CHAPTER 5:

DISCUSSION.

5.1: INTRODUCTION.

A comparative study was undertaken comparing the reliability of the MVPT-3, when translated into Afrikaans with that of the original American study. 80 randomly selected 8-year-old children from the Pretoria east region of South Africa were tested using Afrikaans instructions. The scores obtained for tests were entered onto an excel data sheet, and then an item analysis was undertaken using the STATA and SYSTAT systems. These were done to determine the Chronbach’s alpha for each item and the overall test. This was then compared to the Chronbach’s alpha obtained for the American sample during the standardisation process. In spite of there being some variation in the scores, the results indicate that the Afrikaans translation, although not as good as the English, is still reliable and could safely be used to identify 8-year-old children with visual perceptual problems. However, this study suggests that there are a number of items in the MVPT-3 test that do not contribute to the internal reliability of the test and these can be excluded to improve the reliability of the test for the 8-year-old, Afrikaans speaking population, in the east of Pretoria.

Further analyses indicated that there was a distinct difference in how the male and female 8-year-olds answered the MVPT-3 test items. It was found that the girls did better in the first half of the test, with the boys doing better in the second half of the test. It was also found that with different item analyses done on the two genders, different items could be excluded for the different genders based on the Chronbach’s alpha scores.
It was also found that some children in this study interpreted the instructions to some of the test items differently resulting in some of the items having negative scores, giving the impression that they had been interpreted negatively rather than positively. Unfortunately it was impossible to compare this to the American population as their data analysis was done on the SYSTAT system.

In this chapter the following points will be raised and discussed in the context of this study:

- Was this sample representative of the South African, Afrikaans speaking population?
- Did the distribution of the children across the eight-year-old age group influence the results?
- Did the high percentage of children with learning disabilities influence the results?
- The reliability of MVPT-3 when translated into Afrikaans, when compared to the English version used for the American population.
- The differences between girls and boys when tested using the MVPT-3.
5.2: WAS THE SAMPLE REPRESENTATIVE OF THE SOUTH AFRICAN AFRIKAANS SPEAKING POPULATION IN TERMS OF CULTURE AND SOCIO-ECONOMIC STATUS?

Due to the random sampling technique used and the fact that the sample being taken from a specific geographical region, east of Pretoria, the racial groups contributing to the South Africa population were not correctly represented. This means that the cultural, racial and socio-economic groups selected were not sufficiently reflective of the South African population and this could have implications for the applicability of this study to the South African population as a whole.

Table 5.1: The Distribution of Afrikaans 8-year-olds in the East of Pretoria and South Africa

<table>
<thead>
<tr>
<th>Race</th>
<th>Representation</th>
<th>Race</th>
<th>Representation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In percentage</td>
<td></td>
<td>In percentage</td>
</tr>
<tr>
<td>White</td>
<td>99%</td>
<td>White</td>
<td>33%</td>
</tr>
<tr>
<td>Black</td>
<td>0.27%</td>
<td>Black</td>
<td>4.7%</td>
</tr>
<tr>
<td>Coloured</td>
<td>0.63%</td>
<td>Coloured</td>
<td>62%</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Indian</td>
<td>0.3%</td>
</tr>
</tbody>
</table>

Eastern suburbs of Pretoria    South Africa
5.2.1: RACE

The sample consisted of 80 children all in the 8-year age band. However, the sample was selected from a population limited to an urban area, specifically the eastern suburbs of the Pretoria Metropolis, is not reflective of all 8-year-old Afrikaans-speaking children in South Africa.

The latest figures from the South African statistics department, (see table 5.1) on the representation of the Afrikaans speaking 8-year-olds in South Africa indicate that although the study sample was not representative of the Afrikaans 8-year-old population as a whole, it was representative within the eastern suburbs of Pretoria. Thus the study sample of 98.9%white children and 1.2% coloured children was representative of the Pretoria east population. Black children have low representation in this area namely 0.27% but the fact that there were no black children in the study sample may have been due to the random sampling.

However, when considering the South African distribution it can be seen that there is a higher percentage of coloured Afrikaans speaking 8year-old children than of white Afrikaans-speaking children. This means that the study is not a representation of the South African population but is a representation of the eastern suburbs of Pretoria metropolitan.

In general terms this suggests that it may have been better to have had a larger group of children from the east of Pretoria and to have had both black and coloured representation.
However the number was set at 80 by the statistician to determine the reliability of the test rather than to determine a sample that was racially equitable.

As the study sample was not a good representation of the total Afrikaans speaking population the results should be used with caution when the MVPT-3 is used in the South African context especially with reference to black and coloured children.

5.2.2: SOCIO-ECONOMIC STATUS

Although an attempt was made to draw a sample from a population that had different levels of socio-economic status, exact criteria for differentiating between high and low socioeconomic areas were not determined, and this was done on an assumption that certain areas, where the schools were situated, were high and others were low. This means that the study probably excluded children from a very low socio-economic situation, who may have limited resources and opportunity for preschool education. Due to most of the children coming from the middle to higher income schools it may be assumed that most, if not all of the children included in this study could have attended preschool, and consequently received some sort of visual perceptual training, and this could have affected the results that were obtained when the children were tested using the MVPT-3. Parents may also be more aware of the needs of a preschool and primary school child and do more activities that would facilitate the development of their child’s visual perception. These parents may also have more readily agreed to their children participating in the study due to an awareness of the impact of visual perception on learning.
The study sample can be said to be biased because the lower income schools were smaller than those of the middle to higher income groups, and due to the randomized sampling methods used, fewer children from these schools were included.

5.3: DISTRIBUTION OF THE CHILDREN ACROSS THE 8 YEAR OLD AGE GROUP.

Of the 80 children tested 60% were between the ages of 8 years 0 months and 8 years 5 months, compared to 40% between 8 years 6 months and 8 years 12 months. 88% of the children fell in the ages of 8 years 0 months to 8 years 7 months. This is due to the researcher only selecting children from the second grade classes and not including any children from the third grade in the study. The second grade caters mainly for children who turn 8 within the months of January until October with those turning 9 being in grade 3. The researcher did her data collection in August and September of 2004 resulting in most of the children in the higher range of 8 years being in grade 3.

This could have caused the results obtained in the research to be slightly biased, as there was not an even distribution of children across the 8-year-old spectrum.

When comparing the research to that of the original authors, we find that they assessed 141 eight-year-old children whereas we assessed 80 children. There is no information in the manual of the test as to how many children in each age group were tested.3

There were more girls (56%) than boys (44%) tested, the girls having an average age of 8 years 4.4 months and the boys an average age of 8 years 4.5 months, meaning that the
boys’ ages were slightly higher than the girls. This could have affected the results, but this would have been nominal as there is only a slight difference in ages.

By there being more girls (43) compared to boys (37) tested, the data obtained could be slightly biased to the side of the girls and this would have affected the data analysis, by pushing up the overall reliability of the test. In the data analysis done it was found that the MVPT-3 was more reliable for the girls than for the boys. This suggests that should the test be done on an 8-year-old boy the results may not be as reliable, as when it is done on an 8-year-old girl. It was also found that the MVPT-3 was more reliable for the boys in the second half than in the first half of the test, whereas the girls obtained a higher reliability in the first half than in the second half. This result could have been because there are more spatial elements in the second half of the test than in the first half, and this once again confirms Snell’s results when she found that boys did better in spatial orientated activities than girls in middle childhood.17

When the STATA analysis was done there appeared to be a problem with the interpretation of the Afrikaans instructions. This was indicated by there being a negative sign attached to certain questions, whereas the researcher would have expected that positive signs would have been obtained by all the questions as they were of a positive nature. 8 negative signs were found attached to questions in the combined analysis, 10 with the girls and 13 with the boys. The higher percentage of girls would have affected the sign of the questions when the overall STATA analysis was done, the girls having cancelled out the boys “−” signs in certain questions. This was seen in the higher number
of negative signs in the boys’ analysis, compared to the girls’ and the combined analysis. These scores could be related to a cultural issue, the literal translation not being understood in the same context as the original translation. This is noted in the Israeli study, where the sensory profile was translated into Hebrew and the researchers found that the English and Hebrew questions were answered differently due to the literal translation of the Hebrew meaning something different in the Jewish culture.35

These results also confirm the literature, which suggests that there is no test that does not have a certain element of culture built into it.40 The problem with this hypothesis is that not all the items that had the same instructions came out negative. The negative signs may be more related to the test items than to the instructions, this is discussed later. (See 5.7)

5.4: HIGH PERCENTAGE OF CHILDREN DIAGNOSED WITH LEARNING PROBLEMS.

13.75% of the study sample tested had been diagnosed with learning problems. Of this percentage, 27.27% of the children were girls whereas 72.72% were boys.

This is consistent with the findings in the literature review, which states that boys tend to be more easily diagnosed with learning difficulties as they have problems adjusting to the school’s structured environment and are more difficult to motivate.17
It is important to note that in this study all the children who wore glasses were recorded
as having a visual problem, and so included in the number of children considered to have
learning problems, even though this is not normally considered a disability within the
school environment. At least 1 of the children in the study wore glasses, 2 others
indicated by the parents, had visual problems but no indication was given as to whether
they wore glasses or not. The child who wore glasses also had problems in other areas,
which might not have been related to him wearing glasses. Unfortunately the
biographical information obtained from the parents did not request information on when
the child started to wear glasses and so no relation between the child wearing glasses and
the learning problems can be assumed. It should be noted that in the school environment
glasses are considered to be a visual impairment and not a disability, as a disability would
prevent the child from doing his schoolwork, i.e. the child being blind, whereas
impairment with a corrective device will not impede the child in his/her schoolwork.

Another pertinent question would have been one asking whether the child had any
auditory problems. On reflection it may have been more effective to have a separate
parent information questionnaire asking more questions, but at the start of this study it
was decided to simplify the questionnaire in order to increase the number of possible
returns by the parents.
5.5: RELIABILITY OF THE MVPT-3 WHEN TRANSLATED INTO AFRIKAANS WHEN COMPARED TO THE AMERICAN STANDARDISATION NORMS.

On face value the Chronbach’s alpha calculated for the MVPT-3 administered in Afrikaans using the STATA (0.8041) and SYSTAT (0.791) appeared favourable when compared to the American sample of 0.83, which suggested that the test was reliable when presented in Afrikaans. However there were some anomalies in the test results that needed some further investigation. These were the homogenous and non-contributing items. In the case of the homogenous items all the children’s scores were the same, each child tested answered them correctly, and in the case of the non-contributing items their individual Chronbach’s alphas were larger than the overall Chronbach’s alpha showing that they did not contribute. When they were excluded from the item analyses the Chronbach’s alpha increased, thus increasing the overall reliability of the MVPT-3. This suggests that not all the items in the test are sufficiently discriminating for the South African 8-year-old child.

5.5.1: HOMOGENEOUS ITEMS.

The homogeneous items, as stated before, were those items correctly or negatively answered by all the children suggesting that the questions were either too easy or too hard for the 80 children tested. During the overall analysis questions 4 and 35 were answered the same by each child. When looking at these questions it is seen that question 4 falls into the section that Colarusso and Hammill consider the visual discrimination section, and question 35 falls into the spatial orientation section. Both questions contain strong
elements of form constancy. In question 4 the child has to find a simple shape in a more complex pattern, whereas in question 35 the same shape is given in different spatial orientations, with three of the shapes in the same spatial orientation and only one in the wrong spatial orientation. It is obvious that these questions were too easy for the Afrikaans speaking 8-year-old child and so did not contribute to the overall testing and reliability of the test.

When the analysis was done separately, i.e. all boys’ and all girls’ different questions were homogeneous for each group. Questions 2, 4, 10, 22 and 35 were homogeneous for the boys, whereas questions 4, 26, 35 and 37 were homogeneous for the girls. With further consideration it is seen that the boys have more questions that are homogeneous than the girls and that the boys’ questions tend to be in the first half of the test, i.e. in the visual discrimination, form constancy, visual closure and spatial orientation sections of the test whereas the girls are in the visual discrimination, visual closure and spatial orientation sections of the test. In most of the questions where the boys had homogeneous scores there is a strong form constancy and spatial orientation element, whereas the spatial element is not as obvious in the homogenous items identified for the girls, although it is present. All the items that were homogeneous for the girls had a strong form constancy element. This tends to once again support the findings of Snell as mentioned earlier.17
5.5.2: NON-CONTRIBUTING ITEMS.

These were the items where the items’ Chronbach’s alphas were higher than the overall Chronbach’s alpha. Unfortunately it was impossible to compare the data analysis done on the South African children to that done on the American children as the publisher of the MVPT-3 only sent us the analysis done on the age group 4-10, which was not helpful in comparing the different Chronbach’s alpha scores within the 8-year-old age band. The Chronbach’s alpha scores obtained for the American children were basically the same at 0.997 for all items 1-40 for the age groups 4-10. This was not the case with the item analysis done on the results of the 80 children tested by the researcher, see table 4.4. This raises concern about the reliability of the test as specific scores for each age band are not available even for the American child and there are marked differences in the abilities of a four and 8-year-old in terms of visual perception.

As it was difficult to compare the item scores of the American sample to the Afrikaans speaking sample, the researcher went back to the original analysis done using the STATA analysis system. It was interesting with this evaluation to note that most of the non-contributing items were in the second half of the test. This was confirmed when a split half evaluation was done, as it was found that the first half of the test had a higher Chronbach’s alpha score than the second half (see table 4.10). This suggests that the differences may lie in the difference in skills in visual perception that have been noted between the genders. This could also have been influenced by there being more girls than boys assessed.
There was a difference between the Chronbach’s alpha in the first and second part of the test suggesting that the second half of the test was not as reliable in testing visual perception in the Afrikaans speaking child using the Afrikaans instructions for the MVPT-3 as for the American child using English instructions.

5.6: ANALYSIS OF THE ITEMS WITH A NEGATIVE SIGN.

The test items that had a negative sign where analyzed in terms of the visual perceptual process demands. See table 5.2.

Table 5.2: Different Processes of visual perception found in the negative items.

<table>
<thead>
<tr>
<th>Item number</th>
<th>Memory</th>
<th>Discrimination</th>
<th>Form Constancy</th>
<th>Figure ground</th>
<th>Spatial orientation</th>
<th>Closure</th>
</tr>
</thead>
<tbody>
<tr>
<td>7</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
<td>*</td>
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<td>*</td>
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<td><strong>Total</strong></td>
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<td>4</td>
<td>8</td>
<td>1</td>
<td>6</td>
<td>6</td>
</tr>
</tbody>
</table>
The 8 items which had a negative sign, all contained an element of visual constancy, with 2 items having a memory element, 4 a distinct discrimination element, 1 an element of figure ground, 6 an element of spatial orientation and 7 had an element of visual closure.

This in itself does not give any clues as to why the children interpreted the items negatively, because the only constant between all the items is visual form constancy, suggesting that the Afrikaans child has more difficulty interpreting and identifying shapes that are similar, than the American child. Unfortunately no data is available to confirm this in the manual and when asked if it was possible to run their data, or whether they would run their data using the STATA data analysis program, no reply was obtained from the publishers.

5.7: DIFFERENCES BETWEEN GENDERS.

The authors of the MVPT-3 did not do this analysis although there is sufficient literature to support the gender differences in visual perception, boys having a greater ability to do spatial orientation related work than girls. This can be linked to the different types of activities that are given to a boy as compared to a girl, due to cultural expectations. When comparing the Chronbach’s alpha scores of the boys to the girls, it was interesting to see that there were more homogeneous scores obtained for the boys than for the girls, which tends to suggest that the boys found the MVPT-3 easier or harder than the girls, depending on whether the homogeneous scores were because all the boys answered the questions correctly or incorrectly respectively. It was also interesting to see that most of these scores were in the first 20 test items for the boys whereas they were in the last 20
for the girls. This suggests that there is a definite difference in how a boy interprets visual perceptual stimuli as to a girl. It could also suggest that the boys develop their visual skills differently to the girls and that the order of the test should be different for the girls than for the boys. This finding is similar to the findings of Mao, Li and Lo when they tested Taiwanese children using the Beery’s test of visual motor integration and found that they had to move the test items around to accommodate the developmental levels of the Taiwanese children.36

In the item analysis the boys obtained 13 negative scores, compared to 10 negative scores of the girls. Of the 13 negative scores obtained for the boys most of them were in the first half of the test whereas the girls scored more negative scores in the second half of the test. The same pattern was evident when the non-contributing items were eliminated from the item analysis. The boys eliminated mainly the items in the first half whereas for the girls it was mainly the items in the second half that were eliminated.

All of the above confirms the findings of Snell,17 but suggests that there may be some cultural element that makes girls perform differently in visual perception to boys. This could be due to the cultural expectations. The expectations of the parents as well as peers are different for the girls than the boys as described in Carver’s article on gender identity and adjustment in middle childhood.19 Carver also suggests that boys are given different types of toys and games to play with than girls. Boys are expected to build and to climb whereas girls are expected to play indoors with dolls.19 Although this is speculative it
does present a possible hypothesis as to why girls develop differently to boys when it comes to visual perception.

During the data analysis process, whereby non-contributory items were eliminated from the test, the researcher was able to reduce the test items to 26 items, hereby increasing the Chronbach’s alpha to 0.85 and so the reliability of the test. When this same process was carried out on the item analysis of the two genders 13 items were eliminated for the boys and 8 items for the girls, increasing the girl’s Chronbach’s alpha more than the boys. This questions the validity of the MVPT-3 test when administered to the Afrikaans speaking South African child, especially when the overall Chronbach’s alpha for the boys remains at 0.72. This also questions whether the South African boys differ from their American counterparts. This however was not within the scope of this study. However the findings do suggest that the test may be more reliable when administered to 8-year-old girls than 8-year-old boys.

It is important to note at this stage that there were more girls in the study than boys and this could have caused the results to be slightly biased to the girls’ side when considering the overall Chronbach’s alpha. It also suggests that the MVPT-3 is not as reliable as it appears and that it can be used for 8-year-old Afrikaans speaking girls, but should only be used with precaution or in conjunction with other tests when used on Afrikaans speaking 8-year-old boys.
5.8: CONCLUSION.

When considering table 5.1 it can be seen that the sample group used in this study was an approximate representation of the Afrikaans speaking population in the Eastern suburbs of the Pretoria metropolitan area, but not a representation of the Afrikaans speaking community of South Africa and so the results of this study should be used with caution when applied to other Afrikaans children in the broader context of South Africa. The results tend also to be biased toward the middle to higher class Afrikaans speaking child, as the sample was more representative of this group, but the reliability of the test for subjects from socio-economic groupings has not been examined in the context of this study.

The results of this study in the main, support the hypothesis that the reliability of the MVPT-3 is not affected when it is translated into Afrikaans although there is evidence that suggests that the test is not as reliable when assessing the visual motor performance of the Afrikaans speaking 8-year-old boy as when assessing the performance of the Afrikaans 8-year-old girl. The results also question the validity of some of the test items as a large number of the items were non-contributing and some were homogenous resulting in only 26 out of 40 items contributing to the overall Chronbach’s alpha and therefore the reliability of the test.