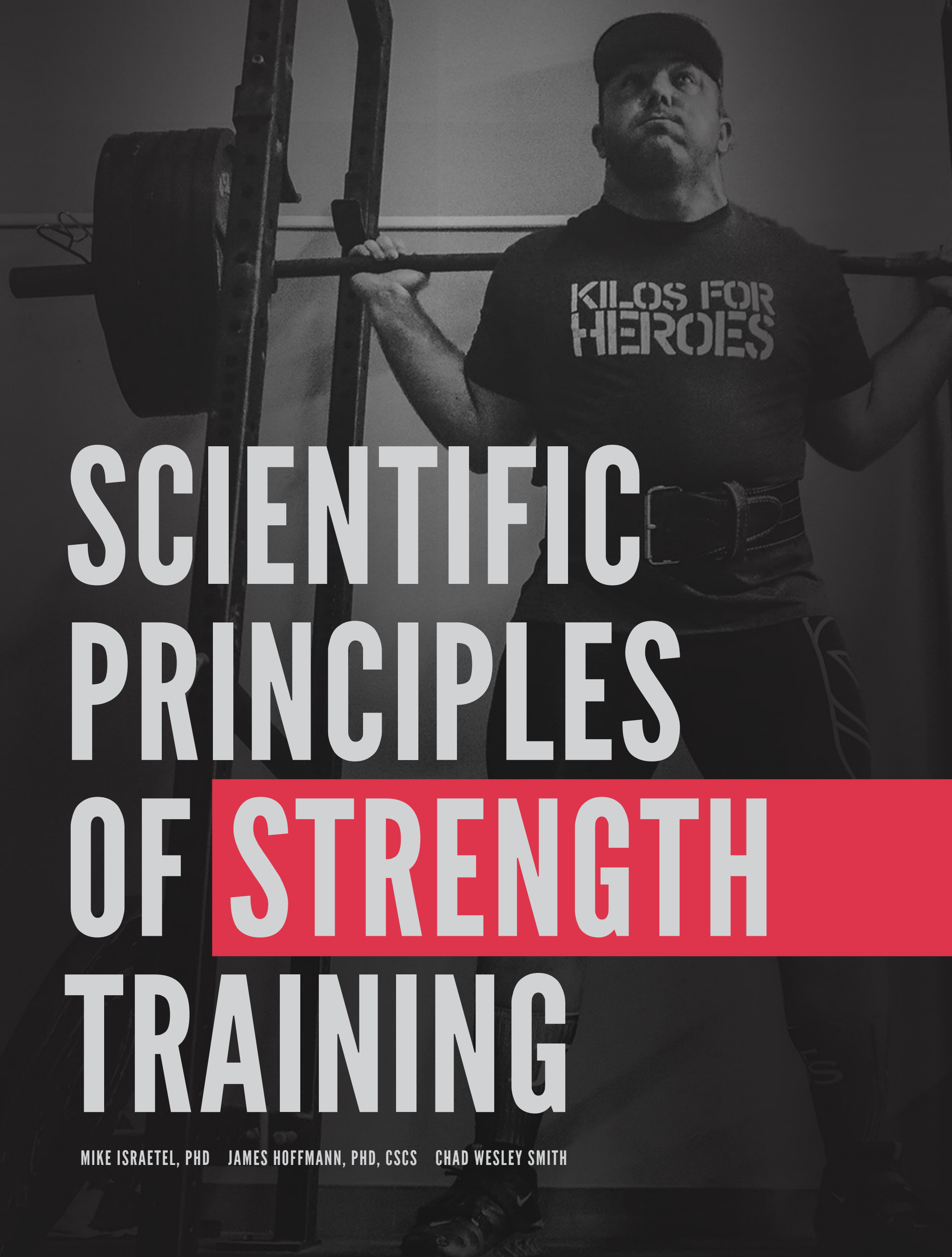

SCIENTIFIC PRINCIPLES OF STRENGTH TRAINING

MIKE ISRAETEL, PHD JAMES HOFFMANN, PHD, CSCS CHAD WESLEY SMITH

SCIENTIFIC PRINCIPLES OF STRENGTH TRAINING

WITH APPLICATIONS TO POWERLIFTING

WRITTEN BY

MIKE ISRAETEL, PHD

JAMES HOFFMANN, PHD, CSCS

CHAD WESLEY SMITH

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ABOUT THE AUTHORS

MIKE ISRAETEL, PHD

Mike is a professor of Exercise Science at Temple University in Philadelphia, PA and was previously a professor at the University of Central Missouri, where he taught Exercise Physiology, Personal Training, and Advanced Programming for sports and fitness. Mike's PhD is in Sport Physiology, and he has been a consultant on sports nutrition to the U.S. Olympic Training Site in Johnson City, TN. Mike has coached numerous powerlifters, weightlifters, bodybuilders, and other individuals in both diet and weight training. Originally from Moscow, Russia, Mike is a competitive powerlifter, bodybuilder, and Brazilian Jiu Jitsu grappler. He used to hold a bunch of state, national, and world records in raw powerlifting back when everyone was in equipment, so that's cool!

JAMES HOFFMANN, PHD, CSCS

James Hoffman is professor or Exercise Science at Temple University in Philadelphia, PA. James earned his PhD in Sport Physiology under Dr. Mike Stone of ETSU, where he focused on the application of sled pushing to sport performance enhancement in Rugby players. James has coached numerous Rugby players at ETSU as the team's assistant coach and Head Sport Scientist, where he was also the head strength and conditioning coach and weight room manager. James is a lifetime athlete, having reached high levels of competition in Rugby, American Football, and Wrestling.

CHAD WESLEY SMITH

Chad Wesley Smith is the owner and founder of Juggernaut Training Systems, as well as one of the most accomplished strength athletes competing today. Starting out in track and field, Chad won 2 collegiate national championships in the shot put before moving on to strength sports. As a powerlifter, Chad has risen the ranks of raw powerlifting with a 1050kg/2314# total, the 10th highest of all-time in knee wraps and a 1010kg/2226# total, the 6th highest of all-time in knee sleeves. Chad also earned his professional status as a Strongman in 2012 and has coached and consulted with athletes in the NFL, MLB, UFC, Bellator and Olympics in a variety of sports.

CHAPTER TWO

THE TRAINING PRINCIPLES & WHAT THEY MEAN

Training for powerlifting is not simply a matter of moving the body around randomly and expecting to get stronger. Every single powerlifting program depends on certain training principles to guide its design, and every powerlifting training session is constructed to exploit those principles to be effective in improving performance. Principles are only effective when they are derived from reality. The way we train must be based on the way the body best responds to training, otherwise we wouldn't get very far.

For example, let's say that we invite over a space alien programmer to design routines for our human powerlifters. Back on his home planet, his species is genetically designed to get stronger from just resting, and any deviation from rest taxes their systems away from such improvements. Thus, the very act of working out would harm their performance, and thus the perfect powerlifting program on that world would begin by making sure the lifters only rest when they are not actually competing, in full concordance with their physiology. Humans, of course, just get weaker if all they do is rest, and the stimulus for training must be something that disrupts homeostasis, giving it the stimulus to adapt

physiology and improve strength. Thus, for human lifters, the Overload Principle is super important, as it's virtually impossible to improve in strength without constantly challenging the physiology of the lifter by pushing it past old boundaries of exertion. Perhaps on another planet, their powerlifters have very poor recovery abilities in relation to ours. They require a full two weeks to recover even baseline performance between training sessions, and the best improvements occur with every three weeks training or so.

Could that program simply be applied to humans and expected to work? Of course not. Because humans have a particular physiology that responds in particular ways to training and rest, the principles used to guide human powerlifter training must be based on that physiology.

It turns out that there are seven primary training principles for human (last time we mention alien training, promise) powerlifters. By following these 7 principles of training, programs will be well-tailored for the best possible results. And this is not by accident… these principles are all based exactly and only on the actual physiological and performances responses of lifters. They were not made up, invented, or manufactured; they were discovered. These principles are the simplified version of how the human body responds to training, and getting them right means better progress, period. Ignoring them will almost every time lead to poorer and less predictable performance.

The following is a rank ordered list of each of the training principles, with some of their sub-principles included: (less important but noteworthy details of the main principle)

1.) Specificity

    a.) Sub-Principle: Training Modality Compatibility

    b.) Sub-Principle: Directed Adaptation

2.) Overload

3.) Fatigue Management

4.) Stimulus-Recovery-Adaptation (SRA)

5.) Variation

6.) Phase Potentiation

    a.) Sub-Principle: Adaptive Decay

7.) Individual Difference

Because these principles are based in physiology and govern the training process, employing them will increase powerlifting performance in any program in which they are implemented. But the principles do not all affect performance to the same degree. The first several are much more impactful on performance than the latter ones. While all programs that get at least specificity and overload correct will work well, the best programs get even more of the principles right. The more principles a program gets right, the better it is, with the best programs using all of the principles properly in their designs.

Below is a visual graphic to illustrate the relative importance of each principle. Those at the bottom of the chart and with the largest areas are the most important, and those with smaller slivers at the top are the least. Notice that Specificity bounds the entire graphic, which hints at the fact that it is by far the most important training principle and should be the highest priority in all powerlifting training. The next question is why, and the answer is described in great detail in Chapter 3!
Each training principle will be thoroughly analyzed in its own dedicated book chapter.

Each chapter including this one will be structured as follows

1.) The definition of the principle in sport science terms.

2.) The definition of the principle as it applies to powerlifting, with expansive implications.

3.) Justification of why the principle is ranked as it is in the priority structure of training as compared to the other principles.

4.) Instructions and examples on how to properly apply the principle.

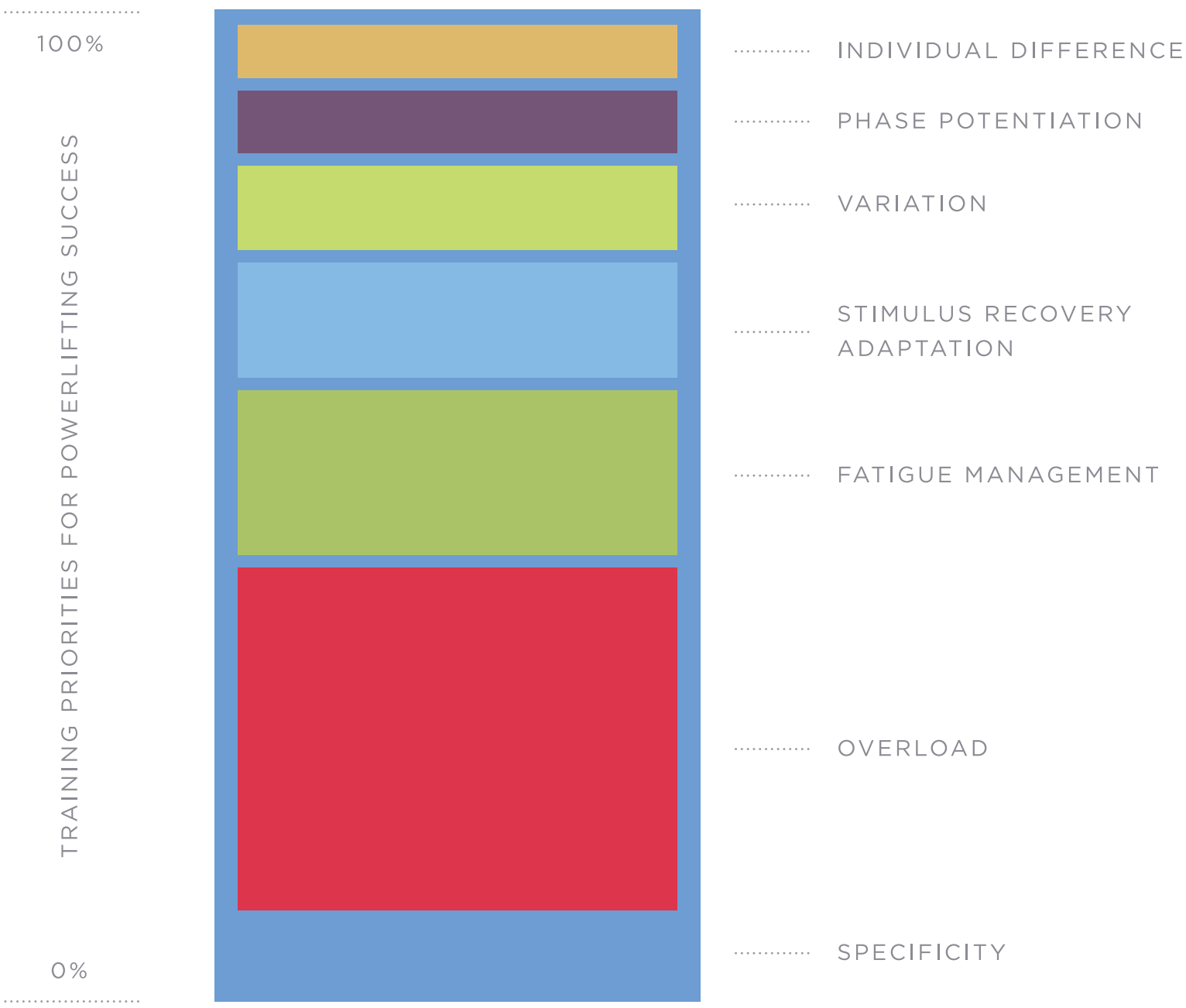
5.) Examples of typical mistakes in under-applying the principle.

6.) Examples of typical mistakes in over-applying the principle.

7.) Summary of the principle in basic terms as it relates to powerlifting training.

8.) Sources and further reading links.

THE PRIORITIES VISUALIZED



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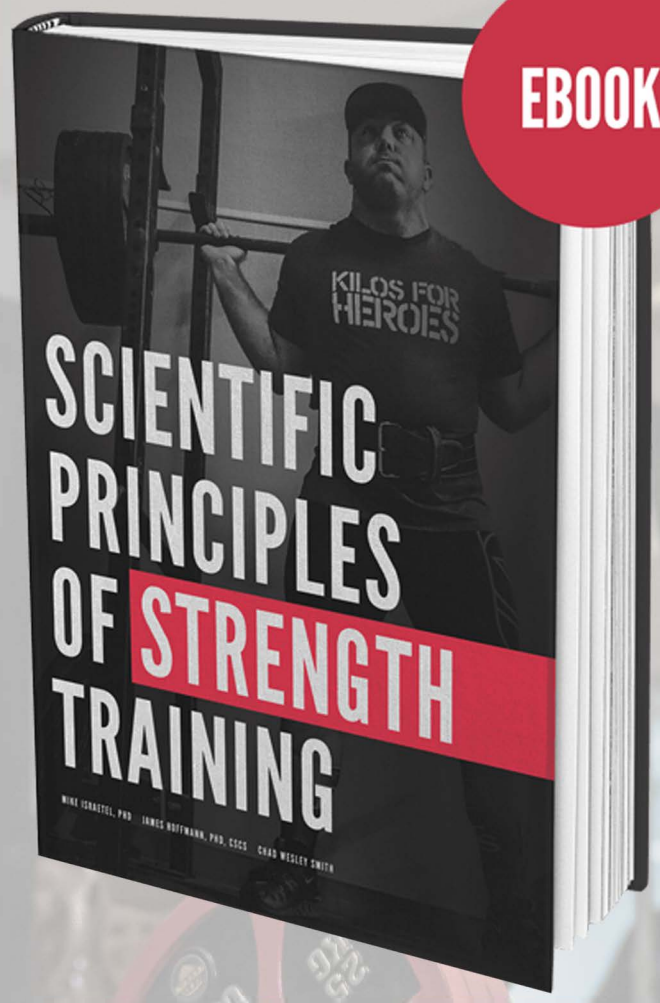

In Scientific Principles of Strength Training we have created one of the most comprehensive resources available on the topic of building strength.

Checking in at nearly 400 pages, Scientific Principles is co-authored by Dr. Mike Israetel (author of The Renaissance Diet), Dr. James Hoffmann (Exercise Science Professor at Temple University) and Chad Wesley Smith (Top 10 Raw Powerlifter of All-Time). This trio of authors has given Scientific Principles a unique combination of scientific and practical knowledge, not found in any other text.
Topics Covered

In depth definitions of important strength training and programming terms. Nuanced discussions of the following foundational training principles and how they can influence your training and program design:

- Specificity
- Overload
- Fatigue Management
- SRA
- Variation
- Phase Potentiation
- Individual Differences
- Various powerlifting periodization schemes and their strengths/weaknesses
- Myths, Fallacies and Fads in Powerlifting

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