



RESEARCH ARTICLE

Leisure-time physical activity as a framework for understanding motivation, identity, and sport participation among aging women: Insights from the 2023 Kona Ironman World Championship

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OPEN ACCESS

PUBLISHED

31 May 2026

CITATION

Brown, CS., Elkins, JS., et al., 2026. Leisure-time physical activity as a framework for understanding motivation, identity, and sport participation among aging women: Insights from the 2023 Kona Ironman World Championship. Medical Research Archives, [online] 14(5).

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ISSN

2375-1924

ABSTRACT

Leisure-time physical activity plays a supportive and central role in healthy aging and offers an opportunity to learn how healthier aging can be negotiated in later life through sport. Aligned with Self-Determination Theory, which emphasizes autonomy, competence, and relatedness across diverse movement environments, rather than exclusively within structured or competitive settings, this study examined how high-intensity endurance sport functions as one pathway within a larger ecology of physical activity. Online snowball sampling was used to identify women triathletes, 18 years and older, and who were competing in the 2023 Kona Ironman World Championship race for study participation. Web based surveys were completed by N = 83 women participants who completed a 10-question demographic survey and the 56 item Motivations of Marathoners Scale for Triathletes (MOMS-T). Results indicated four items including: "To reduce my weight," "To improve my self-worth," "To feel a sense of belonging in nature," and "To have something in common with other people," were all significant at the $p < .05$ threshold. Older women (≥ 50 years old) were most motivated by having a sense of belonging in nature (M = 5; SD 1.4). Centering the lived experiences of women who engage in elite-level endurance sport, provided insight into motivation, meaning-making, and health within a highly specific and temporally bound context.

Introduction

Leisure-Time Physical Activity in Aging Adults

As populations age, identifying strategies that promote healthy aging by enhancing functional ability and enabling well-being in later life is a significant global public health priority.^{1,2} Among these strategies, leisure-time physical activity (LTPA) plays a supportive and central role in healthy aging. LTPA is defined as voluntary movement undertaken during free time for purposes such as recreation, enjoyment, or health enhancement.¹ This framing distinguishes LTPA from occupational, transportation, or household physical activity domains by emphasizing choice, autonomy, and personal meaning. Within public health, leisure, and behavioral sciences, LTPA is often characterized as a modifiable behavior associated with a wide range of positive outcomes, including reduced all-cause mortality, improved cardiometabolic health, enhanced cognitive functioning, and psychological well-being.^{3,4,5}

However, the definition of LTPA still does not fully capture the nuances of the lived, embodied experience of engaging in LTPA, particularly among aging adults. LTPA participation involves a multitude of influences, including environmental factors, shifting identities, social roles, bodily changes, mental health, and physical health.⁶ LTPA is more than a recognized health behavior; it offers an opportunity for healthier aging, in which autonomy, identity, and social connection are negotiated in later life. Data on participation in LTPA among women vary, averaging around 4.67 hours per day⁷ while women continue to fall short of their need to be more active due to gendered, cultural, and structural barriers.⁸ Understanding LTPA in older adulthood, therefore, requires attention not only to frequency or intensity but also to meaning, motivation, and the conditions that enable sustained engagement.

The Self-Determination Theory and Leisure Time Physical Activity

The Self-Determination Theory (SDT) describes human motivation through the psychological needs of autonomy, competence, and relatedness and thus provides a framework to understand motivational processes that support engagement in LTPA.^{9,10} The desire to participate in LTPA for the inherent interest or enjoyment is intrinsic motivation and serves as the cornerstone to well-being, and long-term behavioral adherence.^{11,12} Extrinsic motivation, which is described as motivation leading to a separable outcome, is characterized by four types that vary in the degree and type of self-determination: external, introjected, identified, and integrated regulation.^{11,13} Individuals are more likely to be physically active when their needs are valued and supported⁹ and are likely to maintain that motivation even when faced with aging-related physiological changes that can affect their physical activity behaviors.¹⁴

A substantial body of research demonstrates that SDT-based interventions effectively promote physical activity across the lifespan, including among aging adults.^{12,15} Autonomy-supportive environments, including external spaces, that provide meaningful choice, acknowledge individual perspectives, and minimize pressure have demonstrated enhanced intrinsic motivation among aging adults in individualized, team-oriented physical activity programs.^{16,17} Autonomous (i.e., self-determined) regulation predicts habit-forming behaviors when motivation is driven by intrinsic interest in engaging in physical activity.¹⁸ Social environments support relatedness and may serve as a mediator of need satisfaction to prevent burnout among those dedicated to sport.¹⁹ For midlife to older women in particular, autonomy-supportive instruction and opportunities for self-directed activity have been associated with improved psychological well-being, greater exercise attendance, and stronger internal motivation.²⁰ These findings

underscore the importance of designing LTPA opportunities that respect aging adults' lived experiences.

Sport Participation as a Distinct Form of Leisure Time Physical Activity

LTPA is used as the primary framing construct in this paper rather than leisure-time sport participation to best capture the broader behavioral and experiential landscape in which physical activity occurs across the lifespan, particularly among aging adult populations. While sport represents a structured and salient form of engagement, it constitutes only one subset of LTPA. Framing the present study through LTPA allows for a more comprehensive examination of how movement is initiated, sustained, and adapted over time, particularly among aging women whose activity patterns often extend beyond formal sport contexts, and oscillate between competitive and non-competitive natures. Sport is typically characterized by rule-bound, organized, and often competitive activity that involves skill development, performance goals, and, in many cases, formalized training environments.²¹ While all sports can be considered LTPA, not all LTPA qualify as sports. This distinction is important, particularly in later life, where the demands and meanings associated with sport participation diverge from those of more general forms of physical activity (e.g., walking, yoga, and gardening).

A particularly understudied group within this landscape of LTPA is aging women who participate in high-intensity endurance sports such as triathlon. Competitive triathletes often require more time to prepare for a race, requiring extensive training and extraordinary physical and psychological resilience.²² Most use triathlon for leisure rather than as their occupation (i.e. professional triathlete), averaging between 14-18 hours of training.²³ And although women's participation in endurance events has increased substantially over the past two decades, older women remain underrepresented in research at the intersection of

sport and aging.²⁴ Those who do engage in endurance sport often describe it as a space of empowerment, autonomy, and resistance to age and gender norms.²⁵ The Ironman World Championship, held in Kona, Hawai'i, provides a unique opportunity to explore these dynamics. The Ironman race consists of a 3.8 km swim, a 180 km cycle ride, and a 42.2 km run. Less than 28% of triathletes racing the event are women,²⁶ however, the 2023 event was raced by women only.

Research on triathlons and on women's participation motivation reveals that they value having an association with other triathletes and find greater meaning in life through the sport than men do.²⁷ Additionally, the highest level of motivation, by intrinsic factors, was from women ages 35-50 who raced the Ironman distance more than other triathlon distances.²⁸ Several studies show an age-related decline in endurance performance with maintenance through 40 years of age and a progressive decrease in performance after 50.²⁹ However, women with longevity in the sport accepted and overcame challenges, had a sense of camaraderie and a love for the sport.²⁷ Together, these perspectives position LTPA, and sport participation more specifically, as multidimensional practices embedded within broader social, psychological, and cultural contexts. The present study addresses this gap by examining differences in motivation for participation among younger and older women who participated in the 2023 Kona Ironman World Championship.

Methods

The goal of the study was to use the previously validated Motivations of Marathoners Scale for Triathletes (MOMS-T) to assess motivation for triathlon participation among triathletes competing in the Kona World Championships, and to identify which statements demonstrated the greatest motivational significance to athletes by age. The approach was non-experimental, using a correlational design, and was administered via a web-based survey. Motivations that were not

significant are not reported in the analysis because they are less likely to explain how controlled factors affect motivation. The results reported here are based on data on the sample's extrinsic and intrinsic motivations.

Procedures

Following approval from the (blinded) Institutional Review Board, the triathletes were recruited for participation in the study. Inclusion criteria for participation included self-identifying as a triathlete woman, competing in the 2023 Kona World Championships, and being aged ≥ 18 years. Potential participants were directed to a secure web-based system at (blinded university) that included informed consent forms, a demographic questionnaire, and the MOMS-T survey.

Population and Sampling

Online snowball sampling was used to identify women triathletes for study participation. Multiple triathlete social networks, including USA Triathlon, The Black Triathletes Association, FastChix, and Honey Stinger (LLC), posted information about the study on their Facebook® pages. Early participants were asked to identify other triathletes who met eligibility criteria to participate in the study. Participants were encouraged to do this by *tagging* other women on Facebook® social media pages where the original study information had been posted.

Instruments in the Study

Two instruments were used for this study. A 10-question survey assessed demographics and triathlon participation. The MOMS-T is a revised form of the Motivations of Marathoners Scale³⁰ which has strong evidence of validity and reliability. Four of the 56 statements included the exercises 'cycling and swimming' with 'running', and the word 'triathlete(s)' replaced 'runner(s)' to assess participation motivation in triathlons. Previously validated by Brown³¹ the survey uses a 7-point Likert scale to assess motivation, where 1 indicates

the statement is "not a reason" and 7 indicates it is a "very important" reason for participation of four general categories (physical health, social, psychological coping, and achievement) and nine dimensions (general health orientation, weight concern, self-esteem, life meaning, psychological coping, affiliation, recognition, competition and personal goal achievement).³⁰ Responses on the survey showed good internal consistency, exceeding the .80 threshold.

Statistical Analysis

The analytic plan used Qualtrics XM Platform (April 2026, v. 6.0)³² to collect data and assess participants' motivation (Provo, UT, USA). Descriptive statistics for the demographic questionnaire, including age, race/ethnicity, and the number of times the participant has raced at Kona, and training time one month leading to the race, were analyzed. Chi-square tests were performed to assess significant differences across the 56 MOMS-T items by age. Any missing data were excluded from the analysis.

Results

A total of 93 individuals completed consent and met the inclusion criteria; 10 were excluded for missing demographic data, yielding a final sample of 83 (Table 1). Most participants were under 50 years of age (79.5%), White/Caucasian (81.9%), and first-time Kona competitors (80.7%). Training volume in the month before the race ranged from 4 to over 25 hours per week, with 59% training at an average of 14–18 hours weekly²³, which is typical for most triathletes. Only one participant was a professional triathlete. Time spent in training was recategorized and separated by hours spent training several weeks leading up to the race. Those who trained less than the average hours (i.e., 14-18 hours) most triathletes spent training were placed in the 'lower' category, while those who did more than 18 hours were placed in the 'higher' category.

Table 1

Participant Characteristics

Variable	Values	Number	Percentage
Age (years)	≤ 49	66	79.5%
	≥ 50	17	20.5%
Total		83	100%
Race/Ethnicity	Asian	3	3.6%
	Asian/Indian	1	1.2%
	Black/African American	4	4.8%
	Hispanic/Latina/Spanish	7	8.4%
	White/Caucasian	68	81.9%
Total		83	100%
Kona race first time	Yes	67	80.7%
	No	16	19.3%
Total		83	100%
Time spent training	Higher	16	19.3%
	Average	49	59.0%
	Lower	18	21.7%
Total		83	100%

Completion rates for the 56 MOMS-T items varied (R = 67-77). Chi-square analyses examining age differences identified four items at the $p < .05$ threshold. Age was defined as either less than or equal to 49 years or greater than or equal to 50

years. In Table 2, More than half of the younger group (≤49 years old) felt that the physical-health motive, "To reduce my weight," was not a motivational reason for their participation ($p = .003$).

Table 2

Age and Individual Physical Health MOMS-T Item

MOMS-T Item		$\leq = 49$	$\geq = 50$	Full Sample
To reduce my weight. $p = .003$	Total Count (Answering)	63.0	14.0	77.0
	1- not a reason	54.0%	35.7%	50.6%
	2	14.3%	7.1%	13.0%
	3	14.3%	14.3%	14.3%
	4	1.6%	35.7%	7.8%
	5	7.9%	7.1%	7.8%
	6	1.6%	0.0%	1.3%
	7- a very important reason	6.3%	0.0%	5.2%
	Mean	2.3	2.7	2.3
SD	1.8	1.5	1.8	

There was a roughly even distribution towards this item not being a motivator among the older women (≥ 50), too. For the psychological-coping item, "To improve my self-worth," ($p = .018$), women ≥ 50 endorsed this as a motivator more than the younger women (≤ 49), who showed more variability and lower endorsement of the item. The life-meaning item, "To feel a sense of belonging in

nature," ($p = .012$) was endorsed by older women (ratings 4–7), while younger women rated it as "not a reason" (Table 3). The social-affiliation motive "To have something in common with other people" ($p = .025$) was generally not endorsed by either age group as a meaningful motivator for race participation (Table 4).

Table 3

Age and Individual Psychological Coping MOMS-T Items

MOMS-T Item		≤ = 49	≥ = 50	Full Sample
To improve my sense of self-worth. <i>p</i> = .018	Total Count (Answering)	61.0	14.0	75.0
	1- not a reason	16.4%	0.0%	13.3%
	2	13.1%	0.0%	10.7%
	3	4.9%	28.6%	9.3%
	4	13.1%	35.7%	17.3%
	5	18.0%	7.1%	16.0%
	6	18.0%	14.3%	17.3%
	7- a very important reason	16.4%	14.3%	16.0%
	Mean	4.2	4.5	4.3
	SD	2.1	1.5	2.0
To feel a sense of belonging in nature. <i>p</i> = .012	Total Count (Answering)	60.0	13.0	73.0
	1- not a reason	26.7%	0.0%	21.9%
	2	11.7%	0.0%	9.6%
	3	11.7%	15.4%	12.3%
	4	10.0%	23.1%	12.3%
	5	30.0%	23.1%	28.8%
	6	1.7%	23.1%	5.5%
	7- a very important reason	8.3%	15.4%	9.6%
	Mean	3.4	5	3.7
	SD	2	1.4	2

Table 4

Age and Individual Social MOMS-T Items

MOMS-T Item		≤ = 49	≥ = 50	Full Sample
To have something in common with other people.	Total Count (Answering)	60.0	14.0	74.0
$p = .025$	1- not a reason	25.0%	7.1%	21.6%
	2	6.7%	28.6%	10.8%
	3	20.0%	0.0%	16.2%
	4	20.0%	21.4%	20.3%
	5	23.3%	21.4%	23.0%
	6	1.7%	14.3%	4.1%
	7- a very important reason	3.3%	7.1%	4.1%
Mean		3.3	3.9	3.4
Standard Deviation		1.7	1.9	1.7

Discussion

The purpose of this study was to examine differences in motivation for participation among younger and older women who participated in the 2023 Kona Ironman World Championship through the lens of LTPA. As the first-time iteration of a global endurance competition, this event offered a unique opportunity to explore how LTPA, sport, motivation, and identity intersect in later life. By focusing on female participants, this paper centers the lived experiences of women who engage in elite-level endurance sport, providing insight into motivation, meaning-making, and health within a highly specific and temporally bound context. Previous research highlighted a clear gap in understanding how aging women navigate and sustain engagement in high-intensity endurance environments. The results of the study expand the research scope of analysis related to the SDT in understanding motivation among triathletes. It also

contributes to the literature on understanding differences by age.

Rooted in SDT, we learn that the intersection of age and motivation among the women triathletes varies, but only 4 of the 56 items from the MOMS-T were statistically significant. The four significant items that ascribed how the women were motivated and thus self-identified as triathletes were from three scales of the MOMS-T: physical health, psychological coping, and social. However, their significance is grounded in *not* being motivated to participate to improve their self-worth, reduce their weight, or have something in common with others. Older women had more motivation than younger women with a sense of belonging in nature ($M = 5$; $SD 1.4$). No achievement motives were significant among these participants. However, in a mixed-methods study of women who race triathlons, it was reported that women's motivations were not driven by others'

views of their accomplishments.³¹ In that same study, reducing weight was the least motivating among the weight control items; the older women (50 and older) spoke of earning a lean look and gaining muscle as motivators for their triathlon participation.³¹ In the present study, the overall means were higher among the older women at 4.0 than for the younger women at 3.3, which is different from the Brown³¹ study, which found the opposite for age groups of 36-49 and 50+, whereas the younger women had higher overall means of motivation. When compared to men, women significantly indicate more often the desire to feel camaraderie in the sport³³, and it serves as a way for triathletes to feel part of a community.³¹ Women tend to be more adept at providing social support³⁴ but also display negative psychological responses to stress when they receive social support before, during, or directly after a stressful task.³⁴ This may explain why the women of this study were not motivated by having something common with others. Competing in any triathlon is stressful; the World Championship is considered the pinnacle.

Limitations to the study include methodological issues, participant representativeness, and potential misrepresentation. The surveys were only made available through computer access and social media, making it plausible that the sampling technique did not reach as many subjects as possible. Convenience and snowball sampling targeted a select group of women who compete in a highly selective sport. However, participant self-selection indicates that the potential of those who participated in this study may differ from those who did not.

In addition to findings, this work reminds us that the world is continually moving towards creating societies that encourage physical activity, recognizing that it is key to longevity. The use of LTPA in sport in this study serves to further our understanding of the nuances of motivation through whole-person approaches. These findings

illuminate how, though older women better connect with nature and self-worth, there may be an aspect of individualism that should be interrogated from social and female-gendered perspectives. LTPA allows us to understand the complexities of motivation when leisure meets sport, and when gender and society shape how and why such a high-caliber feat is achieved. In this study, weight control was the most motivating scale within the MOMS-T, but this has not been the case with other studies on women triathletes. Brown³⁴ reported that statements related to personal goal achievement were the most motivating among Black women triathletes. These women did not fit the 'typical' racial/ethnic demographic of triathletes. Understanding what the MOMS-T results would be if the participants did not fit the typical 'triathlete' body form would be of interest to expand on the literature. This could include those who race under the Athena category (those weighing 165+ lbs.) and those who are para-athletes.

Sport participation in older adulthood has been associated with a unique constellation of benefits that extend beyond physical health. These include enhanced sense of purpose, identity development and continuity, social integration, and perceived competence.^{21,35} For many older adults, sport offers a structured context in which to challenge age-related stereotypes and renegotiate assumptions about decline and capability. This is especially salient for women, whose participation in competitive sport historically has been constrained by both access and cultural narratives about aging bodies. Further, in the competitive landscape of social platforms, where individuals and groups seek to influence social change, triathlons and marathons provide a heightened space for older adults to make impactful statements. Take, for example, participants who compete to raise awareness for cancer research, gender equity, policy reform, immigration laws, and broad human rights, among other social changes. Even without signs and campaigns, older

women competing on such a platform encourage social change through visibility and exemplary dedication and action to achieve physical activity throughout their lives. Simply by participating, older female triathletes may inspire younger female athletes for generations to come.

Future directions for motivation in participation among women triathletes should consider differences informed by broader social perspectives (e.g., the desire to catalyze social change), alongside physical health motives, through a lens that includes the rich history of, and restrictions on, female participation in sport. This could include isolating and investigating policies, social stigmas and pressures around sports broadly and leisure that may affect the source of what matters to women now. This expansion would continue theoretical alignment with SDT by emphasizing autonomy, competence, and relatedness across diverse movement

environments rather than exclusively within structured or competitive settings.

Conclusion

The evidence in this study identified how women, who use their leisure time to engage in elite-level endurance sport, are motivated to participate in the triathlon competition. Women who were 50 years old and older were more motivated by having a connection with nature than younger women. And the women were not motivated by concern of their weight, improving their self-worth or finding commonality with other triathletes.

Conflicts of Interest Statement

The authors have no conflicts of interest to declare.

Acknowledgements

Thanks to Camayah E. Brown for her research support in Kona, Hawaii.

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