

ON OVERLOAD, SPECIFICITY AND EPIDEMICS – PHYSICAL ACTIVITY AND PUBLIC HEALTH

The fundamental principles of exercise physiology are overload and specificity. Overload refers to the increase in demands placed on the body's structures and functions whenever physical activity of a greater amount is performed than usual for the individual. If applied in a progressive manner, physiologic overload will improve the capacity and/or efficiency of various tissues and systems.

Specificity refers to the physiologic sequelae or adaptations occurring in response to overload and is influenced largely by the type of activity being performed. Overload on the musculoskeletal system improves muscles, bones and joints; overload on the cardiovascular system improves fitness, circulation and respiration, etc. We have known these fundamental principles of exercise physiology in one way or another for decades. What does this have to do with epidemics?

In just a few short years, the subdiscipline of Physical Activity and Public Health has emerged and has begun to gather an identity of its own. Largely with its roots in cardiovascular disease epidemiology and physiology, we have now grown to include behavioral science and transdisciplinary efforts that include the fields of transportation, public policy and environmental health and planning. Regional and national networks have sprouted throughout the world in attempts to foster communication and advocacy for physical activity promotion and capacity-building in those regions. New scientific journals such as the *Journal of Physical Activity and Health* and the *Brazilian Journal of Physical Activity and Health* are helping to advance the field as well.

With this emergence – an overload in demand has occurred. With more and more scientists, practitioners, policy makers, and public health professionals seeing the tremendous health potential in promoting physical activity in populations, we have outgrown our humble roots. We have overloaded the existing systems to the

point that our field may not be able to sustain its phenomenal growth without adaptations. While understanding and respecting our heritage as a field, I believe that we can no longer remain solely dominated by our exercise science and public health lineages.

The adaptations that are needed are many, but the specificity of developing scientific outlets to foster advancements in knowledge seems to be a foremost, specific, need for our future growth. The recent emergence of the Brazilian Society for Physical Activity and Health and the International Society for Physical Activity and Health are two substantial steps forward in helping adapt to our overload. Although these two organizations are in their embryonic stages, they hold great promise in helping battle national and international epidemics of physical inactivity and in advancing the critical science necessary to impact health of individuals and populations.

As we grow and develop from the embryonic state to infancy – I hope you will join these efforts to bring exercise science together with public health – to create even more momentum. Just as public health can not operate without an understanding of the underlying physiology or etiology of the problem of interest, exercise science can not successfully operate without a clear understanding of the health or performance implications of its area of interest. The emergence of the subdiscipline of physical activity and public health is a specific adaptation to our current overload of demand without capacity. It is an incredibly positive development and I believe it will help to create a traction that will help the next 10 years to be even more impressive than the last in our field.

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