

To play or not to play? What drives women's participation in football?

by

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Abstract

The increased attention to women's football is reflected in the increasing number of female football players over the past few years. This paper identifies and quantifies for the first time the factors that impact participation in women's football. First, we use a revealed preference model to analyse the factors that influence the decision to consider, start and stop playing football. Second, we employ a discrete choice experiment, a stated preference method, to explore factors related to the club context and football organisation. We quantify the importance of female staff and referees, the presence of friends in the team, playing outdoor and having positive peer support for female football participation. Moreover, it is important to offer women's football at nearby locations and affordable prices, in a mix of more or less formal settings and with both women only and mixed teams. Finally, the results give rise to specific recommendations for policymakers.

Keywords: women's football, participation, discrete choice experiment, logistic regression, sports management

JEL classifications: C210, C250, L830, Z2, Z280

1. Introduction

In this paper, the drivers of women's participation in football (European soccer) are investigated. Via a revealed and stated preference analysis, the factors that drive the decision to start or stop playing football are both identified and quantified. The research is timely as, for several years now, women's football has been among the fastest-growing segments within the sports industry (Wold et al., 2013). Noteworthy examples include record-breaking audiences at the 2019 World Cup, a 50% increase in women serving on UEFA's governing bodies since 2019 and a sold-out Camp Nou for the UEFA Women's Champions League semi-final between FC Barcelona and Wolfsburg (Petty & Pope, 2018; UEFA, 2020). Recent developments and expansion in sponsorship opportunities for women's football, increased visibility and professionalisation of national teams and competitions are key growth drivers (Morgan 2019; Sky Sports, 2021). However, women's football still suffers from a shortage of professional clubs, amateur participation, proper infrastructure and available salary budgets (Football Benchmark, 2019). As a consequence, in the EU, football is still perceived as a male-dominated sport (Wetton, Radley, Jones & Pearce, 2013). The percentage of female players with regards to the total number of football players in Belgium, the Netherlands and Germany is 8.5%, 14% and 11% respectively (DFB, 2022; KNVB, 2022; RBFA, 2022).

Several factors contribute to the participation rate of women in football and there is still a large potential for growth (Scelles, 2021). The 2017 European Women's Football Championship (WEURO 2017) organised in the Netherlands, for example, clearly had a positive effect on women's football in the host country, with the number of new participating amateur members increasing by 6.8% in one year (KNVB, 2017).

To extend the current state-of-the-art literature, we use both stated preference (discrete choice experiment) and revealed preference (logistic regression) methods, based on survey data from 854 Belgian participants. We find among other things that for women, the presence of peer support is a decisive factor for enrolling in association football. In addition, female staff and referees, playing along friends, and more opportunities to play, both in women only and mixed teams, and in more, or less formal settings are likely to increase female participation rates. Also offering outdoor football, at nearby locations and at affordable prices is important to encourage increased participation.

This research is relevant for both academics and policymakers. Previous research has identified factors that influence sports and football participation, but the impact has not yet been quantitatively estimated. This research is also relevant for policymakers, as supporting the growth of professional and amateur women's football is a strategic priority of many football federations, including The Football Association (2016) of England, the Football Federation Australia (2017), the Royal Dutch Football Association (KNVB, 2019) and the Royal Belgian Football Association (RBFA, 2019). Gaining more detailed insight into these participation determinants will help clubs, football federations and policymakers to make better-informed decisions concerning the further development of women's football.

The remainder of this paper is structured as follows. The relevant literature on women's football is reviewed in the next section. The methodology is described in Section 3 and the data is presented in Section 4. Section 5 discusses the main results. A number of managerial implications are derived in Section 6. The conclusion, limitations and recommendations for future research are presented in Section 7.

2. A review of factors potentially affecting women's participation in football

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In this section, factors affecting participation in sports and in football in particular, are identified and discussed. The existing literature has been supplemented with a series of ten individual qualitative, semi-structured interviews with a range of stakeholders (players, parents, teachers and policymakers). Most of the interviewees were women of different ages, playing football at different levels. The participants ranged from 16-year-old girls playing at an amateur level to current players of the Belgian A and youth national teams, as well as women who had not played for several years. In addition, a number of women were interviewed who are involved in policymaking at both club and federation level. This approach allowed the uncovering of several socio-demographic, club- and player-related factors encouraging (motivators) or discouraging (barriers) women's participation in football and other sports.

2.1. Player-related factors

First of all, a difference in characteristics related to players may impact their participation in football.

Friends

The influence of friends can be manifested in two different ways. First, making new friends through football is seen as one of the main motivators to start playing (Morrissey, 2014). Women see playing football as an opportunity to meet new friends and socialise (Morrissey, 2014; Wangari, Kimani, & Wango, 2017). Second, Belgian research indicated that 24% of the girls who started playing football did so because they had friends who already played football (Vanmullem, 2020).

Peer support

Although professional and top athletes are frequently recognised as role models, research reveals that family members, friends and other key persons in their lives, such as coaches and teachers, are the most influential role models, particularly for younger girls (Allender et al., 2006). As a result, it is important that children feel motivated and supported by people in their close environment. Moreover, family, friends and partners are of big importance for the continuation of women's playing careers in Finnish football (Torpo, 2022).

Self-consciousness

Research has revealed that participants' perceptions of their own ability have a significant impact on their decision to continue engaging in sports (Morrissey, 2014; Wetton et al., 2013). A study by Wetton et al. (2013) showed that 55% of female respondents agreed that their self-perceived lack of sporting ability stopped them from participating.

2.2. Club-related factors

In addition, a number of factors of the offering at the club may play a role.

Team composition

Girls can play football in a mixed or a women only team. Vanmullem (2020) discovers a preference in Belgium for the latter. 85% of girls playing football in a girls only team would like to continue this. Likewise, 77% of the girls who play in a mixed team would like to switch to a girls only team. On the other hand, for girls who do not play football, the preference for a girls only team is less distinct. Moreover, our interviews with female football players show that it might not always be possible at a young age to create women-only teams, due to a lack of female players.

Staff and officials

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It might be that not only female team members have an influence on girls' participation in football. The entire number of women in the football landscape, e.g., as a coach or a referee, might also impact participation of women in football. Moreover, football federations' objectives are not only to increase the number of female players, but also the number of women in other roles (KNVB, 2019; RBFA, 2019).

Membership type

Several women indicated during our interviews that not having a flexible membership is a barrier to start. Fixed training days may not be convenient and having to commit for the entire season are issues to take into consideration. Moreover, the level of competition that comes with memberships is of importance too. Interview participants reported that the possibility to play in a team that matches their skills and preferred level of competition could convince more girls to play. (Wetton et al., 2013)

Indoor/Outdoor

People's preference to spend spare time indoor or outdoor can be an important factor in their sports choice (Flemr, 2018; Miller & Kuhaneck, 2008). There is no general consensus on what preference people have. For example, studies show that an indoor environment was preferred because of cleanliness (e.g., no mud) and indoors being a less public space (Flemr, 2018; Pellegrini, 1992). On the other hand, outdoor play is popular among other young people because it was perceived as more fun due to the possibility to run and exercise more (Miller & Kuhaneck, 2008). Also the local climate and season may have some influence. Although football is generally seen as an outdoor sport, it would be useful to explore whether this is also the preferred option for players.

Facilities

A significant disparity in investments is observed between men's and women's football (Van Oproy, 2019). This translates into less coaching, poorer infrastructure, as well as less convenient training and competition hours. Although the impact on participation rates is unclear, girls that do not feel welcome in a club might perceive girls only teams as always coming in second place regarding facilities, including pitches and dressing rooms, as well as materials (Vanmullem, 2020).

Membership fee

Membership fees can play a major role in organised sports participation, as they can be quite high for certain sports and hence presents a barrier (Somerset & Hoare, 2018). The study by Jang and Choi (2018) shows that customers of a gym rate membership fees as the most important factor in their decision to enrol.

2.3. Socio-demographic factors

The wider society may also play its role in influencing women's participation in football. Potential factors are described in this section.

Gender stereotypes

Gender stereotypes exist not only in society, but also in sports. Norman (2016) indicates that many sports are predominantly perceived as male activities. For female participants, this can often be a blocking factor to start playing. Moreover, as girls grow older, differences in sport participation rates compared to men become even more significant (Allender, Cowburn, & Foster, 2006; Morrissey, 2014). Already at the age of seven, girls have a less positive attitude towards physical activity (Sport England, 2019). Football too is often perceived as a men's sport and this masculine connotation could

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have a detrimental effect on female participation (Wetton et al., 2013). However, more recently, changing gender stereotypes has helped to attract more and more girls to physical sports (Scheidler & Wagstaff, 2018; Women's sport and fitness foundation, n.d.).

Role models

Another important driver is the presence of role models. Van Oproy (2019) and the KNVB (2019) show that the growing interest in role models results in young girls being inspired to play football. Role models in football are not limited to famous male or female players, but also include female coaches and referees. However, women are underrepresented within the current football landscape (Burton, 2015), leading to a continuing shortage of female role models to inspire and activate the next generation of sportswomen (Women's Sport and Fitness Foundation, n.d.).

Media coverage

Studies showed that increased media coverage of women's sports increases interest in it (Scheidler & Wagstaff, 2018). The importance of media attention and visibility is reflected in the evidence that the number of women playing football increases as the exposure to the sport increases (Women's Sport and Fitness Foundation, n.d.). The growth in participation rates after a country organising an international final tournament for women supports this (KNVB, 2017). Moreover, the media has a key role to play in improving knowledge, perceptions and attitudes towards women's sports, which in turn will positively influence participation levels (Wetton et al., 2013).

Football in schools and youth activities

Physical activities are an inherent part of school and different youth activities. These settings can be important for increasing sports participation among young people (Rosenkranz, Ridley, Guagliano, & Rosenkranz, 2021). Positive school sports experiences might positively affect later sports participation (Curtis, McTeer, & White, 1999). However, the quality and quantity of school sports facilities are sometimes questionable (Cale, 2000).

Distance

The proximity of sports facilities can be an important environmental factor influencing sports participation (Somerset & Hoare, 2018). For example, according to Reimers et al. (2014), if the distance to the nearest gym increases by 1.5 km, the likelihood of girls participating in sports activities in the gym reduces by 24%.

3. Methodology

In this paper, both a stated and a revealed preference method are applied to quantify the impact of the previously described factors on female participation in football. A discrete choice experiment (DCE) allows measuring respondents' preferences via presenting hypothetical scenarios. Second, a logistic regression model is applied to several socio-demographic, club- and player-related factors that potentially influence the consideration to play, the decision to eventually start playing and the decision to stop playing football.

3.1. Stated preference: Discrete Choice Experiment

In a DCE, individuals are asked to indicate their preference from a set of hypothetical alternatives referred to as choice sets (Merino-Castello, 2003). DCEs are based on McFadden's (1974) random utility theory and Lancaster's (1966) economic value theory, which require individuals to select the alternative that maximises their utility. Utility is a measure of relative satisfaction used in economics

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to indicate the benefit an individual derives from a given scenario. (Ben-Akiva & Lerman, 1985; Deelen et al., 2017; Safiullin, Novenkova, Safiullin, 2014).

A DCE is based on conjoint analysis. An experimental setting is constructed in which options are characterised by level combinations of predefined attributes. As Lancaster (1966) argued that consumers do not derive utility from goods as such but from the combination of components or attributes of a specific good; each choice set in this study contains two different scenarios from which the respondent must select the preferred option. As a result, respondents are forced to evaluate trade-offs to make their choices, depending on their preferences (Espinosa-Goded, Barreiro-Hurlé, & Ruto, 2010; Merino-Castello, 2003).

Although a DCE is sometimes considered complex to answer by respondents, it offers some important advantages (Swait & Adamowicz, 2001). First, DCEs allow for better identification of preferences compared to traditional market research, as more information about the decision-making process is revealed (Swait & Adamowicz, 2001). Second, the hypothetical scenarios in DCEs are described by their characteristics, called attributes, and each attribute contains a set of predefined options, called attribute levels (Abihiro, Leppert, Mbera, Robyn, & De Allegri, 2014). Hence, the different constituting attributes can be assessed individually, rather than entire scenarios only (Johnston & Paulsen, 2014). In addition, the researcher can test which level changes within an attribute effectively influence utility, all else being equal. A final advantage is the ability to evaluate different attribute level combinations using coefficients that represent the relative importance of each attribute level (Bjørnskov Pedersen et al., 2011). As a result, a DCE is especially suitable to quantify the impact of different attributes on players' decisions to play football.

Some methodological decisions have to be taken while designing a DCE, such as whether a no-choice option should be included, the attributes and levels that should be included and the experiment's dimensions.

Selection of Attributes and levels

To obtain a suitable set of attributes for the DCE, the following two conditions are to be considered. First, attributes must be relevant to both respondents and policymakers. Second, attributes should meet several technical requirements; they should be complete, simple, operational, mutually independent, non-causal and realistic. (Bateman & Großbritannien, 2002; Bjørnskov Pedersen et al., 2011)

Several studies investigating the complexity and cognitive load associated with DCEs provide evidence that a larger number of attributes have greater explanatory power (Kessels, Jones, & Goos, 2011). This way, the ability to make clear choices is reduced, leading to an increased error variance through the complexity (Kessels et al., 2011). On the other hand, fewer attributes will generally produce results with lower statistical efficiency. Hence, the selection of attributes and levels should be supported by evidence and is the result of a trade-off between statistical and response efficiency (Pérez-Troncoso, 2020). In this study, the selection of attributes and levels follows the approach of Adams et al. (2015), which bases this selection on a systematic review of the existing literature, followed by (the previously described) interviews.

The resulting set of attributes to be evaluated, relevant for both players and policymakers, were presented to an expert panel to propose improvements. This resulted in seven attributes with their respective levels.

Although the amount of attributes is rather high, it is still acceptable. While the cognitive load of a scenario including many attributes may overwhelm respondents, the levels of some of the attributes

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can be held constant in every choice set. The resulting designs are called partial profile designs (Kessels et al., 2011, 2012). In this way, the cognitive load is reduced. Green (1974) started constructing profiles based on only a subset of the attributes. Although such profiles improve response efficiency, statistical efficiency is reduced as it leads to less accurate parameter estimates. However, if there are one or more dominant attributes, choice sets can be constructed that keep this dominant attribute constant, enabling the effectiveness of the other attributes to be better assessed. To sufficiently reduce the complexity of the choice experiment, especially for kids, the survey design accounts for a maximum of 3 alternating attributes. (Kessels et al., 2011, 2012)

The list of attributes is presented in Table 1. Section 2 identified the attributes and their respective levels that are included in this model. As seen in Table 1, some factors discussed in Section 2 are not included in the DCE. The rationale is that some factors cannot be used in a stated preference method, as respondents need to be able to imagine the situation. The added value for a respondent of, for example, football at school or having a role model is too abstract to include in DCEs. This is why our stated preference method has to be supplemented by a revealed preference method.

Table 1. List of attributes and levels of club factors

Attribute	Club level	Hypotheses
Team composition	Mixed team	-
	Single gender team	+
Distance to club	10 minutes	The less the better
	30 minutes	
	50 minutes	
Staffing	Female coach & female referee	Unknown
	Female coach & male referee	
	Male coach & male referee	
	Male coach & female referee	
Membership type	Less formal: Train whenever you want	Unknown
	Average formal: Train on regular base and playing some non-competitive matches	
	More formal: Train as regular base and play competitive matches	
Friends	Friends come with you to play or already play at the club	+
	Friends do not come with you to play and are not playing at the club yet	-
Indoor/outdoor	Playing at an indoor grass field	Unknown
	Playing on an outdoor grass field	
Membership fee (only for parents)	200 euros	The less the better
	300 euros	
	400 euros	

For the amount of time it takes to reach the football club from home, unequivocal numbers are used instead of ranges, as no optimal technique has emerged to recode these answers because the respondent may subjectively interpret those ranges (Bridges et al., 2011). This selection of 10, 30 and 50 minutes is derived from the geography of Belgium. In general, the average distance to travel to a football club is relatively small compared to other countries, as Belgium is a small country. However, in less densely populated parts of the country, this average distance may be larger, hence the necessity of including a 50 minutes option. The competition types represent differences in how training and matches are organised, ranging from a full recreational to a full competitive setup. Finally, parents of at least one girl are presented with an additional attribute: seasonal membership fee. This is because most children do not pay for their hobbies themselves. Similar to the attribute distance to club, ranges were not used for the attribute membership fee for the same reason.

No-choice option

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In the literature, discrete choice experiments often make the trade-off between including a no-choice option or opting for a forced-choice design (Moor et al., 2020). A no-choice option allows participants to choose neither of the presented scenarios if neither option is sufficiently attractive. Including the no-choice option involves several advantages. First, it is consistent with utility maximisation theory as well as demand theory (Bateman & Großbritannien, 2002). In the context of the utility model, a respondent seeks to maximise his utility at all times. In a discrete choice experiment, indicating the no-choice option will provide greater value than choosing one of the two unattractive hypothetical alternatives (Vermeulen; Goos, & Vandebroek, 2008; Haaijer, Kamakura, & Wedel, 2001). As a result, the final model will provide a more accurate representation of reality. Second, a no-choice option improves statistical efficiency (Louviere, Hensher, & Swait, 2000).

Oppositely, a no-choice option may limit the interpretation of the data, since respondents who are given a no-choice option are more likely to avoid making a decision between two alternatives that are equally valuable to them (Moor et al., 2020). If respondents frequently choose the no-choice option, data for estimating the coefficients of the other attributes are lost (Brazell et al., 2006). In case both options are equally appealing, respondents are asked to still pick one. Due to the important concern of losing information to estimate coefficients, a fourth option ('equally interesting'), is included in this study. When respondents would like to play football in both scenarios but have no preference between the two, this option may be indicated. By adding this additional option respondents will rather answer 'equally interesting' instead of 'none of both' when they want to avoid the decision because it is equally useful to them. In this way, less information is lost, as the random choice for one of the two options by those respondents can be programmed afterwards when processing the data.

Dimensions

To achieve a more efficient design, a Bayesian optimal design method is often used. By using prior preferences of attribute levels, in line with the hypotheses indicated in Table 1, better statistical results can be obtained (Balliau et al., 2021). Thereby, choice sets only contain the most important trade-offs, whereas obvious options are eliminated. For example, if Choice A contains all the hypothetical preferred levels and Choice B contains all the hypothetical worst levels, respondents' utility should always be the highest when selecting Choice A (Kessels et al., 2012). The preliminary information used for this research design is based on the literature, economic theory and interviews.

As the experimental design contains more choice sets than feasible for each individual respondent, two alternative surveys are provided using a balanced incomplete block design (BIBD) (Johnson et al., 2013; Kessels et al., 2011). Blocks are equal-sized partitions of the choice sets in the experimental design (Johnson et al., 2013). Here, two blocks or different surveys were used, randomly but equally assigned to the respondents. In a BIBD, the attribute levels are assigned to the blocks in such a way that each pair of attribute levels appears together in a block equally often. By the selection of three varying attributes in each choice set, the cognitive burden falls and the response rate increases (Kessels et al., 2012).

The actual experimental design is obtained using the JMP Pro 16 software, using a Bayesian D-optimal design in a multinomial logit model (Bridges et al., 2011, Anderson & Wiley, 1992; Kessels et al., 2011). The information discussed in the previous paragraphs has been used as inputs in JMP.

3.2. Revealed preference: Logistic Regression Model

Logistic regression is a classification method with a binomial response variable, which means that the discrete dependent variable can only have two possible values (Willoughby, 2002). The event either happens or not.

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A logistic regression will model the probability of an event or outcome based on individual characteristics (Peng, Lee, & Ingersoll, 2002). In this way, we shed light on the revealed preferences of the survey respondents for those characteristics. Using a logit specification, three different models are estimated, respectively for the probability of a respondent considering playing (Model 1), starting to play (Model 2) and stop playing football (Model 3). The independent variables that impact the respective events are listed in Table 2, in addition to the expected impact (positive or negative), based on Section 2. Models 1 and 2 contain the same independent variables, which are a combination of player-related and socio-demographic variables. Model 3 includes some other independent, club-related variables. The questions to measure those variables have only been asked to respondents who stopped playing football, because the other respondents generally do not have sufficient information about these characteristics.

Table 2. Hypotheses of variables included in logistic regression models

Variable	Consider (1)	Start (2)	Stop (3)
Distance	-	-	+
Role Model (Yes)	+	+	
Peer support (Yes)	+	+	
Negative comments (Yes)			+
Friends (Yes)	+	+	-
School activities (Yes)	+	+	
Youth activities (Yes)	+		
Facilities (Better; Equal; Worse)			- ; 0 ; +
Team compositions (Mixed; (Wo)men only team)			+ ; -
Membership type (Less formal; Average formal; More formal)			Unknown
Indoor vs outdoor (Indoor – Outdoor)			Unknown

Although most of the variables are self-explanatory, some require additional explanation. The variables school and youth activities relate to the question whether the respondent played football at school, (e.g., during PE lessons) and during their spare time. Next, with the inclusion of the variable facilities, this study tries to find out how respondents perceive facility quality, compared to those of the opposite gender, impacts willingness to keep or stop playing. Finally, the variable friends in the third model represents whether respondents have or had friends in their last (or current) year on their football team.

Some model-specific considerations are to be made. The variable role model cannot be included in Model 3, as it might induce reverse causality. Furthermore, peer support info is different in the first two models, compared to the third. In the first two models it is analysed whether people in the close environment encouraged the respondent to play football. In Model 3 however, we assess the impact of any negative comments from people in the close environment related to football.

4. Data Description

The questionnaire is both distributed online through social media and manually collected at primary schools. Table 3 shows the number of surveys that are collected through the different channels.

Table 3. Descriptive statistics of collected surveys.

	Primary School Children	Online Survey Children	Online Survey Parents	Total
Female	96	316	39	451
Male	100	268	35	403

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Total N	196	584	74	854
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For the DCE, the quality of responses can be assessed by evaluating the internal validity of the data. Two repeated choice sets were included where one alternative's attribute levels are all better than the other attribute levels. Respondents who choose the worse alternative were removed from the data, resulting in 651 valid observations for (potential) players and 70 for parents of (potential) players. In Table 4, the descriptive statistics of the DCE participants' gender and role are presented.

Table 4. Descriptive statistics of DCE participants

DCE female players	361	DCE male players	290
Under 18	280	Under 18	231
Over 18	81	Over 18	59
DCE Parents (Mothers)	37	DCE Parents (Fathers)	33
False DCE female players	51	False DCE male players	78
False DCE Parents	2	False DCE Parents	2
N (Female)	451	N (Male)	403

The online questionnaire was distributed using Qualtrics software. This software collects the responses and randomly assigns the questionnaires to the respondents. A sample question is included in Figure 1 and Appendix 1 contains screenshots of the information provided to respondents prior to the start of each experiment.

Figure 1. Example of a choice set for players in Qualtrics.

2/10. In which situation would you be most willing to start playing football?

	Choice A	Choice B
Team composition	Mixed team	Mixed team
Travel time to the club	50 minutes	50 minutes
Staff	Male coach & male referee	Female coach & female referee
Membership type	Train on regular base and playing some non-Competitive matches	Train whenever you want
Friends	A friend comes with you to play or already play at the club	A friend comes with you to play or already play at the club
Indoor vs outdoor	Playing on an indoor grass field	Playing on an outdoor grass field

- Choice A
- Choice B
- No choice
- Equally interesting

Table 5 shows the descriptive statistics for the selected socio-demographic, club- and player-related factors of the total sample for the logistic regression model. It is worth pointing out some significant differences between men and women. There is a large disparity in the presence of a role model among men, the support and negative comments they receive from peers and the perception of a better quality of facilities compared to the other gender.

Table 5. Descriptive statistics of logistic regression model factors.

Model	Women				Men			
	Yes	No	Total		Yes	No	Total	
Consider	203	235	438		311	83	394	
Start	103	100	203		253	58	311	
Stop	22	81	103		85	168	253	
Independent Variables	N	%	Average	Std. Dev	N	%	Average	Std. Dev

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			12.8484	10.6796		11.1419	3.5355
Distance							
Role Model							
Yes	74	16.89%			182	46.19%	
No	364	83.11%			212	53.81%	
Peer support							
Yes	127	29.00%			215	54.57%	
No	311	71.00%			179	45.43%	
Negative comments							
Yes	23	22.33%			19	7.51%	
No	80	77.67%			234	92.49%	
Friends							
Yes	88	85.44%			208	82.21%	
No	15	14.56%			45	17.79%	
Youth activities							
Yes	123	28.08%					
No	315	71.92%					
School activities							
Yes	206	47.03%					
No	232	52.97%					
Facilities							
Better (own gender)	6	5.83%			44	17.39%	
Equal	54	52.43%			183	72.33%	
Worse (own gender)	43	41.75%			26	10.28%	
Team Composition							
Mixed	11	10.68%			18	7.11%	
(Wo)men only	92	89.32%			253	92.89%	
Membership Type							
Less formal	7	6.80%			29	11.46%	
Average formal	39	37.86%			82	32.41%	
More formal	57	55.34%			142	56.13%	
Indoor/Outdoor							
Indoor	4	3.88%			14	5.53%	
Outdoor	99	96.12%			239	94.47%	

Since many respondents who do not play or have not played football could not state the time distance to the nearest football club to their home, this variable was not included in Models 1 and 2.

5. Results and Discussion

Table 6 shows the results of the stated preference method, including the DCE parameter estimates of the attributes and their levels with corresponding p-values for women, men and parents. The parameter estimates indicate the relative effects of the variable with respect to the other variables in the model. In addition, Appendix 2 and Appendix 3 show the results for the DCE for different, separate age categories, which allows for a more detailed discussion.

Table 6.

Estimated utility model for women and men participation in football, as well as parent's perspectives for their daughters

Factor	Women		Men		Parents	
	Estimates	p-value	Estimates	p-value	Estimate	p-value
Team composition [Mixed]	-0.1383	<0.0001	-0.2312	<0.0001	-0.3746	<0.0001
Distance	-0.0310	<0.0001	-0.0305	<0.0001	-0.0440	<0.0001
Staff		<0.0001		0.8314		0.3957
Male coach & Male ref	-0.1928		0.0355		-0.1290	

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Male coach & Female ref	-0.1536		-0.0138		-0.0288	
Female coach & Male ref	0.2062		0.0333		-0.0797	
Female coach & Female ref	0.1402		-0.0550		0.2375	
Membership type		0.0004		<0.0001		0.4594
Less formal	-0.1079		-0.2489		-0.0208	
Average formal	0.1595		-0.1051		0.1155	
More formal	-0.0516		0.3540		-0.0947	
Friends [YES]	0.3767	<0.0001	0.4179	<0.0001	0.3967	<0.0001
Indoor/outdoor [Indoor]	-0.1514	<0.0001	-0.0905	0.02386	-0.3249	<0.0001
Membership fee					-0.0046	0.0001
No-choice ASC	-2.2603	<0.0001	-2.6965	<0.0001	-2.9772	<0.0001
AIC	6348.2635		4677.6284		1346.9163	
BIC	6409.9199		4736.8510		1396.2641	
-2*LogLikelihood	6257.6572		4657.5490		1324.5211	

Notes: A positive sign indicates that respondents receive greater utility from this attribute; p-values for the likelihood-ratio test

All of the attributes in Table 6 are significant for women. However, preferences can be heterogeneous in different subgroups. As seen in Appendix 2, this applies to the attributes team composition, indoor/outdoor and membership type. Adult women have a clear preference for playing in a women only team and outdoor, whereas women under 18 do not. Moreover, adult women prefer to play in a competition where both friendly or competitive matches are played, while minors prefer a more competitive format. This makes it clear that both for team composition and competition type, it is important to offer sufficient different options, so that there is the possibility for everybody to play according to their own preferences.

The estimates of the other variables are in line with our hypotheses: a larger distance to the club lowers utility, having friends who play football is a very important driver of participation. The results also show that the absence of women taking on a role in football significantly lowers the utility.

As a side note, staff composition does not impact men's choices. Distance and friends impact men's utility similarly as women's utility. They also prefer to play outdoor in a men only team. Finally, men clearly prefer a more competitive setting, as opposed to women.

For parents, membership type and staff do not significantly influence the parents' choice of the club for their daughter. Oppositely, the presence of friends does influence parents, as well as their daughter playing exclusively with other girls in the team. Furthermore, both distance and membership fee are crucial factors in parents' decisions, as they prefer them to be as low as possible. Finally, the no-choice alternative specific constant (ASC) is significantly negative for all of the DCE models, confirming that not playing football at all is the least preferred option.

The revealed preference results for both men and women are shown in Table 7 and nicely supplement the insights from the stated preference findings. First, the logistic regression models for women are discussed. The findings of the models that map consider playing and start playing football show that, as expected, peer support is a main determinant. Moreover, offering football activities during spare time can help women to become aware of football as a sport for them. Finally, the factors influencing the decision to stop playing football were assessed and identified. The results show that playing in a mixed team, receiving negative comments from people in the close environment and a non-committing type of membership increase the likelihood of women quitting football.

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Table 7. Regression results: estimated coefficients with standard deviations between brackets

Model	Women			Men		
	Consider (1)	Start (2)	Stop (3)	Consider (1)	Start (2)	Stop (3)
Independent variables						
Constant	0.5747 (0.1815)	-0.1604 (0.1979)	0.7043(1.0038)	1.8766 (0.1915)	1.4660 (0.1626)	1.2516 (0.5483)
Distance			0.0076(0.0255)			0.0097 (0.0174)
Role Model [YES]	0.0038 (0.1685)	-0.2159 (0.1872)		0.7666*** (0.1580)	-0.0949 (0.1583)	
Peer support [YES]	1.216*** (0.1471)	0.7170*** (0.1599)		1.3061*** (0.1776)	0.9375*** (0.1615)	
Negative comments [YES]			0.7389** (0.3542)			0.5498 (0.2989)
Friends [YES]			-0.6080 (0.4091)			-0.5081*** (0.1943)
Youth activities [YES]	0.3349** (0.1536)	0.0753 (0.1962)				
School activities [YES]	-0.2088 (0.1364)	-0.3472* (0.1995)				
Facilities			□			□
[Better]			0.7321 (0.8550)			-0.2549 (0.3014)
[Equal]			-0.4309 (0.5322)			-0.0676 (0.2373)
[Worse]			-0.3012 (0.5498)			0.3225 (0.3497)
Team composition [Mixed]			1.6055*** (0-5037)			0.3089 (0.2901)
Membership type			***]			***]
[Less formal]			1.5683(0.6504)			0.5089* (0.3004)
[Average formal]			-0.0828 (0.4849)			0.4233* (0.2316)
[More formal]			-1.4855(0.5034)			-0.9322* (0.2159)
Indoor/Outdoor [Indoor]			0.0719 (0.6989)			0.8088** (0.3412)
Number of observations	438	203	103	394	311	251
R ²	0.2131	0.1046	0.3285	0.2575	0.1288	0.1692

Notes: A positive sign indicates a greater probability of the dependent variable event taking place. Due to a technical error, the school or youth activities variable could not be collected and included in the models for Men. ***p≤ 0.01; **p≤ 0.05; *p≤0.1

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Regarding the models for men, some differences occur in the consider model and the stop model, compared to women. Having a role model, which occurs more frequently among men, has an additional significant positive impact on considering to start playing football. Furthermore, it appears that the absence of friends who play in your football team and playing indoors increases the likelihood of quitting, rather than the presence of negative comments, which does not happen often to men anyway. Finally, also here, a lack of a formal setting increases the likelihood of quitting. A more formal approach may encourage players to keep going, even if they aren't entirely motivated in that instant, rather than relinquishing their hobby.

To check the robustness of our findings for late response bias, the same models have been re-estimated omitting the last 20 online questionnaires received and one class of a primary school. Appendix 4 and Appendix 5 show that the results of the DCE and the logistic regression models remain qualitatively the same. In addition, as an extra robustness check, the levels 'Better' and 'Equal' of the attribute Facilities have been merged, as only a few female respondents had chosen 'Better'. The absence of an impact on the results is an additional indication of the robustness of our results.

6. Managerial Implications

Based on the estimates presented in Section 5, federations could take action to create the setup in which girls feel most comfortable playing football, leading to increased participation rates by addressing some specific factors. The policies can be further optimised by adapting their football offering to specific age categories.

In order to show policymakers the magnitude of the impact of changing some characteristics of women's football offering, Table 8 shows to what extent the probability changes that a woman prefers playing in a situation involving the second level over one involving the first level, keeping all other attributes equal. Also the impact on parents' decisions is shown for the attributes included in the DCE.

The probability that the situation is chosen where attribute s equals level j is obtained by applying Eq. (1),

$$p_{js} = \frac{e^{X'_{js}\beta}}{\sum_{i=1}^N e^{X'_{is}\beta}}, \quad (1)$$

with X the vector of independent variables, β the vector of parameter estimates and N the total number of levels included in attribute s (Balliau et al., 2021). From this, differences can be estimated.

Table 8. Attribute level preferences, expressed as choice probabilities

Target group	Attribute	Level Change	Probability
Women	Team composition	Mixed → Women only team	+13.7%
Women	Distance	20 minutes → 10 minutes	+15.4%
Women	Staff	Male coach & referee → Male coach & female referee	+0.9%
Women	Staff	Male coach & referee → Female coach & male referee	+10.0%
Women	Membership type	Less formal → Average formal	+9.1%
Women	Membership type	Average formal → More formal	-7.4%
Women	Friends	Without friends → With friends	+35.9%
Women	Indoor/Outdoor	Indoor → Outdoor	+15.0%
Parents of girls	Distance	20 minutes → 10 minutes	+21.7%
Parents of girls	Team composition	Mixed → Women only team	+35.8%
Parents of girls	Friends	Without friends → With friends	+37.7%
Parents of girls	Indoor/Outdoor	Indoor → Outdoor	+31.4%
Parents of girls	Membership fee	€300 → €200	+22.5%

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The impact of attribute changes in a logistic regression model needs to be calculated differently. The change in probability of an event (i.e., consider, start or stop playing football) following a level change depends on the reference situation. However, the resulting change in odds (the probability of the event happening divided by the probability of the event not happening, see Eq. 2), expressed as an odds ratio, is independent of the reference scenario. An odds ratio greater (smaller) than 1 in Table 9 indicates level changes leading to an odds increase (decrease) and hence a probability increase (decrease). The more the odds ratio differs from 1, the greater the impact on the probability of the event happening. Through Eq. 3, odds can be converted into probabilities, as this is more indicative for managers. This is shown in Table 10 for illustrative reference scenarios.

$$\text{Odds of event} = e^{X'\beta} = \frac{\text{Probability of event happening}}{1 - \text{Probability of event happening}} = \frac{\text{Probability of event happening}}{\text{Probability of event not happening}} \quad (2)$$

$$\text{Probability of event} = \frac{\text{Odds of event}}{1 + \text{Odds of event}} \quad (3)$$

Table 9. Odds ratios of different attribute level changes.

Target group	Attribute	Model	Level Change	Odds Ratio
Women	Peer support	Consider	No peer support → Peer support	11.38
Women	School or youth activities	Consider	None → Football activities in spare time	1.95
Women	Peer support	Start	No peer support → Peer support	4.20
Women	Negative comments	Stop	No negative comments → negative comments	4.38

Table 10. Probability change following a level changes from the reference scenario.

Target group	Attribute	Model	Level Change	Δ Probability
Women	Peer support	Consider	No peer support → Peer support	+54.3%
Women	School or youth activities	Consider	None → Football activities in spare time	+13.9%
Women	Peer support	Start	No peer support → Peer support	+30.0%
Women	Negative comments	Stop	No negative comments → negative comments	+6.6%

Note: The probability changes are calculated in reference to the situation in all of the 3 logistic regression models where every attribute is set to the level resulting in the lowest probabilities. For distance, 25 minutes is taken as the base level.

The baseline probabilities are 23.4% (consider), 18.0% (start) and 2.1% (stop).

Tables 8-10 show many factors that influence the choice of women to play football, with friends and peers exerting the greatest influence. Additionally, the presence of a female coach or referee is important as well. To this end, football federations could set up recruitment campaigns to reach, convince and integrate women into the current football landscape as coaches or referees. Examples include current initiatives of the RBFA to draw up a plan with the Referee Department to attract 50% more female referees by 2024, as well as working with regional federations to get at least 30 female coaches started each year.

As girls grow older there is a shift in preferences of membership types. Girls prefer to play in a competitive league whereas adult women seem to enjoy playing in a more recreational environment, probably due to changes in their private and professional life. Creating teams of different levels within a club brings the opportunity to both attract and keep engaging players.

Furthermore, the initiation of football outside a football club can offer an opportunity to bring football to girls. If children can discover football in their spare time, participation rates might increase. Love

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Football of the Belgian FA is such an initiative that involves girls in football in a fun way (RBFA, 2019). This could well be one of the reasons for the growing number of female members in Belgium.

Finally, the composition of a team can influence women's participation. Women under 18 have no clear preference for playing in a mixed or women only team, while for women over 18, women only teams are clearly preferred. Additionally, playing in mixed teams is a determining factor for women to stop playing football. As of a certain age, playing with men is no longer officially allowed. Hence, if no women's teams are around, it is not surprising that this will force women to stop playing football. Providing the opportunity to start in a mixed team as well as a women's team, but also offering the possibility to make the transition to a women's team after a certain age can ensure that more girls start and continue playing football.

Also to convince parents to let their daughters play football, the possibility of playing in a girls' only team is important. For these parents, a small distance to the club, the ability to play outdoor and lower membership fees are other important requirements.

7. Conclusions, Limitations and Future Research

Until now, it has been unclear to what extent certain factors influence women's football participation. This paper fills this gap through a discrete choice experiment and logistic regression models, in this way combining both stated and revealed preferences of involved football stakeholders to empirically estimate impacts in a quantitative way.

We find that for women, the presence of peer support is a decisive factor to start playing football. In addition, factors such as proximity of a football club, female staff members and officials, friends and an opportunity to play both in a mixed team or women only team, outdoors and at different levels of formal organisations, are likely to increase women's participation rates. Negative comments for women about their football activities however can have a detrimental impact on the continuation of their football participation. Organising football activities outside of a club can also help to make girls aware of football as a sport for them. Finally, lower participation fees might help convince their parents to enrol their girls in a football club.

As in all studies, some limitations exist that give rise to avenues for future research. First, the scope of this study is limited to Belgium. Follow-up studies in other countries may help to further generalise the results to other countries. Second, the results and implications should not be implemented without considering other factors, as decisions regarding women's football could have an impact on men's football as well. If, for example, mixed teams are implemented as a starting point for all children, the actual effect of this decision on boys' participation should also be investigated. For instance, this study shows that although girls want to play on both mixed and girls' only teams, boys prefer to play in a boys' only team. Although it was not possible to include media coverage in this study due to the difficulty to measure it accurately for the individual respondents, a future, more in-depth analysis of the impact of the shift in media coverage of women's football would be useful. Further research could examine how to study these variables and subsequently determine its impact on participation.

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Appendix 1. Screenshots of survey in Qualtrics

Start of the survey:

Dear respondent,

Thank you for your interest in the study on factors impacting the participation rate among women in football and the differences with men. You will be asked to choose between two hypothetical situations in which you would be most inclined to start playing football. Please always indicate whether you prefer option A or B. If neither option appeals to you, you may select 'No choice'. If both options appeal to you equally, please select the option 'Equally interesting'.

Please note that the data will be processed anonymously.

Instructions for player related choice sets:

You will be asked to choose between 2 situations in which you would be most likely to start playing football.

Please read the following explanation carefully before starting the survey. A hypothetical situation is created for a football club and is determined by a number of characteristics. The two choices you will see differ according to the options assigned to these characteristics. An overview of the characteristics and their corresponding options is given below:

Team composition:

- Mixed team: you play in a team with both boys and girls.
- Girls' only team: you play in a team with only girls

Coaching: The coaching consists of a

- Female coach & female referee
- Female coach & male referee
- Male coach & male referee
- Male coach & female referee

Distance (Travel time to the club): This indicates how long it takes to get to the football club.

- 10 minutes
- 30 minutes
- 50 minutes

Membership type: This factor looks at how you would like your training sessions and matches to be organised. Different alternatives are proposed based on training attendance and match level.

- Join training when you want
- Participate in training sessions on a regular basis and play matches just for fun
- Join all training sessions and play in a league where you want to finish as high as possible

Friends:

- A friend will play football in your club or a friend is already playing
- There is no friend who will play or a friend who already plays

Indoor vs outdoor: You have the possibility

- To play on a grass pitch indoors
- On a grass pitch outside

WHAT DRIVES WOMEN'S PARTICIPATION IN FOOTBALL?

Instructions for parents related choice sets

You will be asked to choose between two situations in which you would be most inclined to let **your daughter** start playing football.

Please read the following explanation carefully before starting the survey. A hypothetical situation is created for a football club and is determined by a number of characteristics. The two choices you will see differ according to the options assigned to these characteristics. An overview of the characteristics and their corresponding options is given below:

Team composition:

- Mixed team: your daughter plays in a team with both boys and girls.
- Girls' only team: your daughter plays in a team with only girls

Coaching: The coaching consists of a

- Female coach & female referee
- Female coach & male referee
- Male coach & male referee
- Male coach & female referee

Distance (Travel time to the club): This indicates how long it takes to get to the football club.

- 10 minutes
- 30 minutes
- 50 minutes

Membership type: This factor looks at how you would like your daughter's training sessions and matches to be organised. Different alternatives are proposed based on training attendance and match level.

- Join training when your daughter wants
- Participate in training sessions on a regular basis and play matches just for fun
- Join all training sessions and play in a league where you want to finish as high as possible

Friends:

- A friend will play football in your daughter's club or a friend is already playing
- There is no friend who will play or a friend who already plays

Indoor vs outdoor: Your daughter has the possibility

- To play on a grass pitch indoors
- On a grass pitch outside

WHAT DRIVES WOMEN'S PARTICIPATION IN FOOTBALL?

Appendix 2. Estimated utility model for female participation in football (under and over 18)

Factor	Under 18		Over 18	
	Estimates	p-value	Estimates	p-value
Team composition [Mixed]	-0.02247	0.4778	-0.4945	<0.0001
Distance	-0.0282	<0.0001	-0.0351	<0.0001
Staff		<0.0001		0.0181
Male coach & Male ref	-0.3751		-0.0612	
Male coach & Female ref	-0.0046		-0.3046	
Female coach & Male ref	0.1196		0.2942	
Female coach & Female ref	0.2601		0.0716	
Membership type		0.0113		<0.0001
Less formal	-0.1596		-0.1337	
Average formal	0.0741		0.4047	
More formal	0.0855		-0.2710	
Friends [YES]	0.3832	<0.0001	0.4715	<0.0001
Indoor/outdoor [Indoor]	-0.0239	0.5451	-0.4747	<0.0001
No-choice ASC	-2.2674	<0.0001	-2.2829	<0.0001
AIC	5005.1533		1253.2108	
BIC	5064.4482		1298.9755	
-2*LogLikelihood	4985.9744		1232.9090	

Appendix 3. Estimated utility model for male participation in football (under and over 18)

Factor	Under 18		Over 18	
	Estimates	p-value	Estimates	p-value
Team composition [Mixed]	-0.2406	<0.0001	-0.8032	<0.0001
Distance	-0.0311	<0.0001	-0.0485	<0.0001
Staff		0.6595		0.1369
Male coach & Male ref	0.0122		0.1473	
Male coach & Female ref	0.0707		0.1910	
Female coach & Male ref	-0.0183		-0.2595	
Female coach & Female ref	-0.0646		-0.0788	
Membership type		<0.0001		0.0002
Less formal	-0.2370		-0.5811	
Average formal	0.0073		0.1519	
More formal	0.2297		0.4292	
Friends [YES]	0.4938	<0.0001	0.6883	<0.0001
Indoor/outdoor [Indoor]	-0.1404	0.0018	-0.1960	0.0486
No-choice ASC	-2.6548	<0.0001	-3.1297	<0.0001
AIC	3715.6581		808.0464	
BIC	3772.6111		850.9250	
-2*LogLikelihood	3695.5585		787.6457	

Appendix 4. Estimated utility model for DCE of women, men and parents, omitting the last 20 online survey participants

Factor	Women		Men		Parents	
	Estimates	p-value	Estimates	p-value	Estimate	p-value
Team composition [Mixed]	-0.1423	<0.0001	-0.2464	<0.0001	-0.3848	<0.0001
Distance	-0.0313	<0.0001	-0.0304	<0.0001	-0.0430	<0.0001
Staff		<0.0001		0.9029		0.3623
Male coach & Male ref	-0.2047		0.0342		-0.1336	
Male coach & Female ref	-0.1290		0.0099		-0.0476	
Female coach & Male ref	0.2052		-0.0118		-0.0817	
Female coach & Female ref	0.1285		-0.0323		0.2629	
Membership type		0.0022		<0.0001		0.4976
Less formal	-0.1151		-0.2509		0.0024	

WHAT DRIVES WOMEN'S PARTICIPATION IN FOOTBALL?

Average formal	0.1440		-0.1191		0.0992	
More formal	-0.0289		0.3700		-0.1016	
Friends [YES]	0.3645	<0.0001	0.4245	<0.0001	0.3597	<0.0001
Indoor/outdoor [Indoor]	-0.1351	0.0002	-0.1040	0.0134	-0.2937	<0.0001
Membership fee					-0.0046	0.0003
No-choice ASC	-2.2464	<0.0001	-2.7440	<0.0001	-2.9532	<0.0001
AIC	5916.8714		4199.9659		564.4825	
BIC	5977.7601		4258.1983		605.3048	
-2*LogLikelihood	5896.8041		4133.4398		543.6758	

Notes: A positive sign indicates that respondents receive greater utility from this attribute; p-values for the likelihood-ratio test

WHAT DRIVES WOMEN'S PARTICIPATION IN FOOTBALL?

Appendix 5. Logistic regression results, omitting the last 20 online survey participants

Model	Women			Men		
	Consider (1)	Start (2)	Stop (3)	Consider (1)	Start (2)	Stop (3)
Independent variables						
Constant	0.6691(0.1983)	-0.0739(0.2060)	1.1545(1.1139)	1.8730(0.1944)	1.6253(0.1795)	1.2070(0.5750)
Distance			0.0044(0.0263)			0.0124(0.0179)
Role Model [YES]	-0.0400(0.1870)	-0.2493(0.1998)		0.7482*** (0.1657)	-0.0908(0.1712)	
Peer support [YES]	1.292*** (0.1601)	0.7188*** (0.1689)		1.2006*** (0.1803)	0.9942*** (0.1779)	
Negative comments [YES]			0.7625** (0.3454)			0.4898(0.3076)
Friends [YES]			-0.5713(0.4037)			-0.5138*** (0.1985)
Youth activities [YES]	0.4187* (0.1648)	0.1677(0.2059)				
School activities [YES]	-0.1981(0.1426)	-0.3170(0.2057)				
Facilities						
[Better]			0.3820(0.8799)			-0.1789(0.3044)
[Equal]			-0.2037(0.5491)			-0.0932(0.2431)
[Worse]			0.1783(0.5586)			0.2721(0.3619)
Team composition [Mixed]			1.5978*** (0.4925)			0.3545(0.3130)
Membership type						
[Less formal]			1.8449(0.6673)			0.5005(0.3008)
[Average formal]			-0.2471(0.4939)			0.4021(0.2348)
[More formal]			-1.3253(0.5001)			-0.9026(0.2177)
Indoor/Outdoor [Indoor]			-0.0719(0.7256)			0.7833** (0.3403)
Number of observations	403	189	101	361	290	239
R ²	0.2308	0.1057	0.3323	0.2350	0.1392	0.1540

Notes: A positive sign indicates a greater probability of the dependent variable event taking place. ***p≤0.01; **p≤0.05; *p≤0.