


# Grit-passion and grit-perseverance in ultramarathon runners

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## ABSTRACT

The purpose of this study was to investigate the relationship between ultramarathon running, grit-passion, and grit-perseverance. A total of 153 ultramarathon runners (age =  $40.5 \pm 9.0$  years) answered demographic questions and completed a survey measuring subcomponents of grit via Google Forms. Grit was measured with the 12-item Grit Scale consisting of two subscales: consistency of interest (grit-passion) and perseverance of effort (grit-perseverance). The ultramarathon runners were recruited through emails from race directors, Facebook groups, and email invitations from the primary investigator. Statistical analyses were performed using Pearson product-moment correlations and a one-way ANOVA. Significance was set to  $p < .05$ . There was a positive correlation between number of years running and grit-passion ( $r = .17, p = .039$ ). On average, participants had spent  $14.4 \pm 9.8$  years running and had competed in ultramarathons for  $4.3 \pm 3.5$  years. A positive correlation was found between the number of kilometres run per week and grit-passion ( $r = .22, p = .007$ ). Participants, on average, ran  $57.9 \pm 21.4$  kilometres per week. For grit-perseverance, there was a statistically significant difference between the short and medium distance groups of ultramarathon runners when compared to the group of runners completing timed ultramarathon races ( $p = .002$ ). Failure to complete their last ultramarathon was not significantly associated with grit-passion ( $p = .37$ ) or grit-perseverance ( $p = .92$ ).

**Keywords:** Endurance; Running; Sports performance.

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## INTRODUCTION

Ultramarathon running has grown in popularity over the past ten years. Ultramarathons consist of any race that is longer than 42.2 km (Hoffman & Krishnan, 2013). There are two common types of ultramarathon events. In one type, the participants cover a set distance, while in the other type, participants run for a specific amount of time. Common ultramarathon distances include 50 km (31.1 miles), 80.5 km (50 miles), 100 km (62.1 miles), and 161 km (100 miles). Timed events usually last for 6, 12, or 24 hours. The timed events are generally run on a track or a short course, often 1.6 km (1 mile). As participation in ultramarathons has increased, so too has the desire to understand individual differences in personality of ultramarathon runners.

Research findings on personality differences between ultramarathon runners and other individuals has been mixed. For example, several studies did not find any significant differences in the personality traits of ultramarathon runners and the general population (Folkins & Wieselberg-Bell, 1981; McCutcheon & Yoakum, 1983; Rauch et al., 1986). On the other hand, when comparing ultramarathon runners to other athletes, personality differences have become more salient. One study reported ultramarathon runners to be more neurotic than short-distance runners (Martinez & Scott, 2016). Another study found ultramarathon runners to be more confident, more committed to running, more competitive, more goal-oriented and less win-oriented when compared to other athletes (Acevedo et al., 1992).

Maintaining interest in a single goal is a component of grit. Grit has been defined as the tendency to pursue long-term challenging goals with passion and perseverance (Angela L. Duckworth et al., 2007). According to Duckworth et al., grit entails persistently working toward challenges while effort and interest in an activity are maintained over the years, despite failures, difficulties, and plateaus (Angela L. Duckworth et al., 2007). Some individuals may change goals or direction after disappointments or failures; however, gritty individuals have stamina and continually overcome challenges and work toward their achievements (Angela L. Duckworth et al., 2007). Grit is composed of two major components including a consistency of interest (grit-passion) and perseverance of effort (grit-perseverance) (Angela Lee Duckworth & Quinn, 2009). As noted earlier, ultramarathon runners were more goal oriented than other athletes (Acevedo et al., 1992); thus, it may be that ultramarathon runners display high grit-perseverance. Another study found that ultramarathon runners have completed more marathon than marathon runners (Knechtle, 2012); thus, ultramarathon runners may have a high level of grit-passion.

Furthermore, because of the challenges one must overcome to run ultramarathons, it has been assumed that ultramarathon runners have a high level of gritty perseverance. Roebuck et al. suggested a key personality characteristic of ultramarathon runners is a very strong drive to explore their physical and mental limits (Roebuck et al., 2018). Thus, longer distance or timed event ultramarathon runners may have a higher ability to persevere. For example, in a small study, ultramarathon runners were able to endure putting their hand in cold water longer than a control group (Freund et al., 2013). This could indicate that ultramarathon runners are able to persevere for a longer time in an uncomfortable situation. Therefore, this study was designed to investigate the association between ultramarathon running, grit-passion, and grit-perseverance.

To our knowledge, no previous study has investigated grit in ultramarathon runners. Therefore, the aim of this study was to assess the grit-passion and grit-perseverance of recreational male and female ultramarathon runners at varying ultramarathon distances or times. It was hypothesized that ultramarathon runners with higher grit-passion and grit-perseverance would complete longer distance races than ultramarathon runners with lower levels of grit-passion and grit-perseverance. Additionally, ultramarathon runners participating in timed ultramarathon races would have higher grit-perseverance scores than

ultramarathon runners participating in distance ultramarathon races. Finally, ultramarathon runners with higher grit-perseverance scores would be more successful at completing ultramarathons than ultramarathon runners with lower grit-perseverance scores.

## MATERIALS AND METHODS

Anecdotally, it is often stated that ultramarathon runners are gritty, but this has not been assessed within the research literature. Therefore, the aim of this study was to assess the grit-passion and grit-perseverance of ultramarathon runners completing both distance and timed ultramarathon races. A cross-sectional design was used to establish the grit-passion and grit-perseverance scores of ultramarathon runners. The cross-sectional design was chosen because a large group of ultramarathon runners who completed a variety of distances and times could be studied. The participants completed an online survey about their running history and grittiness.

### Participants

Men ( $n = 23$ ) and women ( $n = 130$ ) who were at least 18 years of age and had attempted an ultramarathon were recruited to participate in this study. Table 1 shows the descriptive characteristics of the participants. They were recruited by emails from race directors, ultramarathon Facebook groups, and email invitations from the primary investigator. The Institutional Review Board approved the study protocol and digital consent was obtained from all study participants prior to completing the online surveys. The surveys were open for three months from September 2019 through November 2019. No incentives were given for participation in the study.

Table 1. Descriptive characteristics of participants.

	Short Group	Medium Group	Long Group	Timed Group
Age (years)	40.9 ± 9.5	40.9 ± 7.6	41.4 ± 10.4	38.3 ± 7.8
Height (cm)	167.6 ± 7.8	165.7 ± 8.5	168.2 ± 9.3	165.7 ± 7.9
Weight (kg)	65.9 ± 11.5	63.7 ± 11.0	64.3 ± 12.5	66.6 ± 13.2

*Note. Values are means ± standard deviations.*

### Measures and Procedures

All surveys were completed online through Google Forms. The online survey method was used to allow for a wider variety of ultramarathon runners from all around the world to participate. The participants were asked to click a link that took them to the informed consent and then the online surveys. The first survey asked a few basic demographic questions including age, sex, height, weight, years running, years running ultramarathons, kilometres run per week, if they completed their last ultramarathon, and number of ultramarathons attempted and completed at the following distances and times: 50 km, 80.5 km, 100 km, 161 km, 12 hour, and 24 hours.

The next survey completed was the 12-item Grit Scale that measured Grit (Angela L. Duckworth et al., 2007). The Grit Scale is comprised of two major components: consistency of interest (grit-passion) and perseverance of effort (grit-perseverance) (Angela Lee Duckworth & Quinn, 2009). On a 5-point Likert scale to assess grit, participants were asked to rate the extent a behaviour was like them from 1 (*not like me at all*) to 5 (*very much like me*). Six items measured grit-passion. An item from this section included “*I often set a goal but later choose to pursue a different one*”. The other six items measured grit-perseverance. “*I have overcome setbacks to conquer an important challenge*” was an item from this section. High scores on the Grit Scale indicate a higher level of grit.

### Statistical analyses

Correlations between variables were determined by using Pearson-Product Moment correlation analyses. The ultramarathon runners were broken into four groups. The 'short' distance ultramarathon group completed or attempted the 50 km distance. The 'medium' distance ultramarathon group completed or attempted the 80.5 km or 100 km distance. The 'long' distance ultramarathon group completed or attempted 161 km. Finally, the 'timed' ultramarathon group completed or attempted the 12- or 24-hour timed races. Differences in grit-passion and grit-perseverance by ultramarathon distance or time were analysed by one-way ANOVA and Bonferroni post-tests. Statistical significance was set at  $p < .05$ . All statistical analyses were conducted using IBM SPSS Statistics (version 25; IBM SPSS, Chicago, IL, USA).

## RESULTS

Pearson-product moment correlations were run between grit-perseverance, grit-passion, years running, years running ultramarathons, and average weekly kilometres. The results are displayed in Table 2. Grit-passion was found to be positively correlated with years running ( $r = .17, p = .039$ ) and average weekly kilometres ( $r = .22, p = .007$ ), whereas grit-perseverance was not found to be positively correlated with years running ( $p = .28$ ) or average weekly kilometres ( $p = .61$ ).

Table 2. Pearson correlation coefficients ( $r$ ) among study variables.

	1	2	3	4	5
1. Grit Perseverance	1				
2. Grit-Passion	.09	1			
3. Years Running	.09	.17*	1		
4. Years Running Ultramarathons	.14	.00	.29**	1	
5. Average Weekly Kilometres	.04	.28**	.07	.03	1

Note. \*Correlation is significant at the .05 level (2-tailed). \*\*Correlation is significant at the .01 level (2-tailed).

One-way ANOVAs were used to assess the differences between the four groups for grit-passion, grit perseverance, number of years running ultramarathons, and average weekly kilometres. A statically significant difference between the four groups was not found for grit-passion ( $F(3,149) = 0.771, p = .512, h_p^2 = 0.015$ ). For grit-perseverance, there was a statistically significant difference between the short and medium distance groups and the timed group as determined by one-way ANOVA ( $F(3,149) = 5.242, p = .002, h_p^2 = 0.095$ ). The number of years running ultramarathons was found to be statistically different between the short and medium distance groups and the long distance group ( $F(3,149) = 9.276, p < .001, h_p^2 = 0.157$ ). Finally, the average weekly kilometres were found to be statistically significantly different between the short distance and timed groups and the long distance group ( $F(3,149) = 8.336, p < .001, h_p^2 = 0.144$ ). Table 3 displays the means and standard deviations for each group and the results from Bonferroni post hoc test. Figure 1 includes the mean grit scores for perseverance, passion, and combined grit.

Table 3. Grit, years running, and average weekly kilometres by ultramarathon group.

	Short Group	Medium Group	Long Group	Timed Group
Grit-Perseverance	4.1 ± 0.6*	4.0 ± 0.7*	4.3 ± 0.5	4.5 ± 0.4
Grit-Passion	3.6 ± 0.5	3.7 ± 0.7	3.7 ± 0.5	3.5 ± 0.8
Years Running	13.8 ± 10.4	13.8 ± 9.4	15.4 ± 10.3	14.5 ± 9.8
Year Running Ultramarathons	2.8 ± 2.9 <sup>a</sup>	3.6 ± 2.1 <sup>a</sup>	6.3 ± 4.2	4.5 ± 3.3
Average Weekly Kilometres	48.9 ± 18.3 <sup>a</sup>	59.1 ± 18.5	70.2 ± 24.6	53.1 ± 17.1 <sup>a</sup>

Note. Values are means ± standard deviations. Statistically significant difference from timed group; \* $p < .05$ . Statistically significant difference from long group; <sup>a</sup> $p < .05$ .

Failure to complete their last ultramarathon was not significantly associated with grit-passion ( $p = .37$ ) or grit-perseverance ( $p = .92$ ). The failure to complete last ultramarathon group averaged  $63.7 \pm 29.5$  kilometres per week, while the group that completed their last ultramarathon averaged  $56.8 \pm 19.6$  kilometres. This was not a statistically significant difference ( $p = .16$ ).

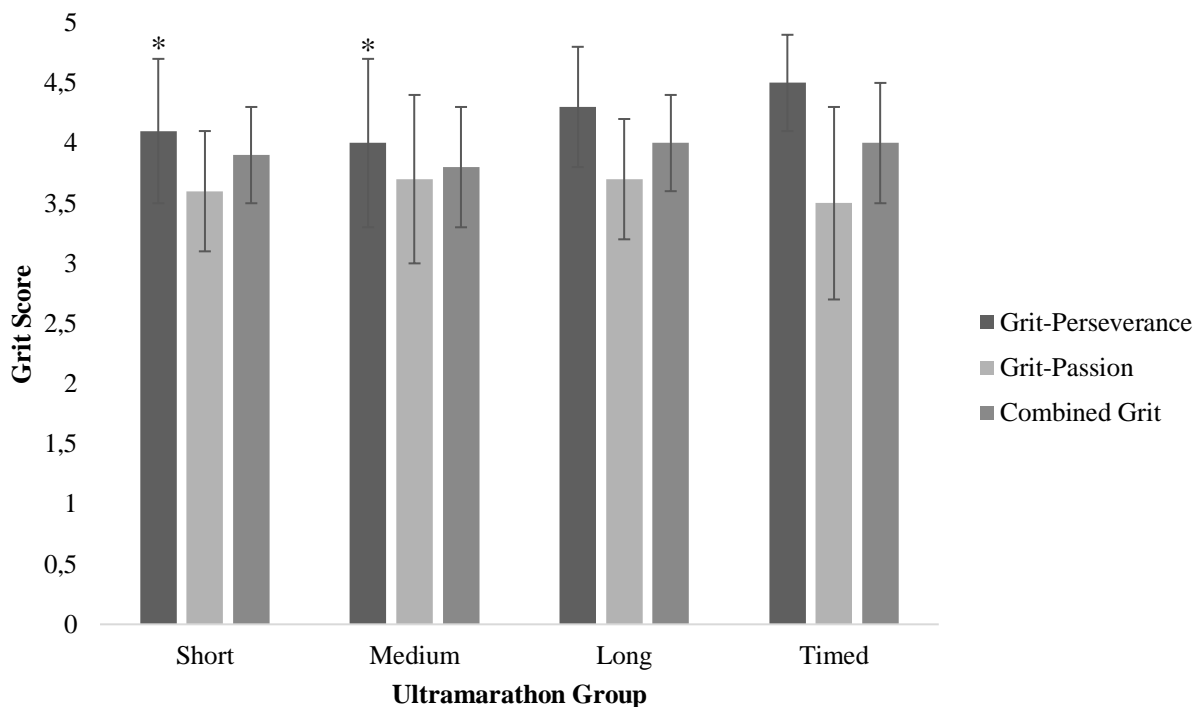


Figure 1. Mean Grit- Perseverance, Passion, and Combined Score by Ultramarathon Group. Values are mean  $\pm$  SD. Statistically significant difference from timed group; \* $p < .05$ .

## DISCUSSION

Ultramarathon runners are often described as gritty. To the best of our knowledge this study is the first study to try to quantify the grittiness for ultramarathon runners. The aim was to investigate whether ultramarathon runners differ in their grittiness. Our first hypothesis was that grittier ultramarathon runners would have completed longer distance races than less gritty ultramarathon runners. More specifically, ultramarathon runners completing long distance ultramarathons would have higher grit-passion and grit-perseverance scores than ultramarathon runners completing short or medium distance ultramarathons. This hypothesis was not supported by the results from this study. A statistically significant difference was not found between the long distance and short or medium distance ultramarathon groups for either grit-passion or grit-perseverance.

Previous research conducted on soccer players found that grittier players were more likely to spend significantly more hours in soccer-specific activities when compared to less gritty soccer players (Larkin et al., 2016). Similarly, Elumaro found grit to be a predictor of sporting achievement (Elumaro, 2016). In our study, runners participating in longer distance ultramarathon races were not found to be grittier than runners participating in shorter distance ultramarathon races. One reason that a statistically significant difference may not have been found between the distance groups of runners in this study was the nature of ultramarathon

running. Ultramarathon races, by nature, are extreme with runners facing a myriad of mental and physical challenges during these races. They require runners to cover a distance on foot that typically takes 6 to 30 plus hours to complete. The terrain is typically a single-track trail with relatively large changes in elevation and unsteady footing. It may be that grittier runners choose to participate in any distance ultramarathon race. Thus, it may be interesting to compare ultramarathon runners to runners completing shorter distance races such as half-marathons and marathons to see if there is a difference in grittiness between types of runners. Similar to our findings, Ueno et al. did not find a significant association between grit and competitive level in athletes (Ueno et al., 2018).

There is a growing interest in the variables that influence ultramarathon runners (Davies & Thompson, 1979; Krouse et al., 2011; Millet et al., 2011). Baumann et al. studied running economy, ventilatory threshold, and maximal oxygen consumption in timed ultramarathon races but did not find any of these to be predictors of performance (Baumann et al., 2014). Thus, additional variables that influence ultramarathon runners should be considered. Our second hypothesis looked at the association of grit-perseverance with timed and distance ultramarathon races. The results of this cross-sectional study suggested that individuals who participated in timed ultramarathons had significantly higher grit-perseverance than runners who participated in short and medium distance ultramarathon races. Ultramarathon runners are a unique group of athletes that are able to persevere through challenging conditions to compete in these types of races. Timed ultramarathons have an additional mental challenge; in addition to being awake for more than 24 hours, these runners must overcome the monotony of running the same 1 to 1.6 km loop for hours, sometimes completing the same loop more than 100 times.

The final hypothesis that ultramarathon runners with higher grit-perseverance scores would be more successful at completing ultramarathons than ultramarathon runners with lower grit-perseverance score was not supported by the results from this study. Our finding that grittiness was not related to successful completion of an ultramarathon was not in accordance to results found for completion of a military training program. Eskreis-Winkler et al. found that grittiness levels were positively related to completion rates among candidates that went through a 24-day Army Special Operations Forces selection course. The grittier cadets were more likely to push their bodies past physical and mental boundaries, coping with fatigue and pain (Eskreis-Winkler et al., 2014). The difference in this finding may be due to the duration of the military training program of 24-day verses the 6 to 30 hours that it typically takes to complete an ultramarathon race.

In an attempt to differentiate finishers from non-finishers in an ultramarathon, previous research found no significant differences in sport-specific cognitions between 100-mile finishers and non-finishers (Acevedo et al., 1992), while another study found differences in tension and fatigue between finishers and non-finishers of a 50-mile race (Krouse et al., 2011). Similar to Acevedo et al. comparing finishers to non-finishers, in our study grit was not significantly different between finisher and non-finishers. This could mean that there are other factors that come into play beyond psychological factors when looking at an ultramarathon runner's ability to complete a race. These factors may include, but are not limited to, weather, terrain, food, or overall health.

Grit-passion is described as a consistency of interest. The number of years a person had been running was found to be positively correlated with grit-passion. Additionally, the number of kilometres the runners completed each week was positively correlated with their grit-passion. This finding is similar to previous research showing that ultramarathon runners were more committed to running than other athletes (Acevedo et al., 1992). Thus, the higher a runner's grit-passion, the longer they had been running and the more kilometres they raced each week.

This study has a few limitations that need to be acknowledged. First, this was a cross-sectional study; therefore, cause and effect cannot be determined. As it is only a snapshot of runners at that time, it does not guarantee representation of all ultramarathon runners. Second, 85% of the study population were females. Despite the limitations, this study provides information to enhance the understanding of ultramarathon runners and, in particular, female ultramarathon runners.

## CONCLUSION

In ultramarathon runners, grit-passion was correlated with number of years running and weekly kilometres run. Ultramarathon runners who participated in timed ultramarathons had significantly higher grit-perseverance than runners who participated in short and medium distance ultramarathon races. Grit-passion and grit-perseverance were not found to be associated with successful completion of an ultramarathon.

## AUTHOR CONTRIBUTIONS

Conception and design of study: J.M Cousins, A.N. Christopher, A.P. Francis, H.H. Betz. Data collection: J.M Cousins, M.J. Peterson. Data analysis and/or interpretation: J.M Cousins, M.J. Peterson, H.H. Betz. Drafting the manuscript: J.M Cousins. Revising the manuscript critically for important intellectual content: J.M Cousins, M.J. Peterson, A.N. Christopher, A.P. Francis, H.H. Betz. Approval of the version of the manuscript to be published: J.M Cousins, M.J. Peterson, A.N. Christopher, A.P. Francis, H.H. Betz.

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## DISCLOSURE STATEMENT

No potential conflict of interest was reported by the authors.

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