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Predicting Kenyan Olympic Running Performance: Youth Transition, Gender, Statusand Venue

Demisse GashuWalle,PhD, *Associate professor, orcid.org/0000-0002-9222-038X*
Asst.prof., Department of Sports Science and Physical Education, Aports Academy, Bahir Dar University, Bahir Dar, Ethiopia
E-Mail: demissiegashu@gmail.com

Abstract

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This study investigated the relationship between Kenyan youth and senior Olympic athletes and the predictive influence of gender, status, and competition venue on performance in middle- and long-distance events. Addressing existing gaps regarding youth-to-senior progression and contextual factors in Kenyan athletics, historical data from Olympic results (2010-2020 Youth; 2012-2020 Senior Games) for 116 Kenyan athletes were analyzed. Descriptive analysis revealed a zero percent conversion rate from youth to senior Olympic participation, highlighting a significant pathway discontinuity. Linear regression showed gender significantly predicted performance across all events ($p<.001$), explaining up to 92% (5000m) and 97% (10000m) of variance, with notable performance time differences (e.g., 87.24s in 5000m, 222.59s in 10000m) linked to gender. Competitive venue significantly influenced long-distance events only, accounting for up to 96% of marathon variance, with performance times decreasing by 2.33s. Findings recommend stakeholders explore factors limiting youth-to-senior transition.

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1. Background

Achieving top performance and securing medals at the Olympic Games represents the pinnacle of athletic ambition, offering substantial and multifaceted benefits. For the athletes themselves, these advantages extend beyond personal achievement to encompass widespread appreciation, enhanced public respect, and significantly improved financial prospects and educational opportunities. Olympic success often leads to expanded professional networking, increased media publicity, and the powerful role of inspiring future generations of aspiring athletes (Ji Hyun, 2009; Dominique &Gaelle, 2011; Kelly & Brownell, 2011; IOC, 2016). Beyond the individual, a nation's Olympic success cultivates national pride, fosters international recognition, and can even contribute to broader societal well-being and economic development. However, achieving and sustaining such elite sports performance is a profoundly complex, dynamic, and multifaceted phenomenon. It is shaped by an intricate interplay of various intrinsic and extrinsic factors. Intrinsic elements include inherent genetic predispositions, specific physiological characteristics vital for the sport, individual personality traits, favorable anthropometric variables (e.g., body composition, limb lengths), and an unwavering commitment to rigorous training regimens. Concurrently, extrinsic environmental constraints, such as the availability of robust financial support, supportive socioeconomic conditions, access to state-of-the-art training facilities, and well-designed local public policies for sports development, also play a pivotal role in determining an athlete's ultimate success (Sonnentag&Frese, 2005; Wright et al., 2014; Smith, 2014; Bondareva&Negasheva, 2017; Vagenas&Vlachokyriakou, 2012; Neto&Bertussi, 2015; Jayantha&Ubayachandra, 2015).

Given these numerous and diverse influencing factors, researchers have increasingly dedicated their efforts to comprehensively understanding the key determinants of athletes' long-term performance. A particular area of focus has been the intricate dynamics of career progression from early stages of athletic development to later, senior elite levels (Neeru et al., 2013; Barreiros et al., 2014; Lloyd et al., 2015; Boccia et al., 2017). Numerous empirical analyses across a wide spectrum of sports have explored the complex developmental pathways of elite athletes (Gulbin et al., 2013; Costa et al., 2011). A recurring observation in much of this research is that the conversion rate from promising youth talent to established senior elite stages often appears surprisingly low. For instance, a notable study involving 256 elite athletes across 27 different sports revealed that less than 7% successfully transitioned from youth to senior competition (Gulbin et al., 2013). Similarly, compelling evidence suggests that a significant majority (89.2%) of international youth athletes do not

manage to reach the global senior stage, and, intriguingly, 82% of international-level senior athletes had not even competed at the international youth level (Güllich et al., 2022). In the specific domain of athletics, the conversion rate for elite sprinters from youth to senior international events has also been consistently found to be low (Agudo-Ortega et al., 2023). Generally, these findings collectively suggest that many highly successful youth athletes do not ultimately achieve comparable levels of success as senior athletes (Arne et al., 2023).

Conversely, some research presents inconsistent findings regarding the strength and nature of the relationship between youth and senior athlete performance. The reported percentage of youth athletes who successfully achieve comparable results at the senior international level varies widely across studies and sports, ranging from a concerning zero percent to a more encouraging 68% (Latorre-Román et al., 2018; Brustio et al., 2021). In highly specialized or early-maturing sports, this conversion rate can even reach as high as 100% (Vaeyens et al., 2009; Barreiros& Fonseca, 2012). This considerable inconsistency across the literature highlights that the youth-to-senior progression is far from universally understood across all athletic disciplines and contexts. Specifically, this critical relationship remains largely unexplored for the highly specialized middle- and long-distance running events, despite their global prominence. This study aims to directly address this significant gap by empirically examining the connection between youth and senior athletes in Kenya, a nation renowned for its dominance in these events. Furthermore, this investigation provides a critical comparative case for other dominant running nations like Ethiopia, which, in contrast to the observed low global rates, has notably identified its own youth-to-senior transition rate to be approximately 23% (Demissie, 2023), offering a unique point of comparison for talent development efficacy

Beyond developmental pathways, the influence of various contextual factors on athlete performance, particularly within the unique socio-cultural and environmental landscapes of Kenyan and broader Sub-Saharan African contexts, remains a relatively understudied area. Existing scholarly research has predominantly focused on specific physiological and environmental factors such as early walking and running habits inherent to the region (Onywera et al., 2006), the role of genetic predisposition (Scott et al., 2003), specific physiological parameters like hemoglobin and hematocrit levels (Moore et al., 2006; Saltin et al., 1995), characteristic body types and lower limb mechanics (Larsen et al., 2004), favorable skeletal-muscle-fiber composition and oxidative enzyme profiles (Saltin et al., 1995), traditional dietary practices (Onywera et al., 2004; Beis et al., 2011), the well-known advantages of living and training at high altitude (Billat et al., 2003; Pitsiladis et al., 2004), and the potent motivation

derived from the pursuit of economic success (Onywera et al., 2006). While the broader influence of more general contextual factors, such as gender, the specific competitive venue, and an athlete's status (e.g., previous achievements), on overall sports performance is widely recognized in the literature (Chew, 2004), their specific and nuanced impact on Kenyan athletes in the highly competitive Olympic arena has not been thoroughly investigated.

Therefore, the overarching purpose of this study was twofold: (1) to systematically examine the relationship, if any, between Kenyan youth athletes who participate in the Olympic Games and their subsequent progression to senior Olympic competition, and (2) to empirically determine the extent of influence that key contextual factors—gender, athlete status (e.g., medalist vs. non-medalist), and competition venue—have on the actual performance (measured as time) of these Kenyan athletes at the Olympic Games. More specifically, this study sought to answer the following detailed research questions:

Is there a relationship between Kenyan youth and senior athletes at the Olympic Games?

To what extent do gender, status, and competition venue predict the performance of Kenyan athletes at the Olympic Games?

Operational Definitions

Athletics: This refers to the specific sports discipline encompassing middle- and long-distance events in both the Youth and Summer Olympic Games. These include 800m, 1000m, 1500m, 2000m, and 3000m steeplechase, 5000m, 10000m, and marathon events.

Contextual Factors: These are components such as gender, status, and competition venue that impact Kenyan athletes' performance at the Olympic Games.

Gender: The biological sex of Olympic participants, categorized as men and women.

Performance: The time, in seconds, required to complete a specific middle- or long-distance athletic event.

Senior: Kenyan athletes over the age of 19 who competed in the 2012, 2016, and 2020 Summer Olympic Games.

Status: The medal experience of athletes in the Olympic Games, specifically gold, silver, bronze, or non-medal.

Venue: The host cities of the Olympic Games, including London, Rio de Janeiro, Tokyo, Singapore, Nanjing, and Buenos Aires.

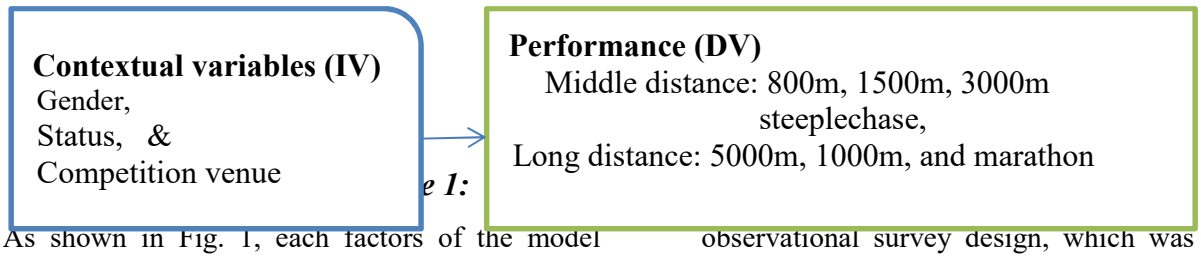
Youth:Kenyan athletes under the age of 19 who competed in the 2010, 2014, and 2018 Youth Olympic Games.

2. Conceptual Model of the Study

This study is guided by the Organizational-Situational Regulation Theory (OSRT), particularly its propositions related to contextual performance, to Olympic Games. This theory provides a foundational understanding of the contextual nature of an athlete's performance. From a theoretical perspective, contextual performance refers to an athlete's capacity to complete a given athletic task within a specified timeframe (Goldstein, 1995). Consistent with this definition, athlete performance in this study is defined as an athlete's ability to of competition within the Olympic environment (Knowles, Holton, & Swanson, 2020; Catherine & Ennis, 2017; Thompson & Clayton, 2004). Examining the relationship between performance and contextual factors is crucial for developing targeted interventions to enhance athlete performance and inform broader development and statistically estimate the performance of athletes in the

successfully complete a given middle- and long-distance athletic event within the Olympic Games. The OSRT suggests that factors within the Olympic Games environment can influence performance. For athletes, elements such as increased persistence in running during competition and challenging other athletes have been shown to influence commitment and performance, contributing to the overall quality training strategies within Kenyan athletics and beyond.

Based on the diverse factors and dimensions influencing performance, the OSRT serves as the theoretical framework for this study. This framework was instrumental in selecting the key study variables, which are illustrated in Figure 1.



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As shown in Fig. 1, each factors of the model addresses specific aspects of the study. The model consists of contextual factors including gender, status, and competitive venue, dealing with the performance of the athletes.

3. Materials and Methods

Design: This study employed a descriptive observational survey design, which was deemed appropriate for its objectives. This design allows for the comparison and analysis of multiple variables concurrently, often with minimal additional cost (Rakesh&Priya, 2019). The study specifically investigated the relationships between senior and youth Kenyan Olympic athletes and

analyzed the impact of gender, status, and competition venue on athletes' performance at the Olympic Games.

Source of Data: Historical data for this study were obtained from the official results webpages of the International Olympic Committee (https://www.olympedia.org/results). As this data is publicly accessible, informed consent from participants was not required.

Sampling: Prior to data collection, the total number of Kenyan athletes who participated in the 2010, 2014, and 2018 Youth Olympic Games and the 2012, 2016, and 2020 Senior Olympic Games was determined to be 264. From this pool, researchers deliberately selected only athletes competing in middle- and long-distance events, resulting in a sample of 116 Kenyan athletes for the study.

The specific distances analyzed for youth athletes included 800m, 1,000m, 1,500m, 2,000m steeplechase, and 3,000m. For senior athletes, the analyzed distances were 800m, 1,500m, 3,000m steeplechase, 5,000m, 10,000m, and marathon. It is important to note that the first Youth Olympics were held in 2010.

The final filtered data, comprising 116 Kenyan athletes competing in youth and senior Olympics, was initially divided into three categories:

- Category 1 (C1): Athletes who competed *only* in the Senior Olympic Games without having previously participated in the Youth Olympic Games.
- Category 2 (C2): Athletes who participated *only* in the Youth Olympic Games.
- Category 3 (C3): Athletes who competed in the Senior Olympic Games and had previously competed in the Youth Olympic Games.

Statistical Analysis: Descriptive statistics,including mean, frequency, and percentage, were calculated for all variables in this study. Regression analysis was employed to investigate the influence of gender, status, and venue on athlete performance in specific athletics events. This analysis aimed to highlight the importance of the predictor variables (gender, status, and venue) relative to the dependent variable (performance) for athletes who competed in the Olympics. All statistical analyses were conducted using SPSS version 25 software.

4. Results and Discussions

This section presents the study's findings regarding the relationship between Kenyan youth and senior Olympic athletes, and the predictive influence of gender, status, and competition venue on Olympic middle- and long-distance running performance. The results are discussed in detail, contextualized within existing literature, and their implications are explored.

4.1. Kenyan Athletes in Youth and Senior Olympics: Examining the Youth-to-Senior Transition

This section presents and discusses the findings directly addressing the study's first primary objective: to examine the relationship between

Kenyan youth and senior athletes at the Olympic Games, specifically focusing on observed progression patterns.

The comprehensive dataset comprised 116 Kenyan athletes participating in middle- and long-distance events across the selected Olympic cycles. Analysis of participation history categorized these athletes into two primary groups: 95 athletes (81.89% of the sample) were identified as Category 1 (C1) participants, indicating their exclusive involvement in the Senior Olympic Games (2012, 2016, and 2020). Conversely, 21 athletes (18.10% of the sample) were classified as Category 2 (C2) participants, having competed solely in the Youth Olympic Games (2010, 2014, and 2018).

A crucial finding directly addressing the objective regarding the relationship between youth and senior athletes was the complete absence of athletes in Category 3 (C3). Category 3 was specifically defined for athletes who had participated in both the Youth Olympic Games and subsequently in the Senior Olympic Games.

Table 1: Characteristics of C1, C2, & C3 Kenyan Athletes by Events

A	Middle and long distance events	Gender			
		M	Status	F	Status
C 1	800m (n= 18, 18.6 %)	9	3(G),1(S)	9	2(B)
	1500m (n=18, 18.5 %)	9	1(S)	9	2(G)
	3000m ST (n=17, 17.5 %)	9	2(G), 2(B)	8	1(S),1(B)
	5000m (n=16, 16.5 %)	9	1(B)	9	1(G), 3(S)
	10000m (n=15, 15.5 %)	7	1(S)	8	2(S),1(B)
	Marathon (n= 13, 13.4 %)	5	2(G),1(S),1(B)	7	2(G),2(S),1(B)
	Total 95 (100)	46 (48.4%)		49 (51.6 %)	
C 2	800m (n= 4, 19.0 %)	2	-	2	-
	1000m (n=1, 4.8 %)	-	-	1	1(B)
	1500m (n=4, 19.0 %)	2	1(G)	2	1(G),1(S)
	2000m (n=6, 28.6 %)	3	1(G), 1(S)	3	3(G)
	3000m (n=6, 28.6 %)	3	1(G), 1(B)	3	1(G),1(S)
	Total 21(100.00%)	10(47.6 %)		11 (52.4 %)	
C3	-	-		-	

Note, A= Athletes, C= Category, M= male, F = female, G= gold, S=silver, B= bronze and ST= Steeplechase

The non-existence of C3 athletes within the sampled Kenyan middle- and long-distance runners signifies a 0% conversion rate from the youth Olympic level to the senior Olympic level. This finding unambiguously indicates that, for the period and events examined, there was no observed direct progression or continuous Olympic participation from the youth to the senior stage among Kenyan athletes. Every Kenyan athlete who competed in a Youth Olympic Games in middle- or long-distance events during the study period did not go on to compete in a Senior Olympic Games in these disciplines, and similarly, no senior Olympians in these events had previously

participated in a Youth Olympics. This result highlights a significant lack of continuity in Olympic representation between these two athlete developmental stages in Kenya.

This finding, indicating that 100% of the Kenyan athletes who participated in the Youth Olympics did not transition to represent their country as senior Olympians, aligns with existing literature reporting low conversion rates in other nations, although the rate observed in this study is notably lower. For instance, only 23.8% of Ethiopian youth Olympic athletes transitioned to the senior Olympic level (Demissie, 2023). Similarly, studies on New Zealand and Australian youth athletes have reported low progression rates to senior representation, with only 68% of New Zealand youth medalists and 71% of Australian youth athletes transitioning (Hollings & Hume, 2010, 2011a; Stephen et al., 2014). This extremely low, or rather, non-existent, conversion rate in the Kenyan context might be attributed to several factors. These could include the highly competitive nature of elite athletics, the potential inconsistencies in athlete development processes, or a lack of structured pathways for youth athletes to progress to senior ranks (Abbott & Collins, 2002; Baker, 2013).

While the primary objective concerning the youth-to-senior transition was starkly answered by the 0% conversion rate, a supplementary observation from the descriptive analysis pertained to medal achievements within each category (see Table 1). In the C1 group (senior Olympians), all middle- and long-distance events saw Kenyan medal winners. Notably, the medal-winning performance of female athletes in the senior category was generally superior to or on par with that of male athletes, particularly evident in the 5000m and 10000m events. Similarly, within the C2 group (youth Olympians), with the exception of the 800m event, medals were earned across genders. Here too, female youth athletes consistently demonstrated better or equivalent medal status across all middle- and long-distance events compared to their male counterparts. This consistent trend across both youth and senior categories, while not directly addressing the youth-to-senior transition relationship, suggests distinct and often superior gender-based performance patterns for female middle- and long-distance runners in Kenya within each Olympic level.

Despite the observed lack of direct progression, it is important to acknowledge that success in youth competitions is not the sole determinant of an athlete's long-term career trajectory, as both personal factors and athletic support systems play crucial roles in sustained development (Gulbin et al., 2013; Lloyd et al., 2015). Therefore, given the 0% conversion rate, it is imperative for Kenyan sports organizations, including athletic federations and sports academies, to thoroughly investigate the underlying reasons why youth athletes fail to

transition to the senior Olympic level. Understanding these specific contextual factors could inform the development of more effective athlete development pathways, improve the conversion rate, and foster more sustained and successful athletic careers for Kenyan talent.

4.2. Regression Analysis: Predicting Athlete Performance

This study examined the relationship between Kenyan youth and senior athletes at the Olympic Games and investigated the extent to which gender, status, and competition venue predict the performance of Kenyan athletes in Olympic middle- and long-distance events. Performance was measured as time, with lower times indicating superior performance.

The analysis of Kenyan athlete participation across Olympic cycles revealed a stark disconnect between youth and senior levels. Out of 116 Kenyan athletes in middle- and long-distance events, 95 (81.89%) participated exclusively in Senior Olympic Games (Category 1, C1), while 21 (18.10%) competed solely in Youth Olympic Games (Category 2, C2). Crucially, there were no athletes who transitioned from Youth to Senior Olympic Games (Category 3). This 0% conversion rate signifies a complete lack of direct progression from youth Olympic participation to senior Olympic competition within the sampled Kenyan middle- and long-distance running talent pathway.

Table 3: Regression Models Predicting Athlete Performance

800m (n = 22)						
IV	B	SE	T	P	F	R^2
Constant	69.2834.879	14.200	.001*			
Gender	16.417	1.01116.238	.001*	105.077	.96	
Status	1.033	.493	2.093	.051		
Venue	1.061.589	1.800	.090			
1500 m (n =21)						
IV	B	SE	T	P	F	R^2
Constant	184.144	19.7699.315	.001*			
Gender	29.277	3.118	9.390	.001*	23.399	.85
Status	4.084	1.471 2.777.013				
Venue	-3.319	1.971	-1.684 .112			
3000 m (n=14)						
IV	B	SE	T	P	F	R^2
Constant	438.443	15.626	28.059.001*			
Gender	61.6804.937	12.494	.001*	78.697.95		
Status	4.3972.529	1.739	.113			
Venue	-3.0093.047 -.987		347			
5000 m (n= 16)						
IV	B	SE	T	P	F	R2
Constant	776.016	27.37528.347.001*				
Gender	80.243	6.928	11.583.001*	50.585	.92	
Status	3.957	3.687	1.073	.304		
Venue	-12.311	4.108	-2.997	.011*		
10000 m (n = 21)						
IV	B	SE	T	P	F	R^2
Constant	-822.576115.080	-7.148	.001*			
Gender	222.598	58.864	3.782	.002 *	161.432.97	
Status	23.214 27.011	.859	.403			
Venue	201.43727.626.3.709		.002*			
Marathon (n = 21)						
IV	B	SE	T	P	F	R2
Constant	7200.776	4.291	1678.26	.001*		
Gender	16.639	1.190	13.979	.002 *	71.11	.96
Status	.236	.524	.450	664		
Venue	-2.337	.673	-3.472	.008*		

*Note: IV=Independent variables,*p < 0.001(2-tailed)*

This finding is particularly noteworthy, as it contradicts the general expectation that youth elite performance often serves as a foundational step for senior success (e.g., Gulbin et al., 2013; Hollings & Hume, 2010). The absence of C3 athletes suggests that the current talent identification and development systems in Kenya for these events might not effectively bridge the gap between promising youth talent and sustained senior Olympic representation. This finding aligns with

recent systematic reviews indicating that early elite success is not a prerequisite for adult success (Arne et al., 2023; Agudo-Ortega et al., 2023; Barth et al., 2022; Brustio et al., 2021; Latorre-Román et al., 2018). It underscores the need for athletic federations, sports academies, and stakeholders in Kenya to explore the underlying factors contributing to this discontinuity.

Beyond the transition, the study also explored performance predictors. The linear regression models for all six middle- and long-distance events (800m, 1500m, 3000m, 5000m, 10000m, and Marathon) were highly statistically significant ($p<0.001$), demonstrating that the selected independent variables (gender, status, and venue) collectively explain a substantial proportion of the variance in athlete performance. The robust R2 values, ranging from 0.85 for the 1500m to 0.97 for the 10000m, indicate that these factors are collectively powerful predictors of performance for Kenyan athletes in these Olympic disciplines.

Gender emerged as a consistently and highly significant predictor of performance across all middle- and long-distance events ($p<0.001$ for all events). This strong statistical significance confirms gender's substantial role in explaining variation in performance times among Kenyan Olympic athletes. The positive unstandardized beta coefficients (B) for gender (where a positive value for gender, if females are coded as 1, indicates slower times) consistently underscore a clear and statistically significant performance disparity. This quantitative evidence aligns with our descriptive finding that Kenyan female athletes demonstrated a relatively stronger medal-winning performance at the Olympics in C1 and C2 categories.

Specifically, the gender-associated differences in performance time widened for longer distances. In the 800m, an average difference of approximately 16.42 seconds was observed (B=16.417). This disparity increased to about 29.28 seconds for the 1500m (B=29.277) and a more substantial 61.68 seconds for the 3000m (B=61.680). For the 5000m, the average performance time difference associated with gender was about 80.24 seconds (B=80.243).

The most pronounced gender-related difference was found in the 10000m, with an average increase in performance time of approximately 222.60 seconds, which translates to a significant 3 minutes and 42.6 seconds (B=222.598). Even in the marathon, a notable average difference of about 16.64 seconds (B=16.639) was observed. These consistent positive coefficients across all events indicate that one gender (likely female based on common physiological differences) demonstrated considerably longer race completion times.

This exceptional performance by Kenyan female athletes could be linked to a combination of factors such as genetic predisposition, a strong work ethic, early engagement in walking and running, comparatively higher hemoglobin and hematocrit

levels leading to better metabolism, favorable skeletal muscle conditions, high-altitude training, and a strong motivation for financial success compared to men (Robert et al., 2003; Colin et al., 2004; Onywera et al., 2006; Randall &Yannis, 2012; Saltin et al., 1995; Scott et al., 2003; Zelalem et al., 2021). The success of Kenyan female athletes in these events offers numerous benefits, including promoting broader participation in long-distance running, creating powerful role models, fostering a global identity for Kenya, and showcasing the country on the international stage (Gregory, 2013). As there are limited studies specifically investigating the influence of gender on middle- and long-distance athlete performance in this context, particularly with such high explanatory power, further research across more Olympic Games, nations, and contexts is warranted.

Conversely, athlete status was generally not a significant predictor across most events. The p-values for 'Status' were above the conventional significance level of 0.05 for 800m (p=0.051), 3000m (p=0.113), 5000m (p=0.304), and 10000m (p=0.403). This suggests that an athlete's medal-winning status (e.g., previous medal wins or being a medalist vs. non-medalist) did not statistically significantly influence their current performance time in most events, after accounting for gender and venue. The sole exception was the 1500m (p=0.013), where status did show a significant, albeit small, positive association with performance time (B=4.084), implying a slightly slower time for athletes with higher status in this specific event. This unexpected finding for the 1500m warrants further qualitative investigation to understand its context.

Finally, the competitive venue emerged as a statistically significant predictor exclusively for long-distance events: the 5000m (p=0.011), 10000m (p=0.002), and Marathon (p=0.008). In the shorter middle-distance events (800m, 1500m, 3000m), venue did not significantly predict performance. The nature of venue's influence varied across these long-distance events. For the 5000m, a negative coefficient (B=−12.311) indicates that, for a one-unit change in venue (assuming categorical coding with a reference venue), athlete performance times could, on average, decrease by approximately 12.31 seconds, suggesting certain venues might facilitate faster times. In contrast, for the 10000m, a substantial positive coefficient (B=201.437) suggests that a change in venue was associated with a significant increase in performance time of about 201.44 seconds, highlighting a considerable impact of the competitive environment on this event, potentially indicating more challenging conditions at certain locations. Similarly, in the Marathon, a negative coefficient (B=−2.337) implies that a one-unit change in venue was associated with an average decrease of approximately 2.34 seconds in performance time.

These results collectively underscore that the specific competitive venue exerts a tangible and statistically significant influence on the performance of Kenyan athletes in long-distance running events, although the direction and magnitude of this effect are event-specific and contingent on the particular characteristics of each venue. This could relate to factors such as climate, track conditions, crowd support, or even specific course profiles (for marathon) at different Olympic cities like London, Rio de Janeiro, and Tokyo. Similar to the impact of gender, the specific influences of competitive venues on long-distance athlete performance are not well-documented. Therefore, further investigation across more Olympic Games and within various Kenyan and East African contexts is recommended.

Study Limitations

This study has several limitations. The inclusion of athletes from a single country, the limited number of athletes, and the restricted number of Olympic Games considered are primary constraints. The findings might have differed if the study had encompassed more Olympic Games, a larger athlete pool, and data from other nations or continents, along with a broader range of variables in the regression equations. Therefore, future research is encouraged to include a greater number of Olympic Games, diverse athletes from various nations, and additional influential variables.

5. Conclusions and Recommendation

This study investigated the relationship between youth and senior Kenyan athletes at the Olympic Games and the influence of contextual factors on their performance. A significant finding was the absence of any conversion from youth to senior Olympic participation among the sampled Kenyan athletes.

The regression analysis confirmed that gender was a statistically significant predictor of athlete performance across all middle- and long-distance events. Specifically, gender explained up to 92% of the variance in 5000m performance and 97% in 10000m performance. The estimated coefficients indicate substantial performance differences associated with gender, with female athletes demonstrating superior medal-winning consistency in certain events.

Furthermore, the results showed that competitive venue significantly impacted performance in long-distance events, explaining up to 96% of the variation in marathon performance. The negative coefficients suggest that certain venues were associated with faster performance times for Kenyan athletes in these events.

The findings of this study have important implications for the development of Kenyan athletics. Understanding the transition gap between youth and senior athletes, as well as the impact of

gender, status, and competitive venue on performance, is crucial for strategic planning.

It is recommended that organizations such as the Athletics Federation of Kenya, the National Olympic Committee, and sports academies/colleges actively investigate the critical factors influencing the very low conversion rate from youth to senior categories. Identifying and addressing the barriers to this transition is essential for nurturing sustained athletic careers.

This study provides valuable evidence for policymakers regarding the performance trajectories of Kenyan middle- and long-distance athletes. The relevant entities should proactively explore key strategies to optimize Kenya's future success in the increasingly competitive global sporting arena.

Given that this study focused exclusively on Kenyan middle- and long-distance athletes, it is imperative to conduct comparable research to broaden the scope of generalizations. Future studies should aim to:

- Ascertain the impact of an athlete's gender, status, and competition venue on the training regimens of elite athletes in nations that have achieved consistent success in these sporting events.
- Explore the influence of various additional factors that contribute to a nation's overall sport system.

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