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MATCH ANALYSIS—WHAT EVERY COACH SHOULD KNOW

Match analysis refers to the detailed analysis of technical, physical and physiological data taken from soccer players during games. For years, sports scientists and coaches have used match analysis as a means of interpreting the physical demands of the game, and to help with designing testing and training programs that will help their players perform to their full capacity.

In soccer, high intensity running and sprinting are probably the two most important components of successful performance in games. In a recent study examining 18 “top-class” professional play-

ers from the Italian Serie A and the UEFA Champions League, as well as 24 “moderate” professional players from the Danish League 1, Bangsbo Et. Al. (2003) measured times spent doing high intensity running and sprinting in the players’ respective professional leagues. Following is a summary of the data collected in this study, and some of the implications for coaches (see Table 1 for a detailed analysis):

Top Class players, on average, perform about 32 high speed runs, lasting an average of 2.1 seconds, and about 20 sprints, lasting an average of 2 seconds, per game. In spite of the fact that, when taken together,

high speed running and sprinting make up only 4.2% of the total time spent moving during a game, it is these brief, 1-2 second fast runs and sprints that represent the moments in a game where goals are scored or prevented, and games are won and lost. Coaches should use data from match analysis studies such as this one to develop exercises and training sessions that incorporate the required amount and duration of high intensity running and sprinting, in order to prepare their players for the physical demands of competition.



High intensity running—both with and without the ball—is usually the variable that will decide the outcome of soccer games

Table 1. Frequency, mean duration and percent of time spent on the locomotor categories for top-class and moderate players (mean \pm \pm 2)

	Standing	Walking	Jogging	Low-speed running	Backwards running	Moderate-speed running	High-speed running	Sprinting	Total
Frequency (n)									
Top-class	163 \pm 6	379 \pm 10*	316 \pm 15	198 \pm 8	73 \pm 4*	109 \pm 7*	69 \pm 5*	39 \pm 2*	1346 \pm 34*
Moderate	163 \pm 10	398 \pm 12	321 \pm 13	185 \pm 8	60 \pm 4	96 \pm 5	49 \pm 3	26 \pm 1	1297 \pm 27
Mean duration (s)									
Top-class	7.0 \pm 0.4	6.4 \pm 0.3	3.0 \pm 0.1	2.6 \pm 0.0	2.7 \pm 0.1	2.2 \pm 0.0	2.1 \pm 0.0	2.0 \pm 0.0	3.5 \pm 0.1
Moderate	7.1 \pm 0.4	6.4 \pm 0.3	3.1 \pm 0.1	2.7 \pm 0.1	2.7 \pm 0.1	2.4 \pm 0.0	2.2 \pm 0.0	1.9 \pm 0.0	3.6 \pm 0.1
% of total time									
Top-class	19.5 \pm 0.7	41.8 \pm 0.9	16.7 \pm 0.9*	9.5 \pm 0.4	3.7 \pm 0.3*	4.5 \pm 0.3*	2.8 \pm 0.2*	1.4 \pm 0.1*	100.0
Moderate	18.4 \pm 1.5	43.6 \pm 0.8	19.1 \pm 0.9	9.4 \pm 0.4	2.9 \pm 0.2	3.8 \pm 0.3	1.9 \pm 0.1	0.9 \pm 0.1	100.0

*Significant difference ($P < 0.05$) between top-class and moderate players.

EXERCISE SPOTLIGHT— ISOMETRIC “747”

Welcome to a new feature of Soccer Fit-Facts, Exercise Spotlight, where, in each issue, we will highlight an important exercise that can—and should—be incorporated into the training program of young soccer players. In this issue, we feature the isometric “747”, an exercise which can help build soccer-specific strength, stability and flexibility in just a few minutes a day. To perform this

exercise, simply stand on one leg, keeping the standing knee completely straight, and lean forward at the waist until your torso is parallel to the floor. As you are leaning forward, extend your arms at your sides, perpendicular to your torso, taking on the shape of an airplane, or “747” (see Figure 1). Hold this position for 20-45 seconds, then repeat using the other leg.

An alternate version of this exer-

cise, the Lateral “747”, is also shown. To perform this variation, stand on one leg and lean forward, but rotate the hip of your non-standing leg outwards at a 45 degree angle, reaching your arm towards the floor (Figure 2).

These exercises are a great way to finish off your cool-down after a hard practice. For optimal results, perform 2-3 sets of 20-45 seconds for each leg, 2 days per week.



Figure 1: Isometric 747



Figure 2: Lateral 747

GET TIRED BEFORE YOU PLAY—AND PLAY BETTER!

Believe it or not, soccer players may actually perform skills and game-related activities better when their muscles are fatigued. That's what a group of researchers from the United Kingdom have proven in their recent study, *Performance of Soccer Passing Skills under Moderate and High-Intensity Localized Muscle Fatigue* (Lyons Et. Al., 2008).

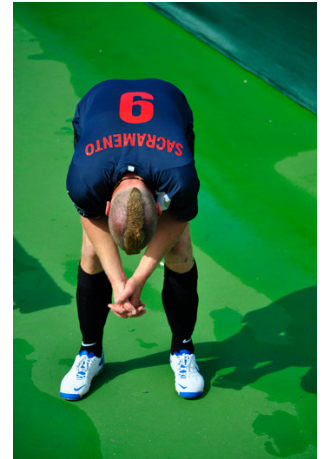
In this study, physically active male college students performed alternating split squat jumps (Figure 1), prior to a soccer-specific skills test. This exercise was used because it fatigues many of the same muscle groups (glutes, quadriceps and hamstring muscles)

that are typically used and fatigued during soccer. To measure the effects of muscular fatigue on skilled performance, researchers used a modified Loughborough Soccer Passing test (Figure 2), which requires players to dribble and pass a ball aimed at set targets in a limited amount of time. Players were required to perform a set number of split squat jumps, corresponding to their individual "moderate" (70%) and "high intensity" (90%) values, expressed as a percentage of their maximum values established during baseline testing. As a measure of control, players also performed the passing test at "rest" or, not preceded by any split squat jumps.

The results of the study showed that the players in the "moderate" fatigue group performed better on the passing test,

as compared to both the "rest" and "high intensity" groups (Table 1). They had a lower average time to complete the test (39.84s), while also incurring a lower average number of passing penalties (7.80) and total penalties (12.65) than the other two groups (numbers highlighted in bold). The players in the "high intensity" group had the lowest scores on the test, as represented by the longest average times to complete the test, and the highest average number of penalties incurred.

These results demonstrate that performance of complex motor skills, such as passing in soccer, require athletes to reach a certain level of arousal and fatigue for optimal performance. Beyond a certain threshold, however, higher levels of arousal and fatigue will lead to a decrease in performance of complex motor skills.



A certain amount of fatigue will actually help you play better



Figure 1: Subject Performing Alternate Split Squat Jumps

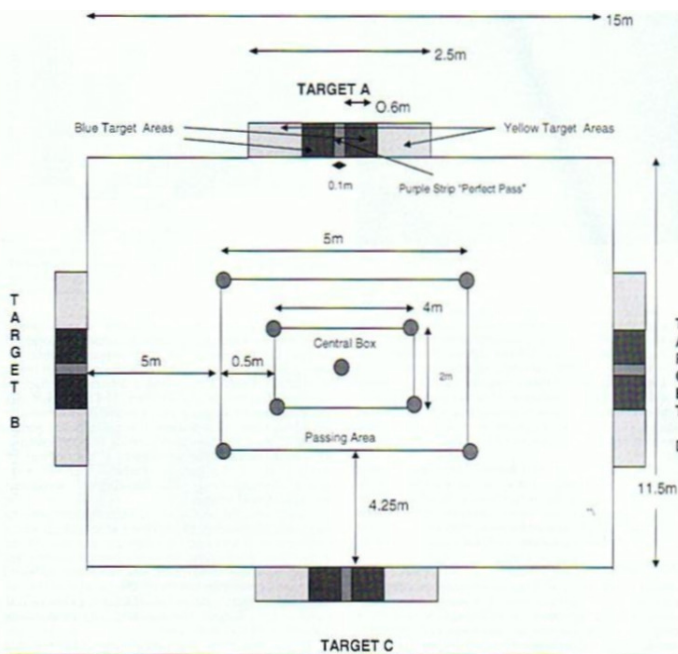


Figure 2: Modified Loughborough Soccer Passing Test

Table 1: Descriptive Statistics for the Three Conditions (all data recorded in seconds).

VARIABLE	NO.	MIN.	MAX.	AVG.
Performance Score (Rest)	20	28.49	74.12	41.07
Performance Score (70%)	20	25.25	80.38	39.84
Performance Score (90%)	20	26.49	69.40	44.32
Passing Penalties (Rest)	20	4.50	12.00	8.20
Passing Penalties (70%)	20	0.00	13.00	7.80
Passing Penalties (90%)	20	5.00	14.00	9.95
Total Penalties (Rest)	20	6.50	32.50	13.48
Total Penalties (70%)	20	2.00	36.00	12.65
Total Penalties (90%)	20	5.00	33.00	17.00

We are on the Web!

www.soccerfitness.ca

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Soccer Fitness was created to help coaches at all levels of the game improve their knowledge and practical skills in training their athletes. With huge and growing numbers of players registered in Canada at the youth level, it often seems that there are just too many players and not enough qualified fitness trainers. Today, most clubs in Ontario have Club Head Coaches and Technical Staffs, whose primary responsibility is to help train, educate their club's "rep" or competitive coaches, and ensure that they are able to plan and deliver appropriate technical and tactical training to their respective teams. Physical training of soccer players, however, seems to be the missing link in most clubs' overall training programs. **Soccer Fitness is a company that aims to help coaches in understanding and implementing appropriate physical training programs for their athletes.**

***** BREAKING NEWS *****

SOCCER FITNESS IS GOING TO SOUTH AFRICA!



In the spring, summer and fall of 2009, Richard Bucciarelli of Soccer Fitness, Robert Rupf and Jason Vescovi of the Canadian Sport Centre Ontario, and Paolo Pacione of the Sports Injury and Rehabilitation Centre, collected data on female Academy, Club, College, Provincial and National team players, for a comprehensive study comparing fitness test scores between these different levels of play in Canada. Our abstract, titled *Speed and High Intensity Running Ability of Female Soccer Players of Different Standards of Play*, was written and submitted in November, 2009, for presentation at the Second World Conference on Science and Soccer, at the Nelson Mandela Metropolitan

University in Port Elizabeth, South Africa, being held June 8-9, 2010. We have recently received confirmation that our abstract has been accepted, and as a result, Richard will be heading to South Africa in June to present the study at the Conference. An internationally recognized event, highlighting the latest in soccer-specific scientific research, the Conference is aimed at academics, sport scientists, teachers, students, and administrators with an interest in the scientific study and/or the practical performance of soccer from grass roots to the professional levels. "It is huge honour for me to be able to attend and present research at such an historic event," commented Richard. "My trip to South

Africa would not have been possible without the help of Robert Rupf, Jason Vescovi, Paolo Pacione, Bassam Naim, Peyvand Mossavat, Gabriella Trichilo, and Altaf Sarangi. I would also like to thank the ANB Futbol Academy, the Canadian Soccer Association, the Ontario Soccer Association, the Ryerson University Women's Varsity Soccer Team, the Erin Mills Soccer Club, and the Glen Shields Soccer Club, for their assistance and participation in the fitness testing." Stay on the look-out for future issues of Soccer Fit-Facts, for an in-depth review of our presentation, as well as highlights from the Second World Conference on Science and Soccer!



For more information on the Second World Conference on Science and Soccer, visit:
<http://www.nmmu.ac.za>