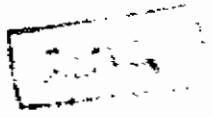
RELATION BETWEEN MYOPIA, INTELLIGENCE AND SCHOOL ACHIEVEMENT



THESIS

Submitted in Partial Fulfilment for the Master of Science in Childhood Studies

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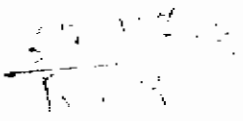

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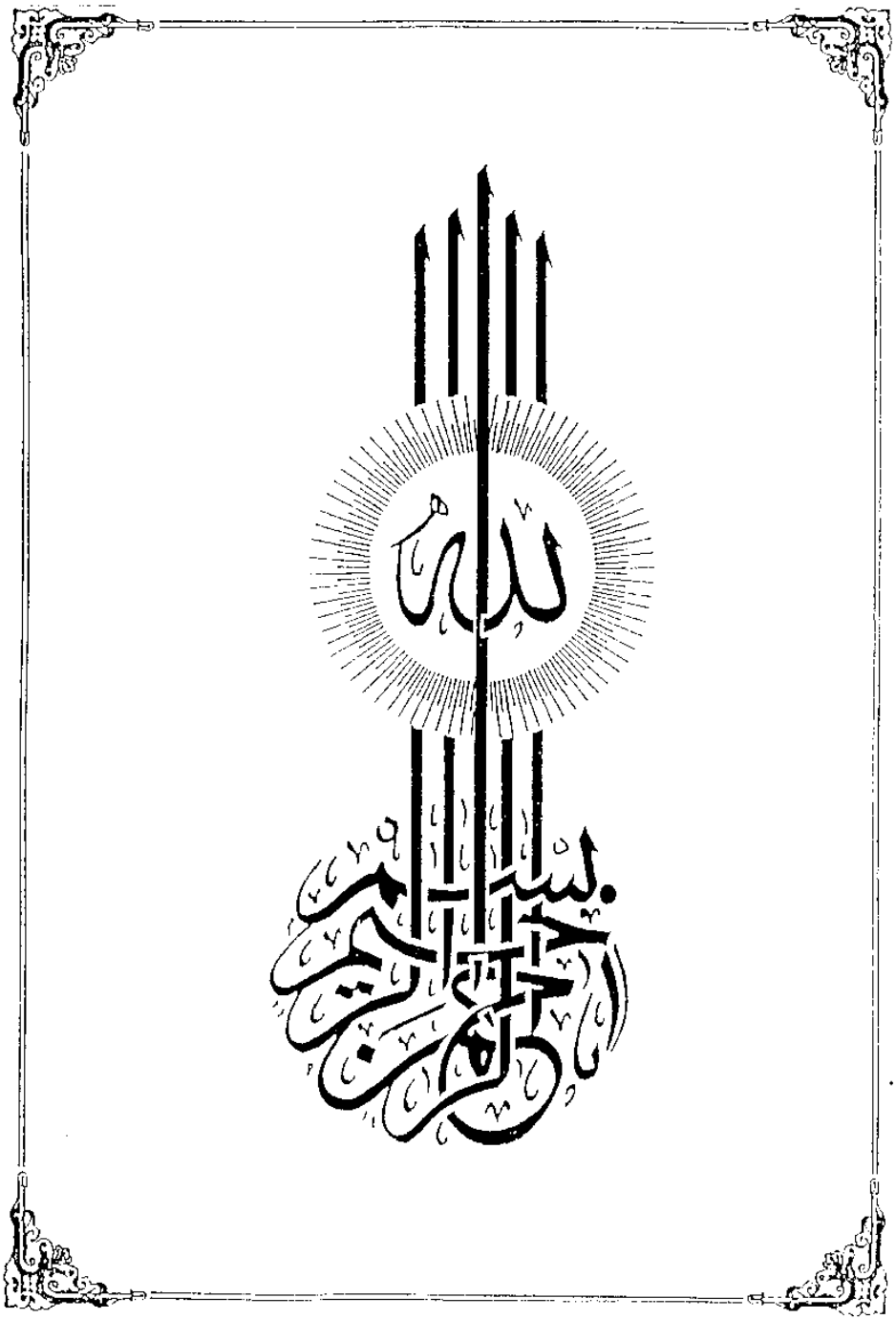

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CONTENTS

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INTRODUCTION

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Myopia, or short sight, is an important and common cause of visual impairment which is usually acquired and nearly always progressive.

It rarely occurs before the age of 6 years, and new cases appear throughout childhood and adolescence, particularly between the age of 7 and 12 years.

The remarkable academic success of the myopic population has naturally raised questions regarding the association of myopia and intelligence. There is no great scientific evidence to support or refuse this concept. Although numerous studies have found the intelligence quotient (I.Q) of the myope to be somewhat higher than that of emmetrope, statistical significance has not been established.

What does appear to be functional in this regard is a superior reading ability.

The association of myopia and intelligence has been noted by a number of investigators. The pionears is this research are Hirch, Karlsson, and Stewart.

(In 1975) Karlsson's results showed that at age 17-18 years the near sighted group scored 10 points above non-myopes on the verbal portion of the test and 7 points higher on the non-verbal portion with an overall average increase of 8 points. The intelligence had been assessed

by California Test of Mental Maturity.

Stewart (1985) reached the conclusion that children who had defects of distant visual acuity of $\frac{6}{12}$ or worse in both eyes, with perfect acuity on near vission, scored significantly higher on tests of intelligence.

The theories which have been put forward to explain the relation between myopia and intelligence are as ingnious, fanciful and contradictory as have accoumulated around any subject of medicine. The theories relationship was seen, alternately, as cause and effect, adeptative and even ontogenetic where in the overdeveloped eye is part of the overdeveloped brain.

Recently, Karlsson (1973) has produced evidence that intellectual gain preceedes the appearance of myopia and has suggested that the gene responsible for short-sightedness may have conferred an evolutionary advantage through its association with intelligence.

The educational performance of children with myopia has been examined in recent years. Stevens and Wolff (1965) found that myopes acquire higher scholastic rankings than do non-myopes. Goldschmidts (1968), Grovenor (1970) reached the same conclusion.

Peckham in 1977 found that children with myopia had higher mean scores on the 11 year reading comprehension, arithmetic and general ability tests than the normally sighted children.

AIM OF THE WORK

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The aim of this work "Relation between myopia, intelligence and school achievement" is to review the recent literature about this subject and review cases in Egyption students to find the type of this relation if present.

The study will include the following:

1. Degree of myopia in relation to
   - age
   - sex
2. School achievement in relation to
   - age
   - sex
   - myopia
   - emmetropia
3. Intelligence in relation to
   - age
   - sex
   - myopia
   - emmetropia

REVIEW OF LITERATURE

PREVALENCE OF MYOPIA

The prevalence of myopia demonstrates notable changes with age, sex, race and ethnic. Socioeconomic factors appear to play some role in the incidence of myopia.

1. AGE

The prevalence of myopia has been noted to show marked changes at three periods of development. There is a sharp reduction in myopia from the premature to the newborn and to a lesser extent, from the newborn to the six months old. Later, myopia demonstrates a sharp rise in incidence from age 5 to 20 years. At the start of adult life the prevalence generally demonstrates a more graduated decrease that can be seen to continue untill age 50 or some what beyond (Brian J. Curtin, 1985).

Myopia is frequently found in the eye of prematures. Grahan and Gray (1963) noted that 45 of their 150 prematures had myopia of more than - 0.5 D (33.3%). These same investigators detected an increase in myopia frequency as birth weight decreased. In the United States, they found 25% of newborns to be myopic in a range of up to -12 D.

The large study recently published (1978) by the United States Public Health Service indicated that myopia among youths ages 12 years to 17 years has increasing prevalence of from 29.9% at age 12 to 33.2% at age 17.

In Japan (1957) surveys of elementary school students found 25% to be myopic, middle school students 45%, high school students 65%. At the university level, a prevalence of 81% was found.

In Britian, Sorsby (1934) obtained a myopia frequency of 3.6% and 4.0% among groups of children 4 to 8 years and 10 to 14 years respectivity.

2. SEX:

Sex appears to have an influence on the incidence, for aithough in the lower degree of myopia both sexes seem about equally affected, with propable excess of males, females are more prone to the higher degrees and to degenerative changes (Duke-Elder, 1970).

This has been detected in childhood by Harman (1913) who found 52% of subjects with myopia of more than 4D to be female.

3. RACIL AND ETHNIC VARIATIONS:

Comparative studies are of considerable value in delineating the degree of variation in refraction that exists between races in a single geographic area. The study of Hawaiian schoolchildren results of clear plurality of the Chineese among myopic children, the almost indenti-cal prevelance rates among the Japnes and other Caucasian groups, and the marked reduction in myopia among native Hawaiian youngsters. The Chineese may be even more dispored toward myopia than Japaneese as indicated in the

comparitive study of these population contained in the Manchurian Railway report. In this report the prevalence of myopia in Japaneese school children was 13% compared with 22% in Chinease (Brain J. Curtin, 1985).

The reduced prevalence of myopia among blacks has been confined by the large United States health survey of adolescents 12 to 17 years of age during the years 1966 to 1970. They found a prevelance rate for blacks of 25.1% as opposed to a 32.7% rate for nonblacks (Roberts, 1974).

Jewish children have been found to exhibit significantly higher prevelance of myopia compared with their counterparts in France, Britain and the United States. It was also found that Jewish male to be particularly affected compared with non Jews in a ratio of about 2:1 among children 5 to 14 years of age.

Meyerhof (1914) studied the refractions of Egyptions, Sudaneese and Nubians and detected essentially the same myopic frequency in Europeans and Egyptians (18%). Myopia was infrequently seen among the Sudaneese and Nubians.

The prevelance of myopia among Africans was studied in Monorvia and Dar-es-Salaam among school children and adults attending eye clinies. The prevelance of myopia up to 5D among school children was found in 1.5% and over 5D in 0.18%. The prevelance of myopia of all degree was 1.68% which was less than that reported from any other