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# Perceptions of Running Performance: The Role of Clothing Fit

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**ABSTRACT**

This study examined the relationship between clothing fit and perceived fitness level.

Participants included 2,386 adults who completed an online survey after a running event. The survey included four questions related to photographs of athletic models wearing loose fitting and tight fitting clothing: (1) which event do you think the model took part in? (2) what do you think is the main reason he/she took part in the event? (3) how well do you think this person performed? and (4) how confident are you that your running time beat this person's time?

Results showed participants were more likely to believe athletes wearing tight fitting clothing ran further and faster than athletes wearing loose fitting clothing; and were less confident in their abilities to run faster than athletes wearing tight fitting clothing than those who wore loose fitting clothing. These findings suggest clothing fit influences perception of athletic ability among runners. Athletes making upward comparisons may become increasingly dissatisfied with their appearance and at risk for avoidance of certain sports, decreased amounts of time spent in moderate to vigorous physical activity, and experience feelings of inferiority that negatively influence sport performance.

**Key words:** athletic training, exercise performance, sport psychology, body image

## INTRODUCTION

Sociocultural comparisons and perceived pressure to be thin can foster body dissatisfaction (15); however, some individuals report a preference for athletic-ideal body shapes over a thin-ideal (13). Comparing oneself to a fit peer can affect body satisfaction and the amount of time one engages in physical activity. For example, a study by Wasilenko and colleagues (2007) with female undergraduates found that women stopped exercising sooner and felt less satisfied with their bodies when they exercised near a woman they perceived as physically fit wearing shorts and a tight tank top as compared to exercising near an unfit woman wearing baggy pants and a baggy sweatshirt (23). Thus, social comparisons with peers may promote unhealthy behaviors or avoidance of certain activities. Additionally, individuals who experience weight-related stigmas may be less willing to participate in physical activity and avoid exercise due to low perceived competence and lack of motivation (16, 22).

Individuals who adopt an external observational view, or a self-objectified perspective of their bodies, may invest a considerable amount of psychological, physical, and financial resources into their appearance (1). Objectification theory proposes that these individuals internalize the observers' view of their bodies (i.e., self-objectification) and become preoccupied with how their body appears to others without regard to how their body actually feels (10). Interviews with elite athletes indicate that they view an athlete's body "as an object to be managed" (17 p. 206). Self-objectifying thoughts and appearance concerns may be triggered in individuals with low self-esteem and exacerbated in certain environments (e.g., gyms with mirrors, women wearing revealing outfits;18). For example, a study by Fredrickson and colleagues (1998) in which participants (70% Caucasian) were instructed to try on either a swimsuit or a sweater in a dressing room with a full-length mirror and then complete a

mathematics test showed that women in the swimsuit condition performed worse on the test than women in the sweater condition. The authors postulated that bodily shame diminished their mathematical performance since their mental energy was focused on their appearance (11). Another study by Hebl and colleagues (2004) with a similar protocol with men and women of Caucasian, African American, Hispanic, and Asian American descent, found that all participants had lower mathematics performance and appeared vulnerable to self-objectification during the swimsuit condition compared to the sweater condition (12). A study by Fredrickson and Harrison (2005) with 202 adolescent girls found that those with higher measures of self-objectification had poorer performance throwing a softball when asked to throw as hard as she could (9). These findings suggest that experiencing bodily shame may negatively influence one's ability to engage in physical activities or other activities that require mental resources.

Clothing appears to be an important, but often ignored, part of how women manage their physical appearance (21). Wearing a swimsuit or other tight, body contouring uniform for a particular sport may be necessary for performance, but there are often gender discrepancies with women usually wearing much less clothing (19). Revealing sports uniforms may be perceived as stressors and exert pressure on some athletes functionality or performance advantage. Indeed, some individuals report feeling uncomfortable wearing revealing attire and may choose not to participate in a particular sport due to required uniforms.

Sports uniforms may contribute to unhealthy eating behaviors and eating disorders, especially among women. For example, female athletes often experience increased body image concerns, unhealthy body comparisons, and body dissatisfaction; however, satisfaction with uniform fit can improve body perceptions (6). In addition, female runners who report high

identification with exercise and high value on having an athletic physique may be vulnerable to obligatory exercise (14).

Performance of sport participants depends upon a number of factors, including their psychological state, which may be influenced by their athletic clothing or uniform. Research by Feltman and Elliot (2011), Dreiskaemper and colleagues (2013), and Feather and colleagues (1997), suggests that the color and fit of an athlete's uniform influences their psychological functioning. For example, during a simulated competition, participants reported feeling more dominant and threatening when wearing red as opposed to wearing blue (8). Participants also perceived their opponents as more dominant and threatening when the opponents were wearing red. Similarly, a study with male fighters taking part in an experimental combat situation found that those wearing a red jersey had significantly higher heart rates before, during, and after the fight compared to wearing a blue jersey (4). In addition, a study of female basketball players showed athletic clothing that provided a satisfactory fit on one's body improved athletes' body perceptions (6).

Findings from the literature (e.g., Feather and colleagues, 1997; Feltman and Elliott, 2011) indicate that clothing choices influence our perceptions and behaviors, which may affect us in a number of ways. At the present time, no studies to our knowledge have examined this phenomenon among endurance athletes. Thus, the purpose of the current study was to explore the role of clothing fit among a group of runners. We hypothesized that individuals would perceive both male and female athletes wearing tight fitting clothing to be more physically fit (i.e., ideal body type for their sport) than athletes wearing loose fitting clothing.

## METHODS

### *Study participants*

Participants included individuals aged 18 and older who took part in a running event at an annual marathon in the Midwestern United States. Participants were recruited through flyers, an advertisement as part of a packet distributed to runners, and through an email list serve managed by the race director. Institutional review board approval was received. Informed consent was obtained from all participants.

Anyone who took part in the race was eligible to take the survey. Participants included 2,386 adults who completed the online survey. Of the total sample, 588 completed the full marathon (24.6%), 1,101 completed the half marathon (46.1%), and 697 completed a shorter distance such as a 5K or 10K (29.2%). The mean age for participants was 37.2 years ( $SD = 10.8$ ; range: 18-91), and the mean self-reported body mass index (BMI) was 24.4 (range: 15.3-47.8). Within the sample, 96.2% were Caucasian, 93.2% were employed, and 67.5% were married. As compensation for participation in the study, participants were entered into a drawing to win one of four gift cards valued at \$50 to \$200 for a local sporting goods store.

The online survey was available for three weeks (i.e., from the day of the event until three weeks following the event). A total of 3,117 individuals logged into the survey during this time. A flowchart provides a detailed description of how the final study participant sample was determined (see Figure 1). The final sample included 2,386 participants (76.5% of those who originally expressed interest in the study), after removing those who originally logged onto the website, but had missing data or did not meet eligibility criteria (e.g., did not report gender, under 18).

*Measures*

As part of an online survey, participants viewed four photographs of models wearing black athletic clothing. The photos were cropped to display the model from neck to ankle. The first photo (Model A) was of a woman wearing a loose fitting short-sleeved top and loose fitting shorts. The second photo (Model B) was of the same woman wearing the same shirt, but in a smaller size and tighter fitting shorts. Similarly, the third photo (Model C) was of a man wearing a loose fitting outfit and the fourth photo (Model D) was the same man wearing a tighter outfit. A manipulation check to assess the validity of the photos as an assessment of perceived physical fitness level was performed by showing the four photos to ten individuals with expertise in physical fitness and eating disorders. Each individual independently viewed the photos and provided an open-ended response. As expected, each person who viewed the photos reported that Model A was perceived as less fit than Model B and Model C was perceived as less fit than Model D.

All participants viewed and answered questions related to each photo. Both males and females evaluated photos across genders. The first and second author developed 4 questions related to the photos: (1) which event do you think she/he took part in? (there were 9 race options as answers to choose from: *marathon, half marathon, 2-person relay, 4-person relay, 5k on Friday plus half marathon Saturday, 5k on Friday plus full marathon Saturday, 10k, 5k, and prefer not to answer*); (2) what do you think is the main reason she/he took part in this event? (there were 5 answers to choose from: *just for fun, to meet a personal goal, to qualify for another event, other reasons, and prefer not to answer*); (3) how well do you think she/he performed? (there was a range of 5 answers: *extremely well, finished in the top 25%; very well, finished in the top 50%; not so well, finished in the bottom 50%; poor, finished in the bottom 25%, and*



*prefer not to answer*); (4) how confident are you that your running time beat this person's time? (there was a rating scale of 6 choices: *I feel certain that I ran faster, I am pretty certain that I ran faster, I think we ran about the same pace, I am pretty certain that I ran slower, I am certain I ran slower, and prefer not to answer*).

### *Statistical Analysis*

All analyses were conducted using SAS 9.2 GENMOD Procedure. Generalized linear models were built to compare the pair-wise contrasts about perceptions of models wearing athletic clothing by gender.

## **RESULTS**

The first research question asked was “**Which event do you think she/he took part in?**” We hypothesized that more participants would report Model B (compared to Model A) and Model D (compared to Model C) ran the full marathon. The results show that male participants were 1.5 times more likely to believe that Model B ran the full marathon compared to Model A (OR = 1.465;  $p = .004$ ). Female participants were 1.4 times more likely to believe that Model B ran the full marathon compared to Model A (OR = 1.409;  $p = .002$ ). See Table 1.

The differences for Model D and C, the male models, were more dramatic. Male participants were 2.8 times more likely to believe that Model D ran the full marathon compared to Model C (OR = 2.817;  $p < .0001$ ). Among men, the results showed that 40% believed Model D and only 17% thought Model C ran the full marathon. Female participants were 3.2 times more likely to believe that Model D ran the full marathon compared to Model C (OR = 3.19;  $p < .0001$ ). For women, the results showed that 46% believed Model D and only 16% thought Model B ran the full marathon.

The second research question asked was, “**What do you think is the main reason she/he took part in this event?**” We hypothesized that more participants would report Model B and D participated in the event to qualify for another running event. Male participants were 2.7 times more likely to believe Model B was trying to qualify for another event compared to Model A (OR = 2.710;  $p = .001$ ). Female participants were 4.0 times more likely to believe Model B was trying to qualify for another event compared to Model A (OR = 3.958;  $p < .0001$ ).

Similar to the previous research question, the differences for the male model were more dramatic. Male participants were 6.3 times more likely to believe Model D was trying to qualify for another event compared to Model C (OR = 6.346;  $p < .0001$ ). While female participants were 10.0 times more likely to believe Model D was trying to qualify for another event compared to Model C (OR = 9.972;  $p < .0001$ ). See Table 1.

The third research question asked was, “**How well do you think she/he performed?**” We hypothesized that more participants would report Model B and D finished in the top 25% of the runners. For males, the odds of Model B finishing in the top 25% was 4.8 times greater than Model A (OR = 4.791;  $p < .0001$ ). For females, the odds of Model B finishing in the top 25% was 3.7 times greater than Model A (OR = 3.701;  $p < .0001$ ). For males, the odds of Model D finishing in the top 25% was 5.3 times greater than Model C (OR = 5.338;  $p < .0001$ ). For females, the odds of Model D finishing in the top 25% was 5.9 times greater than Model C (OR = 5.892;  $p < .0001$ ). See Table 1.

The fourth research question asked was, “**How confident are you that your running time beat this person’s time?**” For this question we were interested in how the participant compared him or herself to the same gender athlete (i.e., female participants compared themselves to Model B, male participants compared to Model D). We hypothesized that more

women would report that they were less confident about their running time compared to Model B (i.e., believe that they ran slower than Model B). Indeed, female participants were 1.5 times less confident in beating the running time for Model B (OR = 0.687;  $p = .0008$ ). We hypothesized that more men would report that they were less confident about their running time compared to Model D (i.e., believe that they ran slower than Model D). The results indicate that male participants were 2.6 times less confident in beating the running time for Model D (OR = 0.385;  $p < .0001$ ). See Table 1.

## **DISCUSSION**

As hypothesized, we found both male and female participants believed that the models wearing the tighter fitting clothing were more likely to have run the full marathon and were more likely to be trying to qualify for another event compared to the models wearing the loose fitting clothing. Particularly interesting was the finding that female participants were 10 times more likely to think the male model in the tight clothing was trying to qualify for another event as compared to the male model in the looser clothing. Our results also indicate that male and female participants believed the models in the tighter fitting clothing were more likely to run faster than them. Additionally, the participants were less confident of their running time when asked to compare themselves to the model of the same gender wearing the tighter clothing. In general, athletes who wore tight fitting clothing were perceived as more physically capable and competitively successful than those who wore loose fitting clothing.

The present findings support previous research involving social comparison theory in that participants were less confident in their running abilities, or negatively influenced by viewing photos of fit peers (23). These results suggest that participants make upward comparisons (3), by

comparing themselves with individuals who were viewed as faster runners (i.e., Models B and D), which in turn, was associated with reduced confidence in their abilities to perform.

Athletic identity, performance enhancement, and style preferences, such as fit, comfort, and aesthetics, are important factors to consider when determining sport clothing needs of consumers (5). For example, a female runner may be more likely to purchase a pair of shorts that offer adequate coverage and sweat-wicking properties than shorts with minimal coverage and lack quick drying material. Consumer spending may also be influenced by how they identify with well-recognized athletes (2). Furthermore, in line with self-objectification theory, an external perspective of body appearance may be influenced by a number of specific functions for clothing selection, such as clothing for comfort, camouflage purposes, and individuality (21). Findings from the present study add to this literature by demonstrating that clothing may also influence perceptions of athletic performance, including physical capability and competitiveness among runners.

## **CONCLUSIONS**

This study has several limitations that should receive consideration. This was a cross-sectional study with an inherent selection bias because the persons who decided to complete the survey may be different from those who chose not to participate. Therefore these findings may not generalize to all runners who took part in this running event or other similar events. For example, the majority of participants who completed the current survey were Caucasian, but participants of other races may have different perceptions of athletic bodies and clothing fit (7).

In spite of these limitations, the current study provides important information about the potential contributing factor of clothing fit on perceived fitness levels of endurance athletes. One

notable strength of this study is the number of participants from a variety of fitness levels, including individuals aged from 18 to 91 years with a wide range of experiences from the casual 5k run/walk to the more serious seasoned marathoner. The popularity of running events is increasing along with the number of persons entering these events each year, which suggests a growing need to continue research in this area.

### **APPLICATIONS IN SPORT**

From a clinical perspective, we are concerned that tight fitting attire will facilitate upward body comparisons. Such comparisons could result in athletes becoming body conscious and dissatisfied with their appearance, possibly resulting in unhealthy weight loss attempts or avoidance of certain sports. However, the results of this study suggest another possible negative consequence related to tight fitting sport attire, but not for the person wearing it. If an individual views such attire as intended exclusively for those who are more physically fit, then the individual may experience feelings of inferiority or inadequacy and not feel fit enough to wear such attire while exercising or competing. Thus, she might feel too uncomfortable to wear sport attire that she associates with physical fitness and success in sport, not to mention attractiveness. Unfortunately that perception also appears to decrease confidence regarding one's own sport performance, which would be an important treatment issue for sport psychologists, who focus on factors affecting sport performance. In essence, she may not feel that she can compete in regards to meeting societal pressures for a certain image that signifies athleticism. If the discomfort with attire and the lack of confidence is significant, the individual may withdraw from her sport/physical activity. Many individuals with low self-perceptions of their physical ability require extra encouragement and support to engage in sports (20).

Future studies should consider measuring clothing fit and perceived fitness level among different target groups, such as individuals who have never participated in a running event to elite athletes participating in intense competitions (e.g., Olympics; Ironman) and other geographical locations. It may be interesting to compare the current results with less physically active individuals as well as elite athletes. In addition, it may be helpful to gather more information on participants' perceptions of themselves, self-worth, and their own confidence level of performance prior to and following exposure to photos.

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Table 1. Odds ratios from contrast estimates of gender, perceptions of clothing fit, and athletic performance

Research Question (RQ)	Chi-Square	Odds Ratio	95% CI	P
RQ1. B-A Males	8.15	1.465	1.127, 1.903	.0043
RQ1. B-A Females	13.55	1.409	1.174, 1.691	.0002
RQ1. D-C Males	59.80	2.817	2.167, 3.662	<.001
RQ1. D-C Females	151.60	3.190	2.652, 3.837	<.001
RQ2. B-A Males	10.45	2.710	1.481, 4.961	.0012
RQ2. B-A Females	47.43	3.958	2.676, 5.856	<.001
RQ2. D-C Males	44.63	6.346	3.690, 10.912	<.001
RQ2. D-C Females	170.15	9.972	7.059, 14.089	<.001
RQ3. B-A Males	23.62	4.790	2.547, 9.010	<.001
RQ3. B-A Females	48.62	3.700	2.562, 5.346	<.001
RQ3. D-C Males	60.51	5.338	3.500, 8.141	<.001
RQ3. D-C Females	194.97	5.892	4.593, 7.557	<.001
RQ4. B-A Females	11.29	0.687	0.551, 0.855	.0008
RQ4. D-C Males	55.45	0.385	0.300, 0.495	<.001

Figure 1. *Recruitment Process for Participants*

