Sport England: Understanding variations in participation between sports

August 2010

Background & Objectives

Background

- Sport England is focused on the creation of a world-leading community sport system

  – Investing to grow and sustain participation in grassroots sport

  – Collaborating with partners at a national and local level

  – Targeting an additional 1 million people doing more sport by 2012-13

- As part of this objective, Sport England has commissioned a series of robust quantitative models aimed at better understanding the factors which account for variations in sports participation, and thereby identify the levers most amenable to public policy intervention
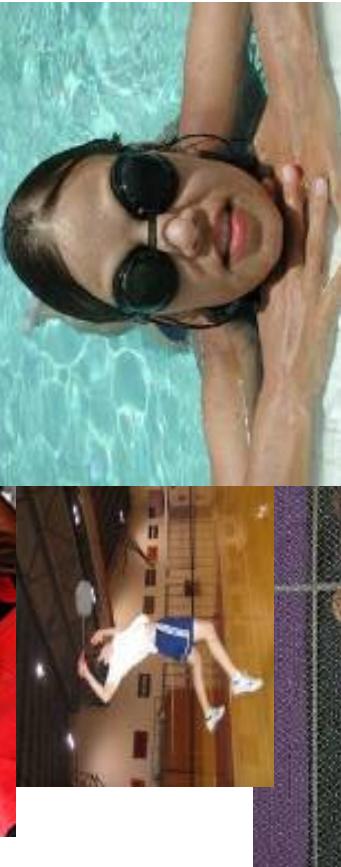
Specific research objectives for the project

- A strengthened theoretical framework for understanding variations in participation in sport

- Robust quantitative models that test

  – the impact of various inputs, and activities on participation

  – the nature and strength of relationships between a range of outputs and the intended outcome

- Illustration of those factors that on their own, or in combination, make the best public policy 'buy' to grow and sustain community participation in sport

Modelling technique for the sports models

Analysis of sample based on proportion achieving criteria listed

0.5%	Cricket once a week x 30 minutes
7.6%	Swimming once a week x 30 minutes
21.5%	NI8 – At least 3 days a week x 30 minutes moderate participation (all adults)
52.6%	NI8 – At least 1 day of 30 minutes moderate participation (all adults)
100%	All respondents
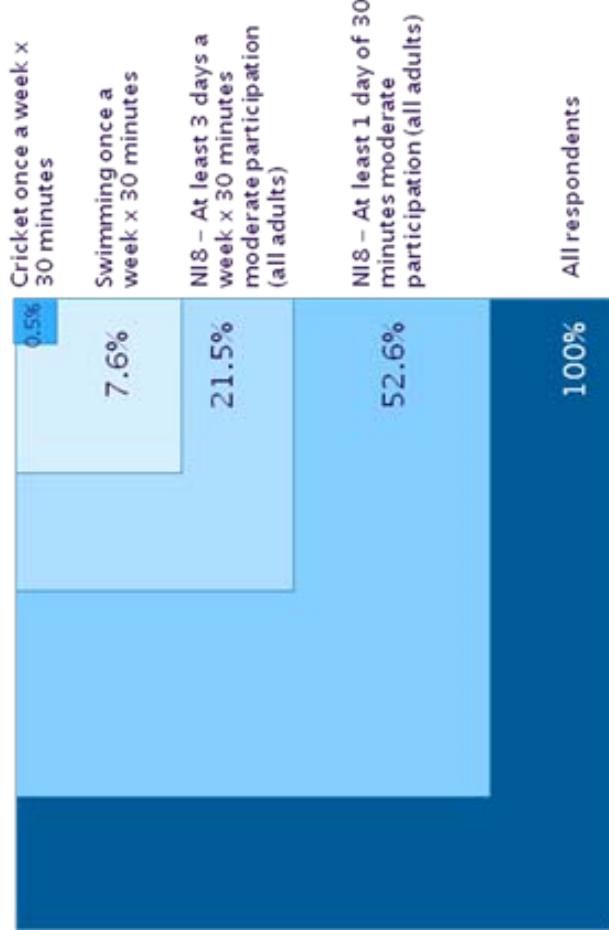
Within the modeling of individual sports, participation rates are typically much lower than for a measure of overall sports participation. Within the 11 sports that we have analysed, participation rates (at least once a week) vary from 7.6% in Swimming to 0.5% in the case of Cricket. In the region of 90-95% of respondents will not have participated in a particular sport. This is problematic for the purposes of the modeling, as it skews the dataset within each sport towards people who have not participated in the sport.

We have therefore used a two-stage estimation procedure to take account of the selection bias. In the case of all 11 sports, we have first built a selection model. This model identifies those who engage in at least some sport – taken to be at least 1 session over the last four weeks that is within the definition used for the 1 million indicator. The second stage of the modeling involved building a separate model for each sport to understand what the drivers of frequency of participation are. We have used frequency rather than a discrete dummy variable due to the additional detail that the frequency data provides and the application that this has to policy

The sports models are made up of two stages

Stage 1: Selection Model to identify those who achieve a basic level of activity. This is defined as at least one "1 million indicator" session in last 4 weeks

i.e. people who do at least some sport in the last 4 weeks

This makes it easier for us to then understand the drivers of participation in a particular sport in greater detail than by starting with the general population.

.
Stage 2: Outcome Model to identify drivers of *frequency* of participation amongst active respondents.

i.e. of people who do at least some sport, what makes them do a particular sport and what makes them do a greater number of sessions

Club based sports have an additional "mezzanine" layer to explain the drivers of club membership

For the four club based sports of football, rugby union, rugby league and cricket, we have taken the approach of building an additional "mezzanine" model which seeks to explain the drivers of being a club member in each of the sports.

This is because for these sports, club membership is by far the biggest driver of frequency of participation, but by itself, it does not tell us enough about why people play more of the sport. Most of these sports require membership of a club in order to reach the critical mass normally required to be able to play, so we need to understand what the drivers of club membership are as well as the drivers of frequency of participation

Stage 1: Selection Model to identify those who achieve a basic level of activity. This is defined as at least one "1 million indicator" session in last 4 weeks

Stage 2: Outcome Model to identify drivers of *frequency* of participation amongst active respondents.

Stage 3: Mezzanine model to identify drivers of club membership for club sports

SPORT ENGLAND   MINDSHARE

Around 42% of the respondents in the sample have done at least one "1 million indicator"* session over past 4 weeks

Number of 1 million indicator sessions over past 4 weeks
% of sample
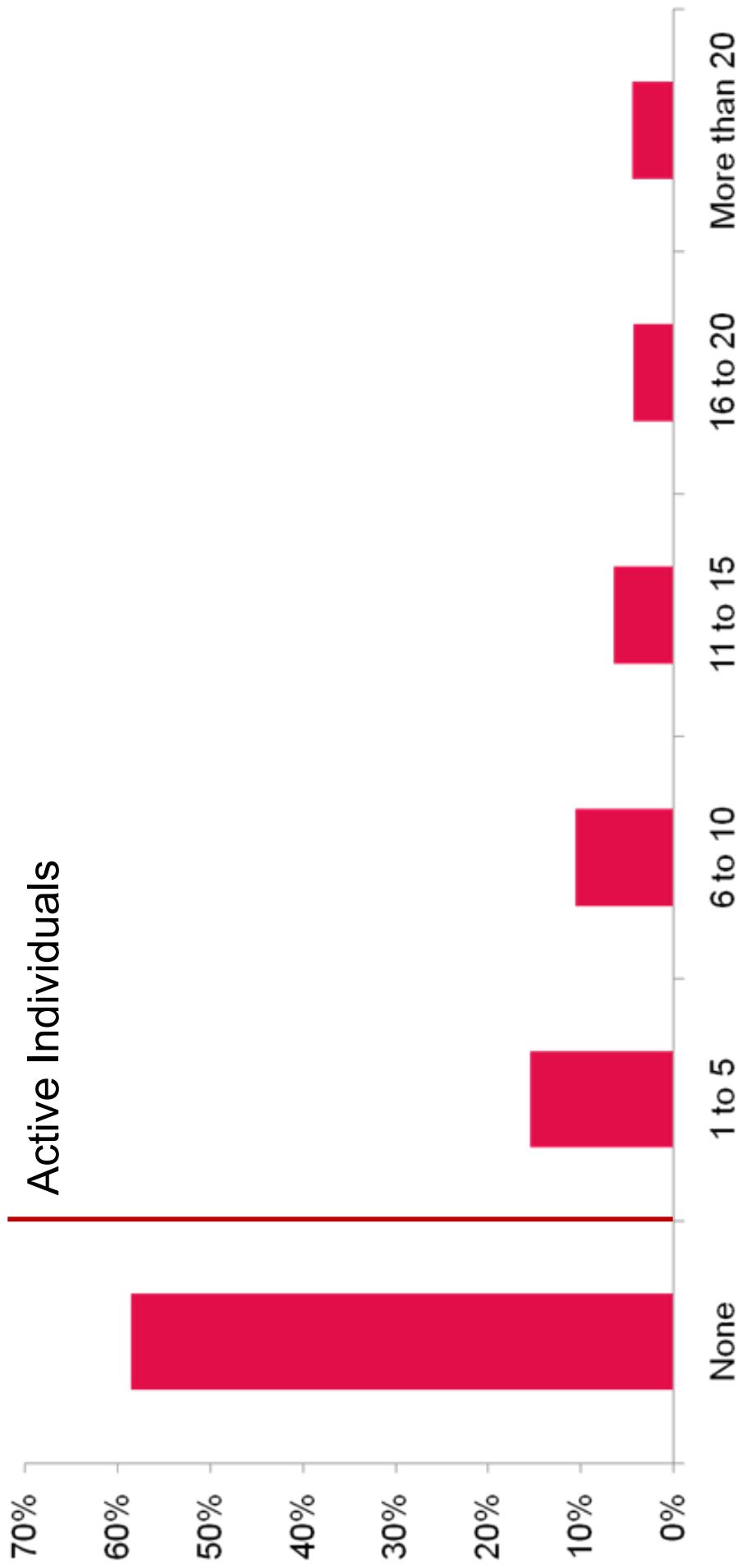
*The '1 million indicator' is linked to Sport England's 'grow' strategic outcome for it's 2008-2011 strategy. Within the 'grow' outcome, Sport England is committed to delivering one million people doing more sport by 2012/13, as measured by Sport England's Active People Survey.

We have looked at which drivers apply in one or the other or both of models

- Where drivers appear in both models we have looked at their combined impact as well as the impact that they have for one sport vs. other sports

Selection model
(Drivers of a basic level of activity)*

Drivers in both models
(Drive both activeness and frequency)

Outcome model
(Drivers of frequency of participation in a particular sport)
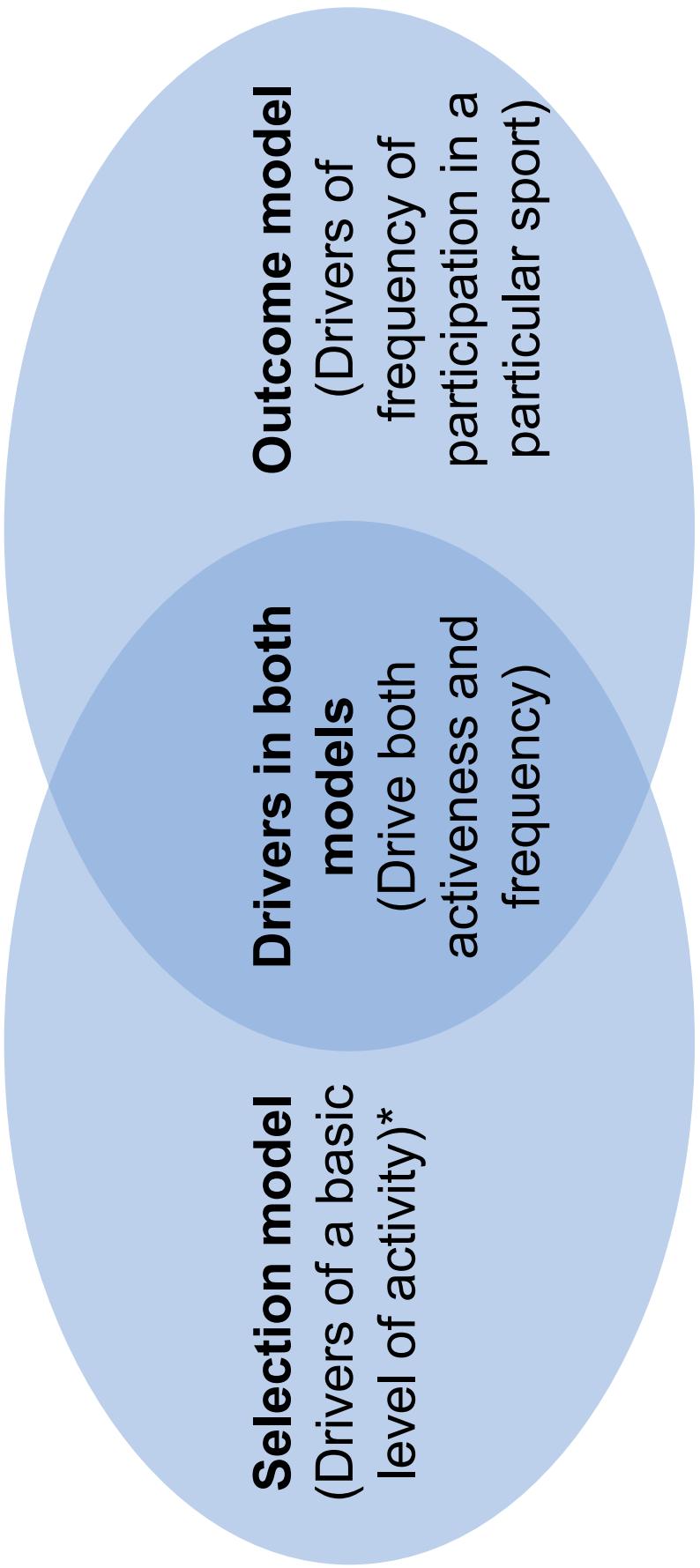
*Basic level of activity is defined as at least one "1 million indicator" session in last 4 weeks

The drivers in the selection model (participation in sport in general) are primarily demographic

| Variable	Impact
Higher Education not at degree level	Positive
A-Levels	Positive
5 or more GCSEs	Positive
Attended cultural events over the last year	Positive
Number of children in household	Positive
Average temperature	Positive
Income Level	Positive
Own Ethnic Percent	Positive
Average GCSE score in Local Authority	Positive
Cultural Events	Positive
Single adult household	Positive
Number of children in household (less than 4)	Positive
Male	Positive
% of people earning same income level	Positive
Live in council housing	Negative
Asian Ethnicity x Age	Negative
Car Van Available	Negative
Age	Negative
Illness	Negative
Deprivation Index	Negative
Own home outright	Negative
Four or more adult household	Negative

Findings from the models

Guide to this presentation

- This presentation illustrates the key findings from the individual sport models, which attempts to draw out the factors that influence how often they participate in a sport

- For tennis and athletics, we have graphed the drivers of participation in the model to show the impact each has on frequency of participation (as these sports were the focus of two separate sport case studies as part of the project)
  - As bar charts or scattergrams for "dummy variables" (factors that are either drivers or not and there is nothing in between, like living in a certain area or gender)
  - As best fit lines for factors which change the more or less they are present (e.g. age, temperature)

- For all other sports, we have supplied a table which depicts the impact of each variable on increasing the frequency of participation, or in the case of the club based sports, increasing the probability of club membership

- Where appropriate we have supplied commentary to the findings through text boxes

- There are a few key points to bear in mind when reading these charts
  - Wherever the impact of a driver is shown, we have controlled for all other drivers. In other words, we show where factors drive participation all other things being equal
  - The charts show the impact on the probability of meeting the NI8 criteria, not the number of people who participate in sport that fall within a certain group

- There is further information on the methodology used in the modeling and the findings of the models themselves in the full technical report

Athletics: overview

NB: Athletics is primarily composed of running – around 95% of all Athletics is road or cross country running.

Drivers of frequency of athletics participation

■ Athletics model   □ Overall combined impact

Whilst car ownership reduces the amount of running, it increases the probability of doing at least one session of sport

| Category	Athletics model	Overall combined impact
Male	0.15	0.75
Degree	0.31	0.45
Own Home Outright	-0.11	-0.04
Access to car	-0.22	-0.07
Gym Member	-0.22	
Asian	-0.58	
Illness	-0.25	-0.39
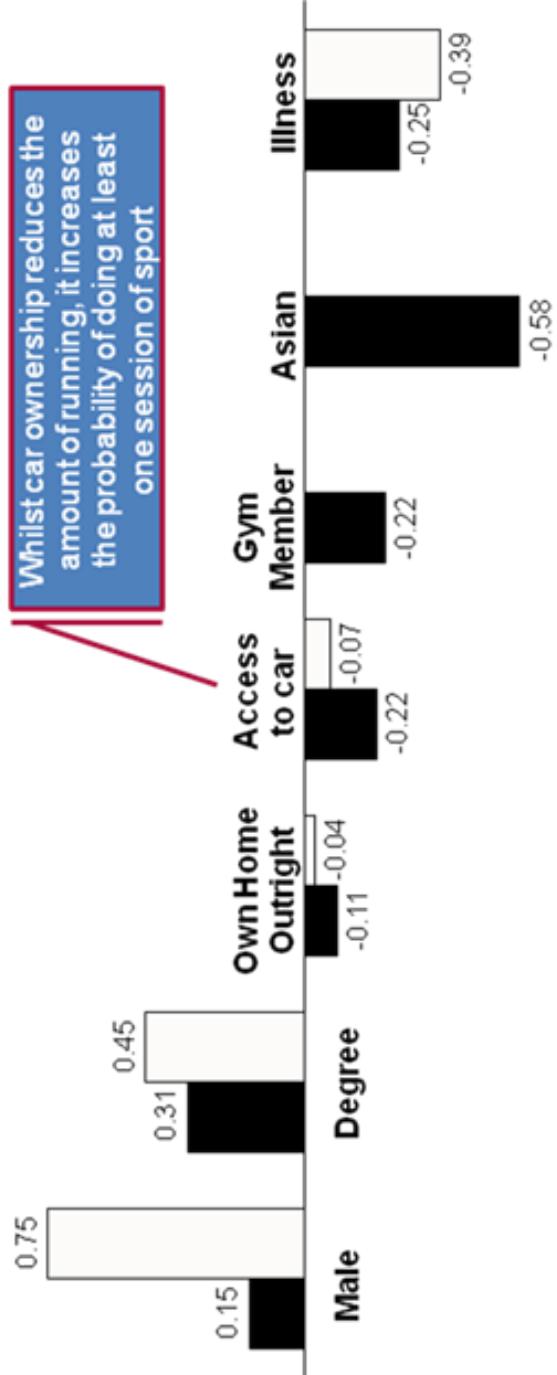
- The chart above shows the combined impact of various factors from both the selection model and the athletics model ("the outcome model") on driving frequency of participation

- Asian people tend to participate in Athletics significantly less often than other ethnicities.

- Gym membership has a negative impact on running frequency, with members running 0.29 days less than non-members. This suggests a substitution effect, active individuals choosing either the gym or athletics as alternative ways of keeping fit.

- Higher education is an important positive driver of frequency – above and beyond the effect that it has on determining whether an individual participates in sport. Combining the two effects, it is estimated that higher education to degree level increases the number of days of Athletics by 0.45 days over four weeks.

Athletics: effect of age

Incremental number of Athletics Days
Amongst Active People
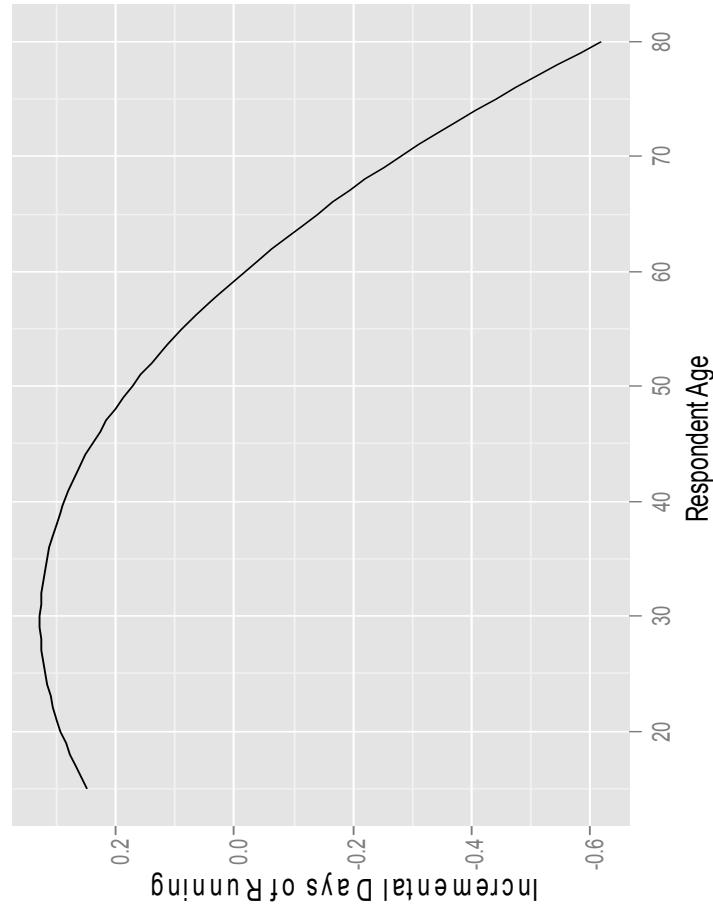
**Incremental number of Athletics Days**
All People
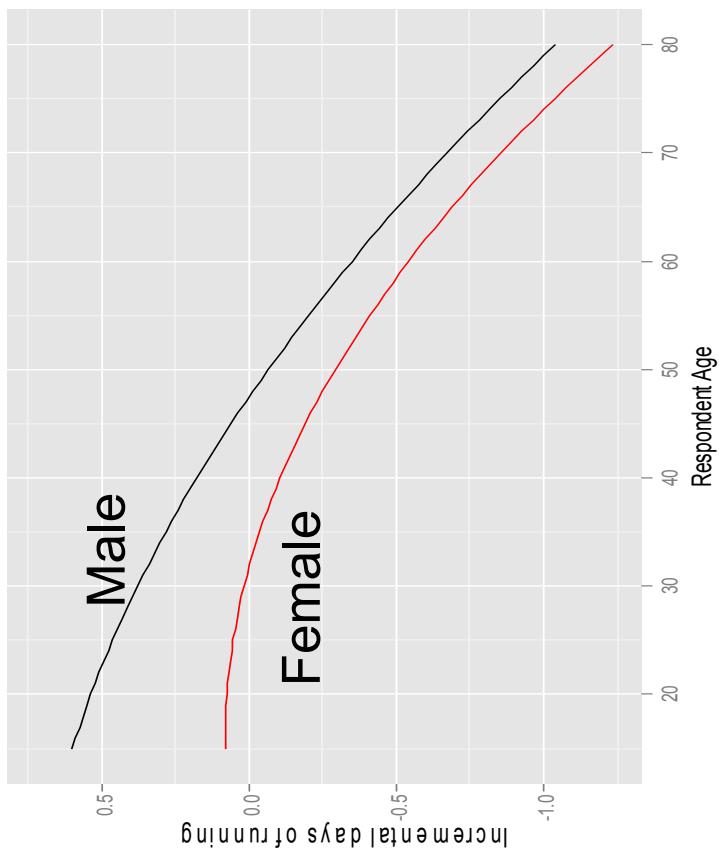
- The age of the respondent is a significant driver of frequency of participation, with Athletics frequency amongst active individuals peaking in the thirties before declining. However, when combining this result with how age influences whether an individual is active, the overall impact of the two is that running frequency tends to decline with age.

Athletics: distance to running club

Incremental number of Athletics Days
Amongst Active People

Incremental Days of Athletics (y-axis): 0.05, 0.10, 0.15, 0.20

Number of clubs within 20km (x-axis): 5, 10, 15, 20
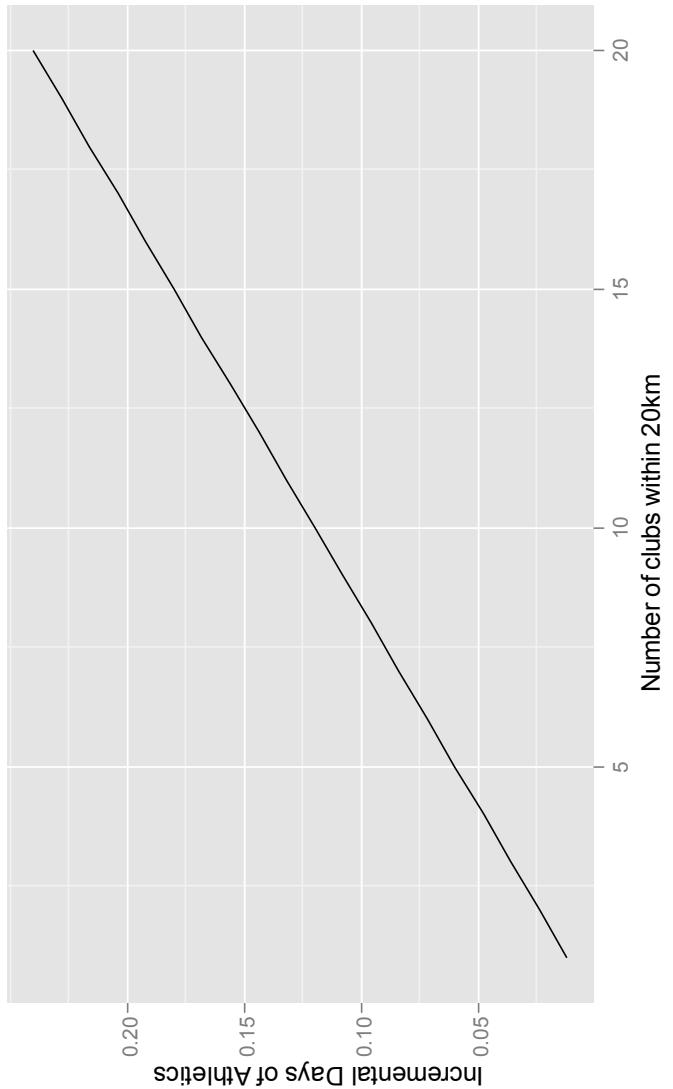
Number of running clubs within 20km

- The club network is a particularly important area within the range of possible interventions. From the modeling, the number of clubs within 20km of an individual has a significant positive influence on participation.

- While the structure and training offered by a club are likely to improve participation rates for those people who join the club, most people who run are not members of a running club (less than 10% of people who have run once in the last week are club members). However, even non-club members are likely to run more often by virtue of living near a club. We can hypothesize from this that clubs catalyse participation in local areas, perhaps by boosting the visibility of running in an area

- For more detail and qualitative findings please refer to the separate athletics case study

SPORT ENGLAND   MINDSHARE

the futures company

the coming together of
Henley Centre HeadlightVision
and Yankelovich

Tennis: effect of age (compared to athletics)

Incremental number of Tennis Days
Amongst active respondents
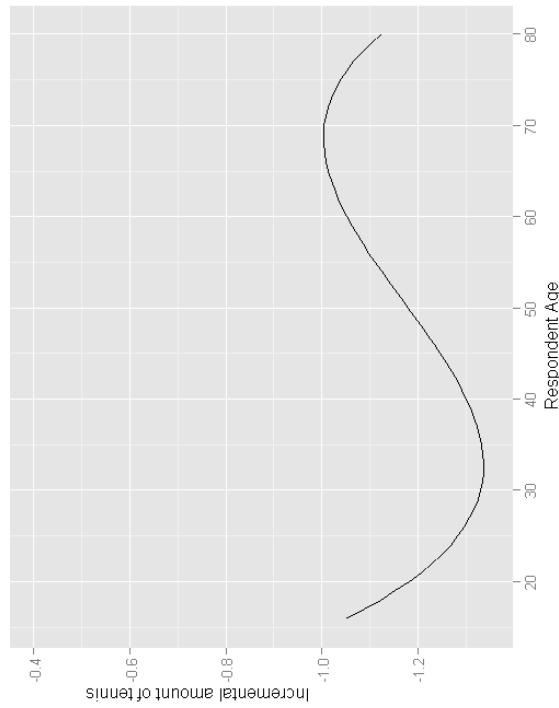
(COMPARISON)

Incremental number of Athletics Days
Amongst active respondents
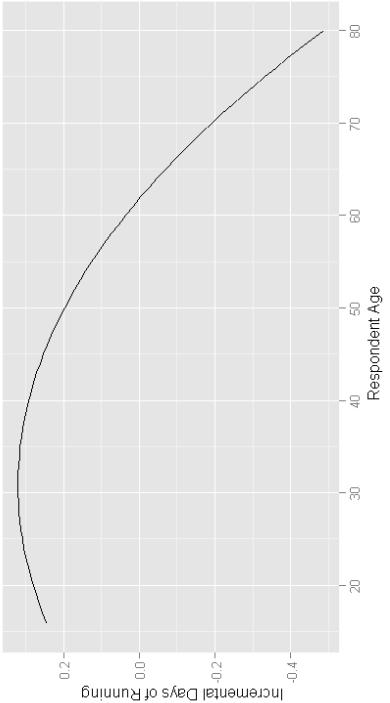
- The modelling work found that active people who are younger than 20 or in their late 40s to late 60s, play tennis more often (see diagram on left hand side). We can see how different this is to running by comparing the drivers of participation by age (running peaks in the early 30s then recedes with age).

- The "double peak" within the graph indicates reengagement with tennis at an older age. This appears partly due to the adaptability of a sport like tennis, which enables people to play at a level appropriate to their age and fitness level

Tennis: overview

Drivers of frequency of tennis participation

	Black	Grey
Has attained a degree	0.07	0.12
Has attained A Levels	0.04	0.06
Own own home outright	0.03	0.06
Gym Member	-0.06	-0.07
Illness	-0.06	-0.10
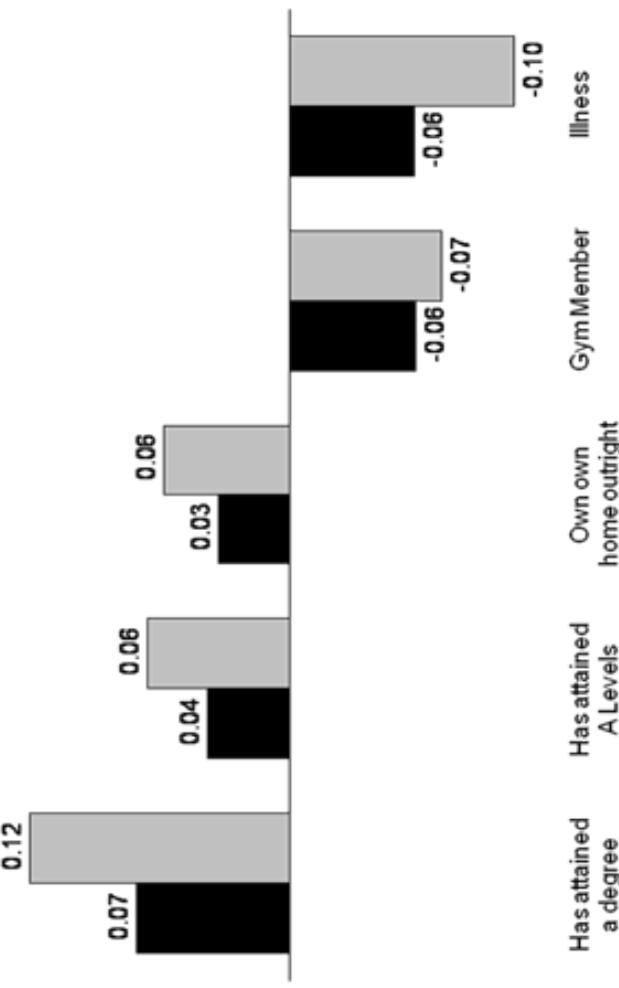
Incremental days of tennis
Versus Professional Occupations

Occupation	Value
Managerial and Technical Occupations	-0.03
Skilled Occupations - Non Manual	-0.05
Skilled Occupations - Manual	-0.08
Partly Skilled Occupations	-0.08
Unskilled Occupations	-0.12
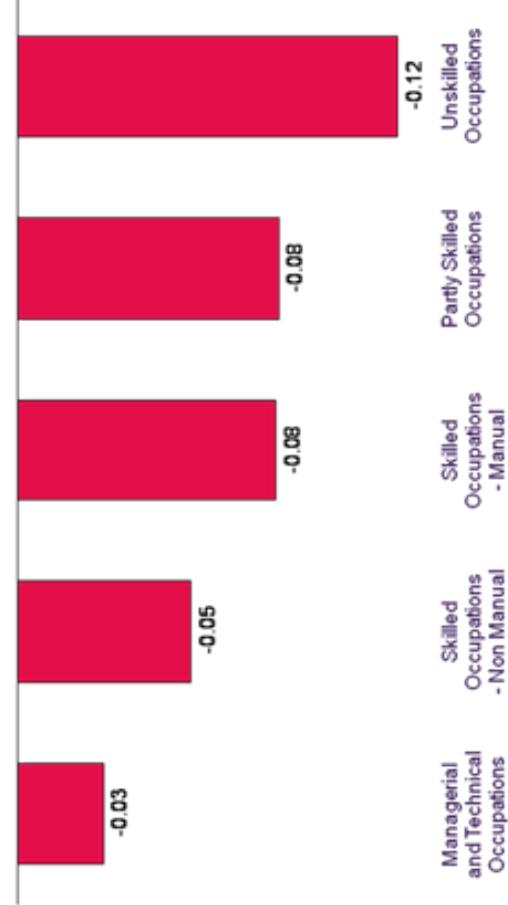
- The other key drivers of increased participation in tennis are:
  - Having a degree level education and/or A levels
  - Working in a professional occupation (which may be a proxy for social class)
  - Living in a Local Authority with a denser population
  - Having older children rather than younger children
- For more detail and qualitative findings please refer to the separate tennis case study

Rugby league: drivers of frequency of participation

Drivers of frequency of participation: incremental days

Chart categories (with Combined Effect and Outcome Model Results values):

| Driver	Combined Effect	Outcome Model Results
SE Region: Yorkshire	0.00	0.02
SE Region: West Midlands	0.00	0.00
SE Region: South West	0.00	0.00
SE Region: South East	0.00	0.01
SE Region: North West	0.00	0.01
SE Region: North East	0.00	0.00
SE Region: London	0.00	0.01
SE Region: East Midlands	0.00	0.01
Household Income: £52,000 or more	-0.02	-0.02
Household Income: £36,400 to £51,999	-0.01	-0.01
Household Income: £31,200 to £36,399	-0.01	-0.01
Household Income: £26,000 to £31,199	-0.01	-0.01
Household Income: £20,800 to £25,999	-0.01	-0.01
Household Income: £15,600 to £20,799	-0.01	-0.01
Attained a degree-equivalent qualification	0.00	0.00
Male	0.06	0.04
Rugby League Club Member	0.00	6.59

Legend: ■ Combined Effect ■ Outcome Model Results

- Other than club membership (the biggest driver of participation), the key drivers of Rugby League participation are region: those who live in Yorkshire and the North West tend to play more often than elsewhere. Men also play more often than females, with frequency of participation falling as age increases. Those who are in households with higher incomes tend to play less often than those with lower incomes.

- The distance to Clubmark Rugby League Clubs and Active Places relating to Rugby League were also tested in our model. However and more so than other sports, the locations of both Clubmark clubs and Active Places is likely to be demand driven and closely related to areas closely associated with traditionally playing Rugby League. It was not unexpected then that both were found to be insignicant when tested.

Rugby league: drivers of club membership ('mezzanine' model)

Drivers of club membership
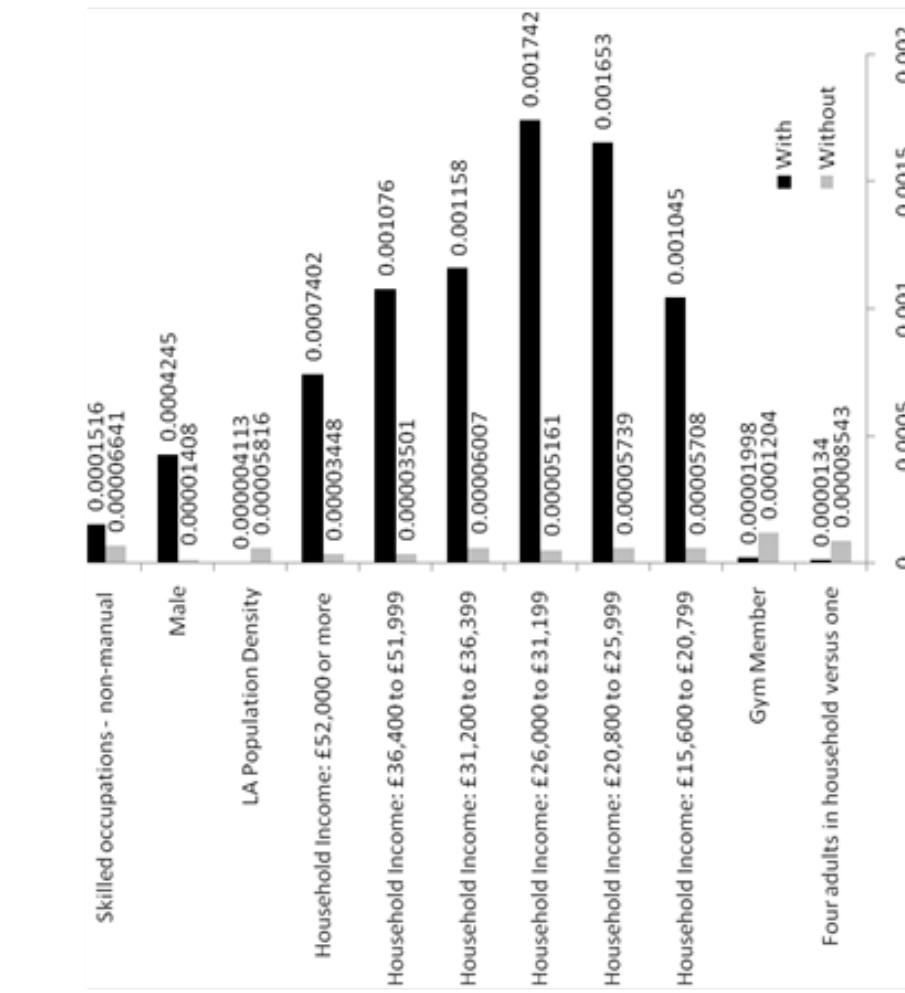
- Household income and being male both have a positive impact on the probability of an individual being a member of a rugby league club (income having the most positive impact around the middle income brackets). In addition, those who work in unskilled and manual skilled occupations are more likely to be members. The probability of being a member of a club falls as age increases (which is in line with both Football and Rugby Union club membership), as does being a member of a gym.

Rugby union: drivers of frequency of participation

Drivers of frequency of participation: incremental days
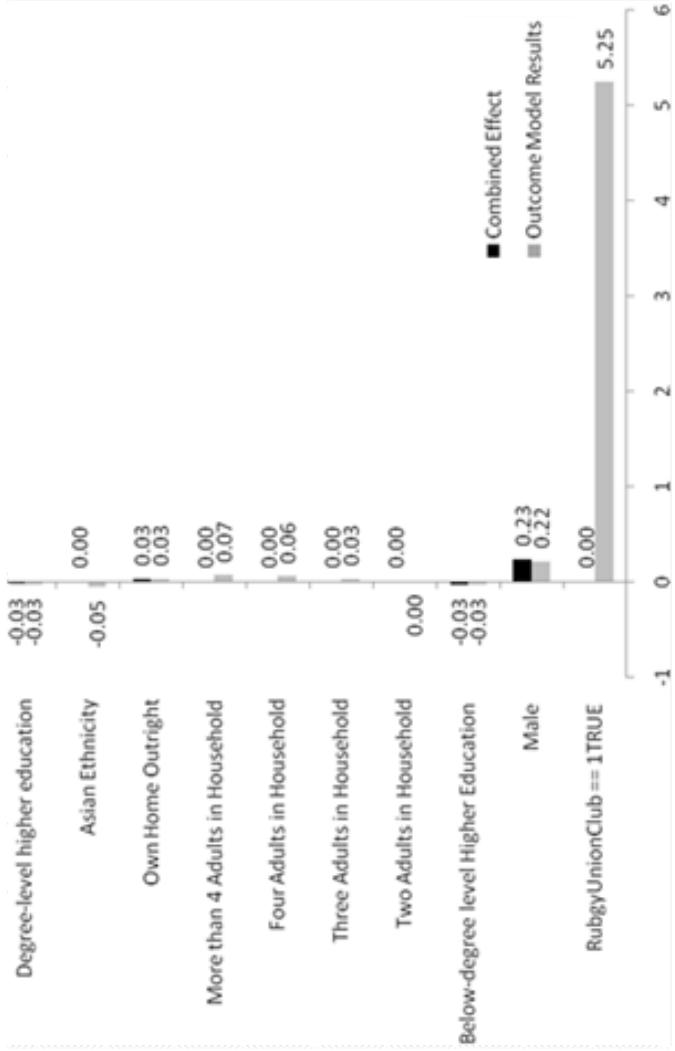
- Aside from club membership key drivers of participation include the level of education that the individual has achieved, with individuals who have achieved some level of higher education playing less frequently than others. As would be expected, male active individuals participate more frequently than females. Frequency of participation falls as age increases for men.

- Active respondents who are Asian participate less frequently than other ethnicities. In line with football, the number of adults in the household has an impact on the frequency of participation, with households containing three or four adults playing more frequently.

- Temperature also has an impact with frequency of participation falling amongst active respondents as temperature increases – this effect is likely to be capturing the seasonality of the sport.

Rugby union: drivers of club membership ('mezzanine' model)

Drivers of club membership
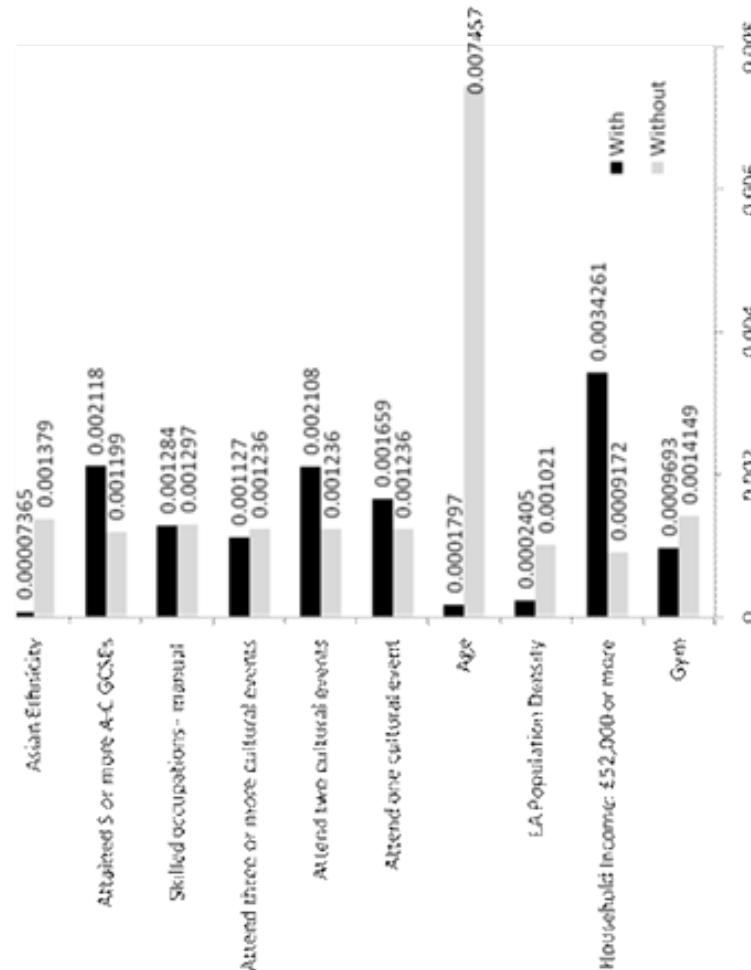
- Attendance at cultural events, income and attaining 5 or more GCSEs are the main drivers of club membership. Those who live in areas where the population is less dense are more likely to be members.

- In line with Rugby League, age and gym membership both have a negative impact on the probability of being a member. In addition, respondents who are Asian are less likely to be members, as are those who work in skilled manual occupations.

Chart data (With / Without):

Driver	With	Without
Asian Ethnicity	0.00007365	0.001379
Attained 5 or more A-C GCSEs	0.002118	0.001199
Skilled occupations – manual	0.001284	0.001297
Attend three or more cultural events	0.001127	0.001236
Attend two cultural events	0.002108	0.001236
Attend one cultural event	0.001659	0.001236
Age	0.0001797	0.007457
LA Population Density	0.0002405	0.001021
Household income: £52,000 or more	0.0034261	0.0009172
Gym	0.0009693	0.0014149

Cricket: drivers of frequency of participation

Drivers of frequency of participation: incremental days

Category	Value
Male	0.3193 / 0.3363
Interview Quarter 7	0 / 0.0302
Interview Quarter 6	0 / 0.0231
Interview Quarter 5	0 / 0.0041
Four or more children Household	0.02086 / 0.021
Three Children in Household	0.05843 / 0.0597
Two Children in Household	0.04972 / 0.0511
One Child in Household	0.01003 / 0.0102
SE Region: Yorkshire	0 / 0.0314
SE Region: West Midlands	0.0081
SE Region: South West	0.0068
SE Region: South East	-0.0019 / 0
SE Region: North West	0.0025
SE Region: North East	-0.0021 / 0
SE Region: London	-0.0217 / 0
SE Region: East Midlands	0.0009
Member of a Cricket Club	0 / 3.9197
Asian Ethnicity	0 / 0.1543

■ Combined Effect
■ Outcome Model Results

- As Cricket is a team sport, some type of club membership is typically required in order to play Cricket: those who are a member of a club tend to play on average once more a week than those who are not members of a club.

- Factors that were found to increase the amount of Cricket being played by active individuals were:
  - Asian ethnicity
  - Male gender
  - Having children in the household (the impact of this increases up to three children before decreasing for four or more children, although this is still positive)

Cricket: drivers of club membership ('mezzanine' model)

Drivers of club membership

- In contrast with the other team membership sports, age has a positive impact on the probability of being a member of a cricket club – those who are older are more likely to be a member. In addition, those who live in rural areas are more likely to be members (which is in line with Rugby Union Club Membership). Respondents who live in households with more adults are also more likely to be members.

- In line with the other club sports, gym membership has a negative impact on probability of being a member.
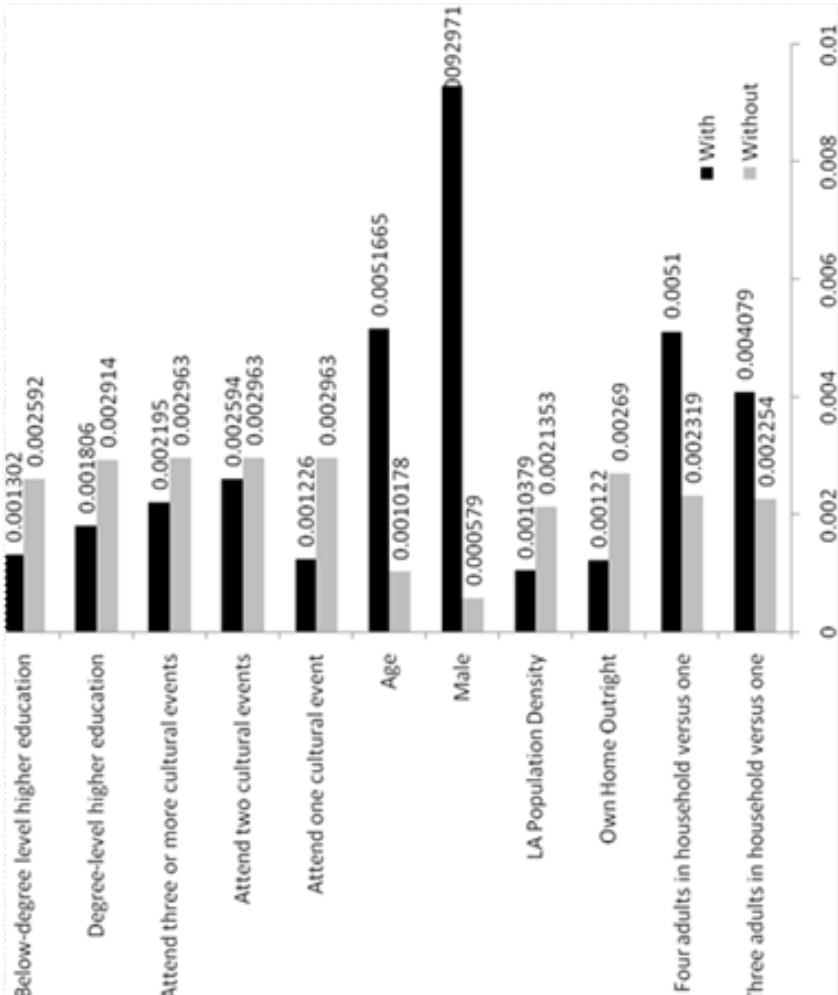
Football: drivers of frequency of participation

Drivers of frequency of participation: incremental days
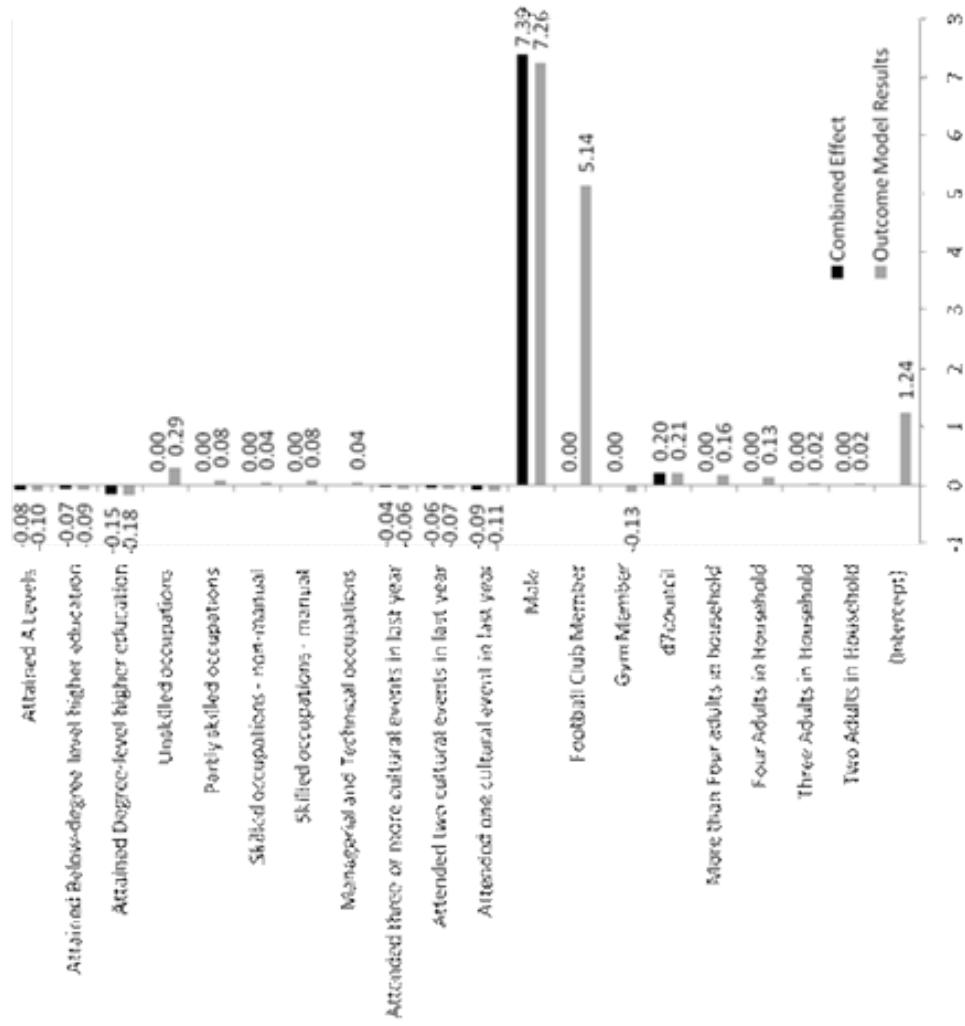
- In comparison to Athletics, where individuals who had attained a degree level education participated more frequently than other individuals, the opposite is true for football; individuals with such a qualification, a degree equivalent qualification or 5 or more GCSEs play football less often than other active individuals.

- Active males are a lot more likely to participate than females, playing seven more football sessions over 28 days compared to females. In addition, those who are members of a football club tend to play almost 5 more sessions than those who are not members – this is likely to be a combination of matches and football training sessions.

- Attendance at cultural events and gym membership both have a significant negative effect on the frequency of participation. Those who live in council-owned accommodation, or who live in households with a higher number of adults tend to play more frequently.

	Combined Effect	Outcome Model Results
Attained A Levels	-0.08	-0.10
Attained Below-degree level higher education	-0.07	-0.09
Attained Degree-level higher education	-0.15	-0.18
Unskilled occupations	0.00	0.29
Partly skilled occupations	0.00	0.08
Skilled occupations - non-manual	0.00	0.04
Skilled occupations - manual	0.00	0.08
Managerial and Technical occupations		0.04
Attended three or more cultural events in last year	-0.04	-0.06
Attended two cultural events in last year	-0.06	-0.07
Attended one cultural event in last year	-0.09	-0.11
Male	7.39	7.26
Football Club Member	0.00	5.14
Gym Member	-0.13	0.00
d7council	0.20	0.21
More than Four adults in household	0.00	0.16
Four Adults in Household	0.00	0.13
Three Adults in Household	0.00	0.02
Two Adults in Household	0.00	0.02
(Intercept)		1.24

Football: drivers of club membership ('mezzanine' model)

- Gender is again a key positive driver of being a member of a club. In addition, respondents who are younger are more likely to be a member of a club (which is in line with Rugby League and Rugby Union).

- Those who are gym members are less likely, as are home owners and who have attained a degree-level qualification. Both Asian and White respondents are also less likely to be a member of a football club.

Drivers of club membership

Swimming: distance to facilities

Swim at least once a week

Distance to nearest Clubmark swimming pool
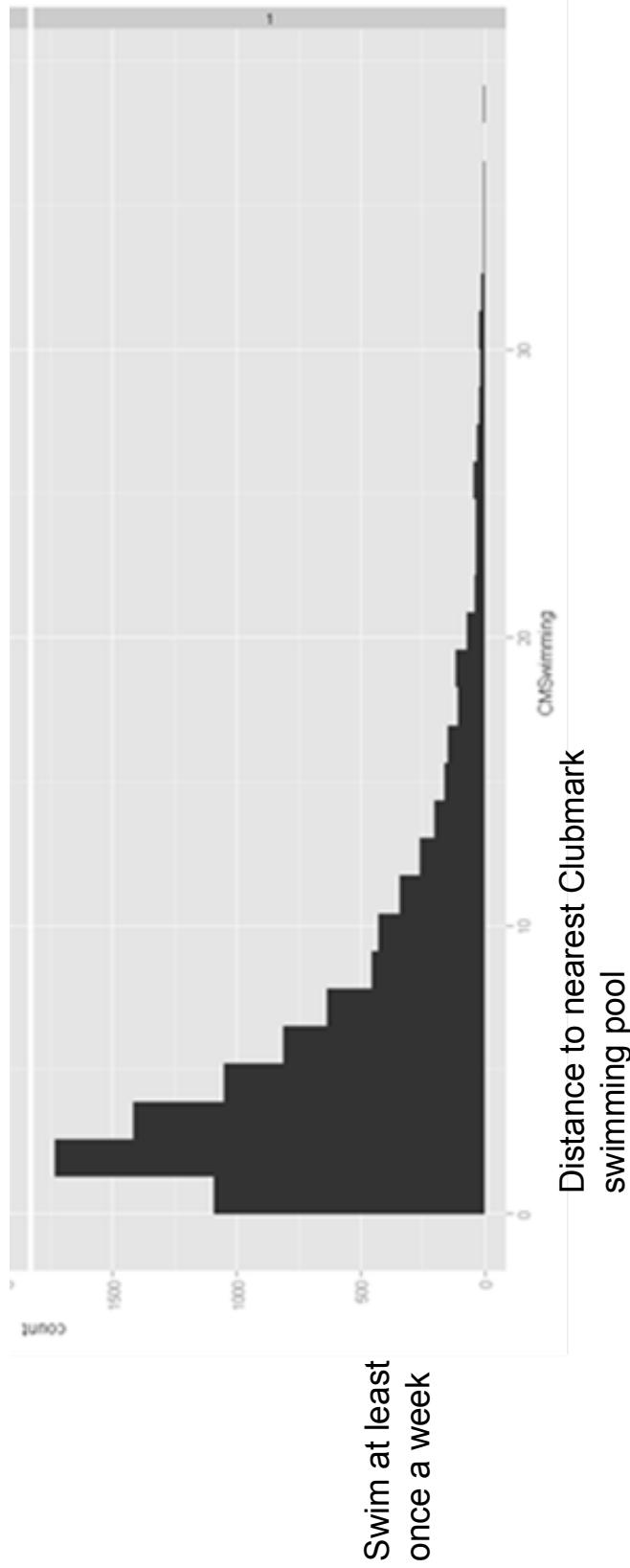
• We have included in the swimming model the distance to the nearest Active Places Swimming Pool. Those who live closer to a pool tend to swim more often than those who live further away. This is consistent with the hypothesis that living closer to a facility will increase participation due to the reduced travelling times.

Swimming: overview

Drivers of frequency of participation: incremental days

Drivers of frequency of participation chart (incremental days):

Driver	Value
SE Region: Yorkshire	0.22
SE Region: West Midlands	0.15
SE Region: South West	0.24
SE Region: South East	0.04
SE Region: North West	0.22
SE Region: North East	0.25
SE Region: London	0.01
SE Region: East Midlands	0.20
Black Ethnicity	-0.56
White Ethnicity	0.39 / 0.41
Respondent has been to three or more cultural events...	0.16 / 0.22
Respondent has been to two cultural events in...	-0.07 / -0.04
Respondent has been to one cultural event in previous...	-0.15 / -0.12
Gym Member Adj	0.65
Four or more children in household	0.17 / 0.17
Three children in household	0.37 / 0.39
Two children in household	0.35 / 0.37
One child in household	0.28 / 0.28
Own Home Outright	0.08 / 0.11

Legend: ■ Combined Effect ▨ Outcome Model Effect

- In line with cricket, swimming frequency increases with the number of children in the household – this is consistent with the hypothesis of swimming as a family friendly sport that is a complement, rather than substitute, for time with the family.

- Those who are gym members tend to go swimming more often than individuals who are not gym members. This may be in part due to health clubs often having swimming pools associated with them, thus increasing the accessibility to swimming.

- Ethnicity also matters to swimming frequency. Active individuals who are white tend to swim more often than other ethnicities, whilst those who are black tend to swim less often. Combining these two effects, an individual who is white does an extra session of swimming than an individual who is black every four weeks.

- Attendance at cultural events also features in the model, with those attending three or more cultural events swimming more frequently than those who attend fewer events. Those who own their own home outright also tend to go swimming more often than those who do not. Both of these effects may capture the life stage of the respondent to some extent.

SPORT ENGLAND   MINDSHARE

Cycling: overview

Drivers of frequency of participation: incremental days
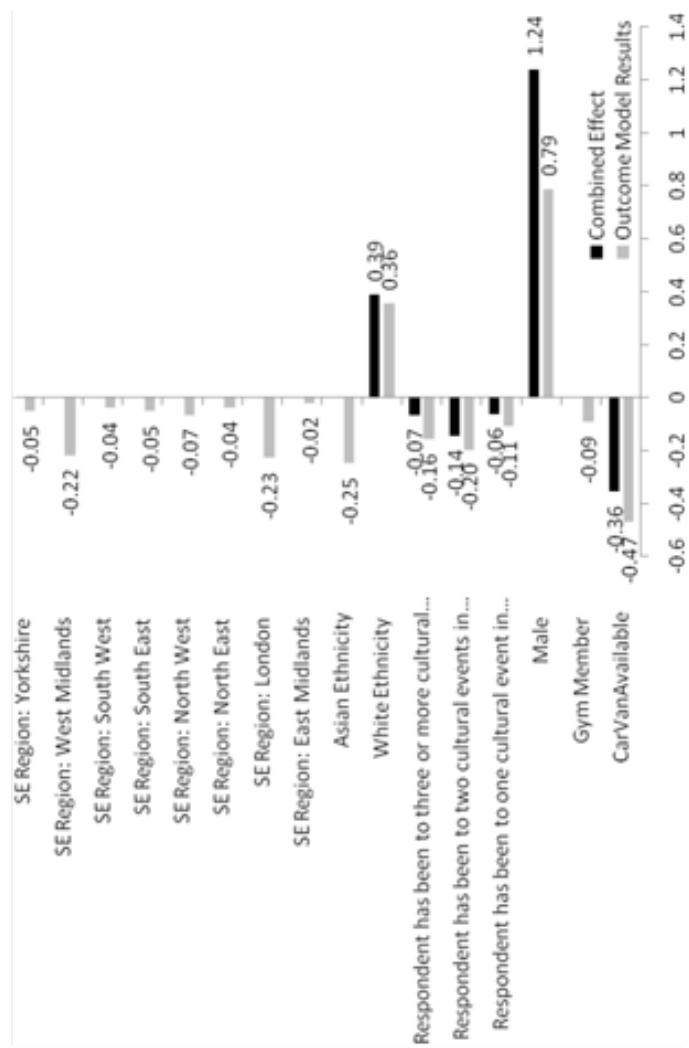
- The availability of a car or van in the household has a significantly negative effect on active individuals, with those with access doing more than a day less cycling than those without access to a car.

- There are also particular regions where cycling is less frequent: respondents living in the West Midlands, North East, North West and London all cycle less frequently than other parts of England. This is likely to be due to a combination of factors including topography, cycling facilities and tradition.

- Those who are gym members also tend to cycle less frequently, as do respondents of Asian ethnicity. There is also evidence of a trade off with cultural events, as attendance at such events causes a lower frequency of participation.

Chart — Combined Effect / Outcome Model Results:

Category	Value
SE Region: Yorkshire	-0.05
SE Region: West Midlands	-0.22
SE Region: South West	-0.04
SE Region: South East	-0.05
SE Region: North West	-0.07
SE Region: North East	-0.04
SE Region: London	-0.23
SE Region: East Midlands	-0.02
Asian Ethnicity	-0.25
White Ethnicity	0.39 / 0.36
Respondent has been to three or more cultural...	-0.07
Respondent has been to two cultural events in...	-0.16 / -0.14 / -0.20
Respondent has been to one cultural event in...	-0.06 / -0.11
Male	1.24 / 0.79
Gym Member	-0.09
CarVanAvailable	-0.36 / -0.47

Axis: -0.6, -0.4, -0.2, 0, 0.2, 0.4, 0.6, 0.8, 1, 1.2, 1.4

Legend: ■ Combined Effect ■ Outcome Model Results

SPORT ENGLAND   MINDSHARE

Badminton: overview

Drivers of frequency of participation: incremental days
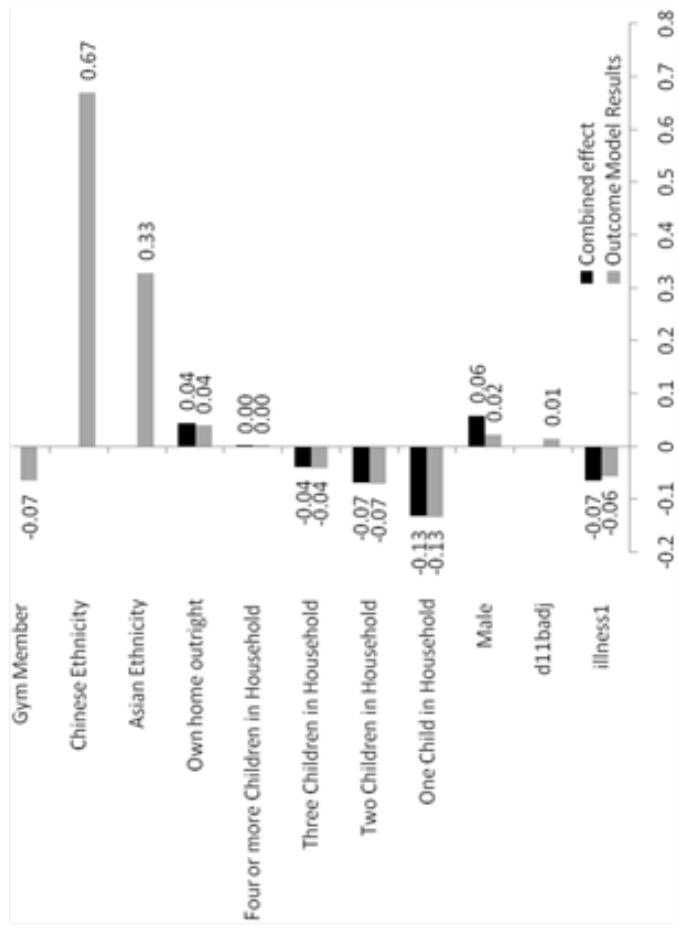
- Within the racquet sports analysed, Badminton participation is the only one where both active Asian and Chinese respondents are more likely to participate. Active males are more likely to play Badminton more frequently than active females, everything else being equal.

- Furthermore, respondents who live in areas which are less ethnically diverse, as measured by the Simpson Ethnic Diversity Index, are more likely to participate than those who live in more diverse areas.

- Active individuals who live in local authorities with denser populations participate in Badminton less frequently than those in live in sparse local authorities. At the same time, living closer to an Active Places sports hall leads to an increase in the frequency of participation.

- Other key drivers of participation tie in with the importance of life stage, namely the age of the oldest child in the household (which is consistent with a similar finding within the Tennis model), which increases the frequency of participation and the number of children in the household which reduces the frequency of participation. Active people who own their own home participate more frequently.

Squash: overview

Drivers of frequency of participation: incremental days
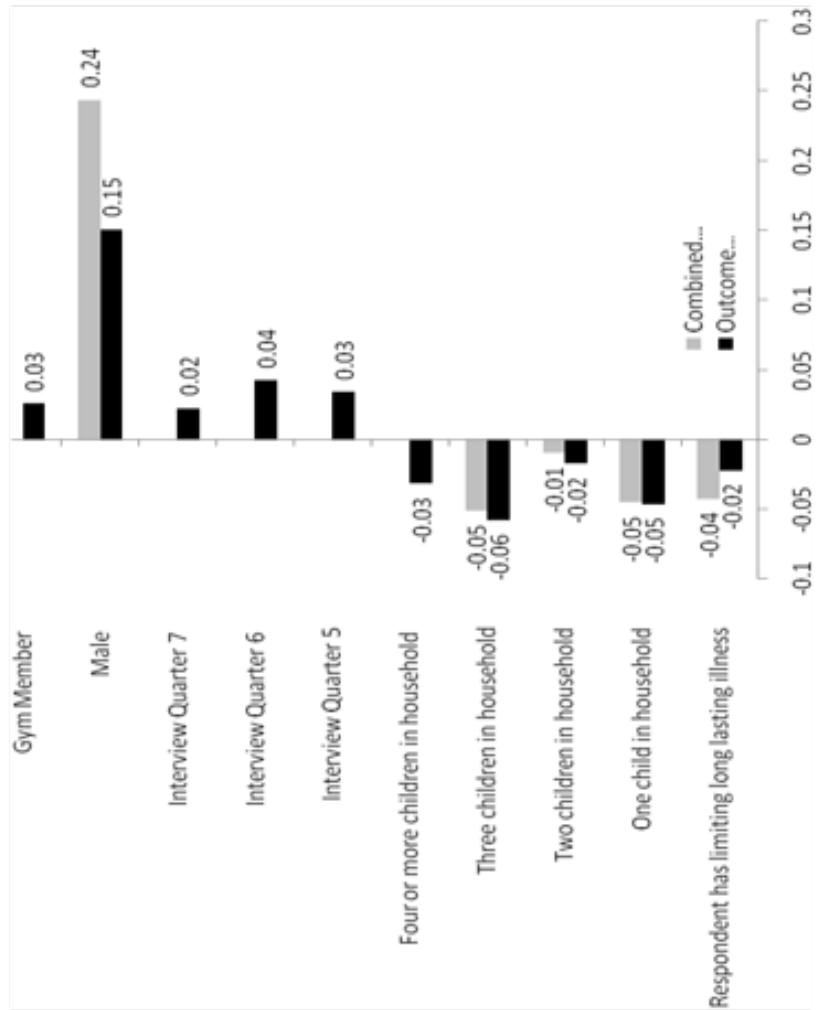
- As with Badminton, active individuals who live in sparser local authorities tend to play Squash more frequently than those who live in denser local authorities. Another common feature is that active males play Squash more frequently than active females.

- In addition, the time of year has an impact on frequency of participation, with individuals playing more often during the autumn and winter. This is likely to be due to Squash being an indoor sport and possibly a substitute for alternative outdoor sports that are less attractive during the winter months.

- In contrast with Badminton, active individuals who are gym members participate more frequently than individuals who are not members. This is likely to be due to Squash courts often being found with gyms, whilst the relationship between gyms and Badminton courts is weaker.

- As with Badminton, the number of children in the household has a negative impact on frequency of participation.

Chart categories and values:

Category	Combined	Outcome
Gym Member		0.03
Male	0.24	0.15
Interview Quarter 7		0.02
Interview Quarter 6		0.04
Interview Quarter 5		0.03
Four or more children in household		-0.03
Three children in household	-0.05	-0.06
Two children in household	-0.01	-0.02
One child in household	-0.05	-0.05
Respondent has limiting long lasting illness	-0.04	-0.02

Golf: overview

Drivers of frequency of participation: incremental days

Chart categories (top to bottom):
- Household Income: £52,000 or more — 0.42 / 0.55
- Household Income: £36,400 to £51,999 — 0.38 / 0.46
- Household Income: £31,200 to £36,399 — 0.29 / 0.35
- Household Income: £26,000 to £31,199 — 0.30 / 0.35
- Household Income: £20,800 to £25,999 — 0.28 / 0.32
- Household Income: £15,600 to £20,799 — 0.20 / 0.23
- White Ethnicity — 0.12
- Unskilled occupations — -0.16
- Partly skilled occupations — -0.01
- Skilled occupations - non-manual — 0.06
- Skilled occupations - manual — 0.09
- Managerial and Technical occupations — 0.09
- Respondent Age — -0.02
- Male — 0.71
- Gym Member — -0.22
- Four or more children in household — -0.23 / -0.23
- Three children in household — -0.12 / -0.10
- Two children in household — -0.14 / -0.12
- One child in household — -0.05 / -0.05
- Own home outright — 0.17 / 0.21

Legend: Combined Effect / Outcome Model Effect

- Along with Squash and Badminton, active individuals who live in local authorities with lower population density play Golf more often than individuals who live in denser authorities, holding everything else constant. This is likely due to the greater availability of open spaces to these individuals.

- Active individuals who live in households with higher income tend to play Golf more often than active individuals who live in households with lower incomes. In addition, individuals who are in managerial and skilled occupations tend to play Golf more often than other occupations. Those who own their own home outright are also likely to play more often than others. Active male individuals play Golf more frequently than active females.

- The number of children in the household has a significant negative impact on the frequency of Golf playing amongst active individuals. At the same time, being a member of a gym also has a negative impact.

- Temperature also has an impact on frequency of Golf playing, with participation maximized at an average temperature of around 18 degrees Celsius. This is likely to be due to the outdoor nature of the sport.

- Active individuals who are white tend to play Golf more often than other ethnicities, whilst frequency of participation tends to increase with age.

Summary of key findings

- **Gender gap:** women are less likely to participate across many of the sports tested (football, athletics, rugby league, cycling, badminton, golf, squash and cricket).

- **Asian ethnicity:** of the 11 sports we tested, Asian people are significantly less likely to participate than other ethnicities in athletics and rugby union . However, in badminton and cricket, Asian people are *more* likely to participate.

- **Club sports:** for the team based sports of rugby league, rugby union, cricket and football, individuals who belong to a club tend to play more often than non-club members. For all four team sports, male gender and non-gym membership are drivers of club membership. For football, rugby union and rugby league, probability of being a club member declines with age; however for cricket, older individuals are more likely to be a club member.

- **Family sports:** in contrast with the NI8 model, frequency of participation in cricket and swimming increases with the number of children in the household. This is consistent with the hypothesis of swimming as a family friendly sport that is a complement, rather than substitute, for time with the family. Furthermore, for tennis and badminton, having older children rather than younger children increases the frequency of participation, which suggests that these sports are well adapted to parents and older children playing together as a family.