

Visual performance and soccer skills in young players

It seems likely that visual performance will have some bearing on skill levels in soccer. Being short sighted, for example, could have an immediate effect on player recognition and anticipation and in the long-term may affect physical development through lack of confidence and inhibition of muscular effort.

This research suggests that there is a correlation between visual performance and playing skill in football.

Visual Assessment

An assessment was carried out by the Sports Vision Association (SVA) on the under 14 players from Nottingham Forest Football Club (N =16) to measure individual visual skills.

SKILLS

The following components of visual performance were measured:

Vision - measured with high and low contrast logMAR Charts.

Stereopsis - (TNO) measuring time taken as well as level achieved.

Vergence facility - Number of cycles per minute using 2 base out/plano prism flippers looking at a 6m, vertical line of letters.

Accommodative facility - Number of cycles per minute using -2.00/plano flippers, looking at a 6m line of letters.

Dynamic Fixation - a combined vergence and motility test. This measures the ability to move the eyes rapidly from one position of gaze to another. Deficits can affect concentration and relaxation. Its speed and accuracy can vary from one sport to another¹.

Dynamic vision - Uses a peg board rotator, measures the minimum speed of rotation in cycles per minute to recognise a single letter.

Contrast sensitivity - Vector Vision CVS 1000 available from Haag-Streit UK.

Peripheral awareness - Using the Peripheral Awareness test available from Campden Instruments.

Eye foot reaction time - This measured the time of a simple reaction test to a light stimulus with left and right feet.

Eye hand response time - Using the Wayne Saccadic Fixator.

Glare recovery - Measures the time taken to see a 6/6 line of letters after looking into a camera flash at 1m.

VISION PROFILE

From the results, a vision profile was compiled for the whole group using the mean and standard deviation for each of the skills (Table 1).

Table 1 Sports vision profile - Nottingham Forest Football Club

TEST	RESULTS						SD
	May Need Attention	Below Av	Av	Above Av	Excellent		
VISION 90%	R	0.13	0.03	-0.06	-0.16	-0.26	0.10
	L	0.10	0.03	-0.04	-0.12	-0.19	0.07
	R	0.37	0.25	0.13	0.01	-0.11	0.12
	L	0.25	0.19	0.12	0.05	-0.01	0.07
STEREOPSIS Minutes of Arc Time (Secs)		79.64	62.32	45.00	27.68	10.36	17.32
		9.50	6.94	4.38	1.82	< 1.82	2.56
VERGENCE (Cyclcs/Min)		8.70	17.15	25.60	34.05	42.50	8.45
FOCUS (Cyclcs/Min)		< 8.50	8.50	19.00	29.50	40.00	10.50
DYNAMIC FIXATION (Secs)		31.65	26.53	21.41	16.29	11.17	5.12
DYNAMIC ACUITY (Revs/Min)		50.46	64.63	78.80	92.97	107.14	14.17
CONTRAST SENSITIVITY (Graded 1-8)		2.56	3.73	4.90	6.07	7.24	1.17
PERIPHERAL AWARENESS (Secs)		1.18	0.93	0.68	0.43	0.18	0.25
EYE/FOOT RESPONSE TIME (Secs)	R	16.19	13.58	10.97	8.36	5.75	2.61
	L	19.20	15.08	10.96	6.84	2.72	4.12
HAND-EYE CO-ORDINATION (secs) Proaction Reaction		37.68	34.19	30.70	27.21	23.72	3.49
		30.45	28.68	26.91	25.14	23.37	1.77
GLARE RECOVERY With Visor Without Visor		15.19	10.84	6.49	2.14	< 2.14	4.35
		21.06	15.43	9.80	4.17	< 4.17	5.63

KEY

Needs attention	More than 2 standard deviations less than the mean
Below average	Between 1 and 2 standard deviations less than the mean
Average	Between 1 standard deviation greater or less than the mean
Above average	Between 1 and 2 standard deviations greater than the mean
Excellent	More than 2 standard deviations greater than the mean

Peg board rotator



Hand/eye co-ordination



Nottingham Forest Football Club



Individual profiles

Individual profiles for each of the players were drawn up comparing their scores with the averages for the squad (Table 2).

A suggested potential score was given, assuming that the recommendation was followed and the deficit corrected to at least an average level.

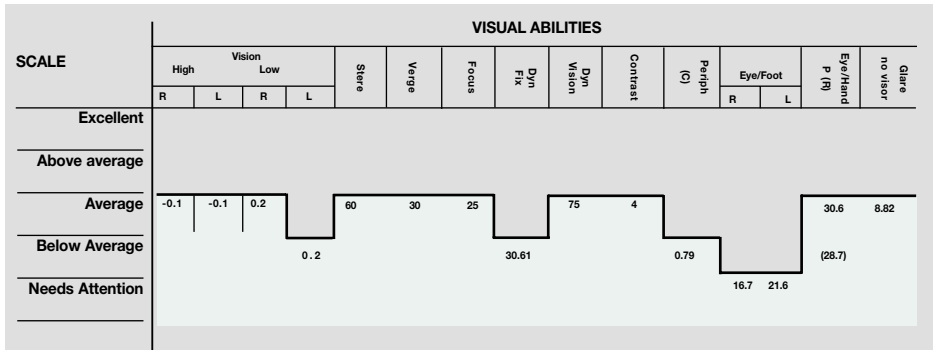
Table 2 Individual vision profile

Name:	Sample 2	Visual Correction (estimate)	
		R	Plano
Age:	13	L	Plano
Sport/Team:	Nottingham Forest under 14 squad		
Position:	Centre Forward	Date of assessment: 26.11.96	

Table 4 Ranking Correlation

RANK			Spearman's rho, statistical test	Column 1	Column 2
Name	Coaches	SVA			
LR	3	1	p=0.01 One tail prediction of positive correlation. (A 99% chance that these results are correlated).	0.65	1
DH	8	2			
GH	6	4			
JJ	3	4			
AP	1	4			
MO	7	7			
AJ	13	8			
PR	1	8			
RP	11	10			
MS	11	10			
MS	15	13			
PW	16	14			
RD	8	15			
MF	10	15			

GOALKEEPERS EXCLUDED: GH SP



RECOMMENDATION

Worth having full eye examination with the Optometrist to check the vision in your left eye.

OTHER

Good all round visual performance. Protect blue eyes in the sun whenever possible. Work on eye foot skills with coach.

Ranking 15 =
Score 38 (Potential 43)

Score

The individual's score was found by counting the squares below the line of the bar chart. All the scores were then put in rank order to give the SVA ranking of visual performance.

Coaches' ranking

After the assessment of the squad and before individual profiles were completed, four coaches at the Club were asked to grade the skill level of

Table 3 Basis for ranking

Score	Skill Level
5	International player
4	Premier league player
3	Full time professional
2	Sunday football
1	Not suitable for any level

the players subjectively on a scale of 1 -5 (Table 3)

The average of the four scores for each of the players was then ranked according to the coaches assessment of skill.

Results

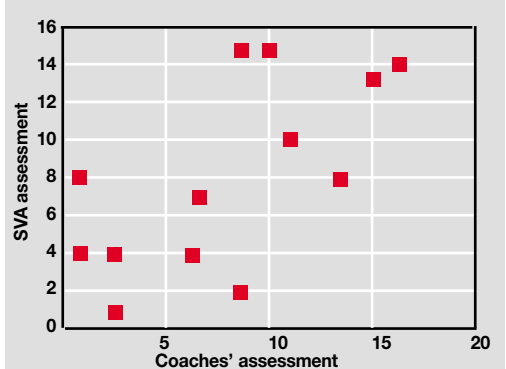
The two sets of data were compared to see if there was any correlation (Table 4). The results show a good correlation visually in the scattergram and in statistical analysis with a probability of 99% that the results are related.

Discussion

The data for the goalkeepers was omitted because it was argued that goalkeeping is a specialist position and these players may have different skills and visual requirements. Their results did not, in fact, follow the pattern of the other players and weakened the correlation.

The correlation of visual and soccer skills for the rest of the players suggests the best players have the best visual performance. It does not follow that players with a good visual performance will automatically become good players, but it is tempting to say that given two equally motivated and physically similar players, the one with the better all-round vision will become the more skilful.

SCATTERGRAM



Analysis of non-retained players

Eight months after the original visual assessment the analysis of the 5 players who were no longer with the club (Table 5) shows that all of them are from the lower ranking order, with below average or poor performances in up to 5 of the visual skills. All the players, who have left the club, had at least one visual skill which needed attention.

The ranking of the non-retained players shows good agreement between the coaches and the SVA.

Glare recovery



Waiting for vision to return



Dynamic fixation



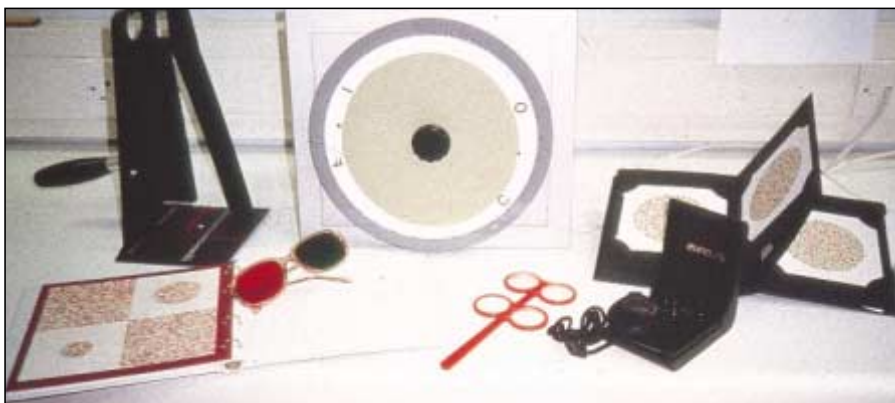
Dominant eye



Table 5 Analysis of non-retained players N = 5 (31%)

POSITION	RANKING		DEFECT	SD's FROM MEAN
	SVA	NFFC		
Striker	8	13	Stereo acuity	+2 (Needs attention)
			Peripheral awareness	+1 (below average)
			Glare recovery	+1 (below average)
Defender	10	11	Accommodation facility	+2 (Needs attention)
Mid-Field	10	11	90% Contrast vision	+2 (Needs attention)
			10% Contrast vision	+2 (Needs attention)
			Dynamic vision	+1 (below average)
			Contrast sensitivity	+1 (below average)
			Foot-eye co-ordination	+1 (below average)
Central	13	15	Peripheral awareness	+2 (Needs attention)
Mid-Field			10% Contrast vision	+1 (below average)
Striker	15	10	Foot-eye co-ordination	+2 (Needs attention)
			Dynamic fixation	+1 (below average)
			10% Contrast vision	+1 (below average)
			Peripheral awareness	+1 (below average)
Mean Rank	11	12		

PEG board rotator and flipper lenses



Conclusion

Basis for selection in soccer

One argument says that sports vision has to be considered in terms of more goals or some scientifically rigorous method of measuring performance.

In reality, it is the coach's or manager's subjective assessment of individual players' skill that decides whether they play or not and at what level.

The high correlation between the SVA ranking and the Nottingham Forest coaches ranking, suggests that visual performance could be used as a guide to playing potential in younger players. It does not necessarily follow that visual correction alone would have saved the players who left the club, because other factors could have contributed to this decision. But we can say that, visual performance may have been one factor and that all youngsters should have access to visual screening to make sure that at least this part of their physical development is not disadvantaged.

About the authors

Don Loran is immediate Past SVA Chairman and Geraint Griffiths is editor of the SVA Journal and a member of its committee of management.

Reference

Griffiths G.W. (1996) *Dynamic fixation, its use in the measurement of athletic potential*. Unpublished MSc Dissertation, Department of Optometry, UMIST.

Test available through Paul Adler
on 01462 732393