

Figure Legends

TABLE 1. Characteristics of Adolescent Competitive Swimmers (mean \pm SD).

TABLE 2. Plyometric Training Continuum for the Swimming Block Start.

TABLE 3. Normative Values for Barrier and Hurdle Heights in Plyometrics.

TABLE 4. Swim Block Start performance measures (mean \pm SD) for the Plyometric training (PT) and Habitual training (HT) groups before and after an 8 week programme.

FIGURE 1. Relationship between SBS velocity and Time to 5.5 metres for baseline and post trial performance for the Plyometric Training (PT) Group.

FIGURE 2. Relationship between SBS velocity and Time to 5.5 metres for baseline and post trial performance for the Habitual Training (HT) Group.

TABLE 1. Characteristics of Adolescent Competitive Swimmers (mean \pm SD).

Characteristics	Plyometric Training	Habitual Training
	group (n=11)	group (n=11)
Age (yr)	13.1 \pm 1.4	12.6 \pm 1.9
Body mass (kg)	50.6 \pm 12.3	43.3 \pm 11.6
Height (cm)	162.9 \pm 11.9	157.6 \pm 11.9
Competitive experience in swimming (yr)	3.4 \pm 1.8	3.8 \pm 2.3
Best 50m freestyle time in previous 2 years (min:s)	34:02 \pm 5:23	35:50 \pm 6:85

TABLE 2. Plyometric Training Continuum for the Swimming Block Start.

		TRAINING WEEK							
EXERCISE (Height of barrier or hurdle in cm)		One Sets x reps (recovery)	Two Sets x reps (recovery)	Three Sets x reps (recovery)	Four Sets x reps (recovery)	Five Sets x reps (recovery)	Six Sets x reps (recovery)	Seven Sets x reps (recovery)	Eight Sets x reps (recovery)
EXERCISE SPECIFICITY	Two-Foot Ankle Hop	2 x 5 (60s)	2 x 5 (60s)	3 x 5 (60s)	3 x 5 (60s)	4 x 5 (60s)	4 x 5 (60s)		5 x 5 (60s)
	Tuck Jump With Knees Up	2 x 4 (60s)	2 x 4 (60s)	3 x 4 (60s)	3 x 4 (60s)			4 x 5 (60s)	4 x 5 (60s)
	Squat Jump	1 x 4	1 x 4	2 x 5 (60s)	2 x 5 (60s)	3 x 5 (60s)	3 x 5 (60s)	3 x 5 (60s)	4 x 5 (60s)
	Split Squat Jump	1 x 4	1 x 4	2 x 6 (60s)	2 x 6 (60s)				3 x 6 (60s)
	Standing Jump Over Barrier (54)	2 x 4 (60s)	2 x 5 (60s)						
	Front Cone Hops (54)			2 x 4 (60s)	2 x 5 (60s)				
	Hurdle Hops (65-79)					2 x 4 (60s)	2 x 4 (60s)	3 x 5 (60s)	3 x 5 (60s)
	Single Leg Bounding	1 x 4	1 x 4	2 x 5 (60s)	2 x 5 (60s)	3 x 5 (60s)	3 x 5 (60s)	4 x 5 (60s)	4 x 5 (60s)
	Single Leg Push-Off (21.6–46.2)					1 x 4 (60s)	1 x 4 (60s)	2 x 5 (60s)	3 x 5 (60s)
	Multiple Box-To-Box Jumps (21.6–43.2)			1 x 4	1 x 4	2 x 4 (60s)	2 x 4 (60s)	3 x 4 (75s)	3 x 4 (75s)
	Box Skip (21.6–43.2)			1 x 4	1 x 4	2 x 5 (60s)	2 x 5 (60s)		
	Alternate Bounding With Double Arm Action					2 x 5 (75s)	2 x 5 (75s)	3 x 5 (75s)	3 x 5 (75s)
	Double Leg Hops		1 x 5	2 x 5 (75s)	2 x 5 (75s)	3 x 5 (75s)	3 x 5 (75s)	4 x 5 (75s)	4 x 5 (75s)
	Depth Jump (43.2–64.3)		2 x 1 (90s)	3 x 1 (90s)	3 x 1 (90s)	4 x 1 (90s)	4 x 1 (90s)	5 x 1 (90s)	5 x 1 (90s)
	Depth Jump To Standing Long Jump (43.2-64.3)			1 x 1	1 x 1	2 x 1 (90s)	2 x 1 (90s)	3 x 1 (90s)	3 x 1 (90s)
	Jump To Box (21.6-43.2)	1 x 1	1 x 1	2 x 1 (90s)	2 x 1 (90s)	3 x 1 (90s)	3 x 1 (90s)	4 x 1 (90s)	4 x 1 (90s)
Standing Jump And Reach	1 x 1	1 x 1	2 x 1 (90s)	2 x 1 (90s)	3 x 1 (90s)	3 x 1 (90s)	4 x 1 (90s)	4 x 1 (90s)	
Standing Long Jump	1 x 1	1 x 1	2 x 1 (90s)	2 x 1 (90s)	3 x 1 (90s)	3 x 1 (90s)	4 x 1 (90s)	4 x 1 (90s)	
Standing Long Jump With Hurdle Hop					3 x 1 (90s)	3 x 1 (90s)	4 x 1 (90s)	4 x 1 (90s)	
IMPACT INTENSITY		LOW			MEDIUM			HIGH	
PROGRESSION		→							

Adapted from Chimera *et al.* (3), Chu (4) and Radcliffe & Farentinos (14)

TABLE 3. Normative Values for Barrier and Hurdle Heights in Plyometrics.

Exercise	Barrier / Box Normative Values (cm)
Standing jump over barrier	46-107
Front cone hops	20-91
Hurdle hops	30-91
Single leg push off	20-61
Multiple box-to-box jumps	20-61
Box skip	20-61
Depth jump	30-91
Depth jump to standing long jump	30-91
Jump to box	30-61
Standing long jump with hurdle hop	30-91

Adapted from Chimera *et al.* (3), Chu (4) and Radcliffe & Farentinos (14)

TABLE 4. Swim Block Start performance measures (mean \pm SD) for the Plyometric training (PT) and Habitual training (HT) groups before and after an 8 week programme.

Performance Measure	PT Group				HT Group			
	Baseline	Post	Absolute Change	% Change	Baseline	Post	Absolute Change	% Change
Angle out of blocks ($^{\circ}$)	26.7 \pm 7.10	34.5 \pm 6.43 ^{§§}	-7.86 \pm 5.39	34.01%	23.2 \pm 7.10	27.6 \pm 7.29 ^{§§}	-4.46 \pm 4.07	22.23%
Distance to head contact (m) **	1.70 \pm 0.19	1.83 \pm 0.19 ^{§§}	0.14 \pm 0.07	8.31%	1.57 \pm 0.13	1.50 \pm 0.17 [§]	-0.07 \pm 0.09	4.74%
SBS Velocity (ms ⁻¹)**	1.29 \pm 0.18	1.48 \pm 0.15 ^{§§}	0.19 \pm 0.13	15.65%	1.17 \pm 0.10	1.10 \pm 0.16 [§]	-0.07 \pm 0.09	6.20%
Time to head contact (s) *	1.32 \pm 0.09	1.24 \pm 0.06 [§]	-0.08 \pm 0.08	5.86%	1.35 \pm 0.10	1.38 \pm 0.20	0.03 \pm 0.12	2.02%
Angle of entry into water ($^{\circ}$)	42.3 \pm 7.33	47.5 \pm 3.95 [§]	-5.18 \pm 6.30	15.01%	45.6 \pm 5.71	48.0 \pm 7.49	-2.45 \pm 3.87	5.16%
Performance time to 5.5 m (s) **	3.88 \pm 0.48	3.29 \pm 0.47 ^{§§}	-0.59 \pm 0.15	15.43%	3.94 \pm 0.39	3.82 \pm 0.38	-0.21 \pm 0.21	2.85 %

A significant (* P <0.05; ** P <0.001) difference was observed between baseline and post-trial change scores between groups.

A significant ([§] P <0.05; ^{§§} P <0.001) difference was observed between baseline and post-trial measures within groups.

SBS Velocity refers to the average velocity of the swimmer from take-off to head contact

FIGURE 1. Relationship between SBS velocity and Time to 5.5 metres for baseline (□) ($y = -1.7549x + 6.1512$ (SEE = 0.38 s, $R^2 = 0.44$) and post trial (●) performance ($y = -2.7788x + 7.4106$ (SEE = 0.20s, $R^2 = 0.83$) for the Plyometric Training (PT) Group.

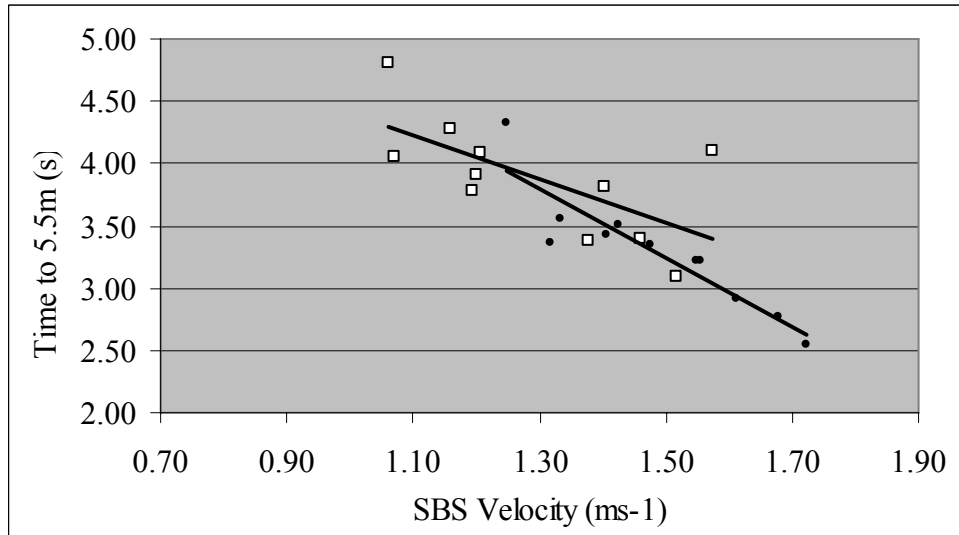


FIGURE 2. Relationship between SBS velocity and Time to 5.5 metres for baseline (□) ($y = -2.9498x + 7.3924$ (SEE = 0.32s, $R^2 = 0.48$) and post trial (●) performance ($y = -1.4871x + 5.4578$ (SEE = 0.35s, $R^2 = 0.34$) for the Habitual Training (HT) Group.

