Strength University Programming

Coach Travis Mash
www.MashElite.com

Methods that Make the System

- Separate Peak Power and Strength (Powerlifting is the exception)
- S.A.I.D.- Specific Adaptation to Imposed Demands
- Conjugate- Change and Variation to avoid accommodation
- Force= M*A (something heavy as fast as possible
- Velocity

Methods Continued

- Power: W/T (something moderate but fast and explosive)
- Max Effort Method- Go Heavy
- Hypertrophy
- Repetition Method- high reps to near failure or to absolute failure
- Post Activation Potentiation (P.A.P.)- a theory that states the contractile history of the muscle influences the mechanical performance of the muscular contractions that follow.

Methods Cont

- Prilepin's Chart- A.S. Prilepin's volume chart
- G.P.P. and Work Capacity
- Individualized Accessory Work to avoid asymmetries
- Compensatory Acceleration/Accommodating Resistance
- Concurrent Training

Methods Cont.

- Undulating Periodization
- Exercises or Drills to fix flaws versus cues
- Prioritize Most difficult movement or weakness
- Relationship between RPE, RIR, Velocity, and Percentages to explain and help athletes understand intent and to assure training effect
- Velocity Based Training

Separate Power & Strength

- Weightlifting, CrossFit, Strength and Conditioning
- Not so much powerlifting
- The focus should be on the sport, moving quickly, and feeling good the last few weeks

S.A.I.D.

- The closer to your sport, meet, or competition; the more this comes into play
- Conjugate doesn’t have to be so extreme
- Definitely consider what is the most important to improve with strength & conditioning or CrossFit (ex. snatch, clean, jerk, squat, pull, etc)

Conjugate

- Avoid accommodation with change
- The degree of change is where I might differ from Louie.
- Consider: rep scheme, tempo, total volume, RPE, RIR
- Then consider: specialty bars, bands, chains, etc

Understanding Important Equations (Force)

- Force= M*A
- Measure in Newtons
- Mass there needs to be time spent going heavy
- There needs to be a focus on speed
- Every rep there should be an intent of as fast as possible unless otherwise noted

Velocity

- V=D/T
- Velocity is important to every sport
- Measured in M/S
- Great for assuring intent
- Great for teaching intent
- Gymaware- Flex Unit

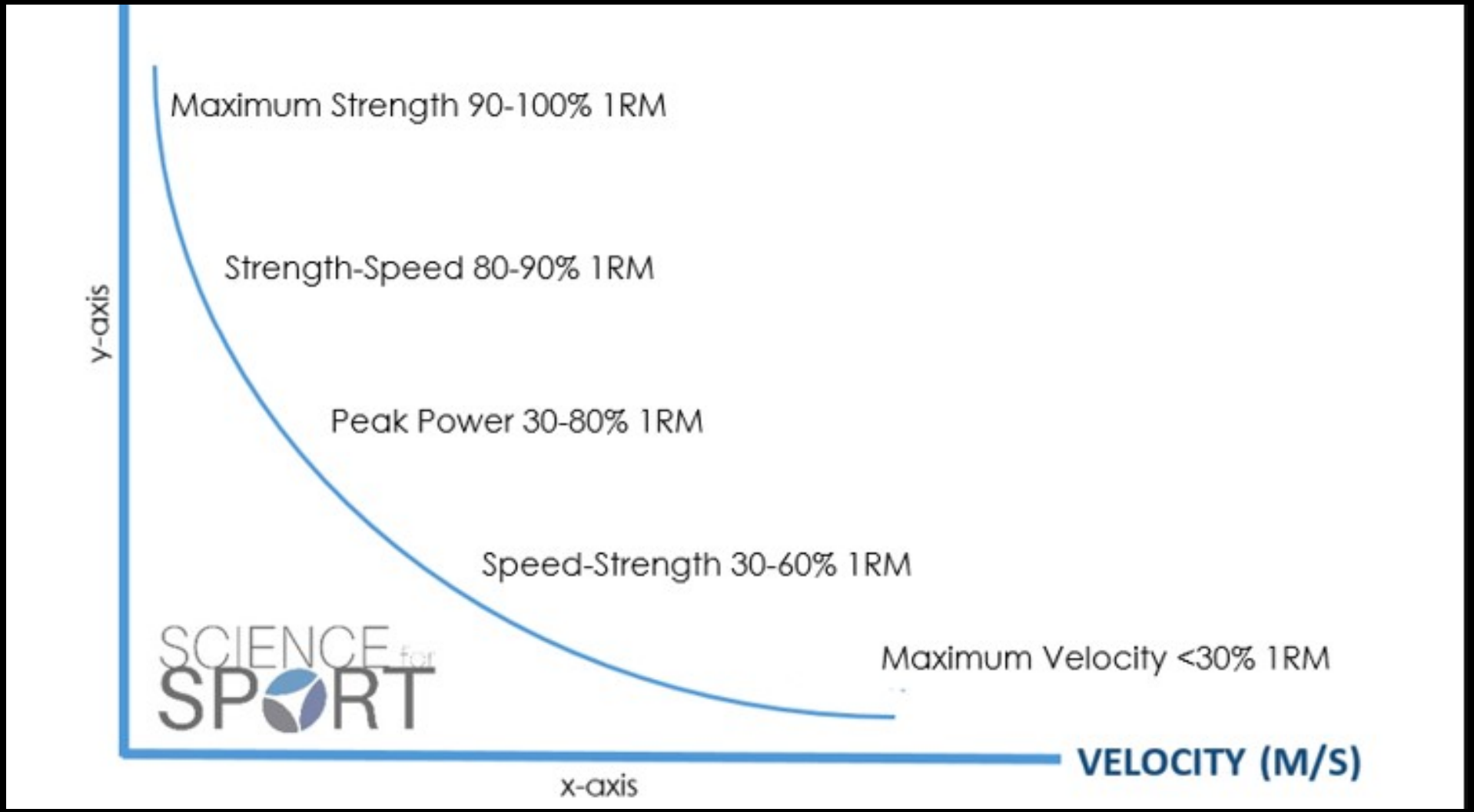
Power (Watts)

$$\text{Power} = \frac{\text{Work}}{\text{Time}} = \frac{\text{Force} \cdot \text{Displacement}}{\text{Time}}$$

$$\text{Power} = \text{Force} \cdot \frac{\text{Displacement}}{\text{Time}}$$

$$\boxed{\text{Power} = \text{Force} \cdot \text{Velocity}}$$

Force-Velocity Relationship



More on Power

	100kg Male	75kg Female	
Bench Press	300		
Back Squat	1100		
Deadlift	1100		
Snatch*	3000	1750	*Tc
2nd Pull**	5500	2900	**2
Clean	2950	1750	bar
2nd Pull	5500	2650	

Power Development v Expression

- Bryan Mann- Squats and Pull develop power
- Cleans and Snatches Express Power
- Combined is where the magic happens

Max Effort Method

- You absolutely have to spend time with this method
- Prilepin said 90% and above
- Key is changing to avoid accommodation
- Complexes and other variations to minimize load

Hypertrophy

- 2 ways to get stronger: efficiency and hypertrophy
- Hypertrophy: Mechanical loading/Volume, Muscle Damage, Metabolic Stress
- Best practices going to failure v. volume/mechanical loading
- Volume with some near failure is best for Type II:I Ratio and Cross Sectional Area (CSA) (Stone)

Hypertrophy Cont.

- Track Volume and consider keeping some RIR
- HITT Training definitely makes you bigger, but probably slower
- Repetition Method/Metabolic stress for lagging Individual muscles
- Lactate>GH>IGF1

P.A.P.

- Great for Hypertrophy if using waves ex. 88% x 3, then 70% for 8-10
- Great for efficiency if using waves ex. 90% x 1, 80% x 2
- Great for Absolute Strength: walkouts, jerk dip squats, bands, weight releasers, etc

Prilepin's Chart

Prilepin's Chart

Percent	Reps/sets	Optimal	Total range
55–65	3–6	24	18–30
70–80	3–6	18	12–24
80–90	2–4	15	10–20
90+	1–2	4	10

Relative Intensity

RELATIVE INTENSITY TABLE

Difficulty		x1	x2	x3	x4	x5	x6	x8	x10
MAX	100.0%	100.0%	95.0%	92.5%	90.0%	87.5%	85.0%	80.0%	72.5%
HEAVY +	97.5%	97.5%	92.8%	90.3%	87.8%	85.5%	83.0%	78.0%	70.8%
	95.0%	95.0%	90.3%	88.0%	85.5%	83.3%	80.8%	76.0%	69.0%
HEAVY	92.5%	92.5%	88.0%	85.8%	83.3%	81.0%	78.8%	74.0%	67.3%
	90.0%	90.0%	85.5%	83.3%	81.0%	78.8%	76.5%	72.0%	65.3%
MOD +	87.5%	87.5%	83.3%	81.0%	78.8%	76.8%	74.5%	70.0%	63.5%
	85.0%	85.0%	80.8%	78.8%	76.5%	74.5%	72.3%	68.0%	61.8%
MOD	82.5%	82.5%	78.5%	76.5%	74.3%	72.3%	70.3%	66.0%	60.0%
	80.0%	80.0%	76.0%	74.0%	72.0%	70.0%	68.0%	64.0%	58.0%
LIGHT +	77.5%	77.5%	73.8%	71.8%	69.8%	68.0%	66.0%	62.0%	56.3%
	75.0%	75.0%	71.3%	69.5%	67.5%	65.8%	63.8%	60.0%	54.5%
LIGHT	72.5%	72.5%	69.0%	67.3%	65.3%	63.5%	61.8%	58.0%	52.8%
	70.0%	70.0%	66.5%	64.8%	63.0%	61.3%	59.5%	56.0%	50.8%
TOO	67.5%	67.5%	64.3%	62.5%	60.8%	59.3%	57.5%	54.0%	49.0%

COLOR CODE

Recommendations	
MAX	*True Test Sets *1x/8-12 wks *Prilepin LOW-OPT
HEAVY +	*Test Sets *Evaluation Sets *0-1x/4 wks *Prilepin LOW-OPT
HEAVY	*Evaluation Sets *Occasional Load Weeks *0-1x/4 wks *Prilepin LOW-OPT
MOD +	*Majority of Load Weeks *Occasional Open Sets *1-3x/4 wks *Prilepin LOW-HIGH
MOD	*Majority of Base Work *Occasional Unload work *0-1x/4 wks *Prilepin LOW-HIGH
LIGHT +	*Majority of Unload Work *Occasional Base Work *1-2x/4 wks
LIGHT	*Super Unload *0-1x/4 wks *Seldom used as Unload
	*Rarely used in Cycles *0-1x/4 wks

Prilepin is just the start

- Athlete will normally fit into one of the following categories:

1. High Intensity and low to moderate volume
2. High volume and low to moderate Intensity
3. In the middle basically Prilepin hits the nail on the head.
4. Key is tracking data of each athlete: total volume, average intensity, time at 90% and above

G.P.P. and Work Capacity

- General Physical Preparedness has to be the priority in the beginning
- Examples: bodyweight training, gymnastics, sprinting, jumping, landing, air squats, lunges, pushups, sled work, and carries.
- Work Capacity must be considered Ongoing because increases one's ability to handle more volume

Individualized accessory Work to avoid imbalances/asymmetries

- Things to consider:
- 1. Clean 75% (+ or – 5%) of squat
- 2. Snatch 80% (+ or – 5%) of clean and jerk
- 3. Standing press match upright row
- 4. Pull-Up Match Dip
- 5. Bench match Row
- 6. Unilateral tests: step up test, press, carry, row, etc

Velocity Based Training

- Helps with athlete intent
- Guarantees programmed quality of strength is being worked
- Keeps things safe Rep Max with minimum velocity
- Another way to peak example moving 85% faster is improvement
- First two years at least focus on Absolute Strength

Concurrent Training

- For the first 10 seconds or so, the body replenishes ATP directly from phosphocreatine (PCr). This is the fastest way the body replenishes stored ATP. This is the alactic system as no lactate is produced.
- After that, and up to a few minutes of high intensity activity we enter the lactate system. The anaerobic glycolytic system is the primary energy source.
- After that, we are relying on the oxidative system. This is aerobic activity utilizing oxygen.

Concurrent Training Cont.

- Aerobic work strengthens the vascular network, so more blood per pump and more oxygen
- HIIT Training and High volume anaerobic training with weights has too much vein occlusion for the oxygen improvement
- in highly trained aerobic athletes, they are able to still maintain blood flow during HIIT and Resistance training allowing for increased performance and recovery.

Concurrent Training

- Another benefit to aerobic training is that the capillary network to all working muscle is increased dramatically so even more blood flow
- One of the most significant adaptations of endurance training is an increased number of mitochondria. Mitochondria are responsible for energy production at the cellular level.
- They produce ATP from both glucose and fatty acids. This happens independent of anaerobic glycolysis. That means less glucose lost to the lactate production.

Concurrent Training Bottom Line

- After the first 8-10 seconds of resistance training, you are tapping into the lactate system. You are also starting to use the aerobic system as well.
- The more efficiently that your aerobic system is firing will lead to less depletion of the body's glucose stores. You will be able to perform more work and the same fatigue, or the same amount of work with less fatigue. Either way, a strong aerobic system is important.

Things to Consider

- Don’t use similar aerobic builders as the strength builders
- If you are squatting, so ride a bike consider swimming
- If you are benching, consider a bike
- Etc.

Compensatory Acceleration/Accommodating Resistance

- Bands and Chains
- Use after a plateau
- Great for velocity
- Great for PAP
- Looks cool

Undulating Periodization

- Studies show this works better than linear
- Have blocks that are hypertrophy in nature and transmutation in nature, while having elements of other blocks
- Ex. 10’s, 5’s, and 3’s (avg 8)
- 5’s, 3’s, and 1 (avg 5) etc

Exercises or Drills to fix flaws

- Drills better than verbal
- External better than internal ex. Int Rotation for snatch
- Internal better than nothing
- Most out of the least

Prioritize Most difficult movement or weakness

- Basic
- If issue is snatch, then snatch
- See Morgan’s plan

RPE, Velocity, & Percentages

10 RPE- .3m/s and down

9 RPE- .3 to .5 m/s

8 RPE- .5 to .75 m/s

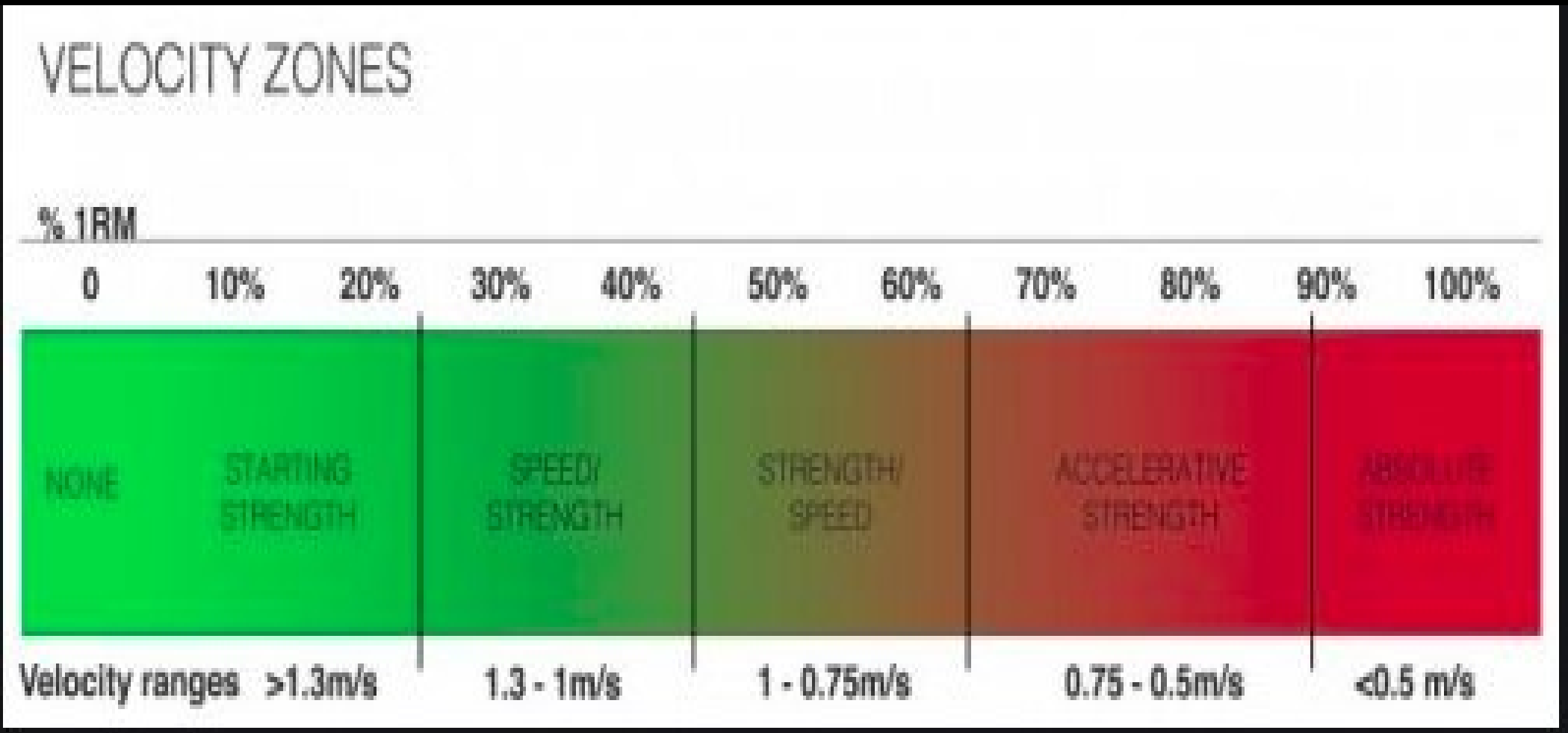
7 RPE- .75 to 1 m/s

6 RPE- 1 to 1.3 m/s

5 RPE- Greater that 1.3 m/s used for starting strength or warm up

1-4 RPE- Warm up weight used for technique and recovery.

RPE, Velocity, Percentages cont.



Data to Track

- Total Reps
- Total Load
- Relative Intensity
- Average Intensity [(Total Load/reps)/1 rep maximum]x10=% (ex. 100/2 x 3, 110/2 x 2, 120/1 x 3) (total load is 1400 and 13 reps were completed. Therefore average load was 108. If your max is 130kg, your average intensity is 83%
- K Value= (average training Intensity x 100)/Total

K-Value

- 3 month cycle with a total volume of 756,000kg and total repetitions of 7,000 and yielded a 300kg total
- Average Intensity= 756,000/7000=108kg
- K-Value= (108x100)=10,800 and then 10,800/300kg= 36
- Then if your goal is a 320kg total, this is the process: 320 x .36= an average intensity of 115kg will be needed
- Morgan ex Total Volume over 20 weeks was 1,420,000

Things to consider

- Asymmetries
- Omegawave
- Velocity
- Developing a Speed-Power Profile
- ROM
- Dysfunctions