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RESEARCH NOTE

Do FIFA World Cup matches affect outgroup bias? Evidence from South Korea

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Abstract
This paper examines the effect of the 2022 FIFA World Cup group matches on outgroup bias among South Koreans. Using a list experiment conducted in four rounds before and during the tournament, we investigate whether these matches promote social learning, enabling individuals to update their perceptions of outgroups directly involved in the match, or if they merely trigger emotional responses to match results, with defeats leading to increased outgroup bias regardless of match contact. Our findings suggest insufficient evidence to conclude that South Korean respondents generally modify their outgroup bias levels in response to these events. However, certain subgroups, particularly males, demonstrate strong reactions to losses, exhibiting heightened outgroup bias towards all outgroups. These results indicate that in the context of negative contact valence, high-stakes intergroup sports competitions can lead to an overgeneralized outgroup bias against various groups among highly engaged individuals. This study contributes to understanding the relationship between sports events and intergroup attitudes, highlighting the potential for negative outcomes to exacerbate biases among certain subpopulations.

1. Introduction

International sports competitions, while being events that many people around the world eagerly follow, can sometimes have far greater impacts than expected, giving rise to fluctuations in domestic violence rates (Card and Dahl, 2011), shifts in political behaviours (Busby *et al.*, 2016), the emphasis on ethnic identity (Depetris-Chauvin *et al.*, 2020) and the cultivation of ingroup favouritism (Kim and Lopez de Leon, 2018). Sporting competitions are also considered as irrelevant events that have significant effects on affect and well-being perceptions that can influence political behaviour (Healy *et al.*, 2010; Graham *et al.*, 2023).

Ordinary citizens invest significant emotional and psychological energy into these events, which the media often portrays as national competitions between ingroups and outgroups, emphasizing differences and frequently resorting to stereotyping opponent national teams based on their personal, group or national characteristics.

The impact of such media portrayal and the emotional investment of fans can be seen in various instances. During the 2014 FIFA World Cup, Brazilian fans experienced a collective sense of shock and humiliation after their team's 7-1 defeat against Germany in the semifinals. The media portrayed the loss as a national tragedy, using terms such as 'humiliation' and 'shame' (Licon, 2014). Similarly, in the

lead-up to the 2018 FIFA World Cup match between England and Colombia, the Sun newspaper in Great Britain published a headline that read 'As 3 Lions face nation that gave world Shakira, great coffee and er, other stuff, we say: GO KANE!', which was 'a pun on Colombia's reputation as a drug exporter.' Colombia's ambassador to the UK said this headline was 'rather sad that they use such a festive and friendly environment, as the World Cup, to target a country and continue to stigmatise it with a completely unrelated issue' (France 24, 2018).

These examples are just a few among many instances in which the outcome of international sporting events is heralded as a source of immense pride in the case of victory or denounced as a source of profound humiliation when faced with defeat against the outgroups represented by the opposing team.[1] Given the emotional and psychological impact of these high-stakes international sporting events, it is highly plausible that they might affect ingroup members' perceptions about outgroups represented by opponent teams. However, few studies have investigated the causal mechanism through which prominent international sporting events (PISE) shape ingroup members' beliefs about outgroups. A notable exception is the study by Rosenzweig and Zhou (2021), which shows that in the 2019 Africa Cup football match between Kenya and Tanzania, winning increases negative views regarding refugees' contributions to the country's diversity while elevating national pride and preferences for resource allocation toward conationals.

However, previous studies have not fully elucidated the precise mechanisms underlying match effects, as they did not distinguish between the effects on 'referent' outgroups (i.e., outgroups in the context of immediate match contact) and those on "non-referent" outgroups (i.e., outgroups outside the context of immediate match contact). This distinction is crucial for discerning whether observed match effects stem from simple psychological reactions triggered by match outcomes or from a deeper process of social learning through which citizens update their beliefs about referent outgroups using newly acquired information from the match. If match effects are caused by simple psychological reactions to match outcomes, they would be observed across various outgroups and likely be short-lived. In contrast, if match effects are driven by social learning, they would be confined to referent outgroups in the context of immediate match contact and more likely to endure over time. In this paper, we investigate whether match effects observed during PISEs originate from simple psychological reactions or social learning processes.

In order to identify the causal mechanism of match effects, we conducted four rounds of list experiments in South Korea before and during South Korea's Group H matches in the 2022 FIFA World Cup (referred to as group matches hereafter). In each round, respondents were randomly assigned to one of five groups: a control group, an ingroup-treatment group, and three outgroup treatment groups (representing South Americans, Africans and Whites). We established these outgroup treatment groups to compare the treatment effects between the referent group and the non-referent groups. As the South Korean team was slated to play against Uruguay, Ghana and Portugal, we utilized the corresponding treatment group (South America, Africa and White, respectively) as the treatment for the referent outgroup, while the other two treatment groups served as non-referent outgroup treatments. For example, the survey conducted immediately after the first match against Uruguay utilized the South America treatment group as the treatment for the referent outgroup, while the other two treatment groups (Africa and White) served as non-referent outgroup treatments.

This design allows for a comparison of match effects between the referent outgroup and the non-referent outgroups while holding the match outcome constant. We compute the average match effect by double difference estimates, which correspond to changes in item count differences between a control group and a treatment group before and after the FIFA World Cup match. We also compute the average match effect of gender by triple difference estimates (Olden and Møen, 2022), which correspond to differences of changes in item count differences between a control group and a treatment group before and after the FIFA World Cup match between male participants and female participants.

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[1]Other notable examples include Brazil's defeat to Uruguay in the 1950 FIFA World Cup final, West Germany's surprise victory over Hungary in the 1954 FIFA World Cup final, and the Football War between El Salvador and Honduras in 1969.

Our findings suggest insufficient evidence to conclude that average South Korean respondents generally altered their outgroup bias levels in response to these events. However, male subgroup demonstrates strong reactions to losses, exhibiting heightened outgroup bias towards *referent as well as non-referent outgroups*. These results indicate that in the context of negative contact valence, high-stakes intergroup sports competitions can lead to an overgeneralized outgroup bias against various groups among highly engaged individuals, particularly men. This finding has important implications for understanding how sports events may differentially impact intergroup attitudes across gender lines. While the overall population may not exhibit significant changes in outgroup bias, the strong reactions observed among males suggest that this subgroup may be more susceptible to the influence of negative outcomes in high-stakes sports competitions.

2. FIFA World Cup and South Korea

Football is one of the most widely followed and popular sports worldwide, attracting the interest of a diverse range of individuals across various ages, nationalities, and lifestyles. People earnestly and passionately engage with this sport, often displaying a deep sense of national identity by supporting their respective national teams. This allegiance can evoke feelings of national pride as well as disappointment or humiliation among fans, depending on the match results or its content. The FIFA World Cup, in particular, represents the pinnacle of international football and is eagerly anticipated by a global audience.

During the FIFA World Cup group stage, participating nations are divided into eight groups, labelled A to H, each consisting of four teams. Within their respective groups, teams engage in a round-robin format, competing against each other. The top two teams from each group advance to the knockout stage. These group matches are intentionally structured to bring together teams selected from each of the six FIFA continental zones: Asia, Africa, North and Central America and the Caribbean, South America, Oceania and Europe. Initially, 32 national teams are selected through a qualifying process and then categorized into four separate pots based on the FIFA World Rankings. The formation of the eight groups is subsequently carried out through a randomized process, with one team selected from each of the four pots. It's worth noting that, during this phase, a stipulation exists that prohibits two teams from the same confederation from being allocated to the same group, except for UEFA teams, where, in certain instances, up to two teams may be placed within a single group (FIFA, 2022).

South Korea's position in Group H, where it faces off against Uruguay, Ghana and Portugal, provides an opportunity to examine how matches against national teams from various continents influence South Korean citizens' attitudes toward outgroups closely related or unrelated to the opponent national team. South Korea, a nation with a relatively homogeneous population, has experienced significant economic growth and democratization in recent decades. Despite these advancements, South Korean society still grapples with issues related to intergroup relations and outgroup bias. By focusing on South Korea's matches in the FIFA World Cup, this study aims to shed light on the mechanisms through which high-stakes international sports events can shape attitudes toward various outgroups among South Korean citizens.

Football, along with baseball, ranks among the most widely followed sports in South Korea. National matches, in particular, serve as unifying events that ignite South Koreans' sense of national pride, mirroring similar sentiments found in many other countries. South Korea holds pride in being the first independent Asian country to participate in a FIFA World Cup tournament, dating back to 1954. However, the pinnacle of South Korea's football success is often associated with the 2002 FIFA World Cup. Co-hosted with Japan, this tournament marked a historic moment as South Korea became the first team from outside Europe and America to reach the semi-finals (Yoon, 2022). Millions of fans, clad in red T-shirts, flooded the streets to fervently support the Korean national team. The 2002 World Cup symbolized a uniquely significant expression of public culture in South Korea (Joo, 2006). Even to this day, the achievements of South Korea in the 2002 World Cup remain cherished and hold

significant national importance among South Koreans. The 2022 Qatar FIFA World Cup marks South Korea's 11th participation in the event.

International sporting events such as the FIFA World Cup hold significant potential for shaping the outgroup beliefs of individuals, particularly in a context like South Korea. South Korea is an ethnically homogeneous society, which means there is a scarcity of co-nationals who share the same ethnic backgrounds with opponent national teams in group matches. As of 2023, the total number of foreign residents is 2.3 million, which corresponds to 4.4% of the South Korean population. Among those 2.3 million, 59.4% live in the area of Seoul and its vicinity (Ministry of the Interior and Safety, 2023). Thus, the opportunity for regular or frequent encounters with foreigners is limited physically and geographically. Moreover, despite the increasing number of foreigners, studies report that South Korean society still holds entrenched nationalist sentiments and enduring prejudices against outgroups with different religious and ethnic backgrounds (Shin and Ma, 2019; Hur and Yang, 2024).

This context makes South Korea an interesting case study for examining the impact of international sporting events on outgroup beliefs. The limited exposure to diverse ethnic and religious groups, combined with the strong sense of national pride associated with the South Korean football team, may amplify the potential for the FIFA World Cup to shape attitudes towards outgroups. By focusing on South Korea's matches in the 2022 FIFA World Cup, this study aims to shed light on how high-stakes international sporting events can influence outgroup beliefs in a relatively homogeneous society with limited opportunities for direct contact with diverse groups.

3. Prominent international sporting events and outgroup bias

In this paper, we define a PISE as an international competition across diverse sports wherein ingroup athletes represent their respective nations. It is important to differentiate a PISE from a club or championship event, where athletes with varied national backgrounds represent individual clubs.[2] Notably, PISEs are replete with cultural, racial and ethnic symbols. In-game symbolic gestures, such as the national team of Morocco engaging in a 'celebratory sujud' following their victory over Belgium in the FIFA 2022 tournament, alongside the racist slogans and derogatory symbols brandished by fans and players – instances include racial slurs targeting Muslim players, mocking gestures towards Asian players, or hurling bananas at African athletes – exemplify the prejudices and biases that are often manifested. Additionally, entrenched national stereotypes, like the Spanish teams' renowned 'tiki-taka' style or the perception of Germans as methodical and unyielding (Sims, 2014), act as cognitive shortcuts or heuristics that citizens might lean on when updating their beliefs about the entire outgroup members represented by opposing teams.

Our hypothesis posits that a World Cup group match accentuates group distinctions and salience, thereby priming ingroup members to become more conscious of their nationality and identity groups. Prior research indicates that the mere presence of an outgroup member can amplify the salience of ingroup identity (Cramer, 2020), and the effects of a one-time contact with outgroups can be generalized to the outgroup as a whole, particularly when outgroup categories are salient (Pettigrew, 1998; Brown and Hewstone 2005; Schemer and Meltzer, 2020). Individuals who might not regularly reflect on their nationality and group identities could become more aware of these aspects as they see their ingroup competing against outgroup members in World Cup matches. Consequently, this heightened salience and awareness of potential threats to one's group from outgroups may lead individuals to rely on heuristics, such as prejudices or negative stereotypes, when making judgments pertaining to outgroups (Hogg, 2000).

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[2]Illustrative examples of PISEs include globally recognized events such as the Olympic Games, FIFA World Cup, UEFA Europe Conference League, World Baseball Classics, and ICC Cricket World Cup. These events frequently recur and command attention well beyond their regular fan bases, primarily due to extensive media coverage and widespread viewership.

The central focus of our experiment is to distinguish the causal impact of a FIFA World Cup group match on outgroup bias toward the referent group and the non-referent group. For instance, we investigate the impact of South Korea's match against Uruguay on outgroup bias toward South Americans, categorizing this as the referent outgroup bias effect. Conversely, we analyze the impact of the same match on outgroup bias toward Africans, one of the non-referent outgroups, considering this as the generalized outgroup bias effect. We examine bias toward the referent group represented by the opposing team's ethnicity, as well as bias directed toward other, non-referent outgroups.

Referent Outgroup Hypothesis *World Cup group matches trigger a target-specific increase in outgroup bias, specifically heightening bias towards the referent group identified by the opposing team's ethnicity.*

Generalized Outgroup Hypothesis *World Cup group matches lead to a generalized increase in outgroup bias, causing an immediate escalation of bias towards all varieties of outgroups.*

If a PISE serves as a medium for 'vicarious contact' with an outgroup represented by the match opponent, we will observe significant changes in bias toward the referent outgroup immediately after the match, which we call a referent outgroup bias.[3] However, if a PISE serves as a moment of emotional outburst that may intensify 'us versus them' categorizations, we will observe an increase in bias toward generalized outgroups, which we call a generalized outgroup bias.[4] Although it sounds subtle, the distinction between a referent outgroup bias and a generalized outgroup bias is important for two reasons. A referent outgroup bias is related to belief updates (or social learning) by ingroup members regarding the characteristics of a specific outgroup in the context of current contact. Repeated interactions and various contact contexts may lead to a better understanding of a specific outgroup. In contrast, a generalized outgroup bias, often triggered by threat perception about group status, is closely related to an attitude of blind rejection of outgroups. This bias may contribute to increases in salience regarding the distinction between 'us' and 'them.' In extreme contexts, this attitude can lead to jingoism and xenophobia.

Next, a World Cup group match outcome may have a directional effect on outgroup bias. Favourable or advantageous contact outcomes for the ingroup have the potential to diminish outgroup bias, whereas unfavourable or disadvantageous contact outcomes could intensify it. The directional effect of the outcome can be explained through the way ingroup members perceive the valence of contact outcome. On the one hand, it can be assumed that a disadvantageous outcome (i.e., a defeat) can serve as a 'negative intergroup contact' with the outgroup, while an advantageous outcome (i.e., a victory) serves as 'positive intergroup contact.' For example, Depetris-Chauvin *et al.* (2020) found that post-match interviewed respondents in the Afrobarometer survey between 2002 and 2015 were less likely to report a strong sense of ethnic identity when their national teams won in high-stakes international football events. On the other hand, adverse outcomes, such as losing an intergroup competition, pose a threat to group identity and status because when encounters between ingroups and outgroups are marked by perceived threat or overt hostility, it increases the likelihood of ingroup members perceiving intergroup contact as negative contact (Árnadóttir *et al.*, 2018). This negative perception of outgroup contact outcomes might heighten the likelihood of ingroup members exhibiting outgroup bias. As a result, negative contact can trigger perceptions of threat to the ingroup identity, while a positive outcome can reduce prejudice by alleviating intergroup anxieties because positive outcomes resulting from intergroup contact effectively protect and uphold group status, thereby

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[3]PISEs are competitions between ingroup members (e.g., South Korean team) and outgroup members (e.g., Uruguay team). Vicarious contact entails exposure to interactions between their own group and the outgroup (Mazziotta *et al.*, 2011; Schemer and Meltzer 2020). In contrast, parasocial contact (Schiappa *et al.*, 2005) entails exposure to outgroup members through mediated channels, devoid of any direct intergroup engagement.

[4]Generalized outgroup bias is similar to the 'Secondary Transfer Effects (STE)' introduced by Pettigrew (2009). He outlines two key concepts regarding the transfer or generalization effects stemming from intergroup contact. The first is the primary transfer effect, which involves generalizing contact effects from specific outgroup members to the entire outgroup. The second, known as the secondary transfer effect, involves extending these contact effects from one contacted outgroup (A) to another non-contacted outgroup (B).
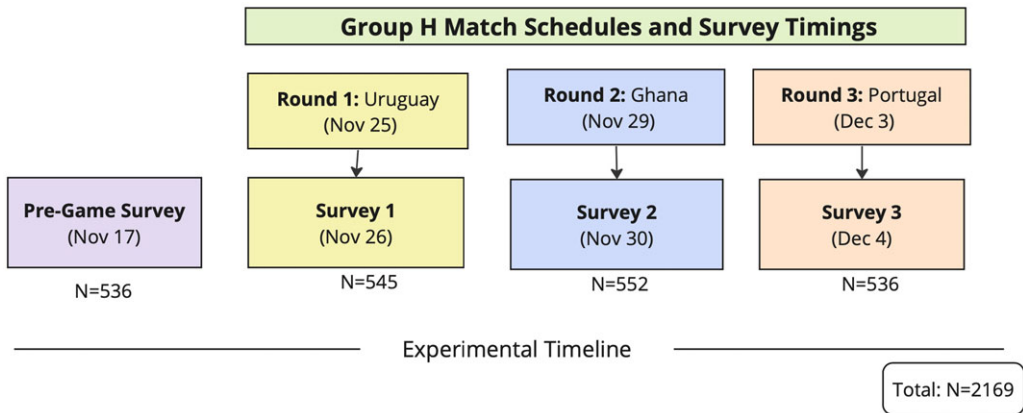
Figure 1. Survey design.

fostering a positive perception of the contact among ingroup members (Pettigrew, 1998; Pettigrew and Tropp, 2006; Wann and Grieve, 2005).

Outcome Hypothesis *World Cup group match outcomes directionally influence respondents' outgroup bias levels; defeats lead to a general increase in outgroup bias, whereas victories lead to a general decrease in outgroup bias.*

Finally, we examine shifts in ingroup bias associated with varying match outcomes. Existing studies have shown that significant national sporting events can intensify ingroup bias, fuelled by increased nationalism and ingroup favouritism (Kim and Lopez de Leon, 2018; Rosenzweig and Zhou, 2021). Nonetheless, the investigation of these effects often depends on specific match results, such as wins (Kim and Lopez de Leon, 2018) or losses (Rosenzweig and Zhou, 2021). The 2022 FIFA World Cup group matches involving South Korea present an ideal case to study fluctuations in ingroup bias, given that the South Korean national team experienced three distinct outcomes: a draw with Uruguay, a loss to Ghana, and a win against Portugal. We hypothesize that match outcomes will directionally influence respondents' ingroup bias levels, with defeats leading to a general decrease in ingroup bias and victories leading to a general increase in ingroup bias.

Ingroup Hypothesis *World Cup group match outcomes directionally influence respondents' ingroup bias levels; defeats lead to a general decrease in ingroup bias, whereas victories lead to a general increase in ingroup bias.*

4. Design

Figure 1 shows the design of our experiment. We conducted four rounds of identical surveys both before and after the South Korean national team's group matches between November 17, 2022 and December 3, 2022. To mitigate the potential confounding bias from irrelevant events, the three post-match survey dates were chosen as the day following each match (Round 0 (Pre-game survey): November 17, Round 1: November 25, Round 2: November 29, Round 3: December 3). Table 1 shows the summary statistics of four samples.[5]

The surveys were deployed via an online interface. Each of the four panels was independently selected from the pool of panelists registered in Hankook Research. The initial survey was distributed a week prior to the FIFA World Cup, aimed at establishing the baseline level of ingroup as well as outgroup bias prior to World Cup group matches. The total number of observations is 2,169, with an average of 542 respondents sampled per survey (Round 0 (Pre-game survey): $N = 536$, Round 1:

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[5]Further details on the experimental design are available in supplementary information (SI) Section 1.

Table 1. Sample summary statistics

		Pre-World Cup		Round 1		Round 2		Round 3	
		Obs.	Percentage	Obs.	Percentage	Obs.	Percentage	Obs.	Percentage
Total		(536)	100.0	(545)	100.0	(552)	100.0	(536)	100.0
Gender									
	Male	(270)	50.4	(273)	50.1	(269)	48.7	(268)	50.0
	Female	(266)	49.6	(272)	49.9	(283)	51.3	(268)	50.0
Age									
	18–29	(90)	16.8	(92)	16.9	(90)	16.3	(88)	16.4
	30–39	(79)	14.7	(76)	13.9	(77)	13.9	(81)	15.1
	40–49	(96)	17.9	(99)	18.2	(103)	18.7	(99)	18.5
	50–59	(107)	20.0	(108)	19.8	(112)	20.3	(106)	19.8
	60+	(164)	30.6	(170)	31.2	(170)	30.8	(162)	30.2
Region									
	Seoul	(99)	18.5	(102)	18.7	(101)	18.3	(103)	19.2
	Inchon/Gyeonggi	(169)	31.5	(168)	30.8	(177)	32.1	(170)	31.7
	Daejun/Sejong/Choongchung	(60)	11.2	(64)	11.7	(61)	11.1	(54)	10.1
	Gwangju/Jeolla	(53)	9.9	(57)	10.5	(53)	9.6	(52)	9.7
	Daegu/Gyungbuk	(52)	9.7	(50)	9.2	(54)	9.8	(51)	9.5
	Busan/Ulsan/Gyungnam	(80)	14.9	(82)	15.0	(82)	14.9	(80)	14.9
	Gangwon	(12)	2.2	(18)	3.3	(19)	3.4	(19)	3.5
	Jeju	(11)	2.1	(4)	0.7	(5)	0.9	(7)	1.3
Ideology									
	Liberal	(183)	34.1	(181)	33.2	(171)	31.0	(178)	33.2
	Moderate	(193)	36.0	(218)	40.0	(202)	36.6	(193)	36.0
	Conservative	(130)	24.3	(117)	21.5	(153)	27.7	(138)	25.7
	DK	(30)	5.6	(29)	5.3	(26)	4.7	(27)	5.0
Education									
	Middle school or below	(11)	2.1	(4)	0.7	(12)	2.2	(8)	1.5
	High school graduate	(117)	21.8	(133)	24.4	(151)	27.4	(121)	22.6
	Professional college graduate	(83)	15.5	(83)	15.2	(87)	15.8	(91)	17.0
	Bachelor's degree	(272)	50.7	(254)	46.6	(239)	43.3	(254)	47.4
	Graduate degree	(53)	9.9	(71)	13.0	(63)	11.4	(62)	11.6

Table 2. List experiment items: Control items were presented to all participants. Treatment group participants received one of the treatment items in addition to control items

Control items	
1	There was considerable election fraud in recent elections in South Korea (parliamentary and presidential elections)
2	The government's announcement on the safety of the COVID-19 vaccine is distorted and the government intentionally concealed its negative side effects
3	The corona virus did not happen by accident, but was intentionally created
4	Global warming is a fact and it is ongoing
5	Dinosaurs did not exist and dinosaur fossils were fabricated
Treatment items	
South American	South Americans are living in poor condition because they are lazy
African	Africans have a temperament to solve problems with violence
White	Whites think non-white people are inferior
Ingroup	Koreans are more hardworking and honest than the rest of the world

$N = 545$, Round 2: $N = 552$, Round 3: $N = 536$). In each round, respondents were randomly assigned to either the control group or one of the four treated groups, each exposed to different stereotype items (African, South American, White and Ingroup).

Our sampling strategy was crafted to ensure representation across five demographic facets: age (18–29, 30s, 40s, 50s, 60 or older), gender (male/female), political ideology (liberal, moderate, conservative, undecided), educational background (ranging from middle school to graduate school) and geographic distribution (spanning regions from Seoul to Jeju).[6]

Our experimental methodology to gauge shifts in ingroup/outgroup bias is the list experiment method, incorporating racial stereotypes as sensitive items. The list experiment is a widely used survey method designed to elicit truthful responses to sensitive questions. It achieves this by enabling respondents to report the total number of items they agree or disagree with, rather than providing direct answers to sensitive questions (Kuklinski *et al.*, 1997; Blair and Imai, 2012; Blair *et al.*, 2014).

Table 2 shows control and treatment items of our list experiment. Five control items were selected to represent non-sensitive popular beliefs, with varying degrees of validity.[7] The four treated groups receive one of the treatment items (South America, Africa, White and Ingroup) in addition to the control items. The sensitive items in the treatment include explicit and overt stereotypical expressions related to the race of the opposing teams (Uruguay, Ghana and Portugal). Our choice to employ the descriptor 'Whites' over 'Europeans' was a deliberate one, rooted in a thorough examination of prevalent South Korean stereotypes. While 'European' might seem a more direct reference to Portugal, this term does not resonate powerfully with distinct stereotypes in the South Korean psyche. Notably, the South Korean general populace often perceives Europeans and North Americans under the shared racial umbrella of 'Whites,' without making fine racial distinctions between the two. The term 'Whites' possesses greater potential to evoke a range of salient and accessible stereotypes among South Koreans, making it a more potent choice for our study. Our intention was to create an experimental environment that captures overgeneralization biases resulting from the match outcome. By adopting a more indirect approach, we sought to tap into the broader cognitive processes underlying outgroup bias, allowing for a nuanced exploration of the phenomenon.

Table 3 demonstrates the division of 2,169 respondents into 20 groups, with each group denoted by a combination of rounds (R0, R1, R2 and R3) and treatments (G0, G1, G2, G3 and G4). Each round represents a survey iteration, with R0 signifying the initial survey and subsequent rounds denoted by

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[6]To compare the compatibility of our sample with the general population of South Korea, refer to Section 1 in the SI.
[7]For details on control items, see SI Section 2.

Table 3. 5×4 experimental groups: Each round (R) represents a survey iteration, with R0 signifying the initial survey and subsequent rounds denoted by increasing integers. Each treatment group (G) is labeled accordingly, with G0 indicating the control group and G1, G2, and G3 representing different treatment conditions. The referent outgroup treatments – (R1, G1), (R2, G2), and (R3, G3) – are highlighted in dark colour

Round (Opponent)	Round 0 (Pre-game)	Round 1 (Uruguay)	Round 2 (Ghana)	Round 3 (Portugal)
Control	(R0, G0)	(R1, G0)	(R2, G0)	(R2, G0)
South American	(R0, G1)	(R1, G1)	(R2, G1)	(R3, G1)
African	(R0, G2)	(R1, G2)	(R2, G2)	(R3, G2)
White	(R0, G3)	(R1, G3)	(R2, G3)	(R3, G3)
Ingroup	(R0, G4)	(R1, G4)	(R2, G4)	(R3, G4)

increasing integers. Similarly, each treatment group is labelled accordingly, with G0 indicating the control group and G1, G2 and G3 representing different treatment conditions. The referent outgroup treatment refers to the treatment group that received the sensitive item directly related to the race represented by the match opponent in the experiment. Conversely, the non-referent outgroup treatment refers to the treatment group that received the sensitive item not directly related to the race represented by the match opponent. The referent outgroup treatments – (R1, G1), (R2, G2) and (R3, G3) – are highlighted in dark colour in Table 3. The non-referent outgroup treatments are (R1, G2), (R1, G3), (R2, G1), (R2, G3), (R3, G1) and (R3, G2).

The main quantity of interests in our experiment is the impact of a FIFA World Cup group match on *changes* in (referent and non-referent) outgroup bias before and after a group match. We denote Y_{1i}^m as an item count of individual i in the mth treated group and Y_{0i} as an item count of individual i in the control group. We define our causal estimand as a difference of difference-in-means between the pre-game survey and the survey after the match:

$$\textbf{Double Difference of the } m\text{th treatment} : \left(Y_{1,t=m}^m - Y_{0,t=m}\right) - E\left(Y_{1,t=0}^m - Y_{0,t=0}\right) \quad (1)$$

where $t = m$ indicates the match with the referent group m, and $t = 0$ indicates the pre-game survey. For example, the double difference of the South American treatment ($m = 1$) as the referent outgroup is $E\left(Y_{1,t=1}^1 - Y_{0,t=1}\right) - E\left(Y_{1,t=0}^1 - Y_{0,t=0}\right)$, which corresponds to the difference of $[(R1, G1) - (R1, G0)]$ and $[(R0, G1) - (R0, G0)]$ in Table 3. The double difference of the South American treatment as the non-referent outgroup is $E\left(Y_{1,t \neq 1}^1 - Y_{0,t \neq 1}\right) - E\left(Y_{1,t=0}^1 - Y_{0,t=0}\right)$, which corresponds to two cases: the difference of $[(R2,G1) - (R2,G0)]$ and $[(R0,G1) - (R0,G0)]$ and the difference of $[(R3, G1) - (R3, G0)]$ and $[(R0, G1) - (R0, G0)]$ in Table 3.

One potential concern about our multi-round survey design is the possibility that the order in which matches occur could influence the results of the survey experiment. According to the FIFA points system, victories are awarded 3 points, draws 1 point, and defeats receive no points. In this framework, the potential confounding effect of match order is likely to be most significant in the final game, as teams may have already accumulated enough points to advance or been eliminated from the competition before this match. However, the situation for the South Korean team diverged from such scenarios. Their failure to secure a sufficient number of points for assured progression until the final match meant that they needed to strive for success in each game. This unique condition ensures that the reactions of the South Korean populace to the outcomes of the group matches remained relatively stable, unaffected by the sequence of match outcomes.

One important assumption in our evaluation of the hypotheses is that viewership remains consistent across matches. Viewer ratings for Group H matches of the 2022 FIFA World Cup in South Korea are available for three terrestrial TV networks (KBS, MBC, and SBS) that broadcast FIFA World Cup matches in South Korea. The combined viewership began at 41.7% in Round 1, subsequently declining

Table 4. Changes in Bias toward Referent Outgroups (top) and Ingroup (bottom): Statistically significant *single* difference estimates are shaded in a brighter colour. A darker colour shade is reserved for statistically significant *double* difference estimates, which is not shown in this table. Robust standard errors are reported

	Post-match		Pre-game		Double difference (Post-match – Pre-game)			
	Est	SE	Est	SE	Est	SE	Lower	Upper
Referent outgroup bias								
South American	0.280	(0.185)	0.009	(0.188)	0.271	(0.263)	−0.246	0.788
African	0.435	(0.177)	0.056	(0.191)	0.378	(0.260)	−0.133	0.890
White	0.513	(0.176)	0.262	(0.180)	0.252	(0.251)	−0.243	0.746
Ingroup bias								
Round 1	0.250	(0.164)	0.625	(0.181)	−0.375	(0.245)	−0.856	0.106
Round 2	0.689	(0.170)	0.625	(0.181)	0.065	(0.248)	−0.424	0.553
Round 3	0.510	(0.173)	0.625	(0.181)	−0.114	(0.250)	−0.606	0.378

to 39.1% in Round 2 and then 32.5% in Round 3 (Lee 2022a, b; Kwon, 2022). Notably, even with this decline, the combined viewership consistently remained above 30%, suggesting that the FIFA World Cup group matches commanded significant national attention.[8] The consistent national attention and engagement with the matches provide a solid foundation for examining the impact of match outcomes on outgroup and ingroup biases, as a significant portion of the population was exposed to these events. However, it is important to acknowledge that the slight increase in viewership for the final match among more fervent fans may have some influence on the results, particularly in terms of the intensity of emotional reactions to the match outcome.

5. Results

Table 4 presents the double difference estimates for referent outgroup bias (top) and ingroup bias (bottom). The second to fifth columns illustrate the constituent terms of these estimates. For example, the referent outgroup bias for the *South American* treatment is calculated as $0.280 - 0.009 = 0.271$. Notably, all double difference estimates are statistically insignificant, indicating that there is insufficient evidence on the post-match change in outgroup bias towards the referent group represented by the opposing team's ethnicity compared to the pre-game survey. Similarly, there is insufficient evidence to suggest that the commencement of the FIFA World Cup or the outcomes of specific matches significantly influenced the level of ingroup bias. However, the lack of significant results in double difference estimates does not necessarily imply a null result, given the significant post-match treatment effects of the second and third rounds (highlighted in Table 4), particularly in the referent outgroup bias. These significant post-match treatment effects suggest that there may be effect heterogeneity, even if the double difference estimates do not reach statistical significance. Additionally, the small sample size may have contributed to the lack of significant double difference estimates.

Table 5 exhibits changes in outgroup bias towards non-referent outgroups. For instance, in Round 1, the referent outgroup comprises South Americans, given that the opposing team is from Uruguay, making Africans and Whites non-referent outgroups as they are not the opponents in Round 1. Similar to Table 4, Table 5 illustrates that there is not strong evidence to suggest that South Korean respondents

[8]For MBC, the leading terrestrial TV network for broadcasting the FIFA World Cup in South Korea, its viewership commenced at 18.2% but experienced an uptick over time, culminating at 23.5% during the final group match against Portugal. This trend indicates that the more fervent fans gravitated towards MBC for the concluding game, hoping for a 'miracle victory' against Portugal. Conversely, fans with more subdued enthusiasm, perhaps anticipating a defeat to Portugal, opted out of viewing the final match. Despite these fluctuations in viewership across networks and matches, the overall high level of combined viewership suggests that the potential confounding effect of viewership discrepancies is likely to be minimal.

Table 5. Changes in Bias toward Non-referent Outgroups: Statistically significant *single* difference estimates are shaded in a brighter colour. A darker colour shade is reserved for statistically significant *double* difference estimates, which is not found in this table. Robust standard errors are reported. Non-referent outgroup for Round 1 are Africans (A) and Whites (B), non-referent outgroup for Round 2 are South Americans (A) and Whites (B), and non-referent outgroup for Round 3 are South Americans (A) and Africans (B)

	Post-match		Pre-game		Double difference (Post-match – Pre-game)			
	Est	SE	Est	SE	Est	SE	Lower	Upper
Non-Referent Outgroup A								
Round 1	−0.190	(0.157)	0.056	(0.191)	−0.246	(0.247)	−0.731	0.240
Round 2	0.408	(0.176)	0.009	(0.188)	0.399	(0.257)	−0.106	0.904
Round 3	0.341	(0.178)	0.009	(0.188)	0.332	(0.258)	−0.176	0.840
Non-Referent Outgroup B								
Round 1	0.254	(0.158)	0.262	(0.179)	−0.007	(0.239)	−0.478	0.463
Round 2	0.457	(0.167)	0.262	(0.179)	0.195	(0.245)	−0.286	0.677
Round 3	0.250	(0.176)	0.056	(0.191)	0.194	(0.259)	−0.316	0.704

significantly changed their levels of outgroup bias towards non-referent outgroups. However, the presence of significant post-match effects (highlighted in Table 5) raises the possibility that the lack of significant double difference estimates could be attributed to insufficient statistical power due to a small sample size or the presence of heterogeneous effects.

The findings presented in Tables 4 and 5 lead to two key conclusions. First, there is limited evidence to support the notion that the 2022 FIFA World Cup substantially altered bias towards ingroup, referent outgroups, or non-referent outgroups among South Korean respondents. Second, despite the absence of statistically significant double difference estimates, the observed post-match treatment effects in the second and third rounds suggest the potential influence of factors such as weak statistical power arising from a small sample size or the presence of heterogeneous effects, which may have obscured the underlying impact of the tournament on outgroup bias.

Heterogeneous Treatment Effects by Gender

Several studies have demonstrated that men and women exhibit different characteristics in terms of their attitudes and experiences regarding competition and intergroup behaviour. The literature discusses hormonal, psychological, and social aspects of these differences. For example, Reimers and Diekhof (2015) demonstrated in their experimental study the relationship between testosterone, the primary hormone in men, and parochial altruism, such as ingroup favouritism and outgroup hostility. Their study, conducted with male soccer fans, revealed that individuals displaying a high degree of parochialism during intergroup competition exhibited significantly elevated levels of testosterone. These findings suggest a correlation between prevailing testosterone levels and parochial altruism in males.

Similarly, Yuki and Yokota (2009) suggested that men may display more 'adaptive' behaviors, such as ingroup cooperation and outgroup derogation, when confronted with cues of intergroup conflict, even if these cues are not directly related to a specific intergroup context. In their famous study on the Male-Warrior Hypothesis, Vugt et al. (2007) observed that men respond more strongly than women to intergroup threats by increasing their contribution to their group in the presence of intergroup competition, while female behaviour regarding ingroup contribution remained relatively stable. Additionally, studies on social dominance orientation (SDO), one of the most popular indicators of individuals' understanding of intergroup competition and group-based social hierarchy, show that males exhibit higher levels of SDO than females (Pratto et al., 2006). Furthermore, SDO was found to be enhanced by outgroup threat priming only in male participants but not in females (Sugiura et al., 2017).

These findings collectively suggest that men may be more susceptible to the influence of intergroup competition and conflict on their attitudes and behaviors towards outgroups. Given the highly

competitive nature of international sports events such as the FIFA World Cup and the strong emotional investment of fans, it is reasonable to expect that male respondents might exhibit more pronounced changes in their outgroup bias levels in response to match outcomes compared to their female counterparts. Therefore, investigating the effects of group matches on outgroup bias conditioned on respondents' gender can provide valuable insights into the potential heterogeneity of treatment effects and contribute to a more nuanced understanding of the relationship between sports events and intergroup attitudes.

To explore the heterogeneity of treatment effects by gender, we conducted subgroup analysis using a triple difference estimate of gender. We define a triple difference estimate for the gender subgroup following Olden and Møen (2022). Suppose g indicates a respondent gender and δ_m indicates a triple difference estimate of gender. Then,

$$\delta_m = \overbrace{\left(\left[E\left(Y^m_{1,t=m,\,g=\text{male}} - Y_{0,t=m,\,g=\text{male}}\right)\right]\right.}^{m \text{ treated male group in R2}-\text{male } m \text{ treated group in R0}} - \overbrace{\left[E\left(Y^m_{1,t=0,\,g=\text{male}} - Y_{0,t=0,\,g=\text{male}}\right)\right]}^{\text{male control group in R1}-\text{male control group in R0}}\left.\right) - \quad (2)$$

$$\overbrace{\left(\left[E\left(Y^m_{1,t=m,\,g=\text{female}} - Y_{0,t=m,\,g=\text{female}}\right)\right]\right.}^{m \text{ treated female group in R2}-\text{male } m \text{ treated group in R0}} - \overbrace{\left[E\left(Y^m_{1,t=0,\,g=\text{female}} - Y_{0,t=0,\,g=\text{female}}\right)\right]}^{\text{female control group in R1}-\text{male control group in R0}}\left.\right). \quad (3)$$

Table 6 presents the triple difference estimates referent outgroups (top), ingroup (middle), and non-referent outgroups (bottom). We highlight statistically significant triple difference estimates for ease of interpretation at the 90% level. The analysis of the triple gender difference (the difference of the difference between male and female respondents before and after the tournament) reveals several noteworthy findings regarding the impact of the 2022 FIFA World Cup on outgroup and ingroup bias among South Korean respondents. Overall, the results strongly suggest that male respondents were more susceptible to the influence of match outcomes on their attitudes towards both referent and non-referent outgroups, as well as their ingroup favouritism.

In Round 2, following the defeat to Ghana, male respondents exhibited a significantly higher chance of displaying biased views towards the referent outgroup (0.977), ingroup (0.841), and non-referent outgroups (0.888 and 0.993) compared to their female counterparts. This finding indicates that the experience of a loss in a high-stake PISE can trigger a more pronounced increase in outgroup bias and ingroup favouritism among men.

Round 3, which saw South Korea's victory over Portugal, also revealed some gender-specific effects. Male respondents showed an increase in ingroup bias and bias towards one of the non-referent groups (South Americans) compared to female respondents. When considering a 90% confidence level, the bias towards another non-referent group (Africans) also increased for males after Round 3. Interestingly, the referent group bias did not exhibit a significant gender difference following the victory in Round 3.

The results suggest that both defeat and victory in the FIFA World Cup group matches affected gender-specific effects on outgroup bias across all outgroups and ingroups. The male-specific effect observed in this study aligns with previous research indicating that male psychology and behaviour are more oriented towards intergroup conflict and competition compared to females (Vugt *et al.*, 2007; Yuki and Yokota, 2009). The findings partially support this notion, as the priming with outgroup threat following a loss heightened outgroup bias among men but not women.

We also examined heterogeneous effects across respondents' political ideology and age groups, which are reported in SI Section 5 and SI Section 4. However, we did not find a discernible pattern in the heterogeneous effects across these subgroups, suggesting that political ideology and age may not play a significant role in shaping the impact of the FIFA World Cup on outgroup and ingroup bias among South Korean respondents.

Table 6. Triple Difference Estimates of Gender Gap in Referent Outgroup Bias, Ingroup Bias, and Non-referent Outgroup Bias: Statistically significant *triple* difference estimates are shaded in a darker colour. Robust standard errors are reported. Given the relatively small sample size, a 90% confidence interval is employed for this analysis. The number of observations for male is 1,080 (270 for the pre-game survey, 273 for Round 1, 269 for Round 2, and 268 for Round 3) and the number of observations for female is 1,089 (266 for the pre-game survey, 272 for Round 1, 283 for Round 2, and 268 for Round 3). Africans (A) and Whites (B) are non-referent outgroups for Round 1, South Americans (A) and Whites (B) for Round 2, and South Americans (A) and Africans (B) for Round 3

	Triple difference											
	Round 1				Round 2				Round 3			
Gender Gap (= Male - Female)	Est	SE	Lower	Upper	Est	SE	Lower	Upper	Est	SE	Lower	Upper
Referent outgroup bias												
	−0.149	0.525	−1.015	0.716	0.977	0.518	0.123	1.831	0.597	0.499	−0.226	1.421
Ingroup bias												
	0.484	0.488	−0.321	1.288	0.841	0.494	0.027	1.655	0.874	0.500	0.050	1.698
Non-referent outgroup bias												
Non-referent Outgroup A	0.297	0.493	−0.516	1.111	0.888	0.512	0.044	1.732	0.961	0.519	0.106	1.816
Non-referent Outgroup B	0.114	0.475	−0.669	0.897	0.993	0.486	0.193	1.794	0.833	0.519	−0.023	1.688

Table 7. Checks for the ceiling and floor effects

Variables	Without ceiling and floor effects		Ceiling effects alone		Floor effects alone		Both ceiling and floor effects	
	Est.	SE	Est.	SE	Est.	SE	Est.	SE
Constant	−0.719	0.414	−0.719	0.413	−0.902	0.392	−0.901	0.393
Male	−0.390	0.356	−0.389	0.354	−0.020	0.270	−0.021	0.270
College	−0.397	0.396	−0.395	0.396	0.129	0.328	0.129	0.327
Young	0.228	0.358	0.226	0.357	0.621	0.269	0.619	0.268
Conservative	0.552	0.419	0.553	0.416	0.007	0.319	0.011	0.317
Proportion of liars								
Ceiling effects			0.00	0.00			0.00	0.00
Floor effects					0.04	0.00	0.04	0.00

6. Robustness checks

Ceiling effects can occur when respondents consistently provide positive responses to all control items as well as the sensitive item. Conversely, floor effects may arise if the control questions are so uncontroversial that most respondents uniformly provide negative responses. Using the method suggested by Blair and Imai (2012), we check the existence of the ceiling and floor effects in our list experiment.

Table 7 presents coefficients from the logistic regression models, where the dependent variable is coded as 1 if a respondent provides an affirmative answer to one of the outgroup treatment items. Table 7 shows that there is no significant sign of ceiling effects. There is a sign of floor effects, especially for young respondents. However, the population proportion of respondents whose responses are affected by floor effects is relatively small (about 4 percent).

7. Discussion

Previous studies assessing the effect of intergroup contact on outgroup bias did not distinguish between referent and non-referent outgroups, making it difficult to explain the exact mechanism underlying the findings. Utilizing the distinctive structure of the FIFA World Cup's group matches, we designed an experiment that examines changes in outgroup and ingroup bias before and after multiple matches across different outgroups and under various outcome contexts. Our study revealed that the defeat of the South Korean team by Ghana resulted in heightened bias toward generalized outgroups among male respondents, while we did not find a similar effect either among female respondents or under different match outcomes.

Unlike previous studies that have demonstrated how significant national sporting events can exacerbate ingroup bias, fuelled by heightened nationalism and ingroup favouritism (Kim and Lopez de Leon, 2018; Rosenzweig and Zhou, 2021), our study did not reveal significant shifts in ingroup bias across different match outcomes or opponents. This absence of a shift in ingroup bias is particularly noteworthy among male respondents, considering their relatively low baseline level of ingroup bias in the pre-game survey.

These results suggest that high-stakes intergroup competitions can lead to an overgeneralized bias against diverse groups among individuals who invest significant psychological energy into these competitions, particularly in the context of negative contact outcomes. In particular, the study highlights the importance of considering gender as a relevant factor when investigating the relationship between sports competitions and outgroup bias. Further research is needed to explore the underlying psychological and social mechanisms that drive these gender-specific effects and to determine the extent to which these findings can be generalized to other contexts and populations. Although we have delimited our discussion to the narrow scope of international sporting events in this paper, we believe

that our findings are generalizable to similar intergroup conflicts and competitions in the international arena.

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