

Olympic Games Home Field Advantage: Country Cohort Analysis

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This paper presents evidence on whether Olympic host country athletes experience a home field advantage, using a novel approach that studies cohorts of athletes who compete in multiple Olympic Games. Olympedia’s comprehensive data set spanning Athens 1896 to PyeongChang 2018 is used. An Olympic team with 100 athletes is estimated to win 4.4 more medals, including 2.6 more gold medals, when competing at home. The home field advantage is stronger for subjective sports.

Keywords: Olympics, medal, home advantage

1 Introduction

Home field advantage has been well-documented across sports. A 2010 meta-analysis finds a 95% confidence interval of [0.590, 0.618] for the win rate of a home competitor Jamieson (2010). The same study reports that higher pressure competition tends to increase the home field advantage. Legaz-Arrese, Moliner-Urdiales and Munguía-Izquierdo (2013) review three decades of research, and discuss various channels, all contested to some extent, that may contribute to a home field advantage. The most compelling channels include crowd influence on referee and judge decision

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making, and improved player confidence and motivation at home. Weaker channels include familiarity of home athletes with competition facilities, travel fatigue for away athletes, and national pride for home athletes.

Past studies of the home field advantage in the Olympic context report mixed results. Balmer, Nevill and Williams (2001) find a home field advantage in the Winter Olympic Games, which is stronger for subjective sports. Balmer, Nevill and Williams (2003) analyze individual events and find a home field advantage for only subjective sports. A recent contribution by Pettigrew and Reiche (2016) suggests a multitude of past country level research designs may be unreliable due to omitting time-varying economic confounders in single country analysis, not accounting for relaxed host country athlete qualification, or including countries that have never hosted the Olympics in the non-host comparison group. Pettigrew & Reiche address these issues by restricting their sample to only countries that have hosted the Olympics. They pair outcomes of each host country in the host year with outcomes in the immediately preceding games, limiting the extent to which time varying confounders can change. No host advantage is found for winning medals. Only host athlete attendance is found to increase, which can be attributed in part to automatic qualifications for host athletes. Another recent contribution by Wilson and Ramchandani (2018) measures the host advantage in terms of "market share", which is a country's medal count relative to the total number of medals awarded that Olympics. In the "market share" calculation medals have different weights (gold=3, silver=2, bronze=1). There is a statistically significant host country advantage for both the Olympic and Paralympic Games.

I revisit the Olympic home field advantage using a larger data set, using a novel methodology that allows me to better identify the home field advantage. The rest of the paper proceeds as follows. Section 2 describes the data source. Section 3 details the empirical strategy and presents results. Section 4 concludes.

2 Data Source

The main data used comes from Olympedia, a website backed by the International Olympic Committee (IOC). Athlete results are available from the 1896 Athens Summer Olympics to the 2018 PyeongChang Winter Olympics. 28 Summer Olympic Games and 23 Winter Olympic Games are included in this time span. There are 275,808 results across 132,283 athletes. Information on athlete biological sex, nationality, and date of birth are available. Delayed disqualifications due to violations such as doping are reflected in the results.

3 Host Countries

3.1 Threats to Validity

To properly identify the home field advantage for host athletes, three main threats to validity must be addressed. The first threat to validity arises when defining treatment and comparison countries. To identify a host country effect, both the treated country and counterfactual, comparison countries need to have the possibility of being assigned to either group. That is to say, it would be inaccurate to include comparison countries that have not hosted the Olympics, and are unlikely to ever do so given geographical size or climate constraints. As a result, I limit my analysis to only countries that have hosted the Olympics at least once.

The second threat concerns how a country's performance is measured. Using a country's total medal count or medals per athlete could seem like obvious choices for measurement. Yet, both measures have drawbacks. The size of Olympic country teams has trended upwards over time as the Olympic Games expands with new events. In addition, Olympic host nations have automatic qualification for their athletes in both individual and team events (Pettigrew and Reiche, 2016), inflating host athlete attendance. Only the medals per athlete measure accounts for growing teams, yet it does not address omitted variables bias introduced by relaxed host qualification rules. Automatic qualification may permit extra host athletes of lower ability to compete, creating

a downwards bias in the medals per athlete measure during a host year.

The third threat to validity also relates to how a country's performance is measured. The Olympic context is unique in that home field and away field observations are separated by four years due to the Olympic cycle. Four years provides ample time for athlete turnover on a country's Olympic roster. This turnover must be addressed. After all, how can one reliably assess home field advantage if a team's players are different when playing away and at home.

To address both the second and third threats to validity, I adopt what I call a country cohort approach. I first create exhaustive pairs of consecutive Olympic Games of the same season. Then, for each country in my sample, I identify athletes spanning both Olympic Games in each given pair. The spanning athletes are grouped by country forming country cohorts. An example cohort would be United States athletes who compete in both London 2012 and Rio 2016. Country cohort athletes are fixed between two Olympic Games by definition. This resolves the third threat to validity since turnover is nullified, though age must be controlled for. The two main cohort performance measures are change in medals per athlete and change in medals per event contested. Change is defined over the two Olympic Games a cohort spans. Only results from individual events will be used for performance measurement, as team events are still vulnerable to confounding due to turnover. The second threat to validity is now also addressed. Cohort size is fixed between two Olympic Games, so a one time influx of athletes due to hosting gets cut out and does not downwards bias the performance measure. Any new athletes of high ability will be included in a country's next cohort, which starts in the hosted games and ends with a future away games.¹

¹A country cohort that ends with a hosted Olympics typically has different athletes than the subsequent cohort that starts with the hosted Olympics. Yet, the home field advantage still has a clear interpretation and is testable in the context of changing cohort members. Suppose the home field advantage exists, then the cohort entering the hosted games would have a positive change in its performance measure, and the cohort leaving the hosted games would have a negative change in its performance measure.

3.2 Sample Construction & Descriptive Analysis

I construct a data set of country cohorts for all countries that have hosted the Olympics.² Each cohort observation is uniquely identified using country, season of games, and the pair of Olympics the cohort spans. I create a time index called Distance to identify how far each cohort is offset from its country's hosted Olympic Games. One unit of Distance corresponds to one Olympic Games of relevant season. Distance zero is used when the cohort's second games is at home, and Distance one is used when the cohort's first games is at home. Distance is determined separately for a country's winter cohorts and summer cohorts.³ When a cohort is located between two hosted Olympics, it is assigned the Distance of minimum absolute value. In other words, the cohort is assigned Distance based on the closer of two hosted Olympics.

Using a cohort's individual event results I create four outcome measures for each cohort observation: change in medals per athlete, change in medals per event contested, change in gold medals per athlete, change in gold medals per event contested. The reason behind using per event contested is that a cohort's athletes may opt to compete in a different number of events during the first and second cohort Olympics, so events contested may be the preferable denominator.⁴

Figure 1 plots change in medal outcomes for all summer host nations, and Figure 2 does the same for winter host nations. Country cohort trends appear to exhibit volatility over time and are centered near zero change. Figure 3 zooms in on the host time period, using Distances -1, 0, and 1. Visually, there appears to be little evidence of a strong home field advantage. Few countries have cohort trends exhibiting a large spike at Distance 0 and a decrease at Distance 1, which would indicate a home field advantage. Figures 4, 5, and 6 tell the same visual story using change in

²I consider Australia the sole host country for the Summer Olympic Games of 1956, since only equestrian events were held in Sweden.

³If a country has only been a summer host, then that country's winter cohorts have undefined Distance. For example, Australia is only a summer host. A similar argument applies to countries that have only been winter hosts. I remove all cohorts with undefined distance from my sample.

⁴Here is an example using the different denominators. Consider a two athlete summer cohort for country X defined on {Olympics 1, Olympics 2}. In Olympics 1 athlete "A" competes in two events and athlete "B" which competes in three events, "A" wins 1 medal and "B" wins 2 medals. Then in Olympics 2 athlete "A" competes in three events and athlete "B" competes in four events, again "A" wins 1 medal and "B" wins 2 medals. $\Delta Medals/Athlete = \frac{3}{2} - \frac{3}{2} = 0$ and $\Delta Medals/Event = \frac{3}{7} - \frac{3}{5} = \frac{-6}{35}$

gold medal outcomes. It is important to note that these visual depictions do not incorporate control variables or account for differing cohort sizes, which contribute to uneven volatility among country cohort series.

3.3 Country Cohorts

Home Field Effect

I estimate the host country, home field advantage using an event study approach, pooling summer and winter cohorts.

$$Outcomes_{cst} = \alpha_c + \sum_k \beta_k I(Distance = k)_t + X_{cst} \gamma + \epsilon_{cst} \quad (1)$$

c is an index for country, s is an index for season, and t is an index for Distance. $Outcomes_{cst}$ can be either $\Delta Medals/Athlete_{cst}$, $\Delta Medals/Event_{cst}$, $\Delta Golds/Athlete_{cst}$, or $\Delta Golds/Event_{cst}$. Country fixed effects α_c account for country differences in mean outcomes. X_{cst} is a vector of controls including $Summer_s$, $MaleRatio_{cst}$, $MeanAge_{cst}$ and $MeanAge_{cst}^2$. $Summer_s$ is a dummy for the cohort's season being summer, $MaleRatio_{cst}$ is the number of male athletes divided by total number of athletes, and both age controls are constructed using athlete age in the cohort's first Olympics.

I limit my sample to Distance -2 through Distance 2. This allows me to use Distance -2 as a benchmark in comparisons. There are two additional reasons for this restriction. First, not all countries have Distance values beyond this range, since availability of Distance values depends on how long a country has been participating in the Olympics. Second, larger ranges of Distance would make country fixed effects less reliable. Countries tend to undergo political and economic changes over long spans of time. For example, athlete cohorts for Germany before WWI, around WWII, and today differ greatly in circumstances.

Table 1 presents results for medal outcomes, and Table 2 does the same for gold medal outcomes. Columns (1), (2), (3), and (4) present weighted regressions using $CohortSize_{cst}$ as weights. Columns (5) and (6) are unweighted. The odd columns use adjusted clustered standard errors.⁵ This particular type of clustered standard errors is vulnerable to bias when the number of clusters is small. Cameron, Gelbach and Miller (2008) find bootstrap standard errors lead to more reliable inference when the number of clusters is small. Since I only have 25 country clusters, I present Rademacher wild bootstrap standard errors, generated using country blocks and 1000 repetitions, for even columns. The bootstrap standard errors are consistently smaller than the clustered standard errors, leading to t-statistics with higher magnitude for even columns. With either type of standard errors, inference is performed using the t-distribution with no more degrees of freedom than the number of clusters. I present critical values in the table notes.

My preferred estimates are in columns (3) and (4). Trends in the Distance coefficients are consistent with a home field advantage. Since Distance -2 is left out, the remaining Distance coefficients represent difference in means relative to it. Distance -1 has cohorts competing in away games, and does not differ significantly from Distance -2. Distance 0 has a positive coefficient, indicating that cohorts entering a host Olympics experience positive changes in medals won per athlete and medals won per event. Distance 1 has a negative coefficient with a relatively large magnitude, indicating that cohorts leaving a host Olympics lose a home boost when transitioning to an away games. Distance 2 has a negative coefficient of smaller magnitude compared to Distance 1, indicating a slight return to the Distance -2 outcome mean. Statistical significance depends on the type of standard errors used. Bootstrap standard errors lead to Distance 0 and Distance 1 coefficients significant at the one percent level, while clustered standard errors have just the Distance 0 coefficient significant at the ten percent level.

Table 2 also exhibits gold medal outcome trends consistent with the home field advantage. Bootstrap standard errors indicate significance at the one percent level for all Distance coefficients, while clustered standard errors only have significance at the one percent level for Distance 1.

⁵The adjustments are the finite cluster correction $G/(G-1)$ and degrees of freedom $(N-1)/(N-K)$ correction.

Shocks to Olympic Attendance

Due to factors including economic hardship, boycotts, and stricter qualification rules, several Olympic Games exhibit major decreases in attendance. Figure 7 plots the total number of individual event athlete debuts over time.⁶⁷ Trends in debut athletes mirror trends for athletes overall. Explanations for major shocks follow.

Lake Placid 1932 and Los Angeles 1932 were hosted in the United States. Amid the Great Depression, several nations were unable to sponsor athletes. Soviet Union military action during the Hungarian Revolution of 1956 led to political tension before the Summer Olympic Games concluded in Melbourne. The International Olympic Committee (IOC) refused to suspend Soviet Union Olympic participation, leading a number of nations to boycott events. Montreal 1976 was boycotted by 29 countries when the IOC did not punish New Zealand for defying a sporting embargo against apartheid South Africa. In 1980, 66 nations boycotted the Summer Olympic Games in Moscow, protesting the Soviet–Afghan War. Lillehammer 1994 introduced stricter qualification rules for the Winter Olympic Games, reducing the number of athletes from countries with warmer climates.

These negative shocks to Olympic Games attendance are problematic for identifying a home field advantage. When there is weaker competition than usual, it is easier for host country athletes to earn medals regardless of whether a home field advantage exists. As a result, I now drop cohort observations that span Olympic Games experiencing attendance shocks. However, I keep Lillehammer 1994 since limiting the number of lower ability athletes does not make it any easier for host country athletes to win medals. The number of countries in my sample decreases from 25 to 24 as Germany gets removed.⁸

Tables 3 and 4 present results. Signs and magnitudes for Distance coefficients are similar to those in Tables 1 and 2. Column (3) clustered standard errors scarcely lead to statistically

⁶⁷Olympic Games occur on a four year cycle. The first ever Winter Olympic Games was Chamonix 1924. Up through 1992, the Winter and Summer Olympics were conducted during the same year, in that order. The Winter Olympic Games has since been staggered by two years beginning with Lillehammer 1994.

⁷The Olympic Games were cancelled in 1916 due to WWI, and in 1940 and 1944 during WWII.

⁸For Distances relevant to my analysis, German cohorts span the Olympics removed.

significant Distance coefficients. Only Distance 1 coefficients in Table 4 are significant. Column (4) bootstrap standard errors continue to indicate that Distance 0 and Distance 1 coefficients are significant at the one percent level. Once again the choice of standard errors matters.

To continue to test the robustness of the empirical specification, I place one more limit on my sample. Barring the postponement of Tokyo 2020, since 1948 the Olympic Games has occurred every four years without fail. Prior to 1948, the games were not as consistently attended or even held. 1948 saw Japan and Germany banned from Olympic competition. Both nations were allowed to return in 1952.

Tables 5 and 6 present results using only Olympic Games cohorts from 1952 onwards. Belgium, Finland, Netherlands, and Sweden are removed due to the time restriction, leaving 20 countries. There is now slightly stronger evidence of a home field advantage for gold medal outcomes in Table 6. For gold medal outcomes, column (3) clustered standard errors now have Distance 1 significant at the five percent level.

Subjective vs. Objective Sports

I now test for whether the home field advantage differs between subjective and objective sports. I define subjective sporting events as events where some number of points must be awarded by a judge. Everything else is considered objective for the purposes of this paper. Recall that only individual athlete events are being used. A full list of subjective individual sports and objective individual sports in my sample can be found in the Appendix.⁹ All sample restrictions accumulated thus far are kept.

Results for medal outcomes are presented in Tables 7 and 9, for subjective and objective sports respectively. Table 5 has both types pooled together. Subjective sports have Distance 0 and Distance 1 coefficients higher in magnitude compared to those when the sports are pooled. This suggests a greater home field effect for athletes in subjective sports. Objective sports have corresponding coefficients with lower magnitudes than when the sports are pooled. The home field

⁹You may notice some very unique individual events that were contested in past Olympic editions. These events end up getting dropped after my sample restrictions.

advantage is weaker for objective sports. Nonetheless, column (4) using bootstrap standard errors shows statistical significance for Distance 0 and Distance 1 coefficients around the one percent level for both types of sports. Column (3) clustered standard errors are not reliably statistically significant, however.

Results for gold medal outcomes are presented in Tables 8 and 10 for the two types of sports, with Table 6 pooling. The same patterns appear. The home field advantage is stronger for subjective sports compared to objective sports. Statistical significance still depends on the standard errors used, though clustered standard errors now result in significant coefficients in several cases.

4 Conclusion

Suppose a country's Olympic team has 100 athletes. If that Olympic team competes at home, it will win about 4.4 more medals, including 2.6 more gold medals.¹⁰ If the team's athletes compete in more subjective sports as opposed to objective sports, this home field advantage will be greater. Nothing beats a home crowd.

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Declaration of conflicting interests

The author declares that there is no conflict of interest.

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¹⁰Computed using coefficients from Tables 5 and 6.

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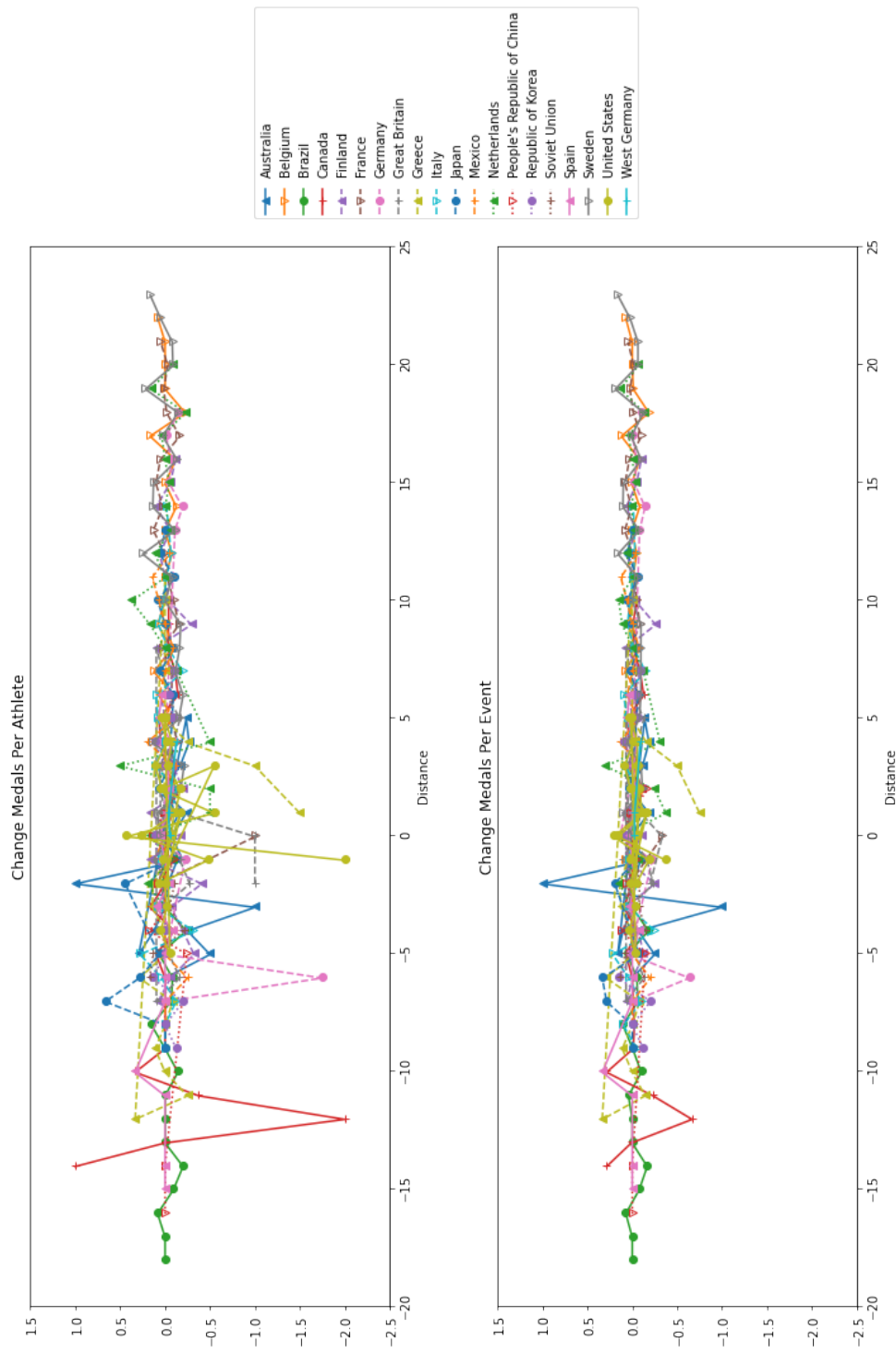


Figure 1: Summer Cohort Medal Change by Distance

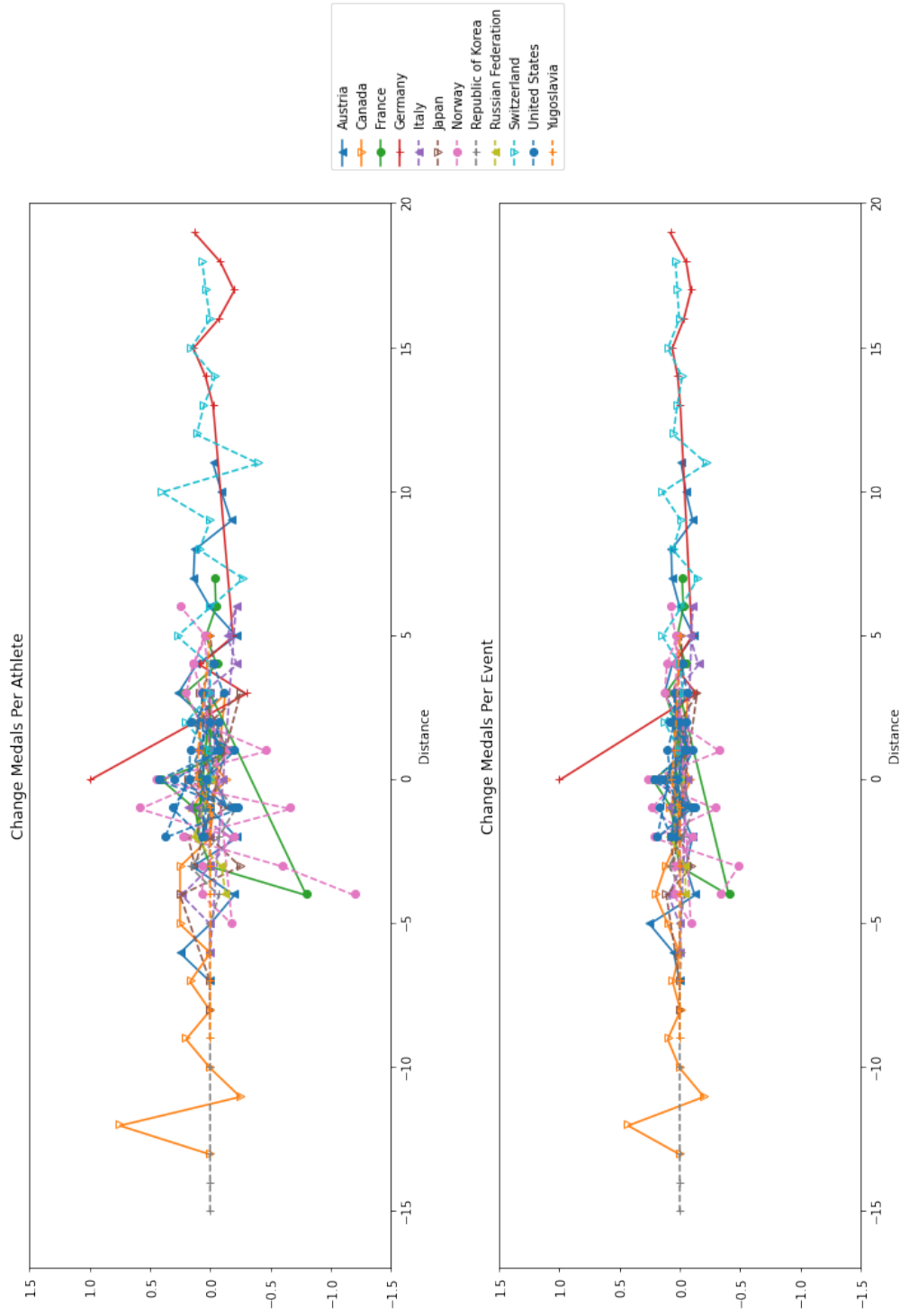


Figure 2: Winter Cohort Medal Change by Distance

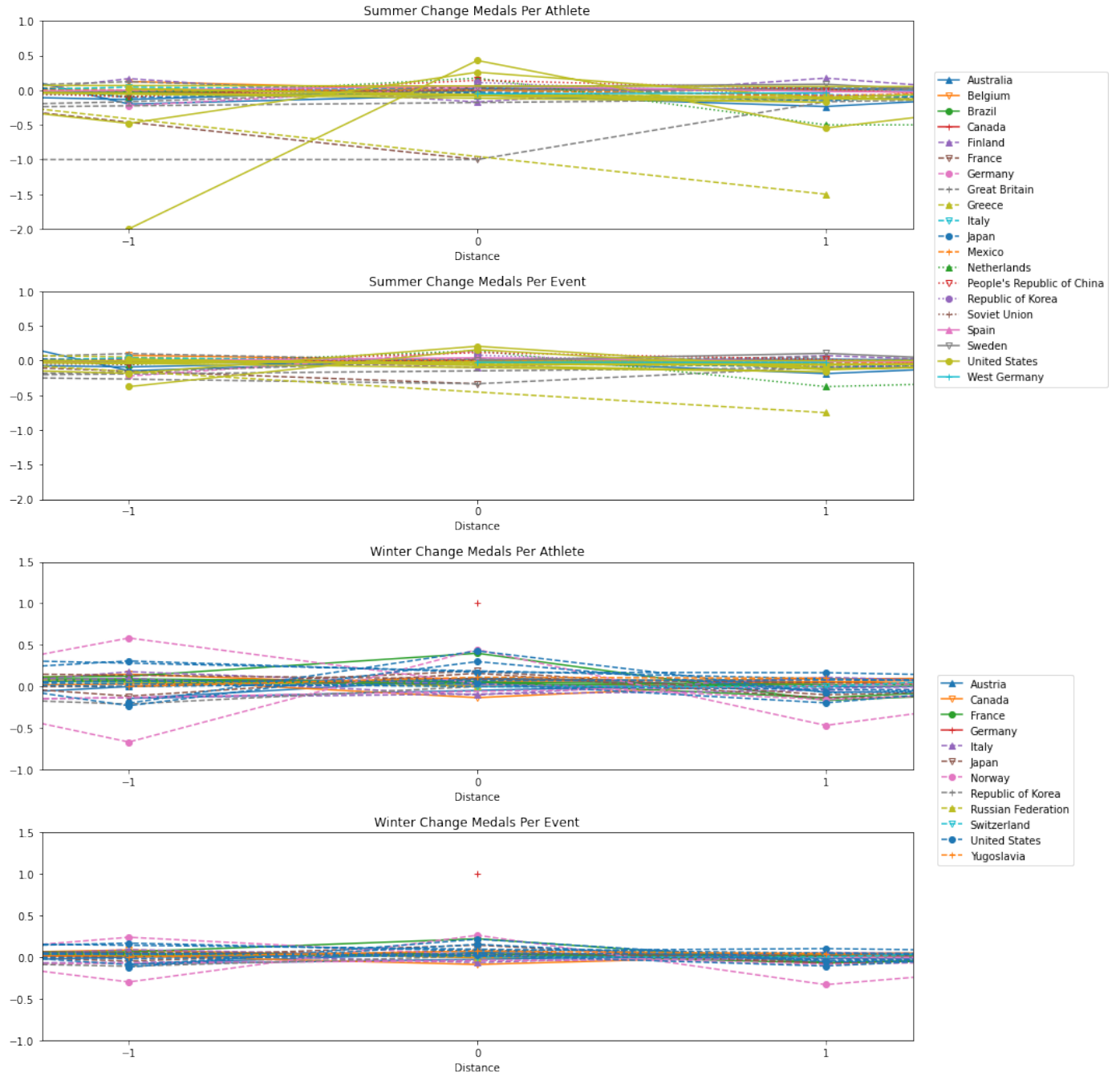


Figure 3: Cohort Medal Change Near Host Distance

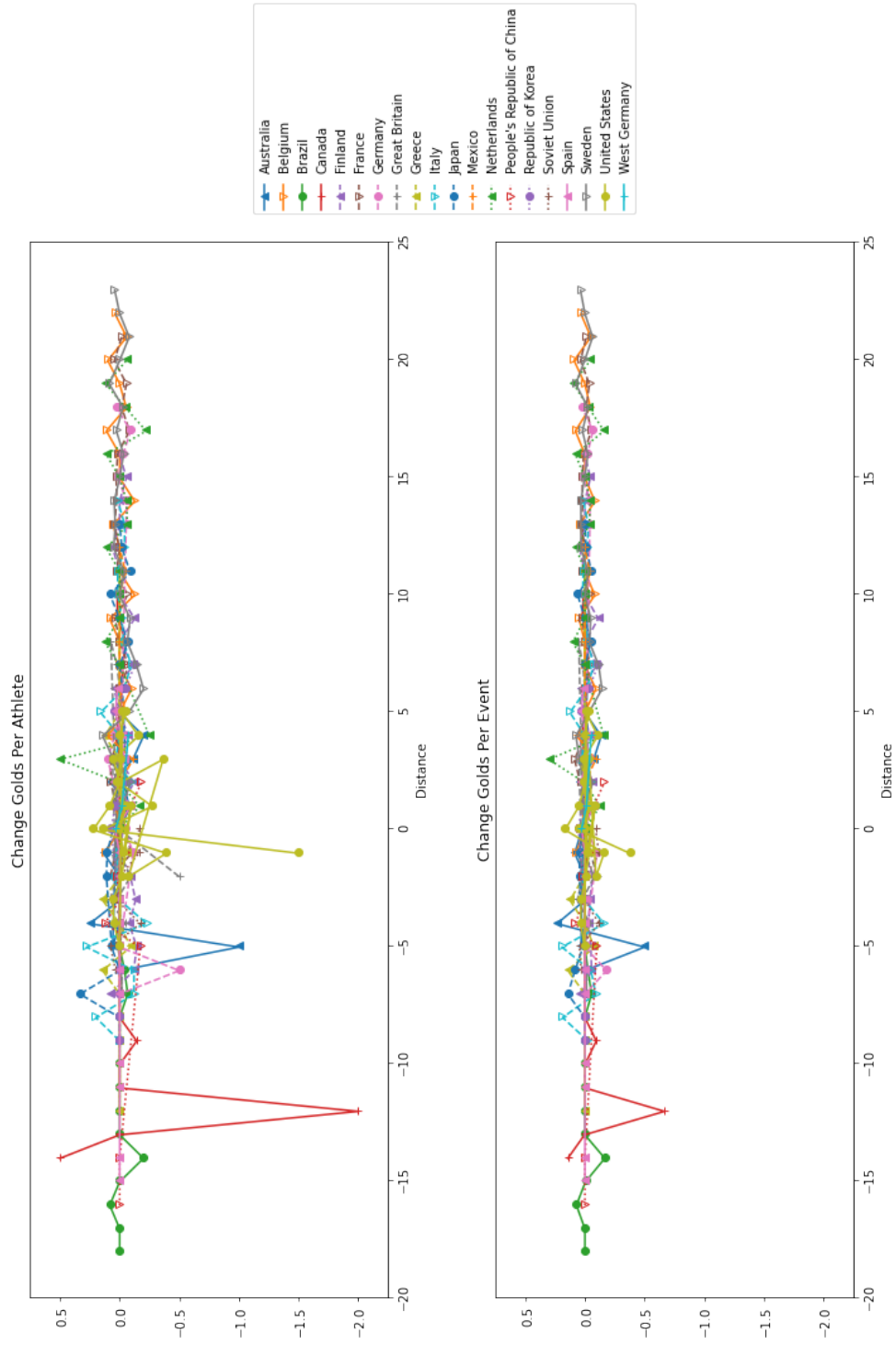


Figure 4: Summer Cohort Gold Medal Change by Distance

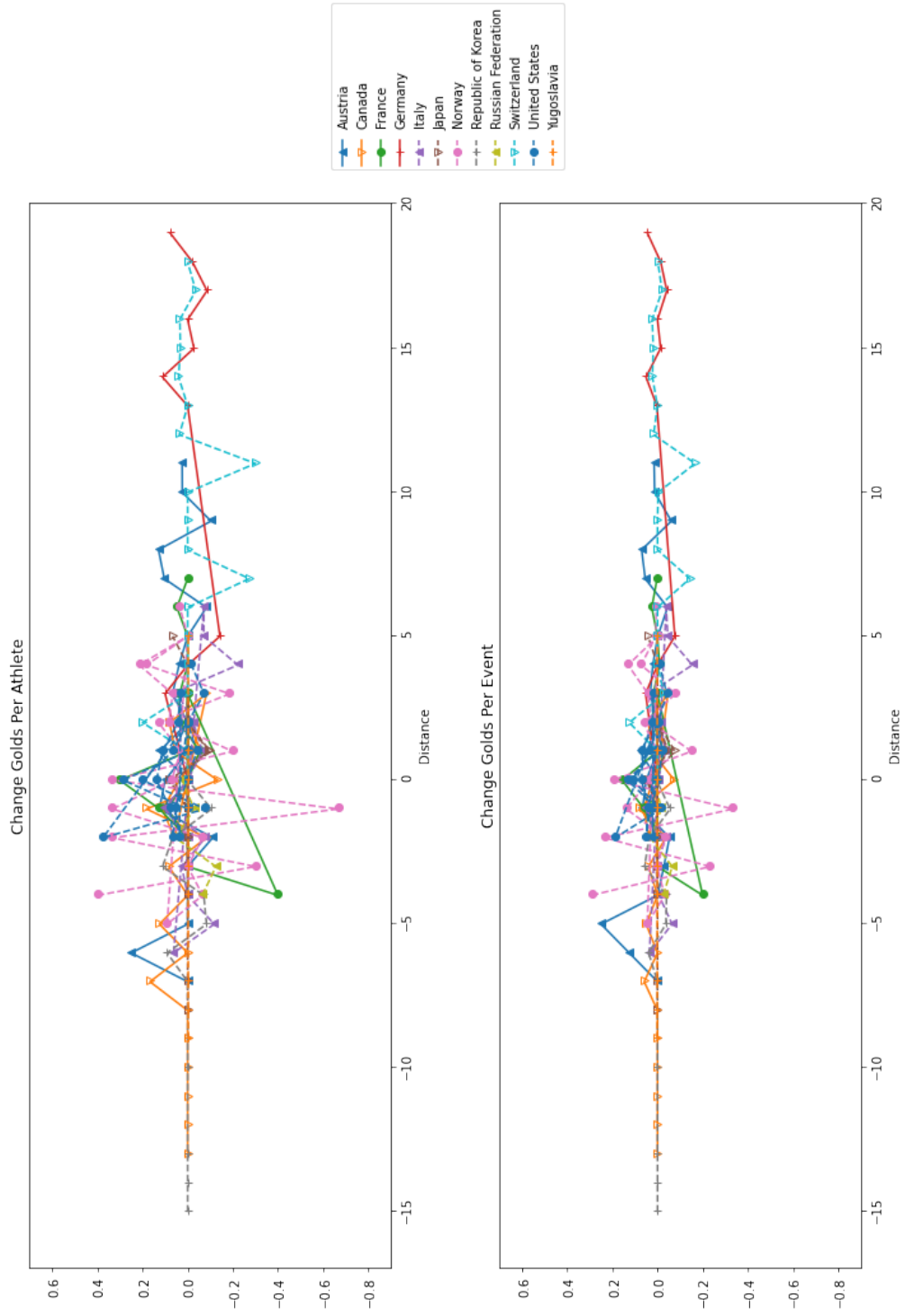


Figure 5: Winter Cohort Gold Medal Change by Distance

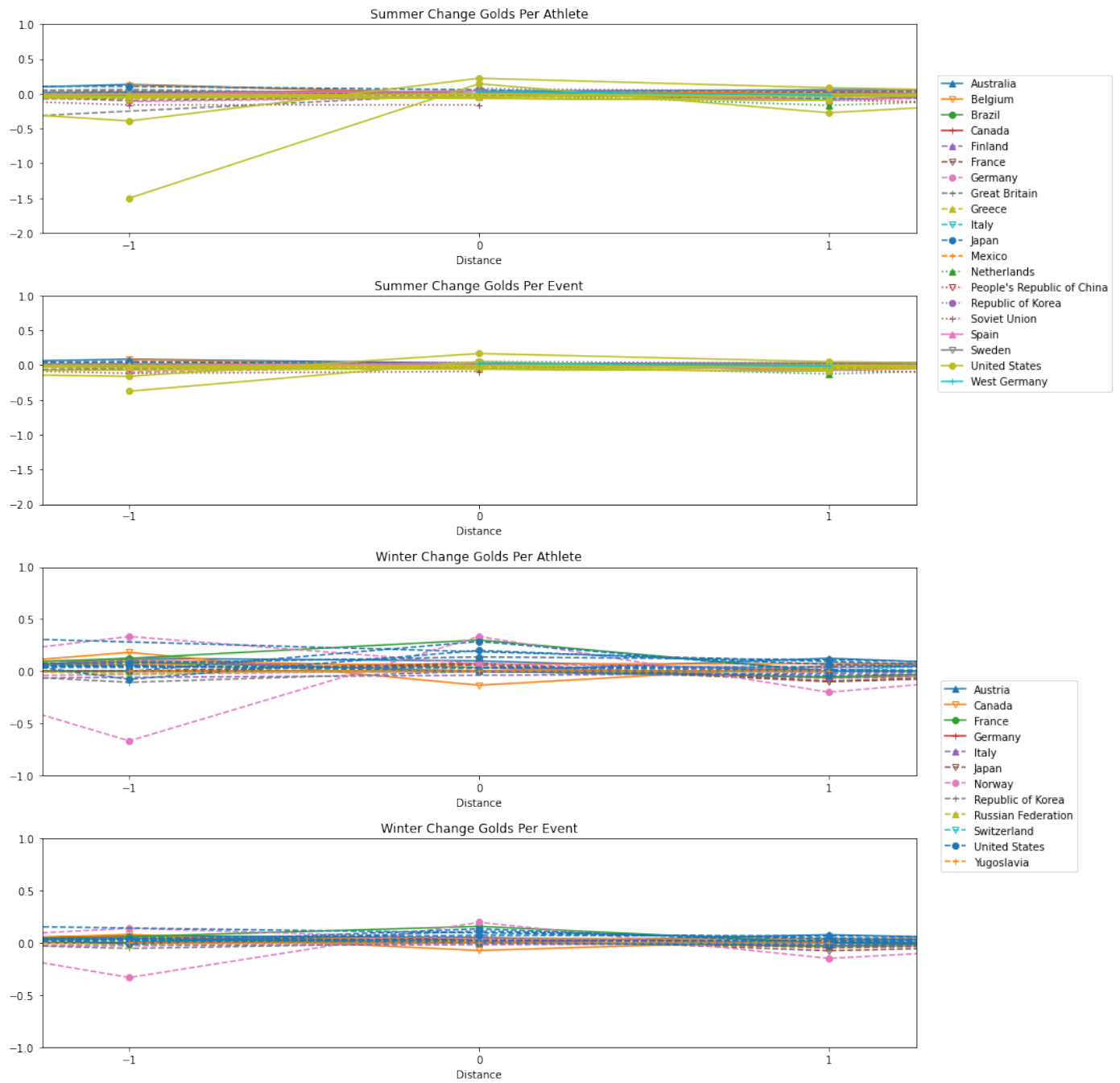


Figure 6: Cohort Gold Medal Change Near Host Distance

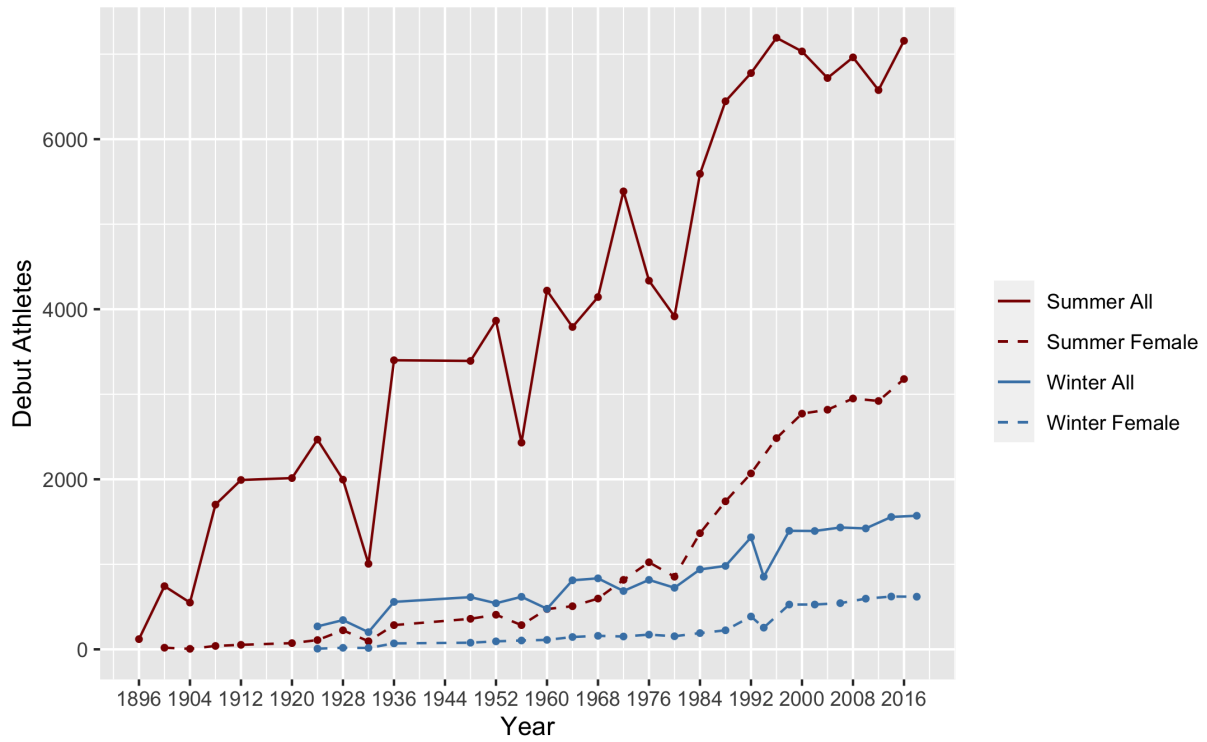


Figure 7: Individual Event Debut Athletes

Table 1: Home Field Effect Medals (-2 to 2)

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Change Medals/Athlete</i>						
Distance -1	-0.017 [-0.416]	-0.017 [-1.675]	-0.019 [-0.432]	-0.019 [-1.698]	-0.129 [-1.445]	-0.129 [-1.640]
Distance 0	0.041 [1.925]	0.041 [8.355]	0.040 [1.720]	0.040 [7.365]	-0.004 [-0.081]	-0.004 [-0.092]
Distance 1	-0.059 [-1.238]	-0.059 [-6.236]	-0.065 [-1.270]	-0.065 [-6.017]	-0.145 [-1.815]	-0.145 [-2.039]
Distance 2	-0.011 [-0.391]	-0.011 [-1.798]	-0.016 [-0.505]	-0.016 [-2.294]	-0.073 [-1.358]	-0.073 [-1.556]
Summer	-0.049 [-4.358]	-0.049 [-15.126]	-0.061 [-3.339]	-0.061 [-9.526]	-0.172 [-2.372]	-0.172 [-2.622]
MaleRatio	-0.030 [-0.524]	-0.030 [-1.806]	0.015 [0.154]	0.015 [0.506]	-0.100 [-0.470]	-0.100 [-0.528]
MeanAge	0.115 [1.181]	0.115 [3.570]	0.174 [1.277]	0.174 [4.241]	0.536 [2.634]	0.536 [3.064]
MeanAgeSquared	-0.002 [-1.247]	-0.002 [-3.786]	-0.004 [-1.337]	-0.004 [-4.484]	-0.010 [-2.628]	-0.010 [-3.053]
<i>N</i>	199	199	199	199	199	199
Adjusted R ²	0.083	0.083	-0.013	-0.013	0.077	0.077
<i>Panel B. Change Medals/Event</i>						
Distance -1	-0.007 [-0.328]	-0.007 [-1.413]	-0.008 [-0.369]	-0.008 [-1.631]	-0.075 [-1.790]	-0.075 [-1.995]
Distance 0	0.030 [2.068]	0.030 [9.297]	0.029 [1.848]	0.029 [8.455]	-0.003 [-0.074]	-0.003 [-0.085]
Distance 1	-0.036 [-1.231]	-0.036 [-6.319]	-0.040 [-1.299]	-0.040 [-6.620]	-0.101 [-2.090]	-0.101 [-2.387]
Distance 2	-0.014 [-0.686]	-0.014 [-3.761]	-0.017 [-0.727]	-0.017 [-3.938]	-0.067 [-1.869]	-0.067 [-2.168]
Summer	-0.026 [-4.086]	-0.026 [-14.450]	-0.037 [-3.811]	-0.037 [-8.980]	-0.106 [-2.197]	-0.106 [-2.493]
MaleRatio	-0.009 [-0.295]	-0.009 [-1.057]	0.026 [0.531]	0.026 [1.655]	0.090 [0.694]	0.090 [0.779]
MeanAge	0.064 [1.106]	0.064 [4.041]	0.102 [1.234]	0.102 [4.587]	0.235 [2.655]	0.235 [2.956]
MeanAgeSquared	-0.001 [-1.223]	-0.001 [-4.482]	-0.002 [-1.343]	-0.002 [-5.029]	-0.004 [-2.644]	-0.004 [-2.933]
<i>N</i>	199	199	199	199	199	199
Adjusted R ²	0.093	0.093	0.010	0.010	0.136	0.136
Country fixed effects	No	No	Yes	Yes	Yes	Yes

Notes:

t-statistics in brackets. (1), (2), (3), and (4) weight by CohortSize. (5) and (6) are unweighted. Standard errors for odd columns are clustered at the Country level. Standard errors for even columns are wild bootstrap, using Country blocks and 1000 repetitions. There are 25 Country clusters. Critical values for the t-distribution with 24 degrees of freedom: 1.71 (10% level), 2.06 (5% level), 2.80 (1% level).

Table 2: Home Field Effect Golds (-2 to 2)

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Change Golds/Athlete</i>						
Distance -1	-0.018 [-0.823]	-0.018 [-2.900]	-0.017 [-0.761]	-0.017 [-2.936]	-0.044 [-0.712]	-0.044 [-0.810]
Distance 0	0.014 [1.256]	0.014 [7.007]	0.011 [0.709]	0.011 [4.524]	0.035 [2.073]	0.035 [2.412]
Distance 1	-0.042 [-4.292]	-0.042 [-16.348]	-0.054 [-3.818]	-0.054 [-17.999]	-0.038 [-1.624]	-0.038 [-1.846]
Distance 2	-0.012 [-0.767]	-0.012 [-4.684]	-0.019 [-0.934]	-0.019 [-6.069]	-0.003 [-0.115]	-0.003 [-0.130]
Summer	-0.041 [-2.991]	-0.041 [-15.114]	-0.025 [-2.082]	-0.025 [-6.989]	-0.070 [-1.629]	-0.070 [-1.853]
MaleRatio	0.021 [0.467]	0.021 [2.028]	-0.003 [-0.066]	-0.003 [-0.239]	-0.032 [-0.330]	-0.032 [-0.358]
MeanAge	-0.046 [-0.606]	-0.046 [-2.267]	-0.073 [-0.695]	-0.073 [-2.725]	0.014 [0.104]	0.014 [0.114]
MeanAgeSquared	0.001 [0.558]	0.001 [2.079]	0.001 [0.641]	0.001 [2.511]	-0.0004 [-0.145]	-0.0004 [-0.160]
<i>N</i>	199	199	199	199	199	199
Adjusted R ²	0.086	0.086	0.082	0.082	-0.062	-0.062
<i>Panel B. Change Golds/Event</i>						
Distance -1	-0.009 [-0.855]	-0.009 [-3.871]	-0.009 [-0.746]	-0.009 [-3.784]	-0.016 [-0.706]	-0.016 [-0.778]
Distance 0	0.010 [1.374]	0.010 [7.616]	0.009 [0.848]	0.009 [5.399]	0.017 [1.971]	0.017 [2.204]
Distance 1	-0.026 [-3.907]	-0.026 [-17.519]	-0.034 [-3.328]	-0.034 [-18.431]	-0.027 [-2.171]	-0.027 [-2.350]
Distance 2	-0.010 [-0.717]	-0.010 [-5.084]	-0.013 [-0.798]	-0.013 [-5.734]	-0.009 [-0.784]	-0.009 [-0.871]
Summer	-0.024 [-2.683]	-0.024 [-15.915]	-0.013 [-2.183]	-0.013 [-7.245]	-0.031 [-1.886]	-0.031 [-2.094]
MaleRatio	0.022 [0.799]	0.022 [4.727]	0.007 [0.321]	0.007 [1.233]	0.017 [0.480]	0.017 [0.538]
MeanAge	-0.033 [-0.760]	-0.033 [-3.484]	-0.049 [-0.785]	-0.049 [-3.716]	-0.018 [-0.403]	-0.018 [-0.468]
MeanAgeSquared	0.001 [0.706]	0.001 [3.251]	0.001 [0.717]	0.001 [3.415]	0.0003 [0.346]	0.0003 [0.401]
<i>N</i>	199	199	199	199	199	199
Adjusted R ²	0.112	0.112	0.165	0.165	0.001	0.001
Country fixed effects	No	No	Yes	Yes	Yes	Yes

Notes:

t-statistics in brackets. (1), (2), (3), and (4) weight by CohortSize. (5) and (6) are unweighted. Standard errors for odd columns are clustered at the Country level. Standard errors for even columns are wild bootstrap, using Country blocks and 1000 repetitions. There are 25 Country clusters. Critical values for the t-distribution with 24 degrees of freedom: 1.71 (10% level), 2.06 (5% level), 2.80 (1% level).

Table 3: Home Field Effect Medals, Drop Games (-2 to 2)

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Change Medals/Athlete</i>						
Distance -1	-0.016 [-0.369]	-0.016 [-1.374]	-0.026 [-0.570]	-0.026 [-2.317]	-0.151 [-1.642]	-0.151 [-1.931]
Distance 0	0.028 [1.148]	0.028 [5.690]	0.022 [0.795]	0.022 [3.762]	-0.046 [-0.732]	-0.046 [-0.802]
Distance 1	-0.065 [-1.421]	-0.065 [-7.059]	-0.076 [-1.500]	-0.076 [-7.673]	-0.152 [-1.727]	-0.152 [-2.015]
Distance 2	-0.014 [-0.503]	-0.014 [-2.524]	-0.021 [-0.604]	-0.021 [-3.158]	-0.085 [-1.175]	-0.085 [-1.327]
Summer	-0.041 [-2.990]	-0.041 [-12.234]	-0.061 [-2.577]	-0.061 [-9.196]	-0.168 [-1.916]	-0.168 [-2.192]
MaleRatio	-0.039 [-0.569]	-0.039 [-2.119]	-0.018 [-0.162]	-0.018 [-0.598]	-0.193 [-0.786]	-0.193 [-0.867]
MeanAge	0.089 [0.872]	0.089 [2.932]	0.147 [1.097]	0.147 [3.427]	0.614 [2.083]	0.614 [2.304]
MeanAgeSquared	-0.002 [-0.918]	-0.002 [-3.136]	-0.003 [-1.145]	-0.003 [-3.657]	-0.012 [-2.113]	-0.012 [-2.336]
<i>N</i>	168	168	168	168	168	168
Adjusted R ²	0.071	0.071	-0.029	-0.029	0.049	0.049
<i>Panel B. Change Medals/Event</i>						
Distance -1	-0.002 [-0.094]	-0.002 [-0.406]	-0.009 [-0.356]	-0.009 [-1.673]	-0.086 [-1.757]	-0.086 [-1.984]
Distance 0	0.018 [1.166]	0.018 [5.680]	0.013 [0.797]	0.013 [3.660]	-0.040 [-0.913]	-0.040 [-1.070]
Distance 1	-0.035 [-1.363]	-0.035 [-7.297]	-0.042 [-1.557]	-0.042 [-8.814]	-0.110 [-2.188]	-0.110 [-2.502]
Distance 2	-0.016 [-0.713]	-0.016 [-4.287]	-0.018 [-0.691]	-0.018 [-4.249]	-0.082 [-1.602]	-0.082 [-1.871]
Summer	-0.019 [-2.264]	-0.019 [-12.145]	-0.034 [-3.074]	-0.034 [-9.955]	-0.081 [-1.956]	-0.081 [-2.245]
MaleRatio	-0.011 [-0.359]	-0.011 [-1.469]	0.009 [0.189]	0.009 [0.682]	0.025 [0.154]	0.025 [0.174]
MeanAge	0.047 [0.805]	0.047 [3.396]	0.085 [1.082]	0.085 [3.890]	0.306 [2.236]	0.306 [2.569]
MeanAgeSquared	-0.001 [-0.907]	-0.001 [-3.879]	-0.002 [-1.203]	-0.002 [-4.413]	-0.006 [-2.313]	-0.006 [-2.655]
<i>N</i>	168	168	168	168	168	168
Adjusted R ²	0.080	0.080	0.020	0.020	0.057	0.057
Country fixed effects	No	No	Yes	Yes	Yes	Yes

Notes:

t-statistics in brackets. (1), (2), (3), and (4) weight by CohortSize. (5) and (6) are unweighted. Standard errors for odd columns are clustered at the Country level. Standard errors for even columns are wild bootstrap, using Country blocks and 1000 repetitions. There are 24 Country clusters. Critical values for the t-distribution with 23 degrees of freedom: 1.71 (10% level), 2.07 (5% level), 2.81 (1% level).

Table 4: Home Field Effect Golds, Drop Games (-2 to 2)

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Change Golds/Athlete</i>						
Distance -1	-0.011 [-0.434]	-0.011 [-1.522]	-0.008 [-0.332]	-0.008 [-1.275]	-0.035 [-0.542]	-0.035 [-0.604]
Distance 0	0.016 [1.713]	0.016 [8.027]	0.018 [1.557]	0.018 [8.547]	0.046 [2.375]	0.046 [2.786]
Distance 1	-0.046 [-4.140]	-0.046 [-17.744]	-0.048 [-3.765]	-0.048 [-17.833]	-0.016 [-0.717]	-0.016 [-0.804]
Distance 2	-0.016 [-0.872]	-0.016 [-5.580]	-0.012 [-0.662]	-0.012 [-4.202]	0.018 [0.785]	0.018 [0.903]
Summer	-0.037 [-2.521]	-0.037 [-12.596]	-0.032 [-2.030]	-0.032 [-6.955]	-0.095 [-1.723]	-0.095 [-1.919]
MaleRatio	0.017 [0.318]	0.017 [1.251]	-0.030 [-0.425]	-0.030 [-1.680]	-0.061 [-0.560]	-0.061 [-0.623]
MeanAge	-0.020 [-0.262]	-0.020 [-0.903]	-0.080 [-0.733]	-0.080 [-2.755]	-0.002 [-0.009]	-0.002 [-0.010]
MeanAgeSquared	0.0004 [0.234]	0.0004 [0.805]	0.001 [0.680]	0.001 [2.574]	-0.0001 [-0.020]	-0.0001 [-0.022]
<i>N</i>	168	168	168	168	168	168
Adjusted R ²	0.090	0.090	0.024	0.024	-0.077	-0.077
<i>Panel B. Change Golds/Event</i>						
Distance -1	-0.003 [-0.248]	-0.003 [-0.991]	-0.001 [-0.095]	-0.001 [-0.437]	-0.009 [-0.408]	-0.009 [-0.469]
Distance 0	0.010 [1.715]	0.010 [9.011]	0.011 [1.662]	0.011 [9.468]	0.020 [2.018]	0.020 [2.301]
Distance 1	-0.028 [-4.397]	-0.028 [-25.727]	-0.029 [-3.773]	-0.029 [-23.083]	-0.016 [-1.838]	-0.016 [-2.082]
Distance 2	-0.013 [-0.825]	-0.013 [-6.423]	-0.009 [-0.548]	-0.009 [-4.120]	0.001 [0.082]	0.001 [0.092]
Summer	-0.021 [-2.137]	-0.021 [-12.306]	-0.016 [-1.774]	-0.016 [-6.600]	-0.040 [-1.760]	-0.040 [-2.062]
MaleRatio	0.022 [0.763]	0.022 [4.545]	-0.008 [-0.286]	-0.008 [-1.479]	-0.004 [-0.120]	-0.004 [-0.137]
MeanAge	-0.015 [-0.368]	-0.015 [-1.646]	-0.053 [-0.858]	-0.053 [-4.091]	-0.024 [-0.385]	-0.024 [-0.443]
MeanAgeSquared	0.0003 [0.323]	0.0003 [1.448]	0.001 [0.781]	0.001 [3.770]	0.0004 [0.343]	0.0004 [0.395]
<i>N</i>	168	168	168	168	168	168
Adjusted R ²	0.126	0.126	0.115	0.115	-0.046	-0.046
Country fixed effects	No	No	Yes	Yes	Yes	Yes

Notes:

t-statistics in brackets. (1), (2), (3), and (4) weight by CohortSize. (5) and (6) are unweighted. Standard errors for odd columns are clustered at the Country level. Standard errors for even columns are wild bootstrap, using Country blocks and 1000 repetitions. There are 24 Country clusters. Critical values for the t-distribution with 23 degrees of freedom: 1.71 (10% level), 2.07 (5% level), 2.81 (1% level).

Table 5: Home Field Effect Medals, Drop Games 1952+ (-2 to 2)

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Change Medals/Athlete</i>						
Distance -1	0.031 [0.763]	0.031 [4.176]	0.028 [0.637]	0.028 [3.649]	0.034 [0.645]	0.034 [0.762]
Distance 0	0.041 [1.695]	0.041 [10.494]	0.044 [1.557]	0.044 [9.800]	0.063 [2.068]	0.063 [2.387]
Distance 1	-0.047 [-1.321]	-0.047 [-8.306]	-0.045 [-0.988]	-0.045 [-6.437]	-0.052 [-1.144]	-0.052 [-1.261]
Distance 2	0.019 [0.547]	0.019 [3.653]	0.027 [0.755]	0.027 [5.259]	0.024 [0.695]	0.024 [0.802]
Summer	-0.031 [-2.606]	-0.031 [-14.905]	-0.042 [-1.163]	-0.042 [-7.010]	-0.031 [-0.912]	-0.031 [-1.049]
MaleRatio	-0.070 [-1.222]	-0.070 [-6.218]	0.030 [0.260]	0.030 [1.543]	-0.024 [-0.226]	-0.024 [-0.259]
MeanAge	-0.013 [-0.102]	-0.013 [-0.539]	-0.067 [-0.313]	-0.067 [-1.871]	0.130 [0.569]	0.130 [0.640]
MeanAgeSquared	-0.00003 [-0.012]	-0.00003 [-0.062]	0.001 [0.214]	0.001 [1.280]	-0.003 [-0.630]	-0.003 [-0.709]
<i>N</i>	124	124	124	124	124	124
Adjusted R ²	0.094	0.094	-0.001	-0.001	-0.015	-0.015
<i>Panel B. Change Medals/Event</i>						
Distance -1	0.019 [0.777]	0.019 [4.564]	0.015 [0.575]	0.015 [3.635]	0.008 [0.314]	0.008 [0.351]
Distance 0	0.024 [1.507]	0.024 [9.204]	0.023 [1.236]	0.023 [7.881]	0.027 [1.462]	0.027 [1.732]
Distance 1	-0.034 [-1.377]	-0.034 [-8.899]	-0.035 [-1.139]	-0.035 [-8.275]	-0.045 [-1.709]	-0.045 [-1.976]
Distance 2	0.003 [0.118]	0.003 [0.834]	0.007 [0.240]	0.007 [1.823]	0.002 [0.071]	0.002 [0.081]
Summer	-0.014 [-1.710]	-0.014 [-9.473]	-0.022 [-1.088]	-0.022 [-6.792]	-0.019 [-1.101]	-0.019 [-1.291]
MaleRatio	-0.061 [-1.456]	-0.061 [-8.501]	-0.005 [-0.064]	-0.005 [-0.412]	-0.020 [-0.344]	-0.020 [-0.406]
MeanAge	0.072 [0.790]	0.072 [4.593]	0.042 [0.303]	0.042 [1.922]	0.161 [1.173]	0.161 [1.362]
MeanAgeSquared	-0.002 [-0.898]	-0.002 [-5.239]	-0.001 [-0.402]	-0.001 [-2.557]	-0.004 [-1.214]	-0.004 [-1.409]
<i>N</i>	124	124	124	124	124	124
Adjusted R ²	0.108	0.108	0.029	0.029	0.038	0.038
Country fixed effects	No	No	Yes	Yes	Yes	Yes

Notes:

t-statistics in brackets. (1), (2), (3), and (4) weight by CohortSize. (5) and (6) are unweighted. Standard errors for odd columns are clustered at the Country level. Standard errors for even columns are wild bootstrap, using Country blocks and 1000 repetitions. There are 20 Country clusters. Critical values for the t-distribution with 19 degrees of freedom: 1.73 (10% level), 2.09 (5% level), 2.86 (1% level).

Table 6: Home Field Effect Golds, Drop Games 1952+ (-2 to 2)

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Change Golds/Athlete</i>						
Distance -1	0.012 [0.556]	0.012 [2.827]	0.021 [0.873]	0.021 [4.699]	0.049 [1.527]	0.049 [1.749]
Distance 0	0.019 [1.637]	0.019 [8.424]	0.026 [1.781]	0.026 [9.902]	0.049 [2.534]	0.049 [2.976]
Distance 1	-0.043 [-3.521]	-0.043 [-19.816]	-0.036 [-2.288]	-0.036 [-13.629]	-0.014 [-0.731]	-0.014 [-0.834]
Distance 2	-0.008 [-0.339]	-0.008 [-2.256]	0.004 [0.168]	0.004 [1.081]	0.020 [0.820]	0.020 [0.954]
Summer	-0.031 [-2.523]	-0.031 [-16.079]	-0.027 [-2.546]	-0.027 [-12.107]	-0.021 [-1.507]	-0.021 [-1.694]
MaleRatio	0.061 [1.386]	0.061 [8.343]	0.037 [0.982]	0.037 [5.149]	0.009 [0.188]	0.009 [0.223]
MeanAge	-0.061 [-0.646]	-0.061 [-2.938]	-0.170 [-1.157]	-0.170 [-5.496]	-0.034 [-0.197]	-0.034 [-0.230]
MeanAgeSquared	0.001 [0.612]	0.001 [2.840]	0.003 [1.100]	0.003 [5.246]	0.0004 [0.118]	0.0004 [0.138]
<i>N</i>	124	124	124	124	124	124
Adjusted R ²	0.166	0.166	0.181	0.181	0.115	0.115
<i>Panel B. Change Golds/Event</i>						
Distance -1	0.004 [0.315]	0.004 [1.651]	0.009 [0.736]	0.009 [4.141]	0.022 [1.412]	0.022 [1.577]
Distance 0	0.010 [1.548]	0.010 [7.703]	0.014 [1.693]	0.014 [9.423]	0.024 [2.236]	0.024 [2.485]
Distance 1	-0.033 [-3.894]	-0.033 [-24.707]	-0.028 [-2.647]	-0.028 [-17.472]	-0.016 [-1.404]	-0.016 [-1.604]
Distance 2	-0.011 [-0.573]	-0.011 [-4.178]	-0.002 [-0.124]	-0.002 [-0.873]	0.006 [0.418]	0.006 [0.473]
Summer	-0.018 [-1.983]	-0.018 [-13.699]	-0.016 [-2.268]	-0.016 [-10.392]	-0.012 [-1.231]	-0.012 [-1.453]
MaleRatio	0.037 [1.008]	0.037 [7.116]	0.013 [0.493]	0.013 [2.732]	0.003 [0.097]	0.003 [0.112]
MeanAge	-0.033 [-0.470]	-0.033 [-2.619]	-0.097 [-0.985]	-0.097 [-4.961]	-0.006 [-0.059]	-0.006 [-0.066]
MeanAgeSquared	0.001 [0.430]	0.001 [2.460]	0.002 [0.920]	0.002 [4.640]	-0.0001 [-0.026]	-0.0001 [-0.030]
<i>N</i>	124	124	124	124	124	124
Adjusted R ²	0.176	0.176	0.211	0.211	0.145	0.145
Country fixed effects	No	No	Yes	Yes	Yes	Yes

Notes:

t-statistics in brackets. (1), (2), (3), and (4) weight by CohortSize. (5) and (6) are unweighted. Standard errors for odd columns are clustered at the Country level. Standard errors for even columns are wild bootstrap, using Country blocks and 1000 repetitions. There are 20 Country clusters. Critical values for the t-distribution with 19 degrees of freedom: 1.73 (10% level), 2.09 (5% level), 2.86 (1% level).

Table 7: Subjective Event Home Field Effect Medals

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Change Medals/Athlete</i>						
Distance -1	-0.014 [-0.257]	-0.014 [-0.655]	-0.047 [-0.769]	-0.047 [-2.019]	-0.020 [-0.290]	-0.020 [-0.351]
Distance 0	0.076 [1.641]	0.076 [4.815]	0.059 [1.055]	0.059 [3.294]	0.038 [0.724]	0.038 [0.859]
Distance 1	-0.132 [-1.966]	-0.132 [-5.297]	-0.143 [-1.849]	-0.143 [-5.005]	-0.124 [-1.348]	-0.124 [-1.622]
Distance 2	0.035 [0.490]	0.035 [1.513]	0.050 [0.664]	0.050 [2.031]	-0.001 [-0.015]	-0.001 [-0.018]
Summer	-0.020 [-0.759]	-0.020 [-1.960]	-0.058 [-2.070]	-0.058 [-5.713]	-0.088 [-2.487]	-0.088 [-2.904]
MaleRatio	0.055 [0.836]	0.055 [2.454]	0.263 [1.975]	0.263 [4.785]	0.162 [1.245]	0.162 [1.419]
MeanAge	0.068 [0.705]	0.068 [1.547]	0.010 [0.076]	0.010 [0.184]	0.088 [0.735]	0.088 [0.824]
MeanAgeSquared	-0.002 [-0.975]	-0.002 [-2.221]	-0.001 [-0.294]	-0.001 [-0.735]	-0.003 [-0.925]	-0.003 [-1.036]
<i>N</i>	122	122	122	122	122	122
Adjusted R ²	0.112	0.112	0.057	0.057	0.006	0.006
<i>Panel B. Change Medals/Event</i>						
Distance -1	0.008 [0.241]	0.008 [0.555]	-0.010 [-0.272]	-0.010 [-0.600]	0.006 [0.105]	0.006 [0.121]
Distance 0	0.041 [1.160]	0.041 [3.080]	0.035 [0.795]	0.035 [2.393]	0.018 [0.375]	0.018 [0.438]
Distance 1	-0.080 [-1.601]	-0.080 [-3.877]	-0.085 [-1.467]	-0.085 [-3.714]	-0.085 [-1.128]	-0.085 [-1.261]
Distance 2	0.023 [0.457]	0.023 [1.550]	0.040 [0.745]	0.040 [2.251]	0.012 [0.215]	0.012 [0.252]
Summer	-0.010 [-0.582]	-0.010 [-1.383]	-0.051 [-3.074]	-0.051 [-8.179]	-0.068 [-3.498]	-0.068 [-3.904]
MaleRatio	0.028 [0.625]	0.028 [2.033]	0.187 [1.784]	0.187 [4.454]	0.124 [1.218]	0.124 [1.443]
MeanAge	0.006 [0.085]	0.006 [0.178]	-0.023 [-0.249]	-0.023 [-0.546]	0.045 [0.439]	0.045 [0.530]
MeanAgeSquared	-0.001 [-0.358]	-0.001 [-0.770]	0.0001 [0.035]	0.0001 [0.080]	-0.001 [-0.601]	-0.001 [-0.725]
<i>N</i>	122	122	122	122	122	122
Adjusted R ²	0.055	0.055	-0.019	-0.019	-0.040	-0.040
Country fixed effects	No	No	Yes	Yes	Yes	Yes

Notes:

t-statistics in brackets. (1), (2), (3), and (4) weight by CohortSize. (5) and (6) are unweighted. Standard errors for odd columns are clustered at the Country level. Standard errors for even columns are wild bootstrap, using Country blocks and 1000 repetitions. There are 20 Country clusters. Critical values for the t-distribution with 19 degrees of freedom: 1.73 (10% level), 2.09 (5% level), 2.86 (1% level). Games with major declines in attendance dropped. Distance [-2, 2] Years 1952+

Table 8: Subjective Event Home Field Effect Golds

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Change Golds/Athlete</i>						
Distance -1	0.007 [0.118]	0.007 [0.336]	0.012 [0.177]	0.012 [0.565]	-0.002 [-0.035]	-0.002 [-0.040]
Distance 0	0.065 [2.062]	0.065 [5.149]	0.073 [2.075]	0.073 [5.430]	0.072 [1.815]	0.072 [2.110]
Distance 1	-0.080 [-1.531]	-0.080 [-4.368]	-0.065 [-1.213]	-0.065 [-3.506]	-0.025 [-0.525]	-0.025 [-0.610]
Distance 2	-0.001 [-0.015]	-0.001 [-0.040]	0.025 [0.449]	0.025 [1.237]	0.017 [0.293]	0.017 [0.342]
Summer	-0.030 [-1.217]	-0.030 [-2.955]	-0.033 [-1.114]	-0.033 [-2.487]	-0.048 [-1.118]	-0.048 [-1.304]
MaleRatio	0.048 [0.720]	0.048 [2.223]	0.080 [0.932]	0.080 [2.607]	0.030 [0.415]	0.030 [0.472]
MeanAge	-0.043 [-0.438]	-0.043 [-0.721]	0.016 [0.123]	0.016 [0.249]	0.076 [0.502]	0.076 [0.574]
MeanAgeSquared	0.001 [0.312]	0.001 [0.523]	-0.001 [-0.308]	-0.001 [-0.634]	-0.002 [-0.672]	-0.002 [-0.771]
<i>N</i>	122	122	122	122	122	122
Adjusted R ²	0.096	0.096	0.077	0.077	0.071	0.071
<i>Panel B. Change Golds/Event</i>						
Distance -1	0.027 [0.592]	0.027 [1.685]	0.027 [0.497]	0.027 [1.637]	0.017 [0.421]	0.017 [0.486]
Distance 0	0.046 [2.075]	0.046 [4.553]	0.049 [1.794]	0.049 [4.573]	0.056 [1.715]	0.056 [1.967]
Distance 1	-0.045 [-1.366]	-0.045 [-3.719]	-0.037 [-1.073]	-0.037 [-3.001]	-0.013 [-0.376]	-0.013 [-0.432]
Distance 2	0.023 [0.669]	0.023 [1.745]	0.040 [0.991]	0.040 [2.764]	0.034 [0.823]	0.034 [0.942]
Summer	-0.021 [-0.992]	-0.021 [-2.367]	-0.025 [-0.947]	-0.025 [-2.117]	-0.036 [-0.923]	-0.036 [-1.057]
MaleRatio	0.042 [0.955]	0.042 [2.929]	0.069 [1.208]	0.069 [3.014]	0.028 [0.533]	0.028 [0.612]
MeanAge	-0.004 [-0.064]	-0.004 [-0.111]	0.025 [0.260]	0.025 [0.553]	0.077 [0.710]	0.077 [0.805]
MeanAgeSquared	-0.0001 [-0.095]	-0.0001 [-0.168]	-0.001 [-0.468]	-0.001 [-1.009]	-0.002 [-0.894]	-0.002 [-1.012]
<i>N</i>	122	122	122	122	122	122
Adjusted R ²	0.083	0.083	0.054	0.054	0.074	0.074
Country fixed effects	No	No	Yes	Yes	Yes	Yes

Notes:

t-statistics in brackets. (1), (2), (3), and (4) weight by CohortSize. (5) and (6) are unweighted. Standard errors for odd columns are clustered at the Country level. Standard errors for even columns are wild bootstrap, using Country blocks and 1000 repetitions. There are 20 Country clusters. Critical values for the t-distribution with 19 degrees of freedom: 1.73 (10% level), 2.09 (5% level), 2.86 (1% level). Games with major declines in attendance dropped. Distance [-2, 2] Years 1952+

Table 9: Objective Event Home Field Effect Medals

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Change Medals/Athlete</i>						
Distance -1	0.036 [0.790]	0.036 [3.704]	0.040 [0.791]	0.040 [4.075]	0.029 [0.464]	0.029 [0.541]
Distance 0	0.029 [1.093]	0.029 [5.279]	0.034 [1.065]	0.034 [5.369]	0.061 [1.298]	0.061 [1.486]
Distance 1	-0.031 [-0.938]	-0.031 [-5.113]	-0.025 [-0.576]	-0.025 [-3.403]	-0.030 [-0.627]	-0.030 [-0.741]
Distance 2	0.011 [0.292]	0.011 [1.482]	0.022 [0.543]	0.022 [2.900]	0.027 [0.536]	0.027 [0.621]
Summer	-0.029 [-2.609]	-0.029 [-10.465]	-0.038 [-1.039]	-0.038 [-5.366]	-0.012 [-0.354]	-0.012 [-0.413]
MaleRatio	-0.087 [-1.075]	-0.087 [-4.538]	-0.034 [-0.215]	-0.034 [-1.047]	-0.097 [-0.677]	-0.097 [-0.778]
MeanAge	-0.025 [-0.232]	-0.025 [-1.165]	-0.163 [-0.886]	-0.163 [-4.858]	-0.006 [-0.033]	-0.006 [-0.038]
MeanAgeSquared	0.0004 [0.156]	0.0004 [0.810]	0.003 [0.770]	0.003 [4.366]	-0.0002 [-0.063]	-0.0002 [-0.073]
<i>N</i>	124	124	124	124	124	124
Adjusted R ²	0.017	0.017	-0.078	-0.078	-0.067	-0.067
<i>Panel B. Change Medals/Event</i>						
Distance -1	0.023 [0.893]	0.023 [4.678]	0.020 [0.729]	0.020 [4.181]	0.004 [0.130]	0.004 [0.148]
Distance 0	0.017 [0.945]	0.017 [5.114]	0.013 [0.673]	0.013 [3.688]	0.020 [0.794]	0.020 [0.904]
Distance 1	-0.025 [-1.145]	-0.025 [-6.706]	-0.027 [-0.989]	-0.027 [-6.125]	-0.035 [-1.385]	-0.035 [-1.595]
Distance 2	-0.004 [-0.153]	-0.004 [-0.963]	-0.003 [-0.095]	-0.003 [-0.600]	-0.004 [-0.144]	-0.004 [-0.167]
Summer	-0.020 [-2.577]	-0.020 [-11.653]	-0.035 [-1.389]	-0.035 [-8.111]	-0.023 [-1.154]	-0.023 [-1.375]
MaleRatio	-0.071 [-1.466]	-0.071 [-7.092]	-0.034 [-0.354]	-0.034 [-2.021]	-0.049 [-0.709]	-0.049 [-0.824]
MeanAge	0.054 [0.593]	0.054 [3.647]	-0.037 [-0.273]	-0.037 [-1.772]	0.041 [0.394]	0.041 [0.450]
MeanAgeSquared	-0.001 [-0.651]	-0.001 [-4.083]	0.001 [0.180]	0.001 [1.189]	-0.001 [-0.463]	-0.001 [-0.530]
<i>N</i>	124	124	124	124	124	124
Adjusted R ²	0.064	0.064	-0.005	-0.005	-0.014	-0.014
Country fixed effects	No	No	Yes	Yes	Yes	Yes

Notes:

t-statistics in brackets. (1), (2), (3), and (4) weight by CohortSize. (5) and (6) are unweighted. Standard errors for odd columns are clustered at the Country level. Standard errors for even columns are wild bootstrap, using Country blocks and 1000 repetitions. There are 20 Country clusters. Critical values for the t-distribution with 19 degrees of freedom: 1.73 (10% level), 2.09 (5% level), 2.86 (1% level). Games with major declines in attendance dropped. Distance [-2, 2] Years 1952+

Table 10: Objective Event Home Field Effect Golds

	(1)	(2)	(3)	(4)	(5)	(6)
<i>Panel A. Change Golds/Athlete</i>						
Distance -1	0.014 [0.468]	0.014 [2.066]	0.018 [0.539]	0.018 [2.621]	0.045 [1.019]	0.045 [1.179]
Distance 0	0.010 [0.790]	0.010 [3.560]	0.012 [0.762]	0.012 [3.748]	0.032 [1.468]	0.032 [1.685]
Distance 1	-0.034 [-2.777]	-0.034 [-15.714]	-0.034 [-2.114]	-0.034 [-12.041]	-0.013 [-0.944]	-0.013 [-1.092]
Distance 2	-0.006 [-0.235]	-0.006 [-1.114]	-0.003 [-0.112]	-0.003 [-0.556]	0.019 [0.570]	0.019 [0.668]
Summer	-0.028 [-2.473]	-0.028 [-12.542]	-0.017 [-1.565]	-0.017 [-5.802]	0.00004 [0.003]	0.00004 [0.003]
MaleRatio	0.018 [0.444]	0.018 [1.747]	-0.017 [-0.321]	-0.017 [-1.224]	-0.075 [-1.013]	-0.075 [-1.197]
MeanAge	-0.006 [-0.080]	-0.006 [-0.304]	-0.114 [-0.844]	-0.114 [-3.434]	-0.003 [-0.020]	-0.003 [-0.023]
MeanAgeSquared	0.0001 [0.038]	0.0001 [0.147]	0.002 [0.799]	0.002 [3.255]	-0.0001 [-0.041]	-0.0001 [-0.046]
<i>N</i>	124	124	124	124	124	124
Adjusted R ²	0.054	0.054	0.026	0.026	0.011	0.011
<i>Panel B. Change Golds/Event</i>						
Distance -1	0.004 [0.244]	0.004 [1.232]	0.005 [0.323]	0.005 [1.637]	0.015 [0.778]	0.015 [0.902]
Distance 0	0.005 [0.709]	0.005 [3.619]	0.004 [0.549]	0.004 [2.730]	0.013 [1.119]	0.013 [1.358]
Distance 1	-0.027 [-3.583]	-0.027 [-22.444]	-0.028 [-2.884]	-0.028 [-16.475]	-0.017 [-2.025]	-0.017 [-2.386]
Distance 2	-0.011 [-0.612]	-0.011 [-3.778]	-0.010 [-0.529]	-0.010 [-3.184]	0.001 [0.080]	0.001 [0.092]
Summer	-0.018 [-2.279]	-0.018 [-13.891]	-0.017 [-1.836]	-0.017 [-9.025]	-0.009 [-0.790]	-0.009 [-0.901]
MaleRatio	0.012 [0.436]	0.012 [2.211]	-0.011 [-0.330]	-0.011 [-1.540]	-0.032 [-1.011]	-0.032 [-1.172]
MeanAge	0.002 [0.035]	0.002 [0.163]	-0.070 [-0.918]	-0.070 [-4.094]	0.003 [0.038]	0.003 [0.043]
MeanAgeSquared	-0.0001 [-0.079]	-0.0001 [-0.382]	0.001 [0.860]	0.001 [3.872]	-0.0002 [-0.107]	-0.0002 [-0.121]
<i>N</i>	124	124	124	124	124	124
Adjusted R ²	0.096	0.096	0.111	0.111	0.043	0.043
Country fixed effects	No	No	Yes	Yes	Yes	Yes

Notes:

t-statistics in brackets. (1), (2), (3), and (4) weight by CohortSize. (5) and (6) are unweighted. Standard errors for odd columns are clustered at the Country level. Standard errors for even columns are wild bootstrap, using Country blocks and 1000 repetitions. There are 20 Country clusters. Critical values for the t-distribution with 19 degrees of freedom: 1.73 (10% level), 2.09 (5% level), 2.86 (1% level). Games with major declines in attendance dropped. Distance [-2, 2] Years 1952+

Appendix

Subjective Individual Sports

Boxing

Light-Middleweight, Men
Featherweight, Men
Lightweight, Men
Light-Heavyweight, Men
Bantamweight, Men
Super-Heavyweight, Men
Middleweight, Men
Welterweight, Men
Light-Welterweight, Men
Flyweight, Men
Heavyweight, Men
Light-Flyweight, Men
Lightweight, Women
Flyweight, Women
Middleweight, Women

Wrestling

Heavyweight, Greco-Roman, Men
Heavyweight, Freestyle, Men
Lightweight, Freestyle, Men
Lightweight, Greco-Roman, Men
Heavyweight, Freestyle, Women
Welterweight, Freestyle, Men
Featherweight, Freestyle, Men
Middleweight, Freestyle, Men
Bantamweight, Freestyle, Men
Featherweight, Greco-Roman, Men
Welterweight, Greco-Roman, Men
Light-Heavyweight, Freestyle, Men
Flyweight, Freestyle, Men
Flyweight, Greco-Roman, Men
Middleweight, Greco-Roman, Men
Light-Heavyweight, Greco-Roman, Men
Super-Heavyweight, Freestyle, Men
Bantamweight, Greco-Roman, Men
Middleweight B, Greco-Roman, Men
Middleweight A, Greco-Roman, Men
Super-Heavyweight, Greco-Roman, Men
Light-Flyweight, Greco-Roman, Men
Light-Flyweight, Freestyle, Men
Unlimited Class, Greco-Roman, Men
Flyweight, Freestyle, Women
Lightweight, Freestyle, Women
Featherweight, Freestyle, Women
Middleweight, Freestyle, Women
Light-Heavyweight, Freestyle, Women

Judo

Half-Middleweight, Women
Lightweight, Women
Heavyweight, Women
Half-Heavyweight, Women
Middleweight, Women
Half-Lightweight, Women
Extra-Lightweight, Women
Lightweight, Men
Extra-Lightweight, Men
Half-Middleweight, Men
Heavyweight, Men
Open Class, Men
Half-Lightweight, Men
Half-Heavyweight, Men
Middleweight, Men

Taekwondo

Flyweight, Women
Featherweight, Women
Welterweight, Men
Flyweight, Men
Featherweight, Men
Welterweight, Women
Heavyweight, Men
Heavyweight, Women

Art Competitions

Literature, Open
Painting, Paintings, Open
Painting, Drawings And Water Colors, Open
Painting, Graphic Arts, Open
Painting, Applied Arts, Open
Literature, Unknown Event, Open
Sculpturing, Open
Architecture, Designs For Town Planning, Open
Sculpturing, Statues, Open
Music, Compositions For Orchestra, Open
Sculpturing, Unknown Event, Open

Artistic Gymnastics (Gymnastics)

Individual All-Around, Women
Floor Exercise, Women
Horse Vault, Women
Uneven Bars, Women
Balance Beam, Women
Individual All-Around, Men
Floor Exercise, Men
Horse Vault, Men
Parallel Bars, Men
Horizontal Bar, Men
Rings, Men
Pommel Horse, Men
Individual All-Around, Field Sports, Men
Individual All-Around, Apparatus Work, Men
Rope Climbing, Men
Side Horse, Men
Club Swinging, Men
Individual All-Around, 4 Events, Men
Tumbling, Men

Rhythmic Gymnastics (Gymnastics)

Individual, Women

Diving (Aquatics)

Plain High, Men
Plain High, Women

Nordic Combined (Skiing)

Individual, Men
Sprint, Men
Normal Hill / 10 km, Individual, Men
Large Hill / 10 km, Individual, Men

Artistic Swimming (Aquatics)

Solo, Women

Ski Jumping (Skiing)

Normal Hill, Individual, Men
Large Hill, Individual, Men
Normal Hill, Individual, Women

Figure Skating (Skating)

Singles, Women
Singles, Men
Special Figures, Men

Freestyle Skiing (Skiing)

Moguls, Women
Aerials, Women
Moguls, Men
Aerials, Men
Slopestyle, Women
Halfpipe, Women
Slopestyle, Men
Halfpipe, Men

Trampoline (Gymnastics)

Individual, Women
Individual, Men

Snowboarding (Skiing)

Halfpipe, Men
Halfpipe, Women
Slopestyle, Women
Slopestyle, Men
Big Air, Women
Big Air, Men

Objective Individual Sports

Shooting

Free Pistol, 50 yards, Men
Free Rifle, Three Positions, 300 metres, Men
Military Rifle, Prone, 600 metres, Men
Military Rifle, Standing, 300 metres, Men
Running Target, Single Shot, Men
Running Target, Double Shot, Men
Military Pistol, 25 metres, Men
Military Rifle, 200 metres, Men
Rapid-Fire Pistol, 25 metres, Men
Air Pistol, 10 metres, Women
Sporting Pistol, 25 metres, Women
Air Rifle, 10 metres, Men
Small-Bore Rifle, Three Positions, 50 metres, Men
Air Rifle, 10 metres, Women
Small-Bore Rifle, Three Positions, 50 metres, Women
Small-Bore Rifle, Prone, 50 metres, Open
Double Trap, Women
Trap, Women
Free Pistol, 50 metres, Men
Air Pistol, 10 metres, Men
Running Target, Single And Double Shot, Men
Small-Bore Rifle, Three Positions, 50 metres, Open
Small-Bore Rifle, Prone, 50 metres, Men
Trap, Men
Skeet, Open
Skeet, Men
Trap, Open
Double Trap, Men
Free Pistol, 50 metres, Open
Rapid-Fire Pistol, 25 metres, Open
Running Target, 50 metres, Men
Running Target, 10 metres, Men
Dueling Pistol, 30 metres, Men
Military Rifle, Three Positions, 300 metres, Men
Military Rifle, Any Position, 600 metres, Men
Free Rifle, Prone, 600 metres, Men
Small-Bore Rifle, Standing, 50 metres, Men
Free Rifle, Kneeling, 300 metres, Men
Free Rifle, Prone, 300 metres, Men
Free Rifle, Standing, 300 metres, Men
Military Pistol, 30 metres, Men
Free Rifle, 1,000 Yards, Men
Running Target, 50 metres, Open
Skeet, Women
Free Rifle, Three Positions, 300 metres, Open
Military Rifle, Prone, 300 metres, Men
Small-Bore Rifle, Prone, 50 and 100 yards, Men
Small-Bore Rifle, Disappearing Target, 25 metres, Men
Small-Bore Rifle, Disappearing Target, 25 yards, Men
Small-Bore Rifle, Moving Target, 25 yards, Men
Small-Bore Rifle, Any Position, 50 metres, Men
Muzzle-Loading Pistol, 25 metres, Men
Free Pistol, 30 metres, Men
Unknown Event, Men

Triathlon

Olympic Distance, Women
Olympic Distance, Men

Canoe Sprint (Canoeing)

Kayak Singles, 500 metres, Women
Kayak Singles, 1,000 metres, Men
Canadian Singles, 1,000 metres, Men
Kayak Singles, 500 metres, Men
Canadian Singles, 500 metres, Men
Kayak Singles, 200 metres, Women
Kayak Singles, 200 metres, Men
Canadian Singles, 200 metres, Men

Weightlifting

Unlimited, Two Hands, Men
All-Around Dumbbell Contest, Men
Featherweight, Men
Light-Heavyweight, Men

Middle-Heavyweight, Men
Lightweight, Men
Middleweight, Men
Bantamweight, Men
Super-Heavyweight, Men
Flyweight, Men
Heavyweight, Men
Heavyweight II, Men
Heavyweight I, Men
Unlimited, One Hand, Men
Heavyweight, Women
Lightweight, Women
Middleweight, Women
Super-Heavyweight, Women
Light-Heavyweight, Women
Featherweight, Women
Flyweight, Women

Racquets

Singles, Men

Canoe Slalom (Canoeing)

Kayak Singles, Slalom, Women
Canadian Singles, Slalom, Men
Kayak Singles, Slalom, Men

Short Track Speed Skating (Skating)

500 metres, Women
1,000 metres, Women
1,500 metres, Women
1,000 metres, Men
500 metres, Men
1,500 metres, Men

Modern Pentathlon

Individual, Men
Individual, Women

Swimming (Aquatics)

100 metres Freestyle, Men
500 metres Freestyle, Men
1,200 metres Freestyle, Men
400 metres Freestyle, Men
200 metres Breaststroke, Men
400 metres Breaststroke, Men
100 metres Butterfly, Women
100 metres Breaststroke, Women
200 metres Breaststroke, Women
400 metres Freestyle, Women
800 metres Freestyle, Women
100 metres Freestyle, Women
200 metres Freestyle, Women
300 metres Freestyle, Women
100 metres Backstroke, Women
200 metres Backstroke, Women
200 metres Individual Medley, Women
400 metres Individual Medley, Women
50 metres Freestyle, Women
200 metres Butterfly, Women
1,500 metres Freestyle, Men
200 metres Freestyle, Men
50 metres Freestyle, Men
100 metres Butterfly, Men
200 metres Individual Medley, Men
200 metres Butterfly, Men
100 metres Backstroke, Men
400 metres Individual Medley, Men
200 metres Backstroke, Men
100 metres Breaststroke, Men
1,000 metres Freestyle, Men
200 metres Obstacle Course, Men
440 yard Freestyle, Men
880 yard Freestyle, Men
One Mile Freestyle, Men
4,000 metres Freestyle, Men
Underwater Swimming, Men
50 yard Freestyle, Men
100 Yard Backstroke, Men
440 Yard Breaststroke, Men
100 yard Freestyle, Men

	220 yard Freestyle, Men	10 kilometres, Women
	100 metres Freestyle For Sailors, Men	20 kilometres, Women
	Plunge For Distance, Men	30 kilometres, Women
Cycling BMX Racing (Cycling)		5/10 kilometres Pursuit, Women
	BMX, Women	15 kilometres, Women
	BMX, Men	5/5 kilometres Pursuit, Women
Fencing		15 km Skiathlon, Women
	Épée, Individual, Men	10 kilometres, Men
	Sabre, Individual, Men	10/15 kilometres Pursuit, Men
	Foil, Individual, Women	10/10 kilometres Pursuit, Men
	Épée, Individual, Women	30 km Skiathlon, Men
	Foil, Individual, Men	
	Sabre, Masters, Individual, Men	Rowing
	Foil, Masters, Individual, Men	Single Sculls, Women
	Épée, Masters, Individual, Men	Single Sculls, Men
	Épée, Masters and Amateurs, Individual, Men	
	Single Sticks, Individual, Men	Athletics
	Sabre, Individual, Women	100 metres, Men
Cycling Mountain Bike (Cycling)		400 metres, Men
	Mountainbike, Cross-Country, Women	800 metres, Men
	Mountainbike, Cross-Country, Men	110 metres Hurdles, Men
Golf		Long Jump, Men
	Individual, Men	Triple Jump, Men
	Individual, Women	1,500 metres, Men
Croquet		Marathon, Men
	Singles, One Ball, Open	Triple Jump, Women
	Singles, Two Balls, Open	Decathlon, Men
Table Tennis		3,000 metres, Women
	Singles, Men	400 metres, Women
	Singles, Women	200 metres Hurdles, Men
Badminton		Discus Throw, Men
	Singles, Men	Shot Put, Men
	Singles, Women	High Jump, Men
Speed Skating (Skating)		56-pound Weight Throw, Men
	3,000 metres, Women	Hammer Throw, Men
	5,000 metres, Women	Javelin Throw, Men
	1,500 metres, Women	Javelin Throw, Both Hands, Men
	500 metres, Women	200 metres, Men
	1,000 metres, Women	Standing Long Jump, Men
	Mass Start, Women	Pole Vault, Men
	500 metres, Men	Long Jump, Women
	1,000 metres, Men	Javelin Throw, Women
	1,500 metres, Men	Marathon, Women
	5,000 metres, Men	800 metres, Women
	10,000 metres, Men	1,500 metres, Women
	Allround, Men	5,000 metres, Women
	Mass Start, Men	200 metres, Women
Biathlon		High Jump, Women
	20 kilometres, Men	100 metres, Women
	15 kilometres, Women	10 kilometres Walk, Women
	7.5 kilometres Sprint, Women	Shot Put, Women
	10 kilometres Pursuit, Women	80 metres Hurdles, Women
	12.5 kilometres Mass Start, Women	100 metres Hurdles, Women
	10 kilometres Sprint, Men	Discus Throw, Women
	12.5 kilometres Pursuit, Men	Heptathlon, Women
	15 kilometres Mass Start, Men	400 metres Hurdles, Women
Sailing		Pentathlon, Women
	Windsurfer, Women	10,000 metres, Women
	One Person Dinghy, Women	20 kilometres Walk, Women
	One Person Dinghy, Men	20 kilometres Walk, Men
	One Person Heavyweight Dinghy, Men	50 kilometres Walk, Men
	Windsurfer, Open	10 kilometres Walk, Men
	Windsurfer, Men	5,000 metres, Men
	20+ Ton, Open	10,000 metres, Men
Cycling Road (Cycling)		3,000 metres Steeplechase, Men
	Road Race, Individual, Men	400 metres Hurdles, Men
	Road Race, Individual, Women	Pentathlon, Men
	Individual Time Trial, Women	3,000 metres Walk, Men
	Individual Time Trial, Men	60 metres, Men
Cross Country Skiing (Skiing)		5 mile, Men
	18 kilometres, Men	10 mile Walk, Men
	50 kilometres, Men	Cross-Country, Individual, Men
	15 kilometres, Men	Discus Throw, Both Hands, Men
	30 kilometres, Men	Discus Throw, Greek Style, Men
	5 kilometres, Women	2,500 metres Steeplechase, Men
		3,200 metres Steeplechase, Men
		Standing High Jump, Men

	Javelin Throw, Freestyle, Men	Continental Style, Men
	3,500 metres Walk, Men	Double York Round, Men
	4,000 metres Steeplechase, Men	Sur La Perche À La Pyramide, Men
	3,000 metres Steeplechase, Women	Double National Round, Women
	Shot Put, Both Hands, Men	Double Columbia Round, Women
	2,590 metres Steeplechase, Men	Double American Round, Men
	All-Around Championship, Men	Unknown Event, Men
	Standing Triple Jump, Men	Canoe Marathon (Canoeing)
	Pole Vault, Women	Kayak Singles, 10,000 metres, Men
	Hammer Throw, Women	Canadian Singles, 10,000 metres, Men
Jeu De Paume		Folding Kayak Singles, 10 kilometres, Men
	Singles, Men	
Tennis		Luge
	Singles, Men	Singles, Women
	Singles, Covered Courts, Men	Singles, Men
	Singles, Covered Courts, Women	Marathon Swimming (Aquatics)
	Singles, Women	10 kilometres Open Water, Men
		10 kilometres Open Water, Women
Skeleton (Bobsleigh)		Roque
	Skeleton, Men	Singles, Men
	Skeleton, Women	Freestyle Skiing (Skiing)
Alpine Skiing (Skiing)		Ski Cross, Women
	Slalom, Women	Ski Cross, Men
	Downhill, Women	Snowboarding (Skiing)
	Giant Slalom, Women	Giant Slalom, Men
	Super G, Women	Parallel Giant Slalom, Men
	Combined, Women	Giant Slalom, Women
	Slalom, Men	Boardercross, Men
	Combined, Men	Parallel Slalom, Men
	Downhill, Men	Boardercross, Women
	Super G, Men	Parallel Giant Slalom, Women
	Giant Slalom, Men	Parallel Slalom, Women
Equestrian Driving (Equestrian)		
	Four-In-Hand Competition, Open	
Equestrian Vaulting (Equestrian)		
	Vaulting, Individual, Men	
Cycling Track (Cycling)		
	20 kilometres, Men	
	Individual Pursuit, 4,000 metres, Men	
	Individual Pursuit, 3,000 metres, Women	
	Points Race, Women	
	500 metres Time Trial, Women	
	1,000 metres Time Trial, Men	
	Points Race, Men	
	50 kilometres, Men	
	5,000 metres, Men	
	100 kilometres, Men	
	¼ mile, Men	
	½ mile, Men	
	5 mile, Men	
	25 mile, Men	
	333⅓ metres Time Trial, Men	
	⅓ mile, Men	
	1 mile, Men	
	2 mile, Men	
	Keirin, Men	
	Omnium, Men	
	25 kilometres, Men	
	10,000 metres, Men	
	12-Hours Race, Men	
	Keirin, Women	
	Omnium, Women	
Archery		
	Individual, Women	
	Individual, Men	
	Pole Archery, Small Birds, Individual, Men	
	Pole Archery, Large Birds, Individual, Men	
	Sur La Perche À La Herse, Men	
	Au Chapelet, 33 metres, Men	
	Au Chapelet, 50 metres, Men	
	Au Cordon Doré, 33 metres, Men	
	Au Cordon Doré, 50 metres, Men	
	Championnat Du Monde, Men	
	Target Archery, 28 metres, Individual, Men	
	Target Archery, 33 metres, Individual, Men	
	Target Archery, 50 metres, Individual, Men	