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Olympic Games Reloaded: can the Olympic Agenda 2020 push residents' support for the mega-event?

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ABSTRACT

Research question: Despite various initiatives to promote the Olympic Games, achieving a support rate of at least 50% in an Olympic referendum remains difficult. Thus, the International Olympic Committee (IOC) reoriented the Games' strict organization with the Olympic Agenda 2020, anticipating increased resident approval for the event. This study is the first to quantitatively assess whether implementing the Olympic Agenda's recommendations could impact residents' support.

Research methods: A survey collected the expectations for the Olympic Winter Games from 664 residents of Tyrol (Austria) before the 2026 Innsbruck Olympic referendum. Residents' support was modeled as a binary dependent variable using logistic regression. Considering the 2026 Innsbruck Olympic referendum as the baseline scenario, a simulation estimated the potential impact of the Olympic Agenda recommendations on residents' support.

Results and findings: The findings indicate that decreasing the expected financial burden, infrastructural costs, and particularly corruption, as well as strengthening intangible effects, such as residents' trust in the IOC, could hypothetically turn the rejected 2026 Innsbruck referendum into a positive one with a support rate above 50%.

Implications: Even if the Olympic Agenda is a beneficial first step, the IOC must regain the public's trust, implement the proposed recommendations and adequately communicate them to increase public support for the Olympic Games.

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Olympic Games; tourism destination; resident support; public referendum; Olympic Agenda 2020

Introduction

A few decades ago, bidding for the Olympic Games was very popular among potential host cities. As a result, the International Olympic Committee (IOC), the event rights owner of the Olympic Games, was tasked with selecting the next Olympic city from a

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pool of highly qualified candidates. Given the IOCs' market power, it could specify the conditions for potential host cities. Despite this, from the 1960s onward, the Olympic Games were transformed into a complex billion-dollar business, becoming the most extensive and expensive of all mega-sports events (Flyvbjerg et al., 2016). Since the early 2000s, the IOC requested that potential hosts include the support of their residents in the bidding process. Thus, many cities began conducting binding referenda when bidding to host the Olympic Games (IOC, 2020a).

In this context, Wicker and Frick (2020) cited eight Olympic referenda that have been conducted, seven of which rejected hosting the games (such as the 2022 Winter Olympic referendum in Graubünden or the 2024 Summer Olympic referendum in Hamburg). At the same time, the Olympic Games, specifically the IOC, faced a sharp increase in societal mistrust stemming from perceived corruption, greed for profit, and gigantism (Giesen & Hallmann, 2018; Könecke et al., 2016; Kulczycki & Koenigstorfer, 2016). Stimulated by these dynamics, sports and tourism research started analyzing the potential impacts on residents' support for mega-sports events (Gursoy et al., 2017; Johnston et al., 2021; Wicker & Coates, 2018).

Following the notable decrease in bid submissions and increase in withdrawals for hosting the event stemming from a lack of resident support, the IOC introduced a strategic reorientation of the Olympic Games' organization in 2014, the Olympic Agenda 2020, followed by an update in 2021, the Olympic Agenda 2020+5 (IOC, 2014, 2021). The main objective is to reorganize the hosting of the Olympic Games and increase residents' support for the event. The Agenda provides a total of 40 organization recommendations, applied from the 2026 Olympic Winter Games onward, that could affect the scope of potential host cities and the IOC itself.

Hypothetically, the recommendations could make a difference as the referendum voting results are often close even though the number of rejected referenda is high. For example, the rejection rate for the 2022 Graubünden Winter Olympics was 52.7%, and 51.6% for the 2024 Hamburg Summer Olympics. Such close results suggest that minor changes in residents' expectations of the Olympic Games might increase their support for the event. Qualitative studies acknowledge this assumption (Schnitzer & Hainzinger, 2019). However, to the best of our knowledge, quantitative investigations directly conducted among locals examining the potential effects of the Olympic Agenda on residents' support are lacking compared to existing research based on aggregated, secondary community data (Wicker & Frick, 2020).

Using a survey conducted with residents of the tourist hotspot Tyrol (Austria) six months before the 2026 Innsbruck referendum, this study investigates the following research questions:

1. Which recommendations of the Olympic Agenda 2020 significantly impact residents' support for the Olympic Games?
2. Which Olympic Agenda recommendations have a sufficiently large potential to hypothetically turn a negative referendum vote into a positive one with a support rate above 50%?

The survey results are calibrated to the rejected 2026 Innsbruck Olympic Winter Games referendum support rate to estimate the potential impact of the Olympic

Agenda recommendations on residents' support in a hypothetical Olympic referendum. As the Olympic Agenda will be applied for the first time to the 2026 Olympic Winter Games in Milan-Cortina (Schnitzer & Haizinger, 2019), the results are to be understood as an analysis of potential impact, not as a forecast.

Literature review

Support for mega-sports events

Research on mega-sports events already analyzes a large number of potential positive and negative impacts on residents' expectations and support for the events (Ribeiro et al., 2020; Ritchie et al., 2020). Thereby, research repeatedly groups the potential effects into tangible and intangible ones (Atkinson et al., 2008; Ma & Kaplanidou, 2017). Studies emphasize that an individual performs a cost–benefit analysis before engaging in an event. The individual should support the event if the perceived costs are smaller than the expected benefits (Li & Wan, 2017). This is in line with rational choice theory, indicating that an individual's decision-making depends on the aim of maximizing utility (Erb et al., 2002; Wicker & Frick, 2020).

To date, numerous studies focus on the tangible effects of hosting mega-sports events, highlighting their benefits as increased economic growth, labor force demand, tourist arrivals, and consumer spending (Lin & Lu, 2018; Meurer & Lins, 2018). However, tangible negative effects inevitably follow. These include increased financial burdens for the host city stemming from necessary infrastructure or sports facility investments (Wicker & Coates, 2018). Thus, the events repeatedly cause price inflation and tax increases (Lee et al., 2013).

As the literature highlights, intangible effects are equally important, perhaps even more so than tangible ones (Mihalik & Simonetta, 1998). For instance, hardly any other event has a similar high media presence as the Olympic Games (Adá-Lameiras & Rodríguez-Castro, 2021; Lu et al., 2019), reflecting most of all positively on the destination's image (Kassens-Noor et al., 2019). Research indicates that mega-sports events encourage intangible benefits such as community attachment, social inclusion, cohesion, and solidarity (Gursoy & Kendall, 2006; Mutz & Gerke, 2018). However, intangible costs occur, such as increased environmental and cultural destruction, crime, and security risks (Ouyang et al., 2019; Zhou & Ap, 2009).

Some researchers highlighted the necessity to expand the basic cost–benefit framework by including the expected event image (Schnitzer et al., 2019). These expectations can reflect an individual's attitude (Lu et al., 2019; Prayag et al., 2013) and may lead to residents' support for mega-sports events (Ritchie et al., 2020; Wicker & Coates, 2018). The expected event image and image of the organizers and stakeholders of such mega-events are related to trust in the literature. Santos et al. (2019) indicate that exemplarily perceived corruption not only reflects on the event itself but also impacts trust in the officials. In contrast, public trust in the related stakeholders, institutions, and event organizers is crucial to ensure support (Nunkoo et al., 2018). An individual who appreciates the event and has a fundamental interest in sports will likely be supportive (Bretherton et al., 2016; Wicker et al., 2017). The same is true for attending live mega-sports events or following them in the media (Lu et al., 2019; Pawlowski et al., 2014; Schnitzer et al., 2019).

So far, only a few studies model support as a binary variable with a probit or logit regression (Johnston et al., 2021; Wicker & Coates, 2018). This method is especially interesting because referendum outcomes constitute a binary decision. Thus, the results of non-binding surveys or opinion polls can be compared and calibrated to those of binding referenda. This approach has not been considered in current research on mega-sports events.

The Olympic Agenda's potential impact on residents' support

The Olympic Agenda 2020 is the IOC's strategic reorientation for organizing the Olympic Games, built on previous research results that were adapted into 40 concrete recommendations (IOC, 2014).

With a new philosophy in the bidding procedure we are encouraging potential candidate cities to present to us a holistic concept of respect for the environment, feasibility and of development, to leave a lasting legacy. With these far reaching changes we respect that there is no 'one size fits all solution' for the sustainability of Olympic Games. Host city candidates strive for very different development goals and start from very different points of development. We embrace this diversity. (IOC, 2014, p.3)

The Agenda strives to reduce the complexities of the bidding process. Thereby, one goal is to decrease the tangible costs of hosting the Olympic Games (recommendations 3 and 12) and increase the sustainability and long-term legacies of the event (recommendations 4, 26, and 29). Synergies of the hosts and stakeholders should be used in all areas (recommendations 13). Potential host cities will be able to submit multi-host bids to significantly decrease tangible costs, thus the event's financial burden (Bakhsh et al., 2018), by exemplarily reusing existing (sports-) infrastructures of each collaborating host.

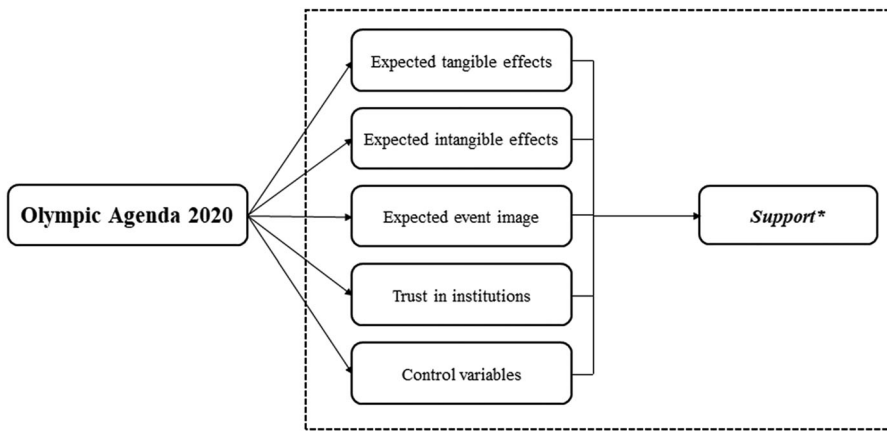
Moreover, the Agenda aims to foster intangible benefits, exemplarily provide a cosmopolitan event (recommendations 23 and 39), support the youth (recommendation 25), increase transparency (recommendation 29), and foster community engagement (recommendations 23, 26, and 33). These recommendations will be applied for the first time for the 2026 Olympic Winter Games in Milan-Cortina. Nevertheless, how effectively the recommendations are implemented will determine the credibility of the Olympic Agenda.

Research indicates that the Olympic Agenda recommendations could benefit the hosts and potentially influence residents' expectations (Bazzanella et al., 2022; MacAloon, 2016). As indicated in [Figure 1](#), the Olympic Agenda may impact the residents' expected tangible and intangible effects, as well as their anticipated event image, trust in institutions and organizers, and whether citizens follow sports events in the media or attend live events. Consequently, the Agenda may influence residents' support for the next Olympics. Although qualitative studies point in this direction, a quantitative analysis of the Olympic Agenda's potential impacts on resident support is still missing in the literature.

Methodology

Contextual background

In 2019, Tyrol, Austria, registered approximately 49.7 million overnight stays (Government of Tyrol, 2020), of which over 55% occurred in the winter season, showing the



--- Simulated impact of the Olympic Agenda on residents' support
 * Support in survey/ hypothetical Olympic referendum

Figure 1. Conceptual model.

importance of the county's tourism industry. Not only is it a tourist hotspot in the Alps, but it also has a memorable Olympic tradition, as the capital of Tyrol, the city of Innsbruck, hosted the Olympic Winter Games in 1964 and 1976, the 1984 and 1988 Winter Paralympics, and the first-ever Winter Youth Olympic Games in 2012 (Schnitzer et al., 2017). Tyrols' idea of reapplying for the 2026 Olympic Winter Games came up in 2016/2017. As the IOC demands cities include public opinions when bidding to host the event, the local government announced the voluntary Olympic referendum before submitting the bid (Innsbruck informs, 2017). In preparation, they held a representative opinion poll, conducted in March 2017, that forecasted an approval rate of 72% for all of Tyrol (Gallup Institut, 2017). Support for the Olympic Games was divided into four answer categories (relative votes are in parentheses): support (36%), rather support (36%), rather not support (13%), and do not support (14%). Contrary to all forecasts, only 46.7% supported the referendum on November 15, 2017 (voter turnout: 63.8%). Thus, the majority of residents (53.3%) rejected the referendum (Government of Tyrol, 2017).

Sample size and data collection

Independently of the local government's opinion poll, this study surveyed Tyrolean residents in May 2017, six months before the Olympic referendum, to gather residents' expectations and support levels for the 2026 Olympic Winter Games. As previous studies indicate that the event affects people to varying degrees depending on residency (Ritchie et al., 2020; Wicker & Frick, 2020), the sample was stratified into three groups: (1) potential host city Innsbruck, (2) any municipality providing infrastructures or sports facilities, and (3) any municipality that would not host an Olympic event.

After designing the questionnaire with experts in the field and discussing its understandability in three focus groups with five participants each (students and experts), 58 volunteers participated in a pre-test. Then, the survey was implemented in the software

Sawtooth (Sawtooth Software, 2020). The e-mail addresses of individuals who volunteered to participate in the survey were collected in person from May 20 to June 3, 2017, by approaching potential participants in pedestrian zones all over Tyrol. In June, the questionnaire was sent to 850 people who confirmed participating via e-mail. Although 771 individuals participated, 664 completed questionnaires were included in the empirical analysis after excluding incomplete surveys.

Questionnaire design

The central question, ‘Should Tyrol submit a bid to host the 2026 Olympic Winter Games?’ contained three answer categories: support (should apply in any case), conditional support (should apply under certain conditions), and rejection (should not apply). Following previous research (Ritchie et al., 2020; Streicher et al., 2017), the respondents choosing conditional support were hypothesized to be indecisive regarding their cost–benefit equation. Thus, they might still require convincing to provide their support in a binding Olympic referendum. Indeed, disagreeing with just one aspect of the Olympics Games’ organization could be decisive for acceptance or rejection. As a result, these individuals were considered ones that may potentially oppose the event.

Olympic Agenda-related variables were determined based on the Agenda’s recommendations, while the questionnaire was based on extensive literature reviews to answer the research questions. Table 1 provides an overview of the questionnaire (the entire questionnaire is available in the Supplementary Material). The independent variables were as follows: (1) expected tangible and intangible benefits (recommendations 1, 2, 6, 13, 20, and 22), (2) expected tangible and intangible costs (recommendations 3, 4, 9, 12, and 29), (3) expected event image (recommendations 14, 16, 17, 30, and 32), and (4) trust in institutions (recommendations 27 and 29). The control variables were age, gender, sports interest, and activity level.

Empirical analysis

The binary logistic regression estimated the respondents’ probability of supporting (1) or rejecting (0) the event. The random utility maximization model, employed by previous studies (Wicker & Coates, 2018), served as the theoretical foundation for this regression analysis (McFadden, 1981).

As many studies include ordinal variables as metric ones and presume monotonicity, this assumption was tested in the analysis. Each ordinal variable was dummy coded separately and included in the regression analysis, a necessary approach due to the losses in degrees of freedom. Examining the estimated regression coefficients provides information on whether or not a linear variable inclusion in the regression is adequate. Aside from two exceptions, all other ordinal variables could be included linearly.

Two expected event image variables, corruption and patriotism, indicated a dichotomous relationship. For corruption, the respondents distinguished between no corruption (not characteristic on the four-point Likert scale) and corruption (rather not, rather, and very characteristic). For patriotism, the interviewees distinguished between no or little patriotism and some or considerable patriotism (on the four-point Likert scale). Both

Table 1. Questionnaire of residents' potential expectations on hosting the 2026 Olympic Winter Games in Tyrol (translated from German to English).

Questions	OA 2020	References
[Dependent] Should Tyrol submit a bid to host the 2026 Olympic Winter Games? (1: yes, 2:no, 3:only under certain conditions) { recoded (1: yes, 0: no & only under certain conditions)}		Ritchie et al., 2020
Please indicate how important the following potential benefits of the Olympic Games are? (Likert scale 1:not important; 5: very important)		
[Increased revenues] There will be increased revenues.	Rec. 2, 10, 20	Lee & Taylor, 2005
[Impact on tourism] They have a significant impact on tourism.	Rec. 6, 13, 19, 20, 23	Fourie & Santana-Gallego, 2011
[Sports facilities] Sports facilities will be modernized or newly constructed.	Rec. 1, 2	Ritchie et al., 2009
[Social reuse of Olympic Village] The Olympic Village can be socially reused.	Rec. 1, 2	Xin & Kunzmann, 2020
[Destination promotion] The destination will be promoted.	Rec. 10, 20(Gursoy & Kendall, 2006)	Gursoy & Kendall, 2006
[Residents' solidarity] They strengthen the residents' solidarity.	Rec. 7, 8, 11, 13	Mutz & Gerke, 2018
[Cosmopolitanism] The Olympic Games promote cosmopolitanism.	Rec. 1, 6, 13, 34, 35	Scholz, 2012
[Sports incentive for youth] They provide sports incentives for the youth.	Rec. 22, 23, 25	Schnitzer et al., 2019
Please indicate how likely the following potential costs of the Olympic Games are? (Likert scale 1:very unlikely; 5: very likely)		
[Financial burden] The financial burden is high.	Rec. 1, 3, 9, 11, 29	Khraiche & Alakshendra, 2020
[Infrastructural costs] They come with high infrastructural costs.	Rec. 1, 2, 12	Kim et al., 2006
[Postponement of other investments] They postpone other necessary investments.	Rec. 1, 2, 3	Müller, 2015
[Environmental damage] The environmental damages are significant.	Rec. 2, 4, 5	Wicker & Coates, 2018
[Security risk] Mega-events provide significant security risks.	Rec. 10	Kim et al., 2015
[Overcrowding] The host city is overcrowded during the event.	Rec. 10	Zhou & Ap, 2009
How characteristic are the following event image terms for the Olympic Winter Games? (Likert scale 1:not characteristic; 4: very characteristic)		

(Continued)

Table 1. Continued.

Questions	OA 2020	References
Respect	Rec. 11, 38	Schnitzer et al., 2019
Friendship	Rec. 14	
Team spirit	Rec. 14, 18, 22	
Fairness	Rec. 7, 22, 38	
Tolerance	Rec. 7, 11, 22	IOC, 2014
Enthusiasm	Rec. 14	
Cultural diversity	Rec. 14, 26	
Doping	Rec. 15, 16, 17	Scheu et al., 2020
Corruption {recoded 1: corruption (Likert scale 2,3,4), 0: no corruption (Likert scale:1)}	Rec. 27, 29, 30, 32	Santos et al., 2019
Patriotism {recoded 1: patriotism (Likert scale 3,4), 0: no patriotism (Likert scale:1,2)}	Rec. 27, 32	Kurscheidt & Prüschenk, 2020
If you rank sports events on whether you like them or not, how would you rate the Olympic Winter Games? (Likert scale 1: no appreciation; 5: high appreciation)		
Getting involved in mega-events is related to trust in stakeholders . How much do you trust the following institutions? (Likert scale 1:no trust; 4: high trust)		
Your friends		Cursoy et al., 2017;
The governor		Giesen & Hallmann, 2018
The International Olympic Committee (IOC)	Rec. 27, 29	Nunkoo et al., 2018
[Sports club member][Club member] Please indicate whether you are a member of one (or more) of the following clubs: (1: Yes/ 0: No)		
Sports club, choir, fire brigade, music band, rifle club, mountain rescue, ambulance service, theater club, environmental association, Austrian Alpine Association, Association with social service, none of them.		Weimar et al., 2015
How often do you do sports? (1: less than 3x a month, 2: 1-2x a week, 3: 3-4x a week, 4: 5x a week or more)		Bretherton et al., 2016
How often do you attend sports events life? (1: never, 2: barely, 3: occasionally, 4: regularly)		Atkinson et al., 2008
How often do you follow sports events in the media (TV, newspaper, social media)? (1: never, 2: barely, 3: occasionally, 4: regularly)		Pawlowski et al., 2014
Please indicate your age: (1: under 15, 2: 15-20; 3: 21-30; 4: 31-40; 5: 41-50; 6: 51-60; 7: over 60)		-----
Please indicate your gender: (1: male, 2: female)		-----
In which business industry are you working? (hospitality and tourism industry, passenger transport industry, other)		Ritchie et al., 2009
Please indicate your postal code: _____		Schnitzer et al., 2020

Note: OA 2020 denotes Olympic Agenda 2020, Rec. indicates recommendation of the Olympic Agenda 2020.

variables were correspondingly re-coded. As all the considered variables were based on similar theoretical concepts, multicollinearity could have been a problem. Therefore, the variance inflation factors (VIFs) were computed. Any VIF below four indicates no multicollinearity problems (Hair, 2009).

Simulation

With the logistic regression the coefficients are estimated, i.e. the expected changes in log-odds of support per unit change in the independent variables. Therewith the respondents' probability of supporting or rejecting an event is computed. The threshold of a resident to support the event is initially set to 0.5. Thus, all respondents having a

probability greater than 0.5 were counted as supporters, representing the survey support rate of 58.7%.

However, the survey support rate is considerably higher than the Innsbruck 2026 Olympic Winter Games referendum outcome, with a value of 46.7%. As studies repeatedly highlight that non-binding opinion poll support rates overestimate those of binding referenda (Maennig, 2017), this overestimation must be considered in the simulation analysis. Thus, the 58.7% survey support rate was calibrated to the support rate of the 2026 Innsbruck referendum, which was only 46.7%, by increasing the initial logistic regression threshold from 0.5 to a value of 0.667.

The simulation aimed to determine whether increasing or decreasing the value of a significant variable on the four- or five-point Likert scale could shift the calibrated support rate of 46.7%. For each respondent, the value of each statistically significant variable (such as environmental damage) was individually changed by adding or subtracting one unit on the Likert scale while holding the other variables constant (Streicher et al., 2017). This reproduces the potential impact of the Olympic Agenda on the respondents' expectations of the targeted variable. In other words, the simulation assumed that the Agenda could convince respondents to support the event through increases or decreases in the expected value of significant independent variables.

This change was not possible if the variable's value was already at the corresponding minimum or maximum of the Likert scale. Hence, those values remained unchanged. For the binary coded variables (corruption and patriotism), the study randomly selected a third of the participants and changed their original 'yes' votes (1) to 'no' (0) and vice versa. In this sense, the simulation assumed that the Olympic Agenda could change the minds of one-third of those who associate corruption with the event and vice-versa. Indeed, the scenario analysis hypothetically supports this premise.

This simulation approach is necessary for two reasons. First, the potential impact of the Olympic Agenda depends on the independent variables, thus the residents' expectations for the Olympic Games. As this value vector of the independent variables differs for each respondent, the sum effect of the value changes for the same variable may be divergent for each respondent. Second, changes in the probability of being a supporter have different consequences. If a particular change improves the support probability of respondents that already support the Olympic Games, the referendum outcome impact would be zero. The same result can be expected if the change impacts the support probability of an individual that sincerely rejects the Olympic Games. While the respondent's probability of supporting a referendum would slightly increase, it would still be below the threshold. The simulation accounts for both of these problems.

Results

Descriptive statistics and regression results

The sample's sociodemographic characteristics are included in Table 2. Slightly more than half of the respondents were male, and the leading age group was between 21 and 30 years old. Over one-third of the respondents lived in the potential host city Innsbruck (37%), with 15% in participating municipalities and 52% in municipalities not hosting the Olympic event.

Table 2. Sociodemographic characteristics of the sample.

Characteristics	Sample		Census %
	N	%	
<i>Gender</i>			
Male	364	54.8	49.2
Female	300	45.2	50.8
<i>Age</i>			
Under 15 years	3	0.5	-
15–20 years	129	19.4	19.3
21–30 years	298	44.9	12.3
31–40 years	83	12.5	13.7
41–50 years	54	8.1	13.2
51–60 years	77	11.6	15.7
Over 60	20	3.0	25.8
<i>Vote</i>			<i>Referendum</i>
Support	390	58.7	46.7
Rejection	274	41.3	53.3

Table 3. Descriptive statistics of the variables.

Variables		Mean	SD	Min	Max
<i>Benefits</i>	Support	0.47	0.50	0	1
	Increased revenues	3.55	1.02	1	5
	Impact on tourism	4.32	0.97	1	5
	Sports facilities	3.97	0.98	1	5
	Social reuse of Olympic Village	3.58	1.09	1	5
	Destination promotion	4.14	0.89	1	5
	Residents' solidarity	3.75	1.07	1	5
<i>Costs</i>	Cosmopolitanism	3.84	0.99	1	5
	Sports incentive for youth	3.88	1.05	1	5
	Financial burden	3.94	0.97	1	5
	Infrastructural costs	3.60	1.02	1	5
	Postponement of other investments	3.32	1.07	1	5
	Environmental damage	3.42	1.13	1	5
	Security risk	3.48	1.16	1	5
<i>Event image</i>	Overcrowding	3.16	1.22	1	5
	Respect	3.37	0.73	1	4
	Friendship	3.06	0.86	1	4
	Team spirit	3.47	0.73	1	4
	Fairness	3.34	0.70	1	4
	Tolerance	3.23	0.76	1	4
	Enthusiasm	3.54	0.69	1	4
	Cultural diversity	3.20	0.89	1	4
	Doping	2.78	0.87	1	4
	Corruption	0.91	0.28	0	1
<i>Trust</i>	Patriotism	0.31	0.47	0	1
	Trust in friends	3.67	0.57	1	4
	Trust in governor	2.42	0.78	1	4
	Trust in IOC	2.21	0.76	1	4
	Appreciation for the Winter Olympics	4.13	0.96	1	5
<i>Control</i>	Club member	0.65	0.47	0	1
	Sports club member	0.46	0.50	0	1
	Sports activity	2.65	1.16	1	4
	Attending sports events live	2.55	0.82	1	4
	Following sports events in the media	3.02	0.91	1	4
	Age	3.58	1.40	1	7
	Gender	1.45	0.50	1	2
Working in a tourism-related sector	0.07	0.26	0	1	

Note: SD denotes standard deviation.

Table 4. Binary logistic regression findings.

	Variables	Logistic regression findings		Weighted logistic regression findings	
		Coefficients	SE	Coefficients	SE
<i>Support</i>	Constant	2.385	*	1.29	1.49
	<i>Benefit</i>				
	Increased revenues	0.000		0.11	0.16
	Impact on tourism	-0.089		0.14	0.16
	Sports facilities	0.076		0.12	0.14
	Social reuse of Olympic Village	0.201		0.10	0.15
	Destination promotion	0.146		0.13	0.16
	Residents' solidarity	0.446	***	0.12	0.14
	Cosmopolitanism	0.273	**	0.12	0.15
	Sports incentive for youth	0.073		0.12	0.15
<i>Costs</i>	Financial burden	-0.463	***	0.13	0.16
	Infrastructural costs	-0.289	**	0.13	0.15
	Postponement of other investments	-0.316	***	0.11	0.13
	Environmental damage	-0.253	**	0.11	0.13
	Security risk	0.020		0.10	0.12
	Overcrowding	0.218	**	0.10	0.12
<i>Event image</i>	Respect	-0.189		0.17	0.21
	Friendship	0.219		0.14	0.16
	Team spirit	-0.041		0.17	0.20
	Fairness	0.037		0.16	0.20
	Tolerance	-0.123		0.16	0.19
	Enthusiasm	-0.064		0.17	0.22
	Cultural diversity	0.051		0.13	0.16
	Doping	-0.061		0.12	0.14
	Corruption	-1.109	***	0.40	0.46
	Patriotism	-0.452	**	0.22	0.20
	Appreciation for the Winter Olympics	0.223	*	0.12	0.16
<i>Trust</i>	Trust in friends	-0.086		0.18	0.21
	Trust in governor	0.079		0.14	0.16
	Trust in IOC	0.271	*	0.14	0.17
	Club member	-0.732	***	0.28	0.31
	Sports club member	0.267		0.27	0.32
<i>Control</i>	Sports activity	-0.001		0.01	0.11
	Attending sports events live	-0.224		0.14	0.17
	Following sports events in the media	0.159		0.13	0.17
	Age	-0.181	**	0.08	0.08
	Gender	-0.020		0.21	0.24
	Working in a tourism-related sector	0.118		0.37	0.46
	Hit ratio (classification)	75.8%		76.4%	
	Observations	664		664	
	Nagelkerke-R ²	0.383			

Note: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$, SE denotes standard error.

The sample was weighted with the structure of the Tyrolean resident population concerning age, gender, and Innsbruck 2026 Olympic referendum outcome.

The descriptive statistics of the independent variables are shown in [Table 3](#).

The logistic regression ([Table 4](#)) correctly classified 75.8% of the votes and had a Nagelkerke-R² of 0.383. Both values signify a good model fit. The calculated VIFs showed a maximal value of 2.08, indicating no multicollinearity.

The findings show no statistically significant impacts on resident support for six out of the eight expected benefits: tangible (increased revenues, impact on tourism, and sports facilities) and intangible ones (social reuse of the Olympic Village, destination promotion, and youth sports incentives). However, out of the six expected costs, only security risk had no statistical impact on resident support. Two out of ten variables, corruption and patriotism, were statistically significant in the event image category. The same is true

for appreciation for the Winter Olympics. At the same time, trust in friends and the governor, being a sports club member, attending live sporting events, or following sports events in the media all played an insignificant role. There was no statistical evidence for the importance of gender or working in a tourism-related sector (control variables). The age group of 21–30-year-old and male participants were slightly overrepresented in the sample. Additionally, the sample support rate was not representing the actual Olympic referendum support rate of 46.7%. Thus, the observation units in the sample were weighted accordingly for a robustness check. While the estimated parameters increased in size, the interpretation of the results remains stable.

Simulation results

The simulation findings are presented in Table 5.

The tangible cost variable financial burden had the highest impact on the calibrated referendum support of initially 46.7%. Based on the simulation results, a one unit decrease on the five-point Likert scale for the expected financial burden leads to a 12% increase in supporters. This would turn the rejected referendum with a support rate of 46.7% into a positive hypothetical referendum with a support rate of 58.7%. If the respondents expect that other substantial investments would be postponed to a lesser degree and the infrastructural costs would decrease, the support rate would increase and result in a positive hypothetical referendum support rate. Furthermore, a one unit decrease in the expected environmental damage could shift the hypothetical referendum support rate to a positive one. A one unit change in the expected intangible benefit variable of residents' solidarity can also turn a rejected hypothetical referendum.

Similarly, an increase in trust in the IOC by one unit leads to an accepted hypothetical referendum. If one-third of the respondents, who associated the Olympics with corruption, revised their attitudes, the hypothetical referendum support rate would be positive. Finally, only some or considerable patriotism in the expected event image category could turn the hypothetical referendum into a positive one with a support rate above 50%.

Table 5. The potential impact of the Olympic Agenda on a simulated Olympic referendum with an initial support rate of 46.7%.

		Likert scale value (–1)	Likert scale value (+1)	Range
<i>Benefits</i>	Residents' solidarity	33.9%	54.1%	20.2%
	Cosmopolitanism	38.1%	51.1%	13.0%
<i>Costs</i>	Financial burden	58.7%	33.1%	25.6%
	Infrastructural costs	51.4%	34.7%	16.7%
	Postponement of other investments	54.7%	37.8%	16.9%
	Environmental damage	53.9%	39.9%	14.0%
<i>Event image</i>	Appreciation for the Winter Olympics	39.5%	51.1%	11.6%
<i>Trust</i>	Trust in IOC	39.0%	53.9%	14.9%
		No (+1/3)	Yes (+1/3)	Range
<i>Event image</i>	Corruption	55.9%	46.1%	9.8%
	Patriotism	48.0%	44.7%	3.3%

Note: Each variable was increased/decreased by one unit on the Likert scale, denoted by the Likert scale value (± 1), holding all other variables constant at their corresponding values. One-third of the original yes/ no answers were randomly changed to no/yes answers for the binary variables. Hypothetical positive referendum votes with a support rate of over 50% are marked in bold.

Discussion

Impact of Olympic Agenda on residents' support

Using a survey conducted with 664 residents of Tyrol (Austria) before the Innsbruck 2026 Olympic Winter Games referendum, this study investigates the potential impact of the Olympic Agenda 2020 on residents' support. Although scholars highlight the importance of tangible benefits on residents' support for mega-sports events, such as increased revenues or destination promotion (Deccio & Baloglu, 2002; Gursoy & Kendall, 2006; Kim et al., 2006), this study's logistic regression findings showed no statistical significance for these tangible benefits. The findings indicate that only two out of eight expected benefit variables are statistically significant, residents' solidarity and cosmopolitanism; both are intangible effects. This is in line with previous research, as many studies already demonstrate that mega-sports events induce intangible benefits (Mutz & Gerke, 2018; Scholz, 2012). Methodologically, this deviation from previous results could stem from differences in the sample size and estimation methods, the logistic regression model's non-linear relationships, or the high number of independent variables in the regression (36 variables). In the latter case, the significant results in previous works could be traced back to a type of missing variable bias. Over time, a shift in focus from material to immaterial values may have also occurred. This would explain why this study's only two significant benefits have an intangible character. However, both interpretations are speculative and should only be used as a starting point for further research, not as a finding.

Almost all expected costs, most of which are tangible, had a significantly negative impact on support. Increases in expected financial burdens and the postponement of other necessary investments had the same impact, which is in line with previous studies (Khraiche & Alakshendra, 2020; Kim et al., 2006; Müller, 2015). To tackle these issues, several of the Olympic Agenda recommendations focus on reducing the event's financial burdens by simplifying the bidding process, increasing transparency, reusing existing infrastructures, and limiting the event size (recommendations 3, 9, 12, and 21). Regarding the latter, the overcrowding variable in this study had an unexpected positive sign in the regression analyses. Still, this result aligns with previous research findings highlighting mixed resident perceptions on related matters (Zhou & Ap, 2009).

Overall, the significant benefits and costs are not equally distributed. The findings specify an asymmetrical effect of tangible and intangible aspects, suggesting that residents' support for the event depends primarily on a reduction in expected costs rather than the presence of expected benefits. In the event image category, only two out of the ten variables, corruption and patriotism, were statistically significant, both of which negatively impact event support. This result confirms recent research findings that were demonstrating the negative correlation between perceived corruption and residents' attitudes toward mega-sports events (Kulczycki & Koenigstorfer, 2016; Santos et al., 2019). This result is vital as the expected event image variables are strongly related to the six fundamental principles of Olympism and the Olympic movement (IOC, 2020b). Residents' negative expectations seem to influence their support levels more than positive views, but these impacts might depend on the survey's timing (before, during, or after the event), as previous research shows (Ribeiro et al., 2020).

The binary logistic regression indicates that only one of the three trust variables, trust in the IOC, positively affects event support, implying that the IOC can increase residents' support by rebuilding their trust. The organization aimed to overcome this dilemma by directly addressing these trust problems in the Olympic Agenda, under recommendations 16 and 27 (IOC, 2014). For the club membership variable, another proxy for trust in some studies (Putnam, 1993, 2000), the results negatively correlate with resident support. As membership is captured with a different and statistically insignificant variable, the negative effect probably stems from civil (fire brigade), cultural (music and choir), or environmental organizations, such as the Austrian Alpine Association (Austrian Alpine Association, 2020). Binary logistic regression is appropriate for estimating residents' support for the Olympic Games. The binary variable is typical for a referendum decision and can directly be compared to a referendum outcome. In addition, the overestimation between non-binding opinion polls and binding referenda can be accounted for by calibrating the model in the analysis, which has not been considered in previous research on mega-sports events.

Impact of Olympic Agenda on a hypothetical referendum support rate

A simulation assessed the potential impact of the Olympic Agenda's recommendations on residents' support in a hypothetical referendum, using the Innsbruck 2026 referendum support rate to calibrate the estimated regression model and account for the overestimation between non-binding opinion polls and binding referenda. As relying on these polls is insufficient for determining residents' support because they often overestimate support compared to binding referendums, the model calibration process helped provide reliable information. This approach represents one of the study's essential contributions, as other studies on mega-sports events do not adjust their regression model to consider overestimation.

According to the simulation, decreasing the expected financial burden by one unit on the five-point Likert scale could hypothetically turn the rejected 2026 baseline Innsbruck Olympic referendum and lead to a positive hypothetical Olympic referendum, with a simulated support rate of 58.7%. The same impact emerges for decreasing the expected postponement of other investments (54.7%) and reducing high infrastructural costs (51.4%). These findings, which are also directly visible in the survey's regression results, confirm those of existing literature (Kurscheidt & Prüschenk, 2020). Accordingly, the Olympic Agenda aims to increase transparency and reduce bidding and overall organizational costs (recommendations 2, 3, and 15).

Moreover, a one unit decrease in the expected environmental damage could shift the referendum result into a positive one, as evidenced by the 53.9% simulated support rate. Indeed, several recommendations align precisely with this direction (IOC, 2014). Increasing the value of residents' trust in the IOC by one unit on the Likert scale can also turn a rejected referendum into a positive one, leading to a simulated support rate of 53.9%. Additionally, perceived and expected corruption seems to be influential, based on the regression findings and existing literature (Nunkoo et al., 2018; Preuss, 2019). Changing the opinions of one-third of those who associate the Olympic Games with corruption can turn a hypothetically rejected referendum into a positive, resulting in a support rate of 53.9%.

Overall, the simulation indicates that the Olympic Agenda could impact residents' support for the event in a hypothetical referendum because it addresses the variables that have turned out to be significant in the context of the logistic regression. However, the results have to be interpreted with caution as they assume that the recommendations are implemented effectively, noticed, and perceived as credible by the population. To date, it is not possible to estimate how long it will take for the population to perceive the recommendations of the Olympic Agenda and to shift their expectations or perceptions of the event by one unit on the Likert scale. So far, the simulation results indicate that if these changes were achieved, they could be sufficient to achieve support rates above 50%.

In practice, the improvements will certainly not relate to a single variable but simultaneously address several recommendations and thus, consist of a bundle of measurements. Interestingly, a simultaneous increase in all significant Olympic Agenda-related variables produces 94.7% 'yes' votes for the event. Although it is impossible to change all considered variables, focusing on minor adjustments can already achieve a decisive share of supporters.

Limitations

Regarding this study's limitations, as this case study was conducted in the tourism destination Tyrol, whether the results are generalizable to other geographical or social contexts should be tested. The sample overrepresented the 21–30-year-old age group and male participants while underrepresenting individuals older than 60. However, several studies report an overrepresented share of young male respondents in surveys on mega-sports events (Ritchie et al., 2020; Wicker & Coates, 2018). Nonetheless, after running weighted logistic regressions according to the participant's age and gender, the robustness of the results was ensured.

Considering that the study's focus was on residents' expectations and support for the Innsbruck 2026 Olympic Winter Games, it is impossible to guarantee equivalent findings with research on other mega-events conducted in cities that are potentially not suffering from over-tourism (Schnitzer et al., 2020). Another limitation concerns the calibration of the threshold in the simulation. One of the main criticisms of mega-sports event research is that most surveys overestimate the population's support rate, which is also the case for the Tyrol government's opinion poll and the findings presented in this research (Gallup Institut, 2017; Maennig, 2017). One of the common explanations is the inability to mobilize a population to vote, but this is unlikely to apply to the Innsbruck referendum, as it was conducted with the national council elections and had a voter turnout of 63.8% (Streicher et al., 2019). Although this study aimed to overcome the overestimation by calibrating the survey results to the referendum outcome, future research should employ methods less prone to this bias, such as discrete choice experiments (Feilhauer et al., 2022; Menapace & Raffaelli, 2020; Penn & Hu, 2018).

Conclusion

This study provides a quantitative assessment of the Olympic Agenda 2020 to determine its effect on residents' support for the mega-event. After surveying 664 residents of Tyrol, Austria, residents' support was modeled as a binary dependent variable. Most of the independent variables were assigned to the Olympic Agenda's recommendations. The results indicate that the Olympic Agenda can impact residents' support for the Games.

Specifically, changes in the expectations on the Olympic Agenda-related variables can have a sufficiently large potential to turn a rejected Olympic referendum into a positive one with a support rate above 50%.

This study offers stakeholders, organizers, promoters, and tourism destinations the opportunity to conceptualize content and public information concerning the mega-event in a resident-approved way. Although the efforts are heading in the right direction, the findings suggest that the public has probably not yet recognized the scope of the Olympic Agenda or still does not trust the IOC and its aimed strategic reorientation. Thus, theoretical discussions on the necessary changes have become redundant. It is time for the IOC to implement these changes practically and adequately communicate them. Unfortunately, essential issues are often neglected in the communication process, as the IOC focuses on spreading enthusiasm for the event. For instance, the expected costs of the Innsbruck 2026 Olympic Winter Games only took up four out of the 132 pages in the information campaign (Proprojekt et al., 2017). In other words, there is a long way to go from the first step, initiating a possible strategic realignment that will take effect for the first time in the 2026 Winter Olympics in Milan-Cortina, to implementing the recommendations and changing residents' expectations.

Rebuilding trust in the IOC is indispensable for rebuilding the event's image and increasing residents' support. Stakeholders must address the sensitive elements in the Olympic Games' organization, such as financial concerns, environmental effects, and corruption as perceived by the local population. They should also focus on intangible effects that appear to at least be as significant as the imminent economic benefits and costs. However, the starting point for implementing changes should center on the expected tangible costs of the events because the intangible costs, such as residents' solidarity or cosmopolitanism, are challenging to impact directly. In this regard, costs can be reduced in various ways. For instance, sharing the financial burden by jointly organizing the event has already been implemented, as the 2026 Olympic Winter Games has been awarded for the first time to two cities, Milan and Cortina (Schnitzer & Haizinger, 2019). Focusing on sustainable planning and using existing infrastructure can reduce costs and decrease environmental damage. However, there is still potential for increasing organizational efforts by dividing the financial risk between the IOC and the organizing cities.

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Declaration of interest

The authors declare that there is no conflict of interest.

Ethical approval

This survey was conducted according to the 'ethical guidelines for surveys' approved by the Institutional Review Board (IRB) of the Department of Sports Science as well as the Board for Ethical Issues (BfEI) of the University of Innsbruck.

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