SUMMARY, CONCLUSIONS AND RECOMMENDATIONS
Sports training is a systematic, scientific and pedagogic process, aimed at attaining high level sports performance. It makes use of various principles derived from other sports sciences. The harmonious development of motor abilities, coordinative abilities and technical perfection help in achieving optimum performance in present day competitions.

Coordinative abilities are one of the groups of prerequisites formerly called as agility. There are seven important coordinative abilities, identified by different sports scientists, which are commonly seen among sports persons and dominate in different sports disciplines in various degrees. They are: Kinesthetic differentiation ability of upper limbs, kinesthetic differentiation ability of lower limbs, space orientation ability, complex reaction ability, dynamic balancing ability, rhythmic ability and adaptation ability of which the scholar has selected the following for the present investigation. They are: Kinesthetic differentiation ability of upper limbs, kinesthetic differentiation ability of lower limbs, space orientation ability, complex reaction ability and dynamic balancing ability.
Different coordinative abilities dominate in different sports disciplines. Hence training these coordinative abilities needs a specific set of carefully selected exercises. Simple and feasible field tests are available to assess these coordinative abilities.

The main purpose of the present study was to assess the percentage of association, which exists between the coordinative abilities. The subordinate purpose of the study was to identify the coordinative ability which dominates in a particular sports discipline. An attempt was also made to find out the variation in coordinative abilities of different sports disciplines and levels of performance.

To achieve this purpose, five standardised field tests were conducted. The study was carried out on six hundred male subjects, twenty five subjects each in eight sports disciplines and three levels of performance.

To find out the magnitude of association among different coordinative abilities, *pearson product moment correlation* was applied and the percentage of association was calculated using the formula $r^2 \times 100$. To determine the dominating coordinative ability in each sports discipline, *multiple stepwise logistic regression* procedure was applied. The *goodness of fit test* was applied, utilising the selected dominating coordinative abilities, to verify the validity of the results.
To find out the differences in the selected coordinative abilities among different sports disciplines and at different levels of performance, two way analysis of variance for independent group was applied.

**Conclusions**

1. The complex reaction ability is found to be greater in athletes, volleyball players and weightlifters; kinesthetic differentiation ability of upper limbs in football players and swimmers; space orientation ability in hockey players and kho-kho players and dynamic balancing ability in kabaddi players.

2. The complex reaction ability is found to be dominating in three sports disciplines. They are athletics, volleyball and weightlifting. The space orientation ability is found to be dominating in two sports disciplines. They are: hockey and kho-kho, whereas kinesthetic differentiation ability of upper limbs, dynamic balancing ability and kinesthetic differentiation ability of lower limbs are found to be dominating in football, kabaddi and swimming respectively.

3. Each coordinative ability assessed different coordinative characteristics. So each coordinative ability is a separate entity.
4. The selected coordinative abilities vary from one sports discipline to another. The magnitude of variation is not constant.

5. The selected coordinative abilities vary among different levels of performance. Mostly state level players are found to be better than university and collegiate level players and university level players are better than collegiate level players. The magnitude of variation is not constant.

**Recommendations**

1. The investigator has studied only five coordinative abilities. It is recommended that the other important coordinative abilities also be probed for the optimum utilisation in the process of sports training.

2. The research scholar has selected only three levels. It is proposed that such studies be conducted on sports persons of other levels.

3. Only eight sports disciplines were selected for this study. It is suggested that investigations be conducted in other sports disciplines and in combatives.

4. The scholar recommends that the same type of investigation may be taken up among girls at different levels and sports disciplines.
5. It is recommended that event specific investigation be conducted in athletics to get the correct information about the requirements of coordinative abilities in order of priority for effective training.

6. It is suggested that investigation be conducted to find out the requirement of optimum percentage of various coordinative abilities in different sports disciplines.

7. Studies may be undertaken to compare the development of coordinative abilities among boys and girls and men and women who take part in different sports disciplines and at different levels.

8. Investigation may be carried out among children not taking part in regular physical training.

9. It is suggested to investigate the sensitive periods among Indian children which will help to develop optimum degree of coordinative abilities in the respective age periods to succeed in higher level competitions.

10. A longitudinal assessment may be conducted on Indian children between the age of 6 and 14 years.

11. Effects of specific exercises on the development of various coordinative abilities, can be investigated.

12. It is recommended that a suitable combined model of coordinative abilities be worked out, to help sports
persons of various disciplines, coaches and scientists to understand, train and attain sports excellence.

13. A model combining both coordinative abilities and motor qualities may be prepared to give an effective approach towards training for excellence in sports.

14. It is recommended to conduct such investigation among highly skilled, low skilled and non skilled sports persons.

15. Research work may be undertaken to workout standards to be achieved at various levels such as mini, sub-junior, junior, senior and inter-national levels.

16. It is suggested that studies may be conducted among sports persons and non-sports persons among mentally retarded, deaf and dumb groups.

17. It is suggested that additional tests may be constructed for various coordinative abilities.

18. Suitable norms may be prepared for different levels of performance, age levels and for both boys and girls.

19. Standard, common, coordinative ability tests, available in literature are used in this investigation. However, the investigator feels that specific coordinative ability tests may be formulated for various sports disciplines, taking into consideration
the neuro-muscular coordination involved in the execution of various skills.

20. The results of the study indicated that complex reaction ability is found to be dominating among athletes, volleyball players and weightlifters. Further studies may be conducted to explore scientific evidences for such domination.

21. The reasons for dominance of specific coordinative ability in a particular sports discipline needs further research.

22. Some of the earlier results are contradictory to the findings of the present study. Only further studies could pave way to clarify the doubt whether the coordinative abilities are subject to variation among different hereditary, environmental and racial characteristics.

23. Fitness modelling for coordinative abilities may be prepared keeping in mind the dominant coordinative abilities, sports disciplines and different levels of performance for men and women.
BIBLIOGRAPHY


**Periodicals**


Hirtz, P. und Ludwig, M. "Ziele, Mittel und Methoden der Koordinativen Vervollkommnung". Körpererziehung. 11, (1976 ), 509.


Ljach, V.I. "Development of coordinative Abilities and Psycho - physiological functions among children between 7 and 17 years". New research works in age physiology.28, (1987 ), 57.


Ljach, V.I. "Sensitive periods of development of coordinative abilities among children from 7 to 17 Years." New research works in Age physiology.22, (1984 ), 34 - 38.


**Theses**

Sajilal, K.P. "Variation of different coordinative abilities among volleyball, basketball and handball male players at university level". Unpublished Dissertation, Annamalai University, India, 1992.

Dictionaries


APPENDIX A

INDIVIDUAL PERFORMANCE CARD

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Names of the coordinative abilities and tests</th>
<th>Test scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Kinesthetic Differentiation Ability of Upper Limbs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Backward Ball Throw&quot; test</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Kinesthetic Differentiation Ability of Lower Limbs</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Jump Down on Line&quot; test</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Space Orientation Ability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Numbered Medicine ball Run&quot; test</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Complex Reaction Ability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Ball Reaction Exercise&quot; test</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Dynamic Balancing Ability</td>
<td></td>
</tr>
<tr>
<td></td>
<td>&quot;Balancing with Long Nose&quot; test</td>
<td></td>
</tr>
</tbody>
</table>

P. John Sebastian
Research Scholar