

# Training of a Weightlifter: A Scientific Approach

SHYAM CHAVDA

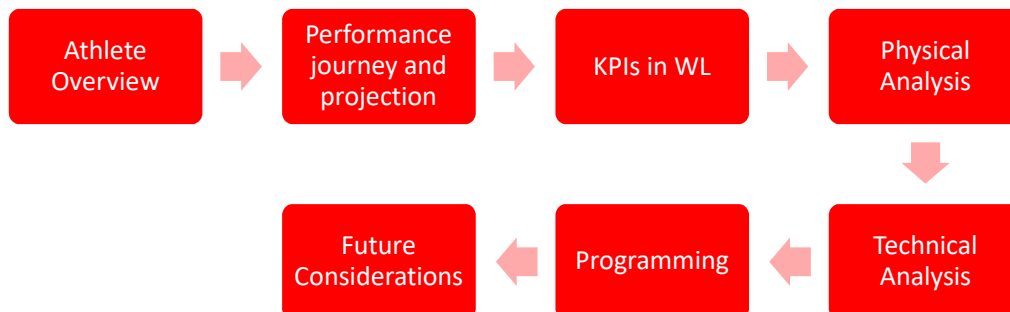
LONDON SPORT INSTITUTE, MIDDLESEX UNIVERSITY



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1

## Content



2

## Athlete Overview

**Name** : Cyrille Tchatchet II



**Age**: 23

**Occupation** : Mental Health Nurse / Student / Weightlifter



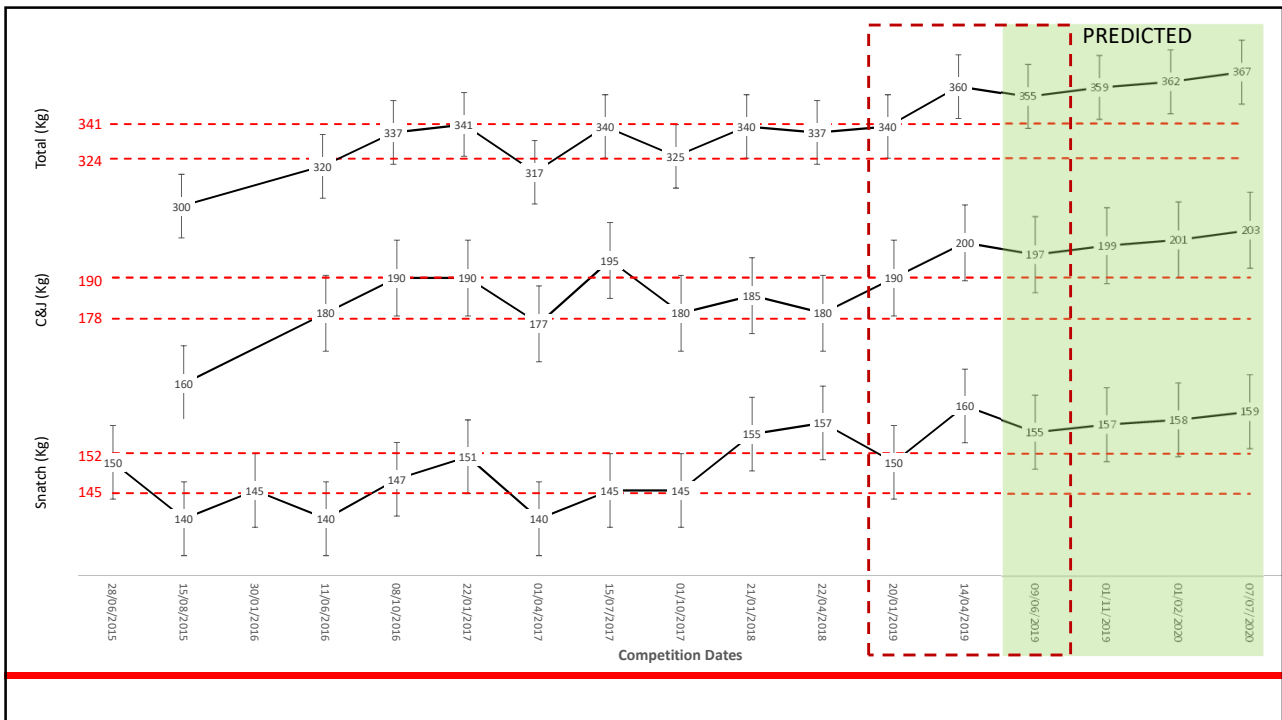
**Primary Weight Class** : 94 < 96 kg (102 kg)

**Injury** : Knee pathology



3

**From the Commonwealth Games to homelessness: the Cameroonian refugee weightlifter hoping to make it to the Tokyo Olympics**

4



5





## Key Performance Indicators (KPI)

Bar kinetics and kinematics<sup>1,2,3</sup>

Anthropometry<sup>4</sup>

Flexibility



Mindset

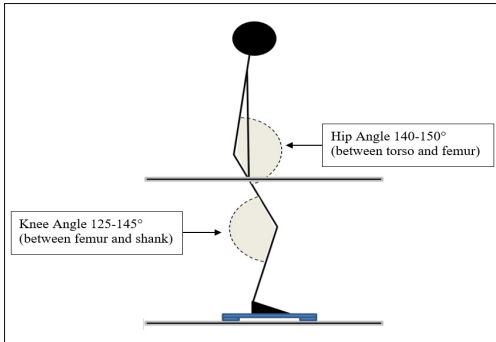
Strength & Power<sup>3,5</sup>

<sup>1</sup>Garhammer (1979) ; <sup>2</sup>Gourgoulis et al (2009); <sup>3</sup>Harbili and Alptekin (2014); <sup>4</sup>Ebada (2013); <sup>5</sup>Beckham et al (2013)

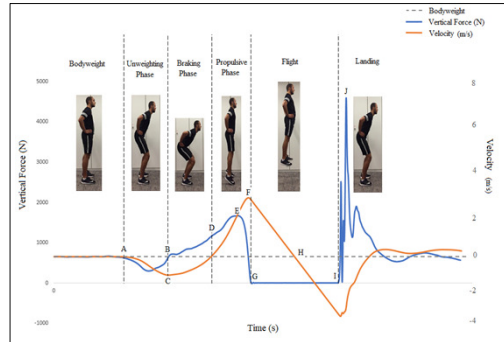
6

# IMTP & CMJ Testing

6



Peak Force (N), relative Peak Force (N/Kg)



Impulse (Ns)<sup>5</sup>, Jump Height (cm)<sup>5, 7</sup>, Power (W)<sup>9</sup>

Well related to WLP<sup>5, 7, 9</sup>

**PF (N) = 0.805 \***

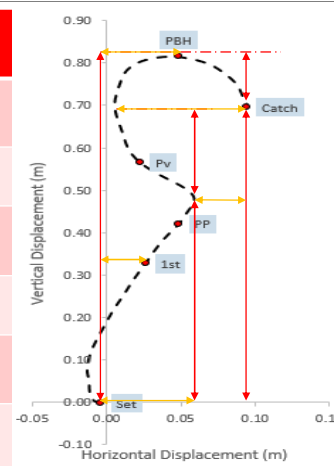
**ConImp = 0.769 \***

\*unpublished data; <sup>5</sup>Beckham et al 2013; <sup>6</sup>Chavda et al (in press); <sup>7</sup>Haff et al (2005); <sup>8</sup>Chavda et al (2018); <sup>9</sup>Carlock et al (2004)

7

# Barbell Trajectory

Point of Interest	Identifier	Key
Set	First frame before 0.01m displacement.	Set
1 <sup>st</sup> Pull	1 <sup>st</sup> vertical peak and 0 acceleration.	1 <sup>st</sup>
Power Position	Lowest v value after 1 <sup>st</sup> peak v and 0 acceleration.**	PP
Peak Velocity	Peak v value.	Pv
Peak Bar Height	Peak vertical displacement of barbell and 0 v.	PBH
Catch	Minimum displacement of barbell and 0 v.	Catch



<sup>10</sup> Stone et al (1998); <sup>11</sup> Ikeda et al (2012)

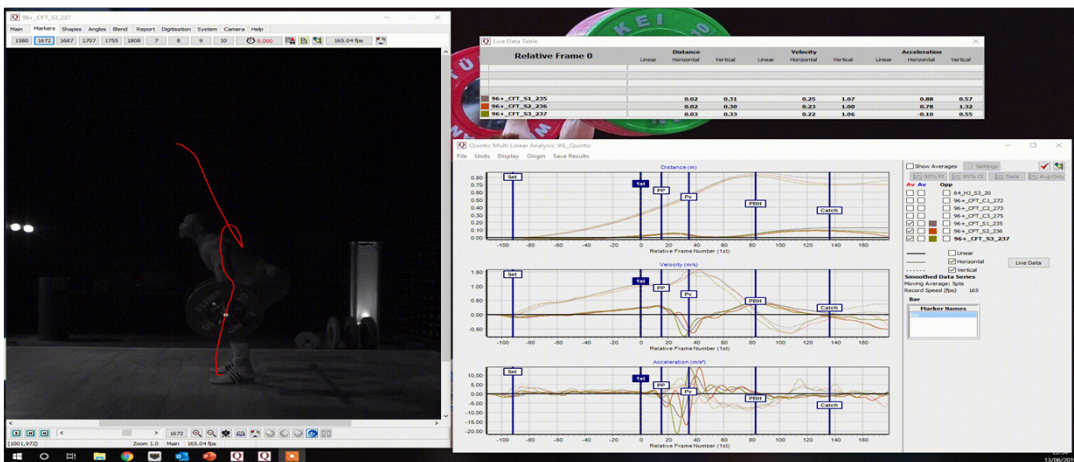
8

# Technical Analysis



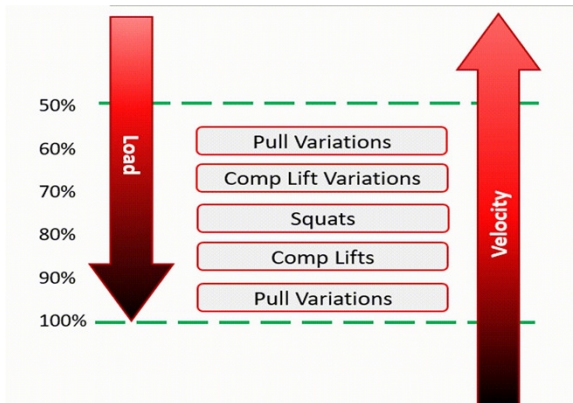
9

# Technical Analysis



10

# Exercise Selection

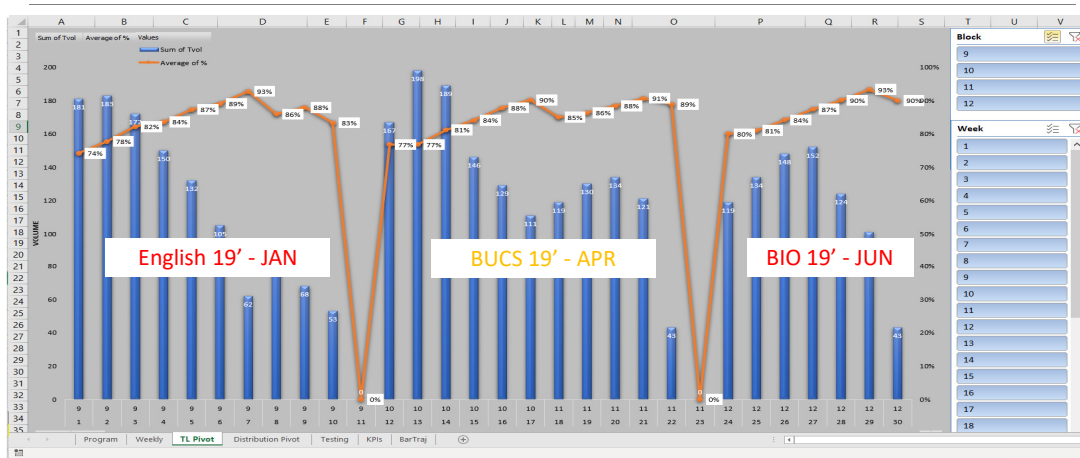


Primary Objective : "Improve pull to PP"	Intensity Range	Set x Rep Range
Secondary Objective : "Improve bar path after contact"		
MTC Pull	140-150%	3-4 x 4-1
Pulls (+ Power Pulls)	90-110%	2-5 x 3-1
Comp Lift Derivatives @ Knee from blocks	70-85%	3-5 x 2-3
High Pull	60-80%	3-4 x 4-2

<sup>12</sup>Suchomel, Comfort and Stone (2015); <sup>13</sup>Suchomel, Comfort and Lake (2017)

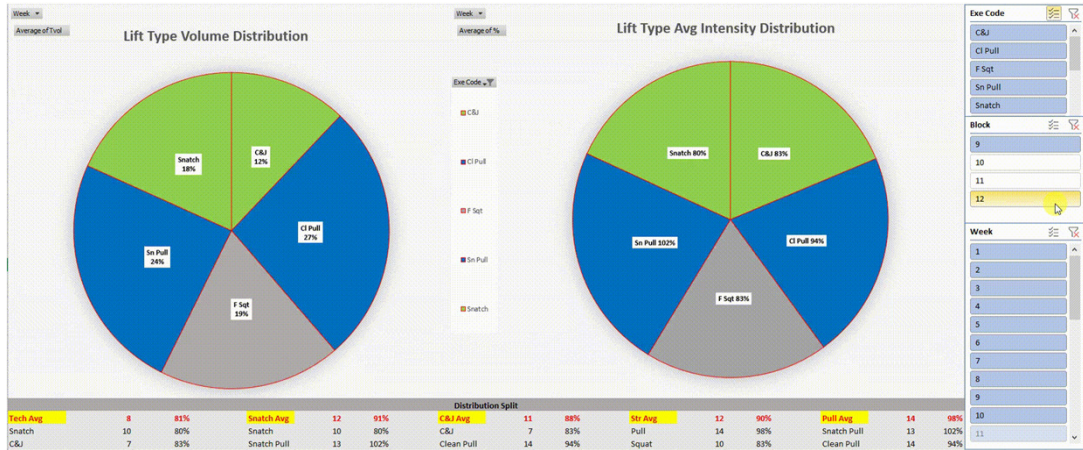
11

# Programming & Distribution



12

# Programming & Distribution



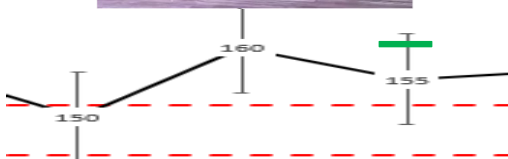
13

# Performance Outcomes

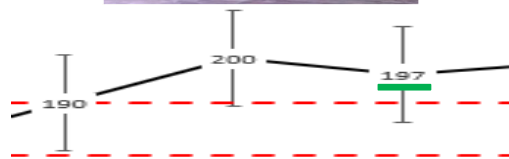
**Snatch – 161 nr lpb**



Projected : 355kg  
Attempted : 366kg  
Achieved : 356kg

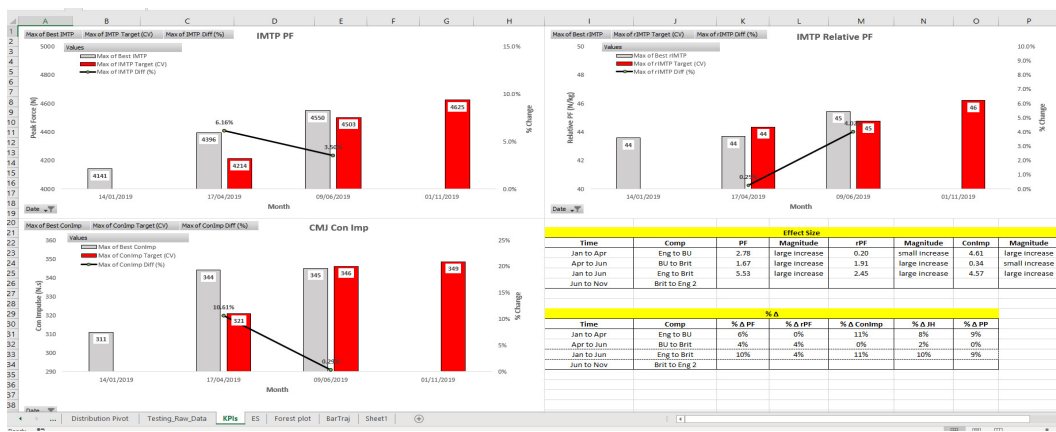


**C&J – 205x nr lpb**



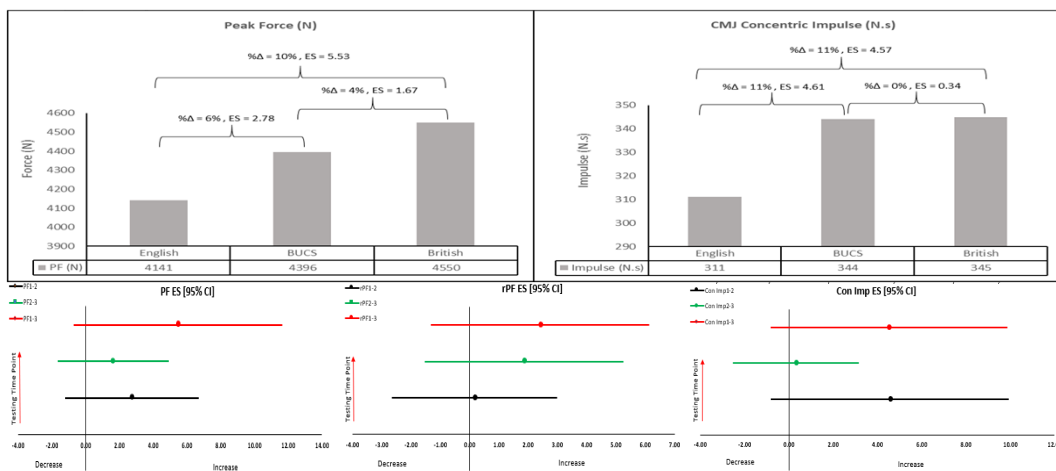
14

# Physical KPI's



15

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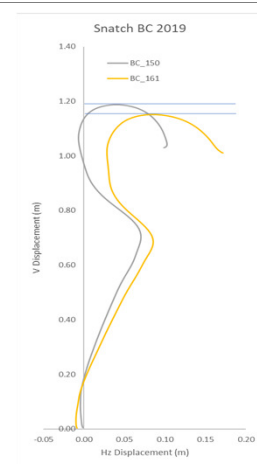


16



## Future Considerations

- Standardise training capture.
- Utilise average trajectories and associated variables from training.
- Explore alternative IMTP F metrics (i.e F@Tp, Impulse).
- Refine regression analysis and change boundaries.



17

Thank you..  
Questions?



@liCyrille



@Cyrille\_fagat

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18

## References

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