

Performance Point

The Physics of Human Movement

by Dr. Allan Wrigley, Biomechanist, Canadian Sport Centre Pacific

October 2006

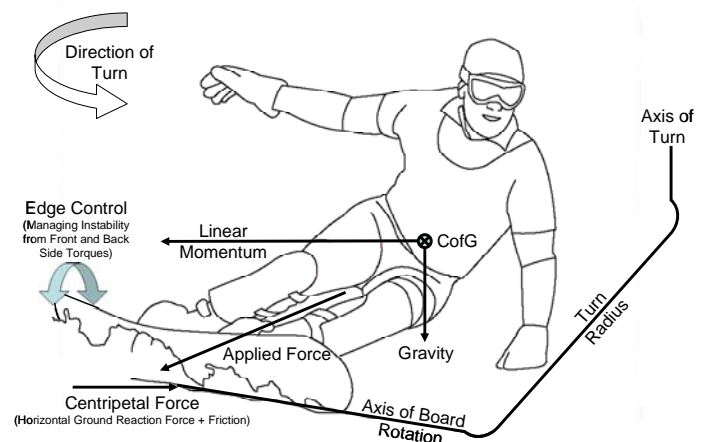
Understanding how to instruct and correct an athletic performance is the most basic duty of a coach. However, the question "Why does the body react that way when I do this?" is typically more puzzling to understand and often not communicated clearly to inquiring athletes. One of the many roles a Biomechanist plays in an ever changing sporting environment is *performance enhancement through coaching facilitation*. Whether it is assisting in the production of technical materials for coach development programs or simply sitting on the side lines and answering questions to explain the 'why's' of human movement, many coaches today are taking advantage of a Biomechanist's thorough understanding of physics to enhance performance. Yet, the potential benefits to technical performance from merging academic and applied sport specific knowledge are still not fully realized.



How many different ways have athletes heard terms like "balance, stability, force, power, energy, momentum, and impulse" used and explained as it related to performance? All of these terms have specific mechanical meaning and play significant roles in governing human movement. For example, a Biomechanist may view freestyle jumps in terms of conservation of angular momentum and the law of action-reaction, but lacks the applied knowledge to relate these concepts to the athletes in a clear and concise way. Coaches can benefit from even a basic understanding of these principles of physics in order to not only clarify why the trick is performed a certain way, but also to promote critical thinking leading to the identification of new ways of performing the trick more efficiently.

"Please allow me to congratulate you for a smash hit with our snowboard coaches last week. Not only did everybody dig the biomechanics theory, but they were incredibly pleased with your "snowboardified" teachings and presentation skills. You have demystified many pre-conceived incorrect theories and confirmed many other concepts enabling our coaches to think critically and clearly.... I believe we are at the beginning of a wonderful relationship merging: science, skill development, coach education and the future."

Christian Hrab, Director of Sport Development, Canadian Snowboard Federation, commenting on ongoing work with their coach development program.



Are you interested in becoming a Biomechanist? Most Biomechanists have a background in either kinesiology, biomedical engineering, or mechanical engineering. Typically a graduate degree (M.Sc. or Ph.D.) and experience in the sporting field are required. For more information please visit: <http://isbweb.org>

Powering Sport Performance

The Canadian Sport Centre Pacific, in partnership with the network of Canadian Sport Centres and PacificSport Centres, delivers sport performance programs to help athletes and coaches win medals for Canada. Working in support of our national and provincial sport partners, the Canadian Sport Centre Pacific is creating a stronger system for the development of athletes, coaches, performance enhancement teams and sport performance facilities. www.cscpacific.ca