hutchinson S., Kubiak C., Wenger-Trayner, B. (Edited by), (2015), *Learning in landscapes of practice. Learning in landscapes of practice. Boundaries, identity, and knowledgeability in practice-based learning* (pp.13-30), New York, Routledge.
- Wicker, P., Frick, B. (2016), The inspirational effect of sporting achievements and potential role models in football: A gender-specific analysis, *Managing Sport and Leisure*, 21(5), 265-282. <https://doi.org/10.1080/23750472.2016.1265461>.

- Williams, T. (1994), Disability sport socialization and identity construction, *Adapted Physical Activity Quarterly*, 11(1), 14-31.
<https://doi.org/10.1123/apaq.11.1.14>.
- Zhang, J., Brackbill, D., Yang, S., Becker, J., Herbert, N., Centola, D. (2016), Support or competition? How online social networks increase physical activity: a randomized controlled trial, *Preventive medicine reports*, 4, 453-458.
<https://doi.org/10.1016/j.pmedr.2016.08.008>