



Sport federations' organizational innovativeness: an empirical comparison of characteristics and attitudes

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Purpose

Being innovative is important for non-profit sport organizations in order to meet the ever-changing and increasing societal needs. Understanding why and to what extent organizational innovativeness differs between non-profit sport organizations is therefore important to assess and increase their chances of survival. The purpose of this study is to compare the structural characteristics and attitudes of innovation attributes between three groups of sport federations (SFs).

Design/methodology/approach

An online self-assessment survey was sent to all recognized regional Belgian SFs (N=156). Simultaneously, an observational desk research (i.e. media analysis) was carried out. Results from both data collection methods were combined to develop a composite organizational innovativeness-index, based on which the federations were then clustered in three distinct adopter groups.

Findings

Comparative statistics show that structural background characteristics generally are poor indicators for adopter categorization. In contrast, the attitudes about compatibility (i.e. the consistency of innovations with existing values) and complexity (i.e. the extent to which innovations are difficult to apprehend) seem the most important distinctive determinants for the different groups of SFs.

Originality/value

This study's contribution is twofold. First, it offers a methodological contribution with the development of an index, which enables the categorization of non-profit sport organizations according to their organizational innovativeness and thus provides a critical counter-argument to the importance of organizational structural

28 background characteristics from previous studies. Second, this study's results may
29 support non-profit sport organizations in improving their innovativeness, for
30 instance by improving the perception of compatibility with innovation, or by
31 guiding policymakers in creating a more supportive environment for these
32 organizations to do so.

33 Keywords: organizational innovativeness; innovation diffusion theory; typology;
34 adopter categorization

1. Introduction

The popularizing innovation diffusion research by Rogers (2003) has led to an abundance of studies across various research disciplines concerning the rate at which individuals, groups or organizations (also more generally referred to as 'units') adopt innovations (Jahanmir and Lages, 2016; Kapoor *et al.*, 2014; Li and Huang, 2016; Meyer, 2004). Since there are clear time differences when different units adopt particular innovations, it is possible to categorize them accordingly so that the heterogeneity between groups and homogeneity within groups is as high as possible (Martinez and Polo, 1996). Following in the footsteps of Rogers (2003), several authors have thus shown that members of a group have common characteristics and attitudes about attributes of innovation that distinguish them from members of other groups (Kapoor *et al.*, 2014; Tabak and Barr, 1998).

Mahajan *et al.* (1990) raised three general premises underlying the importance of distinguishing groups of adopters. Specifically, adopter categorization provides insights to (1) look for new products (based on the identified characteristics and attitudes of needs of the different groups; Kotler and Zaltman, 1976), (2) elaborate marketing/management strategies per adopter group (Blackwell *et al.*, 2006), or (3) predict future demand for a similar product innovation based on the adoption rate (Bass, 1969).

A dominant logic is apparent in the literature which is characterized by studies making use of 'quantitative data concerning a single innovation collected from adopters at a single point in time after widespread diffusion had already taken place' (Meyer, 2004, p. 59). In those studies, the rate of adoption (i.e. the total amount of units that have adopted the innovation over time) is explained via the units' characteristics and attitudes. This logic is mainly used because of the pragmatic advantages it offers to obtain a high response rate, simple data collection and analysis (Meyer, 2004).

As Rogers (2003) himself points out, there is a threat that this logic will lead to redundancy through blind reproduction, and the challenge is to recognize the shortcomings in broadening views on adopter categorization research (Kapoor *et al.*, 2014). In response to this, the present study is guided by two shortcomings identified in the literature. First, from the recognition of pro-innovation biases, there is a consensus that not everyone within a social system will adopt the same innovations (Downs and Mohr, 1976; Hoeber *et al.*, 2015). Questions also arise about whether the innovating organizations can still remember when, how and why they adopted a particular innovation (Lundblad, 2003). Second, the dominant logic focuses on the diffusion of one specific product innovation. The pitfall of this unidimensional logic is that it limits the measure of innovativeness of organizations to their choice of whether or not to adopt one certain innovation (Subramanian, 1996). Moreover, within some sectors, organizations are not looking to imitate their competitors and to adopt the same innovation. The latter shortcoming is the reason why little is known about the adopter categorization of non-profit organizations, like sport federations (SFs).

SFs are characterized by their freedom of association (Scheerder *et al.*, 2017), a reliance on volunteers (Wicker, 2017) and a high regard for autonomy (Wicker and Breuer, 2011). This is remarkable, as SFs and their clubs are important providers of active leisure activities for millions of people. In order to meet the ever-changing societal needs, organizational innovativeness presents itself as a necessary means for SFs to renew their offer and 'to compete for limited resources to promote their particular sport' (Newell and Swan, 1995, p. 318).

Contrary to the general assumption that non-profit sport organizations prefer to maintain their status quo, SFs have been found to being actively engaged in innovation, albeit with inter-organizational differences (Winand *et al.*, 2016). For example, Winand

et al. (2013) found that SFs with high perceptions of competition in terms of financial and human resources adopted significantly more innovations than their non-competitive counterparts. They demonstrated the relevance of categorizing non-profit sport organizations, but did not consider perceptions about the attributes of innovation. Yet, outside the non-profit sport sector, the perceptions about innovation attributes explain the largest proportion of variance between groups. In addition, the typology of Winand *et al.* (2016) is built from the characteristics and attitudes of SFs to subsequently relate to the number of adopted service innovations. On the contrary, this study starts from a more comprehensive measurement of organizational innovativeness to subsequently relate to organizational characteristics and attitudes. Understanding whether and which structural characteristics and attitudes are related to innovation is therefore important to assess how innovativeness differs between non-profit sport organizations.

Considering the above shortcomings, the purpose of this study is to identify the characteristics and innovation attributes that resemble each SF adopter group. Subsequently, this study aims to offer a new index based on a comprehensive measure of organizational innovativeness that categorizes SFs into distinct groups. Hence, the following research questions are addressed: (1) How can the analytic logic of Rogers' (2003) adopter categorization be revisited to categorize non-profit sport organizations based on their organizational innovativeness? (2) Which characteristics and/or attitudes about innovation attributes determine the adopter-categorization of SFs?

Although other previous studies provide valuable insights into the extent to which one innovation is adopted and its attributes (e.g. Rogers, 2003), this study contributes to the literature by offering new knowledge about the characteristics and attitudes of non-profit sport organizations with respect to their innovativeness (Lundblad, 2003). Moreover, this study provides an index that future scholars can validate externally to

measure organizational innovativeness in a comprehensive manner within other types of sport organizations.

2. Theoretical background

2.1 Organizational innovation and innovativeness

Organizational innovation is defined comprehensively as the ‘production or adoption, assimilation, and exploitation of a value-added novelty in economic and social spheres; renewal and enlargement of products, services, and markets; development of new methods of production; and establishment of new management systems. It is both a process and an outcome’ (Crossan and Apaydin, 2010, p. 1155). For a sport-specific definition of organizational innovation, the work of Ratten (2011) provides a starting point. She conceptualizes organizational innovation as an essential part of entrepreneurship. As it is argued that sport entrepreneurship needs a holistic conceptualization (Hindle *et al.*, 2020), Hammerschmidt *et al.* (2020), drawing on Ratten’s research, define sport entrepreneurship as ‘the process by which individuals, acting in a sport environment, pursue opportunities without resources currently controlled’ (p. 842). According to Hammerschmidt *et al.* (2021), innovation together with pro-activity and risk-taking determine the entrepreneurial orientation of the organization. When it comes to sport innovation and entrepreneurship studies, it is apparent that this field of study has especially gained academic interest since the last decade (González-Serrano *et al.*, 2020; Pellegrini *et al.*, 2020). This should not be surprising, as current societal trends and challenges, such as digitalization, individualization and health crises (such as COVID-19), are forcing sport organizations to undertake entrepreneurial activities to ensure their survival (González-Serrano *et al.*, 2020). Moreover, the existing literature also concurs that the sport sector is a natural environment for entrepreneurial

behavior (Hammerschmidt *et al.*, 2021). However, current studies on sport innovation and entrepreneurship are mainly theoretical and centered on elite athletes or for-profit organizations, and focus less on the social role of sport entrepreneurship. Despite the aforementioned academic gap, studies by Winand *et al.* (2016) and Hoeber *et al.* (2015) have shown the relevance of innovation for non-profit organizations, such as SFs and community sport organizations, as well. In this non-profit sport context, according to Scheerder *et al.* (2014), organizational innovation is based on the efficiency principle whereby the means with which and the structure in which one operates determine the functional delivery of services. Scheerder *et al.* (2014) broadly conceive organizational innovation as both the internal and external aspects that relate to structural functioning. This broad conception is also reflected in the operationalization of organizational innovation in previous sport-related research, in particular as a composite measure that includes, among other things, the number of innovations adopted by an organization (Winand *et al.*, 2016), the number of new collaborations (whether or not with competitors; Hammerschmidt *et al.*, 2020), the diverse composition of the Board of Directors, creative external communication (Scheerder *et al.*, 2014) and/or the introduction of new rules and regulations (Caza, 2000).

In his literature review on organizational innovation, Wolfe (1994) suggests that three key research directions can be observed, namely diffusion of innovation research (e.g. Rogers, 2003), organizational innovativeness research (e.g. Daft, 1978) and process theory research (e.g. Downs and Mohr, 1976). This study attempts to bridge the gap between the first two research streams by building on the assumptions of diffusion research to categorize organizations into adopter groups based on their organizational innovativeness. Although the notions of organizational innovation and innovativeness are often used interchangeably (Jaakson *et al.*, 2018), this study builds on the assumption that

organizational innovativeness is a multidimensional construct of the organizational culture that precedes and facilitates innovation (Hurley and Hult, 1998). In other words, organizational innovativeness is the organization's capacity to innovate.

2.2 Adopter categorization

Generally, adopter categorization involves classifying organizations based on an innovation measure. Subsequently, the distinguished groups can be compared with each other regarding their background characteristics and/or attitudes about innovation attributes.

The main underlying theory of these categorizations is the diffusion of an innovation by Rogers (2003), that is built on four important elements: 'the process by which (1) an innovation is (2) communicated through certain channels (3) over time (4) among the members of a social system' (Rogers, 2003, p. 5). Rogers (2003) defines *innovation* as 'an idea, practice, or object that is perceived as new by an individual or another unit of adoption' (p. xviii). *Communication* refers to the process by which a unit passes on information about an adopted innovation to other units, which have not yet appropriated it. A *social system* can consist of individuals, groups or organizations (labelled as units) that share one or more characteristic(s). Finally, *time* includes the innovation-decision process, which consists of different steps that are taken by units before they make the decision to adopt an innovation. The *time* at which a unit takes this last step is described as the rate of adoption. Rogers (2003) argues that most innovations follow an S-shaped curve. In first instance, only a limited number of units within the social system take up an innovation. Gradually, an exponential increase in the rate of adoption is visible, which then flattens out towards the end.

2.2.1. Rogers' Adopter Categorization Methodology

The present section outlines the strengths and limitations of the most commonly applied methodology of Rogers (2003) for categorizing organizations based on a measure of innovation.

In his categorization, Rogers (2003) distinguishes five categories, namely innovators, early adopters, early majority, late majority and laggards based on the mean time of a single innovation adoption and the standard deviation. *Innovators* constitute the first 2.5% (beyond $t - 2\sigma$) of the units adopting an innovation and are labelled as risk takers and change agents. The next 13.5% (between $t - \sigma$ and $t - 2\sigma$) of the units are referred to as the *early adopters*, who serve as opinion leaders or trendsetters, but generally take less risk than innovators. The third group consists of units that belong to the next 34% (between t and $t - \sigma$), representing the *early majority*. Before they adopt an innovation, they want to be sure that the innovation has its benefits. The next 34% (between t and $t + \sigma$) are part of the *late majority*, of which the units can be characterized as skeptical and cost sensitive. Their adoption of the innovation is a response to peer pressure. Finally, the remaining 16% (beyond $t + \sigma$) are the *laggards* of the social system. The laggards usually have a strong tendency to maintain their status quo. Only when no alternative options are available, they will adopt the innovation. This categorization is considered as the standard method due to its simple application of standard deviations that allow for inter-study comparisons (Mahajan *et al.*, 1990).

Despite the fact that Rogers' (2003) adoption categorization provides useful information for both researchers and policymakers about the background characteristics, thresholds and incentives of the different types of adopter groups, there is little understanding of it within the non-profit sport context. Tangen and Istad (2012) found support for the S-shaped curve of Rogers (2003) by investigating the diffusion of golf as a sport innovation in Norway. Nevertheless, since the diffusion of golf was only just in

the late-majority phase at the time of the investigation, differences in characteristics and attitudes between the various adopter groups could not yet be established. Also in relation to golf and Rogers' (2003) diffusion theory, Kim and Kim (2015) identified three market segments of golfers based on a cluster analysis that differ based on their demographic characteristics and communication behaviors. However, their research focuses on the demand side rather than the supply side. Finally, Winand *et al.* (2013) used a cluster analysis to divide SFs into three groups. However, their subdivision based on answers by SFs on 28 items related to change was intended to reveal differences about the adoption of service innovations rather than on organizational innovativeness. As such, the above studies show the limitations of using adopter categorization within the sport sector. As explained above, it amounts to two criticisms, namely the recognition of pro-innovation biases (Lundblad, 2003) and the unidimensional logic (Subramanian, 1996). In particular, non-profit sport organizations operate in a different way than, for example, individuals (Kim and Kim, 2015) or commercial organizations (Lundblad, 2003). Where the latter take full advantage of copying 'best practices', sport organizations' basic work activity is inherently different from each other due to the uniqueness of each federations' sport discipline. An innovation that works within one federation may have little or no effect within another federation. Therefore, it is not always possible or desirable to base the innovativeness of sport organizations on the time of adoption of one innovation (Caza, 2000).

The above arguments reveal the need to discover a new measurement tool that can be used by practitioners, while preserving the analytical essence of Rogers' (2003) categorization methodology to compose groups as homogeneously as possible in a formula-wise manner. Two different types of research methods arise. First, an alternative way to examine innovativeness is by conducting a survey to subdivide non-profit sport

organizations based on their attitude towards innovation, such as Winand *et al.* (2013) did. However, because respondents want to give socially acceptable answers, they often overestimate themselves, which can of course lead to incorrect results, interpretations and implications.

Second, observational methods, such as desk research, can overcome the survey limitations. Indeed, Geeraert's (2019) Sports Governance Observer (SGO) shows how ambiguous concepts, such as good governance and innovation, can be measured via an index using a scientifically substantiated set of hard and soft indicators. Yet, this methodology is not free of downsides either. The main criticism is that a tangle of mathematical combinations or individual indicators behind the index contains an inescapable subjectivity that makes it 'impossible to quantify reality's complexity' (Geeraert, 2019).

The Global Innovation Index (GII), which has been considered for decades as one of the criteria methods for calculating innovation on a global scale (Dutta *et al.*, 2018), provides an answer to the aforementioned shortcomings by combining both methods. Specifically, the GII ranks countries based on their score on seven pillars via 57 indicators from hard data, eighteen composite indicators and five indicators from survey material.

In accordance with the mixed-method procedure of the GII, this study calculates an innovativeness-index for SFs in Belgium based on their responses to a self-assessment survey and a media analysis of the websites of the same SFs. The methodology is discussed in the method section.

2.3 Organizational characteristics and innovation attributes

2.3.1 Organizational characteristics

The innovativeness-index methodology provides useful insights into the differences between the adopter groups by considering their characteristics (Peterson, 1973). Previous research indicated that the organization's innovativeness is subject to its structural characteristics (Damanpour, 1991; Subramanian and Nilakanta, 1996). Depending on the context under investigation, the influence of organizational characteristics on the innovativeness varies. Within the differentiated non-profit sport sector, Hoeber *et al.* (2015) distinguished non-profit sport organizations based on some fundamental contextual features, including participation trends, participation structure, operational structure, and staff involvement. In addition to the aforementioned features, this study also examines organizational characteristics related to the SFs' supply.

2.3.2 Innovation attributes

Although significant differences can be found with respect to structural characteristics, the attributes of the innovation are put forward as the most important predictors of adopter categorization. According to Rogers (2003), five attributes explain 49 to 87 percent of the variance of the time of adoption, namely the relative advantage, compatibility, complexity, trialability and observability of an innovation.

Relative advantage is described as 'the degree to which an innovation is perceived as being better than the idea it supersedes' (Rogers, 2003, p. 213). Like the attitude of innovation, this is a personal interpretation. Depending on the adopter's attitude, the advantage can relate to economic, social and cultural aspects. Generally, the higher the relative advantage of an innovation perceived by a unit, the more likely its adoption becomes.

Compatibility is 'the degree to which an innovation is perceived as consistent with the existing values, past experiences, and needs of potential adopters' (Rogers, 2003, p.

223). If an innovation is found to be incompatible by the unit with its values, previous experiences or needs, its adoption will be postponed or not even take place.

Complexity 'is the degree to which an innovation is perceived as difficult to understand and use' (Rogers, 2003, p. 15). Complexity is linked to the current knowledge of the units, which enables them to understand innovations or not. If complexity is considered on a continuum of very simple to very complex innovations, a higher value will form a threshold for innovation adoption.

Trialability refers to 'the degree to which an innovation may be experimented with on a limited basis' (Rogers, 2003, p. 15). A trial of an innovation makes it possible for units to estimate the other attributes of the innovation prior to the final adoption-decision. The adage of 'learning by doing' applies here. The greater the feeling about trialability, the more likely that users will adopt the innovation.

Finally, *observability* concerns 'the degree to which the results of an innovation are visible to others' (Rogers, 2003, p. 16). Some clearly visible innovations, such as a new air conditioning system, for example, offer immediate, observable advantages over less visible innovations, such as new insulation methods. Although the latter innovation might be more cost-efficient, the higher observability (i.e. immediate visible effects) of the former innovation might result in a faster rate of adoption.

Although adaptations were suggested in various research disciplines, these five attributes remain the most salient to examine (Moore and Benbasat, 1991). However, the above attributes all relate to perceived characteristics of one innovation as an outcome. Since investigating the rate of adoption of one innovation does not provide a comprehensive picture of the innovativeness of its units in every social system (such as the non-profit sport sector), it is interesting to study the attributes in a broader context. More specifically, it can be investigated whether innovators attach more or less

308 importance to attributes, such as the relative advantage that innovations offer in general,
309 than laggards.

310 **3. Methodology**

311 **3.1 Research context**

312 Belgium is a federal state that consists of three communities due to a number of
313 government reforms since 1970 (Belgian Federal Public Service, 2018), namely the
314 Flemish, French and German speaking communities. In Belgium, sport falls under the
315 community's authority. Sport clubs therefore are affiliated to a regional^[1] SF. Regional
316 SFs are supported in their operation by an umbrella organization and receive subsidies
317 from their respective government (Flemish Government, 2016; Ministry of the French
318 Community, 2007; Ministry of the German-speaking Community, 2004). Belgium has a
319 total of 156 SFs.

321 **3.2 Data collection**

322 Data were collected among SFs in Belgium based on the relevant functional level.
323 If a SF has an independent entity in one of the three communities, the community level
324 is used as the functional level. Data were gathered by means of both an observational
325 desk research (i.e. media analysis) and a self-assessment survey.

326 **3.2.1. Observational desk research**

327 Regarding the observational desk research, a website analysis between 25 July
328 2018 and 12 November 2018 was carried out for all SFs at the functional level (N=156)

^[1] Even though SFs in Belgium belong to the communities rather than the regions, we opt, by analogy with Winand and colleagues (2016), to make consistent use of regional SFs in function of intelligibility and cross-national compliance.

by three individual researchers. One researcher collected data of the French-speaking SFs and two researchers collected data of the Flemish and German-speaking federations. Prior to the data collection, several rounds of checking were performed by the three researchers for the same organizations to ensure coding reliability between them. Thus, doubtful items for which there was disagreement were thoroughly discussed and defined in the pre-test. In total, 351 individual items were collected for each federation and later reduced for analysis (see below).

3.2.2. *Self-assessment survey*

The self-assessment online survey was carried out between 25 June 2018 and 10 September 2018. The survey was directed to the presidents of the SFs and contained 88 questions. In total, 37 (presidents of) SFs participated in our survey for a response rate of 23.7%. Representativeness was tested based on the geographical location, type and size of the SFs. In terms of geographical location, the distribution of federations from the sample within the Flemish, French or German-speaking community was compared with that of the population. As for type, mono-SFs that offer one sport branch are distinguished from multi-SFs that offer several sport branches aimed at a specific target group, from omni-SFs that offer several sport branches that are not aimed at a specific target group, and from leisure federations that are composed of one or more associations that practice leisure activities with a sporty element within the same cluster. Finally, the size divides SFs into three categories (i.e. small, medium, large) based on their membership numbers. For all three variables, a non-significant chi-square test proved the representativeness of the sample of this study.

3.3 *Variables*

3.3.1 *Dependent variable*

By analogy with the diffusion methodology of Rogers (2003), a dependent categorical variable was created that divided units into adopter categories based on their innovativeness. In contrast to the rate of innovation adoption of Rogers (2003), a composite measure of innovativeness was calculated using the combined results of a self-assessment survey and the media analysis of the federations' websites.

With regard to the survey, ten statements on a Likert scale from 1 (totally disagree) to 5 (totally agree) were developed based on prior literature on innovation diffusion within organizations (see Appendix A). Particularly, the survey instrument of Savery (2005), who used Rogers' (2003) theory as a framework, was further built on in this study. Two statements each are related to one of the five adopter categories. To obtain a self-assessment innovation score from the answers to the ten statements, a weighted average was calculated on 100 by recoding the answers to questions 4, 5, 9 and 10 and combining them with the answers to questions 1, 2, 3, 6, 7 and 8.

Additionally, 76 indicators at a managerial, organizational and environmental level were collected via analyses of the SFs' official websites. Based on a principal component analysis with orthogonal rotation (varimax), these data were then reduced to 21 items, and subdivided into six factors (with eigenvalues over Kaiser's criterion of 1) that explained 62.85% of the variance (see Appendix B). The factors were labelled as (i) strategic knowledge management, (ii) entrepreneurship, (iii) knowledge sharing, (iv) digital presence, (v) mobile development and (vi) commercialisation. A weighted average of the mean scores on the factors was calculated to obtain an observational innovation score on 100.

A global innovativeness-index for 37 SFs was calculated using the average of the self-assessment and observational score and set to 100. Figure 1 presents the histogram of the innovativeness-index scores. Both the Shapiro-Wilk and the Kolmogorov-Smirnov

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test indicate that the index scores are normally distributed. The standard deviation is 9.224. On average, SFs score 52 out of 100 with a spread of 42 between the lowest score (32) and the highest score (74).

[Figure 1 here]

A separate look at the individual scores (see Figures 2 and 3) of SFs on the survey and observational innovativeness-index shows that SFs generally score better based on the online survey. Moreover, the scores on the observational index show a greater spread. Hence, by combining both scores, the research team controlled for biased answers (Winand *et al.*, 2013) and for window dressing (i.e. misleading presentation on the federations' website).

[Figure 2 here]

[Figure 3 here]

In accordance with the diffusion theory of Rogers (2003), the index scores, just like the rate of adoption, follow a normal distribution and follow an S-shaped curve. In that respect, the ranking based on the index score allows to distinguish SFs. In contrast to the ambiguous use of standard deviations (Rogers, 2003), the study used a one-dimensional K-means cluster analysis to categorize SFs. Five clusters can be formed after only four iterations. A one-way ANOVA analysis shows that each cluster average differs significantly from all other. The five clusters constitute one innovator (2.7%), eleven early adopters (29.7%), nine SFs that belong to the early majority (24.3%), fourteen to the late majority (37.8%) and two laggards (5.4%). Because the number of cases within

the outer categories would be too low, this study followed the process used by other authors that combined the innovators and early adopters on the one hand and the laggards and the group of the late majority on the other hand for the comparative analyses (see for example Agarwal *et al.*, 1998; Jahanmir and Lages, 2015; Kim and Kim, 2015). This ultimately resulted in three different categories, i.e. innovators, intermediates (Martinez and Polo, 1996) and laggards.

3.3.2 *Independent variables*

In order to determine whether the three adopter categories differ from each other, the first step is to look at eleven structural characteristics that can be inductively divided into five contextual features (cf. Hoeber *et al.*, 2015; see Table I below), namely (i) participation trends, (ii) participation structure, (iii) operational structure, (iv) staff involvement and (v) supply.

The participation trend and the participants are divided in federations with an increasing (more than +5%), stagnating (between -5% and +5%), or decreasing (less than -5%) number of members. Because no more recent figures are available, the reference period concerns the period between 2009 and 2015.

Participation structure contains two independent variables: number of members and gender ratio. The categorization with regard to the number of members is approached separately per community because a small federation in the more densely populated Flanders differs from a small federation in the less populated French-speaking and German-speaking communities of Belgium. The lowest tertile comprises the small federations, the second tertile consists of the medium sized federations and the large federations are situated in the highest tertile. Regarding the gender ratio of the members, the SFs are divided into three categories according to whether a SF has more than 60%

428 male members, less than 60% male and less than 60% female members, and more than
429 60% female members in 2015.

430 Five organizational characteristics relate to the operational structure of the
431 organization, namely the community, type, age, Olympic statute and degree of
432 competition of the federation. With regard to the community, a SF can belong to the
433 Flemish, French or German speaking community. The type variable distinguishes
434 between mono-SFs with a focus on one sport, and non-mono-SFs, which provide services
435 for several branches of sport. Regarding the age of the federation, it has to be considered
436 that the so-called 'splitting decree' of 1977 led to the division of existing national
437 federations that wished to receive public subsidies into a Flemish and a French-speaking
438 wing. Considering a three-year margin for SFs to carry out such a split, 1980 becomes in
439 this respect the cut-off year to distinguish old (split) from new federations. Olympic statue
440 divides the SFs into federations that offer an Olympic or non-Olympic sport based on the
441 sport program of the 2020 Olympic Games. Additionally, SFs are divided because of their
442 perception of competition, as indicated in the questionnaire. SFs either experience little,
443 average or a lot of competition.

444 Staff involvement covers the number of paid employees. When a SF has zero, one
445 to five, or six and more employees, it is labelled as a small, medium and large SF,
446 respectively.

447 Finally, the type of sport and the number of sport branches determine the supply
448 of a federation. The former variable categorizes solo, duo, team and combination SFs.
449 Solo sport can be practiced individually (e.g. running). In duo sport, you need an opponent
450 (e.g. tennis). Team sport is practiced in a team context with three or more individuals per
451 team (e.g. football). Combination SFs provide services in several types of sport.
452 Analogous to the type of SF, the latter variable makes a division between federations

based on the number of sport branches, although a further distinction is made here between federations that offer one sport branch, that offer a cluster of sport branches, and federations that offer multiple sport branches.

In addition, the operationalization of the five attributes (i.e. relative advantage, compatibility, complexity, trialability and observability) is discussed. Initially, the attributes were questioned using 21 items (see Appendix C) on a Likert scale from 1 (totally disagree) to 5 (totally agree). For each attribute, items were removed to obtain the highest possible Cronbach's Alpha. Then, each attribute was calculated via the mean of the items and were set to a score on 100 (corresponding with the innovativeness-index). The statements were questioned in such a way that higher scores for compatibility and complexity indicate that SFs experience these attributes as a higher threshold for being innovative. The higher the scores for relative advantage, observability and trialability, the more important the SFs consider these attributes.

3.4 Analyses

In a first phase, cross tabulations were run for all eleven background variables to the different adopter categories. Chi-square statistics were performed to see if there were significant differences between SFs belonging to the innovators, intermediates or laggards.

In a second phase, one-way ANOVAs were conducted on the five innovation attributes to the adopter categorization. Post-hoc Bonferroni statistics were requested to indicate any significant differences between the adopter groups. Because of the low number of cases, a 90% confidence interval is used for both analyses. In addition to statistical significance, the effect sizes are calculated via the squared eta to determine the magnitude of the differences between the groups (Cohen, 1988).

4. Results

4.1 Cross-tabulations

The cross-tabulations intersect the eleven background characteristics of the five organizational features discussed earlier with the different adopter groups for 37 SFs.

Regarding the participation trend feature, SFs are equally distributed within the adopter groups concerning the evolution of members.

The number and gender ratio of members were both investigated as part of the participation structure of the SFs. Concerning the adopter categorization according to the gender ratio of members, more than nine out of ten innovators are SFs with more than 60 percent male members. Nevertheless, the column proportions do not differ significantly.

The number of members also does not seem to affect adopter categorization.

Within the operational structure, the background variable, community, classifies the innovators, intermediates and laggards by their geographical location. Both Flemish and French speaking SFs are equally distributed across all three adopter groups, hence, there is no significant difference. With regard to the type of SF, the proportion of mono-SFs increases from the category of laggards over the intermediates to the innovators. However, the column proportions do not differ significantly from each other either. Additionally, an equal distribution of SFs in relation to age and the level of competition leads to an insignificant Chi-square test. The same applies for the distribution of SFs based on their Olympic statute, even though the Olympic federations form a proportionally larger group within the innovators (85.3%) than within the intermediates (77.8%) and the laggards (43.7%).

In relation to the staff involvement feature, Table I further shows that most innovator SFs employ six to ten people, whereas less than two out of ten laggards can rely on that number of employees. The Chi-square statistic is nevertheless insignificant.

Regarding the type of sport, every category is at least represented by one SF within each adopter group. Even though duo SFs make up half of the innovator group, the p-value is not significant. Finally, regarding the number of sport branches, an equal distribution of SFs leads to an insignificant Chi-square test.

[Table I near here]

4.2 One-way ANOVAs

Table II presents the results from one-way ANOVA analyses on the five attributes according to the adopter categorization. First, the mean scores on relative advantage are higher for the innovator group in comparison with these scores of the laggards and intermediates. Notwithstanding, the p-value indicates no significant relationship. Contrarily, the mean scores for compatibility differ significantly (on a reliability level of 90 percent) between the adopter groups. In particular, the innovators have a significantly lower mean score on compatibility than the intermediates and the laggards. Since a higher score on compatibility points to a higher perceived threshold, we can argue that (a lack of) compatibility constrains laggards from being innovative. A similar trend is visible for complexity. Again, the mean score for the laggards and the intermediates is significantly higher than for the innovators. Complexity therefore seems to deter innovators less from pursuing innovation. For both compatibility and complexity, the eta squared statistics of 0.147 and 0.163 respectively are above the threshold of 0.14, indicating a large effect size

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(Cohen, 1988). Concretely, compatibility and complexity explain respectively 14.7% and 16.3% of the variance of the adopter categorization.

The attribute observability shows similar figures for each group of SFs. Thus, SFs attach equal importance to the visibility of innovations. Corresponding to the scores for observability, the mean scores between the adopter groups for the trialability of innovations lie close to each other, so there is no significant difference.

[Table II near here]

5. Discussion

The research purpose was to discover the differences between groups of SFs based on their innovativeness. A two-folded research design was developed. First, a new measurement-index for organizational innovativeness that addresses the shortcomings of previous research was created. Second, by means of the new index, an empirical comparison of organizational characteristics and attitudes between groups of SFs was made.

To answer the first research question, this study drew on the adopter categorization of Rogers (2003) to propose an alternative measurement index in which SFs are categorized based on their innovativeness, derived from both observational and survey data. A frequency analysis illustrated a normal distribution of SFs based on their innovativeness score. A cluster analysis indicated that the group of innovators, early adopters, early majority, late majority and laggards make up 2.7%, 29.7%, 24.3%, 37.8% and 5.4% of the sample of SFs. This does not correspond to the proportional sizes of the groups according to the standard deviation format of Rogers (2003). However, it is

important to mention that this study reports on a relatively small group of SFs. Perhaps a larger sample would have given different cut-off values and group sizes.

In response to the second research question, the results of this study clearly indicated that organizational characteristics are poor predictors for classifying SFs according to the adopter groups. This contradicts previous positive associations between organizational characteristics and innovativeness (Damanpour, 1991; Subramanian and Nilakanta, 1996; Svensson *et al.*, 2019). As a contribution to the aforementioned literature, the findings show that much depends on how innovativeness is investigated. If the innovativeness of organizations is weighed against the share of radical innovations, it is, for example, not surprising that larger (and often financially more powerful) organizations score significantly better than their smaller counterparts. However, by analogy with Hindle *et al.*'s (2021) definition of sport entrepreneurship, this difference disappears when innovativeness is approached in a more holistic way, as is the case in this study. This implies that all organizations, regardless of their structural characteristics (such as size and Olympic status), can be innovators. We thus concur with Zeimers *et al.* (2021) and Hoeber *et al.* (2015) that a 'one size fits all' solution does not exist for innovation.

The results from the one-way ANOVAs reinforce the idea that attitudes more than organizational characteristics can increase the innovativeness of SFs. Based on previous studies (Kapoor *et al.*, 2014; Tabak and Barr, 1998), the study investigated the attitudes of SFs towards the five most predictive attributes, in particular relative advantage, compatibility, complexity, observability and trialability. The average attitude about compatibility and complexity was found to differ significantly between the adopter groups. Table II illustrates that the average score on compatibility for the innovators is significantly lower than the average scores of the SFs that belong to the intermediates or

the laggards. A high score reflects that SFs have a harder time adopting innovations when they are not compatible with their values and standards. This is in line with the findings from previous diffusion and adopter categorization research, in which the compatibility of an innovation is positively related to the rate at which it is adopted (Kapoor *et al.*, 2014; Tabak and Barr, 1998). Indeed, despite sport being considered a natural setting for innovation, Hammerschmidt *et al.* (2021) found that only a few professional football clubs, which were able to move away from their long-standing traditions and norms due to a proactive and entrepreneurial spirit, adopted innovative approaches. A similar result was found by Winand *et al.* (2013) within the SF sector, in particular, that traditional SFs adopted the least innovations. Accordingly, this study's result implies that each SF's traditional values and standards may prevent it from being innovative.

Additionally, laggards indicate significantly more often to experience bigger problems with complexity. In particular, they will be less inclined to adopt innovations when they are complex, be it financially or structurally. In relation to the diffusion research, this result is in agreement with the general finding that a complex innovation will have a slower adoption curve (Kapoor *et al.*, 2014; Rogers, 2003; Tangen and Istad, 2012). A possible explanation for the fact that laggards are more doubtful to include complex innovations may be that it is more difficult to estimate the risks of complex innovations in advance. This is further complicated by the uncertainty (e.g. with regard to the unpredictability of sport performance and funding resources) that most sport organizations (Pellegrini *et al.*, 2020) and certainly SF (Winand *et al.*, 2013) have to deal with. Complex innovations also often require some prior knowledge that SFs might lack sometimes. As a result, they may prefer to refuse the adoption of a possibly successful innovation rather than to invest in a potentially unsuccessful one.

6. Conclusion

In sum, revisiting the principles of adopter categorization by Rogers (2003) and using earlier insights from sport-specific studies (Geeraert, 2019; Hoeber *et al.*, 2015; Winand *et al.*, 2013), this study created an alternative measurement index to categorize groups of SFs based on their innovativeness and compare these groups' organizational characteristics and attitudes. The findings show that the innovativeness of a SF does not depend on its organizational characteristics, but on its attitude towards innovation attributes, particularly compatibility and complexity. The contribution and originality of this study lies not only in the results, but also in the methodology applied, the theoretical implications, the usefulness for future researchers and the context of the research. In addition to the majority of theoretical papers, this study fills the gap in the sport entrepreneurship field with its empirical and experimental design (González-Serrano *et al.*, 2019). Specifically, building on an existing framework, this study provides an index that can be used by future researchers in light of external validation to examine organizational innovativeness of other types of sport organizations, and thus to identify similarities or differences with SFs.

Since it is difficult for sport policy to provide tailored guidance to each individual SF with regard to innovation, this study also contributes by clustering SFs in three segments. In this way, a number of sport management and policy implications can be put forward. First, we suggest that sport authorities should seek alternative forms of support to stimulate innovation within SFs. Today, Belgian SFs usually receive a financial subsidy that is tailored to their organizational characteristics, such as their operational structure or supply (Winand *et al.*, 2013). The results showed that this does not necessarily contribute to innovativeness. On top of or in addition to the existing financial support, it therefore seems recommendable for sport authorities to offer their expertise

during the adoption process of complex innovations by lagging SFs. This can be done by organizing workshops or by appointing an independent innovation manager who is available for SFs at all times. With regard to the results on compatibility, we suggest that managers of lagging SFs reorient their organization's mission and/or vision to fit the current and future needs of their members, without compromising their traditional values and norms.

This study is of course not without its limitations. Although each functional SF was analyzed through desk research, the global index reports only the combined scores. Consequently, the analyses were conducted on a rather small sample size of 37 SFs. Although the calculation of effect sizes for the significant results gives an indication that the sample size of our study is sufficiently high to observe a statistically significant result with a desired probability (Lakens, 2013) and a low sample size is a general limitation of studies examining SFs given their small number in comparison to sport clubs (Winand *et al.*, 2013), there may be nevertheless a non-response bias as the response rate of this study's survey is 23.7%. Thus, a higher response rate could have had an influence on the curve and size of the groups, so that even clearer differences would have been found among groups. Moreover, the study survey only one respondent per federation. In line with previous research (e.g. Hoeber *et al.*, 2015; Winand *et al.*, 2016), a deliberate choice was made to focus the questionnaire on presidents, who can be expected to be aware of all innovative activities of the sports federation. Notwithstanding, it could be that the presidents' responses to the survey may not reflect the views of the whole SF. Hence, future research could question several people within one SF for a comprehensive understanding of intra-organization differences. Also, researchers are encouraged to further validate this study's measurement instrument of organizational innovativeness. Given the specificity of the sport organizations under investigation in this study (i.e.

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5 650 characteristics and attitudes could also be found in other types of (non-)profit (sport)
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680 [ederaties/160610_Decreet_georganiseerde_sportsector.pdf](https://kics.sport.vlaanderen/Regelgeving/Gedeelde%20%20documenten/Sportfederaties/160610_Decreet_georganiseerde_sportsector.pdf) (accessed 15
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Table I. Cross-tabulations for eleven organisational characteristics according to the SFs’ adopter categorisation

Features	Characteristics	Categories	Laggards	Intermediates	Innovators	N	Sig.
Participation trend	Evolution of members	Positive (>5% increase)	8 (61.5%)	5 (55.6%)	7 (58.3%)	20	.963
		Stagnating (-5%-+5%)	1 (7.7%)	1 (11.1%)	2 (16.7%)	4	
		Negative (>5% decrease)	4 (30.8%)	3 (33.3%)	3 (25.0%)	10	
Participation structure	Number of members	Small	6 (42.9%)	4 (44.4%)	1 (8.3%)	11	.132
		Medium	4 (28.6%)	1 (11.1%)	7 (58.3%)	12	
		Large	4 (28.6%)	4 (44.4%)	4 (33.3%)	12	
	Gender ratio members	>60% male	7 (50.0%)	7 (77.8%)	11 (91.7%)	25	.149
		>60% female	5 (35.7%)	2 (22.2%)	1 (8.3%)	8	
		Gender equity (<60% male/female)	2 (14.3%)	0 (0.0%)	0 (0.0%)	2	
Operational structure	Community	Flemish	6 (37.5%)	5 (55.6%)	6 (50.0%)	17	.745
		French-speaking	9 (56.3%)	4 (44.4%)	6 (50.0%)	19	
		German-speaking	1 (6.3%)	0 (0.0%)	0 (0.0%)	1	
	Type	Mono	11 (68.8%)	7 (77.8%)	10 (83.3%)	28	.663
		Non-mono	5 (31.2%)	2 (22.2%)	2 (16.7%)	9	
	Age	Young	7 (43.8%)	5 (55.6%)	4 (33.3%)	16	.595
		Old	9 (56.3%)	4 (44.4%)	8 (66.7%)	21	
	Olympic statute	Non-Olympic	9 (56.3%)	2 (22.2%)	5 (41.7%)	16	.255
		Olympic	7 (43.7%)	7 (77.8%)	7 (85.3%)	21	
	Competition	Low	7 (43.8%)	5 (55.6%)	6 (50.0%)	18	.862
		Moderate	7 (43.8%)	4 (44.4%)	5 (41.7%)	16	
		High	2 (12.5%)	0 (0.0%)	1 (8.3%)	3	
Staff involvement	Number of employees	None	6 (37.5%)	1 (11.1%)	1 (8.3%)	8	.143
		1-5	7 (43.8%)	3 (33.3%)	4 (33.3%)	14	
		6-10	3 (18.8%)	5 (55.6%)	7 (58.3%)	15	
Supply	Type of sports	Solo	8 (50.0%)	5 (55.6%)	3 (25.0%)	16	.270
		Duo	3 (18.8%)	1 (11.1%)	6 (50.0%)	10	
		Team	1 (6.3%)	2 (22.2%)	2 (16.7%)	5	
		Combination	4 (25.0%)	1 (11.1%)	1 (8.3%)	6	
	Number of sport branches	One sports branch	10 (62.5%)	7 (77.8%)	9 (75.0%)	26	.781

Cluster of sports branches	2 (12.5%)	1 (11.1%)	2 (16.7%)	5
Multiple sports branches	4 (25.0%)	1 (11.1%)	1 (8.3%)	6

Table II. One-way ANOVAs for the five innovation attributes according to the SFs’ adopter categorisation

Variables	Group	N	Mean (SD)	F	Sig.
Relative advantage	Innovators	12	80.00 (5.91)	1.706	.197
	Intermediates	9	73.78 (4.81)		
	Laggards	15	74.40 (6.56)		
Compatibility	Innovators	12	34.45 (7.95)	2.937	.067
	Intermediates	9	44.47 (12.91)		
	Laggards	16	42.91 (11.17)		
Complexity	Innovators	12	51.67 (17.49)	3.320	.048
	Intermediates	9	57.78 (8.33)		
	Laggards	16	64.38 (10.94)		
Observability	Innovators	12	65.00 (9.90)	.605	.552
	Intermediates	9	60.00 (13.74)		
	Laggards	16	62.50 (8.39)		
Trialability	Innovators	12	73.33 (10.73)	.095	.909
	Intermediates	9	74.44 (6.35)		
	Laggards	16	72.81 (8.75)		

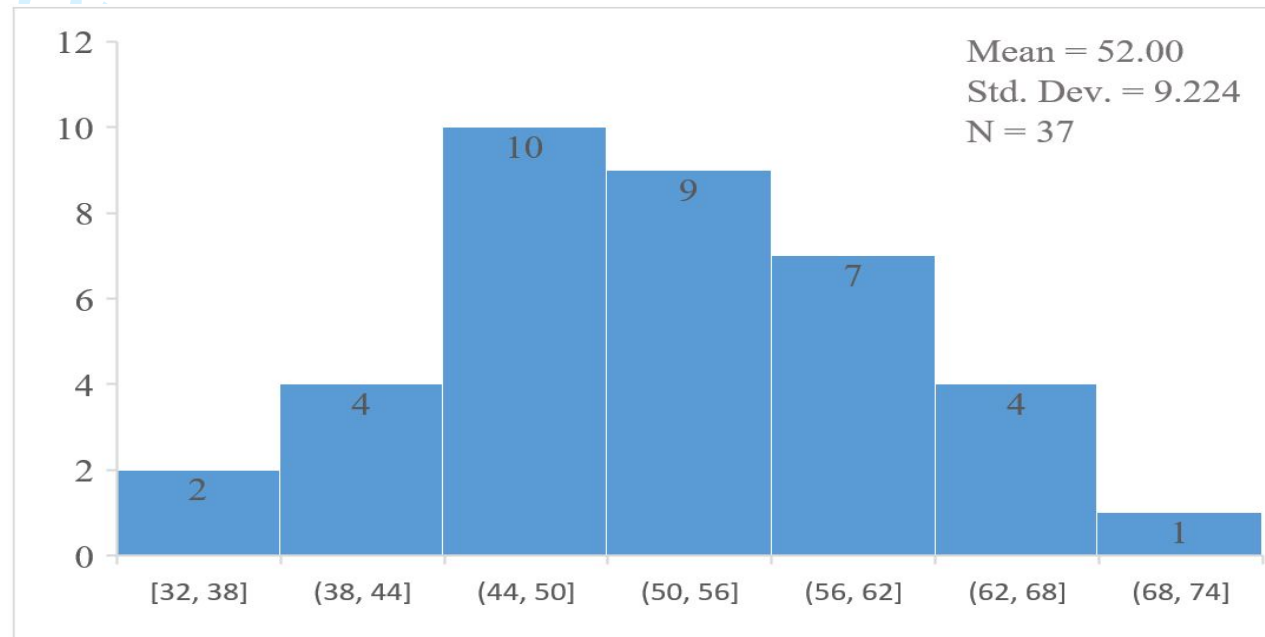


Figure 1. Histogram of the innovativeness-index scores of the SFs

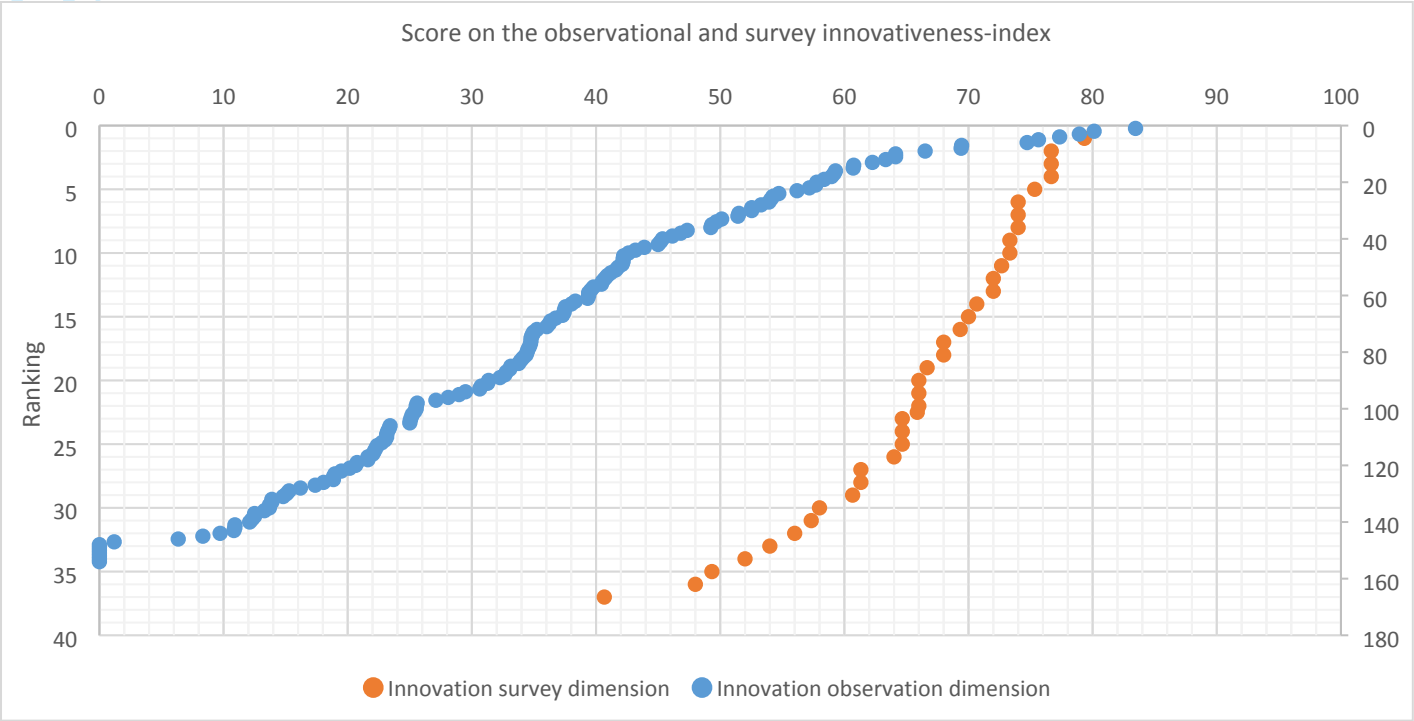


Figure 2. Scatter plot of the individual scores on the observational (N=156) and survey (N=37) innovativeness-index for SFs

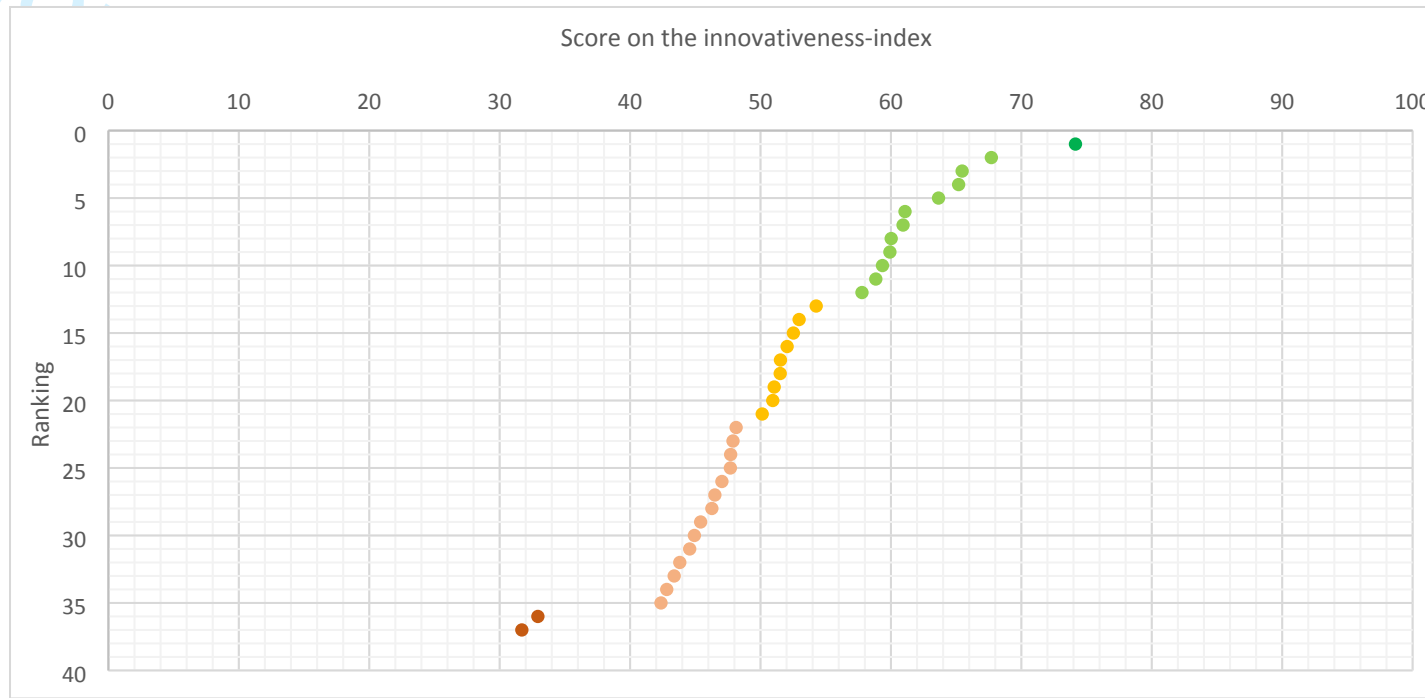


Figure 3. Scatter plot of the individual scores on the global innovativeness-index for SFs (N=37)

1 **Appendices**

2 [References are deleted to maintain the integrity of the review process]

3 **Appendix A**

4 Figure A1. Items of the survey innovativeness-index

Indicate to what extent you agree with the items below (from 1 = totally disagree to 5 = totally agree)	
Item	Question
1	Our federation is entrepreneurial and wants to be the first to implement innovations
2	Our federation implements innovations and influences other organisations to do the same
3	Our federation follows the example of other federations in implementing innovations
4	Our federation must be convinced of the benefits of innovations by other sports federations
5	Our federation is suspicious of innovations
6	Our federation is always looking for innovations
7	The opinion of our federation about an innovation is respected and followed by other sports federations
8	Our federation will implement innovations, but will not influence other sports federations to do the same
9	Our federation implements innovations out of necessity
10	Our federation is cautious about changes

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Appendix B

Figure B1. Items-composition of the observational innovativeness-index based on a rotated component matrix

Item	Component loadings					
	F1	F2	F3	F4	F5	F6
<i>Factor 1: strategic knowledge management</i>						
SWOT analysis	0.815					
Organisation chart	0.719					
Number of the federation's internal regulations published	0.686					
Number of own publications (including brochures, newsletters, books)	0.572					
Research involvement	0.436					
Number of subsidies	0.466					
<i>Factor 2: Entrepreneurship and cooperation</i>						
Number of innovative initiatives		0.686				
Responsible person/committee for innovation		0.598				
Club membership fee differentiation		0.441				
Individual membership fee		0.334				
Number of partnerships within the sports sector		0.616				
Number of partnerships outside the sports sector		0.631				
Number of sponsors		0.538				
<i>Factor 3: Knowledge sharing</i>						
Own website			0.655			
Number of informative messages			0.639			
<i>Factor 4: Digital presence</i>						
Number of online channels				0.886		
Number of social networking sites				0.681		
Number of Facebook posts				0.501		
<i>Factor 5: Mobile deployment</i>						
Mobile application					0.826	
<i>Factor 6: Commercialisation</i>						
Official magazine						0.764
Web shop						0.761
Eigenvalue	6.573	1.800	1.382	1.235	1.134	1.036
Total explained variance	31.30	8.75	6.58	5.88	5.40	4.94

Notes: Extraction Method: Principal Component Analysis: Varimax with Kaiser normalisation.

Appendix C

Figure C1. Statements^a about the perceived importance of the innovation attributes

Innovation attribute	Items
Relative advantage	Our federation primarily implements innovations because they increase our work efficiency
	Our federation primarily implements innovations because they save time
	There are plenty of other benefits of innovations for our federation to consider using
	The benefits of the innovation will ensure that our federation will continue to use it in the future
Compatability	Our federation will continue to use innovations because they help us better manage our time
	Our federation does not need any innovations
	Most innovations are not in accordance with the (traditional) values and beliefs of our federation
Complexity	The ease of use of innovations will ensure that our federation will continue to use them
	Our federation is not sure how we can best implement an innovation in our operations
	Our federation implements an innovation sooner if it is not too complex (in terms of finances, structure, etc.)
	Even though our federation has never implemented a certain innovative product, process, or innovative service, it is not difficult for us to successfully implement it
Observability	The complexity of an innovation will mean that our federation will no longer use it in the future
	Our federation is positively influenced by an innovative product, process, or innovative service, that seemed beneficial to other organisations
	Our federation considers it important to first look at how other federations use innovations before implementing them themselves
	Our federation does not need to observe innovations prior to implementing them
Triability	The extent to which innovations can be observed beforehand ensures that our federation implements the innovations
	Our federation implements innovations more easily after having tested them
	Our federation does not need a test phase to be convinced which innovations are best suited for us
	It is better to experiment with innovations before implementing them
	Our federation does not take much time to try out an innovative product, process, or innovative service before it is finally implemented
	Testing the possibilities of the innovation makes it easier for our federation to implement the innovation

^a The crossed-out items were removed to obtain the highest possible Cronbach's Alpha