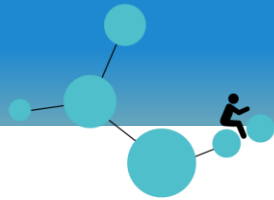


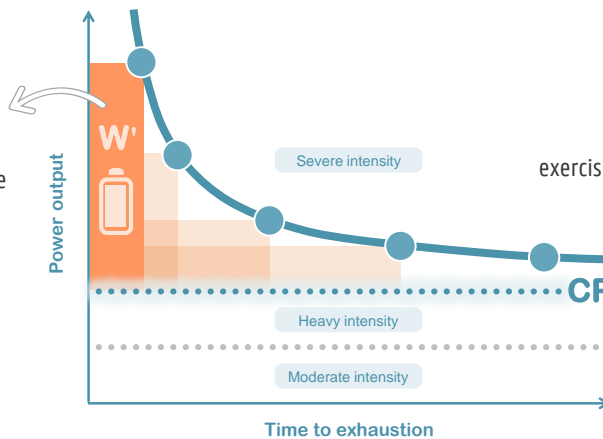
W' RECOVERY DURING INTERMITTENT EXERCISE

Current limitations and future challenges of predictive models

Dr. Kevin Caen



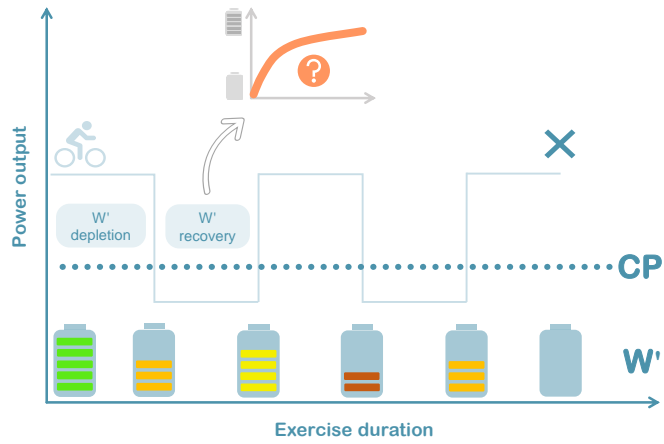
W prime
fixed amount of energy that can be spent above CP



Critical power
exercise threshold that represents the MMSS intensity

Critical power model





Critical power model



$$W'_{\text{bal}} = W' - \int_0^t (W'_{\text{exp}}) (e^{-(t-u)/\tau_{W'}}) du$$

Skiba et al. (2012)

W'_{BAL} model



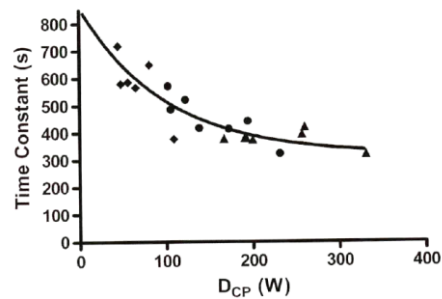
$$W'_{\text{bal}} = W' - \int_0^t (W'_{\text{exp}}) (e^{-(t-u)/\tau_{W'}}) du$$

$$\tau_{W'} = 546e^{(-0.01D_{\text{CP}})} + 316$$

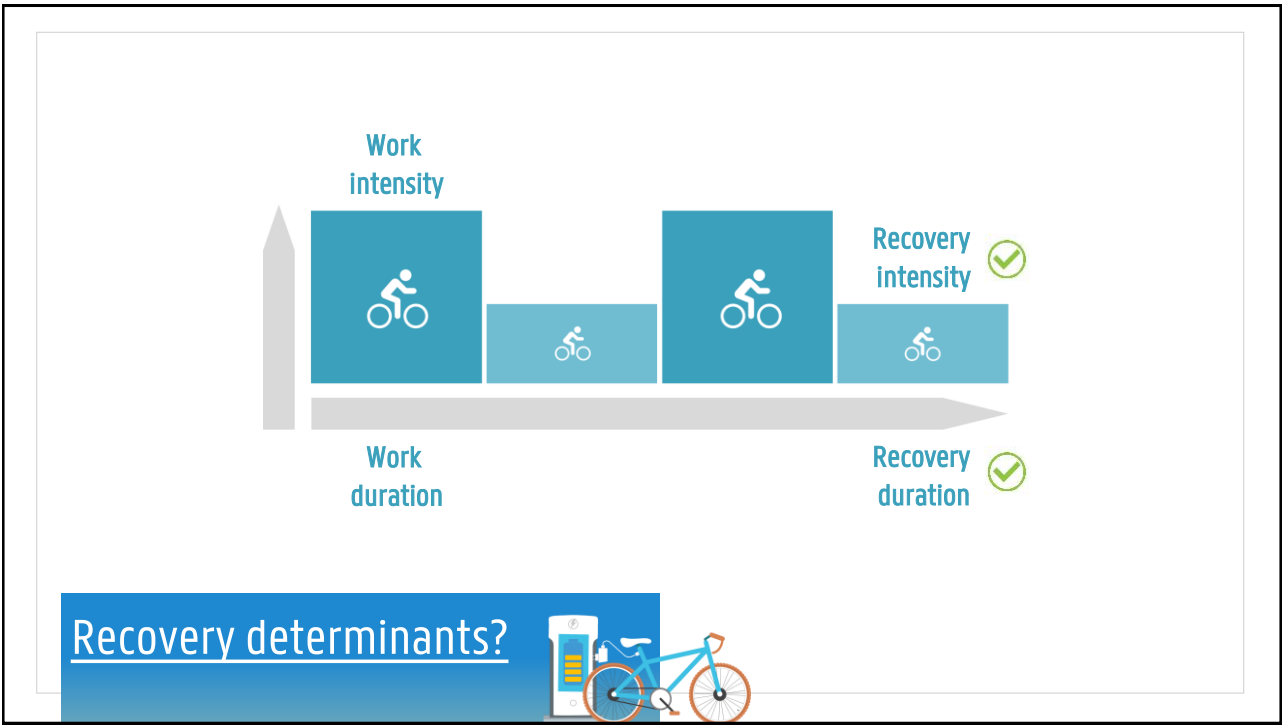
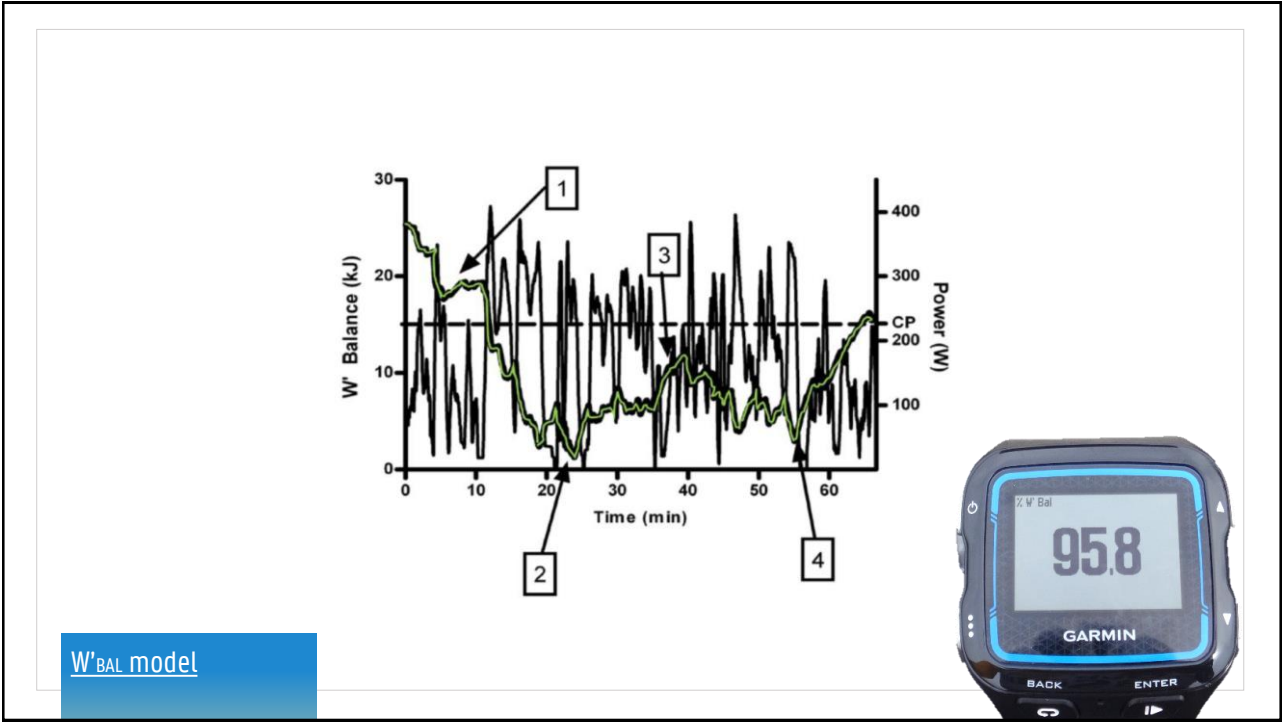
W'_{BAL} model

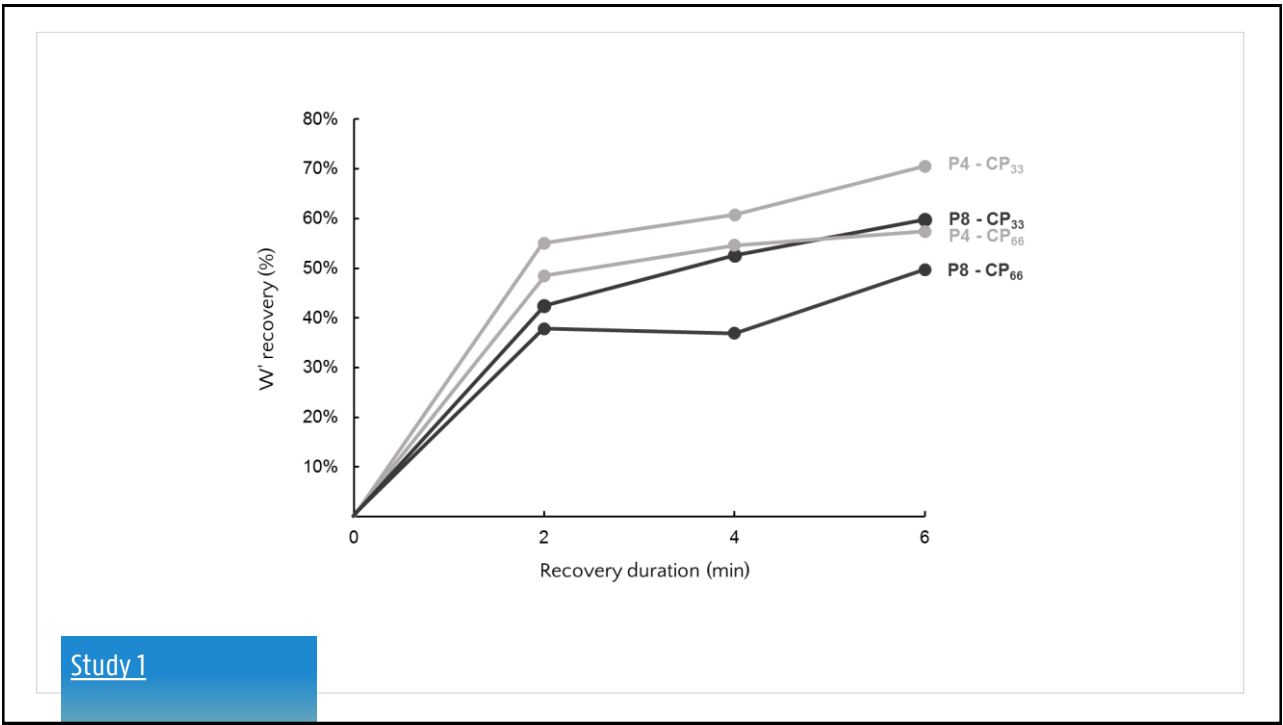
$$W'_{\text{bal}} = W' - \int_0^t (W'_{\text{exp}}) (e^{-(t-u)/\tau_{W'}}) du$$

$$\tau_{W'} = 546e^{(-0.01D_{\text{CP}})} + 316$$



W'_{BAL} model





13.4%

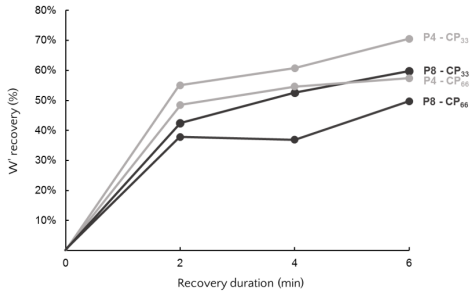
difference between 6 min and 2 min recovery

9.4%

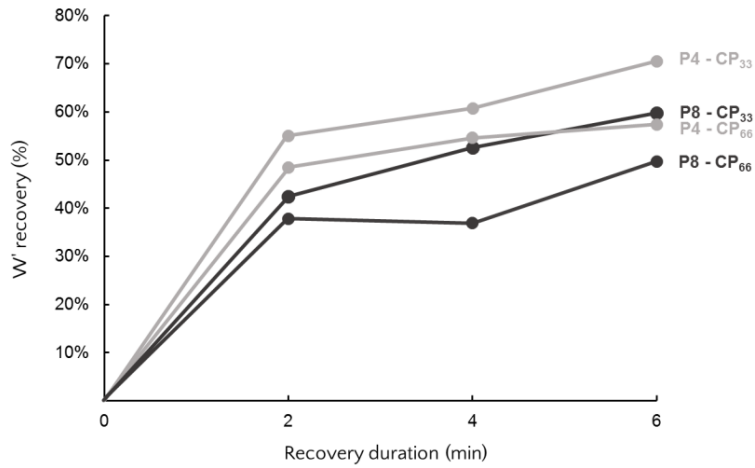
difference between CP₃₃ and CP₆₆

11.3%

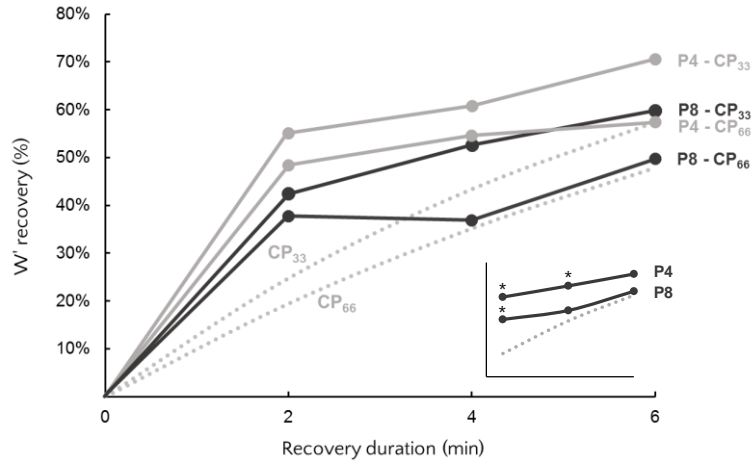
difference between P4 and P8



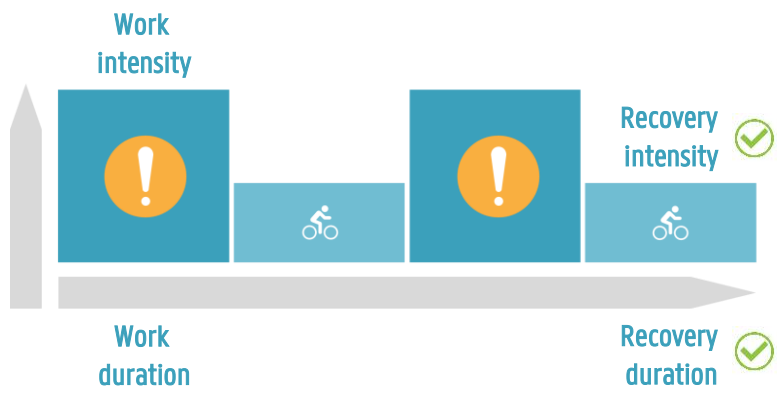
Study 1

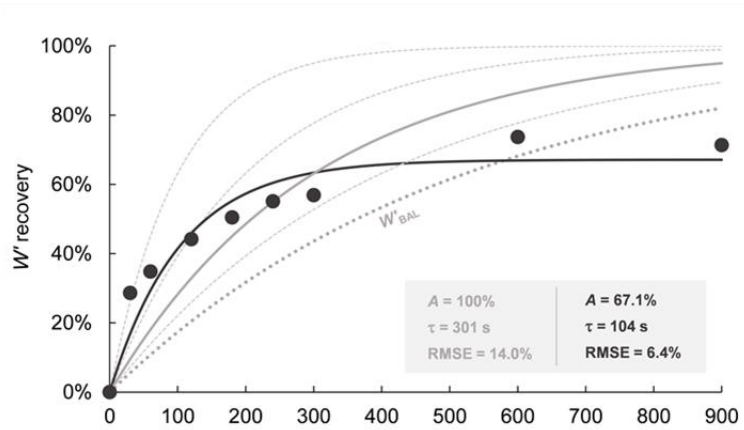


Study 1

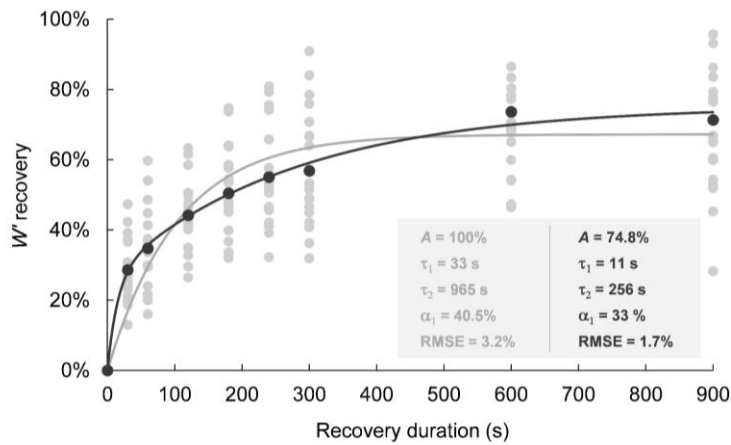


Study 1



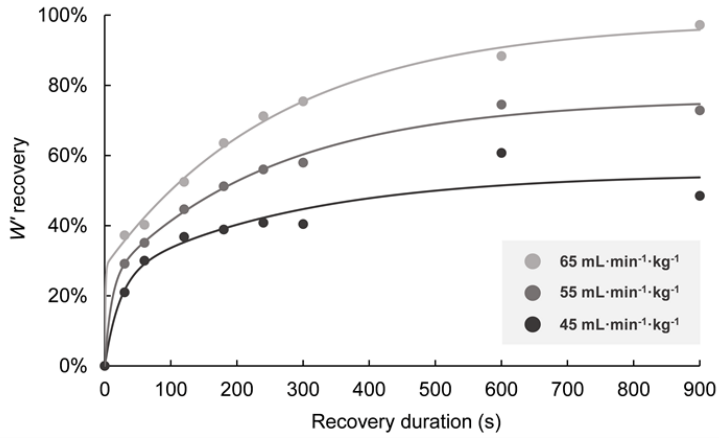


Study 2

Mono-exponential modelling of W' recovery

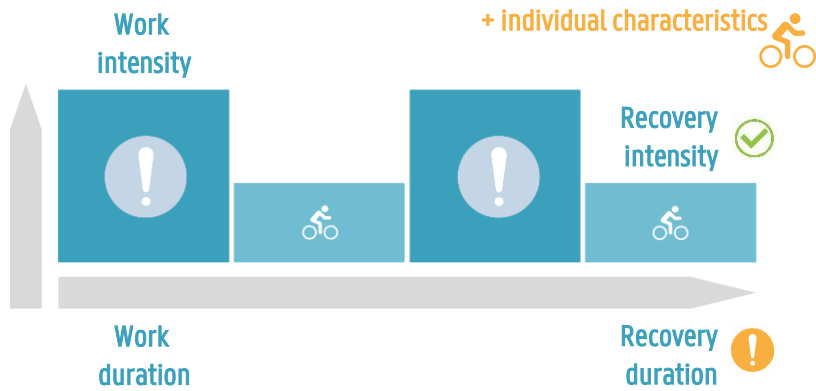
Study 2

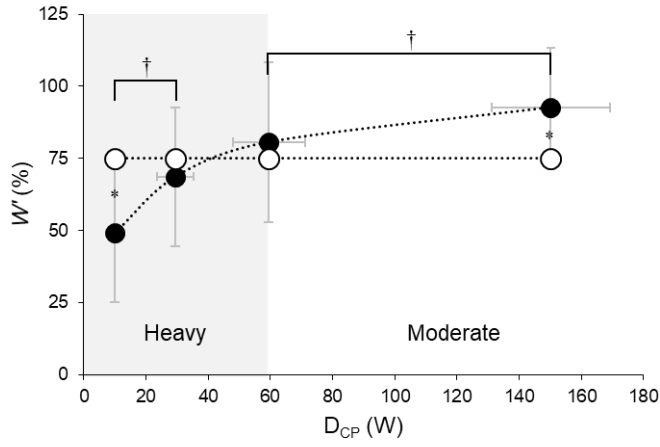
Biexponential modelling of W' recovery



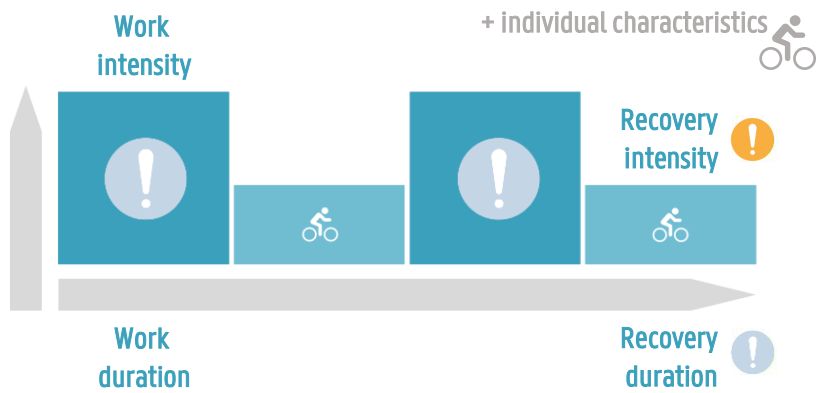
Study 2

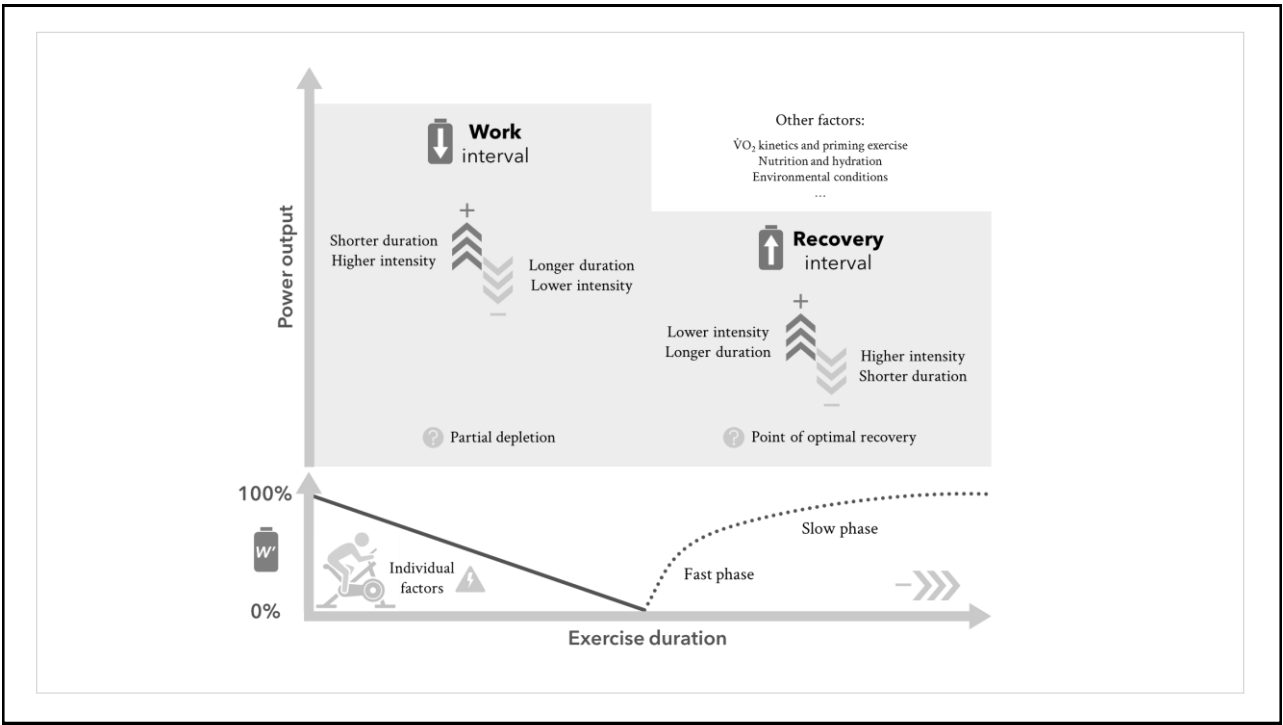
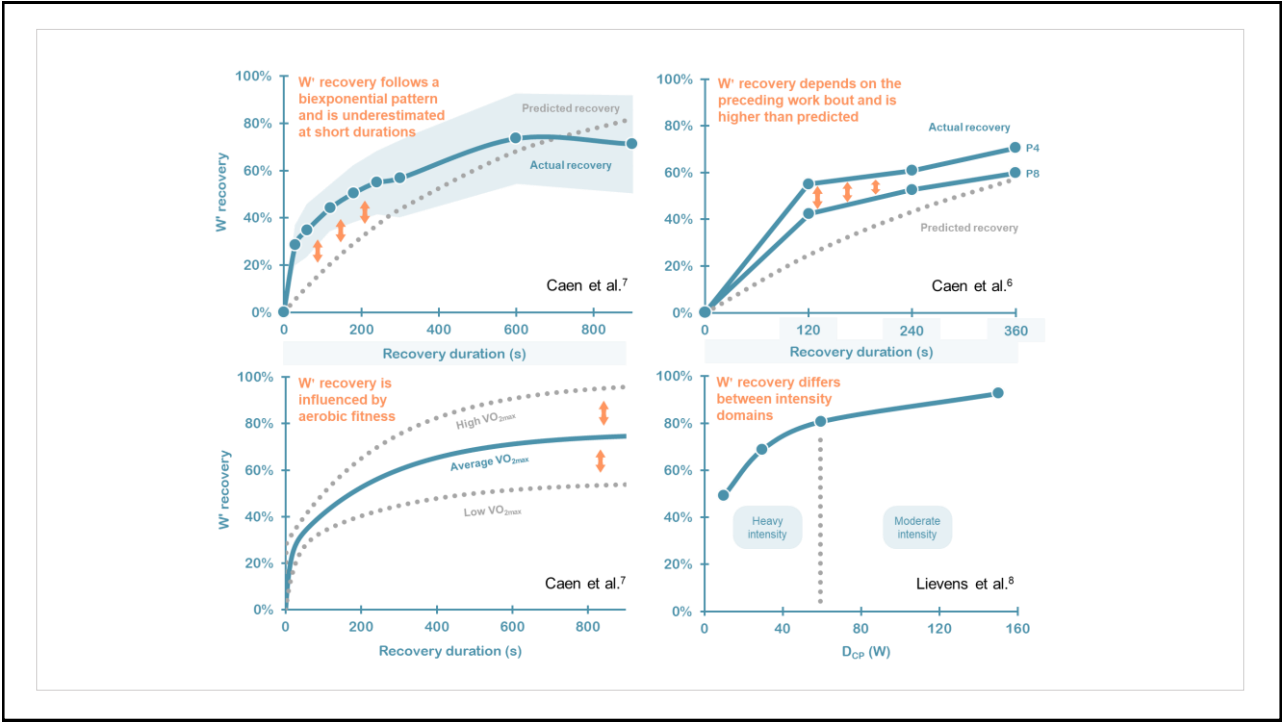
Influence of aerobic fitness (VO_{2max})

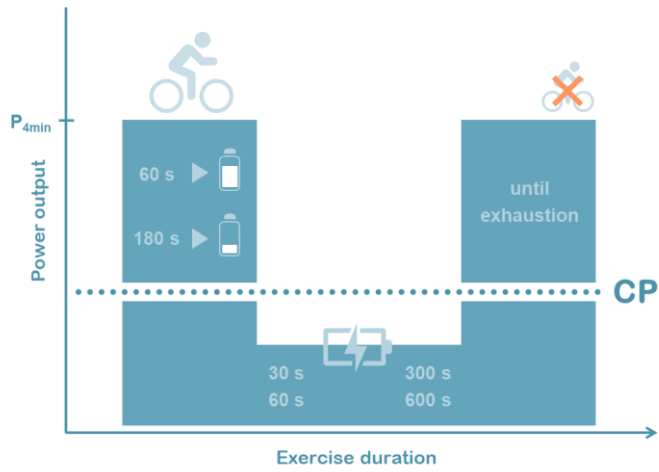




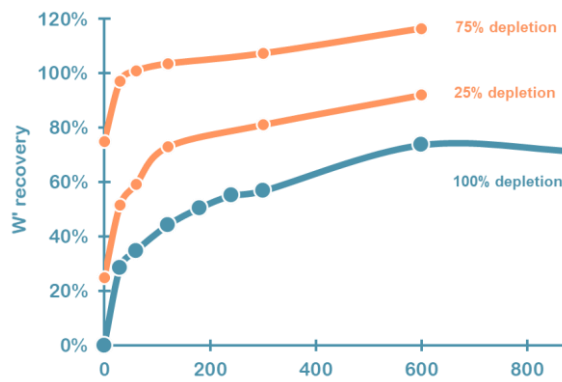
Study 3



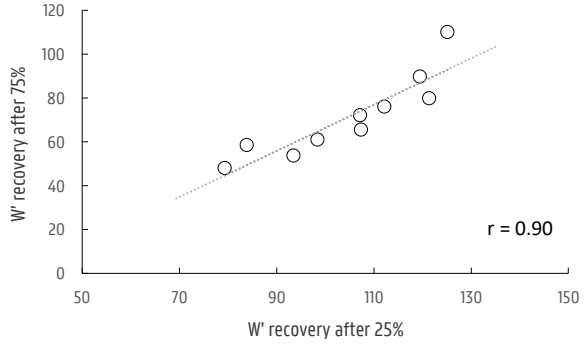
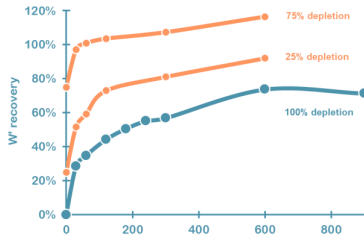




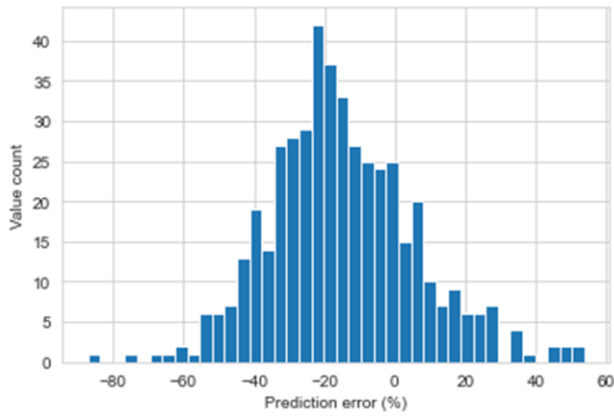
Study 4



Study 4

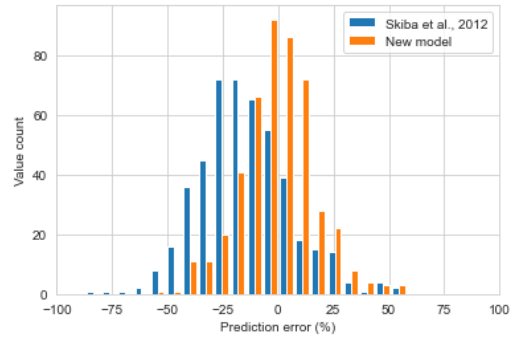
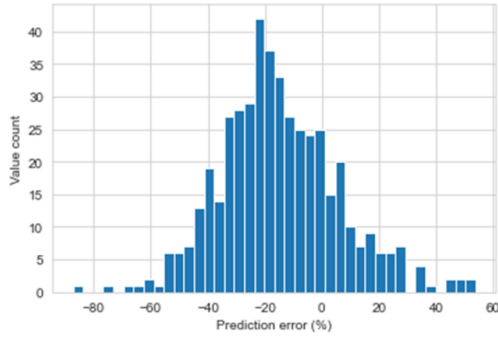


Study 4



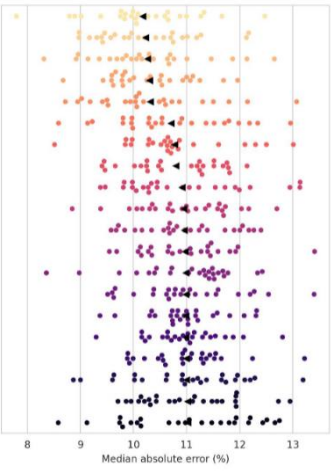
Model predictions





Model predictions

- CP/kg Relative_Dcp / Work_duration_real Recovery_duration_real
- GET Relative_Dcp / Work_duration_real Recovery_duration_real
- Absolute_Dcp constant / Work_duration_real Recovery_duration_real
- Depletion% Absolute_Dcp / Work_duration_real Recovery_duration_real
- VO2max Absolute_Dcp / Work_duration_real Recovery_duration_real
- Work_duration_real Recovery_duration_real / Work_intensity_real^2
- Work_duration_real Recovery_duration_real / W Absolute_Dcp
- CP/kg Relative_Dcp / W Work_duration_real
- Work_duration_real Recovery_duration_real / VO2max Work_duration
- GET VO2max / W Work_duration_real
- GET^2 / W/kg Work_duration_real
- CP constant / Work_duration_real Work_intensity_real_percentage
- CP Depletion% / Work_duration_real Work_intensity_real_percentage
- Work_intensity_real Relative_Dcp / W/kg Recovery_duration_real
- Depletion% Absolute_Dcp / Work_duration_real Work_intensity_real_percentage
- CP Relative_Dcp / Work_duration_real constant
- GET Work_intensity_real_percentage / W/kg Work_duration_real
- Depletion% Absolute_Dcp / CP/kg Work_duration_real
- CP/kg^2 / W Work_duration_real
- Work_duration_real Recovery_duration_real / CP Work_intensity_real



Model predictions

W' RECOVERY DURING INTERMITTENT EXERCISE

Current limitations and future challenges of predictive models

Dr. Kevin Caen

