

# **Analysis Report**

This report is structured as follows.

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## **Outlier Assessment**

In the process of assessing outliers for a dataset involving physical performance measures under different conditions and times, the analysis incorporated the calculation of z-scores, a statistical technique that measures the distance of a single point from the mean in terms of standard deviations. Z-scores provide a method of identifying outliers by quantifying how unusual a data point is in comparison to the average observed values.

For the current analysis, the threshold for identifying extreme outliers was set at a z-score greater than |3|. This cutoff is based on the statistical rule that approximately 99.7% of data within a normally distributed dataset lies within three standard deviations from the mean. Therefore, values exceeding this range are considered highly unusual and potentially detrimental to the integrity of the model, as they can significantly skew the results.

In the data assessed, four cases were identified as extreme outliers and subsequently excluded from further modeling to prevent bias (table below).

SubjectID	Measure	Condition	Time	z_Value
#11	Time_to_take_off	Week 3 - 70%BW	post	-4.957
#5	Take_off_velocity	Week 4 - 90%BW	post	-6.132
#6	Take_off_velocity	Week 6 - 130%BW	post	-8.341
#7	Peak_braking_force	Week 6 - 130%BW	pre	4.433

## **Normality Assessment**

The normality assessment of various groups indicated skewness and kurtosis values within reasonable limits for most variables, suggesting that the underlying distribution of the data did not deviate substantially from normality, apart from the aforementioned extreme cases. This assessment further supports the decision to exclude extreme outliers based on z-scores to maintain the robustness and validity of subsequent analytical models.

Group	Skewness	Kurtosis
Jump_height	0.031	-0.132
Countermovement_depth	-0.187	-0.608
Peak_braking_force	0.279	-0.499
Peak_propulsive_force	0.413	-1.298
Braking_phase	0.390	0.441
Propulsive_phase	-0.234	-0.487
Flight_time	-0.232	0.206
Time_to_take_off	0.470	0.364
Take_off_velocity	-0.269	0.082
Peak_landing_force	0.726	-0.279
RSI	0.052	-0.428
mRSI	0.050	-1.033

For the analysis of the dataset involving multiple physical performance measures recorded under varying conditions (e.g., 70% body weight, 90% body weight, 130% body weight) and times (e.g., pre-intervention, post-intervention), a two-way repeated measures ANOVA was selected as the most appropriate statistical approach. This method was chosen due to its ability to handle data where measurements are taken on the same subjects under different conditions and times, thus accounting for the intra-subject correlation and interaction effects between time and condition.

In this model, individuals were treated as a random effect. This acknowledges the random variation among subjects, allowing for the generalization of the findings to a broader population, beyond just the sampled individuals. By incorporating individuals as a random term, the model effectively separates the intra-individual (within-subject) variability from the inter-individual (between-subject) variability, enhancing the accuracy in detecting the effects of the experimental conditions.

The analysis was conducted using R, a statistical computing and graphics software. Specifically, the `ezANOVA` function from the `ez` package was utilized, which is designed to simplify the analysis and visualization of factorial experiments. Additionally, the `lme4` package was used to fit the mixed-effects models, providing robust estimates of fixed and random effects. The combination of these packages in R allows for a comprehensive analysis of repeated measures data, handling the complexities of such datasets efficiently.

The sections below show the results for each physical measure.

### **The effect of the intervention on Jump Height**

Analysis of the intervention revealed significant effects on jump height when adjusting for baseline measures taken during Week 1 - 30%BW. Decreases in jump height were significant in Week 2 - 50%BW ( $B = -0.019$ ,  $SE = 0.007$ ,  $p = .008$ ), Week 3 - 70%BW ( $B = -0.018$ ,  $SE = 0.007$ ,  $p = .011$ ), Week 4 - 90%BW ( $B = -0.018$ ,  $SE = 0.007$ ,  $p = .015$ ), and Week 6 - 130%BW ( $B = -0.016$ ,  $SE = 0.007$ ,  $p = .027$ ). The reductions during Week 5 - 110%BW and Week 7 - MAXISO did not reach statistical significance. Interaction effects suggested that the timing of the measurement (pre vs. post) did not significantly influence the intervention outcomes, with only the interaction in Week 2 - 50%BW

approaching significance ( $B = 0.017$ ,  $SE = 0.010$ ,  $p = .099$ ), indicating a potentially significant time-specific response. This would mean that the pre/post effect is significantly different at 50%BW compared to Week 1 at 30%BW.

Measure	Effect	B	SE	DF	t	p
Jump_height	(Intercept)	0.453	0.017	141	26.618	0.000
	ConditionWeek 2 - 50%BW	-0.019	0.007	141	-2.703	0.008
	ConditionWeek 3 - 70%BW	-0.018	0.007	141	-2.586	0.011
	ConditionWeek 4 - 90%BW	-0.018	0.007	141	-2.468	0.015
	ConditionWeek 5 - 110%BW	-0.004	0.007	141	-0.588	0.558
	ConditionWeek 6 - 130%BW	-0.016	0.007	141	-2.233	0.027
	ConditionWeek 7 - MAXISO	-0.012	0.007	141	-1.647	0.102
	Timepost	-0.007	0.007	141	-0.940	0.349
	ConditionWeek 2 - 50%BW:Timepost	0.017	0.010	141	1.662	0.099
	ConditionWeek 3 - 70%BW:Timepost	0.017	0.010	141	1.662	0.099
	ConditionWeek 4 - 90%BW:Timepost	0.012	0.010	141	1.163	0.247
	ConditionWeek 5 - 110%BW:Timepost	0.001	0.010	141	0.083	0.934
	ConditionWeek 6 - 130%BW:Timepost	0.010	0.010	141	0.997	0.320
	ConditionWeek 7 - MAXISO:Timepost	0.011	0.010	141	1.094	0.276

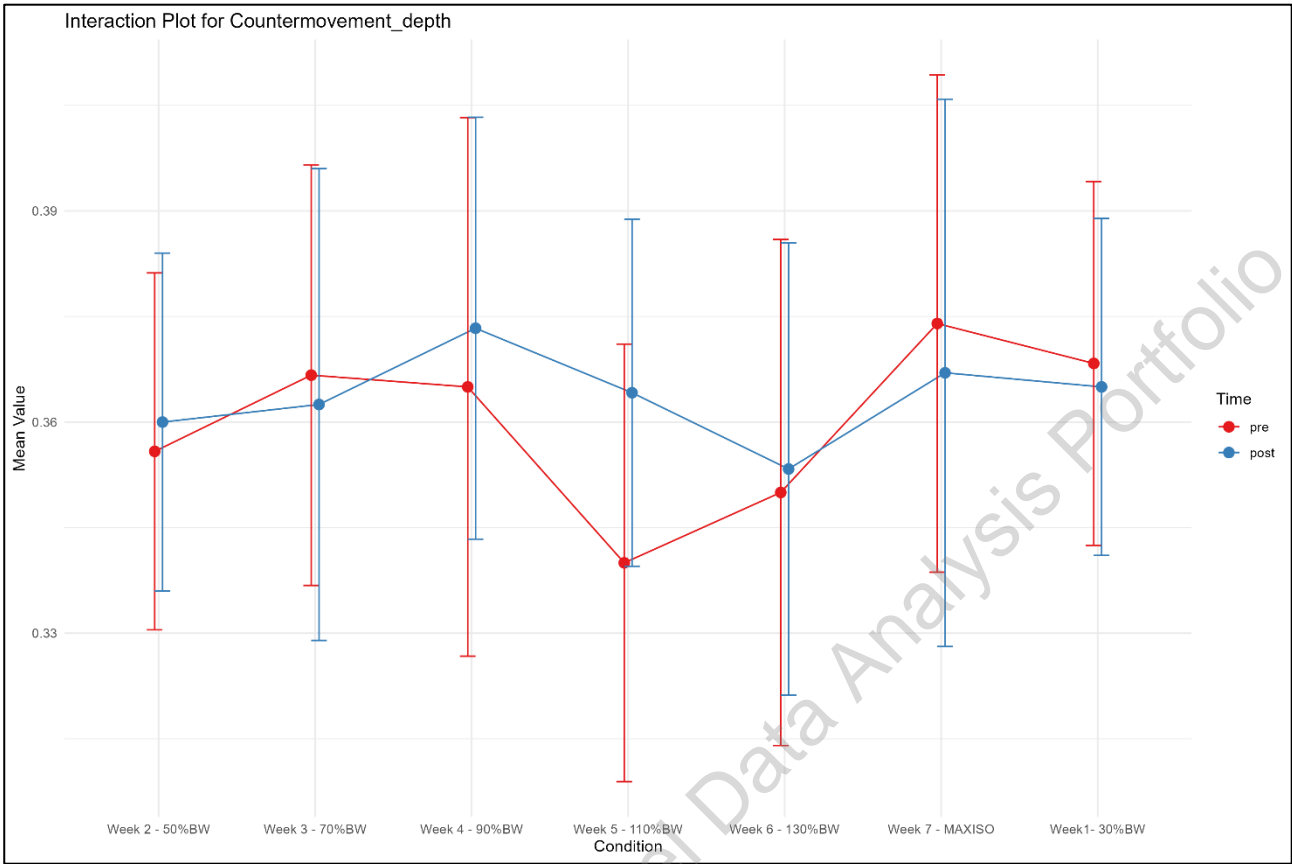
### The effect of the intervention on Counter Movement Depth

The intervention demonstrated less consistent effects on countermovement depth, with only Week 5 - 110%BW showing a significant reduction compared to baseline ( $B = -0.028$ ,  $SE = 0.011$ ,  $p = .008$ ). No other conditions exhibited significant changes. Notably, the marginal increase observed in Week 5 - 110%BW

( $B = 0.028$ ,  $SE = 0.015$ ,  $p = .068$ ) suggests that the timing of the measurements may influence the effects of the intervention, although these results did not consistently reach statistical significance.

Measure	Effect	B	SE	DF	t	p
Countermovement_depth	(Intercept)	0.368	0.015	138	23.986	0.000
	ConditionWeek 2 - 50%BW	-0.013	0.011	138	-1.183	0.239
	ConditionWeek 3 - 70%BW	-0.002	0.011	138	-0.158	0.875
	ConditionWeek 4 - 90%BW	-0.003	0.011	138	-0.315	0.753
	ConditionWeek 5 - 110%BW	-0.028	0.011	138	-2.680	0.008
	ConditionWeek 6 - 130%BW	-0.012	0.011	138	-1.146	0.254
	ConditionWeek 7 - MAXISO	0.004	0.011	138	0.378	0.706
	Timepost	-0.003	0.011	138	-0.315	0.753
	ConditionWeek 2 - 50%BW:Timepost	0.008	0.015	138	0.502	0.617
	ConditionWeek 3 - 70%BW:Timepost	-0.001	0.015	138	-0.056	0.956
	ConditionWeek 4 - 90%BW:Timepost	0.012	0.015	138	0.780	0.436
	ConditionWeek 5 - 110%BW:Timepost	0.028	0.015	138	1.840	0.068
	ConditionWeek 6 - 130%BW:Timepost	0.001	0.015	138	0.049	0.961
	ConditionWeek 7 - MAXISO:Timepost	-0.004	0.016	138	-0.234	0.815

The image below shows the pre and post mean scores (with standard error) on each week for this measure.

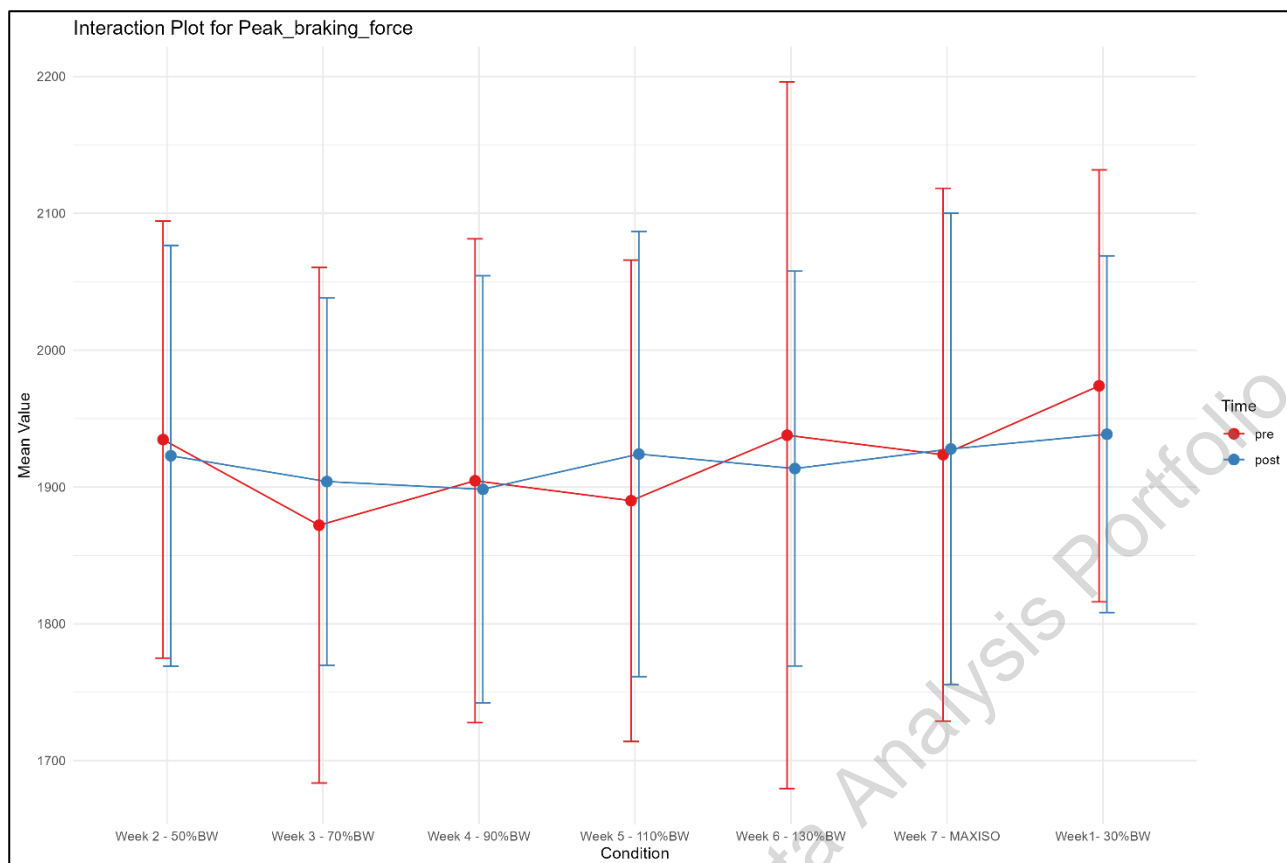


### The effect of the intervention on Peak Braking

The analysis indicated that the baseline peak braking force, when controlling for the initial condition of Week 1 - 30%BW, was substantial ( $B = 1973.917$ ,  $SE = 81.924$ ,  $p < .001$ ). Notable reductions in peak braking force occurred at specific points during the intervention: Week 3 - 70%BW ( $B = -101.833$ ,  $SE = 45.838$ ,  $p = .028$ ) and Week 6 - 130%BW ( $B = -116.488$ ,  $SE = 46.945$ ,  $p = .014$ ), demonstrating significant decreases. Adjustments in Week 5 - 110%BW also approached significance, suggesting a potential reduction ( $B = -83.917$ ,  $SE = 45.838$ ,  $p = .069$ ). Other conditions, including interactions with the post-test measurements, did not demonstrate significant changes.

Measure	Effect	B	SE	DF	t	p
Peak_braking_force	(Intercept)	1973.917	81.924	140	24.094	0.000
	ConditionWeek 2 - 50%BW	-39.250	45.838	140	-0.856	0.393
	ConditionWeek 3 - 70%BW	-101.833	45.838	140	-2.222	0.028
	ConditionWeek 4 - 90%BW	-69.333	45.838	140	-1.513	0.133
	ConditionWeek 5 - 110%BW	-83.917	45.838	140	-1.831	0.069
	ConditionWeek 6 - 130%BW	-116.488	46.945	140	-2.481	0.014
	ConditionWeek 7 - MAXISO	-25.475	46.952	140	-0.543	0.588
	Timepost	-35.333	45.838	140	-0.771	0.442
	ConditionWeek 2 - 50%BW:Timepost	23.500	64.824	140	0.363	0.718
	ConditionWeek 3 - 70%BW:Timepost	67.250	64.824	140	1.037	0.301
	ConditionWeek 4 - 90%BW:Timepost	29.083	64.824	140	0.449	0.654
	ConditionWeek 5 - 110%BW:Timepost	69.417	64.824	140	1.071	0.286
	ConditionWeek 6 - 130%BW:Timepost	91.404	65.612	140	1.393	0.166
	ConditionWeek 7 - MAXISO:Timepost	39.515	66.281	140	0.596	0.552

The image below shows the pre and post mean scores (with standard error) on each week for this measure.



### The effect of the intervention on Peak Propulsive Force

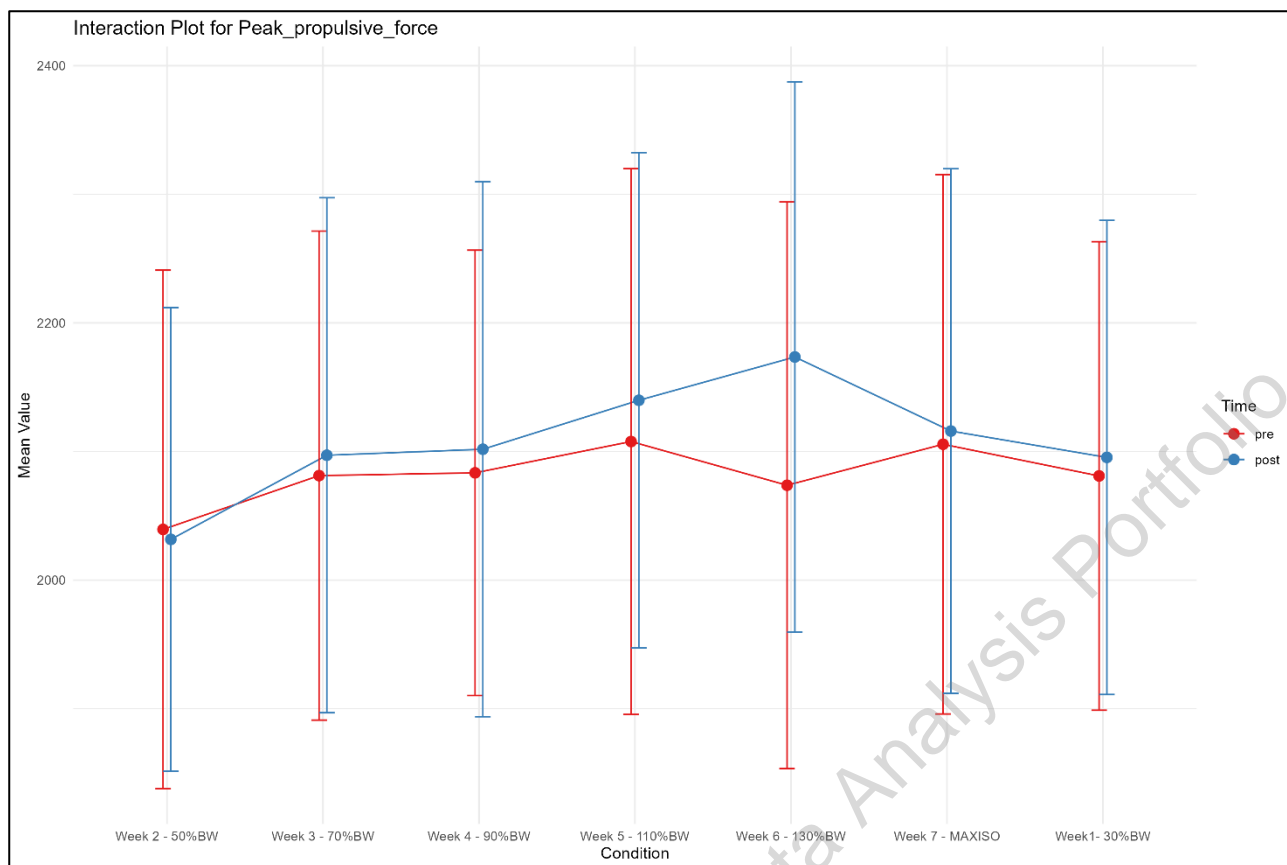
The baseline peak propulsive force measured during Week 1 - 30%BW was 2081.000 (SE = 100.149,  $p < .001$ ). Throughout the intervention, changes in peak propulsive force were not statistically significant in any specific week. However, interaction effects approached significance during Week 6 - 130%BW

( $B = 85.333$ ,  $SE = 48.531$ ,  $p = .081$ ), indicating a possible increase in force production when considering the time post-test, although this did not reach conventional levels of significance.

Measure	Effect	B	SE	DF	t	p
Peak_propulsive_force	(Intercept)	2081.000	100.149	141	20.779	0.000
	ConditionWeek 2 - 50%BW	-41.583	34.317	141	-1.212	0.228
	ConditionWeek 3 - 70%BW	0.250	34.317	141	0.007	0.994
	ConditionWeek 4 - 90%BW	2.417	34.317	141	0.070	0.944
	ConditionWeek 5 - 110%BW	26.750	34.317	141	0.780	0.437
	ConditionWeek 6 - 130%BW	-7.250	34.317	141	-0.211	0.833
	ConditionWeek 7 - MAXISO	38.452	35.151	141	1.094	0.276
	Timepost	14.417	34.317	141	0.420	0.675
	ConditionWeek 2 - 50%BW:Timepost	-22.167	48.531	141	-0.457	0.649
	ConditionWeek 3 - 70%BW:Timepost	1.417	48.531	141	0.029	0.977
	ConditionWeek 4 - 90%BW:Timepost	3.917	48.531	141	0.081	0.936
	ConditionWeek 5 - 110%BW:Timepost	17.667	48.531	141	0.364	0.716
	ConditionWeek 6 - 130%BW:Timepost	85.333	48.531	141	1.758	0.081
	ConditionWeek 7 - MAXISO:Timepost	-4.144	49.622	141	-0.084	0.934

The image below shows the pre and post mean scores (with standard error) on each week for this measure.





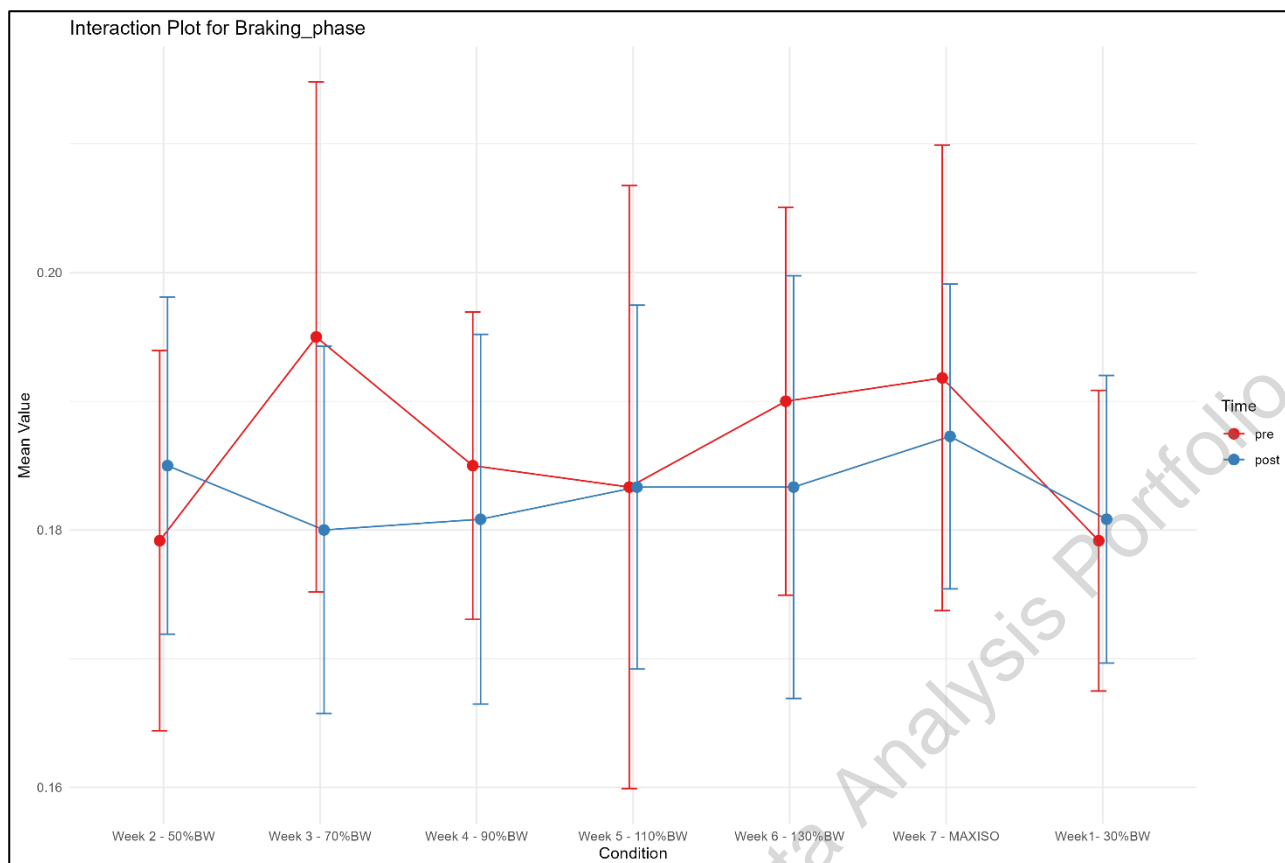
### The effect of the intervention on Braking Phase

The baseline braking phase started at 0.179 (SE = 0.008,  $p < .001$ ). Throughout the intervention, the most notable change was observed in Week 3 - 70%BW, where there was a statistically significant increase in braking phase ( $B = 0.016$ , SE = 0.007,  $p = .036$ ). Other conditions did not show significant effects, although Week 3 - 70%BW

approached significance ( $B = -0.017$ , SE = 0.011,  $p = .117$ ), suggesting a differential response when considering post-test measurements.

Measure	Effect	B	SE	DF	t	p
Braking_phase	(Intercept)	0.179	0.008	141	22.928	0.000
	ConditionWeek 2 - 50%BW	0.000	0.007	141	0.000	1.000
	ConditionWeek 3 - 70%BW	0.016	0.007	141	2.121	0.036
	ConditionWeek 4 - 90%BW	0.006	0.007	141	0.781	0.436
	ConditionWeek 5 - 110%BW	0.004	0.007	141	0.558	0.578
	ConditionWeek 6 - 130%BW	0.011	0.007	141	1.451	0.149
	ConditionWeek 7 - MAXISO	0.011	0.008	141	1.390	0.167
	Timepost	0.002	0.007	141	0.223	0.824
	ConditionWeek 2 - 50%BW:Timepost	0.004	0.011	141	0.395	0.694
	ConditionWeek 3 - 70%BW:Timepost	-0.017	0.011	141	-1.578	0.117
	ConditionWeek 4 - 90%BW:Timepost	-0.006	0.011	141	-0.552	0.582
	ConditionWeek 5 - 110%BW:Timepost	-0.002	0.011	141	-0.158	0.875
	ConditionWeek 6 - 130%BW:Timepost	-0.008	0.011	141	-0.789	0.431
	ConditionWeek 7 - MAXISO:Timepost	-0.006	0.011	141	-0.575	0.566

The image below shows the pre and post mean scores (with standard error) on each week for this measure.

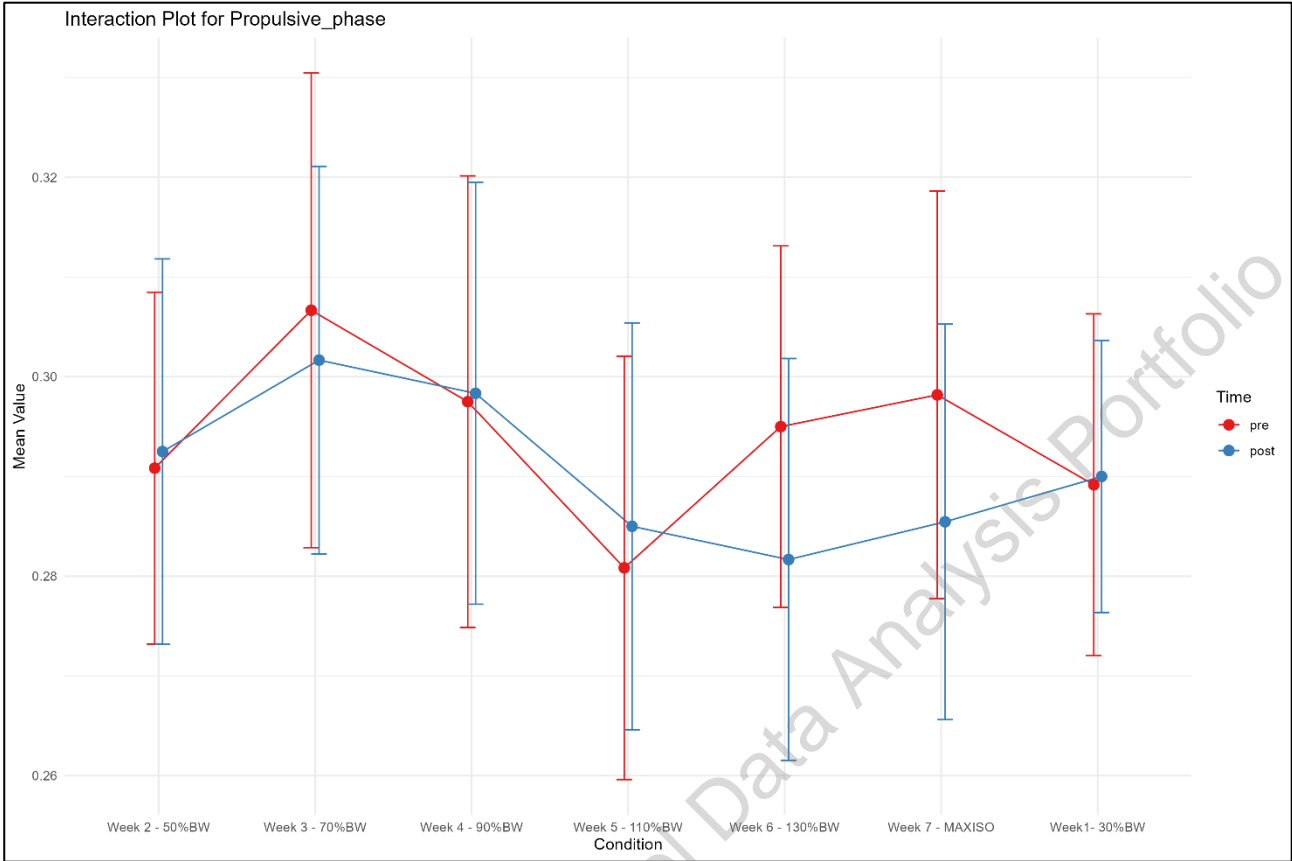


### The effect of the intervention on Propulsive Phase

Significant enhancements in propulsive phase were observed during Week 3 - 70%BW ( $B = 0.017$ ,  $SE = 0.006$ ,  $p = .008$ ). No other condition changes were statistically significant, although results for Week 5 - 110%BW approached significance ( $B = -0.008$ ,  $SE = 0.006$ ,  $p = .200$ ), indicating minor adjustments may occur in this phase of training.

Measure	Effect	B	SE	DF	t	p
Propulsive_phase	(Intercept)	0.289	0.010	141	28.929	0.000
	ConditionWeek 2 - 50%BW	0.002	0.006	141	0.257	0.797
	ConditionWeek 3 - 70%BW	0.017	0.006	141	2.702	0.008
	ConditionWeek 4 - 90%BW	0.008	0.006	141	1.287	0.200
	ConditionWeek 5 - 110%BW	-0.008	0.006	141	-1.287	0.200
	ConditionWeek 6 - 130%BW	0.006	0.006	141	0.901	0.369
	ConditionWeek 7 - MAXISO	0.008	0.007	141	1.181	0.239
	Timepost	0.001	0.006	141	0.129	0.898
	ConditionWeek 2 - 50%BW:Timepost	0.001	0.009	141	0.091	0.928
	ConditionWeek 3 - 70%BW:Timepost	-0.006	0.009	141	-0.637	0.525
	ConditionWeek 4 - 90%BW:Timepost	0.000	0.009	141	0.000	1.000
	ConditionWeek 5 - 110%BW:Timepost	0.003	0.009	141	0.364	0.716
	ConditionWeek 6 - 130%BW:Timepost	-0.014	0.009	141	-1.547	0.124
	ConditionWeek 7 - MAXISO:Timepost	-0.014	0.009	141	-1.448	0.150

The image below shows the pre and post mean scores (with standard error) on each week for this measure.



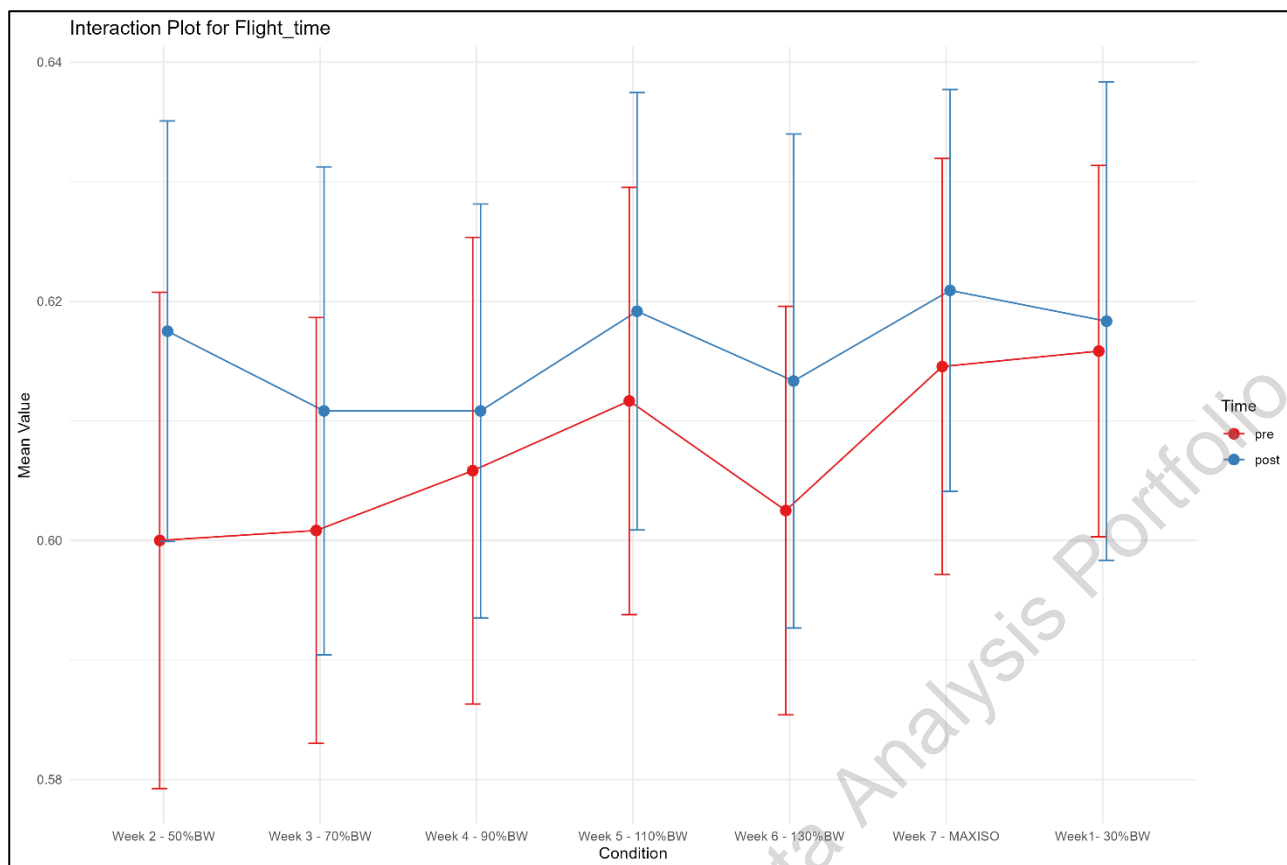
### The effect of the intervention on Flight Time

Significant baseline flight times were recorded ( $B = 0.616$ ,  $SE = 0.009$ ,  $p < .001$ ). The intervention significantly decreased flight time during Week 2 - 50%BW ( $B = -0.016$ ,  $SE = 0.006$ ,  $p = .011$ ), Week 3 - 70%BW ( $B = -0.015$ ,  $SE = 0.006$ ,  $p = .015$ ), and Week 6 - 130%BW ( $B = -0.013$ ,  $SE = 0.006$ ,  $p = .031$ ). Although not reaching conventional significance, the interaction effect during Week 2 - 50%BW

showed potential relevance ( $B = 0.015$ ,  $SE = 0.009$ ,  $p = .085$ ), suggesting a time-specific adaptation in flight time that merits further exploration.

Measure	Effect	B	SE	DF	t	p
Flight_time	(Intercept)	0.616	0.009	141	66.086	0.000
	ConditionWeek 2 - 50%BW	-0.016	0.006	141	-2.589	0.011
	ConditionWeek 3 - 70%BW	-0.015	0.006	141	-2.452	0.015
	ConditionWeek 4 - 90%BW	-0.010	0.006	141	-1.635	0.104
	ConditionWeek 5 - 110%BW	-0.004	0.006	141	-0.681	0.497
	ConditionWeek 6 - 130%BW	-0.013	0.006	141	-2.180	0.031
	ConditionWeek 7 - MAXISO	-0.001	0.006	141	-0.154	0.878
	Timepost	0.002	0.006	141	0.409	0.683
	ConditionWeek 2 - 50%BW:Timepost	0.015	0.009	141	1.734	0.085
	ConditionWeek 3 - 70%BW:Timepost	0.008	0.009	141	0.867	0.387
	ConditionWeek 4 - 90%BW:Timepost	0.003	0.009	141	0.289	0.773
	ConditionWeek 5 - 110%BW:Timepost	0.005	0.009	141	0.578	0.564
	ConditionWeek 6 - 130%BW:Timepost	0.008	0.009	141	0.963	0.337
	ConditionWeek 7 - MAXISO:Timepost	0.004	0.009	141	0.437	0.663

The image below shows the pre and post mean scores (with standard error) on each week for this measure.



### The effect of the intervention on Time to Take Off

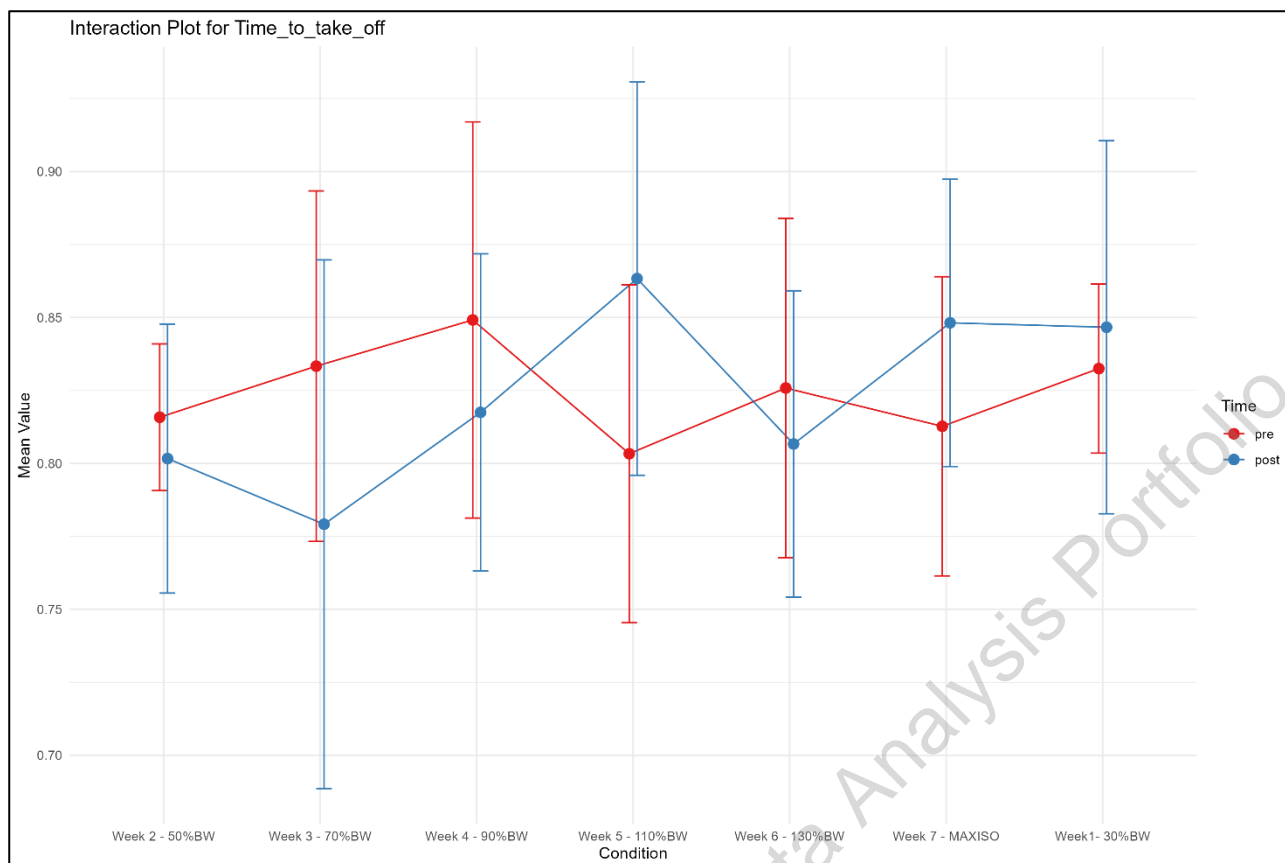
The baseline for time to take off was significantly high ( $B = 0.833$ ,  $SE = 0.027$ ,  $p < .001$ ). Throughout the intervention, there were no significant changes in time to take off for any condition or time point, although interactions for specific weeks, such as Week 4 - 90%BW

and Week 5 - 110%BW

, displayed non-significant trends that could indicate varying responses to the intervention (both  $B = -0.046$  and  $0.046$ , respectively;  $p = .214$ ).

Measure	Effect	B	SE	DF	t	p
Time_to_take_off	(Intercept)	0.833	0.027	140	30.695	0.000
	ConditionWeek 2 - 50%BW	-0.017	0.026	140	-0.641	0.522
	ConditionWeek 3 - 70%BW	0.001	0.026	140	0.032	0.974
	ConditionWeek 4 - 90%BW	0.017	0.026	140	0.641	0.522
	ConditionWeek 5 - 110%BW	-0.029	0.026	140	-1.122	0.264
	ConditionWeek 6 - 130%BW	-0.007	0.026	140	-0.257	0.798
	ConditionWeek 7 - MAXISO	-0.024	0.027	140	-0.913	0.363
	Timepost	0.014	0.026	140	0.545	0.587
	ConditionWeek 2 - 50%BW:Timepost	-0.028	0.037	140	-0.771	0.442
	ConditionWeek 3 - 70%BW:Timepost	-0.034	0.037	140	-0.907	0.366
	ConditionWeek 4 - 90%BW:Timepost	-0.046	0.037	140	-1.247	0.214
	ConditionWeek 5 - 110%BW:Timepost	0.046	0.037	140	1.247	0.214
	ConditionWeek 6 - 130%BW:Timepost	-0.033	0.037	140	-0.907	0.366
	ConditionWeek 7 - MAXISO:Timepost	0.021	0.038	140	0.567	0.572

The image below shows the pre and post mean scores (with standard error) on each week for this measure.



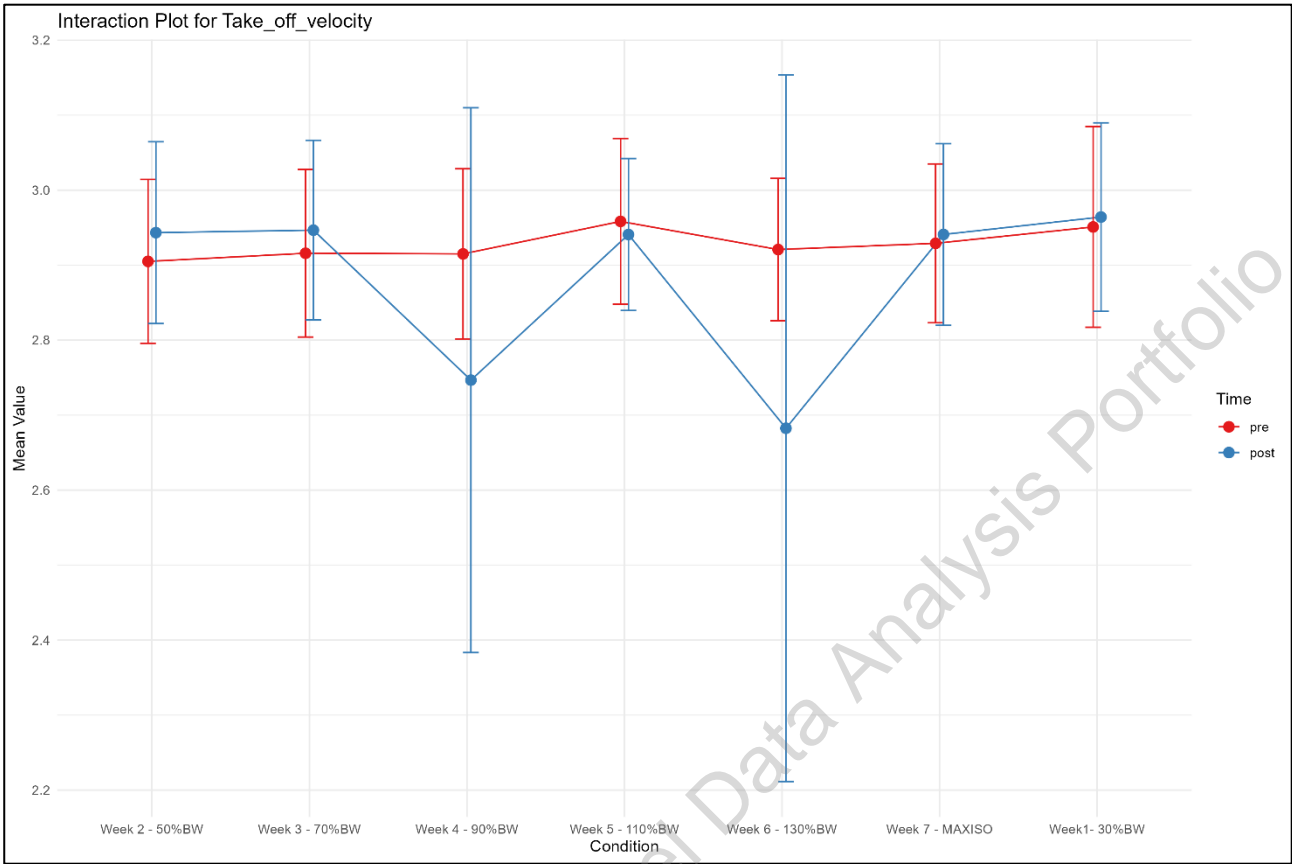
### The effect of the intervention on Take Off Velocity

The baseline for take off velocity was substantial ( $B = 2.960$ ,  $SE = 0.059$ ,  $p < .001$ ). Significant reductions were observed in Week 2 - 50%BW ( $B = -0.055$ ,  $SE = 0.027$ ,  $p = .042$ ). Changes in Weeks 3 and 4 approached significance, with Week 3 - 70%BW showing a reduction of  $-0.044$  ( $p = .102$ ) and Week 4 - 90%BW  $-0.045$  ( $p = .096$ ), suggesting a trend where the intervention may impact take off velocity during these weeks.

Measure	Effect	B	SE	DF	t	p
Take_off_velocity	(Intercept)	2.960	0.059	137	50.553	0.000
	ConditionWeek 2 - 50%BW	-0.055	0.027	137	-2.052	0.042
	ConditionWeek 3 - 70%BW	-0.044	0.027	137	-1.646	0.102
	ConditionWeek 4 - 90%BW	-0.045	0.027	137	-1.677	0.096
	ConditionWeek 5 - 110%BW	-0.001	0.027	137	-0.051	0.959
	ConditionWeek 6 - 130%BW	-0.039	0.027	137	-1.458	0.147
	ConditionWeek 7 - MAXISO	-0.019	0.027	137	-0.703	0.483
	Timepost	0.004	0.027	137	0.168	0.867
	ConditionWeek 2 - 50%BW:Timepost	0.034	0.037	137	0.909	0.365
	ConditionWeek 3 - 70%BW:Timepost	0.026	0.037	137	0.708	0.480
	ConditionWeek 4 - 90%BW:Timepost	0.003	0.038	137	0.087	0.931
	ConditionWeek 5 - 110%BW:Timepost	-0.022	0.037	137	-0.590	0.556
	ConditionWeek 6 - 130%BW:Timepost	0.002	0.038	137	0.066	0.948
	ConditionWeek 7 - MAXISO:Timepost	0.007	0.038	137	0.193	0.847



The image below shows the pre and post mean scores (with standard error) on each week for this measure.

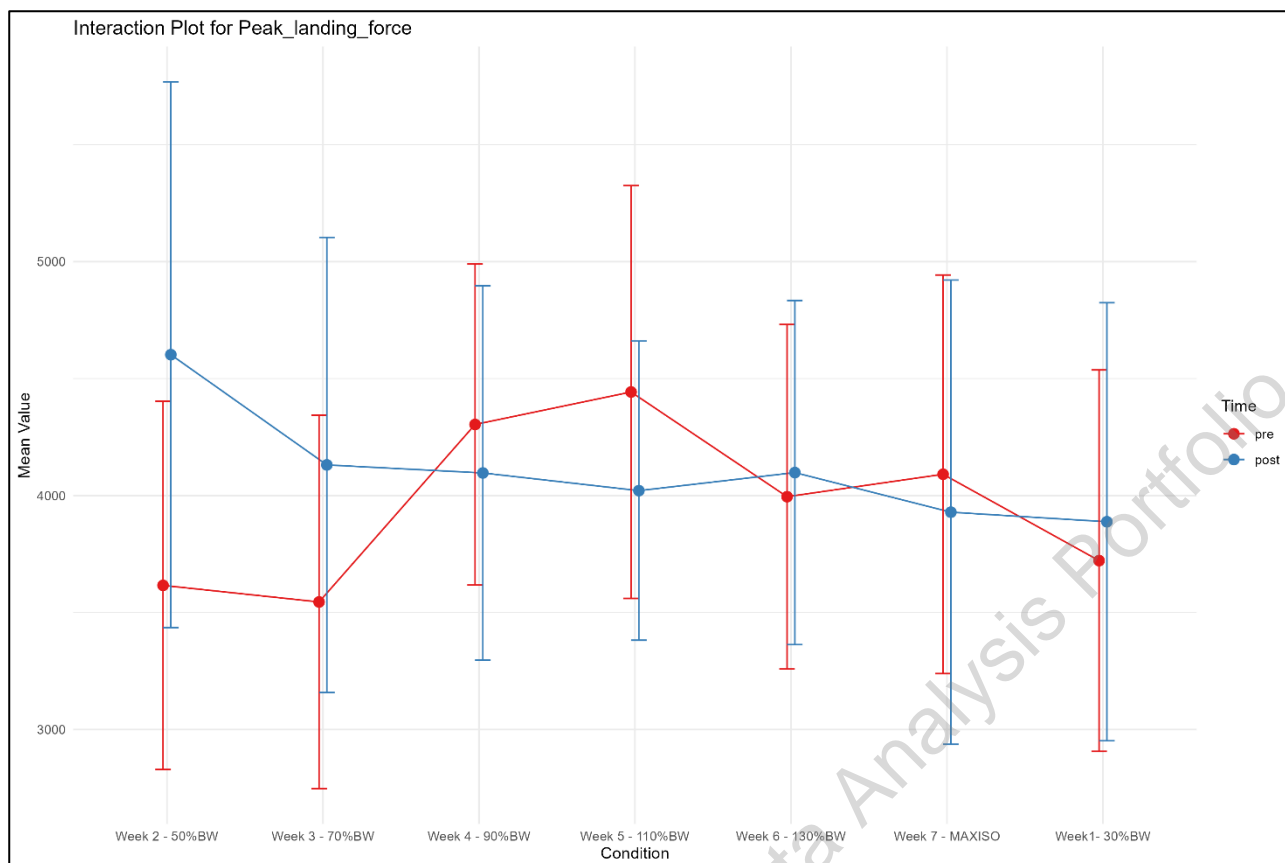


### The effect of the intervention on Peak Landing Force

The initial peak landing force was significantly high ( $B = 3721.917$ ,  $SE = 431.118$ ,  $p < .001$ ), with no significant changes observed in most conditions. However, an increase in Week 5 - 110%BW approached significance ( $B = 720.917$ ,  $SE = 373.071$ ,  $p = .055$ ), indicating potential variations in landing force which could be relevant for further studies on impact absorption and leg strength.

Measure	Effect	B	SE	DF	t	p
Peak_landing_force	(Intercept)	3721.917	431.118	141	8.633	0.000
	ConditionWeek 2 - 50%BW	-105.833	373.071	141	0.284	0.777
	ConditionWeek 3 - 70%BW	-176.667	373.071	141	0.474	0.637
	ConditionWeek 4 - 90%BW	582.000	373.071	141	1.560	0.121
	ConditionWeek 5 - 110%BW	720.917	373.071	141	1.932	0.055
	ConditionWeek 6 - 130%BW	273.333	373.071	141	0.733	0.465
	ConditionWeek 7 - MAXISO	435.670	382.113	141	1.140	0.256
	Timepost	166.167	373.071	141	0.445	0.657
	ConditionWeek 2 - 50%BW:Timepost	820.000	527.602	141	1.554	0.122
	ConditionWeek 3 - 70%BW:Timepost	419.667	527.602	141	0.795	0.428
	ConditionWeek 4 - 90%BW:Timepost	-373.417	527.602	141	0.708	0.480
	ConditionWeek 5 - 110%BW:Timepost	-587.917	527.602	141	1.114	0.267
	ConditionWeek 6 - 130%BW:Timepost	-63.083	527.602	141	0.120	0.905
	ConditionWeek 7 - MAXISO:Timepost	-328.258	539.459	141	0.608	0.544

The image below shows the pre and post mean scores (with standard error) on each week for this measure.

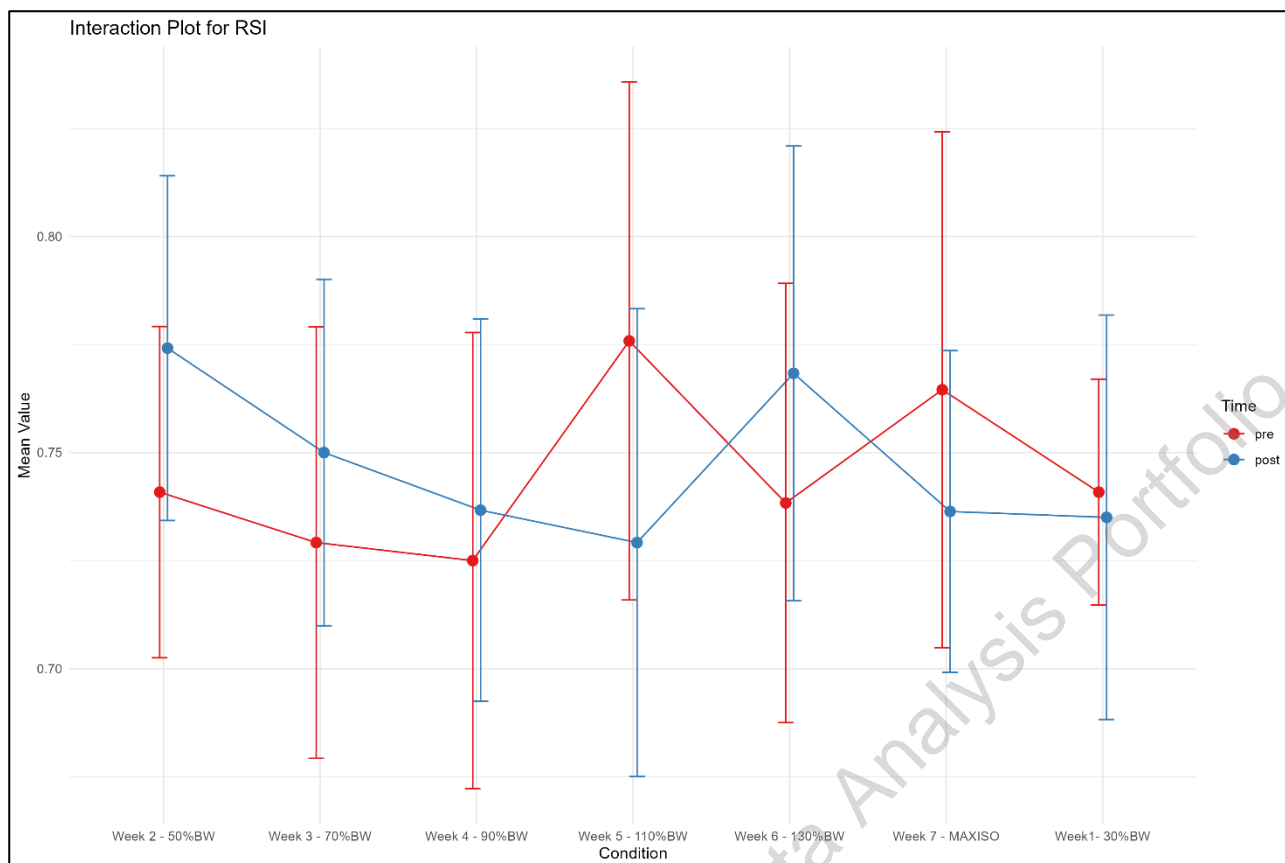


### The effect of the intervention on RSI

The baseline RSI was notably high ( $B = 0.741$ ,  $SE = 0.024$ ,  $p < .001$ ), with no significant changes across the intervention. This suggests that the intervention did not significantly affect the reactive strength of participants as measured by the RSI.

Measure	Effect	B	SE	DF	t	p
RSI	(Intercept)	0.741	0.024	141	30.781	0.000
	ConditionWeek 2 - 50%BW	0.000	0.024	141	0.000	1.000
	ConditionWeek 3 - 70%BW	-0.012	0.024	141	-0.495	0.621
	ConditionWeek 4 - 90%BW	-0.016	0.024	141	-0.672	0.503
	ConditionWeek 5 - 110%BW	0.035	0.024	141	1.486	0.140
	ConditionWeek 6 - 130%BW	-0.003	0.024	141	-0.106	0.916
	ConditionWeek 7 - MAXISO	0.028	0.024	141	1.174	0.242
	Timepost	-0.006	0.024	141	-0.248	0.805
	ConditionWeek 2 - 50%BW:Timepost	0.039	0.033	141	1.176	0.242
	ConditionWeek 3 - 70%BW:Timepost	0.027	0.033	141	0.800	0.425
	ConditionWeek 4 - 90%BW:Timepost	0.018	0.033	141	0.525	0.600
	ConditionWeek 5 - 110%BW:Timepost	-0.041	0.033	141	-1.226	0.222
	ConditionWeek 6 - 130%BW:Timepost	0.036	0.033	141	1.076	0.284
	ConditionWeek 7 - MAXISO:Timepost	-0.022	0.034	141	-0.656	0.513

The image below shows the pre and post mean scores (with standard error) on each week for this measure.

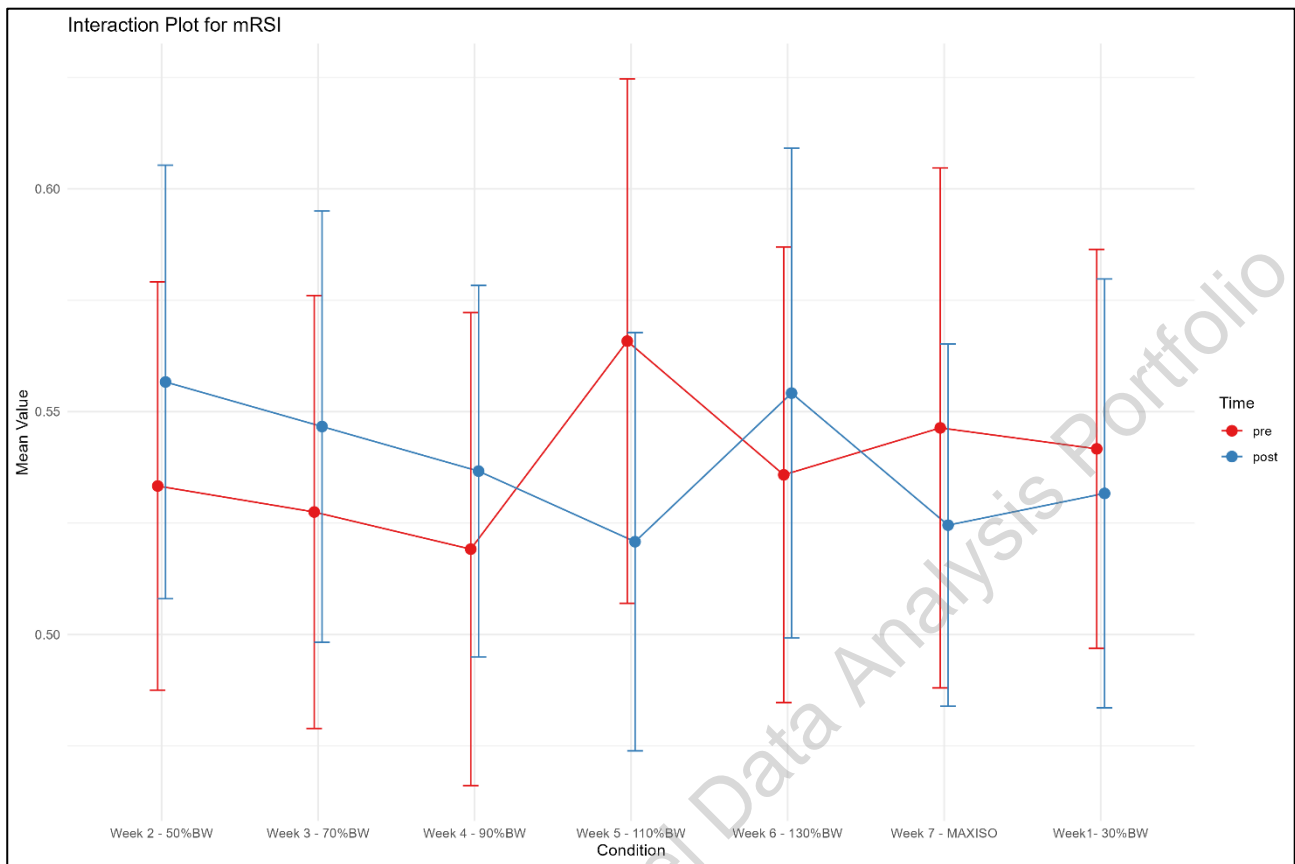


### The effect of the intervention on mRSI

Similarly, the baseline mRSI was significant ( $B = 0.542$ ,  $SE = 0.025$ ,  $p < .001$ ). Throughout the intervention, no significant changes were observed, indicating that the mRSI, like the RSI, remained relatively unaffected by the conditions of the intervention. This stability in RSI and mRSI may imply a maintenance of reactive strength despite varied training conditions.

Measure	Effect	B	SE	DF	t	p
mRSI	(Intercept)	0.542	0.025	141	21.513	0.000
	ConditionWeek 2 - 50%BW	-0.008	0.019	141	-0.443	0.658
	ConditionWeek 3 - 70%BW	-0.014	0.019	141	-0.753	0.452
	ConditionWeek 4 - 90%BW	-0.023	0.019	141	-1.197	0.234
	ConditionWeek 5 - 110%BW	0.024	0.019	141	1.285	0.201
	ConditionWeek 6 - 130%BW	-0.006	0.019	141	-0.310	0.757
	ConditionWeek 7 - MAXISO	0.012	0.019	141	0.633	0.528
	Timepost	-0.010	0.019	141	-0.532	0.596
	ConditionWeek 2 - 50%BW:Timepost	0.033	0.027	141	1.253	0.212
	ConditionWeek 3 - 70%BW:Timepost	0.029	0.027	141	1.097	0.275
	ConditionWeek 4 - 90%BW:Timepost	0.028	0.027	141	1.034	0.303
	ConditionWeek 5 - 110%BW:Timepost	-0.035	0.027	141	-1.316	0.190
	ConditionWeek 6 - 130%BW:Timepost	0.028	0.027	141	1.065	0.289
	ConditionWeek 7 - MAXISO:Timepost	-0.012	0.027	141	-0.435	0.664

The image below shows the pre and post mean scores (with standard error) on each week for this measure.



## Summary of Results

The collected data on the effects of an intervention involving progressive overload in squat exercises over several weeks provide insightful observations on various athletic performance metrics. Here's a comprehensive technical summary of the intervention's impact across all measured parameters:

**Jump Height:** The intervention significantly reduced jump height during several weeks when compared to the baseline at Week 1 - 30%BW. Notable reductions occurred in Weeks 2, 3, 4, and 6 with the effects being statistically significant (p values ranging from 0.008 to 0.027). There were no significant changes during Weeks 5 and 7. The interaction effects were largely non-significant, suggesting the reduction in jump height was consistent across the pre- and post-test measurements, except a borderline significant interaction in Week 2.

**Countermovement Depth:** Changes in countermovement depth were less consistent. Only Week 5 showed a significant reduction from baseline ( $p = 0.008$ ). Marginal changes suggesting a decrease in depth occurred in this week both pre- and post-intervention, although they did not consistently reach statistical significance, highlighting a potential variability in how the intervention affected this measure.

**Peak Braking Force:** Significant reductions in peak braking force were observed in Weeks 3 and 6 ( $p = 0.028$  and  $p = 0.014$ , respectively), with the effect in Week 5 approaching significance ( $p = 0.069$ ). These findings suggest that the higher intensities of the squat loads had a more pronounced effect on decreasing braking force, which might be indicative of fatigue or adaptations in neuromuscular response strategies.

**Peak Propulsive Force:** The intervention did not significantly alter peak propulsive forces across the study duration. However, an interaction effect in Week 6 post-test approached significance ( $p = 0.081$ ), suggesting a potential delayed response in force production capabilities following the higher load interventions.

**Braking Phase:** A significant increase in the braking phase was noted in Week 3 ( $p = 0.036$ ), with no significant changes observed in other weeks. This indicates a specific adaptation occurring mid-intervention, possibly as athletes adjusted to the increasing demands of the squat loads.

**Propulsive Phase:** Only in Week 3 was there a significant improvement in the propulsive phase ( $p = 0.008$ ). Like the braking phase, the propulsive adaptations were more pronounced during mid-intervention, suggesting a key period of adjustment to training stimuli.

**Flight Time:** Significant decreases in flight time were observed during Weeks 2, 3, and 6 ( $p$  values  $\leq 0.031$ ), indicating that the intervention could potentially be influencing factors related to explosive power and jump efficiency. A marginal interaction in Week 2 suggests a time-specific adaptation to the training loads.

**Time to Take Off:** This metric showed no significant changes across the intervention period, suggesting that the timing of explosive movements might be less sensitive to the changes in squat loading patterns or that the measurement intervals were insufficient to capture the subtle variations in performance.

**Take Off Velocity:** Significant reductions were observed in Week 2, with Weeks 3 and 4 showing trends towards significance, indicating that the intervention might be impacting the athletes' ability to generate rapid velocity during take-offs under increased loading conditions.

**Peak Landing Force:** While baseline measurements indicated a high ability to absorb forces, only Week 5 showed a near-significant increase in force absorption capabilities ( $p = 0.055$ ), possibly reflecting adaptations in muscular control and technique enhancements due to training.

**RSI and mRSI:** Both indices showed high baseline values with no significant changes throughout the intervention. This stability suggests that the reactive strength and modifications thereof were maintained despite varying loading conditions, highlighting a resilience in these attributes against the training regimen applied.