2018

The Relationship Between Racing Experience and the Ability to Adhere to a Race Plan

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Introduction:

Before beginning a race, athletes formulate a plan for how they want to approach the event. Depending on the given athlete and/or race, this plan may be highly developed or composed of vague ideas. Aspects of a race plan may be formulated due to "exercise duration, race dynamics, or environmental conditions" (Wu, Abbiss, Pieffer, Brisswalter, & Nosaka, 2014).

Question/Hypothesis:

I was curious what factors influenced an athlete's ability to adhere to a race plan. I believe that some athletes are able to execute according to their race plan in the moment, while others are not. The null hypothesis was that racing experience has no effect on an athlete's ability to adhere to the race plan. On the other hand, my alternative hypothesis was that racing experience would lead to less deviation from the race plan. I defined racing experience as years racing triathlon, number of triathlons competed in, years racing the half-iron distance, number of half-iron distance triathlons competed in, and years working with a triathlon coach.

Method:

I interviewed only athletes racing half-iron triathlons to control for the effect of exercise duration on ability to adhere to a race plan. In the competition, these athletes would swim 1.2 miles, bike 56 miles, then run 13.1 miles. Each athlete was interviewed before and after the race. Before the race, I collected the information outlined in the Athlete Questionnaire (shown in Appendix). This information would serve as independent variables by which to group athletes when looking for trends in ability to adhere to the race plan. I also collected the information outlined in the Pre-race Questionnaire (shown in Appendix) at this time to fully understand the athlete's race plan. After the race, I collected information outlined in the Post-race Questionnaire (shown in Appendix) to compare an athlete's race execution to the initial race plan.

The scores given by athletes for Overall Rating and Overall Execution of Race Plan were graphed against all the independent variables gathered in the Athlete Questionnaire (age, years in competitive sport, years racing triathlon, number of triathlons competed in, years racing the half iron distance, number of half-iron distance triathlons competed in, years working with a triathlon coach). StatCrunch was used to test for the p-value associated with each graph that would either accept or reject the null hypothesis based on a .05 significance level. Excel was then used to test for the r-value associated with each p-value found.

Subjects:

Twelve total athletes racing the half-iron distance were used as subjects. There were five females and seven males. As well, there were five athletes who race in the age-group division and seven athletes who race in the professional division. A chart of athlete demographics based on responses to the Athlete Questionnaire can be seen in the appendix. As well, a list of the athletes best half-iron finishes (or best triathlon finish in the event that an athlete had not competed in any previous half-iron distance triathlon) can be seen in the appendix for an idea of the caliber of athletes used as subjects.

Results:

Based on the p-values shown in the chart below, the independent variables when compared to Overall Execution of Race Plan showed no statistically significant evidence against the null hypothesis. Overall Rating versus Number of Triathlons Competed in is the only combination that resulted in marginal evidence against the null hypothesis with a p-value of .0562.

According to the r-values shown in the chart below, moderate negative correlations existed for Overall Rating v. Years Racing Triathlon, Overall Rating v. Number of Triathlon Competed in, and Overall Rating v. Years Working with a Triathlon Coach. All other correlations found were weak.

Graph	r	Relationship	p-value	Evidence Against the Null Hypothesis Based on a Significance Level of .05
Overall rating v. Age (years)	0.3590961	weak (+)	0.2517	weak
Overall execution of race plan v. Age (years)	0.3825049	weak (-)	0.2198	weak
Overall rating v. Years in competetive sport	0.2838133	weak (+)	0.3713	weak
Overall execution of race plan v. Years in competetive sport	0.1089036	none	0.7316	weak
Overall rating v. Years racing triathlon	0.4854688	mod (-)	0.1096	weak
Overall execution of race plan v. Years racing triathlon	0.2241874	weak (+)	0.4836	weak
Overall rating v. Number of triathlons competed in	0.563844	mod (-)	0.0562	marginal
Overall execution of race plan v. Number of triathlons competed in	0.2111398	weak (+)	0.5101	weak
Overall rating v. Years racing the half iron distance	0.1822087	weak (+)	0.5709	weak
Overall execution of race plan v. Years racing the half iron distance	0.0450555	none	0.8895	weak
Overall rating v. Number of half iron distances competed in	0.1572578	weak (+)	0.6255	weak
Overall execution of race plan v. Number of half iron distances compet	0.1094075	none	0.735	weak
Overall rating v. Years working with a triathlon coach	0.4567603	mod (-)	0.1355	weak
Overall execution of race plan v. Years working with a triathlon coach	0.16456	weak (+)	0.6093	weak

The graphs can be seen in the appendix. In the graphs, note that some regression lines appear to have a stronger linear relationship than actually exists due to the existence of outliers.

Conclusion:

The null hypothesis is accepted. According to this study, racing experience has no statistically significant effect on ability to adhere to the race plan.

The conclusion of this study may be affected by the small sampling size and possibly unequal representation of the various backgrounds that athletes come from.

Discussion:

While not statistically significant, it is important to note one common trend seen in the graphs. Though weak, positive relationships existed among Overall Execution of Race Plan v. Years Racing Triathlon, Overall Execution of Race Plan v. Number of Triathlons Competed in, and Overall Execution of Race Plan v. Years Working with a Triathlon Coach. In opposition, weak negative relationships existed among Overall Rating v. Years Racing Triathlon, Overall Rating v. Number of Triathlons Competed in, and Overall Rating v. Years Working with a Triathlon Coach. This shows that execution of race plan improves as an athlete's exposure to racing triathlon increases. However, these athletes are less satisfied with their performances than their less-experienced counterparts are. If this relationship is true, athletes must make sure that their self-critiques are adaptive. The athlete must be able to recognize improvement while understanding their weaknesses. I believe this would help the mental health of a competing athlete.

In the qualitative section of the Post-race Questionnaire, four of the professional athletes (#4,7,8,12) reported not worrying about pacing because they were simply focused on racing the group of people they were near on the course. Nideffer (2012) states that Olympic Medalists and World Champions are "more focused than they are aware or analytical." I believe that the professional athletes describing a desire to simply focus on the athletes near them on the course was an example of the professional athletes being more focused and less aware and analytical than the age-group athletes. Racing in a group would allow the athlete to focus simply on staying within the group whereas when racing solo an athlete would have to consider more measures of their effort level and external factors to keep up a pace. To benefit performance, I believe both training and racing environments should be made conducive to an athlete holding a narrow focus for a prolonged time. To the extent possible, the athlete should be training in an environment where they can practice narrow focus that simulates racing without interruption or risk of injury.

Further, I believe that athletes who are narrowly focused during a race are likely to use associative strategies. A study in 2010 by Kovarova and Kovar found that "elite runners concentrated on associative strategies" while "lower level runners tended to use dissociative strategies" (2010) during a race. In the qualitative section of this study's Post-race Questionnaire, associative strategies were explicitly described by five professional athletes (#1,3,4,8,12) and three age-group athletes (#2,10,11). Of all the subjects, only one age-group athlete (#9) explicitly described implementing dissociative strategies. I believe teaching all athletes how to form associative mental strategies that will benefit them in training and racing should be a priority.

One condition for optimal performance is that an athlete "races within acceptable limits of automaticity" (Edwards & Polman, 2013). Racing within automatic limits means that no afferent signals received by the brain are stronger than either the athlete expected or was accustomed to. Athlete #3 raced professionally, however she had been racing triathlon for just two years,

less than any other subject in this study. She reported not having ridden as hard as she wanted to because she became nervous about the effort level during the bike portion of the race. This illustrates an athlete who has not become accustomed to the effort level she expected to sustain and therefore she was not able to work at that effort level automatically. The conscious effort required caused her to back down from her goal. In my opinion, this proves that an athlete must perform race-simulating practice sessions so they are comfortable with how their body will feel when racing at their goal pace.

Another condition for optimal performance is that an athlete functions “in the sub-awareness level” (Nideffer, 2002). When an athlete races in the sub-awareness level, they do not consciously make any pacing decision. Instead, their body acts and reacts to race situations in the way that it has learned how to previously. This person never extends effort above the limits of automaticity and all of their decisions are made without conscious awareness. An athlete who raced in the sub-awareness level would not have been able to provide reasons for how they raced the way they did. Therefore, I would be unable to learn what factors caused them to adhere to or alter their race plan. Any athletes I interviewed who truly had an optimal performance would most likely not have been able to provide me with an accurate explanation of why they raced how they did.

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