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LAE FISIEKE AKTIWITEIT SE VERBAND MET ONTWIKKELINGSKOÖRDINASIEVERSTEURING: THUSA BANA-STUDIE

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ABSTRACT

The aims of this study was twofold, firstly to determine if their is any relationship between low physical activity levels and Developmental Coordination Disorder (DCD) and secondly, if gender plays any role in this relationship among 10 to 12-year-old children. Six hundred and forty five learners who proportionately represented several racial groups [White (n=90), Black (n=467), Coloured (n=47), Indian (n=41)] in the North West Province were identified and evaluated with the Movement Assessment Battery for Children (MABC-T) and the Previous Day Physical Activity Recall (PDPAR) questionnaire to determine their coordination status and physical activity levels (PA). Statistica for Windows 6.0 was used to analyse the data for descriptive purposes, t-testing and partial correlation analysis. The SAS-statistical program was used to analyse physical activity patterns. Children classified in the DCD category with the MABC-T (<15th percentile) were compared with children without DCD with regard to their physical activity levels (low, moderate and high). The results showed that 50% of the children who were classified in the DCD category were also low active and that low active DCD children had significantly poorer ball skills compared to higher active DCD children. No differences were found between low active boys and girls with DCD. Partial correlation analysis indicated that physical activity and socio-economic conditions had the highest relationships with DCD.

Key words: Developmental Coordination Disorder (DCD); Physical activity; Ball and balance skills; Manual dexterity; Gender.

INLEIDING

Fisieke aktiwiteit (FA) is belangrik in die ontwikkeling en handhawing van ’n gesonde leefwyse (Cairney *et al*., 2005); daarom behoort deelname aan voldoende FA so vroeg moontlik deel gemaak te word van ’n kind se dagpatroon (Pratt *et al*., 1999). Wanneer ’n kind fisiek onaktief is, kan dit daartoe aanleiding gee dat motoriese agterstande ontwikkel (Bouffard *et al.*, 1996); derhalwe word gereelde FA deur navorsers uitgewys as belangrik om ’n kind motories te ontwikkel. In dié verband rapporteer Raudsepp en Jürimäe (1996) dat voldoende FA tydens ’n kind se groeifase noodsaaklik is om normale groei, gesondheid en motoriese ontwikkeling te handhaaf, terwyl Butcher en Eaton (1989) aantoon dat blootstelling aan en die beoefening van verskillende aktiwiteite vaardigheidsontwikkeling kan beïnvloed. Sääkslahti *et al.* (1999) het ’n studie ten opsigte van 3- tot 4- jarige kinders uitgevoer om FA-patrone gedurende ’n naweek met antropometriese metings, fundamentele motoriese vaardighede en kardiovaskulêre hartvatsiektes te vergelyk. Dié studie toon dat FA reeds ’n

geringe verband met fundamentele motoriese vaardighede (loop, hardloop, standverspring, ratsheid, gooi en vang, eenbeenbalans, galop en skop van ’n bal) op ’n vroeë ouderdom het. Cairney *et al.* (2005) wys in die verband op die langtermynkonsekwensies van motoriese agterstande, naamlik onaktiwiteit met gepaardgaande risiko om chroniese gesondheids-probleme met toename in ouderdom te ontwikkel.

Volgens Sallis *et al*. (1993) is daar eksterne faktore wat daartoe bydra dat hedendaagse kinders minder fisiek aktief as dié in die verlede is. Hierdie faktore sluit onder meer in ondersteuning deur ouers, intensiteit van oefeninge, sosiale invloede, fisieke fiksheid, toegang tot apparaat en fasiliteite en moderne tegnologie (bv. rekenaars en televisie-speletjies) (Coblentz, 1997). Biddle *et al*. (2004) identifiseer demografiese-, biologiese-, gedrags-, sosiale-, psigososiale- en omgewingsveranderlikes as die belangrikste determinante van fisieke aktiwiteit by kinders.

Kinders met koördinasie-afwykings van ’n sekere omvang word volgens die DSM-IV (American Psyciatric Association, 1994) geklassifiseer as kinders met ontwikkelings-koördinasieversteurings (“Developmental Coordination Disorder, DCD”). Sodanige kinders toon agterstande met betrekking tot sommige of selfs alle fundamentele vaardighede, wat hulle daaglikse en skoolaktiwiteite kan belemmer. Verder is gevind dat kinders met koördineringsprobleme gewoonlik nie fisiek hoog aktief is nie (Bouffard *et al*., 1996; Skinner & Piek, 2001; Prinsloo & Pienaar, 2003), en dat hulle laer motiveringsvlakke het om uitdagende aktiwiteite te probeer aanpak (Rose *et al*., 1998). Cairney *et al.* (2005) se navorsing bevestig ook laer vlakke van deelname en self-effektiwiteit met betrekking tot fisieke aktiwiteite by DCD kinders. Geen geslagsverskille word deur dié navorsers aangedui nie, alhoewel hulle aantoon dat seuns met DCD meer geneig as seuns sonder DCD was om nie aan vryspel-aktiwiteite te wil deelneem nie. Aktiwiteite wat kinders in die hoogaktiewe kategorie plaas, is volgens Peters en Wright (1999) egter nodig vir die ontwikkeling van kardio-respiratoriese funksies; derhalwe beperk DCD ontwikkeling in dié verband.

Dit blyk uit die literatuur (Henderson & Sugden, 1992; Cairney *et al.*, 2005) dat meer seuns motoriese agterstande toon as dogters, alhoewel ’n groter mate van passiwiteit by dogters in die literatuur gedokumenteer word (Pate *et al.*, 1994; Boreham, *et al.*, 1997; Trost *et al.*, 1999). Wat Suid-Afrikaanse kinders betref, is min toepaslike inligting met betrekking tot die rol van lae fisieke aktiwiteit in motoriese agterstande bekend. Hierdie studie het ten doel om te bepaal of 10–12- jarige kinders wat laag fisiek aktief (LA) is, aan ’n groter mate aan koördinasieversteurings sal ly as meer fisiek aktiewe kinders in die ouderdomsgroep. Verder wil bepaal word of daar ’n verband is tussen geslag, koördinasieversteurings en lae fisieke aktiwiteitsvlakke.

METODE

Ondersoekgroep

Die Thusa Bana-navorsingsprojek, waar die term Thusa staan vir “Transition and Health during Urbanization in South Africa” en Bana vir kinders, is ’n interdissiplinêre projek van die Fakulteit Gesondheidswetenskappe aan die Noordwes-Universiteit waarvan die Skool vir Biokinetika, Rekreasie en Sportwetenskap een studie-area uitmaak. Die totale aantal proefpersone wat vir die navorsingsprojek geïdentifiseer is, was 1 300 kinders tussen die

ouderdomme 10-15 jaar. Hierdie studie was egter gefokus op ’n subpopulasie van die projek, naamlik al die 10-12-jarige seuns en dogters (N=645), aangesien die meetinstrument wat ontwikkelingkoördinasieversteuring bepaal, slegs gestandardiseer is tot op 12-jarige ouderdom. Die proefpersone is deur middel van ’n gestratifiseerde ewekansige steekproef in samewerking met die Statistiese Konsultasiediens van die Universiteit geselekteer. Uit die lys skole van die Noordwes-provinsie wat in 12 skooldistrikte gegroepeer is en elk 4-7 streke met ongeveer 20 skole (minimum 14, maksimum 47) per streek verteenwoordig, is streke en skole ewekansig met betrekking tot populasiedigtheid gekies. Seuns en dogters in die 10-12 jarige ouderdomsgroep is ewekansig vanuit elke skool geselekteer. Daar is van 645 proefpersone (318 seuns en 327 dogters) voldoende inligting verkry vir die doel van die studie.

Opnames is deur middel van ’n eenmalige dwarsdeursnitopname tydens skoolure uitgevoer, wat oor ’n tydperk van 15 maande gestrek het. Etiese goedkeuring vir die projek is deur die etiekkomitee van die Universiteit verleen en ingeligte toestemming is van elke proefpersoon se ouers verkry voordat hy/sy aan die studie kon deelneem.

Meetinstrumente

Movement Assessment Battery for Children (MABC-T)

Die Movement Assessment Battery for Children is deur Henderson en Sugden (1992) vir gebruik by 4-12-jarige kinders ontwikkel (vier ouderdomsbande waarvan 9-10- en 11-12-jarige bande in hierdie studie gebruik is), en toon bevredigende geldigheid. Die MABC-T meet fynspiervaardighede (FV) (drie toetsitems), balvaardighede (BV) (twee toetsitems) en statiese en dinamiese balansvaardighede (BLV) (drie toetsitems) van kinders, wat afsonderlik in subafdelings sowel as gesamentlik as ’n totale punt bereken kan word. Die meetinstrument is ’n normgebaseerde meetinstrument wat kinders wie se puntetotaal laer as die 15e persentiel val, in die DCD kategorie klassifiseer. Die wat laer as die 5e persentiel val se probleem word as ernstig gereken, terwyl die wat tussen die 5e en 15e persentiel val as grensgevalle vir remdiëring beskou word. Vir die doel van die studie is alle kinders wat laer as die 15e persentiel geval het, in die DCD-kategorie geklassifiseer. ’n Laer MABC-totaal asook subskaal-totale dui op ’n beter prestasie. Die onderskeie toetsitems van die MABC-T is deur opgeleide kinderkinetici afgeneem, en vir die Setswana-kinders is daar van voorafopgeleide tolke gebruik gemaak om die korrekte instruksies aan die kinders te verskaf.

Previous Day Physical Activity Recall (PDPAR)

Vir die bepaling van ’n proefpersoon se fisieke aktiwiteitsvlak is die “Previous Day Physical Activity Recall” gebruik (Trost *et al.,* 1999). Byvoegings tot die kodering van aktiwiteite is op aanbeveling van die outeurs gemaak as gevolg van kulturele verskille in verskillende lande. Byvoegings is vanuit die “Compendium of physical activities” en ’n vraelys vir Maputo-jeug, wat onderskeidelik deur Ainsworth *et al*. (1993) en Prista en Marques (2000) ontwikkel is, gemaak.

Die vraelys bestaan uit die bepaling van die tipe aktiwiteit waarmee kinders hulle besig hou, die tydsduur en die intensiteit daarvan. Inligting word ingewin oor die proefspersoon se aktiwiteitspatrone tydens die voorafgaande dag in die week sowel as een dag tydens die naweek vanaf 7:00 soggens tot 23:00 saans. Daar is van die proefpersone verwag om terug te dink aan die vorige dag en die aktiwiteit wat hulle in elke 30-minuut- periode uitgevoer het, is

op die vraelyste gerapporteer. Die inligting is deur middel van onderhoudvoering ingewin. Aangesien daar proefpersone was wat nie Afrikaans of Engels magtig is nie, is die inligting by sodanige 10–12-jarige kinders deur middel van opgeleide tolke op die vraelys genoteer.

Die tipe aktiwiteit en intensiteit daarvan is ook op die vraelys ingevul. Die intensiteit van die aktiwiteit is deur middel van die vermoeidheidsfaktor daarvan as hoog, matig en laag geklassifiseer. Sketse wat laag (<3 METS), matig (>3 METS) en hoë (>6 METS) intensiteit weergee, is gebruik om die klassifikasie aan kinders te verduidelik. Die MET-waardes van die fisieke aktiwiteite is direk vanuit die "Compendium of physical activities" en energieverbruiklys van die "PDPAR" geneem (Ainsworth *et al*., 1993; Weston *et al*., 1997). 'n Relatiewe energieverbruikswaarde (1 MET = 1kkal.kg.h) per 30- minuut-ruitblok is toegeken. Dié waardes is gebruik om die totale daaglikse energieverbruik te bepaal, veral die energieverbruik gedurende 'n spesifieke tydsperiodes en in spesifieke aktiwiteite.

Die hoeveelheid 30-minuut-periodes met 'n MET-waarde wat gelyk is aan 3 METS of meer, sowel as die 30-minuut-periodes met 'n MET-waarde wat gelyk is aan 6 METS of meer, is bymekaar getel. Die proefpersone se aktiwiteitsvlak is dan as hoog fisiek aktief geklassifiseer wanneer een of meer 30-minuut-periodes met 6 METS gekodeer is, en as matig fisiek aktief wanneer twee of meer 30-minuut-periodes gelykstaande aan 3 METS gekodeer is (Pate *et al*., 1997). Proefpersone is as laag-aktief (LA) geklassifiseer wanneer daar nie aan die hoë (HA) of matige aktiewe standaarde (MA) voldoen is nie (Pate *et al.*, 1997).

Die "PDPAR" is deur Weston *et al*. (1997) as betroubaar en geldig verklaar (die toets-hertoets-betroubaarheidskoffisiënt is 0.99 ($p<0.01$) en is reeds deur verskeie navorsers gebruik.

Statistiese Prosedure

Vir die dataverwerking is van die "Statistica for Windows 6.0"-rekenaarprogrampakket (Statsoft, 2001) gebruik gemaak. Vir beskrywende doeleindes is daar rekenkundige gemiddeldes ($\bar{x}$), standaardafwykings (sa), maksimum en minimum waardes en persentasies bereken (StatSoft, 2001). Vir analitiese doeleindes is gebruik gemaak van afhanklike en onafhanklike t-toetsing, waar $p\leq0.05$ as 'n betekenisvolle verskil aanvaar is. Verder is parsiële korrelasies gebruik waar gekorrigeer is vir veranderlikes (ras, geslag, ouderdom, vetpersentasie, massa, lengte, LMI, fisieke aktiwiteit en sosio-ekonomiese status) wat die afhanklike veranderlike kan beïnvloed. Aktiwiteite waaraan die kinders deelgeneem het, is deur middel van die SAS-program (SAS, 2003) volgens gemiddelde voorkoms in halfure, in volgorde gerangskik.

RESULTATE

Uit die totale groep van 645 kinders het 429 kinders onder die 15e persentiel geval en is hulle gevolglik in die DCD kategorie geklassifiseer (24.8% in die matige DCD-kategorie en 36.4% in die ernstige DCD-kategorie). Dit dui op 'n groot persentasie kinders wie se koördinasie beinvloed word deur hulle fynspiervaardigheid, balans en balvaardigheid, alhoewel fynspiervaardighede in hierdie studie die meeste bygedra het tot die DCD klassifikasie (Pienaar, 2004). 'n Ontleding van die resultate om moontlike verbande met DCD te ondersoek (sien Tabel 4 en die bespreking daarvan), dui aan dat swak sosio-ekonomiese omstandighede

'n faktor is wat 'n rol hierin kon speel. Die resultate is egter eerstens met betrekking tot 'n beskrywing van die fisieke aktiwiteitsvlakke van die totale groep kinders, sowel as kinders met en sonder DCD tydens die week en naweek, ontleed. Hierna is verbande tussen die MABC en die subskale daarvan by DCD geklassifiseerde kinders ontleed met betrekking tot moontlike faktore wat 'n rol daarin kan speel. Laastens is geslagtelike verskille met betrekking tot DCD-kinders wat verskillende fisieke aktiweitsvlakke het, ontleed om sodoende vas te stel of FA by die onderskeie geslagte andersoortige invloede met betrekking tot motoriese behendigheid het.

TABEL 1. **KLASSIFIKASIE VAN FISIEKE AKTIWITEIT TYDENS DIE WEEK EN NAWEEK**

Veranderlikes	Week							Naweek						
	N	LA	%	MA	%	HA	%	N	LA	%	MA	%	HA	%
Seuns	318	147	46%	125	39%	46	15%	318	109	34%	163	51%	46	15%
Dogters	327	201	62%	100	31%	26	8%	327	151	46%	135	41%	41	13%
Totaal	645	348	54%	225	35%	72	11%	645	260	40%	298	46%	87	14%

LA=laag fisiek aktief, MA=matig fisiek aktief, HA=hoog fisiek aktief

Tabel 1 en Figuur 1(a) toon dat van die totale groep seuns en dogters (N=645) die grootste persentasie in die week laag aktief is (54%), teenoor 11% wat hoog aktief is. Tydens die naweek is die grootste persentasie kinders matig aktief (46%). Dieselfde tendense word ook by die seuns afsonderlik waargeneem (Figuur 1b). Wat dogters betref (Figuur 1b), blyk dit dat die grootste persentasie tydens die week en die naweek laag aktief is. Volgens Tabel 1 is meer dogters laag fisiek aktief (n=201, 62%) gedurende die week, sowel as gedurende die naweek, (n=151, 46%) as seuns.

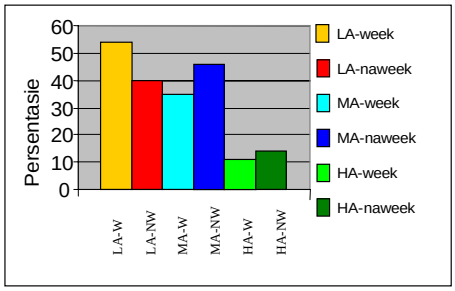

Fig. 1a: **FA van die groep tydens die week en naweek**

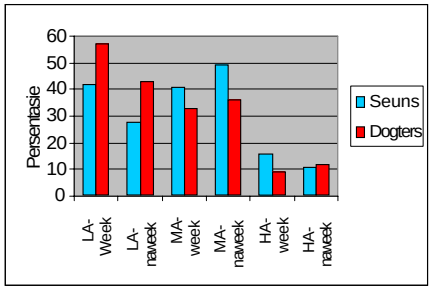

Fig. 1b: **FA van seuns en dogters week en naweek**

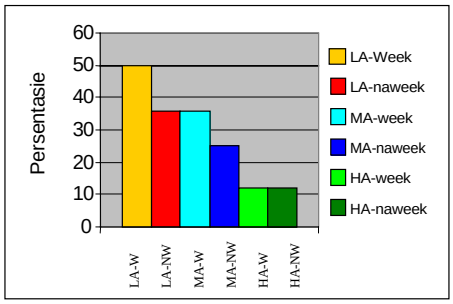

Fig. 1c: **FA van die DCD-groep tydens die week en naweek**

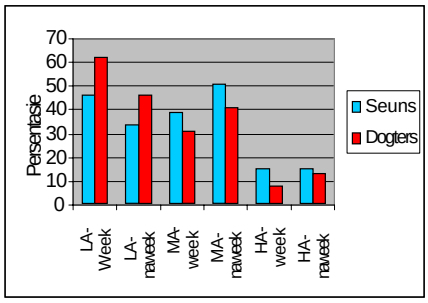

Fig. 1d: **FA van DCD seuns en dogters tydens die week en naweek**

FIGUUR 1a – d. **FA VAN KINDERS MET EN SONDER DCD TYDENS DIE WEEK EN NAWEEK**

Tabel 2 en Figuur 1(c) toon dat 214 van die totale groep van 429 kinders wat met DCD gedurende die week geklassifiseer is, ook laag aktief is (50%). Dié Tabel en Figuur 1(d) toon verder dat meer dogters met DCD (n=134) ook laag aktief (41%) is as laag aktiewe DCD seuns (26%) tydens die week sowel as die naweek (31% en 17%). 'n Tendens van lae aktiwiteit gedurende die week (50%, n=214) en gedurende die naweek (36%, n=155) kom ook uit die tabel en uit Figuur 1c-d na vore.

TABEL 2. **FISIEKE AKTIWITEITSVLAKKE VAN KINDERS SONDER EN MET DCD TYDENS DIE WEEK EN NAWEEK**

Veranderlikes	Week			Naweek			DCD	DCD en laag aktief			
	N	Laag aktief	%	N	Laag aktief	%	N	Week	%	Naweek	%
Seuns	318	147	46%	318	109	34%	193	80	26%	54	17%
Dogters	327	201	61%	327	151	46%	236	134	41%	101	31%
Totaal	645	348	54%	645	260	40%	429	214	50%	155	36%

Tabel 3 bied 'n uiteensetting van parsiële korrelasies gekorrigeer vir ras, geslag, ouderdom, vetpersentasie, massa, lengte, fisieke aktiwiteit (FA) en sosio-ekonomiese status (SES) met betrekking tot moontlike verbande met die MABC-totaal sowel as die subskale van die MABC by DCD-kinders. Wat seuns en dogters gesamentlik betref, is wel betekenisvolle verbande met klein en matige betekenisvolheid gevind tussen die onderskeie veranderlikes van die MABC en die veranderlikes waarvoor gekorrigeer is. Ouderdom, massa, lengte en LMI het 'n positiewe klein verband met fynspiervaardighede (FV) getoon. Verder is positiewe verbande tussen ras en geslag en balvaardigheid, en negatiewe verbande tussen ouderdom, lengte-massa-indeks (LMI), FA en balvaardighede gevind. Wat balans betref, het onderlinge klein positiewe verbande met ouderdom, LMI en massa voorgekom, asook 'n klein negatiewe verband met SES, terwyl slegs SES met die MABC-totaal 'n omgekeerde klein verband getoon het (hoe laer die SES, hoe swakker die MABC-waarde). Balvaardigheid het die meeste onderlinge verbande getoon, onder andere met ras, geslag, ouderdom, LMI en fisieke aktiwiteit. Die grootste verbande wat 'n matige korrelasie aandui, het tussen ras (r=0.28), geslag (r=0.30) FA (r=-0.24) en balvaardighede voorgekom.

TABEL 3. **VERBANDE TUSSEN RAS, GESLAG, OUDERDOM, SES, FA EN LIGGAAMSAMESTELLINGSKARAKTERISTIEKE EN DCD BY SEUNS EN DOGTERS MET DCD (F=P<0.05)**

Veranderlikes	Ras	Geslag	Ouder-dom	Vet %	Massa	Lengte	LMI	FA	SES
Seuns en Dogters									
Fynspier-vaardigheid	-0.02	0.07	0.21*	0.08	0.14*	0.11*	0.11*	0.09	0.08
Balvaardigheid	0.28*	0.30**	-0.16*	0.06	-0.05	0.08	-0.12*	-0.24*	-0.08
Balans	-0.07	0.09	0.12*	0.05	0.13*	0.05	0.12*	0.08	-0.13*
MABC-Totaal	0.01	0.03	0.09	0.02	0.02	0.03	0.01	0.06	-0.10*
Seuns									
Fynspier-vaardigheid	-0.03		0.07	0.13*	0.34**	0.24*	0.20*	0.07	-0.27*
Balvaardigheid	-0.03		-0.16*	-0.01	0.04	0.13*	-0.03	-0.14*	0.02
Balans	0.11*		0.09	0.02	0.10*	0.07	-0.06	-0.11*	-0.17*
MABC-Totaal	-0.05		0.13*	0.07	0.10*	0.11*	0.07	-0.02	-0.12*
Dogters									
Fynspier-vaardigheid	-0.01		0.27*	0.02	0.08	0.07	0.07	0.13*	0.01
Balvaardigheid	0.25*		-0.04	-0.08	-0.09	0.07	-0.18*	-0.24*	-0.09
Balans	0.03		0.16*	0.04	0.14*	0.02	0.16*	0.24*	-0.08
MABC-Totaal	0.05		0.09	-0.04	-0.04	-0.02	-0.04	0.12*	-0.09

r=0.1 (klein)* r=0.3 (matig)** r=0.5 (hoog)*** FA=fisieke aktiwiteit

Wat seuns betref, toon vetpersentasie, massa, lengte en LMI positiewe verbande en SES negatiewe verbande met fynspiervaardigheid. Ouderdom, lengte en FA toon verbande met balvaardigheid, terwyl ras, massa, FA en SES met balans, en ouderdom, massa, lengte en SES met die MABC-totaal verbande toon. Wat dogters betref, is daar verbande tussen ouderdom, FA en fynspiervaardigheid gevind asook tussen ras, LMI, FA en balvaardigheid, terwyl ouderdom, LMI en FA assosiasies met balans het. FA toon ook met die MABC-totaal 'n assosiasie, alhoewel nie in die verwagte rigting nie. Fisieke aktiwiteit het by beide seuns en dogters negatiewe verbande uitgewys, wat aantoon dat laer FA 'n verband met swakker balvaardighede het. Swak SES het ook by seuns en by die groep 'n verband getoon met swakker balans en 'n swakker MABC-totaal.

Uit hierdie ontleding wil dit voorkom of geslag wel moontlike verbande met fisieke aktiwiteitsvlakke van 10-12-jarige kinders het (veral wat dogters betref, terwyl sosio-ekonomiese omstandighede meer verbande met betrekking tot seuns se vaardighede uitgewys het).

TABEL 4. **AKTIWITEITE WAT SEUNS EN DOGTERS TYDENS DIE WEEK EN NAWEEK VERRIG HET, GERANGSKIK VOLGENS DIE HOOGSTE VOORKOMS**

SEUNS								
	LA – Week – Naweek				MA en HA – Week – Naweek			
No	Aktiwiteit	Gem	Gem	Mets	Aktiwiteit	Gem	Gem	Mets
1	Slaap	0.227	0.213	0.9	Slaap	0.227	0.213	0.9
2	Kyk tv	0.157	0.175	1.5	Kyk tv	0.157	0.175	1.5
3	Eet	0.080	0.078	1.5	Eet	0.080	0.078	1.5
4	Loop stadig	0.077	0.044	2.8	Sokker	0.031	0.069	7.0
5	Sit stil	0.045	0.040	1.0	Loop stadig	0.077	0.044	2.8
6	Sokker	0.031	0.070	7.0	Sit stil	0.045	0.040	1.0
7	Godsdiens	0.028	0.030	1.5	Stort/bad/ was	0.025	0.035	1.5
8	Was skottelgoed	0.025	0.023	1.6	Godsdiens	0.028	0.030	1.5
9	Stort/bad/was	0.025	0.035	2.0	Was skottelgoed	0.025	0.023	1.6
10	Kuier by vriende	0.023	0.010	1.5	Skoolwerk	0.017	0.017	1.4
11	Kook	0.020	0.005	2.1	Huistake/vee	0.018	0.016	2.1
12	Huistake/ vee	0.018	0.016	2.1	Rekenaarspele	0.010	0.015	1.5
13	Skoolwerk	0.017	0.017	1.4	Sit, lees boek	0.008	0.014	1.3
14	Dra water	0.015	0.008	3.8	Inkopies	0.009	0.011	2.0
15	Sing	0.013	0.008	2.5	Kuier by vriende	0.023	0.010	1.5
16	Rekenaarspele	0.010	0.015	1.5	Sit, studeer	0.007	0.010	1.8
17	Sit, skryf/teken	0.009	0.004	1.8	Sing	0.013	0.008	2.0
18	Inkopies	0.009	0.011	2.0	Dra water	0.015	0.008	3.8
19	Sit, lees boek	0.008	0.014	1.3	Krieket	0.001	0.007	5.0
20	Speel met motor	0.007	0.003	2.0	Loop vinnig	0.001	0.006	5.0
21	Motor/bus/trein	0.007	0.006	1.5	Motor/bus/trein	0.007	0.006	1.5
22	Sit, studeer	0.007	0.009	1.8	Kook	0.020	0.005	2.1
23	Was klere	0.006	0.004	3.0	Maak bed op	0.004	0.004	2.0
24	Albasters	0.005	0.004	3.0	Sit, skryf/teken	0.009	0.004	1.8
25	Skaapwagter	0.005	0.002	4.0	Albasters	0.005	0.004	3.0
26	Maak bed op	0.004	0.004	2.0	Was klere	0.006	0.004	3.0
27	Luister na musiek	0.003	0.003	1.5	Maak tuin nat	0.001	0.004	1.5
28	Ry stadig fiets	0.003	0.003	3.0	Draf/hardloop/ Rek	0.002	0.004	7.0
29	Topspel	0.003	0.000	2.0	Ry stadig fiets	0.003	0.003	3.0
30	Snoeker	0.003	0.001	2.5	Speel met motor	0.007	0.003	2.0
31	Dra/laai hout	0.002	0.001	5.0	Luister na musiek	0.003	0.003	1.5
32	Speel – troeteldier	0.002	0.002	3.0	Karate	0.001	0.003	10.0
33	Stryk	0.002	0.001	2.3	Skop bal	0.001	0.003	3.0
34	Draf/hardloop rek	0.002	0.004	7.0	Babaversorging	0.001	0.003	3.0
35	Netbal	0.002	0.000	6.0	Tennis	0.000	0.003	7.0

DOGTERS								
	LA – Week – Naweek				MA en HA – Week – Naweek			
No	Aktiwiteit	Gem	Gem	Mets	Aktiviteit	Gem	Gem	Mets
1	Slaap	0.234	0.218	0.9	Slaap	0.234	0.218	0.9
2	Kyk tv	0.142	0.156	1.5	Kyk tv	0.157	0.175	1.5
3	Eet	0.078	0.082	1.5	Eet	0.078	0.082	1.5
4	Loop stadig	0.067	0.034	2.8	Stort/bad/was	0.040	0.041	2.0
5	Sit stil	0.044	0.030	1.0	Was skottelgoed	0.030	0.041	1.6
6	Stort/bad/was	0.040	0.041	2.0	Loop stadig	0.067	0.034	2.8
7	Godsdiens	0.039	0.031	1.5	Godsdiens	0.039	0.031	1.5
8	Was skottelgoed	0.030	0.041	1.6	Sit stil	0.044	0.030	1.0
9	Skoolwerk	0.030	0.023	1.4	Huistake/vee	0.027	0.028	2.1
10	Huistake/vee	0.027	0.028	2.1	Skoolwerk	0.030	0.023	1.4
11	Kook	0.020	0.019	2.1	Netbal	0.008	0.022	6.0
12	Kuier by vriende	0.019	0.014	1.5	Sit, lees boek	0.016	0.020	1.3
13	Sit, studeer	0.019	0.013	1.8	Kook	0.020	0.019	2.1
14	Sit, lees boek	0.016	0.020	1.3	Kuier by vriende	0.019	0.014	1.5
15	Sing	0.014	0.007	2.0	Sit, studeer	0.019	0.013	1.8
16	Inkopies	0.012	0.009	2.0	Spring tou	0.011	0.011	10.0
17	Spring tou	0.011	0.011	10.0	Inkopies	0.012	0.009	2.0
18	Motor/bus/trein	0.010	0.007	1.5	Tennis	0.003	0.008	7.0
19	Netbal	0.008	0.022	6.0	Sing	0.014	0.007	2.0
20	Sit, skryf/teken	0.007	0.003	1.8	Speel pop	0.006	0.007	2.5
21	Babaversorging	0.007	0.005	3.0	Motor/bus/trein	0.010	0.007	1.5
22	Was klere	0.006	0.007	3.0	Was klere	0.006	0.007	3.0
23	Luister na musiek	0.006	0.003	1.5	Skop bal	0.002	0.006	3.0
24	Speel pop	0.006	0.007	2.5	Dra water	0.006	0.005	3.8
25	Dra water	0.006	0.005	3.8	Babaversorging	0.007	0.005	3.0
26	Maak bed op	0.005	0.004	2.0	Loop vinnig	0.001	0.005	5.0
27	Braaivleis	0.004	0.000	2.0	“Hopscotch”	0.002	0.005	5.0
28	Rekenaarspeletjies	0.003	0.004	1.5	Maak bed op	0.005	0.004	2.0
29	Blikkies	0.003	0.004	3.0	Rekenaarspele	0.003	0.004	1.5
30	Bons en vang bal	0.003	0.001	2.5	Sokker	0.001	0.004	7.0
31	Speel in sand	0.003	0.000	2.5	Draf/hardloop rek	0.001	0.004	7.0
32	Tennis	0.003	0.008	7.0	Blikkies	0.003	0.004	3.0
33	Klippies	0.003	0.002	3.0	Stryk	0.001	0.003	2.3
34	Huis-huis	0.003	0.002	3.0	Sit, skryf/teken	0.007	0.003	1.8
35	Speel met troeteldier	0.003	0.002	3.0	Luister na musiek	0.006	0.003	1.5

Tabel 4 bied beskrywende inligting van die aktiwiteite waaraan DCD kinders (seuns en dogters apart) wat onderskeidelik laag en hoër aktief is, deelgeneem het. Kinders met DCD wat laag aktief is, word in Tabel 5 vergelyk met kinders met DCD wat hoër aktief is met betrekking tot die MABC-totaal en die subskale. In hierdie analise is die FA van die kind tydens die week en naweek gesamentlik ontleed en as laag en hoër aktief (matig en hoog is in die ontleding bymekaargevoeg) beskryf. Seuns en dogters met DCD word ook in die tabel apart ontleed.

Wat fynspiervaardighede, balans en die MABC-totaal betref, kon geen betekenisvolle verskille tussen die groepe DCD-kinders wat laag en hoër aktief is, gevind word nie. DCD-kinders wat laag aktief gedurende die week en naweek is, se balvaardighede het egter betekenisvol swakker getoets as dié wat hoër aktief is.

Wat seuns betref, toon Tabel 5 dat daar geen betekenisvolle verskille tussen DCD-seuns wat hoër aktief en dié wat laag aktief is, voorkom nie. Wat balvaardigheid, balans en die MABC-totaal betref, blyk dit dat dié vaardighede van die laag aktiewe seuns wel effens swakker is as dié van die hoër aktiewe seuns. Hierteenoor was die fynspiervaardighede van die seuns wat hoër aktief is, in vergelyking met dié wat laag aktief is, effens swakker. Meer navorsing sal in hierdie verband onderneem moet word om die rede vir hierdie tendens te bevestig, aangesien die aktiwiteitspatrone van die seuns (Tabel 4) nie enige lig daarop kon werp nie.

TABEL 5. **BETEKENISVOLHEID VAN VERSKILLE TUSSEN KINDERS MET DCD WAT LAAG EN HOËR AKTIEF (MA EN HA) IS**

Veranderlikes	LA Week en Naweek			Hoër aktief (MA en HA) Week en Naweek			Betekenisvolheid van verskille		
	N	*x*	s	N	*x*	s	gvv	t	p
Groep									
Fynspiervaardigheid	120	8.31	2.36	319	8.55	2.59	437	-0.89	0.374
Balvaardigheid	28	4.55	2.02	54	3.76	1.37	85	2.15	0.034*
Balans	92	7.34	2.21	227	7.68	2.17	317	1.27	0.210
MABC-Totaal	123	14.86	4.55	304	15.33	4.37	425	-0.99	0.323
Seuns									
Fynspiervaardigheid	43	8.04	2.03	164	8.47	2.58	205	-1.03	0.307
Balvaardigheid	8	3.63	1.19	25	3.32	0.90	31	0.77	0.446
Balans	35	7.71	2.23	116	7.29	1.98	149	-1.10	0.276
MABC-Totaal	41	15.18	4.09	150	14.94	4.23	189	0.33	0.743
Dogters									
Fynspiervaardigheid	77	8.47	2.35	155	8.64	2.61	230	-0.49	0.628
Balvaardigheid	20	4.93	2.18	34	4.09	1.56	52	1.64	0.107
Balans	57	7.11	2.18	111	8.10	2.29	166	2.67	0.008*
MABC Totaal	82	14.70	4.78	154	15.70	4.49	234	-1.60	0.110

$p<0.05$ * betekenisvolle verskil

By die dogters (Tabel 5) blyk dit dat balans van hoër aktiewe DCD-dogters betekenisvol swakker was ($p=0.008$) as dié van die laag aktiewe DCD-groep. Verder was die fynspiervaardighede van die hoër aktiewe groep ook swakker, alhoewel nie betekenisvol nie. Die betekenisvolle swakker balans van die hoër aktiewe groep is ’n moeilik verklaarbare resultaat. ’n Effens groter standaardafwyking binne die HA-groep met betrekking tot balans dui meer variasie binne dié groep aan, wat moontlik hiertoe kon bydra. Geen moontlike verklarings kon ook uit hulle aktiwiteitsvoorkeure wat in Tabel 4 getoon word, verkry word nie. Die positiewe LMI en ouderdomkorrelasies wat met balans by dogters tussen die ouderdomme van 10–12 jaar gevind is (Tabel 3), kan moontlik toon dat dié wat hoër aktief is, dalk reeds in die groeiversnellingsfase is, en dat hulle op grond hiervan in sport waar lengte ’n vereiste is (soos netbal, Tabel 4), nog kan oorheers; vandaar die hoër FA. Literatuur bevestig egter ook dat balans negatief deur ’n hoër LMI beïnvloed word (Gallahue, 1996). Die tendens wat met betrekking tot fynspierprobleme voorgekom (hoe laer die FA, hoe beter die FV, alhoewel nie betekenisvol nie) het, is dieselfde as wat by seuns gevind is. Die tyd wat seuns en

dogters bestee aan televisiekyk en tv-speletjies in die laag en hoër aktiewe DCD-groep, is egter volgens Tabel 4 dieselfde, en kan nie as 'n moontlike verklaring vir die tendens wat gevind is, gebruik word nie. Die hoër aktiewe DCD-dogters toon ook 'n nie-betekenisvolle swakker MABC-totaal, (alhoewel nie betekenisvol nie), wat waarskynlik deur hulle swakker balans veroorsaak word.

'n Vergelyking van seuns met DCD wat laag aktief is (Tabel 5) met dogters wat laag aktief is met DCD (Tabel 5), se gemiddelde waardes in die MABC en die subskale is ook getref. Dié ontleding met onafhanklike t-toeting het getoon dat dogters ($\bar{x}$ =8.47) se fynspiervaardighede swakker is as die van seuns ($\bar{x}$ =8.04), en dieselfde tendens is gevind met die balvaardighede. Hierteenoor was die balansvaardighede en die MABC-totaal van die laag aktiewe dogters beter as dié van die seuns. Geeneen van die verskille tussen die laag aktiewe DCD-seuns en -dogters was egter betekenisvol nie ($p>0.05$).

BESPREKING VAN RESULTATE

Alhoewel onderliggende oorsake van DCD reeds deur verskeie navorsers ondersoek is (Willoughby & Polatajko, 1995; Raudsepp & Jürimäe, 1996; Jacobson, 1998) het geeneen van die studies die rol van faktore soos fisieke onaktiwiteit in ontwikkelingskoördinasie-versteuring direk ondersoek nie. Met die onderhewige studie wou eerstens bepaal word of DCD-kinders geneig is tot lae aktiwiteit, en indien wel, of lae aktiwiteit motoriese vaardigheid sal belemmer. Uit die resultate wat bestudeer is, blyk dit dat 50% van DCD geklassifiseerde kinders wel ook LA is. Navorsers (Peters & Wright, 1999; Cairney *et al*., 2005) het aangedui dat een van die moontlike kenmerke van DCD-kinders lae aktiwiteit is, wat hierdie resultate rugsteun. Lae aktiwiteit by DCD geklassifiseerde kinders blyk uit die resultate 'n belemmerende rol in hulle balvaardigheid te speel. Hierdie resultate sluit aan by die bevindinge van navorsers soos Bouffard *et al*. (1996), Butcher en Eaton (1989), Henderson *et al.* (1989) en Sääkslahti *et al.* (1999) wat aangedui het dat lae aktiwiteitsvlakke by kinders aanleiding gee tot 'n verhoging in motoriese agterstande. Sääkslahti *et al.* (1999) het gevind dat wanneer kinders buite speel, totale spier- én kragafhanklike vaardighede deur hulle gebruik word, en geleenthede om vaardighede soos die skop van 'n bal, wat nie binnenshuis kan plaasvind nie, in te oefen. Die tendens van effense beter fynspiervaardigheid van laag aktiewe DCD-kinders vergeleke met hoër aktiewe DCD-kinders in hierdie studie suggereer dat hulle heelwat tyd met aktiwiteite soos rekenaarspeletjies deurbring wat nie werklik totale spierontwikkeling bevorder nie. Uit hulle aktiwiteitspatrone wat ontleed is, blyk minder deelname aan aktiwiteite soos netbal, tennis, krieket, balskop en sokker die geval te wees by laer fisiek aktiewe DCD kinders.

Geslagtelike verskille met betrekking tot lae aktiwiteit by DCD-kinders het aan die lig gebring dat meer dogters met DCD ook laag aktief is, as wat by seuns gevind is. Studies met betrekking tot dogters se fisieke aktwiteitsvlakke bevestig ook hierdie tendens (Pate *et al.*, 1994; Boreham, *et al.*, 1996; Trost *et al.*, 1999). Cairney *et al*. (2005) se navorsing is die enigste wat die fisieke aktiwiteitsvlakke van DCD kinders direk ondersoek het, en het getoon dat dogters met DCD die laagste aktiwiteitsvlakke van al die groepe in die studie getoon het. Dit blyk ook dat seuns en dogters met DCD se motoriese vaardigheid verskillend deur lae FA beïnvloed kan word. Alhoewel 'n tendens van swakker totale met betrekking tot balans, balvaardighede en MABC-totale by seuns wat laag aktief is, in hierdie studie gevind is, vergeleke met DCD-seuns wat hoër aktief is, wil dit tog voorkom uit die gekorrigeerde

korrelasies dat FA met betrekking tot balans, balvaardighede en die MABC-totaal groter verbande by dogters met DCD wat laag aktief is, uitwys. Swak SES het geblyk ’n groter rol in seuns se FA, balans en MABC-totaal aan te dui, ’n tendens wat deur navorsing bevestig word (Herbst & Huysamen, 2000). Die positiewe verband wat tussen seuns se FV-waarde en hulle massa gevind is, kan moontlik daarop dui dat onaktiwiteit wat moontlik met ’n hoër liggaamsmassa verband hou, tot dié resultaat kon bydra. Seuns en dogters met DCD wat laag aktief is, se gemiddelde waardes vir die MABC en die subskale verskil egter nie betekenisvol van mekaar nie, waaruit afgelei kan word dat laag aktiewe DCD-seuns en -dogters se motoriese vaardigheid nie werklik verskil nie. Cairney *et al*. (2005) rapporteer soortgelyke resultate.

Vanuit ’n gesondheidspersektief beskou, kan die lae FA van DCD-kinders ’n negatiewe uitwerking op hulle kardiorespiratoriese ontwikkeling uitoefen. Die feit dat hulle motoriese kompetensie ook daardeur benadeel word, kan ook hulle totale welstand benadeel, aangesien ’n bose kringloop van onttrekking aan aktiwiteite met gepaardgaande sosialserings- en selfbeeldprobleme hieruit kan voortspruit (Heath *et al*., 1994; Marsh & Johnson, 1994; Manios *et al.*, 1998; Cairney *et al*., 2005). Dogters blyk ’n groter risiko vir hierdie verdere benadeling, as hulle reeds DCD het en ook boonop laag aktief is, te toon as seuns.

SAMEVATTING

Bogenoemde bevindinge met betrekking tot die rol wat fisieke aktiwiteit in die ontwikkeling van ’n DCD-kind se motoriese vaardighede speel, is belangrik vir onderwysers, opvoeders en kinderkinetici wat daagliks met hierdie kinders werk. Die resultate beklemtoon dat aandag aan DCD-kinders se motoriese probleme bestee moet word en dat deelname aan fisieke aktiwiteite vir sodanige kinders belangrik is. Balvaardighede behoort veral aandag te kry. Daar word aanbeveel dat toekomstige navorsers ondersoek instel om te bepaal of intervensieprogramme wat motoriese probleme sowel as die verhoging van fisieke aktiwiteitsvlakke behandel, nie ’n moontlike verbetering van DCD-kinders se motoriese vaardighede kan bewerkstellig nie. Die rol wat ras, geslag en sosio-ekonomiese toestande speel in die ontwikkeling van motoriese vaardighede van DCD geklassifiseerde kinders, behoort ook meer indringend ondersoek te word in verdere studies van dié aard.

SUMMARY

The relationship between low physical activity and Developmental Coordination Disorder (DCD): Thusa Bana study

Children with coordination difficulties of a certain degree are classified with the DSM-IV (American Psychiatric Association, 1994) as children with DCD. These children show developmental difficulties in some or all of their fundamental skills which can negatively influence their daily living and school activities. In addition, they are usually not very active (Bouffard *et al*., 1996; Cairney *et al*., 2005). Physical activity which can place a child in the high physically active category is, however, essential for the development of cardio-respiratory funcions (Peters & Wright, 1999). Literature also shows that boys have more motor problems than girls, although they are more active than girls (Pate *et al.*, 1994; Boreham, *et al.*, 1997; Trost *et al.*, 1999).

The purpose of this study was to examine the relationship between Developmental Coordination Disorder (DCD) and physical activity of children in the age group 10-12-years living in the North West Province (N=645), and secondly to examine differences between the low active boys and girls classified as children with DCD (N=429). A group of children was randomly selected from all the districts in the North West Province, proportionally representing the different racial groups [White (n=90), Black (n=467), Coloured (n=47), Indian (n=41)]. In this group, 318 boys and 327 girls completed the Movement Assessment Battery for Children (MABC) (Henderson & Sugden, 1992) and the Previous Day Physical Activity Recall (PDPAR) (Trost *et al.*, 1999). Children who tested below the 15th percentile were classified in the DCD group, while physcal activity levels (PA) were classified as low, moderate or high.

For the analysis of the data, the Statistica for Windows (Statsoft, 2001) computer package was used to analyse the data for descriptive purposes, t-testing and partial correlation analysis. The SAS-statistical program (SAS, 2003) was used to analyse physical activity patterns.

Children classified in the DCD category with the MABC-T (<15th percentile) were compared with children without DCD with regard to their physical activity levels (low, moderate and high). The results showed that 50% of the children who were classified with DCD were also low active and that low active DCD children had significantly poorer ball skills compared to higher active DCD children. Analysis of differences in PA levels of boys and girls with DCD showed that more girls with DCD are low active and that the girls with DCD are less active than the boys with DCD. Low and higher active boys and girls did not differ with regard to the different subtests (manual dexterity, ball and balance) and the MABC total, although the balance of higher active DCD girls was poorer than that of the lower active DCD girls. The motor proficiency of the low active DCD boys and girls also did not show any significant differences. A partial correlation analysis correcting for race, gender, age, fat percentage, weight, height, body mass index, physical activity, and socio-economic status showed that socio-economic conditions and physical activity had the highest association with motor skill development of low active DCD children. Overall, the conclusion can be made that a low PA level has a relationship with the motor proficiency of a 10-12 year old child who is classified with DCD.

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USING A DEVELOPMENTAL MOVEMENT PROGRAMME TO ENHANCE ACADEMIC SKILLS IN GRADE 1 LEARNERS

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ABSTRACT

The effects of movement on academic performance and cognitive development is often underrated. Many theorists argue for the importance of movement to be recognized because there appears to be an elaborate interplay of brain and body. Brain research has shown that the brain is "plastic" in that it can adapt continuously, and its structure can be changed by certain kinds of stimulation, including movement. The body is a sensory-motor response system that causes the brain to organize itself. Movement is essential to learning and can be regarded as the door to learning. This article reports on a developmental movement programme which was established to determine whether movement would enhance the academic skills of Grade 1 learners. Four groups of learners were used in this research project. Learners were randomly selected for one of the following groups: the experimental, control, free-play or educational toys group. The results of the pre-testing and post-testing indicate that the learners of the experimental group showed a significant improvement in spatial development as well as in reading and mathematical skills, compared to the learners in the control group, free-play group and educational toys group.

Key words: Movement programme; Academic skills; Cognitive learning; Physical activities; Development.

INTRODUCTION

The benefits of physical exercise for fitness and health are seldom questioned. More controversial is the debate around the impact of movement on the academic performance and mental development of young children. Research does not consistently show that movement programmes have a positive effect on learning, so the schools do not have a clear mandate in this regard. The result is that physical education is often seen as a frill, and has been discontinued in many South African schools, which might be a misguided kind of thinking (Summerford, 2001: 6). This research is an exploratory investigation into the efficacy of a movement programme on the academic skills of Grade 1 learners.

Brain development and learning: the role of movement

The link between movement and successful learning stems from earlier theorists such as Delacato (1959; 1974), Cratty (1972; 1973), Kephart (1975), and Ayres (1979). They believed that movement reflects neural organisation and provides the stimulation to neurological systems that is necessary for their development and optimal functioning. In more recent years, many theorists reflect these views. Pica (1998: 18) and De Jager (2001: 8) agree that we consider the brain and body as a united whole. The more closely we consider the elaborate

interplay of brain and body, the more clearly we see that movement is an integral part of all mental processing. Every movement is a sensory-motor event, linked to our understanding of our physical world, from which all learning derives (Hannaford, 1995).

The explosion of brain research supports these theories. Examples include the work on nerve growth factor for which Rita Levi-Montcalcini won the Nobel prize in 1986; Changeux and Conic (1987), whose work provided evidence that movement is necessary for neural growth, and Ito (1984; 1987), who found that stimulation of the vestibule-ocular reflex arc resulted in changes to the structure of the cerebellum. Further brain research has shown quite conclusively that the brain is "plastic" in that it can adapt continuously, and its structure can be changed by certain kinds of stimulation, including movement (Thompson, 1996; Gold, 1997; Robertson, 2000; Berthoz, 2000; Stiles, 2001 and Le Poncin cited in Kokot, 2003a: 45). These findings mean, in effect, that the body, as a sensory-motor response system, causes the brain to learn and thus to organise itself, rather than the other way around (Kokot 2003a: 45).

Piaget (1952) called the first stage of intellectual development the sensorimotor stage, when children experience the world primarily through their senses and motor abilities. This forms the bedrock on which the subsequent hierarchy of all intelligence is built. Randolph and Heiniger (1994: 21) explain that children learn from the inside out - first through experiencing their own bodies and then from their own bodies in relation to the rest of the world.Hannaford (1995: 12) states that movement activates the neural wiring throughout the body, making the whole body the instrument of learning.

Black (1995: 33) reports that good physical education programmes can boost academic achievement and feels that children may be learning more in physical education classes than anyone ever imagined. Black (1995: 34) concludes that schools that insist that children sit still for most of the day deny the connection between movement and learning. Maude (2001: 49) found indications that early movement served as the springboard for learning language.

Summerford (2001), who also studied the impact of movement on learning, based her initial conclusions on a research study with mice. These findings built on earlier work showing that exercise boosts the number of brain connections in the hippocampus, the part of the brain known to be centrally important to learning and memory. Associated work suggests that similar mechanisms may operate in humans (Summerford, 2001: 7).

While these studies report positive findings, it is necessary to consider the content of movement programmes or the type of movement programme that is used to stimulate brain function. A study by Longhurst (2002) found that a regular physical education programme made no significant difference to the motor proficiency or academic performance of learning-disabled children, while significant improvements in both areas were noted in groups of children engaged in sensory-and perceptual-motor programmes.

With this in mind, the nature and quality of movement programmes in early childhood education should be evaluated. Consideration has to be given to what is being done, because (at present) there is no single recipe for best practice in early childhood physical education (Campbell, 1997: 37) or other movement programmes.

A lack of movement: the key to understanding learning restraints

Learning restraints have been the subject of much research in many disciplines, but no single cause has as yet been found. There is some evidence that a lack or insufficient degree of

movement during a child's developmental stages may contribute to or underlie most learning restraints (Pheloung, 2003: 53). This includes the view of Goddard-Blythe (2000: 156), who believe that attention (A), balance (B) and coordination (C) constitute the primary ABC upon which all later learning depends. If these skills are not developed at the time that children enter school, children run the risk of later developing specific learning difficulties, not because they lack intelligence, but because the basic systems fundamental to learning are not fully in place at the time they start school. Movement that is meaningful for development will ensure that these skills develop.

Spatial awareness, which is needed for school readiness, is reliant on healthy gross motor development (Corso 1993). Until children have had experience orienting their bodies in space by moving up, on, under, beside, and in front of things, it is possible that they will have difficulty dealing with letter identification and the orientation of symbols on a page (Olds 1994: 33). Olds' research revealed that 98% of 500 children who had been identified as being learning disabled were also characterised as being physically clumsy.

Difficulties with eye convergence leading to reading problems are possibly the result of neurological disorganisation particularly related to vision, and arise because of underlying movement problems (Hager, 2000). Hager (2000) concludes that movement is necessary to stimulate the brain's ability to take in, process and store information well. Movement is seen as essential to strengthening short-term memory, long-term memory, as well as cortical hemispheric dominance.

Movement as a remedial measure

Studies using movement to remediate learning difficulties have been few and show conflicting results. Bass (1985: 160) found that running or jogging is an effective treatment for children's behavioural and learning difficulties. Bass (1985: 160) cites other studies documenting the effects of exercise on learning, including Young (1978), who correlated physical activity with improvement in test scores of intelligence, brain function, speed of performance, memory, and learning; Elsom (1981), who found that jogging improved the visual and auditory attention span and decreased the hyper behaviour of hyperactive boys and Evans (1981), who noted that adolescents decreased their talking-out behaviour in class and completed more written assignments after running treatments.

Goddard-Blythe and Hyland (1998) demonstrated the positive effect of movement in addressing specific learning difficulties that have their origin in neurological dysfunction. Hotveldt (2001) also found movement to be an effective remedial measure and the more movement she included in daily lessons, the more attentive the learners were.

Jensen (1998: 87) writes: "Give a school daily dance, music, drama and visual art instruction where there is considerable movement and you might get a miracle".

On the other hand, Corrie and Barratt-Pugh (1997: 30) report on studies showing that certain perceptual-motor training was not an effective intervention technique for academic, cognitive or perceptual-motor variables. The results show little effect in any developmental domain, even on children's gross motor skills. Furthermore, the programmes made little difference to the reading, arithmetic, language or spelling of children with learning difficulties or of normally developing children. However, even though it may initially seem that Corrie and Barratt-Pugh (1997) do not accept the theory that movement leads to learning, they do state

that it is not the importance of perceptual-motor development that is disputed, but the way of supporting and facilitating that development that is critical. This gives rise to the question: "What should a movement programme contain?" It seems that physical education programmes need to be far more than mere physical fitness activities (Feigley, 1990: 20) or preparation for sporting proficiency.

Movement to address the root cause of learning difficulties

The design of a movement programme should be guided by knowledge of the root cause of a learning problem. This reduces the "shotgun" approach to symptomatic behaviours or difficulties with learning, and characterises the approach followed by the HANDLE® Institute, based in Seattle in the United States of America (www.handle.org). HANDLE practitioners focus on the underlying causes of learning and other neurodevelopmental problems, rather than the behavioural symptoms. For example, it may be necessary to understand why a child with attention problems blocks certain types of stimulation (such as the voice of an adult) and seeks others (such as constant movement) and why he or she has difficulty adjusting attention flexibly enough to meet certain demands of the environment and not others (such as being able to fixate on a computer screen, but not on an academic task). For a child to experience success in learning areas, a number of underlying sensory-motor systems have to be functioning well.

If the vestibular, proprioceptive, tactile, visual and/or auditory systems are malfunctioning, they will fail to support the child's attempts to learn academic work, sit still, pay attention, complete tasks and learn appropriate social behaviours (Kokot, 2003b: 15).

These sensory systems develop according to a hierarchy. Success on one level is necessary for success on the next. Therefore, if any of these developmental steps have been interrupted or skipped, it is likely to affect the degree to which the child experiences academic success.An assessment is done to determine which sensory systems are "faulty". Once these systems have been identified, an individualised programme of both active and passive activities is designed for the learner in order to rehabilitate the "weak" systems (Kokot, 2003a: 47). This is a holistic approach and while other factors are also taken into account, movement forms an integral part of the support given to the learner.

Tony Hager, a trained neurodevelopmental specialist and founder of CAN LEARN, agrees that movement is the key to overcoming learning disabilities and foresees a bright future for learning-impaired children if the core problem is treated, rather than the symptoms (Hager, 2000).

Movement as a means of adjusting the underlying systems that support learning is also the premise of Brain Gym (Dennison & Dennison, 1989). The Brain Gym activities were created to either stimulate (lateral dimension), release (focusing dimension), or relax (centring dimension) individuals involved in particular types of learning situations. Brain Gym does not attempt to diagnose any ailment or impairment, but some of the movement activities are similar to those used in the HANDLE approach and those proposed by Hager (2000).

THE MOVEMENT PROGRAMME

In accordance with the literature and the experience of the researchers that certain therapeutic movement programmes bring about rapid and lasting improvements in children's ability to concentrate and learn, it was decided to design and implement a specific movement programme, based largely on the HANDLE approach, and evaluate its effect on a class of Grade 1 learners as an exploratory study in a single school.

Method

A detailed 10-week programme comprising 20 minutes per weekday of highly specific, developmental movements was designed by Professor Kokot of the University of South Africa (Unisa). The activities were drawn from those included in the HANDLE approach, similar to some used by Hager (2000), and others were drawn from perceptual-motor and sensory-motor programmes.

The exercises were designed to focus on the following: the developmental sequence of movements through infancy, midline crossing, balance, proprioception, laterality, interhemispheric integration, vestibular work, convergence, divergence, visual accommodation, integrating reflexes, listening ability, muscle tone and tactility.

The nature of the exercises ensured that more than one of the preceding aspects would be addressed during the duration of the particular activity.

Programme design

The following is an example of a single day's programme used during weeks 1-5:
Tuesday (Week 4)

1. Warm-up activity
2. Flip-flops
3. Beanie back-roll
4. Side-to-side tips
5. Quarter-turn roll
6. Ball throw and tap (modification of the clapping game)
7. Accentuation hop (left, left, right)
8. Animal-walk exit

Each day's programme began with a warm-up activity. (Discretion could be used in the choice of the warm-up activity from a given list of activities). The format of the programmes for weeks 6-9 was different. During this time the group was divided into three smaller groups each day and each group would, after the warm-up activity, work at a different workstation. The groups would rotate, so that each group spent approximately five minutes at each workstation. Different activities were prescribed for each day of the week. The following is an example taken from week 7:

(Tuesday)

Station 1: Low walking boards
Equipment: Place a low board (balance-beam, plank, two strips of tape, or two lines of chalk, about 10 cm apart) on the floor.
(A) Children walk across, with eyes focused on teacher's hand (held at a comfortable distance in front of the eyes).

(B) On the second time around, those children who manage this easily, may be given an obstacle to step over halfway along the walk (e.g. another child may hold a stick, broom handle, etc. in the way at a height of about 15 cm).
(C) On the third time around, able children may balance a beanbag on their head, as they walk – and step over the obstacle.

Station 2: Obstacle course

Equipment: Mats, two cross-bars and hula hoop
(A) Children jump over cross-bar from a stationary position. (Bar may be supported by small chairs.)
(B) Crawl under low cross-bar. (Child should be close to the ground.)
(C) Crawl through the hula hoop without touching any part of it with body.

On subsequent turns, the child may be challenged to find a different way of moving through the obstacles. The teacher may also hold the hula hoop in different positions.

Station 3: Ball-bouncing with hoops

Equipment: Ball and 5 hula hoops.
(A) The child bounces and catches the ball once in each of the five hoops, followed by a jump into each of the hoops.
(B) The child hops through the hoops on one foot and bounces the ball into each hoop. (The bouncing of the ball into the hoop precedes the hop.)

Emphasise: The child bounces the ball into the hoop, followed by a jump into the same hoop. Both feet leave the ground at the same time on each jump. Eyes focus on the ball with hands and fingers forming a pocket to properly catch the ball. Exit hall with cross-patterned walk, touching each knee with the opposite hand. The activities prescribed for week 10 were similar in format to those used in weeks 1-5.

Participants

The school at which the programme was tested had four Grade 1 classes. The division into experimental group, control group, free-play group and educational toys group was done randomly. There were 58 learners in total in the four classes, but not all 58 were included in the results. Some learners were absent on the day of the pre-testing so, although they participated in the programme, they were not included in the findings. The following frequency table gives the biographical information of the participants in this study:

TABLE 1. **FREQUENCY TABLE OF BIOGRAPHICAL INFORMATION**

Gender	Boy	23
	Girl	30
Group	Experimental	13
	Control	13
	Educational toys	14
	Free-play	13
Language	English	42
	Afrikaans	6
	Other	5
Age/month	Up to 5.5 years	16
	>5.5 to 6.5 years	20
	>6.5 years	17

Procedure

Step one

A seminar was held with the teachers to introduce the project, clarify their involvement in the project and ensure that the staff members responsible for the programme (an occupational therapist and Grade 1 teacher) were knowledgeable about the significance and specific aspects of the different movements/activities. The exercises were taught to and practised by these two staff members. The four groups were identified as well, namely

* a free-play group (play), where the children were allowed to run and use playground equipment such as jungle gyms, etc.
* an educational toys group (toy), where the children were contained in their classroom, but allowed to use table-top educational games.
* a control group (cont), which followed the normal school curriculum
* an experimental group (exp), which followed the movement programme

Step two

Pre-testing of each of the learners in the four groups was performed. The learners were assessed on the following:

* *the Aptitude Test for School Beginners (ASB).* This test comprises eight sub-tests, namely perception, spatial, reasoning, numerical, Gestalt, co-ordination, memory and verbal comprehension
* *reading age*
* *maths age*
* *draw-a-person (DAP) (for emotional indicators)*

The teacher of each class also performed qualitative observation.

Step three

The programme had to be done on a daily basis and one of the researchers involved in the project was assigned the task of overseeing the correct implementation of all the prescribed movement activities.

Step four

Owing to interruptions at the beginning and end of the 10-week term, it was only possible to run the programme over eight weeks. After the eight weeks each learner was reassessed (post-testing) on the eleven quantitative aspects referred to under step two.

Step five

The results of the pre-tests and post-tests were compiled in order to be able to conduct different statistical analyses.

STATISTICAL ANALYSIS AND FINDINGS

The statistical analysis sought to answer the following questions:

- Would there be any significant difference in the "before" and "after" performance scores of the learners after participating in their respective groups (i.e. the free-play,

educational toys, control or experimental groups)?

- Would there be an improvement in their scores after having participated in their respective groups?
- If any improvement was evident, was the improvement meaningful?
- Did age, language, group and/or gender influence any meaningful improvement that may exist?

In order to answer the above-mentioned questions, it was necessary to start by converting all the scores obtained with the pre-testing and post-testing for the different tests, to a percentage. Creating such a uniform scale allowed for comparisons to be made between the different test measurements. The next step entailed calculating means, standard deviations and means according to the biographical factors for each of the 11 test measurements. This was done with the pre-test and post-test scores.At this point a possible tendency was noted, but at this early stage no conclusion could be drawn in respect of meaningful differences. These observations (listed in Table 2) were merely descriptive and informative.

TABLE 2. **PRE-TEST AND POST-TEST: MEANS, STANDARD DEVIATIONS AND MEAN DIFFERENCES**

	Pre-test MEAN	Post-test MEAN	Paired-diff t-test: Mean difference	SD	Significance
Apt 1	97.74	98.30	0.57		
Apt 2	76.42 a	83.40 b	6.98	18.25	**
Apt 3	91.13 a	95.28 b	4.15	9.29	**
Apt 4	80.94 a	87.55 b	6.60	16.75	**
Apt 5	87.92	86.13	-1.79	11.15	
Apt 6	75.35	77.67	2.33	16.14	
Apt 7	93.02 a	96.79 b	3.77	19.67	*
Apt 8	72.17 a	83.54 b	11.41	10.02	***
Draw	69.51	66.87	-2.64	11.71	
Read	82.04 a	86.25 b	4.21	2.68	***
Maths	85.96 a	91.87 b	5.91	3.43	***

Apt = Aptitude test
Significance associated with test:
0.0001 or 0.1% : ***
0.05 or 5% : **
0.1 or 10% : *

In Table 2, for each of the seven performance tests where a significant difference in the means was observed, the performance measurement is indicated as an improvement.

In order to confirm these noticeable tendencies seen in Table 2, the next step entailed calculating the difference between the "before" and "after" testing for each learner. These differences were tested by means of a parametric and non-parametric test. The tests that were used were the paired-difference t-test and the Wilcoxon Signed Rank Test. When making use of a paired-difference t-test, a normal distribution of observations is a prerequisite and this requirement was met. The two tests would test the null and alternate hypotheses:

Null hypothesis: The mean difference between the "before" and "after" scores for each of the eleven performance tests does not differ significantly from zero.

Alternate hypothesis: The mean difference between the "before" and "after" scores for each of the eleven performance tests differs significantly from zero.

Only the significant findings for the two tests are given in Table 3.

TABLE 3. **PAIRED-DIFFERENCE T-TEST (PARAMETRIC) AND WILCOXON SIGNED RANK TEST TO TEST**

Ho:$\mu_D = 0$ against Ha:$\mu_D \neq 0$

	Student's t	P(t) >ltl & Significance	Conclusion	Wilcoxon (S) Signed Rank Test	Pt(s) >lSl & Significance	Conclusion
aptdiff 2	2.79	0.007 **	Average mean diff is sign different from zero (Pre-post differ)	191.5	0.003 **	Average mean difference is sign different from zero (Pre-post differ)
aptdiff 3	3.25	0.002 **	Average mean diff is sign different from zero (Pre-post differ)	129	0.001 ***	Average mean difference is sign different from zero (Pre-post differ)
aptdiff 4	2.87	0.006 **	Average mean diff is sign different from zero (Pre-post differ)	176	0.007 **	Average mean difference is sign different from zero (Pre-post differ)
aptdiff 8	8.30	<0.0001 ***	Average mean difference differ sign from zero =>Pre-post test differ sign	543.5	<0.0001 ***	Average mean difference differs sign from zero =>Pre-post test differ sign
diff draw	-1.64	0.106 *	Average mean difference differ sign from zero =>Pre-post test differ sign	-244.5	0.024 **	Average mean difference differs sign from zero =>Pre-post test differ sign

TABLE 3. **PAIRED-DIFFERENCE T-TEST (PARAMETRIC) AND WILCOXON SIGNED RANK TEST TO TEST**

Ho:$\mu_D = 0$ against Ha:$\mu_D \neq 0$ (Continued)

diff read	11.44	<0.0001 ***	Average mean difference differ sign from zero =>Pre-post test differ sign	669.5	0.024 ***	Average mean difference differs sign from zero =>Pre-post test differ sign
diff maths	12.53	<0.0001 ***	Average mean difference differ sign from zero =>Pre-post test differ sign	663	<0.0001 ***	Average mean difference differs sign from zero =>Pre-post test differ sign

Probability & Significance associated with test:
<0.01 0.0001 or 0.1% : ***
<0.05 0.05 or 5% : **
<0.001 0.1 or 10% : *

From the results of the paired t-test given in Table 3, it is evident that the following means differed significantly from zero: spatial, reasoning, numerical, verbal comprehension, reading age and maths age. According to the results of the Wilcoxon Signed Rank Test, the following differed significantly from zero: spatial, reasoning, numerical, verbal comprehension, draw-a-person, reading age and maths age. The findings listed in Table 3 indicated a difference in the means between the "before" and "after" scores. In the light of these findings, the null hypothesis is rejected and the alternate hypothesis accepted for the following: spatial, reasoning, numerical, verbal comprehension, draw-a-person, reading age and maths age.

To establish the effect of the biographical factors on the significant mean difference in performance, an analysis of variance was done for each test. This analysis of variance would indicate the possible effect of the biographical variables on the improvement in the performance of the learners. The four variables of gender, group, language and age were therefore included in the model. The ANOVAS were done on the differences between the pre-test and post-test scores (presented as a percentage) for the eight aptitude tests, the DAP, reading age and maths age. The significance associated with each ANOVA (F probability) and with the biographical variables entered in the ANOVA (F probability as well) to determine their possible effect on the relevant test score differences, are supplied in Table 4. Once again only the significant findings are reported in Table 4.

TABLE 4. **SUMMARY: ANALYSES OF VARIANCE RESULTS**

Test-score difference	Significance f-probability	Biographical variables included: Gender	Group	Language	Age		
Apt diff 2	0.0018 ** 0.002	0.20	0.014 *	0.01 **	0.13	53	Sign differences established between pre-test and post-test can to some extent be explained by sign effect of group and language
Diff read	0.01 **	0.21	0.001 ***	0.74	0.31	53	Effect of group explains part of the sign difference established between pre-test and post-test results
Diff math	0.05 **	0.10 *	0.10 *	0.54	0.07 *	53	Effects of gender and group explain some of the sign difference established between pre-test and post-test results

Probability & Significance associated with test:
<0.01 0.0001 or 0.1% : ***
<0.05 0.05 or 5% : **
<0.001 0.1 or 10% : *

The findings reported in Table 4 indicate that spatial (apt 2), reading age and maths age are meaningfully influenced by the biographical variables. This can be explained as follows:

(1) With spatial, some extent of the significance can be attributed to the group and the language.
(2) The effects of the group explain part of the significant difference established between pre-test and post-test results with regard to reading age.
(3) The effects of the group and the gender of the learner explain some of the significant difference established between the pre-test and post-test results in respect of mathematical age.

To interpret these findings, the means and standard deviations for the biographical effects included in the ANOVAS are given in Table 5 where it shows “how” and “where” the four groups differed from one another.

TABLE 5. **MEANS (AND SD) FOR THE BIOGRAPHICAL EFFECTS INCLUDED IN THE ANOVA MODELS**

Apt diff		Gender		Group		Language		Age	
2	Spatial	7.3a	girl girl	exp	17.69a	Afr	28.33a	<5.5	1 1.25a
		6.5a	boy boy	toy	10.71ab	other	10.06b	>6.5	5.88a
				cont	5.39bc	Eng	3.57b	5.5-6.5	4.50a
				play	-6.15c				
10	Read diff	boy	4.61a	exp	5.92a	other	4.60a		
		girl	3.90a	toy	5.07ab	Eng	4.17a		
				play	3.38bc	Afr	4.17a		
				cont	2.38c				
11	Maths diff	boy	6.52a (5.02)	exp	7.3a				
				cont	6.8a				
		girl	5.43a (2.88)	play	5.7ab				
				toy	4.06				

In Table 5 the improvement in the performance of the experimental group on the spatial test is given as 17.96 percentage points, which is significant compared to the -6.15 percentage point difference of the free-play group. This significant difference is also greater than that of the educational toys group (10.71) and that of the control group (5.39). Similarly, with the significant difference in respect of reading age and maths age the experimental group showed a greater significant difference than the other groups. For the reading age, the experimental group showed a 5.92 percentage point difference, compared to the 5.07 of the educational toys group, the 3.38 of the free-play group and the 2.38 of the control group. As far as the significant difference in respect of the maths age is concerned, the experimental group showed a 7.3 percentage point improvement compared to the 6.8 of the control group, the 5.7 of the free-play group and the 4.06 of the educational toys group.

The teachers were asked to record any observations that they thought could be meaningful when interpreting the results. When all four groups were assessed at the end of the term, the teaching staff noticed that not a single learner in the experimental group showed problems with midline crossing, whereas this was a common problem experienced by children in each of the other three groups. Midline crossing was dealt with in the first five weeks of the movement programme.

CONCLUSION

The calculations of the means for the pre-tests and post-tests showed a significant difference in respect of seven of the 11 performance tests: spatial, reasoning, numerical, memory, verbal comprehension, reading age and maths age. The mean difference between these scores showed an improvement in performance upon post-testing. However, at that stage no decision could be made as to the significance of the difference in means. Therefore these differences were tested by means of a parametric and a non-parametric test. The results of the paired t-test and the Wilcoxon Signed Rank Test that were used for this purpose indicated significant differences in the following: spatial, reasoning, numerical, verbal comprehension, draw-a-person, reading age and maths age. An analysis of variance was then done to determine the

effect of the biographical factors on the improvement in the performance of the learners. The ANOVAS that were calculated indicated the following as being significant: spatial, reading age and maths age. Further analysis showed that the experimental group had the most significant difference with regard to spatial, reading and mathematical skills.

Based on the findings we conclude that a developmental movement programme did have a positive impact on the learners over a remarkably short period of eight consecutive weeks. As seen from the results, these learners improved where spatial factors were involved in learning. From the literature survey, the indication is that spatial awareness is necessary for success in reading and mathematics. It is therefore not surprising that the learners in the experimental group also showed a greater improvement in their reading and mathematical skills compared to the learners in the other three groups. In addition the learners in the experimental group were reported to be more alert and quicker in their responses in the classroom after the exercise period. It can thus be concluded that when movement targets those systems that are crucial to a child's ability to learn, certain learning experiences of the Grade 1 learner will be enhanced.

The results of this exploratory study suggest that further research is warranted to confirm the strong possibility that carefully designed, developmental movement programmes during early childhood may make a difference to those learners who are at risk when it comes to learning problems. This implies that educators should reconsider the value of such programmes in the school curriculum. The possibility exists that other variables may have influenced this improvement and further research may have to control such variables. One shortcoming in this study was that the emotional indicators obtained with the draw-a-person test were not included in the results. The effect of emotional factors should be considered in future research and the effects of a programme sustained over a longer period of time must also be investigated. In this instance the ten-week programme had to be reduced to eight weeks due to interruptions in the academic programme. This could have had an influence on the results.

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BRAND CONFUSION IN SOUTH AFRICAN RUGBY – SUPER 12 BRANDS VS CURRIE-CUP BRANDS?

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ABSTRACT

Through the application of marketing principles and practice, sport marketers should anticipate, manage and satisfy sports consumers' needs and wants when marketing sport. They should strive to create and build awareness of a specific sports team, which should ultimately lead to loyal supporters. Sports teams' brands should therefore be emphasised and marketed. Branding is a relatively new phenomenon in rugby, a sport that a decade ago became professional and commercialised in South Africa. Despite the importance of brands and consumer perceptions of brands, rugby management in South Africa has been slow to realise the importance of brand management (Williams, 2004: 18). A case in point is the South African Super 12 rugby brands and the apparent lack of differentiation from the traditional Currie Cup brands. This study investigated South African rugby supporters' awareness of the various South African Super 12 and top Currie Cup brands. The aim was to determine whether there is brand confusion regarding these brands among South African rugby supporters.

Key words: Sports marketing; Sports branding; Rugby; Super 12; Currie Cup.

INTRODUCTION

Sports marketing globally has become highly sophisticated, employing traditional consumer-goods techniques. For example, Manchester United Football Club is listed on the London Stock Exchange, and had a market capitalisation of US$466 million in 2000 (Adam & Adam, 2002: 1). Because sports marketers are no longer content to allow win-loss records to dictate attendance levels and financial fortunes, many sports teams are being marketed through a creative combination of advertising, promotions, sponsorship, direct mail and other forms of marketing communication. Brand symbols and logos in particular have become important financial contributors to professional sports (Keller, 2003: 28).

When focusing on branding, one needs to clarify certain concepts. One such concept is *brand*. A *brand* is a name, term, phrase, design, symbol, or any combination of these, chosen by an individual or company to distinguish a product from competing products (Bovée *et al*., 1995: 247). However, marketers refer to a brand as being more than that, because it also creates a certain amount of awareness, reputation and prominence in the marketplace (Weitz & Wensley, 2002: 7). Brand awareness refers to the strength of a brand's presence in the

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consumer's mind (Aaker, 1996:10). It is a measure of the percentage of the target market that is aware of a brand name (Bovée *et al*., 1995: 248).

The brand-related marketing activities of sport teams should therefore focus on building the sport teams' brands (Kelly *et al*., 1999: 472). According to Williams (2004: 18), South Africa's international isolation from the 1970s to the early 1990s resulted in the South African rugby unions missing out on a generation of global sports development, both on and off the field. When South African rugby became professional in 1995 (Basson, 2003: 15), management was often primitive, and while the top sporting nations were evolving professional structures and brand management, South African sport was stagnating (Williams, 2004: 18). Hence South African sports brands still have some catching up to do before they reach the earning levels of the top sports brands in the world (Hasenfuss, 2001: 52).

In South Africa there are 14 rugby unions, in 14 geographically distributed areas. These are the Blue Bulls (situated in Pretoria), Boland (Wellington), Border (East London), Eastern Province (Port Elizabeth), Falcons (Springs), Free State (Bloemfontein), Golden Lions (Johannesburg), Griffons (Welkom), Griqualand West (Kimberly), Leopards (Potchefstroom), Mpumalanga (Witbank), Natal (Durban), South Western Districts (George) and Western Province (Cape Town). When rugby was professionalised, the reorganisation of the rugby unions afforded the various South African rugby unions an opportunity for branding and aggressive marketing (Anon., 1998: 22). Most of the unions have since updated their rugby brands to reflect a more powerful and aspirational feel (Van der Berg, 2003: 5). Annually, the South African rugby unions compete in various tournaments (Anon., 2000b: 1). For the purposes of this article, only the Currie Cup and the Super 12 brands will be investigated.

THE CURRIE CUP TEAMS

The Currie Cup is the oldest of its kind in world rugby competition. It was originally a floating trophy for interprovincial competition and was played for the first time in 1891 (Anon., 1999b: 1). Over the years, the Currie Cup has assumed various forms, but from 2003, the ABSA Currie Cup reverted to a strength-versus-strength format. It featured two sections, a top section of six teams and a lower section of eight teams. A double round of games is then played with the top two teams in each pool qualifying for the finals (Anon., 2002a: 1). The top six teams in 2002/2003 and 2003/2004 were the Blue Bulls, the Cheetahs, the Golden Lions, the Natal Sharks, Western Province and the Mpumalanga Pumas (Colquhoun, 2003; 2004; 2005), which will be the focus of this article.

Blue Bulls Rugby Union

The Blue Bulls Rugby Union, previously known as Northern Transvaal, was founded in 1938 (Colquhoun, 2001: 200). The Blue Bulls play in light blue jerseys and dark blue shorts (Colquhoun, 2003: 245). Their home stadium is Loftus Versfeld in Pretoria, which opened in 1914 and seats 50 000 spectators (Anon., 2000c: 2). The Blue Bulls' original brand was a Barberton Daisy (Anon., 1999a: 2), but this was changed to the brand illustrated in Figure 1. However, the Blue Bulls still sport a Barberton Daisy on the left side of their jerseys (Colquhoun, 2004: 271).

Free State Rugby Union

The Free State Rugby Union was founded in 1895 as the Orange Free State Rugby Union (Colquhoun, 2001: 260). The team is now known as the Cheetahs and plays in white jerseys with old gold stripes and black shorts (Colquhoun, 2003: 305). Their home stadium is Vodacom Park in Bloemfontein, which seats 38 000 people (Colquhoun, 2004: 320). The brand is illustrated in Figure 1.

Golden Lions Rugby Union

The Golden Lions Rugby Union was founded in 1889 as Transvaal (Colquhoun, 2001: 272). They play in white and red jerseys and black shorts (Colquhoun, 2003: 257). The team is now known as the Golden Lions (Lake, 2002: 2) and their home stadium is Ellis Park in Johannesburg, which has a capacity of 62 500 (Colquhoun, 2004: 330). The Lions' brand is illustrated in Figure 1.

Mpumalanga Rugby Union

The Mpumalanga Rugby Union was founded in 1969 as South Eastern Transvaal (Colquhoun, 2001: 308). The team is better known as the Pumas and used to play in navy blue, red and black jerseys with white shorts (Colquhoun, 2003: 257). However, in 2003, the team changed to dove grey and red jerseys, with black shorts (Colquhoun, 2004: 370). The Pumas' home stadium is Atlantic Park in Witbank (Colquhoun, 2004: 370). Their brand is illustrated in Figure 1.

Natal Rugby Union

The Natal Rugby Union was founded in 1890 (Colquhoun, 2001: 320). The team is known as the Natal Sharks and plays in black and white jerseys and white shorts (Colquhoun, 2003: 377). The Natal Sharks' home stadium is ABSA Stadium in Durban, which seats 53 000 people (Colquhoun, 2004: 380). Their brand, which was originally a wildebeest (Anon., 1999a: 2), was changed to the brand illustrated in Figure 1.

Western Province Rugby Union

The Western Province Rugby Union, which was founded in 1883, is the oldest rugby union in South Africa (Colquhoun, 2001: 356). The team plays in royal blue and white hooped jerseys and black shorts (Colquhoun, 2003: 401). Their home stadium is Newlands in Cape Town, which seats 49 500 people (Colquhoun, 2004: 400). Western Province holds the record for the most Currie Cup victories (Anon., 2000d: 1). Their brand is illustrated in Figure 1.

Blue Bulls Rugby Union	
Free State Rugby Union	
Golden Lions Rugby Union	
Eastern Province Rugby Union	
Natal Rugby Union	
Western Province Rugby Union	

FIGURE 1. **BRANDS OF THE TOP SIX CURRIE CUP TEAMS (**Adapted from Colquhoun, 2004; 2005)

THE SUPER 12 TEAMS

The Super 12 originated from the Super 10, which was introduced in 1993 (Anon., 2000a: 1) and played for the first time in that year (Anon., 2002b: 11).

In this tournament, five regional rugby teams from New Zealand, three from Australia and four from South Africa compete on a round robin basis, which produces semifinals and a final (Claassen, 2001: 4). Under the Super 12 agreement, various rugby franchises in the three countries were established (Anon., 2001: 1). Initially, the Super 10 fielded South Africa's four

top provinces from its 1995 Currie Cup competition. Three years into the Super 12 tournament, South Africa changed to regional sides, which compelled the South African provincial teams to unite and form four new regional teams with new identities (Hendriks, 1997: 20). The four new regional sides were the Bulls, Cats, Sharks and Stormers (Anon., 2000a: 1).

The Bulls

The Bulls' brand has experienced various identity changes since its introduction in 1995. In 1996 the Bulls competed as Northern Transvaal. However, in 1998, four rugby unions, the Blue Bulls, the Falcons, Mpumalanga and the Leopards, joined forces to form one regional team (Gilbert, 2000: 34), with their home stadium at Securicor Loftus in Pretoria (Colquhoun, 2004: 192). The team became known as the Blue Bulls in 1997, changed to the Northern Bulls in 1998 and finished eleventh in the Super 12 competition that year. In 1999 the Bulls finished twelfth and in 2000 eleventh. Most of the worst records in the Super 12 tournament are held by the Bulls (Tarik, 2002: 4). In 2000, the Bulls played in white and green jerseys with blue shorts (Colquhoun, 2001: 158), but their strip was changed to sky blue jerseys and socks and navy blue shorts in 2001 (Colquhoun, 2002: 128). In the same year they changed their name to the Bulls. The Bulls brand is illustrated in Figure 2.

The Cats

The Cats have also experienced many identity changes since the Super 12 commenced in 1995. Originally the team competed as Transvaal and finished tenth in the tournament in 1996. In 1998, the rugby unions, Free State, the Golden Lions, Griqualand West and the Griffons, joined forces and became the Gauteng Lions (Gilbert, 2000: 34). They only managed to finish fifth in the Super 12 competition that year. In 1998, they changed their name to the Golden Cats and finished twelfth. Since 2000 they have been operating as the Cats (Tarik, 2002: 3), playing in navy blue jerseys with red shoulders (Colquhoun, 2001: 143). In 2001 they again changed their strip to white and navy, with navy shorts and socks (Colquhoun, 2002: 134). Their strip was changed yet again in 2002 to white jerseys and socks and navy shorts (Colquhoun, 2003: 170). The Cats' home stadiums are Ellis Park in Johannesburg and Vodacom Park in Bloemfontein (Colquhoun, 2004: 198) and their brand is illustrated in Figure 2.

The Sharks

The Sharks' brand was introduced in 1996. In 1998, the Natal Rugby Union, Border Rugby Union and Eastern Province Rugby Union united and formed The Sharks (Gilbert, 2000: 34). The team played in black and white jerseys with red and brown bands in 2000 (Colquhoun, 2001: 148). In 2001, they played in black and white jerseys and black shorts and socks (Colquhoun, 2002: 140) and there strip changed yet again in 2002 to black, grey and white jerseys and black shorts (Colquhoun, 2003: 176). The Sharks' home stadium is ABSA Stadium in Durban (Colquhoun, 2004: 204) and they were the first Super 12 franchise to draw their one millionth spectator in 2001 (Tarik, 2002: 1). The major revenue generator of this franchise is ticket sales (Lamberti, 2001: 16). The Sharks brand is illustrated in Figure 2.

The Stormers

The Stormers' franchise is based in Cape Town. At first, the Stormers made irregular appearances in the Super 12 owing to the fact that, during the 1996 Super 12, Western Province finished eleventh. Then, in 1997, owing to the nature of the South African system of selecting the top four teams from the Currie Cup, they were dropped for the Free State Cheetahs. In 1998, the Western Province Rugby Union, South Westerns Districts Rugby Football Union and Boland Rugby Union joined forces (Gilbert, 2000: 34) and the team became known as the Western Stormers; however, it only finished ninth in the Super 12 tournament that year. Only in 1999 did the team start operating as the Stormers (Tarik, 2002: 2). The Stormers have been marketing themselves as the "Men in Black" (Van der Berg, 2001: 1), and played in black jerseys and shorts and white socks in 2000 (Colquhoun, 2001: 153). However, since 2001 they have played in black jerseys, shorts and socks (Colquhoun, 2002: 146). They had a 45% winning average during 2000 to 2003. The Stormers' brand is illustrated in Figure 2.

The Bulls	
The Cats	
The Sharks	
The Stormers	

FIGURE 2. **SOUTH AFRICAN SUPER 12 RUGBY BRANDS (**Adapted from Colquhoun, 2004)

In 2006 the Super 12 rugby tournament will be enlarged to the Super 14 (Smith, 2004: 1) and, as a result, the various South African Super 12 teams will once again have to change to accommodate a fifth South African regional team (Anon., 2005: 2). According to Du Plessis (2005: 1), the fifth franchise for the Super 14 rugby tournament has been controversially awarded to a central region consisting of the Free State, Griqualand West and Griffons Rugby Unions.

REASON FOR THE STUDY

South Africa has a proud rugby tradition, with some of the provincial teams being older than 100 years. With the start of the Super 12 in 1995, South African rugby saw a new area of rugby competition, giving the South African Super 12 franchises an opportunity for new brands and images.

One may thus assume that rugby supporters would support their provincial teams for longer than 10 years, and would support their Super 12 teams for less than 10 years, and if this is not the case, one may conclude that supporters are indeed confusing provincial teams with regional teams. This study was undertaken to determine whether rugby supporters in South Africa have a clear understanding of the differences between the South African Super 12 brands and the Currie Cup brands.

OBJECTIVE OF THE STUDY

To achieve the objective of the study, the main aim of this article was to determine whether brand confusion exists among South African rugby supporters regarding the leading Currie Cup brands and the South African Super 12 rugby brands. To attain the objective of this article, the following hypotheses were drawn:

H_1 = Bulls' supporters support their team for an average of 10 years or less.
H_2 = Cats' supporters support their team for an average of 10 years or less.
H_3 = Sharks' supporters support their team for an average of 10 years or less.
H_4 = Stormers' supporters support their team for an average of 10 years or less.

RESEARCH METHODOLOGY

The Telkom telephone directories of the town or city headquarters of the 14 rugby provinces served as a sample frame for the population. This database consists of the names, addresses and contact details of potential rugby supporters by provinces. The sample elements (respondents) or target population of this research include all rugby supporters in South Africa. Only adults aged 16 years and older were included in the research.

For the purposes of this study, the Bayesian approach to sample size determination was used. This approach provides a formal procedure for selecting the sample size that maximises the difference between the expected payoff of sample information and the estimated cost of sampling (Diamantopoulos & Schlegelmilch, 2002: 17). Using this approach, a total sample of 50 respondents each in Durban, Pretoria, Cape Town and Johannesburg and 30 respondents in each of the other smaller cities and towns (Potchefstroom, Port Elizabeth, Wellington, Witbank, Springs, East London, Bloemfontein, Kimberly, George and Welkom) were ultimately included in the study (n=500).

Probability sampling was used to select respondents, more specifically a multistage sampling technique was applied to finally select the sample elements (respondents). The stages used to sample the population are shown below:

- **Stage 1**

With the target population being rugby supporters located across South Africa, it was decided that a total random selection of respondents might result in some of the 14 towns or cities (being the headquarters of the 14 rugby unions under survey) not being included or not being adequately represented in the sample. South Africa is geographically divided into the 14 rugby provinces and the town or city where the specific rugby union was based (ie its headquarters) was chosen as a stratum. The rugby unions based in each town or city were then listed.

- **Stage 2**

The potential sample units (households) per union were listed. For this purpose local telephone directories were used initially to select at least 30 sample units per rugby union systematically (50 sample units were selected for the four major cities in South Africa, Cape Town, Durban, Johannesburg and Pretoria). According to systematic sampling, sample units are selected at regular intervals. A sample interval was calculated by applying the formula $^{N}/_{n}$ where N=total population and n=sample size (n=50 in four largest cities, and n=30 in smaller towns and cities). This approach allowed each sample unit an equal chance of being selected. Within each of the strata, the respondents were randomly selected by means of systematic random selection where one name from every n^{th} page was chosen.

The selection of the pages from the directories differed for each stratum because it was calculated by dividing the total number of pages by the sample size for that stratum. For example, the Pretoria telephone directory has 712 pages, divided by 50, equals 14. This implies that every 14^{th} page in the telephone directory was selected. The household on each of these pages was selected randomly, by folding the selected pages in half and then choosing the name in the middle of the page in the first column. The first column was selected by means of simple random sampling.

- **Stage 3**

The sample elements (respondents) were finally selected by random chance. Once a sample unit (household) was contacted, any rugby supporter in the household was selected, by means of a screening question, for interviewing purposes.

Inferential statistics

Cozby (1985: 142) states that inferential statistics allow researchers to make inferences about the true differences in the population on the basis of the sample data. A basic tenet of statistical inference is that it is possible for numbers to be different in a mathematical sense but not significantly different in a statistical sense (McDaniel & Gates, 2001: 413). From the abovementioned hypotheses, the following null and alternative hypotheses can be formulated:

$H_{o1}: \mu \leq 10$	$H_{A1}:$ >10
$H_{o2}: \mu \leq 10$	$H_{A2}:$ >10
$H_{o3}: \mu \leq 10$	$H_{A3}:$ >10
$H_{o4}: \mu \leq 10$	$H_{A4}:$ >10

For the purpose of this research, the significance level of 0.05 was considered sufficient (=0.05). The z-test was used to test the hypotheses. The z-test allows researchers to compare the mean generated from a sample with the mean hypothesised to exist in the population and thus allows researchers to decide whether the sample mean confirms that the hypothesised mean is true (Tustin *et al.*, 2005: 587).

Data were collected by means of a structured questionnaire and the internal consistency reliability method was used to determine reliability. In this study, the coefficient alpha value across the entire set of scale questions was 0.72, which indicates an acceptably high internal reliability consistency.

RESULTS

The sample in this study consisted of 65% males and 35% females, with 25% of the respondents older than 50 years. The rugby supporters that took part in this study considered themselves to be extreme rugby supporters (43%). A correlation was made between age and the degree of rugby support (p=0.011, R=0.114), that is, the older respondents are the more extreme supporters.

The majority of the respondents (33%) mentioned the Stormers the most when asked which Super 12 team they were aware of. The Sharks were also mentioned to a large degree (22%). The Bulls were the third most mentioned team (19%) and the Cats had the fourth most mentions (12%). It was, however, clear that supporters were confused, as teams were mentioned as regional teams when they were actually provincial or national teams. The most mentioned provincial rugby team was the Western Province (16%), followed by the Blue Bulls (11%), Cheetahs (10%) and then the Golden Lions (9%). Again, respondents confused national, regional and provincial teams. This study also indicated that the most admired team in South Africa was the Stormers (27%), followed by the Sharks (23%), Bulls (22%), Blue Bulls (8%), Western Province (7%) and the Springboks (5%).

Most of the respondents (23%) supported the Stormers (and have done so for 16 years, on average). Following from that, supporters supported the Sharks (19% for, on average, 17 years), the Bulls (15% and 24 years of support) and the Cats (10%, and an average of 15 years of support).

H_1 = Bulls' supporters support their team for an average of 10 years or less.

When conducting the z-test, H_{o1} was rejected (p_1=0.000), thus accepting H_{A1}. Therefore, by accepting H_{A1}, one may conclude that Bulls' supporters support their team for more than 10 years. This is not possible, however, as the Bulls team has only been in existence since 1996, and it is therefore clear that supporters are in fact confusing the Bulls with the Blue Bulls.

H_2 = Cats' supporters support their team for an average of 10 years or less.

When conducting the z-test, H_{o2} was rejected (p_2 =0.003), thus accepting H_{A2}. By accepting H_{A2}, one may conclude that Cats' supporters support their team for more than 10 years. This is once again, impossible, as the Cats team was only formed in 1996, and it is therefore clear that supporters are in fact confusing the Cats with either the Golden Lions and/or the Cheetahs.

H_3 = Sharks' supporters support their team for an average of 10 years or less.

When conducting the z-test, H_{o3} was rejected (p_2 =0.000), thus accepting H_{A3}. By accepting H_{A3}, one may conclude that Sharks' supporters support their team for more than 10 years. As with the other findings, this was also not possible as the Sharks team has only existed since 1996, and it is therefore clear that supporters are in fact confusing the Sharks with the Natal Sharks.

H_4 = Stormers' supporters support their team for an average of 10 years or less.

When conducting the z-test, H_{o4} was rejected (p_4 =0.000), thus accepting H_{A4}. By accepting H_{A14} one may conclude that Stormers' supporters support their team for more than 10 years. Again, as the Stormers team has only been around since 1996, it is clear that supporters are in fact confusing the Stormers with Western Province.

One may therefore conclude, with a 95% certainty, that rugby supporters in South African are confusing South African Super 12 teams with the top Currie Cup teams.

CONCLUSION

This study aimed to determine whether rugby supporters in South Africa were confused as a result of the fact that Currie Cup teams merged to form four new regional teams.

South African rugby supporters indicated that they were very interested in rugby. According to sports marketing theory, these supporters have a higher level of connection with their rugby teams and therefore have distinct and exclusive preferences for a specific team (Kolbe, 2002: 1). They have formed a personal commitment towards and deep personal empathy with their respective rugby teams and are resistant to any short-term changes made to a team; they are convinced that their team is the best compared with other teams or other forms of entertainment (Kelly *et al*., 1999: 473). They are well informed; to such an extent that they think they are experts (Goff & Spence, 2003: 1). However, this study has indicated that, although the rugby supporters are well informed, they are confusing South African Super 12 teams with the top Currie Cup teams. This should clearly indicate to South African rugby management that there are serious deficiencies in the management of rugby brands on Currie Cup and Super 12 level.

SA Rugby, together with every South African rugby union, should first strive to create brand awareness of their teams. When they focus on creating positive brand awareness in the minds of supporters, they will also establish positive brand associations. Furthermore, the management of South African rugby should differentiate the various South African Super 12 rugby teams to ensure that supporters perceive them differently from the Currie Cup teams.

Because the provincial brands are so strong, rugby management should reconsider the regional brands and should consider sticking to the provincial brands. The top four Currie Cup teams from the previous year could, for example, participate in the Super 12, contracting players from the region to strengthen the team if needed and as has been recommended by various commentators of the game.

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SUBJECTIVE PERCEPTIONS OF SUCCESS IN TOP-CLASS TENNIS PLAYERS

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ABSTRACT

This paper explores the subjectively perceived performance success of top-class tennis players, largely in an effort to supplement the massive body of purely cognitive, psychophysiological sport psychology literature that already exists. In-depth, semi-structured interviews were conducted individually with nine players at three levels of expertise: provincial, national, and international. The players also completed the Telic Dominance and Negativism Dominance Metamotivational Scales, in line with the Reversal Theory of emotion and motivation. Cyclical thematic analysis of the interview texts and descriptive statistical analysis of the scale items were carried out. Ten integrative theme clusters emerged exploring what it means to be successful in tennis, including nine themes illuminating the elements subjectively perceived as necessary to achieve success. Some significant differences were found in certain theme categories for provincial, national and international players. The scale scores supported and questioned previous research that success in sport is related to paratelic and negativistic metamotivational dominance.

Key Words: Reversal theory; Metamotivational dominance; Subjective perceptions of success; Self-belief; The "edge"; Individual strengths; Emotional reactivity.

INTRODUCTION

Tennis is an available study in the psychology of personality. Through observing the characteristics of players who reach the top, it is possible to speculate on what elements ensure success in professional tennis. Apart from this intuitive approach to understanding how tennis players (and athletes in general) perform and behave, empirical studies have investigated what drives sports professionals and which factors ultimately determine their success.

Sport psychology has largely been dominated by a cognitive or information processing approach to the behaviours and motivations of athletes. Much research has focused on mental practice, specifically the mental practice needed for sequences of movement during athletic performances (Kremer & Scully, 1994: 100). In addition, the concepts of *retention* and *forgetting* are now well established in the sport science literature. Other research has examined the effect on sport performance of massed and distributed practice, whole and part methods, blocked and random practice and the transfer of learning. While valuable, this research concentrates mainly on motor skills as factors impacting on performance success (Kremer & Scully, 1994). Furthermore, the narrow focus on this area of research, as comprising the heart of sport psychology, is problematic.

Kerr (1997) suggests that what is missing within the sport psychology literature is a lack of theory and, furthermore, that there is an "excessive adherence to traditional methodologies" (Schutz, 1994 cited in Kerr, 1997: 189). While the reliance on empirical methods is an accepted practice of psychophysiological research, this study suggests that this focus needs to be challenged. Empirical research routinely ignores the relationship between subjective feelings (e.g., motivation, personality and affective factors) and athletes' performance (Kerr, 1997). The present study argues that the brilliance of athletes needs to be assessed from their own subjective standpoints. A focus on the subjective perceptions of athletes may help coaches and players to discover something more about what differentiates the champions from those who never quite make it to the top. Since equality of physical performance in the sport is becoming more and more apparent, it seems likely that this crucial distinction is a result of mental performance and talent.

AIM

This study investigates how top-class tennis players subjectively perceive success in their game. The aim is to gain an overall understanding of the personal experience of tennis players at three varying levels: provincial, national, and international elite; in order to identify what they regard as the basis of a satisfying performance or career, and to outline the characteristics that lead to success in professional tennis. A further aim of this study is to identify salient differences among the aforementioned groups, and to explore the possible reasons for these discrepancies.

LITERATURE REVIEW

Reversal theory provides an appropriate theoretical framework for the study. It proposes that people alternate between four pairs of metamotivational states that they possess, allowing for 16 different state combinations. The pairs of states are Telic-Paratelic (arousal-avoiding and goal-directed versus arousal seeking, spontaneous and sensation-oriented), Conformist-Negativistic (compliant and cooperative versus rebellious and stubborn), Mastery-Sympathy (desire to compete versus desire for harmony) and Autic-Alloic (concern with self versus concern with others) (Kerr, 1997). A tennis player about to serve for the championship title at Wimbledon is most likely in the telic-conformist-mastery-autic state.

Reversals between states are mediated by metamotivational dominance (which state of each pair one most often tends towards); protective frames (how arousing the individual *subjectively* perceives a situation to be); and reversal inducing agents (e.g., frustration, satiation and contingent events) (Kerr, 1997). Acts are classified according to the actor's *subjective* interpretation thereof (e.g., conformist as opposed to negativistic) (Kerr, 1997). Furthermore, the theory accounts for human inconsistency (Apter, 2004) by introducing the concept of *multistability*: personality is explicable in terms of "patterns of change"; "we not only differ from each other, but also, over time from ourselves" (p. 2).

Tennis requires impulsive actions (new movement and skill combinations are constantly needed during play) and is thus classified as an *explosive* sport (similar to surfing, baseball, cricket, basketball, touch football, windsurfing and soccer) (Kerr, 1997; Diehm & Armatas, 2003). As such, it is a predominantly paratelic sport. Contrastingly, a preference for *endurance* sports, which are characteristically repetitive and monotonous (e.g., long-distance

running, cycling and rowing), usually indicates the planned lifestyle orientation of telic metamotivationally dominant people (Kerr, 1997). The association between lifestyle and sport preference, as well as between particular states and success in sports, has been investigated by a number of researchers. For example, Apter (1982 cited in Kerr, 1997) found the negativistic state to be associated with creativity in sport. Additionally, Braathen and Svebak (1992 cited in Kerr, 1997) found that sport professionals with a high score on the proactive Negativism Dominance Scale (NDS) had reached a higher level of excellence in their sport.

A useful model for the present study is *The Inner Game of Tennis*, conceptualised by Gallwey (1975), who believes that the relationship between the two *selves* in a tennis player determines a player's "ability to translate his knowledge of *technique* into effective *action*" (p. 25). The conscious, instructing Self 1's mistrust of the unconscious, automatic, but fully competent "doer", Self 2, is the source of faulty performance in a player's tennis game (pp. 25-26). Concentration and "quieting the mind" (p. 33) are the solutions. Cognitive research parallels the *Inner Game*, suggesting a corroboration of quantitative and qualitative approaches. Concentration in sport is seen as identical to normal *attention* in everyday cognitive perceptual experience. Athletes identify "'advance cues' that are relevant to the task at hand while 'screening out' distractions" (Abernethy, 1987 cited in Moran, 1996: 77). Most studies are psychophysiological in nature and focus on how physiological arousal involuntarily narrows an athlete's attentional focus, leading to a decrease in quality of performance (Moran, 1996).

Furthermore, Syer and Connolly (1984) propose that sport performers may be either *neurotic* or *creative* competitors. The former are seen to be motivated by extrinsic circumstances, desiring the win to boost their deficient self-esteem, or to "measure up to some external standard" (p.148); while the latter are seen as self-assured, confident and purposeful, engaging in sport to express and exercise their inner resources (p. 148). These descriptions of the creative competitor are reminiscent of paratelic dominance. The connection between subjective perceptions of success and the labels above is of interest in the present study.

METHOD

Sample

Case selection was purposive since the desired population is naturally small, and individuals therein have specific characteristics, on which the study focuses. Three international, two national and four provincial players were recruited. All the players except one of the international participants (a British player) were South Africans. While it would have been desirable to have a larger sample, the small sample was felt to be sufficient for the present study, as it is exploratory and qualitative in nature thus focusing on obtaining in-depth accounts rather than large quantities of data. Furthermore, owing to the high profile of professional tennis players, access was a constraint. Fortunately, however, the following helpful contacts assisted as gatekeepers in this regard: a member of the Lawn Tennis Association (LTA) who formerly personally looked after players during the major tournaments, and a South African tennis player, who was ranked in the top ten for doubles and serves as a Players' Representative for the Tennis Players' Union.

Instruments

Semi-structured interviews were conducted with players to discover their subjective perceptions of success. The interviews comprised different areas of enquiry intended to generate conversation about the inner world of top-class tennis players such as: background information to contextualise the interviewees in the tennis world; what they understood to qualify as success in tennis; their opinions on the "mental side" of tennis; and a comparison between the empirical research and their personal experiences. Since all but one of the players are South Africans, perspectives unique to this country were explored. Interviews were flexible, allowing for the emergence of unexpected, useful information. While it may be argued that this technique lacks reliability and validity, it was felt that a more flexible approach would allow for a more in-depth and personal exploration of the experience, motivation and behaviours of professional tennis players. Sacks (1984 cited in Miller & Glassner, 1997) points out the potential reliability of such transcripts. Revisions were made on the basis of the pilot study and based on commentary made at the French Open and Wimbledon tennis grand slams.

Furthermore, the following two psychometric reversal theory scales were administered to each player, as it was felt that the data obtained from these would compliment the qualitative material: The Telic Dominance Scale (TDS) (Murgatroyd, Rushton, Apter & Ray, 1978 cited in Kerr, 1997) and the Negativism Dominance Scale (NDS) (McDermott & Apter, 1988 cited in Kerr, 1997). Since the TDS was developed for adults, only the two younger provincial players did not complete this scale. The TDS is scored on the following three subscales – *Seriousmindedness (SM)*, *Planning orientation (PA)*, and *Arousal avoidance (AA)*. The first aspect, however, is the defining scale of telic dominance (Kerr, 1997). Regarding the test's reliability, the Cronbach's alpha coefficients for the subscales are SM=.691, PO=.655, AA=.734, Total=.837; test-retest reliability was evaluated over various time periods and was significant each time at the $p<.01$ level (Murgatroyd, Rushton, Apter & Ray, 1978 cited in Kerr, 1997). The NDS consists of 18 items, which were extracted by factor analysis of 137 items (McDermott, 1988a cited in Kerr, 1997). Further studies confirm its usefulness and meaningfulness by showing that a two-factor solution results from large item pools very similar to the original one used. Seven items load heavily onto each of the two factors, and these were interpreted as *proactive* and *reactive* negativism. Four filler items were included to disguise the purpose of the scale (Kerr, 1997: 208).

Method of analysis

Thematic analysis was used to analyse the interview material. This is a qualitative approach in which data collection, analysis and theory are highly interrelated (Babbie, 2001). Rubin and Rubin (1995 cited in Mouton, 2001: 198), describe how the analysis "begins while the interview is still underway…[and] tells you how to redesign your questions to focus it on central themes as you continue interviewing". Further themes and concepts emerge thereafter and the final analysis involves organizing, contrasting and integrating such themes into an "accurate, detailed, yet subtle interpretation" (p. 198) of the research. Qualitative methods of analysis are gaining respect as independent, largely intuitive and creative endeavours (e.g., Babbie, 2001; Janesick, 2004). Although language, the dominant tool of this type of research, inevitably "fractures" reality and experience (Miller & Glassner, 1997: 127), it may be argued that quantitative, numerical-rendering statistical processes do the same.

Themes were primarily drawn out and coded and subsequently integrated into broader emergent themes, which provided a basis for discussion in the absence of any comparable sport psychology literature (Squibb & Schomer, 2004).

Procedure

Interviews were tape recorded with a small, unobtrusive Dictaphone. It was decided that written notes would not capture the complexity of interview information (such as the participant's tone, emotional undercurrents, emphases, and detail of contextual information). Tape recording allowed for the interviewer to concentrate on participants and on the content and atmosphere of the interview.

The psychometric scales were analysed with descriptive statistics. The metamotivational scales were scored as follows: for the TDS, one point was given when the telic alternative was chosen (these are specified in Kerr, 1997), and half a point was given for the "Not sure" item. Three subscale scores resulted, with a maximum of 14 points for each. The overall score of telic dominance could therefore yield a maximum of 42. Similarly, for the NDS, the negativistic alternative yielded 2 and the "not sure" item, 1. The maximum for each subscale score was 14 and the overall negativism dominance score was therefore a maximum of 28 (Kerr, 1997).

RESULTS AND DISCUSSION

Qualitative

Coding

Coding resulted in primary thematic concepts, which, through cyclical analysis, memo-making and integrative recoding, were related to form various larger theme categories. Ten integrative theme clusters emerged outlining what it means to be successful in tennis, which included nine themes illuminating the elements subjectively perceived as necessary to achieve success in the game. The lack of literature surrounding South African sport proved problematic in terms of basing the analysis on established techniques. For this reason interviewees' responses were accorded great significance (Squibb & Schomer, 2004). For confidentiality, the players' names were replaced with selected letters.

Analysis

What comprises success?

Each player was adamant about which factors determine success and what constitutes success in tennis. Through exploring which top players the interviewees deemed the most successful of all time, and why, it emerged that their primary measure of success was winning. Every player mentioned Wimbledon as the most desirable title to win – a title that bestows status and an aura of success.

International players took it for granted that winning (in the form of grand slams, other titles and rankings) is the essence of success in tennis. They glossed over questions relating to what success exactly *is* and concentrated more on how it is achieved. Contrastingly, **A** (national

player) insisted that his personal success in tennis related to having reached a state of harmony and fulfilment, in which he enjoyed his life, owning a tennis club and imparting skills and wisdom to players. **D** (national player) confirmed this philosophy, emphasizing the original enjoyment that drew him to tennis, which he feels he loses with the pressure of competition. **I** (international player), however, related that winning in tennis has an addictive power that makes it enjoyable. The provincial players all regard making it professionally and winning titles as the core of a successful career. Only **H** (under 18 number one) added another proviso: enjoying the game. He did not, however, perceive such enjoyment as independent from winning, making the telling statement that, "the more you enjoy it, the better you'll play." These differences amongst the three levels of tennis players suggests that the level of success a player actually achieves (or *expects* to achieve, in the case of provincial players), possibly influences what they will admit as entailing true success.

The dream begins it: Desire, commitment and determination

The international players all committed seriously and without uncertainty to tennis at a young age. They termed it an emotional – not a logical – decision. **B** explained, "I mean, if *you* told me there was something I had to do to play tennis, to be a better tennis player, I would do it. I think that that's a *huge* part of things." **I** decided to go to Australia to train with a top coach, instead of going to university. The risk paid off: he qualified for the Australian Open that year, and then Wimbledon. The public often sees excluding other facets of life as sacrifice, but players perceive things differently. The love of the game and the desire to master it negates any perception of sacrifice. **B** stated, "to me it was just the way things were; it was the way it was meant to be done". The national players advocated a more balanced approach in terms of their commitment to playing tennis, while the provincial players discussed being reticent to commit to the game because of the low standard of tennis in South Africa.

South African tennis

All the players were adamant that substandard levels of South African tennis had a negative effect on their careers. The national and two South African international players felt that they would have been more successful had tennis in their country matched tennis overseas; and the provincial players were uncertain about how wholeheartedly they should commit themselves to the game, because of its questionable professional future in South Africa. This is highly problematic, as the data show a strong connection between desire/commitment and success in the game.

The chief problem the players cited was the lack of a professional attitude towards tennis in this country. **B**, the most successful player in the present study in terms of world rankings and titles argued that "our system is very far behind". He suggested that South African players lack competition exposure (there are too few people competing at top levels here, and no funding for them to travel frequently), and receive a standard of coaching that is "very low". Top South African players are defeated and discouraged by the intensity and dedication of overseas players. **B** insists that what South Africa's top upcoming players need is "somebody with the presence of mind to say, you're the number one or number two in South Africa, but you're still the number 50 in America. And only two of those 50 are ever going to make it. So if you want to be a professional tennis player, you're behind".

The provincial players were well aware of the superiority of tennis overseas, with regard to professionalism; funding and scholarships; depth (a broad range of competition); status and monetary rewards. **H** has been offered a tennis scholarship to an American university and **G** (under 16 number one) aspires towards the same. **E** (under 14 number one) has a British passport and is investigating playing for Britain, as did his coach. South Africa's top young players are leaving, to grasp what they see as their only chance of "making it" in tennis. **A**, a former national player and current coach, says that he and many others in his position never said, "that's what I'm going to go and do, because there's nothing *to* do in this country". The sport is a focused business overseas, insists **A**, and South Africa is far behind in its transition of tennis from an amateur to a professional sport. The recent scandalous disappearance of MTN funds for South African tennis and the organizations' refusal of Cell C's subsequent superior funding offer because of its sole condition of cheque validation, speaks volumes.

Personality

The interviewees' perceptions of personality's place in tennis varied. Some considered its impact significant; while others saw it as an element peripheral to self-belief, hard work and motivation. One commonality, however, emerged: that it is not so much one's *set* personality that has a *set* influence on the type of player one will be, but rather that success involves an intricate tailoring of one's specific strengths into what **I** referred to as "the edge". Personal strengths must be combined and correctly weighted to arm players with the strength to face the 'gladiatorial' match setting. The international players emphasised personality characteristics, and provincial players regarded these as the least significant determinants of success. **B**'s perception was that "the positive, confident personality is a big part of" success in tennis. This he related to self-belief and also to what he regarded as an inborn emotionally resilient nature whereby things that go wrong on court just don't affect the resilient player. He emphasised that it was not that the player had to try not to let external things affect him, but rather that "it's just not in you…you're not sensitive to it".

I corroborated the perception of tennis matches as "gladiatorial contests", in which one needs ruthlessness and some kind of "confrontational aggression" (**B**) to win. **A** called it the "killer instinct". **I** termed it "the edge" and matter-of-factly emphasised that it is *this* that makes champions, that separates the mere players from the winners. Reference was made to players "stalking" future grand slam opponents, purely to unsettle and unnerve them – to establish a dominating presence, to intimidate, to aggress. Any kind of emotional fragility was seen as impossible to have in a winning tennis player: "You don't find weak natures who run away from conflict. That just is not an option" (**B**).

Many players mentioned the mammoth success John McEnroe made of overtly aggressive, confrontational-style tennis. The dominance of emotion over logic was obvious in his game: "he would be 6-0 5-0 40-0 and make a mistake and smash his racket. Because he's lost one point, and he wants to win *every* point" (**A**). The success of McEnroe can be put forward as a good example of the individual strengths theory. For him, anger worked. **E** observed the grace of McEnroe's explosive method: after shouting about one dubious point, he would play the next with precision and flair – often his *best* tennis. Another provincial player said of the desirability of emotional reactivity in tennis, "if you get cross and it helps you to win, then get cross" (**F**). It seems, then, that one needs a non-tennis, non-technical weapon to succeed: an emotional weapon. **B** called it a willingness to be either overtly or covertly aggressive. This

might be the "quiet strength" (**B**), the lack of expressed emotion, the intimidating impenetrability of Sampras and Borg; the continually upbeat body language of Jimmy Connors, even when facing match point; the tenacity, doggedness and fighting spirit of Lleyton Hewitt; the unsettling pace of everything about André Agassi; the relaxed attitude of Roger Federer; the dominating physical presence of Boris Becker; or the monumental rage of McEnroe – anything that upsets the emotional stability of one's opponent.

They have the shots, but do they have the belief?

One of the most integrated themes to emerge revolved around the ubiquitous notion of self-belief. All of the players cited it as integral to success, and each of them related personal experiences of its effect on their tennis. Self-belief relates closely to *emotional resilience/mental toughness*, in that it arises out of what a player honestly believes his capabilities to be; in this sense, it converges with the fundamental psychological concept of self-efficacy. Self-belief in tennis is perceived by the players as one of the most important ingredients of success: if not *sufficient*, it is without a doubt *necessary*, in their subjective experience.

At any level in tennis and *especially* at the very top level, there is minimal variability in the technical and physical ability of players. Thus psychological mechanisms (e.g., self-belief) emerge as the most plausible determinants of success (Ungerleider, 1985 cited in Schomer & Connolly, 2002) – that which contributes towards "the edge". As a striking example: after attending just six sessions with a clinical psychologist, **H** rose in the under 18 rankings from number 11 to number one in South Africa in a matter of tournaments. He said, "The players that I used to lose to I *beat* them. Everything was exactly the same, but I just believed that I could beat everyone".

Emotional resilience/mental toughness

All the players spoke of the mental aspect of tennis as being primarily – if not solely – emotional. One might expect it would refer to thinking *logically* about how to beat an opponent, but the players define it rather as an amalgamation of not crumbling under pressure, using anger constructively, believing in oneself, valuing and loving the game to the point of obsession, being flexible, having the gall to intimidate one's opponents, having a fighting spirit, and being proud, passionate, aggressive, positive, confident and dominating. Those who are detached and cold will inevitably fall short of their potential for glory. Not one player failed to emphasise, and voluntarily elaborate on, the importance of being mentally strong in tennis, and all of them had some notion of it as entailing emotional resilience.

Two distinct mental approaches to the game emerged: the desire to win versus the fear of losing. **C** (recently retired international player and coach) contrasted two of his provincial players in this respect. **E** has big match temperament: "big points – that's what he loves. And you can see before the match, he's confident." **G**, though, "doesn't quite have it. Instead of thinking 'I'm way better than this guy, I'll just go out and play my normal game and I'll be fine' – he's worried about losing". Future longitudinal research that focuses on whether this attitudinal distinction can predict success could be useful.

The motivational division relates to research on Neurotic versus Creative players (Syer & Connolly, 1984). Their polar mental attitudes seem to contribute largely to the latter's more

frequent success. This evidence further relates to the philosophy of the *Inner Game*: positive thinking can be just as destructive as negative thinking, as performance decreases when one tries to live up to an expectation. One of Gallwey's tennis students realized: "Compliments are criticisms in disguise! Both are used to manipulate behaviour, and complements are just more socially acceptable!" (Gallwey, 1975: 42-43).

How predetermined is success: Is there a naturally great tennis player?

All nine players acknowledged that at least some talent is essential for success in tennis. Although the term "talent" was prominent throughout the interviews, only **I** grappled with its multiplicity of meanings: "What is talented? You can be mentally talented, you can have an eye for a ball, you can hit and serve away, you can be physically talented and be very strong, sharp, fast, flexible. I think the word talented is very overused". A lack of talent in comparison to other players at one's level can, to some extent, be compensated for by extremely hard work and by a "good mind" (see *emotional resilience*). According to **I**, "the true winner is one who wins when he's not playing well, and still manages to win when things aren't going right".

This relates to Gilbert and Jamison's philosophy of *Winning Ugly* (1993): Agassi's former coach and a former professional player himself, he managed some astounding wins over the best tennis players, including Becker, Sampras, Agassi and Connors, without brilliant technique or talent. His method involved extremely thorough mental preparation, and playing his strengths to his opponents' weaknesses. Gilbert's message coalesces with Gallwey's in that he insists one can actually win more by putting in less effort: by not trying so hard. Professional tennis players sometimes throw sets in order to preserve energy and then simply make sure that they win the shots vital to the match outcome. Tennis match point totals are sometimes actually in the loser's favour.

All or…mediocre?

Players believed that balance is possible and even desirable in professional tennis. It was, however, only seen to be achieved at the cost of greatness. This inevitable compromise, it was suggested, comes with experience and maturing; top players are never "as hardcore at 30 as they were when they were 20…[when] that's their life" (**B**). Some players, it was said, have consciously chosen balance throughout their careers, for example Wayne Ferreira, South Africa's most prominent player. **A** and **B** spoke about Ferreira's renown for "tanking" a match when it is not easily going his way – this means losing intentionally, for which players can be fined. Most professional players are skilled enough to tank subtly, so that although they may be suspected of it, they cannot be blatantly accused. In this way, Ferreira has managed to pick and choose his fights, going with his good days and dismissing his bad. The result has been impressive career longevity and a consistently high enough ranking, in and around the top 20 to 30 in the world, to ensure massive accumulative financial earnings. This approach thus can indeed work.

However, "in tennis it's more valuable to be somebody who plays amazingly well one week and terribly for three weeks", enabling you to break into the rankings during a brilliant week (**B**). A mediocre, monotonous performance level of tennis means a loss of the obsession, narrow focus, competitive drive, "killer instinct", and excessive attention to detail that create "the edge"(**I**), which makes a champion. Unlike other sports, such as marathon running in which "you can go to three quarter of your maximum" for most of the race and still win, with

tennis it is essential to keep "the discipline of mind and body together for as long as it takes. You have to *want* to win, you can't just go through the motions, you have to lift yourself up to *attack* the other person and to beat the other person, and if you lose some of that – you're finished" (**I**). Success therefore involves a committed decision and a very narrowly defined way of life. Balance is, paradoxically, a sacrifice: true greatness cannot be achieved without *full* commitment.

My best or the *best?*

Pete Sampras was named by all interviewees as the most successful tennis player ever. Even if their favourite player was someone else, they all acknowledged Sampras as the undisputed best tennis player of all time. The reasons given were his utter domination of the game (240 consistent weeks at number one), including his seven Wimbledon titles and his grand slam record of 14 titles. His 14th title – the 2002 US Open – was the last professional match Sampras ever played. This confirms that success is perceived as winning. Many players also mentioned his dominant command of such a *deep* field of competitors (i.e. there were so many worthy competitors "at his heels", **A**) as compounding his success. Borg was similarly successful in terms of depth of surfaces, and this emerges as another likely indicator of success in tennis.

The paradox of pressure

Pressure points are inevitable in big matches, and pressure in general will obviously be part of a professional tennis career. It is interesting, then, that the players in this study felt they play their worst when under pressure. A big part of being mentally strong in tennis involves finding a way to deal with pressure, to *not* put pressure on oneself and to focus on something else. The *Inner Game* is relevant, emphasizing how players should trust their bodies to hit shots to their full potential, in a relaxed manner, instead of trying too hard, tightening muscles and inevitably using more than necessary (Gallwey, 1975). There is an inverse relationship between pressure and performance. Removing enjoyment from tennis - making it 'work' or focusing too much on competition - usually results in performance deterioration. There is a strong psychological effect of knowing, for example, that another player is 'better' than you, even though this may only be on paper.

Quantitative

The international players – the most successful in terms of what emerged from this study – scored highest on Seriousmindedness (SM) and Planning orientation (PO) subscales, and lowest on the Arousal avoidance (AA) subscale, which may indicate that this latter characteristic is crucial to success. They are less telic dominant than their national counterparts, which supports the notion that paratelic dominant individuals are more successful in sport. The fact that the provincial players are lowest on overall telic dominance and all its subscales, may be due to their age: they have fewer responsibilities, plan less and are willing to take more risks. This is especially possible since the scales are general motivation measures – not specific to sport. It may also indicate their future success in tennis.

TABLE 1. **METAMOTIVATIONAL DOMINANCE SUBSCALE SCORES: MEANS AND STANDARD DEVIATIONS, BY LEVEL OF TENNIS EXPERTISE**
(based on descriptive statistics table in Tacon & Abner, 1993: 167, 170 & 172)

Means (and standard deviations) for TDS and NDS subscales and for total telic dominance and total negativism, by level of expertise

	SM	PO	AA	TTD	PN	RN	TN
Provincial	4.5 (0)	5.25 (0.35)	5.5 (1.41)	15.25 (1.77)	1 (1.41)	5.75 (1.71)	6.75 (1.5)
National	5.5 (5)	6 (4.24)	7.5 (4.95)	19 (14.14)	3 (4.24)	4 (5.66)	7 (10)
International	6 (2)	6.5 (1.32)	5.17 (3.75)	17.67 (1.15)	2.33 (1.53)	3 (2.65)	5.33 (1.15)

Unexpectedly, the national players were, on average, the most negativistically dominant. However, the fact that there were only two players in this category and that it had an uncharacteristically high standard deviation of 10, demanded an examination of the raw data, which revealed that one player obtained a negativism score of 0, while the other scored 14 – the highest individual raw score recorded. This could represent an anomaly, and research with far greater subject pools would be needed to investigate further. The provincial players followed with TN=6.75 and the international players scored the lowest, with TN=5.33. However, subjects in the latter group had relatively homogenous TN scores (sd=1.15), which inspires confidence that this group's motivational dominance has been most accurately represented.

Limitations and cautions

This study was limited in that qualitative research has been argued to be prone to bias and has been criticised because it does not easily apply itself to generalisation and standardisation. However, this presents minimal difficulty to a focused area of research that aims to explore subjective perceptions and find commonalities and differences amongst them. The small, predominantly male sample and the fact that questionnaires were administered to such a small group constitute other limitations that could be improved upon in future research.

CONCLUSION

What has emerged from the present study is that, especially at top levels, tennis is predominantly played in the minds of the two players. Most players competing at this level are likely to be equal in technique, but not all will have the personality and mental attributes that give them "the edge" and that ensure victory. The results of this study show that according to the subjective perceptions of players, mental aspects and personality characteristics can determine a successful outcome in world class tennis. Of these aspects, self-belief emerged as particularly salient. *The Inner Game* teaches that,

> "there are in fact two games going on on the court. There is of course an outer game played with our external opponent, but there is an inner game as well: it takes place in the mind of the player and is played against such elusive opponents as nervousness, self-doubt and lapses of concentration. It is a game played on and off the court every

> day. In short, it is a game played by the mind against its own bad habits." (Gallwey, 1975)

This research study has provided new ideas about how individual players at the top of their respective levels subjectively perceive the components and determinants of success. The integrative themes could serve as starting points for further qualitative sport psychology research in this area.

Qualitative research points to the dynamic, changeable and indefinable aspects of people, and thus differs from cognitive psychology, which explores the measurable and definable elements of human nature. Thus although the qualitative nature of this study suggests that it is difficult to know exactly *how* success can be achieved in tennis, a strong theme that emerged from the analysis was the image of the tennis player as an individual, dynamic organism who, on realising his talent for, commitment to and love of tennis, must work out the strengths and weaknesses in his personality and mind, and arrange these to the best advantage for the aggressively competitive nature of professional tennis.

The empirical literature was generally well supported by the results of the present study, in a way that made it more meaningful and applicable. Furthermore, new and relevant areas of interest were established and this study suggests the need for both better training techniques in terms of the mental side of tennis and for the rebuilding of South African tennis as a whole.

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NOTES

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DIE EFFEK VAN 'N MOTORIESE INTERVENSIEPROGRAM GEBASEER OP 'N GEÏNTEGREERDE BENADERING VIR 5- TOT 8-JARIGE PLAASWERKERKINDERS MET DCD: FLAGH-STUDIE

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ABSTRACT

The aim of this study was to determine whether a motoric intervention programme based on the integration of different intervention methods can improve abilities associated with Developmental Coordination Disorder (DCD) among young school children. From 55 children (5- to 8-years of age) living on farms and attending farm schools in this region, a group of learners from one school were randomly divided into an intervention group (n=11) and a control group (n=13) after having been diagnosed with DCD by means of the Movement Assessment Battery for Children. A second control group (n=13) was selected from another farm school in the same region. The Test of Gross Motor Development-2 was used to determine the quality of fundamental movement skills in the group. A test-retest research design was applied. An eight-week intervention programme, of 45 minutes, was presented twice a week, based on perceptual motor, sensory integration and task specific components and conducted by means of an integrative approach. The results, analysed by means of Statictica for Windows, showed that the programme improved balance, gallop, striking and underarm rolling while the overall performance quality of fundamenal motor skills also improved significantly in the intervention group. Although the task specific method contributed to the best improvement, alternation to the different methods is recommended for success. A more individualistic approach, a longer duration of the programme and less goals to address in one lesson are recommended to improve the programme.

Key words: DCD; Clumsiness; Kinesthetic; Intervention; Perceptual-motor; Sensory integration; Child.

INLEIDING

Goodway *et al*. (2003) is van mening dat groot uitdagings aan kinders wat in armoedige omstandighede grootword, gestel word om akademies te vorder, en dat ontwikkelings-agterstande kenmerkend van sulke groepe is. Die navorsers dui in dié verband aan dat kinders wat blootgestel word aan risikofaktore waarvan omgewingsfaktore soos armoede een is, 'n groter kans het om ontwikkelingsagterstande en opvoedkundige mislukking te beleef, dat dit 'n kumulatiewe effek op kinderontwikkeling uitoefen en selfs oor generasies heen, 'n invloed kan uitoefen. Ontwikkelingskoördinasieversteuring (*DCD*) is 'n probleem van groot omvang onder skoolgaande kinders en kom voor wanneer 'n kind se motoriese koördinasie laer is as die van kinders van sy chronologiese ouderdom (Willoughby & Polatajko, 1994). Die probleem kan aanleiding gee tot sosiale, emosionele en akademiese probleme. Daar word beweer dat ongeveer 8%-15% laerskoolkinders gemelde probleme ondervind (Willoughby &

Polatajko, 1994), terwyl Maldonado–Duran (2002) van mening is dat ongeveer 4%-6% voorskoolse kinders hierdeur geraak word. Daar is ook bevind dat seuns meer geneig is om koördinasieprobleme te ondervind as dogters, en wel in die verhouding 3:1 (Hoare & Larkin, 1991).

Die perseptueel-motoriese funksioneringspeil van kinders met koördinasieprobleme is ondergemiddeld, hulle sukkel dikwels om die spoed en krag van voorwerpe en bewegings te bepaal en om hul ledemate te koördineer, wat tot swak tydsberekening kan lei (Hoare & Larkin, 1991). Probleme met die gehalte van bewegingsuitvoering kan ook voorkom. Nel *et al*. (1990) stel in die verband dat die kwalitatiewe ontwikkeling en uitvoering van motoriese vaardighede in die vroeë kinderjare van groot belang is, aangesien die aanleer van foutiewe metodes en tegnieke in die uitvoering van motoriese vaardighede verdere ontwikkeling en verfyning van meer gevorderde vaardighede kan belemmer.

Volgens die literatuur bestaan daar teenstrydigheid ten opsigte van die doeltreffendste behandeling van kinders met DCD. ’n Aantal behandelingsmetodes word in die literatuur gemeld. Die perseptueel-motoriese intervensiemetode integreer verskillende intervensie-prosedures, perseptuele kwaliteite en motoriese vermoëns (Lerner, 1993), terwyl sensoriese-integrasieterapie gebaseer is op die teorie dat ’n kind die vermoë moet ontwikkel om sensoriese inligting te orden en te organiseer sodat motoriese en akademiese vaardighede kan verbeter. Derhalwe word gepoog om die neurologiese disfunksie wat vir belemmering verantwoordelik is, deur middel van sensoriese integrasie te hanteer sonder om sekere vaardighede aan te leer. Die taakspesifieke-intervensiemetode (Revie & Larkin, 1993; Sigmundsson *et al*., 1997) betrek algemene vaardighede of prosesse terwyl die geïntegreerde benadering op die integrasie van bogenoemde metodes berus (Davidson & Williams, 2000; Ernst, 2003).

Dit blyk uit die literatuur belangrik te wees dat die kind met motoriese probleme so vroeg as moontlik geïdentifiseer moet word (Pienaar, 1994), aangesien behandeling wat vroeg en op ’n individuele basis gegee en spesifiek op die probleem gerig is, die beste resultate blyk te lewer. Dit blyk ook dat hoe jonger die kind is, hoe meer bereidwillig hy of sy sal wees om saam te werk, aldus die navorser.

Uit bogenoemde literatuurverkenning blyk onsekerheid te bestaan oor die sukses van verskeie genoemde intervensiemetodes. Leemtes kom ook nog voor met betrekking tot navorsing oor die waarde van intervensieprogramme vir DCD-kinders. Die eerste vraag wat met hierdie navorsing beantwoord wil word, is of ’n motoriese intervensieprogram wat op ’n integrasie van verskeie metodes gebaseer is en vir 5- tot 8-jarige plaaswerkerkinders wat met DCD gediagnoseer is, aangebied word, ’n positiewe invloed op hul motoriese uitvoering sal uitoefen. Tweedens word die vraag gestel of die kwaliteit van hulle bewegingsuitvoering van fundamentele vaardighede sal verbeter nadat die bogenoemde intervensieprogram gevolg is.

METODE VAN ONDERSOEK

Keuse van proefpersone

In dié studie is van beskrywende navorsing met ’n voortoets-natoets-ontwerp gebruik gemaak. Die studie maak deel uit van ’n multidissiplinêre navorsingsprojekstudie (Farm Labourers and General Health [FLAGH-studie]) wat deur die Fakulteit Gesondheidswetenskappe van die Noordwes-Universiteit uitgevoer word en deur die etiekkomitee van genoemde Universiteit goedgekeur is. Na aanleiding van die resultate van die Thusa-studie is plase met plaasskole en skole met plaaswerkerkinders in die Noordwes-provinsie vir die navorsing geïdentifiseer (Voster *et al.*, 2000).

Al die kinders van twee plaasskole tussen die ouderdomme van 5 tot 8 jaar (n=55), wat woonagtig is binne ’n radius van 10 km op plase in die Klipdrift- en Potchefstroom-omgewing, is getoets om dié met moontlike DCD te kan identifiseer asook die kwaliteit van hulle bewegingsuitvoering te kan bepaal. Nadat toestemming by die betrokke skoolhoofde verkry is en ingeligte toestemmingsvorms deur die ouers ingevul is, is die kinders by die navorsingsprojek ingesluit. Uit 29 kinders by skool 1 en 26 kinders by skool 2 is 32 geïdentifiseer wat aan die kriteria vir DCD voldoen het. Kinders by Skool 1 wat in die DCD-groep gekategoriseer is, is daarna ewekansig in ’n eksperimentele en kontrole-groep verdeel. ’n Tweede kontrolegroep is by skool 2 gekies om te kontroleer vir moontlike beïnvloeding van die kontrolegroep deur die intervensiegroep by Skool 1. Kontrole groep 1 se proefpersone was daagliks teenwoordig waar die intervensieprogram tydens skoolure aangebied is, en die navorsers was bekommerd dat hulle sou kyk wat met die kinders in die eksperimentele groep gedoen word en dit gevolglik ook sou inoefen.

’n Intervensiegroep (I) bestaande uit 11 kinders (5 seuns, 6 dogters) van 5 jaar, (n=1 dogter), van 6 jaar (n=2: 1 seun, 1 dogter), 7 jaar (n=4: 2 seuns, 2 dogters) en 8 jaar (n=4: 2 seuns, 2 dogters) is by skool 1 geselekteer. Die kontrolegroep by skool 1(K1) het bestaan uit 8 kinders (5 seuns, 3 dogters) van 5 jaar (n=1 seun), 6 jaar (n=1 seun), 7 jaar (n=4: 3 seuns en 1 dogter) en 8 jaar (n=2 dogters). Die kontrolegroep by skool 2 (K2) het bestaan uit 13 kinders (6 seuns, 7 dogters) van 5 jaar (n=1 dogter), 6 jaar (n=2: 1 seun, 1 dogter), 7 jaar (n=5: 3 seuns, 2 dogters) en 8 jaar (n=5: 2 seuns, 3 dogters).

Meetmetode

Movement Assesment Battery for Children (MABC-T) (Henderson & Sugden, 1992)

Die MABC-T bestaan uit vier ouderdomsgroepe, waarvan die ouderdomsgroepe 4 tot 6 en 7 tot 8 jaar in die studie gebruik is. Die komponente wat in die toets geëvalueer word, is fynmotoriese vaardighede, balvaardighede en balans. Die MABC-T gebruik persentielskale vir die bepaling van die graad van DCD. Indien die proefpersoon se totale telling laer as die vyfde persentiel val, beteken dit dat hy ernstig deur DCD geraak is en intervensie benodig, terwyl ’n telling tussen die vyfde en vyftiende persentiel ’n risiko vir DCD aandui. ’n Groter totaal wat behaal word, dui op swakker prestasie. In hierdie studie is alle kinders wat onder die 15e persentiel geval het, by die navorsing ingesluit. Die MABC-T meet kwalitatiewe en kwantitatiewe uitvoering en die betroubaarheidskoëffisiënt daarvan is r=0.88 (Henderson & Sugden, 1992).

Test of Gross Motor Development (TGMD-2) (Ulrich, 2000).

Hierdie meetinstrument bepaal die kwalitatiewe ontwikkeling van lokomotoriese vaardighede en objekkontrole (gooi, slaan en vang) van kinders tussen die ouderdomme 5 en 11 jaar. Die instrument bestaan uit ses items elk vir objekkontrole (slaan, bons, vang, skop, gooi en rol) en lokomotoriese vaardighede (hardloop, galop, eenbeenspring, sprong, horisontale sprong en glypasse). Standaardtellings van dié subitems word uit die routellings bereken en saamgevoeg om ’n grootmotoriese totaal te verkry wat as ’n motoriese kwosiënt bereken kan word. ’n Standaardtelling tussen 1 en 3 word as baie swak geïnterpreteer, terwyl ’n telling tussen 17 tot 20 as uitstekend beskou word. Persentielskale word ook gebruik waarvolgens die kind se prestasie in vergelyking met sy ouderdomsgroep vasgestel kan word. Die geldigheids-koëffisiënt van die TGMD-2 toets is r=0.89 (Ulrich, 2000).

Intervensieprogram

Die proefpersone in die eksperimentele groep het ’n intervensieprogram bestaande uit sessies van 45 minute lank, twee keer per week vir agt weke lank tydens skoolure gevolg. In die agste week, direk na voltooiing van die intervensieprogram, is ’n natoets uitgevoer om die invloed van die program te bepaal. ’n Gedetailleerde program van agt weke lank is saamgestel, gebaseer op ouderdomspesifieke motoriese ontwikkelingseienskappe van kinders tussen 5 en 8 jaar (Haywood, 1986), asook op perseptuele (soos liggaamsbewustheid, propriosepsie en balans) en sensoriese (oogspierfunksie, vestibulêre funksies en refleksinhibering) komponente wat die onderbou van motoriese agterstande by kinders uitmaak. Die taakspesifieke metode (Revie & Larkin, 1993) is gebruik om fundamentele vaardighede soos hardloop, galop, skop, rol en dribbel te verbeter, alhoewel die integrering van verskillende metodes wat in die behandeling van kinders met DCD voorgestel word, verder in die aanbieding van die program gebruik is (Peters & Wright, 1999; Davidson & Williams, 2000). Dit staan ook bekend as die proses-georiënteerde benadering waar die doel met intervensie primêr is om die onderliggende prosesse betrokke by die motoriese probleme te beïnvloed. Die meeste van die aktiwiteite is so gekies dat dit verskillende aspekte gelyktydig onder die loep kan neem. Die program is twee-weekliks progressief aangepas. Opwarming, balans en balvaardighede is in groepverband aangebied, maar fynspieraktiwiteite en oogspieroefeninge op ’n meer individuele grondslag. Die volgende is voorbeelde van die 5de en 6de les wat op ’n Dinsdag en Donderdag onderskeidelik aangebied is.

Les 5 (Dinsdag)

Opwarming
- Loop op hakke
- Loop op tone
- Eenbeenspring
- Galop
- Hardloop

Balans
- Eenbeenstand, platvoete en op tone
- Loop vorentoe en agteruit oor ’n tou

Balvaardighede
- Gooi, klap en vang
- Gooi raak aan neus en vang
- Bons bal (dribbel)

Les 6 (Donderdag)

Opwarming
- Kraploop, bobbejaanloop
- Bootjie rolle
- Hardloop en spring oor boontjiesakkie

Balans
- Loop agteruit oor ’n tou en ’n balansbalkie
- Loop hak-toon oor tou en balansbalkie
- Loop sywaarts

Balvaardighede
- Gooi vir maatjie (wat aan ’n

Fynmotories
- Teken ’n mannetjie op papier en plak op ‘n banksakkie wat met sand gevul is
- Wen ’n sandsakkie (aan ’n lyntjie vas) om ’n sosatiestokkie op

Oogfunksie

Kind sit, sandsakkie word om sy kop gewaai en elke keer as hy die mannetjie sien, moet hy dit groet

liggaamsdeel wat uitgeroep word, moet raak voordat die bal gevang word)
- Gooi tennisbal deur hoepel vir maatjie
- Rol tennisbal deur hoepel vir maatjie

Fynmotories
- Knyp wasgoedpennetjies aan maatjie se hemp vas met die linker- en regterhand
- Knyp papierballetjies, wat die kind self frommel, met wasgoedpennetjies vas en plaas in emmer

Oogfunksie

Blaas borrels, volg met oë en steek stukkend met vinger

Statistiese verwerking

Die data is met behulp van Statistica for Windows (Statsoft, 2004) ontleed. Die rekenkundige gemiddeldes, standaardafwykings en minimum en maksimum waardes is vir beskrywende doeleindes ontleed, terwyl afhanklike en onafhanklike t-toetsing en variansie-analise (ANOVA) gebruik is om betekenisvolle binnegroep- en tussengroepverskille te bepaal. Die vyf en negentig persent peil van betekenisvolheid ($p<0.05$) is as ’n betekenisvolle verskil aanvaar.

RESULTATE

Aangesien dit die doel van die studie was om die invloed van ’n intervensieprogram by jong kinders te bepaal, was dit belangrik om die verandering wat tydens die intervensietydperk by hulle voorgekom het, te vergelyk met die kontrolegroepe wat geen intervensie in die genoemde tydperk ontvang het nie. Uit die variansie-ontledings van intergroepverskille wat tydens die voortoetsgeleentheid (VT, Tabel 1) en natoetsgeleentheid (NT, Tabel 3) uitgevoer is, blyk dit dat betekenisvolle verskille by slegs drie veranderlikes tydens die VT voorgekom het (balans van die MABC-T, en die kwalitatiewe uitvoering van die galop- en onderhandse rolvaardigheid in die TGMD-2). Die verskille wat gevind is, was nie tussen al die groepe betekenisvol nie, en die groepe wat elke keer die hoogste gemiddeld behaal het, het verskil. Die MABC-totaal is as veranderlike gebruik om die groepe ewekansig te verdeel, en wat die veranderlike betref, is geen betekenisvolle verskille tussen die drie groepe tydens die VT gevind nie. Hieruit is die afleiding gemaak dat die groepe wel voor die aanvang van die program ewekansig was.

Tabel 1 dui aan dat die balanstotaal van die intervensiegroep (I) die swakste van al drie groepe tydens die VT was, en ook betekenisvol swakker as die van kontrolegroep 2, alhoewel dié verskil tydens die NT nie meer betekenisvol was nie. Die verbetering ($\bar{x}$ =4.32, Tabel 2A) wat by die (I)-groep plaasgevind het vanaf voor- tot natoetsing was dus van so ’n aard dat die verskil kleiner en nie meer betekenisvol geword het tussen (I) en (K2) nie (verbetering by K2=0.73, Tabel 2A en 2C). Wat die kwalitatiewe uitvoering van die galopvaardigheid betref, blyk dit uit Tabel 1 dat (I) betekenisvol swakker as (K2) was tydens die voortoetsing, terwyl

die waardes nie meer betekenisvol tydens die natoetsing verskil het nie (verbetering van 1.82 by (I) teenoor 'n verswakking van 0.08 by K2, Tabel 2A en C). Wat die kwalitatiewe uitvoering van onderhandse rolvaardigheid betref, het (K1) betekenisvol swakker as (K2) tydens die VT presteer, maar tydens die NT is die verskil opgehef (Tabel 1, 2A en B), en dui die resultate 'n effense verswakking by (K2) aan. Tydens die NT het die (I) groep betekenisvol beter as K1 presteer (Tabel 3).

TABEL 1. **BETEKENISVOLLE INTERGROEPVERSKILLE TYDENS VOOR-TOETSING**

	Skool 1(I)		Skool 1-(K1)		Skool 2-(K2)		p-waarde	Betekenisvolle intergroep-verskille
	Voortoets	Natoets	Voortoets	Natoets	Voortoets	Natoets		
Balanstotaal	5.45*	1.14	3.5	0.78	1.19*	0.46	0.0269	I-K2
Galop	4.54*	6.36	5.5	5.38	6.9*	7	0.0025	I-K2
Onderhandse rol	5.73	7.0	3.63*	5.25	6.3*	6.15	0.027	K1-K2

(I) = Intervensiegroep, (K1) = Kontrolegroep 1, (K2) = Kontrolegroep 2, * = Betekenisvolle verskille ($p<0.05$)

Tabel 2A-C toon die beskrywende inligting van elk van die drie groepe afsonderlik tydens die VT en NT sowel as 'n aanduiding van betekenisvolheid van verskille wat vanaf die VT na die NT binne elke groep voorgekom het. Uit die 21 veranderlikes wat vir die doeleindes van die studie ondersoek is, het agt veranderlikes by die intervensiegroep betekenisvol ($p<0.05$, Tabel 2A) verbeter. Dit sluit in die MABC-totaal, en die subskale vir fynmotoriese vaardighede en balans, kwalitatiewe uitvoering van galop en onderhande rol, die rou- en standaardtelling van die balvaardighede, sowel as die somtotaal van kwalitatiewe verbetering van fundamentele motoriese vaardighede.

TABEL 2A. **BESKRYWENDE WAARDES EN BETEKENISVOLHEID VAN VERSKILLE TUSSEN VT EN NT BY DIE INTERVENSIEGROEP (I)**

		VOORTOETS				NATOETS						BETEKENISVOLHEID VAN VERSKILLE		
Veranderlikes	N	$\bar{x}$	sa	Min	Maks	$\bar{x}$	sa	Min	Maks	Verskil	sa	t-waarde	gvv	p-waarde
Fynspiervaardigheidstotaal	11	9.00	3.25	2.5	13.0	6.07	3.13	0.0	11.0	2.93	4.25	2.29	10	0.0453 *
Balvaardigheidstotaal	11	3.14	2.45	0.0	8.0	2.09	2.21	0.0	5.5	1.05	2.71	1.28	10	0.2289
Balanstotaal	11	5.54	4.87	0.0	15.0	1.14	1.61	0.0	5.0	4.32	5.35	2.68	10	0.0231 *
MABC-totaal	11	17.55	5.78	10.5	26.5	9.32	4.29	1.5	17.0	8.23	7.35	3.71	10	0.0040*
Hardloop	11	6.64	1.36	4.0	8.0	7.09	1.30	4.0	8.0	0.45	1.81	-0.83	10	0.4241
Galop	11	4.55	2.21	0.0	8.0	6.36	1.69	2.0	8.0	1.82	1.99	-3.03	10	0.0127 *
Eenbeenspring	11	9.55	0.69	8.0	10.0	9.09	0.94	8.0	10.0	-0.45	1.29	1.17	10	0.2708
Sprong	11	4.18	1.83	0.0	6.0	3.45	1.75	0.0	6.0	-0.73	2.65	0.91	10	0.3839
Horisontale sprong	11	7.18	1.25	4.0	8.0	7.09	1.45	4.0	8.0	-0.09	1.87	0.16	10	0.8750
Gly-pas	11	6.82	1.25	4.0	8.0	6.82	1.40	3.0	8.0	0.00	2.19	0.00	10	1.0000
Lokomotoriese routelling	11	38.91	4.48	29.0	44.0	39.91	4.16	32.0	45.0	1.00	4.40	-0.75	10	0.4688
Slaan	11	6.64	2.80	0.0	10.0	8.27	1.19	7.0	10.0	1.64	2.84	-1.91	10	0.0848
Bons	11	2.55	2.07	0.0	6.0	3.91	2.17	0.0	8.0	1.36	2.38	-1.90	10	0.0863
Vang	11	4.55	1.13	3.0	6.0	4.09	0.83	3.0	6.0	-0.45	1.44	1.05	10	0.3196
Skop	11	7.18	1.60	4.0	8.0	8.00	0.00	8.0	8.0	0.82	1.60	-1.69	10	0.1209
Oorhandse gooi	11	5.73	2.57	2.0	8.0	7.00	1.26	4.0	8.0	1.27	2.57	-1.64	10	0.1318
Onderhandse rol	11	5.73	1.74	2.0	8.0	7.00	1.26	4.0	8.0	1.27	2.00	-2.11	10	0.0177 *
Balvaardigheidsroutelling	11	32.36	6.89	22.0	42.0	38.27	4.13	32.0	44.0	5.91	7.16	-2.74	10	0.0209 *
Lokomotoriese standaardtelling	11	9.55	1.44	7.0	12.0	10.00	3.16	6.0	17.0	0.45	2.62	-0.58	10	0.580
Balvaardigheidstandaardtelling	11	7.73	2.87	4.0	13.0	10.00	1.95	8.0	14.0	2.27	3.04	-2.48	10	0.0324 *
TGMD-totaal	11	17.27	3.58	13.0	25.0	20.00	4.34	15.0	31.0	2.73	3.23	-2.80	10	0.0187 *

TABEL 2B. **BESKRYWENDE WAARDES EN BETEKENISVOLHEID VAN VERSKILLE TUSSEN VT EN NT BY DIE KONTROLEGROEP (KI)**

		VOORTOETS				NATOETS						BETEKENISVOLHEID VAN VERSKILLE		
Veranderlikes	N	$\bar{x}$	sa	Min	Maks	$\bar{x}$	sa	Min	Maks	Verskil	Sa	t-waarde	gvv	p-waarde
Fynspiervaardigheidstotaal	8	7.94	1.99	5.0	10.5	2.13	1.48	0.0	4.0	5.81	3.15	5.22	7	0.0012 *
Balvaardigheidstotaal	8	1.69	2.43	0.0	7.0	0.63	1.41	0.0	4.0	1.06	2.88	1.04	7	0.3320
Balanstotaal	8	3.50	3.75	0.0	10.0	0.63	1.19	0.0	3.0	2.88	3.45	2.36	7	0.0506
MABC-totaal	8	13.06	5.94	5.0	25.5	3.38	2.63	0.0	8.0	9.69	5.83	4.70	7	0.0022 *
Hardloop	8	7.25	0.89	6.0	8.0	7.88	0.35	7.0	8.0	0.63	0.74	-2.38	7	0.0491 *
Galop	8	5.50	0.93	4.0	7.0	5.38	2.26	0.0	7.0	-0.13	2.17	0.16	7	0.8750
Eenbeenspring	8	8.88	0.83	8.0	10.0	9.00	0.93	8.0	10.0	0.13	0.99	-0.36	7	0.7317
Sprong	8	4.63	1.19	3.0	6.0	4.38	1.60	2.0	6.0	-0.25	1.83	0.39	7	0.7110
Horisontale Sprong	8	7.25	0.89	6.0	8.0	7.63	0.74	6.0	8.0	0.38	1.41	-0.75	7	0.4757
Gly-passe	8	7.00	1.07	5.0	8.0	6.38	1.19	4.0	8.0	-0.63	2.00	0.89	7	04050
Lokomotoriese routelling	8	40.50	2.73	38.0	44.0	40.63	3.85	36.0	46.0	0.13	4.16	-0.09	7	0.9345
Slaan	8	6.13	2.10	4.0	10.0	6.50	1.85	4.0	9.0	0.38	2.39	-0.44	7	0.6701
Bons	8	4.63	2.72	0.0	8.0	5.38	1.69	2.0	7.0	0.75	2.55	-0.83	7	0.4328
Vang	8	3.88	1.13	2.0	5.0	4.88	0.99	4.0	6.0	1.00	1.51	-1.87	7	0.1035
Skop	8	7.88	0.35	7.0	8.0	8.00	0.00	8.0	8.0	0.13	0.35	-1.00	7	0.3506
Oorhandse Gooi	8	4.63	2.97	0.0	8.0	7.00	1.41	4.0	8.0	2.38	3.38	-1.99	7	0.0870
Onderhandse rol	8	3.63	2.77	0.0	7.0	5.25	1.58	2.0	7.0	1.63	3.25	-1.41	7	0.0200*
Balvaardigheidsroutelling	8	30.50	4.60	21.0	36.0	37.00	3.78	31.0	42.0	6.50	4.34	-4.23	7	0.0038 *
Lokomotoriese standaardtelling	8	10.23	1.49	8.0	12.0	10.63	1.77	9.0	13.0	0.38	2.45	-0.43	7	0.6776
Balvaardighede-standaardtelling	8	7.38	2.45	3.0	10.0	9.75	2.31	6.0	13.0	2.38	2.0	-3.37	7	0.012 *
TGMD-totaal	8	17.63	2.67	14.0	22.0	20.38	3.81	15.0	25.0	2.75	3.58	-2.18	7	0.0661

TABEL 2C. **BESKRYWENDE WAARDES EN BETEKENISVOLHEID VAN VERSKILLE TUSSEN VT EN NT BY DIE KONTROLEGROEP (K2)**

		VOORTOETS				NATOETS						BETEKENISVOLHEID VAN VERSKILLE		
Veranderlikes	N	$\bar{x}$	sa	Min	Maks	$\bar{x}$	Sa	Min	Maks	Verskil	sa	t-waardes	gvv	p-waarde
Fynspiervaardigheidstotaal	13	9.73	3.30	1.0	13.0	4.19	2.51	0.0	8.0	5.54	2.81	7.11	12	0.0000 *
Balvaardigheidstotaal	13	1.42	1.64	0.0	5.0	0.62	1.19	0.0	4.0	0.81	1.83	1.59	12	0.1378
Balanstotaal	13	1.19	2.02	0.0	5.0	0.46	1.66	0.0	6.0	0.73	2.83	0.93	12	0.3706
MABC-totaal	13	12.35	5.18	2.0	22.0	5.27	4.40	0.0	17.0	7.08	6.36	4.01	12	0.0017 *
Hardloop	13	7.08	1.50	4.0	8.0	7.23	1.01	6.0	8.0	0.15	1.95	-0.28	12	0.7810
Galop	13	6.92	0.95	6.0	8.0	7.00	0.91	6.0	8.0	0.08	1.12	-0.25	12	0.8077
Eenbeenspring	13	9.00	0.91	8.0	10.0	9.31	0.85	8.0	10.0	0.31	1.03	-1.08	12	0.3033
Sprong	13	4.23	1.01	2.0	6.0	3.69	1.80	0.0	6.0	-0.54	2.18	0.89	12	0.3914
Horisontale sprong	13	6.85	1.34	4.0	8.0	7.54	0.78	6.0	8.0	0.69	0.95	-2.63	12	0.0217 *
Gly-passe	13	5.08	2.75	0.0	7.0	6.62	1.85	1.0	8.0	1.54	3.53	-1.57	12	0.1417
Lokomotoriese routelling	13	39.15	5.16	28.0	45.0	41.38	3.86	35.0	48.0	2.23	6.18	-1.30	12	0.2175
Slaan	13	6.54	1.94	3.0	10.0	6.69	1.38	4.0	9.0	0.15	1.91	-0.29	12	0.7762
Bons	13	3.00	3.37	0.0	8.0	5.62	1.98	0.0	8.0	2.62	3.66	-2.57	12	0.0243 *
Vang	13	4.38	1.39	1.0	6.0	4.38	1.12	2.0	6.0	0.00	1.91	0.00	12	1.0000
Skop	13	7.62	0.77	6.0	8.0	7.23	1.74	2.0	8.0	-0.38	1.61	0.86	12	0.4057
Oorhandse gooi	13	6.15	1.91	2.0	8.0	6.08	1.89	3.0	8.0	-0.08	2.63	0.11	12	0.9177
Onderhandse rol	13	6.31	1.49	4.0	8.0	6.15	1.52	3.0	8.0	-0.15	1.57	0.35	12	0.7304
Balvaardigheidsroutelling	13	34.00	7.06	20.0	44.0	36.15	5.41	23.0	42.0	2.15	7.96	-0.98	12	0.3483
Lokomotoriese standaardtelling	13	8.92	2.78	3.0	13.0	10.69	2.10	8.0	13.0	1.77	3.03	-2.10	12	0.0571
Balvaardigheidstandaardtelling	13	8.69	1.65	6.0	11.0	9.00	2.12	6.0	14.0	0.31	3.22	-0.34	12	0.7368
TGMD-totaal	13	17.62	3.15	12.0	23.0	19.69	3.28	15.0	27.0	2.08	3.97	-1.89	12	0.0835

In kontrolegroep 1 het ses veranderlikes betekenisvolle verandering van die VT tot die NT ondergaan (Tabel 2B). Vyf van die veranderlikes, naamlik fynmotoriese vaardigheid, die MABC-totaal, onderhandse rol en die rou- en standaardtelling van die objekkontrole subskaal wat verbeter het, was dieselfde as by die intervensiegroep. Die hardloopvaardigheid het ook kwalitatief by die groep verbeter.

In kontrolegroep 2 (Tabel 2C) het vier veranderlikes betekenisvolle verandering van die VT tot die NT ondergaan, naamlik fynmotoriese vaardigheid en die MABC-totaal, en die horisontale sprong en bonsvaardigheid. Die MABC-totaal en fynspiervaardigheid het ook by die (I)-groep en (K1) betekenisvol verbeter.

Tabel 2A toon dat fynspiervaardighede by die (I)-groep die minste verbetering getoon het en dat hulle volgens Tabel 3, wat intergroepverskille tydens die natoetsing aandui, betekenisvol swakker as (K1) in die vaardigheid was. ’n Groot standaardafwyking in fynspiervaardighede sowel as maksimum en minimum waardes by die (I)-groep tydens VT en NT dui heelwat variasie binne die groep aan (Tabel 2A), wat dié resultaat in ’n mate kan verklaar. Hoewel die (I)-groep se MABC-T die swakste tydens VT was en heelwat verbeter het was dit betekenisvol swakker as die van (K1) tydens die NT.

Wat die kwalitatiewe ontleding betref, het die (I)-groep betekenisvol beter as (K1) in die slaanvaardigheid gevaar. Die intervensiegroep (I) het met 1.64 verbeter waar (K1) slegs ’n verbetering van 0.15 getoon het (Tabel 2A en B). Dieselfde tendens het ook by die onderhandserol-vaardigheid voorgekom, waar ’n betekenisvolle verskil tussen (I) en (K1) voorgekom het (Tabel 2A, Tabel 2B en Tabel 3). Tydens die VT het K1 en K2 betekenisvol verskil terwyl die (I)-groep die beste groep en betekenisvol beter as K1 tydens die NT was.

TABEL 3. **BETEKENISVOLLE INTERGROEPVERSKILLE TYDENS NATOETSING**

	Skool 1(I)		Skool 1-(K1)		Skool 2-(K2)		p-waarde	Betekenisvolle intergroep-verskille
	Voortoets	Natoets	Voortoets	Natoets	Voortoets	Natoets		
Fynspiervaardig-heidstotaal	9.0	6.07*	7.94	2.13*	9.73	4.20	0.0118	I-K1*
MABC-totaal	17.55	9.32*	13.06	3.38*	12.35	5.27	0.0159	I-K1*
Slaan	6.64	8.27*	6.13	6.50*	6.54	6.70	0.0414	I-K1*
Onderhandse rol	5.73	7.0*	3.63	5.25*	6.31	6.15	0.0570	I-K1*

(I) = Intervensiegroep, (K1) = Kontrolegroep 1, (K2) = Kontrolegroep 2, * = Betekenisvolle verskille in natoetswaardes ($p<0.05$)

Die enigste MABC-veranderlike wat slegs by die intervensiegroep betekenisvol verbeter het, was balans. Die intervensiegroep se voor- en natoetsresultate bevestig ook dat die veranderlike moontlik by die intervensieprogram gebaat het. Geen van die lokomotoriese vaardighede van die TGMD-2-meetinstrument wat by die onderskeie groepe verbeter het, was dieselfde nie, en

slegs die verbetering in die galopvaardigheid kan aan die invloed van die intervensie program toegeskryf word. Slaan- en onderhande rolvaardighede het ook as ’n resultaat van die intervensie program verbeter. Wat algemene grootmotoriese ontwikkeling betref toon die NT resultate van die verskillende groepe dat die algehele verbetering wat by die (I)-groep gevind is moontlik aan die effek van die program toegeskryf kan word, aangesien geen verskille tussen die groepe met betrekking tot diè veranderlike voor die aanvang van die program voorgekom het nie.

BESPREKING VAN RESULTATE

Hierdie studie wou bepaal of intervensie wat op ’n geïntegreerde benadering gebaseer is, probleme wat met ontwikkelingskoördinasieversteuring geassosieer word, kan verminder. Uit die resultate soos bespreek, blyk dit dat die intervensieprogram wel ’n geringe effek op agterstande van kinders met DCD sowel as op die kwalitatiewe uitvoering van hulle fundamentele vaardighede uitgeoefen het.

Wat betref die vraag of die program tot die verbetering van die kinders se motoriese behendigheid sal bydra, het balans verbetering getoon — ’n resultaat wat ondersteun word deur navorsing van Ernst (2003) wat soortgelyke resultate in haar studie met ouer plaaswerkerkinders gekry het. Die feit dat fynspiervaardigheid se verbetering nie aan die program toegeskryf kan word nie, is teenstrydig met die resultate van Ernst (2003) en Davidson en Williams (2000) wat aanvoer dat handvaardighede vinniger as ander vaardighede tydens intervensie verbetering toon. Tydens die voortoetsing was dit opmerklik dat die meeste van die proefpersone redelik onbedrewe was met die gebruik van ’n skêr (terwyl verwag sou word dat skoolgaande kinders reeds die instrument kan hanteer). Heelwat tyd is gevolglik tydens die program spandeer om die tekortkoming te probeer aanspreek. Dié onhandigheid kon gevolglik daartoe bygedra het dat betekenisvolle progressie nie oor die tydperk van die intervensieprogram gemeet is nie. Die verbetering wat wel in die intervensiegroep se fynmotoriese vaardighede voorgekom het kan tot ’n mate deur die aanspreek van die probleem verklaar word. Dit kan egter wees dat die tydperk na bemeestering van dié basiese knipvaardigheid wat die gebruik van die twee kante van die liggaam gesamentlik verbeter het, te kort was om verdere neerslag in ander fynmotoriese vaardighede te kon vind. Indien die program en aanbieding daarvan langer geduur het, kon daar dalk ten opsigte van hierdie aspek beter resultate verkry gewees het. Balvaardigheid het van al die subitems van die MABC-T, die kleinste uitvalle getoon, en die verbetering wat bewerkstellig is, was te gering om betekenisvol te wees. Die MABC-totaal wat uit die drie subitems saamgestel is, het ook nie sodanig verander dat die rol van die intervensieprogram daarin beduidend is nie.

Slegs een van die lokomotoriese vaardighede, naamlik galop, het sodanig verbeter dat dit aan die program toegeskryf kan word, terwyl slaan en onderhandse rol en objekkontrole se rou- en standaardtelling ook verbeter het. Galop, slaan en onderhandse rol is van die mees komplekse fundamentele vaardighede wat moet ontwikkel (Ulrich, 2000), wat die invloed van die intervensieprogram bevestig. Verbetering van al die aspekte tesame het waarskynlik bygedra tot die betekenisvolle verbetering in die algehele grootmotoriese totaal van die intervensiegroep. Hierdie aspekte is hoofsaaklik weens die taakspesifieke metode onderrig, en stem ooreen met die resultate van ander navorsers (Revie & Larkin, 1993; Sigmundsson *et al.*,1997; Goodway *et al.*, 2003). Die verskil tussen taakspesifieke intervensie en ander

bestaande metodes is dat dit algemene vaardighede of prosesse betrek, en die belangrikste rede hiervoor is die fokus op ’n spesifieke vaardigheid tydens die uitvoering van die taak.

Die gevolgtrekking wat gemaak kan word met betrekking tot die geïntegreerde benadering wat tydens die intervensie gevolg is en wat op perseptueel-motoriese, sensoriese-integrasie- en taak-spesifieke komponente berus het, is dat dit minder effektief was as wat verwag was. Verskeie redes kan hiervoor aangevoer word. Die feit dat enkele vaardighede wel kwalitatief verbeter het en die taakspesifieke metode hoofsaaklik daarvoor gebruik is, wys daarop dat die gebruik van die metode wat sodanige aktiwiteite betref, waarskynlik aanleiding gegee het tot die resultate. Alhoewel die sensoriese-integrasiemetode deur Willougby en Polatajko (1994) as ’n minder geskikte metode in die literatuur gekritiseer word, het die bevindinge van hierdie studie tog aan die lig gebring dat die komponente wat wel statisties betekenisvol verbeter het, op ’n hoofsaaklik taakgeoriënteerde wyse aangeleer is en dat beter sensoriese integrasie as gevolg van die program wat gevolg is, ook ’n invloed daarop kon uitgeoefen het (soos die invloed van verbeterde visuele persepsie op hand-oog-koördinasie en balans). Visuele oefeninge het ’n groot deel van die program uitgemaak en kon dus ’n bydrae gelewer het tot die verbetering wat by balans en objekkontrole vaardighede voorgekom het. In hierdie verband meld navorsing met betrekking tot sensoriese integrasie dat die vestibulêre, die visuele en die proprioseptiewe sisteem ’n belangrike rol speel in die stabilisering van die oë gedurende die beweging van die kop, posturale kontrole, liggaamsbewustheid en ruimtelike oriëntasie (Willougby & Polatajko, 1994). Shumway-Cook en Horak (1990) beweer verder in die verband dat perifere-vestibulêre patologie die keuse van ’n bewegingstrategie affekteer en dat laasgenoemde balans sal beïnvloed. Die intervensie deur middel van sensoriese integrasie kon dus in die studie bygedra het tot die verbeterde balans en hand-oog-koördinasie.

Uit die resultate kan die aanbeveling gemaak word dat die intervensiemetode wat gebruik word, in plaas van geïntegreerd, eerder afgewissel moet word, afhangende van wat spesifiek ondervang wil word. Die aanvanklike gebruik van die taakspesifieke metode sou in die geval van fynmotoriese vaardigheid byvoorbeeld goed gewees het om sodoende heel eerste te kon verseker dat die kinders die knipvaardigheid bemeester het. Die feit dat daar egter meestal met ’n groep DCD-kinders en nie met individue tydens die aanbied van die intervensieprogram gewerk is nie, bemoeilik hierdie metode, aangesien elke kind se probleme meestal uniek is en die erns van die probleme ook van kind tot kind verskil. Gevolglik moet daar eintlik vir die beste resultate op ’n een-tot-een-basis met sodanige kinders gewerk word. Die doel is egter ook om ’n program te ontwikkel wat ook deur opvoedkundiges gebruik kan word, en dit is prakties onmoontlik vir die onderwyser om op individuele wyse met kinders met sodanige probleme te werk. Dit beteken egter ook dat die assessering van die aanvanklike status van die kind veel meer intensief sal moet wees en wat ook waarskynlik moeilik in ’n groepmetode toegepas sal kan word. Goodway *et al*. (2003) het ’n studie op voorskoolse kinders vanuit agtergeblewe gemeenskappe uitgevoer waarin hulle wou bepaal of ’n intervensieprogram van nege weke wat twee keer per week uitgevoer word, die fundamentele vaardigheids-ontwikkeling van die kinders sal verbeter. Die lengte en tydsduur van die program was soortgelyk aan hierdie studie, behalwe dat die navorsers slegs op lokomotoriese vaardighede en objekkontrole se verbetering in hule studie gefokus het, en wat ook betekenisvol verbeter het. Dié resultate bevestig die vermoede dat die huidige program dalk te veel aspekte ingesluit het wat aangespreek moes word en oor ’n te kort tydperk, en dat dit dalk die grootste tekortkoming van die studie was wat aangespreek sal moet word indien die program geïmplimenteer wil word.

SAMEVATTING

Heelwat leemtes is met die studie ervaar, alhoewel waardevolle kennis oor die aard en sukses van motoriese intervensieprogramme vir jong kinders met agterstande in ontwikkelings-koördinasie ingewin is. Heelwat eksterne faktore wat buite die beheer van die navorsers was, kon die resultate wat behaal is, beïnvloed het. Kommunikasieprobleme tussen die kinders en aanbieders en weersomstandighede soos koue wat moeilik beheerbaar was, kon die uitvoering van veral fynmotoriese vaardigheidstoetse beïnvloed het. Die groter verbetering by (K1), die kontrolegroep wat by dieselfde skool as die intervensiegroep geselekteer is vergeleke met die (K2), kan moontlik toegeskryf word daaraan dat hulle saam met die intervensiegroep gespeel het en op hierdie wyse ook die vaardighede aangeleer het. Die groepe was verder klein, en van die kinders in die studie was dikwles afwesig en het die skool verlaat — 'n tendens wat baie by skole in afgeleë gebiede voorkom. Ryping is 'n verdere faktor wat 'n invloed op kinders se ontwikkeling op hierdie ouderdom uitoefen. Die intervensieprogram se duur moes ook by die skoolkwartaal aangepas word en dit kan wees dat 'n langer tydperk van intervensie aanleiding kon gegee het tot beter resultate. Dit, of die aanbied van soortgelyke programme op 'n daaglikse basis, word gevolglik ook aanbeveel. Die plek van aanbieding was ook nie sodanig dat die kinders afgesonder van die nuuskierige oë van die res van die skool aan die program kon deelneem nie, gevolglik was dit moeilik om aandagafleibare kinders se aandag altyd te behou. Met opvolgstudies moet aandag aan hierdie tekortkominge geskenk word.

Geen soortgelyke studies is al op jong kinders afkomstig van landelike en lae sosio-ekonomiese omstandighede in Suid Afrika uitgevoer nie. Die enigste soortgelyke studie is op ouer kinders uitgevoer, en die resultate van die studie is nie met 'n kontrolegroep vergelyk nie. Daar word derhalwe aanbeveel dat verdere soortgelyke navorsing uitgevoer moet word met betrekking tot die verbetering van koördinasieagterstande by jong kinders, en ook meer spesifiek by kinders wie se ontwikkeling deur risiko beinvloed kan word.

ERKENNING

Die Mediese Navorsingsraad (MNR) van Suid Afrika word bedank vir die geldelike steun wat verleen is vir die uitvoering van die studie en die volgende Kinderkinetika honneursstudente vir hulle bydrae tot die insameling van die inligting en aanbieding van die intervensieprogram (Dané Du Plessis, Cindy Dyman, Christine Scheepers en Caro-Lee van der Westhuizen).

SUMMARY

The effect of an intervention programme based on an integrated approach on 5- to 8-year-old farm worker children with Developmental Coordination Disorder: Flagh-Study

The first aim of this study was to determine whether a motoric intervention programme based on the integration of different intervention methods could improve abilities associated with DCD status among young school children from rural communities. A second aim was to determine whether the quality of their fundamental movement skills would improve having followed the motor intervention programme. From 55 children (5- to 8-years) living on farms and attending farm schools in the region, a group of learners were diagnosed with DCD by means of the Movement Assessment Battery for Children (MABC-T) (Henderson & Sugden, 1992) and randomly divided into an intervention group (n=11) and a control group (n=8). A

second control group (n=13) was selected from children in the same age group at another farm school to compensate for influence. A pre-test, post-test research design was followed. The MABC-T was used to determine the children's DCD status (>15th percentile), while the test of gross motor development, 2nd version (TGMD-2) (Ulrich 2000) was used to evaluate the quality of fundamental movement patterns. An eight-week intervention programme, lasting 45 minutes was presented twice a week during school hours whereafter a re-evaluation of the subjects took place. The programme was based on perceptual motor, sensory integration and task-orientated components.

The data were analysed by means of the Statistica for Windows computer programme. Variance of analysis was used to analyse the results of the pre-testing which indicated no statistical significant differences between the intervention group and the two control groups with regard to their MABC totals. The change from pre - to post testing was evaluated in each group by means of dependant t-testing, and from 21 variables, eight improved significantly ($p<0.05$) in the intervention group. This includes the MABC total and the subscales for manual dexterity and balance. With regard to the TGMD-2 assessment, the quality of the gallop, underarm roll, the raw and standard scores of the object control subscale, and the composite score of the TGMD-2 improved significantly. However, manual dexterity and the MABC totals also improved in the control groups. Running, horizontal jumping, underarm roll, dribble and the raw and standard scores for object controle improved significantly in the control groups. Balance, gallop, striking, underarm rolling and the overall quality of fundamental motor skills improved in the intervention group which could be ascribed to intervention. Visual control exercises which formed part of the programme to improve eye functioning could have contributed to the improvement of these skills, indicating that the integration of sensory and task specific methods in the programme had value.

It can be concluded that the implementation of such a motor intervention programme may have advantages for children diagnosed with DCD to participate in. However, it was found that too many aspects wants to improved in a too short time and that the programme should be lenghten to improve the outcome. Also, a more individualistic approach is recommended when such a programme is conducted because of the degree, but also due to the diversity of the problems children diagnosed with DCD, experience. The teaching method should also be more focused on the task specific method, although alternation of the different methods is also recommended. In order for the skills to be properly mastered, it is also recommended that the frequency of the programme be increased to each day of the week or that it be conducted over a longer period of time.

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NOTAS

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DIE EFFEK VAN SPORTSIELKUNDIGE INTERVENSIETEGNIEKE OP DIE PRESTASIE VAN MIDDELAFSTAND-ATLETE

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ABSTRACT

This study examined the effect of sport psychological intervention techniques on the performance of 1 500 m track athletes. Six participants took part in a single-subject multiple baseline across individuals design, which was used to evaluate an intervention package which included relaxation, self-talk, goal setting, imagery and concentration skills. Performance scores were plotted for each run and subjects' graphs were assessed for intervention-related change against mean performance change and established split-middle analysis criteria. Visual inspection of plotted values was supplemented by quantitive analysis using repeated measures analysis of variance (RANOVA). The results indicated the mental skills package to be effective in enhancing athletic performance.

Key words: Sport psychological intervention; Athletic performance; Single-subject research.

INLEIDING

Sportsielkundige vaardighede word dikwels in die praktyk deur konsultante en sportlui toegepas. Shambrook en Bull (1996) beweer egter dat die effektiwiteit van sportsielkundige intervensies somtyds wanvoorgestel en selfs oorskat mag word. Theodorakis *et al*. (2001) wys op die gevaar van ongeverifieerde sportsielkundige intervensietegnieke en beklemtoon die noodsaaklikheid dat sportlui in die effektiewe gebruik daarvan geskool moet word. Die kwessie rakende die effektiwiteit van sportsielkundige intervensietegnieke word ook deur sommige navorsers (Wolko *et al*., 1993; Rogerson & Hrycaiko, 2002) bevraagteken, aangesien hulle van oordeel is dat daar nie genoegsame empiriese bewys vir die effektiwiteit daarvan binne ekologies-geldige situasies is nie. Bevindings soos gebaseer op laboratorium-navorsing (byvoorbeeld by die gebruik van doelwitprogramme in die bedryfsveld), kan nie outomaties op sportsituasies van toepassing gemaak word nie. Sportlui stel met ander woorde belang in doeltreffende sportsielkundige vaardighede wat tydens oefen- en kompetisie-situasies toegepas kan word om sportprestasie te optimaliseer (Widmeyer & Ducharme, 1997; Page *et al*., 2000). 'n Behoefte bestaan dus vir getoetste sportsielkundige intervensietegnieke wat praktykgerig en verbruikersvriendelik is (Gould *et al*., 1999; Giges & Petitpas, 2000).

Kendall *et al*. (1990) wys daarop dat dit onwaarskynlik is dat die implementering van 'n enkel sielkundige tegniek 'n betekenisvolle verandering in sportprestasie sal bewerkstellig. Hulle beklemtoon die feit dat daar in verskeie ondersoeke juis op so 'n enkele vaardigheid gefokus is. Die alternatief is derhalwe om 'n kombinasie van sportsielkundige tegnieke in die

onderhawige ondersoek te implementeer wat die kans op ’n beduidende behandelingseffek sal verhoog.

Verskeie navorsers (Kendall *et al.*, 1990; Pates *et al.*, 2001; Rogerson & Hrycaiko, 2002) ondersteun die idee van ’n *pakket* van verskeie sportsielkundige intervensietegnieke. Die atleet moet met ander woorde in verskeie tegnieke en metodes geskool word, sodat hy/sy ’n repertoire van basiese sportsielkundige vaardighede kan ontwikkel wat volgens die individuele behoeftes in verskillende sportsituasies toegepas kan word. Thelwell en Greenlees (2001) wys ook daarop dat alhoewel daar steun vir die effektiwiteit van sodanige sportsielkundige intervensiepakette is, verdere navorsing nodig is voordat besliste gevolgtrekkings gemaak kan word.

’n Verdere probleem met betrekking tot die effek van sportsielkundige intervensietegnieke op die prestasie van sportlui, is dat die meerderheid navorsers van konvensionele tussengroepe-ontwerpe in hul navorsing gebruik gemaak het. Hierdie benadering het tot die probleem gelei dat enige potensiële positiewe effek ten opsigte van individuele proefpersone deur die groepsanalise van die data gemaskeer kan word (Shambrook & Bull, 1996). ’n Belangrike beperking van laasgenoemde navorsingsontwerp is juis volgens Barlow en Hersen (1984) dat dit moeilik is om vanaf die algemene respons van die groep na ’n besondere individu te veralgemeen. Lerner *et al*. (1996) meld dat die enkelproefpersoon-ontwerp as ’n metodologie in eie reg beskou moet word en dat dit ’n waardevolle bydrae tot toegepaste en eksperimentele werk lewer.

Daar bestaan dus ’n behoefte om navorsing vanuit ’n enkelproefpersoon-navorsingsontwerp te benader, aangesien so ’n ontwerp as uiters geskik geag word om die effek van spesifieke intervensies te ondersoek. Hrycaiko en Martin (1996) stel ook die behoefte dat die enkelproefpersoon-ontwerp se geloofwaardigheid deur verdere navorsing uitgebou sal word.

DOEL VAN ONDERSOEK

Die primêre doel van die onderhawige navorsing was dus om die gekombineerde effek van sportsielkundige intervensietegnieke op die prestasie van sportlui in ’n natuurlike sportsituasie (kompetisies) te toets. ’n Pakket van sportsielkundige intervensietegnieke is na ’n omvattende literatuurondersoek saamgestel en in die volgende breë kategorieë van sielkundige vaardighede ingedeel, naamlik ontspanningsvaardighede, toepaslike selfspraak, doelwitstelling, beelding en konsentrasievaardighede.

’n Verdere doelwit van die onderhawige navorsing was ook om ’n ideografiese enkelproefpersoon-navorsingsontwerp in die ondersoek te gebruik, ten einde die effek van ’n pakket van sportsielkundige intervensietegnieke binne ekologies-geldige situasies waar te neem en om daarby ook die geloofwaardigheid en bruikbaarheid van dié tipe ontwerp binne die sportsielkunde milieu te bevorder en uit te bou. Die voordele wat die gebruik van dié tipe ontwerp by toegepaste navorsing inhou, word volledig deur Hrycaiko en Martin (1996) bespreek.

METODE

Proefpersone

Vier vroulike en twee manlike middelafstand hoërskoolatlete (onder 17 tot onder 19) het belanggestel om vrywillig aan die navorsingsprojek deel te neem en in sportsielkundige tegnieke geskool te word. Al ses die atlete het van dieselfde afrigter gebruik gemaak en het ook nie van tevore skoling in sportsielkundige tegnieke ontvang nie.

Afhanklike veranderlike

Die afhanklike veranderlike in die onderhawige ondersoek is gedefinieer as die tydsduur wat dit elke deelnemer neem om die 1 500 m wedloop te voltooi. Die afhanklike veranderlike is elke keer met ’n sportstophorlosie gemeet wanneer ’n atleet aan die betrokke baanitem deelgeneem het.

Eksperimentele ontwerp

’n Enkelproefpersoon-navorsingsontwerp, die meervoudige basislyn oor individue is in die onderhawige navorsing geïmplementeer. Die proefpersone is in basislyn- en intervensiefase waargeneem. Die sportsielkundige intervensie is sover moontlik vir elke deelnemer toegepas sodra die afhanklike veranderlike stabiel was (dit wil sê relatief konsekwent oor tyd), of ’n tendens in die teenoorgestelde rigting getoon het as dit wat na toepassing van die onafhanklike veranderlike verwag is. Die deelnemers het die opleidingsintervensie in opeenvolging van mekaar ontvang.

Ooreenkomstig die prosedure vir die meervoudige basislynontwerp oor individue, is die basislyngedragsprofiel vir al die proefpersone bepaal waarna die intervensie vir die eerste deelnemer toegepas is, terwyl die ander atlete in basislyntoestand waargeneem is. Daarna het die tweede proefpersoon op dieselfde wyse aan die beurt gekom, terwyl basislynobservasie vir die res volgehou en die eerste proefpersoon se prestasie steeds binne intervensiefase, gemonitor is. Hierdie prosedure is volgehou totdat al die deelnemers die intervensie ontvang het en elkeen se prestasie in die 1 500 m oor basislyn- en intervensiefase waargeneem is (Ming & Martin, 1996; Patrick & Hrycaiko, 1998; Rogerson & Hrycaiko, 2002).

Intervensieprosedure

Die sportsielkundige intervensie is ten opsigte van elke deelnemer oor ’n tydperk van vyf dae toegepas. Een sessie is per dag aangebied wat gemiddeld twee uur lank geduur het. ’n Totaal van 30 intervensiesessies is dus oor ’n tydperk van 30 dae aangebied. Die sportsielkundige intervensiepakket is in werkboekformaat gestandaardiseer en tydens die begin van die intervensie aan elke deelnemer oorhandig. Dieselfde inligting, riglyne, oefeninge en huiswerkopdragte wat elke deelnemer tydens die intervensie ontvang het, is daarin vervat.

Die skoling van deelnemers in ontspanningsvaardighede was tydens die eerste werksessie hoofsaaklik gemik op die regulering van aktivering. Elke atleet is met ander woorde geskool om sy/haar eie vlak van aktivering binne unieke sportsituasies te monitor, te evalueer en om dan op die toepaslike tegniek te besluit om dit doeltreffend in beide die somatiese en kognitiewe dimensies te reguleer (Botterill & Brown, 2002). Proefpersone het dus tegnieke

aangeleer met die doel om ’n balans te bewerkstellig tussen ’n toestand van ontspanning en gespanne gereedheid (Hardy *et al*., 2001). Ontspanningstegnieke vir die verlaging van aktivering het gekontroleerde asemhalingstegnieke, progressiewe spier-ontspanningsoefeninge en tegnieke vir vinnige of tydelike ontspanning, ingesluit (Taylor & Taylor, 1998; Taylor & Wilson, 2002). Tegnieke om aktiveringsvlakke te verhoog het onder andere die gebruik van energie genererende beelding, die versnelling van asemhalingstempo en emosioneelbelaaide selfspraak ingesluit (Lynch & Scott, 1999; Smith, 1999).

Elke proefpersoon is tydens die tweede werksessie in die gebruik van effektiewe selfspraak geskool. Proefpersone is vertroud gemaak met tegnieke om bewus te raak van die inhoud en frekwensie van die interne selfgesprek, om negatiewe selfspraak wat sportprestasie kan belemmer te identifiseer, dit te elimineer en om dit met geïndividualiseerde positiewe selfspraak en selfbevestigings te vervang (Gauron, 1984; Williams & Leffingwell, 2002).

Tydens die derde werksessie is elke proefpersoon blootgestel aan die proses van doelwitstelling as metode om sportprestasie te verbeter. Die proefpersoon is onder andere geleer om tussen die verskillende soorte doelwitte te onderskei en om die toepaslikheid van elke tipe ten opsigte van verskillende sportsituasies te oorweeg. Daarby het hul ook strategieë aangeleer om hul geformuleerde doelwitte na te streef, te monitor en om wanneer dit nodig is, aan te pas (Kitsantas & Zimmerman, 1998; Filby *et al*., 1999).

Tydens die vierde werksessie is elke proefpersoon onder andere in beeldingstegnieke opgelei om hulself te motiveer, selfvertroue te bou, aktiveringsvlakke te reguleer en om strategieë vir sportdeelname psigies te repeteer. Hulle het ook geleer dat visualisering slegs een komponent van beelding behels en om ook die ander sintuie by die toepassing van beelding te gebruik (Vealey & Walter, 1993; Martin *et al*., 1999; Munroe *et al*., 2000; Murphy & Martin, 2002).

Die laaste werksessie was daarop gemik om effektiewe konsentrasie te bevorder. Die oorkoepelende doelwit tydens hierdie sessie was om elke proefpersoon in staat te stel om ’n begrip van die verskillende kategorieë en variasie van aandagfokus te vorm, sodat hy/sy die vermoë kon ontwikkel om die aandag toepaslik in verskillende sportsituasies te fokus (Turatto *et al*., 1999; Nideffer & Sagal, 2001).

Prosedurele-betroubaarheidsevaluasie

’n Gestandaardiseerde gedragkontrolelys wat die volgorde van die prosedure wat tydens die sportsielkundige intervensie gevolg word, vasstel en spesifiseer, is voorberei. Die betrokke navorser en ’n onafhanklike waarnemer het daarna die kontrolelys afgemerk soos wat elke intervensiekomponent afgehandel is. Die onafhanklike waarnemer het dus geverifieer dat die intervensie volgens die vaste volgorde soos in die kontrolelys gespesifiseer word, toegepas is. Dieselfde strategie is ook deur Patrick en Hrycaiko (1998) in hul navorsing gevolg.

Manipulasie-kontrole

Die noodsaaklikheid van manipulasie-kontrole is deur verskeie navorsers beklemtoon (Lovell & Collins, 2001; Murphy & Martin, 2002). Die doel met manipulasie-kontrole is om te verseker dat die betrokke deelnemers wel die relevante sportsielkundige vaardighede en tegnieke waarin hul skoling ontvang het, deur die verloop van die navorsingsprojek gebruik.

In die onderhawige ondersoek is individuele proefpersone konsekwent en sistematies na afloop van elke 1 500 m wedloop uitgevra oor die betrokke tegnieke wat hul voor of gedurende die wedloop toegepas het. Die manipulasie-kontrole was effektief en het wel daartoe bygedra dat die atlete gemonitor en aangespoor kon word om die aangeleerde sportsielkundige vaardighede gereeld tydens die duur van die intervensiefase, in te oefen.

Verwerking van die data

Die data is grafies voorgestel en visueel op grond van die volgende kriteria soos gebruik deur Rogerson en Hrycaiko (2002) ontleed:

Wanneer die grafiese data geïnspekteer word ten einde te bepaal of die intervensie wel ’n effek op die afhanklike veranderlike gehad het, kan daar met vertroue tot die gevolgtrekking gekom word dat ’n effek wel waargeneem is:

1. Indien die prestasie volgens die basislyn stabiel is of `n teenoorgestelde rigting aandui as dit wat vir die intervensie voorspel is. Die basislyn toon die waardes van die afhanklike veranderlike aan vóórdat die sportsielkundige intervensie toegepas is.
2. Hoe meer dikwels `n effek oor verskillende proefpersone herhaal word.
3. Hoe minder datapunte oorvleuel tussen basislyn en intervensiefases.
4. Hoe gouer `n effek voorkom nadat die intervensie toegepas is.
5. Hoe groter die effek is in vergelyking met die basislynprestasie.
6. Laastens, het die navorser vertroue in die waarneming, indien die resultate in ooreenstemming is met bestaande data en teorie.

RESULTATE

Evaluering van betroubaarheid

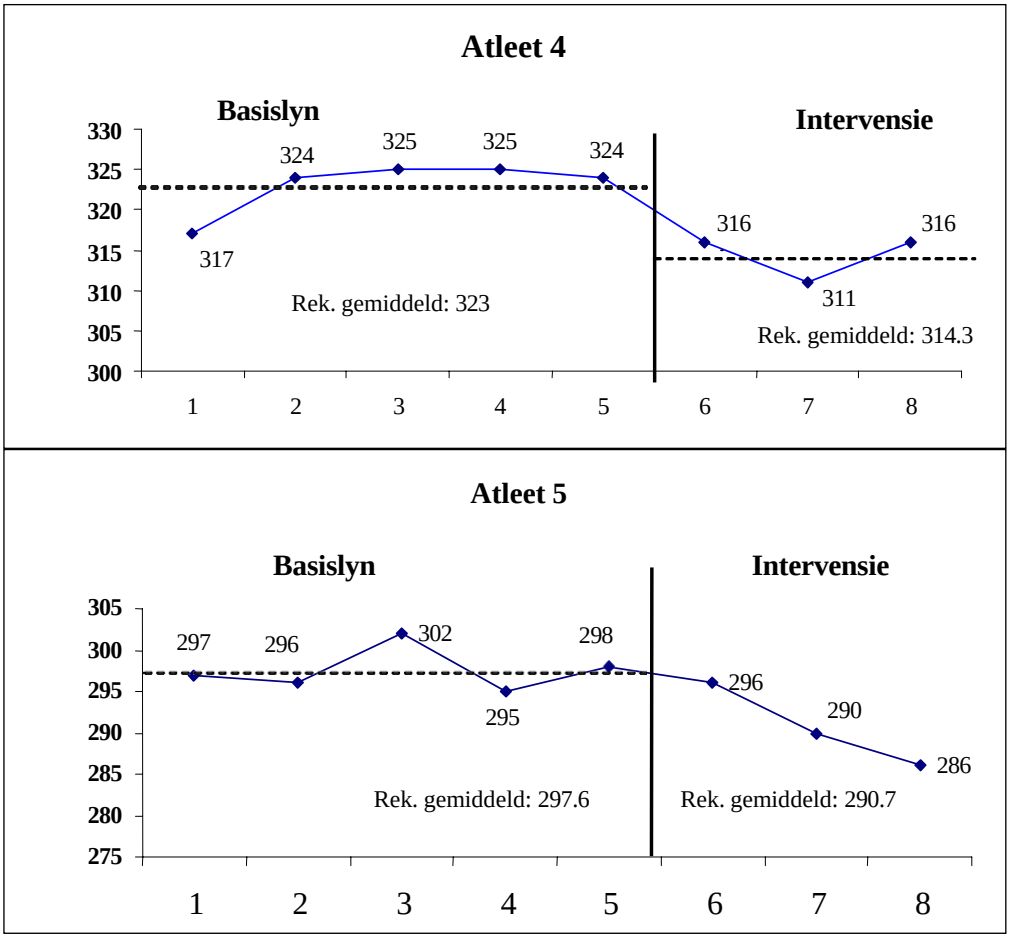
Tussenbeoordelaar-betroubaarheid is vir 50 wedlope, waartydens die ses deelnemers aan die 1 500 m deelgeneem het, bereken. Die afhanklike veranderlike is terselfdertyd tydens elke wedloop deur twee onafhanklike beoordelaars gemeet. Die evaluasies met betrekking tot tussenbeoordelaar-betroubaarheid het `n gemiddelde van 99.94% opgelewer en het dus bo die 80% aanvaarbaarheidsvlak geval (Wanlin *et al*., 1997).

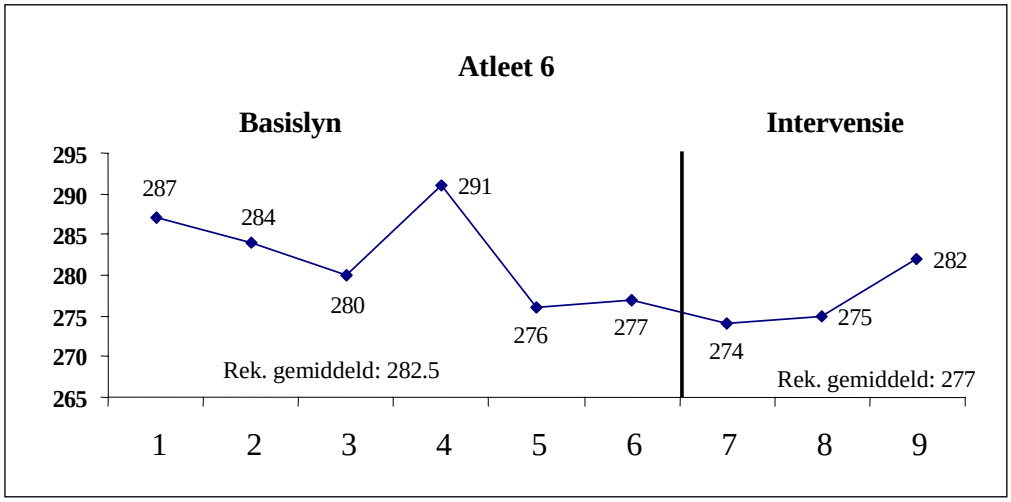
Eksterne en interne geldigheid

Die eksterne geldigheid van die behandelingsintervensie word gedemonstreer indien die resultate wel oor verskeie proefpersone veralgemeen kan word. Hrycaiko en Martin (1996) wys verder daarop dat by elke nuwe demonstrasie van ’n behandelingseffek oor verskeie proefpersone, dit minder waarskynlik is dat die resultate die gevolg van een of ander ongekontroleerde veranderlike is. Die feit dat die intervensiefase vir elke proefpersoon op ’n ander tydstip as die res van die proefpersone begin, versterk die interne geldigheid van die navorsing indien ’n effek voorkom sodra die intervensie toegepas word (Hrycaiko & Martin, 1996).

Intervensie-effekte

Die intervensie-effekte met betrekking tot elke proefpersoon word grafies in Figuur 1 aangetoon.





FIGUUR 1 (VERVOLG). **PRESTASIETYE VAN PROEFPERSONE IN DIE 1 500-METER GEDURENDE BASISLYN- EN INTERVENSIE-FASE**

Interpretasie van resultate verkry deur middel van visuele analise van data

Proefpersoon 1

Hierdie proefpersoon se basislyn het ’n neiging tot verswakte prestasie aangetoon. Sy het egter ’n onmiddellike effek direk na die intervensie gedemonstreer met slegs een datapunt van die intervensiefase wat met die basislyn oorvleuel. Daar is nie enige effek met betrekking tot latentheid vir hierdie deelnemer aangedui nie. Hierdie atleet het ’n 6.25 sekonde verbetering in haar gemiddelde tyd (1 500 m) vanaf die basislyn na die intervensiefase getoon. Haar prestasie (1 500 m) tydens die laaste wedloop was haar persoonlike beste tyd ooit in die betrokke baanitem.

Proefpersoon 2

Hierdie proefpersoon het ook ’n onmiddellike effek na die intervensie gedemonstreer. Haar basislyn was redelik stabiel. Drie van haar post-intervensietye (1 500 m) het egter met vorige tye gedurende basislyn oorvleuel. Haar tye (1 500 m) vir die laaste drie sessies tydens die intervensiefase was egter onder die basislyn-gemiddeld (dus verbeterde prestasie). Die atleet het ’n 4.8 sekonde verbetering in haar gemiddelde tyd vanaf basislyn na die intervensiefase getoon. Haar tyd van 4 minute : 41 sekondes (281 sekondes) tydens die laaste sessie was op daardie stadium haar beste van die seisoen.

Proefpersoon 3

Hierdie proefpersoon het ook ’n onmiddellike effek direk na die implementering van die opleidingintervensie getoon en geen datapunte tydens die intervensiefase oorvleuel met datapunte tydens die basislyn nie. Dié atleet het ’n 10.4 sekonde verbetering in sy gemiddelde

tyd (1 500 m) vanaf basislyn na die intervensiefase getoon. Sy prestasie in die 1 500 m het egter na die aanvanklike verbetering tydens die intervensiefase gestabiliseer en afgeplat. Sy tyd in die 1 500 m direk na die toepassing van die intervensie was sy beste prestasie in die nommer vir die betrokke seisoen. Sy basislyndata varieer egter in so 'n mate dat 'n algehele tendens tot prestasie-verbetering nie duidelik deur middel van visuele inspeksie afgelei kan word nie.

Proefpersoon 4

Hierdie proefpersoon se basislyn was stabiel en het min variasie getoon. Sy het ook 'n onmiddellike effek na die implementering van die opleidingintervensie getoon en nie enige van die datapunte tydens die intervensiefase oorvleuel met dié van die basislyn nie. Dié atleet het 'n 8.7 sekonde verbetering in haar gemiddelde tyd (1 500 m) vanaf die basislyn na die intervensiefase getoon. Haar 1 500 m tyd van 5 minute : 11 sekondes tydens die intervensiefase was haar beste tyd van die seisoen.

Proefpersoon 5

Hierdie deelnemer se basislyn was ook redelik stabiel en het min variasie getoon. 'n Effek is ook onmiddellik na toepassing van die sportsielkundige intervensie waargeneem. Dié atleet het 'n 6.9 sekonde verbetering in haar gemiddelde tyd (1 500 m) vanaf die basislyn na die intervensiefase getoon. Slegs een van die datapunte tydens die intervensiefase oorvleuel met vorige datapunte tydens basislyn. Haar prestasie tydens haar laaste 1 500 m-wedloop was ook haar beste ooit in hierdie baanitem.

Proefpersoon 6

'n Onmiddellike verbetering in prestasietyd is wel by hierdie proefpersoon tydens die eerste wedloop, direk na die toepassing van die intervensie waargeneem, maar sy prestasie het daarna toenemend verswak. Hierdie atleet het egter steeds 'n 5.5 sekonde verbetering in sy gemiddelde tyd (1 500 m) vanaf die basislyn na die interensiefase getoon. Een van die datapunte tydens die intervensiefase het ook met drie vorige datapunte tydens die basislyn oorvleuel. Visuele inspeksie van die deelnemer se basislyn (Figuur 1) skep ook die indruk dat dit 'n dalende tendens toon en dat die afname in vlak tydens die intervensiefase bloot 'n voortsetting van sodanige tendens kan wees. 'n Duidelike intervensie-effek kan dus nie by dié proefpersoon waargeneem word nie.

Opsomming van visuele inspeksie van die data

Indien slegs die gemiddelde prestasietyd in ag geneem word, wil dit voorkom asof proefpersoon 3 en 4 die grootste verbetering in prestasie vanaf basislyn na die intervensiefase toon. Waar 'n redelike mate van dispersie in die data voorkom, kan die blote vergelyking van gemiddeldes egter misleidend wees en is dit ook nodig om verdere aspekte soos die tendens in die data te bepaal (Richards *et al*., 1999).

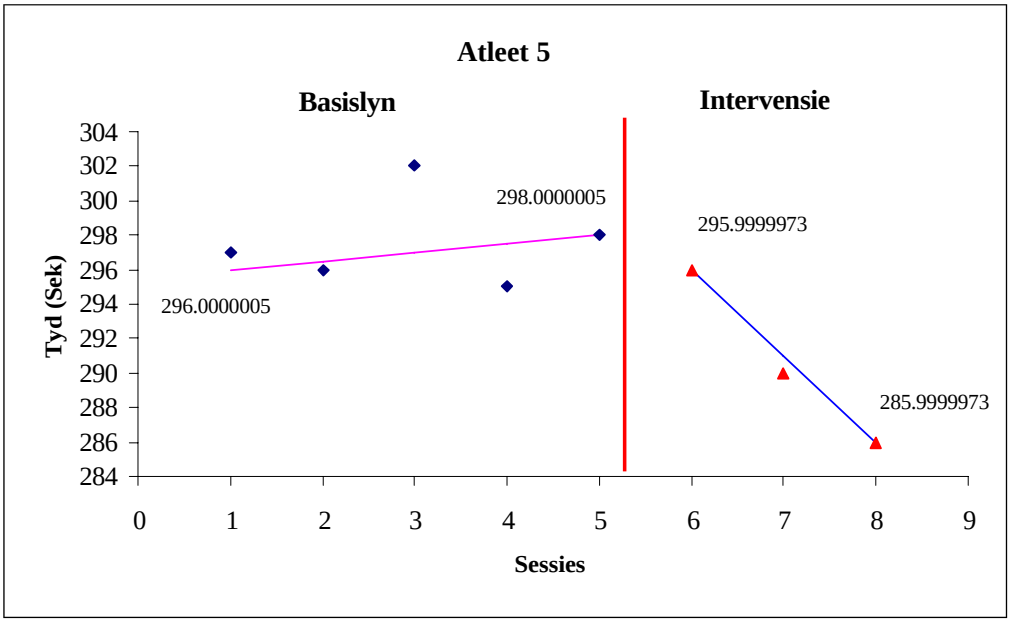
In die onderhawige ondersoek dui visuele inspeksie van Figuur 1 aan dat die basislyndata ten opsigte van atleet 3 tot so 'n mate varieer dat 'n algehele tendens nie duidelik afgelei kan word nie. Die visuele inspeksie van die basislyn van proefpersoon 6 dui klaarblyklik op 'n afwaartse neiging wat impliseer dat sy prestasie reeds tydens die basislyn 'n neiging tot verbetering

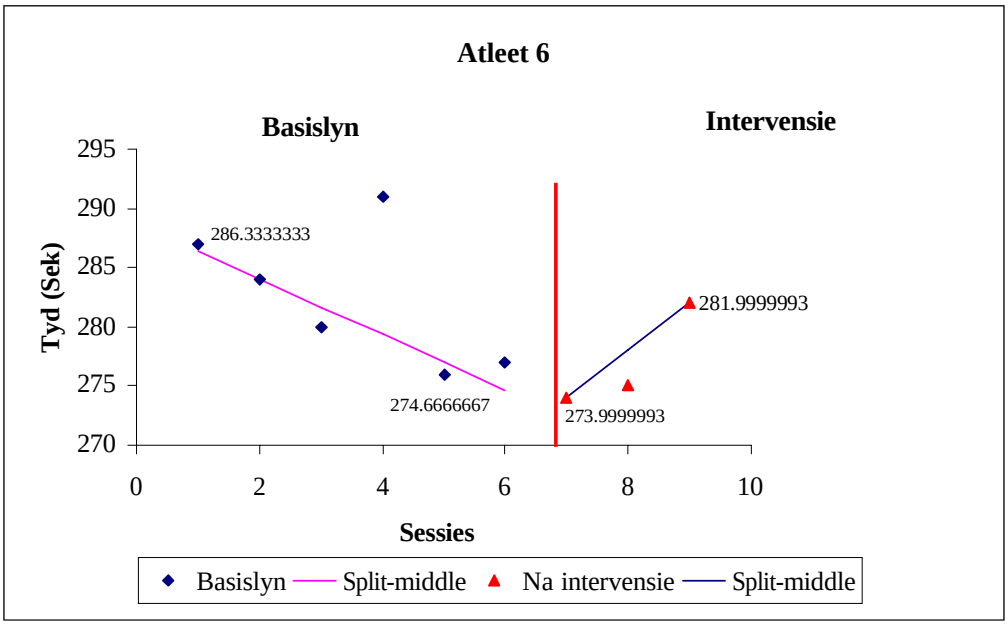
toon. Die datapunte tydens die intervensiefase varieer weer aansienlik ten opsigte van proefpersone 2 en 6.

As gevolg van die relatiewe dispersie in die navorsingsdata, het die navorser derhalwe besluit om tendenslyne ten opsigte van die data deur middel van die "*split-middle*"-tegniek te konstrueer (Shambrook & Bull, 1996). Die "*split-middle*"-tegniek bied volgens Richards *et al.* (1999) 'n beter uitbeelding van die algemene tendens in die data. Die helling van die tendenslyne asook die verandering in vlak oor opeenvolgende fases, kon met behulp van die tegniek grafies en numeries uitgedruk en vergelyk word. Die verandering in vlak verwys in dié opsig gewoonlik na 'n verandering by die punt waar die intervensie plaasvind. 'n Verandering in helling verwys na 'n verandering in tendens oor fases.

Resultate verkry met behulp van die *"split-middle"*-tegniek

Die datapunte en tendenslyne van die afhanklike veranderlike oor basislyn- en intervensiefase is met behulp van `n statistiese rekenaarprogram *"Excel"* uitgewerk en word grafies in Figuur 2 voorgestel.





FIGUUR 2 (VERVOLG). **PROEFPERSONE 1-6 DATAPUNTE EN TENDENSLYNE "SPLIT-MIDDLE" VIR PRESTASIE IN 1 500-METER OOR BASISLYN- EN INTERVENSIEFASE**

Die soliede vertikale lyn toon punt van intervensie aan waardes aangetoon het betrekking op "split-middle". Die helling en vlakke van die tendenslyne word numeries in Tabel 1 aangedui.

TABEL 1. **DIE NUMERIESE UITDRUKKING VAN DIE HELLING EN VLAKKE VAN DIE TENDENSLYNE OOR DIE BASISLYN- EN INTERVENSIEFASE**

	P 1	**P 2**	**P 3**	**P 4**	**P5**	**P6**
Helling pre	3.5	3	-4.5	0.5	0.5	-2.33
Helling post	-1.75	-2.67	0	0	-5	4
Vlak pre	305	296	259.5	325.5	298	274.67
Vlak post	297.375	294.31	258	315.99	295.99	273.99
Verandering in vlak	÷1.03▲	÷1.005▲	÷1.006▲	÷1.03▲	÷1.006▲	÷1.002▲
▲ Die ÷ teken word gebruik om 'n afname in prestasietye te reflekteer						

Soos daar uit Figuur 2 en Tabel 1 afgelei kan word, toon deelnemers 3 en 6 se tendenslyne reeds 'n afwaartse neiging tydens die basislyn. Laasgenoemde impliseer dat daar reeds tydens basislyn 'n neiging by hierdie proefpersone was om hul prestasietyd in die 1 500 m te verbeter. Proefpersoon 3 se tendenslyn is tydens die intervensiefase plat (helling=0) wat daarop dui dat geen progressiewe verbetering in prestasie na die toepassing van die intervensie

voorgekom het nie. Die moontlikheid bestaan dat dié proefpersoon ’n plafon met betrekking tot sy vermoë tydens die intervensiefase bereik het. Proefpersoon 6 se tendenslyn tydens laasgenoemde fase toon ’n opwaartse neiging en dus prestasieverswakking. Alhoewel daar dus ’n klein afname in vlak van tendenslyne by proefpersone 3 en 6 oor fases voorgekom het, (kyk Tabel 1), kan daar nie met oortuiging tot die gevolgtrekking gekom word dat die intervensie-opleiding wel vir hierdie twee proefpersone suksesvol was nie.

Die “*split-middle*”-ontleding bevestig dat die interpretasie van die resultate via visuele inspeksie versigtig geïnterpreteer moet word en dat die blote aanduiding van die verbetering in gemiddelde tyd oor fases, misleidend kan wees. Soos dit egter verder uit Figuur 2 en Tabel 1 blyk, onderskryf die “*split-middle*”-ontleding die resultate soos deur middel van visuele inspeksie verkry ten opsigte van deelnemers 1, 2, 4 en 5. Indien die verandering in helling en vlak ten opsigte van gemelde deelnemers oor fases geëvalueer word, blyk dit dat die sportsielkundige intervensie wel in hierdie geval suksesvol was. Die helling van die tendenslyne het vir proefpersone 1, 2, 4 en 5 vanaf pre- na post-intervensie afgeneem wat verminderde prestasietye en dus verbeterde prestasie reflekteer (kyk Figuur 2 en Tabel 1).

STATISTIESE ONTLEDING VAN RESULTATE

Gemiddelde prestasietye

’n Herhaalde waarnemingsanalise van variansie toon ’n beduidende verskil tussen proefpersone se gemiddelde tye tydens basislyn en hul gemiddelde tye tydens intervensiefase ($F^{1,5}$=69.341, p<0.01). Die effek van die intervensie word dus statisties bevestig. Die statistiese analise maskeer egter individuele verskille soos hierbo vermeld ten opsigte van atlete 3 en 6.

Maksimum prestasietye (swakste prestasie)

’n Herhaalde waarnemingsanalise van variansie toon ’n beduidende verskil tussen proefpersone se maksimum tye tydens basislyn en hul maksimum tye tydens intervensiefase ($F^{1,5}$ = 13.902, p<0.01). Die maksimum tye (swakste prestasie) is oorwegend tydens basislyn aangetoon met die uitsondering van proefpersoon 2 wat haar swakste tye in beide fases aangeteken het.

Minimum tye (beste prestasie)

’n Herhaalde waarnemingsanalise van variansie toon ’n beduidende verskil tussen proefpersone se minimum tye tydens basislyn en minimum tye tydens die intervensiefase ($F^{1,5}$ =38.684, p<0.01). Die proefpersone se beste 1 500 m-tye is in al die gevalle tydens die intervensiefase aangeteken.

Bogemelde resultate verkry deur middel van statistiese analise bied dus empiriese steun dat die opleidingintervensie wel suksesvol was en ’n positiewe effek op die sportprestasie van die proefpersone gehad het.

BESPREKING

Die resultate van die onderhawige ondersoek demonstreer dat ’n behandelingseffek wel by vier van die ses proefpersone waargeneem is. Die resultate bied ook steun vir die gebruik van enkelproefpersoon-navorsingsontwerpe by die evaluering van die effektiwiteit van intervensies binne die toegepaste sportsielkunde. Navorsers maak hoofsaaklik van visuele inspeksie gebruik om die navorsingsdata by dié tipe ontwerp te interpreteer (Patrick & Hrycaiko, 1998; Rogerson & Hrycaiko, 2002). In die teenswoordige ondersoek is die “*split-middle*”-tegniek asook statistiese analise gebruik om die visuele analise aan te vul. Hierdie strategie is ook deur Shambrook en Bull (1996) gevolg. Laasgenoemde navorsers beweer ook dat visuele en statistiese benaderings nie as onverenigbare, mededingende mediums beskou moet word nie, maar eerder as komplementêre tegnieke gebruik word. So ’n benadering stel die navorser daartoe in staat om die akkuraatheid van die interpretasie van die navorsingsresultate te verhoog.

Verskeie navorsers beklemtoon die belangrikheid van ekologies-geldige navorsing (Wanlin *et al*., 1997; Pates *et al*., 2002). Die waarde van die onderhawige navorsing lê dus onder andere daarin dat daar aangetoon is dat sportsielkundige intervensies wel suksesvol met die oog op kompetisie-deelname uitgevoer kan word. Weens beperkte tyd kon daar egter nie ’n opvolg-evaluering gedoen word om vas te stel of die atlete wel die aangeleerde sportsielkundige vaardighede na afloop van die navorsingsprojek gebruik het nie. Navorsers behoort hierdie aspek aan te spreek om vas te stel of die proefpersone wel die betrokke sportsielkundige tegnieke op die medium- of langtermyn in hul repertoire van vaardighede integreer en aktief bly toepas.

Die bevindinge van die huidige ondersoek doen aan die hand dat die gebruik van sportsielkundige intervensies soos ontspanningstegnieke, effektiewe selfspraak, doelwitstelling, beelding en konsentrasievaardighede, wel sportprestasie effektief binne ’n ekologies-geldige sportmilieu kan bevorder.

SUMMARY

The effect of sport psychological intervention techniques on the performance of middle-distance athletes

After a comprehensive study of sport psychology literature the following skills were identified as most prominent in mental skills training programmes: relaxation, self-talk, goal setting, imagery, and concentration training. On the basis of this information a mental skills package in the form of a work book and one-on-one sessions was developed. The work book contained information on the relevant mental skills and also included homework assignements.

This study investigated the effect of the implementation of this package on the performance of six athletes in the 1 500 m track event. A convenient sample of six subjects was used in the implementation of the programme and the evaluation of its effect. The subjects were four female and two male high-school middle-distance track athletes. They were all from the same school in Pretoria and trained by the same coach. None of the athletes had previous exposure to sport psychology. The mean age of the sample was 16 years (+- 1.23). Participation in the project was voluntary. Written consent to particiapation was obtained from the athletes as well

as from their parents. The athletes also had to undertake to refrain from consulting another sport psychologist during the seven-week project.

The mental skills traning package was developed, implemented and evaluated using a single-subject, multiple-baseline design. The dependent measure was time taken to complete the 1 500 m run in official age-group (U17 and U19) competition settings. Most of the ahtletes also competed in the 800 m at some competitions.

The mental training package was implemented on a one-one-one baisis over a five-day period. The sessions were conducted in a quiet environment at the homes of the athletes. The total process of implementing and evaluation the programme was concluded over a period of seven weeks. A total of 30 training sessions was offered over a period of 30 days.

Performance scores were plotted for each 1 500 m run and subjects' graphs were assessed for intervention-related change against mean performance change and established split-middle analysis criteria. Visual inspection of plotted values was supplemented by quantative analysis using repeated measures analysis of variance (RANOVA). The study also included procedural reliability checks to ensure that the athletes did, in fact, utilise the mental skills they received training in.

Visual analysis indicated the mental skills package to be effective in enhancing performance times (1 500 m) in the case of four of the athletes. Overall, repeated measures analysis of variance revealed significant improvement in 1 500 m performance times for subjects across phases. However, a split-middle analysis of within-subject variation indicated that a significant intervention effect was not observed in two of the six subjects.

The social validity assessment by athletes and their two coaches provided further confirmation of the overall effectiveness of the intervention. Social validation checks indicated all participants to have perceived the intervention to be successful and all were satisfied with the delivery and content of the training package.

The results support the usefulness of single-subject research designs for assessing the impact of mental training. The study demonstrated that a mental skills training package consisting of relaxation, self-talk, goal setting, imagery, and concentration skills was effective in enhancing athletic performance.

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A COMPARISON OF TALENTED SOUTH AFRICAN AND ENGLISH YOUTH RUGBY PLAYERS WITH REFERENCE TO GAME-SPECIFIC-, ANTHROPOMETRIC-, PHYSICAL AND MOTOR VARIABLES

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ABSTRACT

Research on talent identification in youth rugby is still unexploited. The aim of this study is a comparision of talented South African and English youth rugby players (18-year old) with reference to game-specific-, anthropometric- and physical and motor variables. Three groups of elite rugby players were selected from the two countries and were tested on 13 anthropometric-, six physical and motor- and eight game-specific tests. The results showed that there are no big differences as far as anthropometric variables are concerned, the English players, however, significantly demonstrated the worst results in all the physical and motor abilities while the South African players performed the best in game-specific skills due to possible better coaching.

Key words: Elite youth rugby players; 18-years-old.

INTRODUCTION

During the past ten years several studies have been done on the profile of elite youth rugby players (Spamer, 2000). Many characteristics of the talented or elite rugby player were researched at age levels that varied from 11-year olds to senior international players. The research project that was initiated in 1994 concentrated on several aspects of elite youth rugby players and the aim of this project is to look at different aspects of the profile of talented youth players. Research, already completed, concentrated on longitudinal studies of potential talented players from the age of 11-years to 17-years-old (Spamer & Hare, 2001), practical models to identify potential talented players (Pienaar & Spamer, 1998), prediction functions for different age-groups (Pretorius, 1997; Van Gent, 2003), norm scales of performance for different age groups and positions (Van der Merwe, 1997; Spamer, 2000; Spamer & Winsley, 2003b), anthropometric-, physical-, motor and game specific variables that distinguish talented players from less talented players (Spamer, 2000), and a battery of tests that can be used by coaches to identify talented players according to playing position (Van Gent, 2003). This research project on talent identification and development among youth players is now a combined project between researchers of South Africa, England and New Zealand and some of the results by these countries have already been published (Spamer & Winsley, 2003a).

Research on talent identification in youth rugby is still unexploited, partially because research in talent identification in team sport is more difficult than individual sports due to the number of variables that can play a role. After the game of rugby became professional in 1995, research in this sport is more popular (Noakes & Du Plessis, 1996). However, very few

studies to date compare the performance of elite youth rugby players of different countries.

AIM OF THE STUDY

A comparison of talented South African and English youth rugby players (18-years old) with reference to game-specific-, anthropometric- and physical and motor variables.

METHOD OF RESEARCH

Three groups of elite under 18-year old rugby players were selected: the first group consisted of the first team of the Ivybridge Sport School in South Western England (N=22) and two groups from South Africa, viz. the Craven Week teams for high schools of the Blue Bulls (N=20) and the Leopards (N=22). The elite players were tested during the peak season of 2003 (Plotz, 2004).

The battery of tests used, consists of 13 anthropometric variables (mass, length, triceps-, sub-scapular-, mid-axillary-, supraspinal-, pectoral-, abdominal-, thigh- and calf skinfold, upper arm-, ankle- and calf girth) according to the International Group on Kinanthopometry (Ross & Marfell-Jones, 1991), six physical and motor ability tests (sit- and reach test, vertical jump, zig-zag run for agility, speed and grip force, left and right) (Hattingh, 2003), and eight game-specific skills (ground skills, side steps, air and ground kicks, passing for distance, passing for accuracy over 4 metres and 7 metres, kicking and kick-off for distance) (Pienaar & Spamer, 1998). The battery of tests was executed by post-graduate students in Sport Science during the peak season of 2003.

Descriptive statistics and practical significance (d-values) was used to compare data (Cohen, 1988).

RESULTS

Anthropometric Variables

According to Table 1 the English players weighed the heaviest ($\bar{x}$ =87.84 kg) followed by the Blue Bulls ($\bar{x}$ =87.38 kg) with the Leopards weighing the least. If length is considered as a variable, the Blue Bulls are the tallest ($\bar{x}$ =185.61 cm) with the Leopards the shortest ($\bar{x}$ =179.52 cm). Regarding the rest of the anthropometrical variables, no noteworthy differences were found that could provide a typical morphological uniqueness to a specific group.

Very little can be reported according to the practical differences between the groups. The only variables between the Blue Bulls and the English players that meaningfully differ, are the pectoral skinfold (d=0.81), calf skinfold (d=1.05) and the ankle girth (d=1.48). There is practically no significant difference between the two South African teams.

If the Leopards are compared to the English elite players, practical meaningful differences are found between the pectoral skinfold (d=0.91), calf skinfold (d=1.27), ankle girth (d=1.45) as well as calf girth (d=0.95). The results showed the same tendency as those between the English players and the Blue Bulls. With regard to anthropometrical variables there are not many big differences between the profiles of these three groups.

TABLE 1. **DESCRIPTIVE STATISTICS AND PRACTICAL MEANINGFUL DIFFERENCES (D-VALUES) BETWEEN ELITE BLUE BULLS-, IVYBRIDGE- AND LEOPARDS-U/18 RUGBY PLAYERS WITH REGARD TO ANTHROPOMETRICAL VARIABLES**

Variables	**Blue Bulls (n=18)**		**Ivybridge (n=21)**		**Leopards (n=21)**		**Blue Bulls vs Ivy-bridge**	**Blue Bulls vs Leopards**	**Leopards vs Ivybridge**
	$\bar{x}$	S	$\bar{x}$	S	$\bar{x}$	S	d-value	d-valuee	d-value
Mass (kg)	87.38	14.27	87.84	11.52	84.90	11.76	0.03	0.17	0.25
Length (cm)	185.61	6.57	181.86	7.40	179.52	8.11	0.50	0.75	0.29
Triceps skinfold (mm)	10.33	4.21	13.45	4.79	14.93	5.44	0.65	0.30	0.10
Sub-scapular skinfold (mm)	12.72	5.54	15.65	7.05	12.76	5.08	0.42	0.01	0.41
Mid-axillary skinfold (mm)	10.66	6.36	13.05	8.28	9.00	5.58	0.29	0.26	0.49
Supraspinal skinfold (mm)	14.27	11.10	13.42	4.64	10.85	5.89	0.08	0.31	0.44
Pectoral skinfold (mm)	8.27	4.50	13.07	5.91	7.71	3.64	0.81	0.12	0.91
Abdominal skinfold (mm)	16.97	11.03	19.54	8.46	14.90	8.89	0.23	0.19	0.52
Thigh skinfold (mm)	14.55	6.21	17.25	7.04	13.80	5.13	0.38	0.12	0.49
Calf skinfold (mm)	9.77	5.25	15.28	5.16	8.71	4.40	1.05	0.20	1.27
Forearm girth(cm)	28.83	2.98	28.80	1.30	28.78	1.63	0.01	0.02	0.02
Ankle girth(cm)	23.82	2.28	27.20	1.26	24.98	1.53	1.48	0.51	1.45
Calf girth (cm)	38.20	3.14	40.09	3.07	36.89	3.36	0.60	0.39	0.95

$\bar{x}$ =Mean average
S=standard deviation
High practical meaningful differences: d≥0.8
Medium practical meaningful differences: d≥0.5
Low practical meaningful differences: d≥0.2

Physical and Motor Abilities

From Table 2 it appears that the English elite players did not attain the best achievement in any of the six tests. The Leopard players only achieved the best performance in one test, namely zig-zag running ($\bar{x}$ =5.96 sec.), while the Blue Bulls performed best in the remaining tests.

If we look at the practical meaningful differences between the Blue Bulls and the Leopards, the only big practical significant difference appeared in the zig-zag run (d=2.70). In contrast to the Leopards, the Blue Bulls differ practically meaningfully from the English players in five of the six variables, namely, vertical jump (d=1.16), zig-zag running (d=1.00), speed (d=0.93), grip force left (d=1.04) and grip force right (d=1.19). The Leopards' achievement differs

higher meaningfully in three tests, namely zig-zag running (d=1.64), speed (d=0.97) and grip force left (d=1.11) compared to the English players.

The deduction can be made from Table 2 that the two South African groups with regard to physical and motor abilities achieved better than their English peers, with the Blue Bulls the best achiever.

TABLE 2. **DESCRIPTIVE STATISTICS AND PRACTICAL MEANINGFUL DIFFERENCES (D-VALUES) BETWEEN ELITE BLUE BULLS-, IVYBRIDGE AND LEOPARDS -U/18 RUGBY PLAYERS WITH REGARD TO PHYSICAL AND MOTOR ABILITIES**

Variables	**Blue Bulls (n=18)**		**Ivybridge (n=21)**		**Leopards (n=21)**		**Blue Bulls vs Ivy-bridge**	**Blue Bulls vs Leopards**	**Leopards vs Ivybridge**
	$\bar{x}$	S	$\bar{x}$	S	$\bar{x}$	S	d-value	d-value	d-valuee
Sit- and reach test (cm)	13.03	3.38	6.64	17.52	13.00	4.93	0.70	0.51	0.36
Vertical jump (cm)	52.40	4.20	44.00	7.26	50.54	8.59	1.16	0.64	0.76
Zig-zag running (sec)	7.24	0.47	6.71	0.38	5.96	0.45	1.00	2.70	1.64
Speed (sec) - 45.7m	6.43	0.48	6.88	0.32	6.53	0.36	0.93	0.21	0.97
Grip force left (kg)	56.05	9.78	45.86	4.70	52.55	6.03	1.04	0.36	1.11
Grip force right (kg)	59.61	7.94	50.15	5.54	55.00	8.22	1.19	0.56	0.59

$\bar{x}$ =Mean average
S=Standard deviation
High practical meaningful differences: d≥0.8
Medium practical meaningful differences: d≥0.5
Low practical meaningful differences: d≥0.2

Game Specific Skills

The results in Table 3 show that the English players only achieved the best results in two of the eight tests, namely side steps ($\bar{x}$ =78%) and air and ground kicks ($\bar{x}$ =73.3%). The Leopards only achieved the best in one test, namely ground skills ($\bar{x}$ =3.28 sec) while the Blue Bulls achieved the best in the remaining five tests. If one looks at the practical meaningfulness in achievement among the three groups, one finds that significant differences occur between the Leopards and Blue Bulls in two tests (side steps: d=1.57 and passing for accuracy: d=0.82). The Blue Bulls achieved meaningfully better than the English in five tests, namely basic skills (d=1.13) passing for distance (d=2.23), kicking for distance (d=2.16), kicking off for distance (d=1.27) and passing for accuracy (d=0.99). Meaningful differences in achievement between the Leopards and the English was found in six variables, with the English best in two tests (side steps: d=2.24 air and ground kicks: d=1.61), and the Leopards meaningfully the best in ground skills, passing for distance, kick for distance and kick-off distance.

Results on game-specific skills proved that the Blue Bulls showed the best results. The only variables that indicated they are not the best, are side-steps, air and ground kicks and passing for accuracy.

TABLE 3. **DESCRIPTIVE STATISTICS AND PRACTICAL MEANINGFUL DIFFERENCES (D-VALUES) BETWEEN ELITE BLUE BULLS-, IVYBRIDGE- AND LEOPARDS-U/18 RUGBY PLAYERS WITH REGARD TO GAME-SPECIFIC SKILLS CHARACTERISTICS**

Variabless	**Blue Bulls (n=18)**		**Ivybridge (n=21)**		**Leopards (n=21)**		**Blue Bulls vs Ivy-bridge**	**Blue Bulls vs Leopards**	**Leopards vs Ivybridge**
	$\bar{x}$	S	$\bar{x}$	S	$\bar{x}$	S	d-valuee	d-value	d-value
Ground skills (sec)	3.43	0.29	3.79	0.31	3.28	0.20	1.13	0.52	1.61
Side steps (%)	71.4	0.86	78.0	0.67	56.1	0.97	0.76	1.57	2.24
Air and ground kick (%)	65.0	1.22	73.3	0.81	57.1	1.00	0.68	0.64	1.61
Passing for accuracy (m)	28.41	3.34	19.66	3.88	25.50	3.97	2.23	0.73	1.47
Passing for accuracy – 4m (n)	6.29	1.92	4.37	1.78	4.47	2.22	0.99	0.82	0.05
Passing for accuracy – 7m (n)	24.50	3.91	23.31	3.85	24.85	3.21	0.31	0.09	0.40
Kick for distance (m)	47.73	6.63	33.16	6.69	47.22	4.13	2.16	0.08	2.10
Kick-off for distance (m)	48.42	11.3	34.03	8.25	47.15	7.19	1.27	0.11	1.59

$\bar{x}$ =Mean average
S=Standard deviation
High practical meaningful differences: d≥0.8
Medium practical meaningful differences: d≥0.5
Low practical meaningful differences: d≥0.2

CONCLUSIONS AND RECOMMENDATIONS

The speed and agility of elite rugby players can be influenced by excess fat body mass carried by players (Nicholas, 1997). Although the fat percentages of the three groups are not indicated, the values of skinfolds and body mass can give an indication that this component had an effect on the English players' poor score in speed. A further conclusion can be made that there are no big differences as far as the body compositions of South African and English players are concerned.

Hare (1997) is of the opinion that big and strong rugby players could possibly achieve better with regard to physical and motor abilities. The fact that the Blue Bulls, after the English, were the heaviest and also the tallest confirms Hare's statement because the Blue Bulls achieved the best in five of the six physical and motor tests. Nicholas (1997) declares that players having a bigger muscle mass show better strength, which can be to the advantage of rugby skills, as was also found in the Blue Bulls' kicking distance compared to that of the

English players. The results of the physical and motor ability tests clearly showed that the English players performed the worst, compared to the South African groups. The Blue Bulls showed the best results.

The poor suppleness of the English players could also have contributed to their weak score in speed according to Nicholas (1997). Carlson *et al*. (1994) found that bigger values in vertical jumps also resulted in better movement speed. This declares why the Blue Bulls show the best speed value, as well as the best vertical jump score in contrast to the English players' scores in these two tests. Overall, the South African teams, performed better. The possibility exists that this may be due to better coaching where coaches give more attention to basic skills. An interesting fact is that the Blue Bulls were the winners of the 2003 Craven Week Rugby Tournament, and the Leopards finished 14th.

It can be concluded from the results of the three groups regarding anthropometrical variables that they do not indicate big differences, and showed a similar pattern. The English players need to improve on their performance in physical and motor abilities, especially their suppleness, explosive strength of the upper legs and grip force. The difference in game-specific skills is not the result of the difference in body composition, but possibly occurred as a result of exposure to rugby skills programmes, practice facilities and exposure to rugby training and physical conditioning. Ericsson and Charness (1995) are of the opinion that success in sport is primarily determined by exercise. If the results of this study are compared to other research as referred to in the Introduction, the conclusion can be made that the English and Leopard players were less exposed to specialist rugby coaching, but it does not mean that they do not have the talent to perform.

It can be stated that comparative research results, among the different rugby playing countries at youth rugby level, are lacking. This study was a first of this kind and helped researchers in this field to compile a profile of the elite 18-year old rugby player. It also contributed to set test norms (average scores) that can be used by coaches at school level to identify potential talented players.

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A SUSTAINABLE MARKETING STRATEGY FOR DUTCH TOURISTS TO SOUTH AFRICA

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ABSTRACT

In 2003, 120 933 Dutch tourists visited South Africa, which was an increase of 14.1% on 2002 arrivals. However in 2004 it dropped to a mere 0.24% growth. The Dutch market is regarded as a priority market because of cultural and historical links, but it is also a market that has not been properly analysed (segmented). By doing the latter it would become easier to apply the right marketing mix, which could translate into a more sustainable growth rate. In order to maintain a steady growth rate in tourism, South Africa needs to improve its marketing strategies. This research argues that it is important to establish a sustainable marketing strategy, which is based on proper market segmentation. A marketing strategy should not be a one-year campaign but rather a strategy that can lead to a steady growth rate. A survey was conducted in the Netherlands on Dutch citizens (N=325) travelling by train from Groningen in the North to Breda in the South and from this a sustainable marketing strategy which is based on three market segments has been developed.

Key words: Market; Tourists; The Netherlands (Dutch); Destination marketing, Marketing strategy; Sustainability; Market segmentation.

INTRODUCTION

According to the World Travel and Tourism Council - WTTC (1999), tourism is currently the world's largest generator of work opportunities. This is supported by the fact that there was a remarkable increase in international tourist arrivals from 25 million in 1950 to 694 million in 2002, an average annual growth rate of 7% (SAT, 2003). By the year 2020 international arrivals are predicted to reach 1.18 billion, representing an average annual growth rate of 4.1%. Long-haul travel is predicted to grow even faster (WTO, 2001).

According to Saayman (2000) and Faulkner *et al*. (2003), tourism can be defined as the total experience that originates from the interaction between tourists, job providers, government systems and communities in the process of attracting, interacting with, transporting and accommodating tourists. If one looks at travel to South Africa, as many as 6.5 million foreign tourists visited South Africa in 2003 (SAT, 2003). The main markets to South Africa in 2003 (excluding tourists from Africa) were: UK (456 468 foreign arrivals), Germany (257 018), USA (187 447), France (127 760), and the Netherlands with 120 933 (SAT, 2003). Since 1993, the Netherlands has been a strong contributor of travel to South Africa and as many as 59 tour operators in the Netherlands were offering tour packages to South Africa (SAT, 2002). The Netherlands is situated on the western part of the European continent and shares borders to the south with Belgium and to the east with Germany, while the North Sea lies to the north and west. The Netherlands is divided into twelve regions namely Drenthe, Flevoland,

Friesland, Gelderland, Groningen, Limburg, Noord-Brabant, Overijssel, Utrecht, Zeeland, Noord-Holland and Zuid-Holland (Anon., 2001).

If one looks at the arrival figures of Dutch tourists to South Africa then it becomes clear why a sustainable strategy is advised. In 2003 a 14.1% growth rate was achieved compared to 2002. However, in 2004 a growth rate of only 0.24% was achieved (SSA, 2002; SAT, 2003; Thomson, 2005). Figure 1 shows how the current growth rate is fluctuating. Uys (2003) indicated that a sustainable growth rate should be between 3-5% per year.

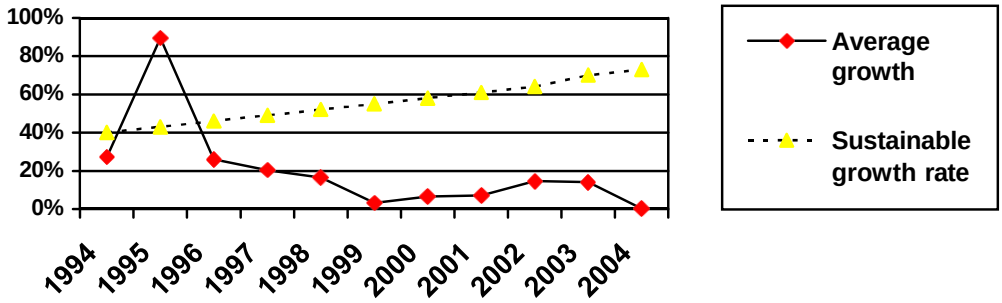

FIGURE 1. **AVERAGE GROWTH RATE OF DUTCH TOURISTS TO SOUTH AFRICA** (SAT, 2001, 2002, 2003; SSA, 2002; Thomson, 2005)

Since only 0.64% of the Dutch population of 15 million visited South Africa before, one can assume that South Africa as a destination (product) is still in a growth phase (CBS, 2002). This finding plays an important role in arguing for a sustainable marketing strategy.

It is also important to understand the travelling behaviour of the Dutch tourist market to be able to develop a marketing strategy. The reason for this is because in the past the South African Tourism Board (Satour), now called South African Tourism (SAT), used previous years' arrival figures to select target markets (Saayman & Saayman, 2001). The implication was a mass marketing approach where a single offering was made to the whole market (Randall, 2001). This approach, which is considered by Lamb *et al*. (2002) as not sustainable was followed for all major markets. Based on the latter, marketing allocations (budgets) were made to each of the international offices annually, but no clear marketing priorities in terms of promotional efforts have been set, causing the marketing spend to be allocated on an ad-hoc basis (Saayman & Saayman, 2001). A comparative study by the World Tourism Organisation (WTO) found that this situation was not unique to South Africa. Other destinations also had no clear correlation between marketing spend and tourism arrivals or promotional budget spend and tourism income (Campbell, 1993; Slabbert, 2002). Other methods that can be used to select target markets are: to determine the expenditure of the market; the economic impact of the expenditure; and lastly, to do a market analysis in the source market (Saayman, 2001).

According to Van der Tuuk (2002), a market analysis in the source market is the best method even though it is expensive. The reason is that this method helps to observe current feelings and perception of the destination. Another advantage of this method is that one will also be able to determine the reasons why Dutch tourists do not travel to South Africa. The latter point is very important for a proper marketing strategy.

PROBLEM STATEMENT

Billions of dollars are spent each year on tourism marketing all over the globe. The magnitude of these expenditures necessitates researchers to help guide tourism marketing decisions (Spotts, 1997). Perdue (1996) states that target market selection and the allocation of promotional efforts across alternative markets are key strategic concerns of a destination marketing organisation. South Africa has increased its tourism marketing budget significantly (463%) since 1994 from R80 million to more than R450 million in 2004. As a result of limited promotional resources, increasing costs and increasing accountability demands, tourism marketers must allocate promotional efforts across alternative markets to achieve two goals: (i) maintaining important existing markets, and (ii) penetrating markets with high incremental sales potential.

South Africa needs to improve its tourism marketing strategy by developing a sustainable marketing strategy (Saayman, 2001; Uys, 2003). Sustainability is a concept that can be used to describe various situations and it must be understood in the context that it is used. The World Tourism Organisation (WTO, 1995) described it as follows: "Sustainable tourism development meets the needs of present tourists and host regions while protecting and enhancing opportunities for the future. It is envisaged as leading to management of all resources in such a way that economic, social, and aesthetic needs can be fulfilled while maintaining cultural integrity, essential ecological processes, biological diversity, and life support systems". Therefore the three main principles of sustainable tourism development are:

- ecological sustainability ensures that development is compatible with the maintenance of essential ecological processes, biological diversity and biological resources;
- social and cultural sustainability ensures that development increases people's control of their lives, is compatible with the culture and values of people affected by it, and maintains and strengthens community identity;
- economic sustainability ensures that development is economically efficient and that resources are managed so that they can support future generations (McNeely *et al.,* 1992; Saayman & Myburgh, 2002).

This research however focused on economic sustainability, which ensures that marketing is economically efficient, effective and that resources are managed to ensure future growth (McNeely *et al*., 1992; McCool *et al.,* 2001; Peter, 2005). Therefore, a sustainable marketing strategy is a strategy where a steady growth rate is maintained, market segments are identified and a marketing mix is developed for each specific segment (McDonald & Dunbar, 1995; Middleton & Hawkins, 1998; Uys, 2003; Hooley, 2004). It therefore differs from mass marketing because it is more focused. To this effect Poon (1993) argues that mass marketing is no option to promote destinations due to an increase in the number of competitors as well as a decline in the availability of resources.

The purpose of market segmentation is to identify homogeneous groups of people with similar characteristics from among the heterogeneous population of tourists. Effective market segmentation can lead to an increase in tourist numbers and better use and management of scarce resources (Middleton, 2001). The marketing mix has been described as product, distribution, promotion and pricing strategies intended to bring about mutually satisfying exchange relationships with target markets (Russell & Lane, 1999; Lamb *et al*., 2002), providing or developing a product or a service and its associated marketing programme to fit a

place in the tourist's mind (Green *et al*., 1988; Bowie, 2004). After the marketing mix is in place a marketing strategy should be developed.

A marketing strategy is primarily responsible for future sales revenue generation by specifying the segments, products and associated action programmes required to achieve sales and market share against competitors and to deliver customer satisfaction (Piercy, 1992; Middleton, 2001; Hooley, 2004). Walker *et al.* (1992), Saayman (2001) and Howie (2003) suggested that the most effective destination marketing strategy is a differentiated strategy. This strategy entails that a destination identifies more than one viable target market segment and prepares marketing mixes for each segment.

In research done by Saayman and Saayman (2001) the researchers stated that South African Tourism needs to strategise and repackage products and be more innovative and creative in terms of promotional efforts to continue attracting tourists from these primary markets, which includes UK, Germany, USA, France and the Netherlands, which provide high economic returns. Therefore, South Africa's marketing strategies must continuously strive to improve upon the currently successful solution to the market's needs. The aim of this study is therefore to determine what a sustainable marketing strategy for Dutch tourists to South Africa entails.

In order to achieve the above mentioned aim, the paper has been organised in the following sections. In section 3 of this article, the method of research is explained. Section 4 discusses the results of the research. Section 5 discusses the implementation of a sustainable marketing strategy and in section 6 certain conclusions and recommendations are made.

METHOD OF RESEARCH

The research followed a two-pronged approach, namely a literature study of the most recent and relevant publications and a survey by means of a questionnaire. The results of the literature review were cited above.

Measuring instrument

Based on a qualitative content analysis a questionnaire was developed. The questionnaire was in Dutch for the reason that not every Dutch citizen understands English very well, especially the elderly. The questionnaire was designed to derive the socio-demographic-, economic-, psychographic- and geographic aspects of current and potential Dutch tourists by making use of a 4 point Likert scale, open questions and multiple-choice questions with multiple answers. From these results different markets would be identified and strategies formulated.

Sampling and Sampling description

The survey was conducted in the Netherlands during March 2003. Four hundred questionnaires were distributed during different days of the week on different train routes from Groningen in the North to Breda in the South, of which 81% (N=325) of the questionnaires were useful. According to Steyn *et al*. (1998) a convenience sample of 400 from a big population will yield results within 5% of accuracy, which is statistically acceptable. The reason for 400 questionnaires was mainly because of a financial limitation.

The survey was conducted on a train route for the following reasons:

- people had time and they were willing to complete the questionnaire;
- most age groups were represented, and
- tourists from 11 of the 12 regions were present on the train.

The regions that were represented were Friesland 29% (N=94), North Brabant 18% (N=59), Gelderland 11% (N=36), North-Holland 9% (N=29), Overijssel 9% (N=29), Groningen 8% (N=26), Utrecht 5% (N=16), South-Holland 5% (N=16), Drenthe 3% (N=10), Limburg 2% (N=7) and Flevoland 1% (N=3).

Data-analysis

The Statistical Services of the North-West University processed the data by using the SAS System for Windows Release 9.1. Effect-sizes were used to measure the practical significance and validity of the research results (Steyn, 1999; 2000).

RESULTS AND DISCUSSION

The results indicated that only 8% (N=26) of the study population had visited South Africa before and 92% (N=299) have not visited South Africa. The latter is the market that is currently not targeted properly and the proposed strategy will also address this potential market. This finding supports the literature review (CBS, 2002) indicating that this market has growth potential. The greatest ***similarities*** of **Dutch people that have visited South Africa** and those that **have not visited South Africa** are that they read the same newspapers (*Volkskrant*, *Algemeen Dagblad*) and magazines (*ANWB KAMPIOEN*, *National Geographic*, *Allerhande*, *VIVA*, *WT Wonen*), they use email daily, watch news, current affairs and documentary programmes. Thus the results confirm that decision-making to visit a specific destination is influenced by tour operators, internet and magazine advertisements (see Table 1).

The most significanct ***differences*** between the two groups are as follows:

Dutch people that have not visited South Africa can be categorised into two potential segments, namely: students between the age of 20-24 years or an older group of 35-49 years. These tourists indicated that financial considerations followed by perception of crime and safety kept them from coming to South Africa. It is therefore important to take the cost of packages into consideration. These tourists would like to visit the Western Cape, which could be used as a draw card in getting them to South Africa. **Dutch people that have visited South Africa** are mainly between the age of 25-34 years. These tourists have a positive image of the country and specifically the natural and scenic beauty. Ninety six percent of their expectations were met, which is important from a marketing point of view, for they would most probably sell the country by word of mouth. This is supported by the fact that 22% indicated that they have been to South Africa more than four times. Therefore based on the above, three target markets were identified, of which two potential markets have not travelled to South Africa before.

TABLE 1. **A COMPARISON BETWEEN DUTCH CITIZENS THAT HAVE VISITED SOUTH AFRICA AND THOSE WHO HAVE NOT VISITED SOUTH AFRICA (N=325)**

	92% (N=299) Have not visited South Africa	8% (N=26) Have visited South Africa
Age	20-24 years (27%) 35-49 years (24%)	25-34 years (32%)
Marital status	Unmarried (51%)	Married (40%)
Occupation	Students (32%)	Sales personnel (16%)
Gross annual income	26 681.21€	43 892.06€
Favourite radio stations	Radio 538 (45%), Sky radio (31%) Radio 3 FM (28%)	Sky radio (32%), Radio 538 / Radio 3 FM (28%)
Where did they hear of South Africa		Friends and family (86%), magazines (55%), television (50%)
Reasons for visiting South Africa		Scenic beauty (87%) holiday/ leisure (83%) game/wildlife (78%), climate (71%)
Number of times visited South Africa		one time (70%) more than 4 times (22%)
Satisfaction of expectation		96%-expectations were met
Image of South Africa		Nature and wildlife (25%) South Africa is a world in one country (15%) Kruger National Park (15%)
Average spending in South Africa (excluding air tickets)		R13 535.71
Reasons for not visiting South Africa	Finances or costs (75%), crime or safety (45%) lack of knowledge (31%)	
What would they like to see in South Africa	Cape Province (24%) travel through the destination (12%) nature reserves (11%)	

The **effect size** determined the practical significance between the different age groups, which not only makes the difference independent of units and sample size, but relates it also with the spread of the data according to Steyn (1999) and Steyn (2000). The practical significance of the three age groups were measured by using the following factors: marital status, occupation, gross annual income, influences of decisions to visit a specific destination, size of international travelling group, average length of stay, reasons for visiting South Africa and reasons for not visiting South Africa. Only those that have a small-large effect size were indicated in Table 1 and 2. The other factors that were not indicated had no effect. Cohen (1988) gives the following guidelines for the interpretation of the effect size in the current case:

(a) small effect: d=0.2, (b) medium effect: d=0.5 and (c) large effect: d=0.8.

The factors that were measured for practical significance and indicated a medium to large effect size are indicated in Table 2. According to Table 2 the socio-demographic aspects for the different age groups that have practical significance are marital status, occupation and coupled to this, income. Hence the marketing strategy should take into consideration that the 20-24 years are primarily unmarried. The 25-34 years are 40% married and the 35-49 years are mostly married. An analysis of occupation showed that the 20-24 years are mostly students whilst the 35-49 years of age category are mostly managers and professionals. The reasons for travelling revealed that the younger market prefers to travel in Europe because it is cheaper and the travelling distances are shorter. If one looks at the reasons why 25-34 year old tourists visited South Africa, scenic beauty remains the major draw card. Again this research support findings that most tourists from other countries travelling to South Africa visit the latter for its scenic beauty (Saayman & Saayman, 2001; SAT, 2003; Uys, 2003).

TABLE 2. **EFFECT SIZES OF THE AGE GROUPS 20-24 YEARS (N=84), 25-34 YEARS (N=65) AND 35-49 YEARS (N=78)**

	Effect size
Marital status	0.71 **
Occupation	0.88 **
Reasons for visiting South Africa	
- Climate	0.53 *
- Scenic beauty	0.77**
- Culture	0.54 *
- Cheap destination	0.49 *
Reasons for not visiting South Africa	
- Children too young to travel	0.47 *
- Income (See calculations below)	

** Large effect: Practical significant

* Medium effect: Might be an indication of a practical significant effect

The effect size of the average income of the three age groups were determined by using the standardised difference between the means of two populations, i.e. the difference between the two means divided by the estimate for standard deviation. The following formulae were used:

$$d = \frac{\left|\bar{x}_i - \bar{x}_j\right|}{\sqrt{MSE}}$$

d = effect size
MSE = the mean square error of analysis of variance which is 14493.87 (Root MSE)
Xi-Xj= is the difference between Xi-Xj without taking the sign into consideration.

The data that were used to determine the effect size of income are indicated in Table 3.

TABLE 3. **INCOME (N=162)**

Age group	**Mean**
20-24 years	11329.20€
25-34 years	28389.47€
35-49 years	39907.46€

Difference between the age group 20-24 years and 25-34 years:

$$\frac{(11329.20 - 28389.47)}{14493.87}$$

= 1.17 large effect size

Difference between the age group 25-34 years and 35-49 years:

$$\frac{(28389.47 - 39907.46)}{14493.87}$$

= 0.79 large effect size

Difference between the age group 20-24 years and 35-49 years:

$$\frac{(11329.20 - 39907.46)}{14493.87}$$

=1.97 large effect size

The income of the three different income groups differ, with the largest effect size difference between the age group of 20-24 years and 35-49 year old Dutch citizens which indicates that the larger the effect size the more significant is the difference. As one would expect that a higher age group should result in higher income. This translates into presenting different product offerings for different markets because of different needs (McDonald & Dunbar, 1995; Middleton & Hawkins, 1998; Hooley, 2004). Added to this is length of stay and being able to afford more luxuries and comfort. These three age groups (segments) formed the bases for the development of a sustainable marketing strategy.

IMPLEMENTATION OF A SUSTAINABLE MARKETING STRATEGY

A sustainable marketing strategy for the Dutch tourist market to South Africa was made up by using the following (a) type of strategy, (b) market segments and (c) marketing mix for the following three segments: 20-24 years, 25-34 years and 35-49 years (Uys, 2003).

a) Type of strategy
   A differentiated strategy will be followed which implies that more than one viable target market segment is identified and marketing mixes for each segment are prepared.

b) Market segments
A cluster analysis was used to identify the segments (tourists were grouped together with similar profiles on the measured bases), and from this three segments were identified.

c) Marketing mix
The marketing mix according to Kotler and Armstrong (2001) indicated that the former consists of the product, price, place and promotion. The marketing mix for the Dutch market is as follows:

Product: Dutch citizens, depending on their age, will visit places with a lot of entertainment, scenic beauty, wildlife or historical attractions. The Dutch citizens that have visited South Africa indicated that the reasons for visiting the country were scenic beauty, holiday/leisure, game/wildlife and climate. Key attributes that could be used to distinguish the segments are occupation, income and marital status. Hence, one product that fits all is clearly not the way to go. The latter is the current approach by SA Tourism. The Western Cape Province and specifically Cape Town could be used as a draw card to attract especially the 20-24 and 35-49 year old tourists to South Africa. The 20-24 year old tourists also require a variety of entertainment.

Price: The Dutch market and specifically the 20-24 year old tourists are price sensitive, and therefore affordable tour packages should be offered to this market. These packages should be competitive with packages offered in other parts of Europe as well as Australia. Backpacking tours for students (20-24 years) and more exclusive tours for higher income groups (25-34 and 35-49 years of age) can be offered.

Place: The Dutch tourist market can be reached by increasing the number of tour operators and travel agents who offer and sell tour packages to South Africa (60% of Dutch citizens make use of organised travel). According to SAT (2002), currently only 59 tour operators in the Netherlands offer touring packages to South Africa. South African Tourism can increase the number of tour operators and travel agents by offering familiarisation tours that would include the media.

Promotion: Based on the results all three market segments can be reached by the same promotion mix, which include:

- Documentaries of South Africa.
- Advertisements on Radio 538, Sky Radio and Radio 3 FM.
- Advertisements in travel magazines such as *ANWB Kampioen* and *National Geographic*, in the food and wine magazine, *Allerhande*, or the Lifestyle magazines: *VIVA* and *WT Wonen*. National Newspapers *Volkskrant* and *Algemeen Dagblad* are also very popular. The usage of emails should also be considered. The overriding promotional message should be based on the country's scenic beauty and wildlife as well as to give assurance on tourist safety. For this purpose satisfied tourists who have been to South Africa more than once could be used to sell the destination.

Plog's model (1976) was used to personify the target groups, so that dry statistics mentioned above are transposed into a "living" profile to which economists and marketers can respond more easily. This method was successfully applied by Botha (1998) and Saayman and Slabbert (2004). In applying Plog's model "a 20-24 year old Dutch citizen" is personified as Jos Bosma. A 25-34 year old Dutch citizen as Peter Bergmans and 35-49 year old Dutch citizen as Anne Beemer. The following descriptions of Jos Bosma, Peter Bergmans and Anne

Beemer are based on the information obtained from the survey and the CBS (2002) report of tourism and recreation.

Jos Bosma is a 22 year old male who is an unmarried student. Jos earns 11 329€ per year and therefore likes to go on affordable tours normally doing back-packing. Jos undertakes one long holiday for two weeks per year and travels with two or three friends. He normally spends 59€ per day. He has not visited South Africa but normally likes to travel in Europe, visit places like Turkey, and also prefers visiting cities with a variety of entertainment.

Peter Bergmans is a 30 year old male who is a married to Yvonne. Peter is a salesman who earns 43 892€ per year and undertakes one long (two weeks) and one shorter (one week) holiday per year with his wife. He normally spends 51-70€ per day. He has visited South Africa but travels more often to France and Spain. Peter likes to see most of the countryside but also likes to visit big cities. He likes to visit places of scenic beauty and wildlife and to stay in his own holiday house or tent.

Anne Beemer is a 42 year old female who is a married to Emiel. Anne is a non-profit worker who earns 37 806€ per year and likes to go on exclusive tours with her husband and daughter. Anne also prefers one long holiday for two weeks and a shorter stay of one week. She normally spends 52€ per day. She has not visited South Africa but has travelled in Europe to countries such as France and Switzerland. She likes to see the countryside and have a nature experience but also enjoys historical attractions.

Peter visited South Africa but Anne and Jos have not been to South Africa. The lack of knowledge by Anne and Jos were identified as one of the reasons for their not visiting South Africa.

CONCLUSIONS AND RECOMMENDATIONS

The main aim of the study was to develop a sustainable marketing strategy for Dutch tourists to South Africa. The strategy is based on the premise that different target markets should be identified and a marketing mix for each target market should be developed. This was achieved by means of a survey in the Netherlands and statistical analysis of the data. The strategy therefore focuses on both those that have travelled and those that have not been to South Africa. Previous strategies by SA Tourism (SAT) were based on arrival figures only, therefore ignoring the market and their reasons for not travelling to South Africa. The latter makes up 92% of the potential Dutch market. Taking the growth of the marketing budget into consideration it supports the fact that the current strategy is failing due to the fact that tourist arrivals shows a sharp decline whilst marketing spend has increased.

The contribution of this research is the successful application of a differentiated strategy to sustain marketing initiatives. It was the first time that this methodology was applied in South Africa for this market and resulted in three target markets that were identified. The reason why this strategy can be considered sustainable is because it is applicable to a greater number of potential tourists (markets) from the Netherlands. It can also assist the marketing agency (SAT) to focus its resources on promoting South Africa in the Netherlands. In order to ensure that the market is growing it becomes important to repeat this process every 3-5 years. The statistical analysis clearly indicated that the factors with the largest practical significance have

been income, occupation and marital status. Coupled to this is the reason for visiting South Africa, namely scenic beauty.

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NOTES

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FACTORS AFFECTING THE JOB SATISFACTION OF SOUTH AFRICAN SPORT COACHES

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ABSTRACT

Sport organisations today face heightened competition on a global basis resulting in their raising expectations regarding results. Sport coaches are thus experiencing increased pressures with regard to recognition for good work done, compensation and support, rapport with colleagues, and supervision that influence their job satisfaction. The aim of this study was to determine the nature and extent of job satisfaction of coaches. The sample consisted of 250 coaches to whom a validated coach satisfaction questionnaire was administered. The results suggest that coaches derive satisfaction from performing the coaching task itself, but experience dissatisfaction from the compensation, administrative work, media and community support and job security. There is thus a need to devise ways to improve the job satisfaction of coaches.

Key words: Job satisfaction; Sport coach; Performance.

INTRODUCTION

Sport organisations today face heightened competition on a global basis resulting in their raising expectations regarding results. This has an impact on the coaches who are among the primary employees (Chelladurai & Ogasawara, 2003) in sport organisations. Sport coaches, whose careers are volatile, are thus experiencing increased pressures with regard to recognition for good work done, compensation and support, rapport with colleagues, and supervision that influence their job satisfaction (Akindutire, 1993).

Researchers have diverse views of job satisfaction. Chelladurai (1999) views job satisfaction as a pleasurable affective condition resulting from one's appraisal of the way in which the experienced job situation meets one's needs, values and expectations. Arnold & Feldman (1988), on the other hand, view job satisfaction as the amount of overall positive feelings that individuals have about their job experiences. Balzer *et al.* (1990) add that job satisfaction may be described as the feelings an individual has concerning his/her job experiences in relation to previous experiences, current expectations or available alternatives. For the purposes of this study the researchers view the job satisfaction of coaches as their attitude towards the various aspects of their job as well as their job in general.

Job satisfaction is significant at three levels (Chelladurai, 1999), namely the humanitarian

level, the economic level and the theoretical level. At the humanitarian level, sport coaches are

concerned with the welfare, achievements and performances of their athletes, since there is evidence that job satisfaction is related to life satisfaction. Sport coaches are interested in job satisfaction at the economic level since increased satisfaction with the job may lead to increased enthusiasm, increased motivation and fewer work-related accidents. This supports Lu's (1985) assertion that the motivation that coaches obtain from their jobs is decisive for their job satisfaction.

There are many factors that can contribute to the job satisfaction of sport coaches. Among these factors are achievement, supervision, responsibility, the job itself, compensation, security and working conditions (Oshagbemi, 1997). Rogers *et al*. (1994) add that role conflict, lack of effective communication within the organisation and role clarity contribute to job tension which in turn leads to a decrease in job satisfaction. This may impact negatively on coach turnover, productivity and athlete/team success.

The instilling of job satisfaction is a crucial task of management, since job satisfaction creates confidence, loyalty, improved quality and increased production. Job satisfaction, however, does not result from just offering more incentives to employees. Research on job satisfaction conducted since the 1970's has revealed that job satisfaction is not a static state, but is subject to influence and modification from forces within and outside the individual (Lam, 1994).

The satisfaction of coaches is of considerable significance to the success of sport organisations (Li, 1993). This is because sport coaches are frequently in direct contact with the customers (athletes and spectators) of the sport organisation and if they are satisfied, a positive image of the sport organisation may be communicated to the customers. Furthermore, it is logical to assume that satisfied coaches would produce better athletes, thereby contributing to the success of the organisation.

PROBLEM STATEMENT

Today sport coaches demand more of their jobs and respond favourably to management activities that give them greater control of their lives (Ivancevich, 1998). Previous studies on the job of coaches by Li (1993), Chelladurai & Ogasawara (2003), Surujlal (2004) and Surujlal *et al*. (2004) indicate that sport coaches experience, on average, moderate levels of job satisfaction. This has become problematic in sport organisations in South Africa (SA) where the recognition and acceptance of the importance of sport coaching in the past was based on the notion of developing healthy participants (Singh & Moodley, 2001). However, South Africa's re-entry into the international sporting arena has resulted in an increased interest and growth of sport creating the need for more coaches (Singh & Moodley, 2001). Although research on job satisfaction dates back to 1935, relevant research data since have demonstrated the importance of job satisfaction to an organisation in terms of its efficiency, productivity, employee relations, absenteeism and turnover (Koustelios, 2001). Coach turnover in SA is high (Surujlal, 2004). Previous research by Meyer and Allen (1997) indicated that job satisfaction is negatively correlated with turnover. Therefore the need has arisen in sport organisations in SA to study the job satisfaction of sport coaches scientifically.

AIM OF THE STUDY

The aim of the study was to determine the nature of job satisfaction and to assess the extent to which sport coaches were satisfied with their jobs.

METHODOLOGY

Participants

The sample in this study comprised sports coaches who coached at regional, provincial and national level in SA. In the context of this study the sport coach is regarded as the individual who possesses a body of knowledge in a particular sport and derives his/her main income by imparting this knowledge. For purposes of this study the following team sports which employed both male and female coaches were selected – soccer, rugby, cricket and hockey. It is in these sports that the highest number of coaches in SA functions (Surujlal, 2004).

Of the 179 coaches that responded, 63% were male and 37% were female. The difference in the number of male and female respondents can be attributed to the fact that there are more male professional sports coaches than female coaches in sport federations in South Africa (Surujlal, 2004). Twelve percent of the coaches were in the 18-25 year age group, 48% in the 26-35 year age group, 28% in the 36-45 year age group and 12% older than 45 years of age. With regard to coaching experience, 25% had less than five years experience, 43% between five and nine years experience and 32% more than 10 years experience. The coaching experience ranged from one year to 33 years with a mean of 8.18 years and a standard deviation of 6.00. Of the coaches that responded, 40% coached soccer, 22% coached rugby, 24% coached cricket and 17% coached hockey. Three percent of the coaches coached more than one code of sport.

Instrument

In addition to a review of secondary data which comprised an appropriate literature study concerning job satisfaction, a validated 41-item coach satisfaction questionnaire (CSQ) that was used in previous research of this nature in the United States (Chelladurai & Ogasawara, 2003) was used to measure the job satisfaction of coaches in South Africa. The items in the questionnaire were scored on a 9-point Likert type scale ranging from 1 (very dissatisfied) to 9 (very satisfied). The questionnaire was mailed to 250 coaches in SA. The response rate for the questionnaires was 72% (n=179). The returned questionnaires were subjected to editing and coding for input into the statistical programme for the social sciences (SPSS-version 12).

Results and discussion

Exploratory factor analysis was conducted on the items. The factor analysis matrix was rotated orthogonally using varimax with Kaiser normalisation. The eigenvalue criterion with a cut-off of 1 was used since it is most reliable when the number of variables is between 20 and 50 (Hair *et al*., 1998). In addition, the number of factors to be extracted was also established by sketching a scree plot. On examining the scree plot it was established that the scree levelled off after nine factors, indicating that further extraction of factors does not enable any meaningful interpretation of data. Thus, a total of nine first order factors were interpreted. Of these factors there were four major underlying dimensions and the balance were unique on the

first order. For reporting purposes the major underlying dimensions were used since the remaining dimensions had fewer than four items each. The Cronbach-alpha reliability coefficients for the major dimensions are illustrated in Table 1.

TABLE 1. **CRONBACH ALPHA RELIABILITIES OF THE MAJOR DIMENSIONS PER NUMBER OF ITEMS**

Factor	Cronbach Alpha	Number of items
The job itself	0.910	13
Supervision	0.877	5
Compensation and support	0.837	7
Administration and colleagues	0.848	7

According to Nunnally (1978), the recommended coefficient alpha to conclude that the proposed dimensions are reliable is 0.7. Therefore the dimensions in Table 1 are deemed reliable as the lowest Cronbach alpha value is 0.837. The majority of the respondents responded in the 5-9 category, resulting in a high positive skewness and kurtosis (2 & 7). Thus to form a more normal distribution the category 1-4 needed to be collapsed, resulting in a 6 point Likert-type scale.

DIMENSIONS OF SATISFACTION

In the tables that follow, the scales from 1–6 reflect the extent of job satisfaction experienced from very dissatisfied to very satisfied.

The job itself

With reference to Table 2, most coaches expressed moderate to high levels of satisfaction - the mean exceeding 3.5 on a six-point scale. The lowest levels of satisfaction – a mean of below 4 – were expressed with regard to the scheduling of facilities, ie. the way facilities are made available to coaches for coaching sessions (item 30, $\bar{x}$ =3.61) and the degree to which team members shared the same goals (item 23, $\bar{x}$ =3.83). It appears that facilities are not always available to coaches when needed. It is a fact that during the apartheid era sport in SA was governed under a dichotomous system (Surujlal, 2004) consisting of a white, establishment side and a black under-resourced side. The establishment side had sporting links with the apartheid government and had access to modern sporting facilities and sophisticated training methods while the non- establishment side had to be content with make-shift facilities and virtually no training opportunities (Goslin, 1996). With restrictions being lifted on sport since the 1994 National Government elections, a backlog of facilities and services was expressed. This is perhaps the reason for the low satisfaction with regard to facilities. The labour laws in SA stipulate that organisations should be fully representative of the population of SA. As a result, individuals from diverse backgrounds are required to work with each other and they may not necessarily share the same views. This may perhaps be the reason for the low level of satisfaction with regard to item 23 (the degree to which members share the same goals), as there has been anything but a history of cooperative and collaborative functioning in SA sport.

TABLE 2. **ITEMS, MEANS AND FREQUENCIES (PERCENTAGES (N)) WITH REGARD TO THE JOB ITSELF**

Item	Item description	mean	1	2	3	4	5	6
2	Being able to keep busy all the time	4.08	2.8(5)	8.4(15)	16.3(29)	32.0(57)	30.9(55)	9.6(17)
5	The pride I get from coaching	4.85	2.2(4)	2.8(5)	6.2(11)	19.1(34)	36.5(65)	33.1(59)
6	The chance to work independ-ently of others	4.17	3.4(6)	1.7(3)	11.2(20)	29.1(52)	35.2(63)	19.6(35)
10	The chance to do things that don't harm other people	4.13	4.0(7)	7.3(13)	13.6(24)	36.7(65)	26.6(47)	11.9(21)
16	Being active most of the time	4.15	6.1(11)	6.1(11)	14.5(26)	31.3(56)	24.0(43)	17.9(32)
18	The enjoyment I get out of coaching	4.89	3.9(7)	1.7(3)	3.9(7)	18.4(33)	37.4(67)	34.6(62)
23	The degree to which my team members share the same goal	3.83	7.3(13)	7.8(14)	17.3(31)	36.9(66)	26.8(48)	3.9(7)
29	The feeling of accomplish-ment I get from coaching	4.65	2.8(5)	2.2(4)	12.8(23)	23.5(42)	30.2(54)	28.5(51)
30	The scheduling of facilities for my team	3.61	11.7(21)	10.6(19)	17.9(32)	33.0(59)	21.8(39)	5.0(9)
32	The freedom to use my own judgment in coaching	4.39	2.2(4)	3.9(7)	11.7(21)	34.6(62)	27.9(50)	19.6(35)
37	The meaningful-ness of the job I do	4.51	2.8(5)	2.8(5)	11.9(21)	28.4(50)	31.8(56)	22.2(39)
38	The chance to try my own methods in coaching	4.40	3.4(6)	2.2(4)	14.0(25)	30.2(54)	29.6(53)	20.7(37)
41	The significance of the job I do	4.72	1.7(3)	2.8(5)	8.9(16)	25.7(46)	32.4(58)	28.5(51)

On the other end of the scale, coaches indicated that the greatest satisfaction that they achieved were from the pride that they derived from coaching (item 5, $\bar{x}$ =4.85), the enjoyment that coaching provided them (item18, $\bar{x}$ =4.89), the feeling of accomplishment that they derived from coaching (item 29, $\bar{x}$ =4.65) and appreciation of the significance of the job they did (item 41, $\bar{x}$ =4.72). These intrinsic variables were highly rated by the coaches. This implies that coaches derived most satisfaction from situations that they had most control over. These variables are explained by Herzberg's theory (1966) that suggests that job content-related factors like achievement and responsibility contribute to satisfaction. The implications of Herzberg's theory (1966) are that individuals need to be maintained in a relatively cozy environment in terms of safety, security and status, and be developed through achievement, recognition and advancement (Watt, 1998). Furthermore, empirical studies of job satisfaction (Locke, 1976; Lam, 1994) indicate that conditions that provide interesting work, reasonable workload and compensation, and minimises role conflict lead to job satisfaction. Furthermore, there is evidence that job content-related factors like responsibility and accomplishment enhances intrinsic satisfaction whereas extrinsic factors such as remuneration may lead to higher performance levels which lead to a feeling of accomplishment resulting in higher job satisfaction. The satisfaction that coaches experienced could also be due to the prominence that sport is beginning to gain in SA, the increase in sponsorship and funding that sport is attracting (Surujlal, 2004); and the increased opportunities that South African athletes are offered to compete internationally. These factors appear to work together in contributing to the feeling of coaches' satisfaction with their jobs.

Compensation and support

TABLE 3. **ITEMS, MEANS AND FREQUENCIES (PERCENTAGES (N)) WITH REGARD TO COMPENSATION AND SUPPORT**

Item	Item description	m	1	2	3	4	5	6
8	The media's coverage of my team	2.55	40.8(73)	17.9(32)	10.1(18)	13.4(24)	12.8(23)	5.0(9)
9	My pay compared to the amount of work I do	2.53	38.8(69)	16.3(29)	18.0(32)	10.1(180)	10.1(18)	6.7(12)
15	The way coaching provides for steady employment	2.91	27.4(49)	15.1(27)	22.9(41)	16.8(30)	8.9(16)	8.9(16)
21	The media's support for my team	2.42	44.3(77)	10.3(18)	18.4(32	17.2(30)	8.6(15)	1.1(2)
22	How my pay compares with those for similar jobs in other colleges/univ	2.64	33.5(60)	20.1(36)	13.4(24)	19.6(35)	11.2(20)	2.2(4)
27	My job security	3.27	19.8(35)	15.8(28)	18.6(33)	21.5(38)	14.1(25)	10.2(18)
31	The local community's support for my team	3.56	15.3(27)	8.5(15)	19.2(34)	26.6(47)	27.1(48)	3.4(6)

Table 3 indicates that sport coaches generally experienced moderate to low (a mean of less than 3.5 on a six-point scale) levels of satisfaction with regard to compensation and support (from the media and the community). This is supported by Herzberg's theory (1966) which states that dissatisfaction with job-context related factors like pay, security and working conditions could lead to overall job dissatisfaction. Furthermore, these findings are consistent with the findings of Koustelios (2001), Murphy *et al*. (2002), Chelladurai and Ogasawara (2003), Surujlal (2004) and Surujlal *et al.* (2004). Low satisfaction with pay is said to be a universal problem and not unique to sport coaches (Chelladurai & Ogasawara, 2003). However, it is also universally conceded (Li, 1993) that until sport organisations find better approaches to improve the job satisfaction of coaches, the fiscal incentive system will still be used. It is therefore important that the allocation of financial rewards is based on the coach's efforts and effectiveness, or they could lead to job dissatisfaction. Sport coaches experienced a low level of satisfaction with job security (item 27, $\bar{x}$ =3.27). One of the reasons for this situation can be attributed to the mobility of coaches. There is a high turnover of coaches, especially in the popular sports like soccer, rugby and cricket (Surujlal, 2004) although most coaches are contracted to sport organisations (Surujlal, 2004). This suggests that most coaches in SA, in contrast to their international counterparts, do enjoy tenure of employment through contractual obligations with their employers. However, it is disturbing that their employment contracts do not promise security or stability for coaches (Singh & Moodley, 2001), resulting in coaches becoming insecure in their jobs. Despite the fact that most coaches were consulted in the drawing up of their contracts, most contracts were to the advantage of one party, namely the employer (Surujlal *et al*., 2004). Furthermore, the absence of a coaches' association contributes to the job insecurity of the coaches resulting in low job satisfaction. This is reflected in the low mean for the way coaching provides for steady employment (item 15, $\bar{x}$ =2.91). A low satisfaction with media support indicates the significant role that the media plays in sport. It implies that more support is expected of the media by coaches. A study by Singh & Moodley (2001) found that the majority of coaches felt pressured by the media,

resulting in their anxiety and stress. In addition, the media brought them under public scrutiny thereby increasing the pressure on them to deliver success. Consequently coaches experienced lower satisfaction in this regard.

Administration and colleagues

TABLE 4. **ITEMS, MEANS AND FREQUENCIES (PERCENTAGES (N)) WITH REGARD TO ADMINISTRATION AND COLLEAGUES**

Item	Item description	Mean	1	2	3	4	5	6
12	The amount of paper work I have to do	3.06	19.1(34)	14.6(26)	25.8(46)	25.3(45)	13.5(24)	1.7(3)
13	The level of cooperation among coaches in my university/college	3.19	15.9(28)	18.2(32)	19.3(34)	28.4(50)	13.6(24)	4.5(8)
19	The responsibility I have over my own work	4.46	5.6(10)	3.4(6)	8.4(15)	27.9(50)	33.0(59)	21.8(39)
24	The administrative duties I have to perform	3.48	10.1(18)	14.5(26)	21.8(39)	30.2(54)	19.6(35)	3.9(7)
25	The way coaches in my college/university get along with each other	3.55	11.7(21)	9.5(17)	21.8(39)	30.2(54)	19.6(35)	3.9(7)
34	The amount of work I have to do	3.93	6.7(12)	10.6(19)	15.1(27)	30.2(54)	24.6(44)	12.8(23)
35	The friendship with other coaches	3.93	8.9(16)	5.6(10)	20.1(36)	31.3(56)	19.0(34)	15.1(27)

As evidenced in Table 4, coaches generally experienced moderate to good satisfaction with administration and colleagues. Moderate satisfaction (mean <3.5) was expressed by coaches with regard to the paperwork and mundane administration that coaches had to do (item 12, $\bar{x}$ =3.06 and item 24, $\bar{x}$ =3.48). This implies that coaches were not comfortable with the amount of paperwork and administration duties that they had to perform. Sport and more so coaching sport is a very practical and hands-on activity therefore coaches perhaps do not perceive the importance of sound administration. Sport coaches also expressed moderate satisfaction with regard to the level of co-operation among themselves (item 13, $\bar{x}$ =3.19). It is perhaps because of the insecurity that sport coaches experience with regard to their jobs that they compete with each other to retain their jobs. This could possibly contribute to the lack of co-operation between coaches. Research done on educators (Oshagbemi, 1997), whose profession is similar to that of coaches showed that co-workers' behaviours, pleasant working colleagues, congeniality with colleagues, friendship with colleagues and collaboration with colleagues played an important role in their job satisfaction. With regard to this factor, coaches were most satisfied with the responsibility that they have over their jobs (item 19, $\bar{x}$ =4.46). Lu (1985) states that the sense of responsibility that employees obtain from their jobs is extremely decisive for their job satisfaction. This may imply that coaches welcome responsibility and autonomy in their jobs. Koontz (1980) supports this by stating that employees' job satisfaction may suffer if they do not have the autonomy that corresponds with the responsibility.

Supervision

TABLE 5. **ITEMS, MEANS AND FREQUENCIES (PERCENTAGES (N)) WITH REGARD TO SUPERVISION**

Item	Item description	Mean	1	2	3	4	5	6
4	The way my supervisor handles his/her employees	3.49	9.0(16)	14.1(2	26.0(46)	24.3(43)	22.5(38)	5.1(9)
17	The competence of my supervisor in making decisions	3.75	10.9(19)	6.9(12)	21.1(37)	26.3(46)	25.7(45)	9.1(16)
28	The personal relationship between my supervisor and his/her employees	3.73	8.6(16)	7.3(13)	22.3(40)	30.7(55)	22.3(40)	8.4(15)
36	The way my supervisor delegates work to others	3.62	12.3(22)	7.3(13)	20.1(36)	29.6(53)	24.6(44)	6.1(11)
40	The feedback I get from my superiors	3.70	12.3(22)	8.9(16)	16.8(30)	26.8(48)	26.8(48)	8.4(15)

Table 5 shows that coaches experienced moderate satisfaction with regard to the supervision that they received. This may imply that either the coaches want to be responsible for their tasks and do not welcome "interference" by their supervisors or that their supervisors are not competent enough to supervise them. According to the study done by Singh & Moodley (2001) most coaches indicated that management influences the selection of teams, thereby implying that coaches did not own the end product of the coaching process. This marginalised the coaches from the decision making process yet held them accountable when their team lost. Such a predicament is counter-productive and unacceptable. The lowest level of satisfaction was experienced with regard to the way coaches were treated by their supervisors (item 4, $\bar{x}$=3.49). According to Donnely (in Li, 1993) proper supervision enhanced the satisfaction of coaches working under severe job pressures. In addition, supervisor behaviour also contributed to coaches' job performance which has an impact on their job satisfaction. Therefore, if coaches were not treated well by their supervisors, their job satisfaction would suffer.

RECOMMENDATIONS

Coaches experienced moderate levels of satisfaction with regard to the level of co-operation among themselves. It is important for coaches to have good interpersonal relationships as this will reduce internal conflict, improve co-operation and lead to improved job satisfaction. Regular interaction of coaches through workshops and meetings with the intention of bridging differences between coaches is encouraged.

The results indicate that coaches are not satisfied with their pay. This may perhaps be compensated by the satisfaction that they derive by doing the job. Therefore, to compensate for shortfalls in financial incentives it is crucial for sport organisations to concentrate on creating conditions that inspire high performance. This can be achieved by ensuring that coaches are given autonomy in their job functions (for example, a coach is given the latitude to draw up his/her own programmes and coaching rules), and are given meaningful assignments, allowing them to be involved in the decision making for their area of expertise (for example in the selection of players). Furthermore, pleasant working conditions (like

proper training facilities) can not only improve the job satisfaction of coaches but also inspire them to remain in their organisation. In addition, offering sport coaches training to keep them current on their job functions and allowing them to learn new skills can also be utilised to improve their satisfaction with the organisation (Sigler, 1999).

The low level of satisfaction experienced by coaches with regard to the scheduling of facilities could be overcome by coaches scheduling their coaching sessions according to the availability of the facility. Management should also liaise with coaches when implementing the booking of the facility. With regard to the media coaches have little control over what the media prints. Sport organisations should provide professional counseling to coaches to help them deal with the media and increase their immunity towards the negative aspects of media reports.

The low level of satisfaction experienced by coaches with regard to job security was, in most instances, linked to the contracts that coaches had with sport organisations. Sport organisations can enhance the job security of coaches by ensuring that the clauses in the sport contracts are equally binding on both the coach and the organisation.

The moderate level of satisfaction that coaches experienced with regard to supervision can be overcome by cultivating in both the coach and supervisor a sense of belonging to a team. Sport coaches need recognition and understanding from their supervisors for their efforts (Li, 1993). In addition, sport organisations should ensure that supervisors have the required competences and qualifications to perform their jobs.

CONCLUSION

In summary, this study suggests that sport coaches derive satisfaction from performing the coaching task itself but experience dissatisfaction from their compensation, the administrative work that they have to do, lack of media support, lack of job security and lack of co-operation among coaches. It is not necessarily true that satisfied employees are automatically more productive, but dissatisfied employees do tend to leave the organisation more often, be absent more frequently and produce lower quality work than satisfied workers. Therefore, further research needs to be done to devise ways to reduce dissatisfying elements in the job of the coach.

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