A couple of times every month, the mainstream media decides to be helpful by bringing you the exercise science community's latest innovative investigations into fitness. This gives the informed reader a chance to see what these people do all day in their classrooms, laboratories, and conference rooms. As a pair of recent examples will show, their recommendations must be examined more carefully than the mainstream media often does.

The first paper, entitled “Critical Discourse Analysis of Motivational Content in Commercially Available Exercise DVDs: Body Capital on Display or Psychological Capital Being Developed?” by Cardinal BJ et al. will be published in Sociology of Sport Journal. (I like that the burdensome length of the term “Sports” has been given the haircut it so desperately needed.)

Dr. Cardinal and some of his graduate students from Oregon State University investigated the psychological “messaging” in 10 exercise DVDs, and have concluded that some of the “messaging” could potentially cause psychological harm to those people unfortunate enough to be exposed to it. As reported on the OSU website,

“A study of 10 popular commercial exercise DVDs showed that the imagery in the fitness videos may be perpetuating and reinforcing hyper-sexualized and unrealistic body images, said Brad Cardinal, a kinesiology professor in the College of Public Health and Human Sciences at Oregon State University.”

Has it occurred to Dr. Cardinal that lots of people who buy these silly videos may be intensely interested in seeing hyper-sexualized and unrealistic body images? For various reasons?

A look at the paper itself reveals that The Team analyzed 10 fitness DVDs they got from either the library (4), off the internet (2), or brought with them to school from the house (4). They analyzed the potential psychological effects of a quarter-billion-dollar industry using 10 DVDs, 40% of which they already owned. Then they analyzed the physical characteristics and attire of the instructors and models featured in the DVDs, the sex and race of the models and instructors (which was “assumed”), and the motivational content of the instruction.

They did all kinds of interesting statistical analysis on their analysis, and they decided that about 25% of the verbal statements made in the 10 DVDs were motivational, but that 1 in 7 of these statements was negative, and therefore “demotivating.”
In other words, for every 1000 words spoken in the DVDs, 35 of those words might possibly hurt someone's feelings. Considering the fact that 65% of Americans are now overweight or obese – a lot of people's feelings could stand to be hurt just a little. I'm amazed that people continue to buy $250 million of them every year.

In other developments, a group of Australian and Canadian exercise scientists have determined that it's okay for cyclists to eat bread. The aversion to gluten – the major protein found in wheat, the world's most widespread food crop – has swept the globe. Athletes, always the first group to jump on a new nutritional bandwagon, have lead the way. In their attempts to improve performance, many athletes have adopted gluten-free diets.

Despite the fact that gluten is the primary source of vegetable protein for the human race, the suspicion is that all humans have a touch of Celiac Disease, an autoimmune disorder that features an inflammatory reaction to a component of gluten. Faddish weirdness notwithstanding, the vast majority of the human race has no trouble with wheat – if it did, it wouldn't be so damn popular.

But these guys (oh, sorry, I forgot to mention that The Team in the previous paper has concluded that the term “guys” was demotivating) from Australia and Canada decided to test the hypothesis that gluten adversely affects performance. So they did the usual Exercise Science thing: they performed an underpowered, poorly-designed, poorly-executed study on a small group of subjects who could not possibly prove or disprove their hypothesis. This, of course, was in no way an impediment to getting it published.

As reported in The New York Times and published in Medicine and Science in Sports and Exercise (2015 Dec;47(12):2563-70), here's what they did: they chose 13 competitive endurance cyclists without any Celiac Disease or other chronic bowel symptoms, and tested the differences in their performance between a gluten-free diet and a diet supplemented by 16 grams of gluten per day – a “fairly hefty amount of gluten,” according to NYT – while they continued to train.

A range of 10-40 grams of gluten per day is considered normal gluten consumption for non-Celiac patients, so it's entirely possible that 16 grams of gluten was less than the cyclists were eating before the study. If I were going to design a study to show the effects of gluten vs. no gluten, I'd use more gluten than the lower end of the normal range.

Anyway, the cyclists ate each diet for a total of 7 days. Seven (7) whole days. Amazingly enough, no differences were reported in the performances or lab work of either group.

Do you see the problems here? There were 13 cyclists in the study. This just isn't enough cyclists. If you don't have enough people in your study, small effects (the kind you would expect) don't show up at sufficiently noticeable frequencies or levels to tell you anything useful, to allow you to see any changes, or to allow you to see the absence of any changes. Any differences in performance between the gluten-containing and the gluten-free diet would not be present in enough people at sufficient amplitude to constitute an observable difference.

More importantly, experienced competitive cyclists don't change performance levels in a week as the result of minor dietary interventions. Neither do you, as you're aware. A single dietary protein that was safe enough to manipulate that the Human Subjects Committee approved it for study, and which was administered sparingly, is not going to show up as having changed anything in seven days. Remember, these people were selected for not having Celiac Disease, and for not being on a gluten-free diet prior to the study.

This is a huge structural problem for this study. We're taking a small group of competitive cyclists who had been eating sandwiches and drinking beer (yep, barley has gluten, and they were
apparently Australian cyclists, after all), taking away gluten for a week, adding a little gluten back in for a week, training them the whole time, and nothing different happened.

You're investigating a phenomenon that you have no reason to suspect is an enormous phenomenon (since wheat is consumed by virtually everybody on the planet with no problems for the vast majority), you find no evidence of its effects on performance in a badly-designed study on grand total of 13 people, so you postulate that it has no effects.

But they still got it published. Now, The Literature says that gluten has no effect on training. The New York Times refers to this methodology as “an ingenious solution,” and says that “the results, strikingly, showed no significant differences.” Strikingly.

I’m not saying that gluten affects training one way or another, because I don’t know. I suspect it is a perfectly benign plant protein for the vast majority of both athletes and humans, but I don’t know. My point is that neither do they, and neither do you.

The Oregon State University website is going to print what they’re told to print by the administration, which is going to support any publishing done by the faculty of OSU. But The New York Times still has a huge impact upon the general public’s perceptions of science, and unfortunately everything else. A grain of salt is insufficient, I’m afraid.

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