Strength's Identity

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There remains a belief in 'types' of strength, including 'absolute strength', 'speed-strength', 'explosive strength' and 'starting-strength', to name but a few[1]. However, these concepts are descriptions of *appearances* and *intensions* (i.e., the nature of the *application* of one's strength) but are not actual 'types' of strength, as some fitness authorities allude to.

It may be argued that because these types of strength are not in any formal physiology text book that they do not exist or they are not what they purport to be. I will not make this argument since many proven and interesting observations and discoveries in various disciplines continue to go unnoticed or ignored. Rather, I will present my arguments based on what is known together with important questions that have yet to be answered by anyone in support of 'types' of strength.

First, we need to look at the definition of strength. In the context of human movement, strength can be defined as *a measure of force produced by the tissues*, i.e., nervous, muscular, and tendonous, and whether to exert or resist. In essence, the demonstration of strength is a demonstration of force, and is true whether speaking isometrically or dynamically. The definition could be simplified by stating that it is *a force produced by the tissues*, but I included the abstraction of a 'measure of force' for reasons that will become obvious.

Now, we will look at one type of strength, that being starting-strength. This refers to the ability to move from a stopped position and exerting maximal force, such as exploding off the blocks of a sprint. In this regard, would starting-strength fit the description above, that to move from a dead-stop position requires a measure of force produced by the tissues? Definitely, and how quickly a person moves from a dead-stop position actually is <u>irrelevant</u> to the nature of the concept of strength.

Moreover, we constantly move from dead-stop positions, and reversal and changes of directions in our activities of daily living, sports, and other actions. To suggest that specific instances are 'starting-strength' simply because of the *measure* of force produced by the tissues, whereas other instances are not starting-strength because of a lesser measure, is irrational.

Next we have speed-strength. This term, as well as many neologisms in the fitness industry, has various definitions. However, consider the definition offered by the International Sports Sciences Association certification company. Speed-strength, as defined by the ISSA[2] is *"how well you apply force with speed,"* and consists of 1) starting strength, and 2) explosive strength.

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[1] Fred Hatfield, of the ISSA, claims that there are over 30 types.

[2] *Fitness: The Complete Guide*. International Sports Sciences Association.

How well one applies force is an issue of quality and does not define what the concept is. In order to discover more, we would then have to look at starting strength and explosive strength.

The issue of starting-strength was addressed previously, and the ISSA defines explosive strength as *"Once your muscle fibers are turned on, your ability to LEAVE them turned on for a measurable period"* (emphasis theirs). In this context, "explosive strength" sounds like muscular endurance, which I'll discuss momentarily. Also, what is meant by "measurable", i.e., for how long? Since these terms are not defined, or clarified, and are subjective, would ten minutes of constant activity, measured via a stopwatch, constitute a demonstration of explosive strength? Apparently so.

Conversely, Vladimir Zatsiorski defines explosive strength as "*The ability to exert maximal forces in minimal time.*"[3] Therefore, if effort is not 100%, or maximal, and the time not minimal, the action was not explosive. This makes sense in the context and analogy of an exploding bomb, which is abrupt and violent. To demonstrate explosive action, then, there must be a maximum attempt in producing force – regardless of the opposing force – and done as quickly as possible, or in the least amount of time.

Do note, however, that explosive strength is nothing more than a *measure* of strength relative to time. It is <u>not</u> a different concept, separate from strength, i.e., a measure of force produced by the tissues. It is only one of many different and possible applications of movement based on the same concept. The other point, which is just as important, is that two completely different definitions of the same word, from two self-proclaimed expert sources in the field, exist. Exercise cannot be a science under these conditions. Definitions must be standardized, to communicate ideas logically.

Now, think about what has been stated thus far, from the definition of strength to some of the select definitions of the 'types' of strength. In essence, they do not differ except in terms of measurement or quality. This is vital to understand as it pertains to the concept of what a definition is, i.e., a statement that identifies the vital characteristics or units of an entity, and not the various measurements of an entity.

We can relate this to the concept of a table, defined as *an article of furniture consisting of a flat, slablike top supported on one or more legs or other supports*.[4] The definition does not tell us the shape, color, materials of construction or other similar characteristics of *measurement*, only what is vital to define the concept of table. Likewise, all these 'types' of strength are not separate entities from that of 'strength', but are different measurements of the concept… descriptions of appearances and application of strength.

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[3] Zatsiorsky, Vladimir, M. *Science and Practice of Strength Training*. IL: Human Kinetics, 1995. 225.
[4] Webster's Unabridged Dictionary.

The argument does not end there, however. Analyze the types of strength on a physiological basis. Activity results in energy breakdown to fuel the forces produced by the tissues. There are differences in aerobic and anaerobic activity as far as energy production and uptake is concerned (although there is a cross-over to a large extent), but this does not mean one is exhibiting 'aerobic-strength' or 'anaerobic-strength,' two other neologisms offered in the fitness industry. Rather, aerobic and anaerobic refers to the energy system in use, which is different from the concept of strength. There is no purpose or function in combining the two.

Now, if one were to demonstrate speed-strength, what chemical processes or myofilament contractile characteristics are different from other types of strength, to make speed-strength a unique concept and something different from 'strength' or the other 'types' of strength besides a different measurement of force and time?

In essence, the only difference is an apparent high rate of speed, which may result in a higher uptake of fuel and faster contraction of muscle fibers, but is no different than strength in general in regard to how the muscles contract, how they behave, or the production of energy through chemical breakdown. And to reiterate, a change in measurement of a concept does not produce a new concept. A table is a table, regardless of its measurement, and strength is strength regardless of its measurement.

Next, consider the concept of 'strength-endurance,' a final neologism for this position paper. Endurance, in the context of human movement, refers to *the ability to sustain muscular effort*. A half-second of effort is one measure of endurance, whereas ten seconds is a different measure and, with all factors being equal, is a greater demonstration (measure) of endurance. Consequently, when one exhibits a measure of strength, he or she simultaneously demonstrates a measure of endurance. Hence, 'strength-endurance' is both redundant and has nothing to do with performing 'higher reps' with a 'lighter weight' as has been suggested.

If the field of exercise is to be considered a science, which it is since it follows the fundamental principles of stress physiology, then we need to view it in a more philosophical context. We need to understand the concepts of *identity* and *definition* before spewing forward further exercise terms that do nothing more than to confuse, bewilder, and establish myths. And if the arguments put forward are not convincing of this quandary, I welcome the reader to submit a position paper to the contrary. Perhaps such a debate will clear the murky waters.