COMPARATIVE STUDY OF THE EFFECTS OF BILINGUALISM AND MONOLINGUALISM UPON INTELLIGENCE AND ACHIEVEMENT OF CHILDREN

BY

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CHAPTER I
INTRODUCTION

Importance of Learning Other Languages

In the world of today, isolation is being eradicated in the social, political, economic and educational spheres of life. The world is rapidly shrinking and there is a growing need for international communication and as such the learning of other languages besides the mother tongue has become a necessity.

4. Phillips Davison (41) stressed this necessity in the following words:

As the technical possibilities for bringing the whole world population into one audience loom on the horizon, together with the ability of this audience to respond through the use of opinion polls, a new difficulty presents itself — language. Mass media are only aids to communication; the actual transmission of most ideas still takes place as it has throughout human history — in words. Music and pictures are only a partial substitute for words. To communicate with peoples in Europe, Asia, Africa, Australia, and South America, all of whom are rapidly becoming our next-door neighbors, we need words they will understand. (41:41-42)

Similarly, W.J. Buehner (21) claims that the knowledge of other languages for international purposes deserves a place of first importance. He is of the opinion that as one can know nothing about the taste of wine without
tasting it, in the same way it is impossible to learn about a nation's culture, its life and thought without knowing its language. He further points out that learning of a foreign language is a wise economy when billions of dollars are spent on producing the atomic bomb and many more billions on the hydrogen bomb.

In support of learning the languages of other people, Emilio Goglio (54) puts forward another argument. He writes:

By every language you learn, a new world is opened before you. It is like being born again; and new ideas break upon the mind with all the freshness and delight with which we may suppose the first dawn of the intellect to be accompanied. (54:272)

In the light of these views, it may be added that the knowledge of another language would make accessible to an individual literary, scientific and artistic masterpieces which could be an invaluable aid in the development of his mental faculties, a source of inspiration and a guide to intellectual accomplishments. He could keep himself in touch with the research work which has been and still is being done in other parts of the world. Accordingly in almost every field of knowledge, learning modern languages is extremely useful for the sculptor, the architect, the musician, the chemist, the physicist, the botanist, the anthropologist, the physician, the lawyer,
the businessman, the politician, the diplomat and the teacher.

Keeping in view the social and cultural aspect of language, the leading educationists and social scientists (193, 22, 100, 32, 54, 67) have maintained that the study of modern languages would lead to a sound and intelligent comprehension of the cultural, social and spiritual life of other people and consequently bring about a gradual elimination of racial and religious prejudices and a greater international unity and solidarity. According to them, the knowledge of other languages gives a better insight into human relations and a deeper appreciation of man's struggles and achievements. Understanding and good-will towards humanity are established on a larger scale. It is generally believed that if communication is stopped, political rivalries, economic distress and social ills may develop.

The arguments stated above in favour of learning other languages may be summarized as follows:

1. The enhancement of international understanding and world peace

2. The improvement of human relations among the various ethnic groups

3. Facilities of world trade and commerce
4. Provision of general literacy with respect to foreign affairs

5. Enriched cultural experiences

6. Acquisition of an additional medium of communication

7. Contact with research work for professional growth


Conditions and Motivation for Learning Languages Other Than the Mother Tongue

Knowledge of other languages is conditioned to a variety of social, economic, cultural, religious and political situations in almost every country of the world today. However, extreme differences are involved in the needs and motivations of every country. Some of the persuading factors for learning languages other than the native language have been immigration, inter-marriage, trade, colonization, religious conversion, military conquest, travel or residence in a foreign community.

For example, in the case of the United States, Irish, Italian, German, Polish, Spanish, Japanese, Swedish, Jewish, Mexican, Scottish and Indian immigrants are compelled to
adopt English. The language of the state is insisted upon and regarded as the chief instrument for Americanization. The American nation wants to build up a common spiritual heritage by having a common means of intercourse. The aim is to assimilate all immigrants into one nation. (103)

Similarly, the centralized school system of France insists on having one language over all its territory without taking into account the current languages of the Bretons, the Basques, the Alsatians and the Provencaux. (129)

On the other hand, in South Africa the Act of Union in 1910 laid down the principle of equality in language. It was stated that:

Both the English and Dutch (now Afrikaans) languages shall be official languages of the Union, and shall be treated on a footing of equality and enjoy equal freedom, rights and privileges. (103:30)

This principle was implemented immediately in the school legislation of all the provinces. Bilingualism progressed rapidly in South Africa following the formation of the Union in 1910. According to the 1936 Union Census, 64.4 percent of the Europeans aged 7 years and over were able to speak both English and Afrikaans, 19 percent English only, 16.4 percent Afrikaans only and 2 percent neither. In 1918 only 42.1 percent could speak both. However, according to Malherbe (103) the rate of growing bilingualism subsequently slowed down.
Integration of the two races was the main objective of South Africa. Cooperation, respecting the individuality of both traditions, is insisted upon. An atmosphere is needed in which the two traditions are looked on not as hostile but as complementary to one another in South African education. Children are not taught that there is a section which will ultimately dominate and produce a unilingual state but that just as Rome produced the best citizens when its two languages were integrated in the same way, a South Afrikan cannot be a complete man unless he is at home in both official languages — homo utriusque linguae — who has made two cultural traditions his own. (103)

Though owing to political circumstances, ideas of separateness and incompatibility as far as learning of languages is concerned have come formerly to the minds of English people and later to those of Africans, yet practically people feel that knowledge of both the languages is an asset for the stability of their Union — South Africa. Their love for South Africa should include love for both official languages.

The mixed linguistic areas of some parts of Switzerland and Belgium such as Sienne, Fribourg and Brussels etc. have an altogether different situation. In Switzerland, the child is taught through the language of the municipality where he lives. The language of the home is not taken into
account. In cities like Geneva, about one-third of the inhabitants speak French in their homes but there are scarcely any schools where French-speaking parents may send their children if they wish to enjoy the South African principle. (103)

Belgium presents a combination of the Swiss and the South African principles. There are three linguistic areas: in Wallonia, French is spoken; in Flanders, Flemish is accepted; and in the remainder of the country including Brussels bilingualism is prevalent. Here preference for German or English depends upon the political and social conditions. (103, 39)

In Wales, English and Welsh are the two main languages. They do not enjoy equal status. English enjoys more prestige than Welsh. The schools where the medium is Welsh are in a minority as the principle of mother tongue medium is not accepted in Wales. Davies (39) points out that in spite of the fact that there are many secondary schools in both North and South Wales which could be turned into Welsh-medium as 100 percent and 84 percent of the pupils are Welsh-speaking, the demand for qualifications keeps the medium English. The common attitude of the people is also not very encouraging towards Welsh. They hold the view that the best medium to make money by is the English language. ... If you want to
enjoy the luxuries of life... the only way to do so is by learning English well." (39:16)

Davies (39) further states that there is no separate radio transmission in Welsh: the daily programmes are in English, with an occasional Welsh feature. Daily newspapers are also not in Welsh. The position of Welsh in Wales is similar to that of Dutch in South Africa before Afrikaans as the vernacular speech ousted Dutch as the written language.

Welsh Nationalism is a purely cultural movement for the equality of English and Welsh as official languages in Wales. Prominent cultural leaders are of the view that Welsh will die if some action for its revival is not taken.

Bilingualism in Wales is a national problem. It is being demanded that some prompt and decisive action on the part of the central and particularly local authorities be taken to solve the language problem in Wales. (39)

In Eire, in spite of the fact that Irish is encouraged through incentives like grants and other government policies, there is little enthusiasm for Irish among the masses and the language remains little more than a school subject. The influence of English in the home and through business, trade, sport, the radio, cinema and the Press has surrounded the children. According to Davies (39) as in Wales, English has a strong bread and butter appeal in Eire also. English
is considered the key to the future of the Gaelic speaking Irish in America and Britain. The general attitude of the people is that "when you pass the bridge at Carry Roulgan, you won't need Irish any more." (39:53)

There are historical explanations for the distribution of French and English in Canada; of Czech and Slovak in Czechoslovakia; of Swiss, German, French, Italian and Romansh in Switzerland; of Afrikaans and English in the Union of South Africa; and of Serbian, Croatian and Slovenian in Yugoslavia. All of these countries are officially bilingual though it is not possible that their entire population is bilingual. (45)

The decision to adopt Hebrew as a national language of Israel is motivated by a desire for national unity. (122)

In the Soviet Union, fifty ethnic groups are divided among fifteen republics called Union Republics. The native language is the language of local government, schools, and other institutions. Russian is the official language of the Union and the language of intercourse between all citizens. The creation of a national language and culture runs parallel to the spectacular expansion and assimilation of local culture. The study of the Russian language begins in the second quarter of the first grade after the alphabet of the native tongue has been learned. (85)
In the case of colonies, European countries have been introducing their own education for many decades. In British tropical Africa, 400 major languages are spoken. One territory may have ten languages spoken by large groups of people; twenty or thirty or more spoken by small groups of a thousand people or even fewer; and each of the ten main languages may be split into variant dialects. There is a similar situation in other territories, such as in the Solomon Islands. In Mauritius, Hindi, Urdu and Tamil are taught in schools besides the five other languages spoken in the island by small groups. In the case of Nigeria, dozens of languages are spoken in the presence of the three main languages, Hausa, Ibo and Yoruba.

In a UNESCO general conference, a Nigerian speaker quite appropriately confounded the doctrinaire advocates of education in the vernacular by asking how they could manage in his home town, in which each classroom contained the speakers of eight different languages. There is no solution to the problem of the small language groups. Their children must of necessity learn a foreign language as the medium of instruction. Even in some of the important languages (Mende, Akan, Hausa, Ibo and Yoruba for West Africa, Luganda, Kikuyu, Swahili and Shona for East and Central Africa, very few higher-level textbooks have as yet been published. However, it is realized by the colonial countries that as
long as their own native languages are not developed to meet the needs of the time, English has to be the common language. (186)

Ward (186) points out that even though in some of the colonies, education of history, geography, art and music etc. was based on local languages, people became suspicious and demanded in effect, "we know enough of our own culture, we want you to teach us yours." (186)

Ward (186) relates an incident about a boy whom he suggested that he should drop Latin and take extra English. His father wrote a pathetic letter to Ward in which he said that all Englishmen know Latin and he wanted his son to have as good a chance in life as any English boy by learning Latin.

Ward (186) further points out:

... students in colonies study European culture, not because it is imposed on them, but because they want it. Knowledge means power and power with wealth - is what they desire. Because of his knowledge, the white man is in a position of authority. If they can learn what he has learnt, if they can pass the same examinations and gain the same certificate no doubt they will be able to succeed to his authority. Hence comes their indiscriminating thirst for knowledge; hence their anxiety not to deviate at all from the syllabus as devised for English pupils. (186:61)

Ward (186) has also made a distinction between education in French and British colonies. According to him,
French education is more formal and less child-centred, whereas British education does not impose an intolerable strain on the child by teaching a foreign culture through the medium of English at a very early age. British education was based on the indigenous system.

Gradually a change has taken place though the change is according to the whole set of conditions in every individual country. In most of the colonies after independence there is a revival of interest in their own languages. Forty years ago it was impossible to get educated people in Ceylon to take any interest in Sinhalese and Tamil. People were more interested in English. In Africa, people considered that their own dress was for informal wear and that European dress was a sign of smartness for educated people. The revival of interest in the Sinhalese and Tamil languages and cultures is now in full swing in Ceylon, and African dress is universally worn on state occasions in Ghana. (186)

in Historical perspective of the languages

Language problem as it exists in Pakistan will be discussed in its historical perspective with special reference to the educational set up from pre-British rule
to this time in the following section of this chapter.

In Pakistan there is considerable linguistic diversity. At present, English is the official language and Urdu and Bengali are the two national languages of Pakistan. Punjabi, Sindhi and Baluchi are the regional languages of West Pakistan.

Before the establishment of Pakistan, the learning of languages took different turns due to social, economic, cultural and political reasons. It will be useful if an historical perspective in regard to changes in the field of education is made.

Pakistan and India shared a common history before 14th August, 1947. Muslims and Hindus had been living together in the sub-continent for centuries.

When the language diversity before the British rule is examined, it becomes obvious that Persian and Arabic were the two languages of culture and civilization for Muslims, and Sanskrit for Hindus. Most of early education was imparted in the mother tongue along with some arithmetic and accounting which followed the traditional patterns. Persian, Arabic and Sanskrit were studied by the cultured class and by those who aspired for higher learning. According to Hasan (61) the "religio-humanistic" system of education was prevalent at that time in India.
In the early days i.e. prior to 1813, the East India Company inspite of being extremely busy in strengthening its footing politically and economically made some sporadic attempts to promote oriental learning in the shape of the Calcutta Madrissa and the Sanskrit College, Banaras, established in 1781 and 1792 respectively. Hastings, the first Governor-General of British territories in India, while discussing the role of Madrissa in his Minute of April 17, 1781, stated that it was established to promote the growth and dissemination of the liberal knowledge of the East and the science of Muslim jurisprudence. Similarly, the Sanskrit College was to preserve and cultivate the Hindu laws, literature and religion. Hastings, being a scholar of Persian and possessing a good knowledge of Bengali and Urdu, was in favour of promoting oriental learning. The Fort William College was an attempt to train the employees recruited in England but it also served the above stated purposes. Whatever progress was made in modern Indian languages and particularly Urdu through the Madrissa, College or the Fort William College was in fact to serve the particular needs of the company. (151, 60, 29)

The earliest endeavours to give a European look to the existing system of education was started by missionaries, private societies and individuals. The Baptist Mission College at Serampore and Bishop's College at Calcutta were
two examples of this kind. Their prime object was to proselytise the people. In spite of the fact that the East India Company encouraged them by issuing grants, these schools could not attract the public. The people took a suspicious view of their education. Muslims and Hindus were aware of the English education's proselytising purpose. (151)

The Charter Act of 1813 was the first to grant legislative recognition to Indian education. It stated the following two objectives very clearly:

1. The revival and improvement of literature and the encouragement of the learned natives of India.

2. The introduction of the knowledge of science among the inhabitants of the British territories in India. (151:22)

Grant was an advocate of the adoption of English as the medium of instruction. His reasons for such a change were both political and religious. In his observations he emphasised communicating the "light and knowledge" to "erring Hindus" and providing "the best remedy for their disorder." (151:62-83)

In July 1823, the Governor General in Council constituted the General Committee of Public Instruction for the following purposes:
1. To ascertain the state of public education
2. To submit suggestions and measures for better instruction
3. To introduce useful knowledge
4. To improve the moral character. (151:53)

The Court of Directors in the despatch of February 18, 1824 doubted the utility of teaching oriental literature, but the Committee of Public Instruction did not agree with this view. In its letter of August 18, 1824, it presented reasons for retaining the oriental subjects of study with a blending of the Oriental and European knowledge wherever it would be necessary. It appears that this stand of the Committee was responsible for the controversy between the Orientalists and the Anglicists. The former were in favour of the use of classical languages i.e. Persian, Arabic and Sanskrit, as medium of instruction and the latter upheld the use of English as medium of instruction. This controversy lasted for almost a decade and there was no sign of compromise between these two groups. (151)

In 1835, Macaulay wrote his Minute which gave a new direction to the educational system in India. In the new system of education, English was to be used as the only medium of instruction and all the money appropriated was to be spent on the cultivation of "a knowledge of English literature and science through the medium of the English language." (151:131)
Macaulay's views were endorsed and approved by the Governor General in Council in the Resolution of March 7, 1835.

The decision was not acceptable to the Orientalists. When William Bentinck handed over his charge to Lord Auckland, they pressed again for their demands. But Lord Auckland in his Minute agreed with the views of the Anglicists and quietened the Orientalists. (151)

In 1837, English was substituted in place of Persian as the language of administration of the Government.

So great was the encouragement given to the English language that in 1844 the Government asked the Council of Education and the local committees to prepare a list of students studying in the English institutions "for a fair prospect of employment in the public service." (60:90)

All this had a far reaching effect on the cultural and national life of the people of India. Some of the Indians were impressed by the Western knowledge and ideas imparted through English. Raja Ram Mohan Roy started a college at Calcutta in 1816 and with the cooperation of David Hare, a rationalist watch-maker, established a society for the promotion of Western education.

Sir Syed Ahmad Khan and Hali were staunch supporters of modern sciences and European learning. They played a great role in inspiring the Muslims for Western education.
As the Muslims had been ruling over India for about 900 years before the advent of British rule, they were exasperated by the British Government, when the allowances for indigenous Muslim education were discontinued and furthermore when a policy of religious neutrality in education was adopted. Sir Syed Ahmad and Hall realized that in spite of the fact that the Muslims were justified in their dislike and reluctance to participate in the government's system of education, they were likely to suffer a lot by neglecting Western education. (11)

Aziz (11) noted that the spread of the English language was restricted to the upper classes of society in accordance with the "Filtration Policy" adopted by the Government. The "Filtration Policy" aimed at educating the upper classes who in turn would educate the lower classes. Education of the masses as well as the development of the vernacular were thus neglected. This led to the division of society into social classes which had little in common with each other. The people, who had received English education, were in a minority and those who had not far exceeded than in number. It seems that English education was being adopted by the people for political, economic and religious gain and it did not take roots in the soil.
Inspite of the increasing popularity of the English language, some voices of dissent were still heard. For example, Sir Syed (155) writes: "The students experience great difficulties in mastering the English language and before any perfection is achieved the time for acquiring knowledge passes away." (155:2)

Sir Syed Ahmad Khan, although a staunch support of English, doubted the logic of making it the medium of instruction. Mahatma Gandhi (51) expressed a similar view. He stated:

I say without fear of my figures being challenged successfully that today India is more illiterate than fifty or hundred years ago, and so is Burma, because the British administrators when they came to India, instead of taking hold of things as they were, began to root them out. (51:734-735)

In 1854, the Wood Despatch generally known as the "Magna Carta" of English education in India, brought forth a new scheme of education in India. It recognised the importance of the modern and classical Indian languages but did not part with the Anglicist philosophy of using English as the only medium of instruction.

The following are some of the main features of the Despatch which were proposed as a first step towards coordinating educational activities in India:
1. Establishment of a Department of Public Instruction
2. Establishment of the Universities
3. Education of the masses
4. Secularization of education
5. Grants-in-aid system for the private schools

As far as the languages were concerned, the despatch appears to be ambiguous. In the case of modern Indian languages, it recognised their importance; but on the other hand, the official patronage and the problem of earning a livelihood left no alternative for the natives but to attend schools where the medium was English.

The Government was establishing new schools and discouraging private enterprise. At the same time, the Christian missionaries were getting grants-in-aid due to their special type of education. This type of treatment was likely to keep the Indian languages with a lower status.

Later on, the Indian Education Commission of 1882, the Indian Universities Commission of 1902 and the Government of India Resolution of 1904 urged the use of mother tongue as the medium of instruction. But of all these Government Pronouncements, the Resolution was more specific in its approach to the teaching of the mother tongue.
At the same time, the spirit of Nationalism was taking root in the country. The people wanted to free India from British rule. Consequently, the imitation of Western ideas and literature started giving way to the development of local themes and the vernacular. The general attitude of the public was reflected by the writings of Iqbal and Tagore.

Keeping in view the general mood of the country, the Government of India realized that it was necessary to improve the elementary and the indigenous system of education.

It was also indicated in another Policy Statement - the Resolution of 1913 - that the scholars who had completed their education only in the vernacular were exceptionally efficient.

A similar motion was made in the Imperial Legislative Council in 1915 by K. Rayningar. He pleaded for the vernacular to be the media of instruction and English the second compulsory subject in secondary schools.

In the Calcutta University Commission Report of 1919, the use of the mother tongue was considered to be an effective means of mental training which had long been neglected in the school system of India.

In 1937, Mahatma Gandhi's Scheme of Basic Education, or Wardha Scheme, attempted to bring primary education closer to the needs of the common man. Its main features were service to the community, learning by doing and the vernacular as the medium of instruction. (11)
But on the other hand the use of English as the medium of instruction was also encouraged at school level. The Six Year National Plan of Educational Development 1951, which was the first coordinated effort to reorganize the educational system of Pakistan, proposed the establishment of more English type public schools. Later a plea for their expansion was also made by the Commission on National Education 1959. The Second Five Year Plan 1960-65 not only endorsed the policy of the Commission in favour of English medium residential schools but made these schools a part of the national development plan. In the Third Five Year Plan, 1965-70, the continuance of these schools was encouraged. (11)

Since the establishment of Pakistan, an enormous amount of money has been spent on these schools because they emphasize on espirit de corps, and the development of the qualities of leadership and initiative.

Accordingly it is hoped that these schools will produce men of character, personality and disciplined habits.

Regarding the use of the national and regional languages as media of instruction in West Pakistan, the Commission of 1959 made a recommendation that in the case of multilingual groups, the best results are achieved when the mother tongue of the pupils is used as the medium of instruction up to class V and the national language studied as a subject from
the third grade onwards replacing the mother tongue as the medium of instruction from class VI. In Peshawar, Pashto is mostly used as medium of instruction in the first five classes and Urdu is introduced as a compulsory subject from the third grade. In Sind, the majority of the schools have Sindhi as the medium of instruction and Urdu as a compulsory subject. There are also some schools which teach all the subject in Urdu and also teach Sindhi as a compulsory subject. In the case of the Panjab and Baluchistan, Urdu is the medium of instruction throughout the school, from class I to X.

The state of English seems to be anomalous. Throughout the British rule and even after the establishment of Pakistan, the use of English, particularly as the medium of instruction, at all levels has been opposed. But the use of English as the medium in the Public Schools, which are modelled upon the English Public Schools is always given special attention. Missionary schools where the medium is English are considered prestige schools.

The basic philosophy of these schools where the medium of instruction is English appears to contradict the views expressed in the Report of Commission on National Education 1959 in support of the use of the national language as the medium of instruction. It is stated in the Report that:
Education in a foreign language places an enormous strain on students, forcing them to memorize and to spend an undue proportion of their time on learning the language. On the other hand, education in the national language enables the students to devote more time to the acquisition of knowledge and the development of their intellectual capabilities. It leads to original thinking and promotes facility of writing. It develops imagination, initiative and creative thinking. (123; 289)

In the New Education Policy, 1970 it is realized that the basic criteria in selecting the right medium of instruction are its ability to help students to:

1. acquire knowledge as effortlessly as possible
2. communicate with clarity and objectivity
3. think critically and creatively.

It is further emphasised in the New Education Policy 1970 that the continued use of English as distinct from the study of English as a language cannot of course be justified as it tends to defeat the basic educational objectives. (113)

Newspaper Reports and Views of Educationists

As we shall see below, newspaper reports which reflect public feelings on the language issue.

A.K. Cornelius (34) said that thinking power depends on expression, and can only take place in one's own language.
Sayed Shabir Hassan Sokhari (173) pointed out that the potentialities of a nation can only flourish if the use of a second language is replaced by the first language. A person will not acquire self-confidence when using a second language.

During Urdu Week, Syed 'Abdullah (172) in a meeting while favouring the change-over said,

"Dispose English fever by taking Urdu Aspro"

Karamat Hassan Jaffery (84) in the same meeting, said that a man cannot be a complete man unless he is brought up in his own language. Real expression is only possible through his own language.

Qudrat Ullah (136), a distinguished scientist, while addressing the 10th All Pakistan Medical Conference, said that a nation cannot progress with the use of a foreign language. He further pointed out that students spend so much time on learning English that other subjects are ignored. This is the main cause of their failure and disappointment.

In an editorial of "Hashriq", the views of Qudrat Ullah were corroborated and it was emphasized that the potentialities of the nation are being paralyzed by the use of English.
Hamid Ahmad Khan (58) very emphatically supports the cause of the Urdu language. His critical insight and wisdom have exposed the psychological realities. He is of the view:

"Aa kahaan aazmein mera aazam, aik sami le haveli he...

"Saeed daa ba realt ho, realt na saaeed daa, realt na saaeed daa ka haiz bhi saaeed, saaeed, saaeed, saaeed. Saale, saaeed...

"Koi naa, koi naa... saeeed daa saeeed daa, saaeed daa na saeeed daa, saeeed daa na saeeed daa ka haiz bhi saeeed, saaeed, saaeed, saaeed.

"Koi naa, koi naa... saeeed daa saeeed daa, saaeed daa na saeeed daa, saaeed daa na saeeed daa ka haiz bhi saeeed, saaeed, saaeed, saaeed.

"Zindagi mein saheb ka wafa, saheb mein saheb, saheb mein saheb, saheb mein saheb... saheb mein saheb... saheb mein saheb...

"Zindagi mein saheb ka wafa, saheb mein saheb, saheb mein saheb, saheb mein saheb... saheb mein saheb... saheb mein saheb...

"Ab kuch acha hai ke saaeed daa ki darazay pakki tin aabi ki yaad zindagii zindagii...
"It is futile to cook one's own food in someone else's pot."

"Even a scientist, no matter how great an inventor he may be, thinks with his own mind. It may be the mind of a scientist or that of a common man like me. Its basic characteristic is that it works for more with the help of words than with sensory pictures. And what are those words? Mostly, they are those which his cultural language goes on wearing, without any inconvenience, into the chain of his thoughts. His thinking falters wherever it is obstructed by the slightest inherent incompetency of a foreign tongue. To think in someone else's language is like thinking with someone else's mind. That is why our mental labours, through the media of a foreign language, look like an attempt at copying others' thoughts."

"We ought to learn a lesson from the fact that although we have been speaking and writing English for the last a hundred and fifty years or so, our contribution towards the treasure of scientific thinking is so meager that its quantity has not the least proportion to our great number and our acknowledged intelligence."

"The time has now been reached when the portals of science should be opened to the cultural languages of Pakistan so that the masses may benefit by scientific insight. Were it a law of nature that wisdom could only be talked in English, the possibilities of progress would have permanently come to an end in Norway, Denmark, France, Germany and Russia."

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In spite of the fact that the above mentioned thinkers support the change-over from English to Urdu, they do not want to abandon the English language, due to its international importance. In the same way, some of the educationists consider that the study of English is indispensable. Their views are presented below.
in this Abdul Naque (59) presents his view by stating that Urdu should be given a proper place but at the same time, the importance of the English language need not be reduced.

Norman Jenison (43) has made suggestions in support of English for Pakistanis. He is of the opinion that:

> English is undoubtedly the most widely used medium of international communication in the world today. This fact ought not to be obscured by any political or emotional considerations. Apart from anything else, it would be just plain bad business, if Pakistan were wilfully to neglect the valuable asset which she has inherited in the English language. The results achieved by international scholarship are made available to the world through publications in English and if Pakistan is to benefit by and contribute to this work, her scientists and scholars must know English. (43:2)

The importance of English as a foreign language has been very appropriately observed in the Report of Commission on National Education 1959. (123) According to the Report, English is a widely spoken language in the world. It is the medium of international communication and information. It provides the means by which scientists, technologists and professional experts can keep in touch with current developments in the world. It is forcefully recommended that all educated people should have a knowledge of this world language.

In Hamoodur Rahman's Report (124) the importance of English is emphasised due to its international status. It is stated that all the books for higher studies are available
4. English, almost being the "Lingua Franca" of the world, serves at present as the "Lingua Franca" between the two wings of Pakistan.

5. Its valuable wealth of literature brings one nearer to the understanding of western civilization and culture.

6. A knowledge of English opens up a person's prospects of employment at home and abroad.

In view of the above arguments it may be safely concluded that the study of the English language is an indispensable and essential need of the time. But the use of English as the medium of instruction has become an issue which needs to be resolved.

**Bilingualism**

The investigator has already mentioned how the extent of a person's knowledge of a second language is conditioned by a variety of social, economic, cultural and political situations in almost every country of the world today. The term "Bilingualism" has been used in different senses in accordance with their varying approaches.
Current literature reveals that though the term "Bilingualism" seems plain and definite, it carries a variety of meanings and interpretations. The range of meanings extends from a colloquial knowledge of the mother tongue plus a very casual acquaintance with another language to the other extreme where the word may be used to indicate an ideal state of perfection in both the languages. (103)

The term "Bilingualism" is compounded from the prefix 'bi' meaning 'two' and a stem derived from the Latin 'Lingua' meaning 'a tongue'.

Leopold (94) is of the view that bilingualism is the ability to speak two languages which are spoken equally well for all the purposes of life.

According to Weinreich (189) bilingualism is the "use of two languages alternately by the same person." (189;8)

These definitions do not appear to be feasible to Mackey (101). He believes that there are many types of bilinguals and all bilinguals are not equally proficient in the use of a second language. He adds that bilingualism should be considered a relative concept. Its definition should be limited to the kind of language activity involved in the use of two or more languages. The number of languages involved, the type of languages used and the influence of one language upon another should be considered.
According to Brooks (19) bilingualism is quite a complicated state. The following quotation makes his point clear:

Bilingualism cannot be defined as the ability to speak two languages, nor can it be considered as a stage eventually reached after prolonged experience with a second language. Rather bilingualism implies the presence in the same nervous system of two parallel but distinct patterns of verbal behaviour. These include not only the overt facts of vocabulary, structure and phonology but also the inner predisposition that guide the selection of the elements of discourse and separate sets of concepts to which meanings are referred. If, when in conversation in a second language, a speaker's language behaviour both overt and internal is characterized by adherence to the concepts and the patterns of the second language rather than of the mother tongue, we may call the speaker at least with reference to this cultural linguistic and semantic area - bilingual. (19:41)

In the Report of the Central Advisory Council for Education Wales (139) it is stated that bilingualism implies the simultaneous learning of, though not necessarily an equally proficient control over, two languages by an individual child.

A uncamp (10) points out another condition of bilingualism, "In which two languages exist side by side in a country, each spoken by one national group, representing a fairly large proportion of people." (10:9)
Stern (169) in a report on bilingualism distinguished between 'compound' and 'coordinate' bilingualism. According to him 'coordinate' bilinguals keep the two languages separate, whereas in 'compound' bilingualism the individual understands the code of one language in terms of the other.

Williams (192) regards coordinate bilingualism as true bilingualism. He suggested that a bilingual person has no difficulty in code switching as he does not translate from one code to another. According to him, a direct link exists between thinking and verbal expression in the two languages and that the command of a second language is not limited to the overt aspect of language such as vocabulary, sentence patterns and phonology, but also includes the ability to think in that language.

The following are the views of those psychologists and educationists who proclaim that the equal mastery of two languages is an ideal concept, which is very rare.

Atkins and Nutton (9) believe that a bilingual having an equal command of both languages is "a mythical personage". (9:19)

West (191) is of the same opinion. He says that "bilingualism which consists in perfect mastery of two languages is extremely rare." (191:58)

Malherbe (103) finds a difference between 'bilingualism' and 'equi-lingualism'. Equi-lingualism means equal ability
in two languages. Walherbe states that it is "unmitigated nonsense" to consider this "unapproachable ideal of perfectability in both languages" as the only acceptable criterion of bilingualism. According to Walherbe, bilingualism does not necessarily mean equi-lingualism. He, further, stressed that the question ought not to be "Is a man bilingual?" but "How much, or to what extent is he bilingual?"

This "how muchness" can be graded like steps on a ladder, depending, largely on the purpose for which bilingualism is required. (103:27)

Singer (154) states his point of view in the following words:

Actually bilingualism and monolingualism can be thought of as opposite extremes of a continuum for each aspect of language. Only rarely does a bilingual approach the ideal of perfect achievement in all aspects; in fact, most people do not attain this goal in the vernacular. (154:446)

It may be noted that no universally acceptable definition of bilingualism has thus far been given. This may be one of the reasons why the mass of research on bilingualism has led to a host of contradictory conclusions.

The Faculty of Education of the University College of Wales in its Pamphlet No. 1, 1953, expressed anxiety over the absence of an accurate definition of the term and the effect this has had on the results.
United States at the age of ten. Lowie was quite successful in retaining his German while learning English and he developed both of them into adequate creative instruments. He writes:

I am impressed with the difficulty of mastering a single language, let alone two languages, in the fullest sense... (The bilingual) suffers in either tongue when judged by the highest standards... he also has insight not granted in quite so vivid a manner to others. (62:396)

The popular impression that a man alters his personality when speaking another tongue is far from ill-grounded. When I speak German to Germans I automatically shift my orientation as a social being. (62:396)

Hyburn (144) says that the teaching of English side by side with the mother tongue does not create any hindrance. He goes on to say that there is sometimes a false antithesis set up between English and the mother tongue. It is wrongly supposed that if the latter is emphasized, the former suffers. As far as the teaching of English in schools is concerned, the mother tongue can be of the greatest assistance directly or indirectly. Any emphasis laid on the mother tongue will have a good effect on the standard of English. Other things being equal, strength in the mother tongue will mean strength in English work put into improving the standard of the mother tongue will show itself in an improvement in English.
Unfavourable Views. There are others, who consider that bilingualism should be discouraged because of its unfavourable effects.

Viljoen (184) puts forward the opinion of South African educators, who are of the view that if it is regarded from a purely linguistic standpoint, it is a doubtful privilege to be educated in a bilingual country. Learning one language well is a sufficiently intricate business for the first few years of school life, and in a bilingual environment lasting confusion very often results from an imperfect mastery of idiom.

Sir W. Risley (142) states that in Indian schools, much of the practice of committing to memory ill-understood phrases and extracts from text-books or notes may be traced to the scholars having received instruction through the medium of English before their knowledge of the language is sufficient to enable them to understand what they are taught.

The educational ill-effects of bilingualism as observed amongst school children in India are summarized in the Report of the Calcutta University Commission (138) as follows:

1. Lack of responsiveness
2. Lack of interest
3. Saturation and inability to assimilate
4. To compare the intelligence of bilinguals and monolinguals at 10th class level

5. To compare the intelligence of bilingual girls and monolingual girls at 10th class level

6. To compare the intelligence of bilingual boys and monolingual boys at 10th class level

7. To compare the intelligence of bilinguals and monolinguals at 6th class level

8. To compare the intelligence of bilingual girls and monolingual girls at 6th class level

9. To compare the intelligence of bilingual boys and monolingual boys at 6th class level

10. To compare the achievement of bilinguals and monolinguals at 10th class level

11. To compare the achievement of bilingual girls and monolingual girls at 10th class level

12. To compare the achievement of bilingual boys and monolingual boys at 10th class level

13. To compare the intelligence of bilingual boys and girls at 10th class level

14. To compare the intelligence of monolingual boys and girls at 10th class level
15. To compare the intelligence of bilingual boys and girls at 6th class level
16. To compare the intelligence of monolingual boys and girls at 6th class level
17. To compare the achievement of bilingual boys and girls at 10th class level
18. To compare the achievement of monolingual boys and girls at 10th class level.

Significance of the Problem

The psycho-social concomitants of bilingualism are different from country to country. In America the language of the State is that used as the medium of instruction irrespective of the language of the home or locality. In Canada due to religious allegiance Roman Catholic children even from English-speaking homes as a rule receive instruction in French. In the case of Switzerland, the child is taught through the language of the place where he lives. The language of the home is not considered. (103)

In Pakistan English due to its historical background has attained a prestige value and education in it constitutes a mark of culture or status.
at present, although the switch-over from English to the national languages is being emphatically insisted upon and the government is keen for it, the importance of English for higher education and scientific knowledge is not being reduced. In the case of job opportunities, those who are educated in the English medium schools are given preference.

In these circumstances the middle and the higher status people wish to send their children to the schools where the medium of instruction is English. Parents keep in view the social, academic and economic gains at the time of admitting their children in these schools. This type of attitude is not particular to Pakistan. Parents have the same feelings wherever there are the same conditions in other parts of the world.

In Wales and Eire, parents keeping in view the future prospects of their children, consider that:

The best medium to make money by is the English language ... if you want to enjoy the luxuries of life ... the only way to do so is by learning English well. (39:6)

English for them has a bread and butter appeal. The same is the case in Pakistan, though at the same time there is widespread scepticism regarding the justification of clinging to English. Social and educational type problems are now giving way to the idea that the effects of learning
in a foreign language should be explored. Researches conducted in foreign countries—particularly those where the language of the home is not the medium of instruction (America, Canada and Switzerland etc.)—could help as guidelines for further researches if it were not for the fact that, owing to different socio-cultural factors, their findings are not always relevant to conditions prevailing in Pakistan.

At this time when the controversy is at its height between those who are in favor of using one of the national languages—Urdu—as the medium of instruction at all levels and those who favor English as the medium of instruction, this research on the effects of bilingualism upon intelligence and achievement of the children should certainly be of great help in reaching some positive decisions.

Hypotheses

1. There is no difference between bilinguals and monolinguals in intelligence at the 10th class level

2. There is no difference between bilinguals and monolinguals in intelligence at the 6th class level
3. There is no difference between bilinguals and monolinguals in achievement at the 10th class level.

4. There is no difference between bilingual boys and bilingual girls in intelligence at 10th class level.

5. There is no difference between monolingual boys and monolingual girls in intelligence at 10th class level.

6. There is no difference between bilingual boys and bilingual girls in intelligence at 6th class level.

7. There is no difference between monolingual boys and monolingual girls in intelligence at 6th class level.

8. There is no difference between bilingual boys and bilingual girls in achievement at 10th class level.

9. There is no difference between monolingual boys and monolingual girls in achievement at 10th class level.
Procedures and Methodology

Sample. Lahore proper was selected as English and Urdu medium schools are found there.

The total sample was drawn from the following schools:

1. St. Anthony's School
2. Cathedral School
3. The Convent of Jesus and Mary
4. Government Central Model School No. 1
5. Madrassa-Tul-Basat

Bilinguals were taken from the first three schools where the medium of instruction is English. Monolinguals were taken from the last three schools where the medium of instruction is Urdu.

The following table gives the number of children taken from each school.
### Table 1. Number of Children from Each School

<table>
<thead>
<tr>
<th>Schools</th>
<th>Boys</th>
<th>Girls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Class 10</td>
<td>Class 6</td>
</tr>
<tr>
<td>English Medium:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. St. Anthony's School</td>
<td>30</td>
<td>21</td>
</tr>
<tr>
<td>2. Cathedral School</td>
<td>20</td>
<td>29</td>
</tr>
<tr>
<td>3. Convent of Jesus &amp; Mary</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urdu Medium:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Government Central Model</td>
<td>50</td>
<td>50</td>
</tr>
<tr>
<td>School No. 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Madrasa-Tul-Banat</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Lady MacClagan School</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100</td>
<td>100</td>
</tr>
</tbody>
</table>

Table 1 shows that the total number of the boys was 100 at secondary level and 100 at the primary level, and in the case of the girls the total number was 100 at secondary level and 100 at primary level.

It should be pointed out from Table 1 that the sample of 50 children in most of the groups was taken from more than
one school as some of the children had to be dropped on account of the non-availability of the full information required for research purposes. Some of them were not taken due to their linguistic background assessed by Hoffman's Schedule (66) and in the case of age, extreme cases were dropped keeping in view the influence of the age factor. These factors were responsible for reducing the number of children. In the schools from which 50 children were taken, number of students was larger although the procedures for selection were the same in all the schools.

The following figure gives an outline of the sample.
Figure 1 shows that the total sample consisted of 400 children who were taken from two types of schools. Two hundred children were from schools where the medium of instruction is English and 200 children from ones where the medium of instruction is Urdu. As the comparison was to be made at the primary and secondary levels, between bilinguals and monolinguals and between boys and girls among bilinguals and monolinguals, each group was kept equal in number with 50 children.

It should also be pointed out that the administration of the tests at the primary level was started from class 5 and at secondary level from class 9. During the administration of the test, however, children at both the stages were promoted to the next class, so that those in class 5 went into class 6 and those in class 9 went into class 10.

Tools. As the bilingual and monolingual children at the 10th and 6th classes in this research belong to the same urban community with similar national and cultural backgrounds, studying in equivalent grades in their English medium and Urdu medium schools, no special procedure was needed to match (a) school class, (b) urban-rural differences and (c) social and cultural differences.
Information on age was obtained through (a) school records and (b) a proforma (Appendix B).

Information about the children's socio-economic and educational backgrounds was obtained by the same proforma (Appendix B).

The language background of the children was estimated by Hoffman's Bilingual Schedule. (66)

The intelligence of the children at secondary and primary levels was tested by the tests given below:

1. Scholastic Aptitude Test (149)
   This is a group verbal test

2. Raven's Standard Progressive Matrices (137)
   This is a group non-verbal test

3. Burt's Arithmetic (written graded Test Problem (27)
   This is a group test

4. Koh's Block Design Test (87)
   This is an individual performance test.

Achievement of the 10th class children was tested by taking the results from the Board of Intermediate and Secondary Education, Lahore. For the 6th class children there was no standardised test or any other common basis like matric results.
Delimitations

1. The study was limited to the schools of Lahore City.

2. As no standardized achievement test was available, the investigator had to depend on the results from the Board of Intermediate and Secondary Education at the 10th class level. For 6th class children there was no suitable test.

3. Information about the socio-economic and educational backgrounds of the children was limited to the responses of the questionnaire. This factor was not controlled as it was assumed that approximately those students go to English medium schools whose socio-economic and educational background is higher and approximately those go to Urdu medium schools whose socio-economic and educational background is lower.

4. With the exception of Scholastic Aptitude Test, other three tests were not standardized on Pakistani children.
A review of the related literature on the effects of bilingualism and monolingualism upon the intelligence and achievement of the children will be given under the following headings:

1. Biographies of bilingual children

2. Empirical studies in which bilingualism was found to have no effect upon intelligence

3. Empirical studies in which bilingualism was found to have a favourable effect upon intelligence

4. Empirical studies in which bilingualism was found to have an unfavourable effect upon intelligence

5. Empirical studies in which bilingualism was found to have no effect upon achievement

6. Empirical studies in which bilingualism was found to have a favourable effect upon achievement

7. Empirical studies in which bilingualism was found to have an unfavourable effect upon achievement
8. Views and empirical studies in which bilingualism was found to have a favourable effect upon emotional adjustment.

9. Views and empirical studies in which bilingualism was found to have an unfavourable effect upon emotional adjustment.

Studies will be dealt with under their appropriate headings chronologically. As some of the studies reviewed fall under more than one category according to the nature of their findings, references will be made to them under each of the relevant sub-headings.

In compiling the review of previous related views and researches, special acknowledgements are due to Darcy (37), Paul and Lambert (127) and Hasan (61).

Biographies of Bilingual Children

A survey of the literature on the intellectual and educational effects of bilingualism will include some of the biographies which are—though not based on experimental methods—important from an historical point of view. Huszen and Cogger (120) supported the biographical method by stating that it gives a multidimensional picture of simultaneous and successive factors in the behaviour and circumstances
of a child. Millicent Shinn (152) made another point by mentioning that this method provides information of one stage after another and the steps by which changes come about. Even comparative statistics are helpless in this kind of elaborate account. He further stressed that if an information of a thousand babies is required, it will be more economical and authentic to have a careful watch of a single baby.

To keeping in view the qualitative aspects of this method, some of the biographies are given below.

Jules Nonjat (143) gave an account of the language development of his son, Louis, in his biography. The family lived in France. The child learnt two languages simultaneously, German from his mother and French from his father. Each parent consistently talked to the child in only one language. Nonjat called this method 'one person - one language'. Vildomec (183) summarized the results of Nonjat's observation:

The pronunciation was since the beginning that of aunilingual child in both languages. Bilingualism did not lead to backwardness in talking. ... parallel development of phonetics, morphology and syntax took place in both languages. The child soon became aware of his bilingualism and translated messages from one language into the other. He also acquired the abstract idea of language. These good results in the opinion of Nonjat cannot be attributed exclusively to the method of 'one person - one language' although it is the safest and least tiring way. (183:30)
It was further reported by Monjar in 1923 to test that Louis used either language with equal facility in ordinary conversation. He preferred French for technical matters, as it was the school language, and German for literary self-expression. According to test the two languages in this case were not alternative in function.

Pavlovitch (126) recorded the speech development of his son, Novaham, who learned Serbian and French simultaneously. The boy's pronunciation of each language was like that of a native child. He was not handicapped in either of the languages. He did not use incongruous or absurd words for the same concept in either language. Like Louis Monjar, he was quite successful in acquiring both languages but the same balanced opportunities to participate in both the languages were not available to him.

The linguist Leopold (94) gave a very thorough and systematic account of the speech development of his daughter, Hildergard, whose speech was recorded by means of phonetic transcription. She learned German from her father, while at the same time she learned English because the family lived in America. A complete speech development diary was kept up to the age of fifteen. During the first two years her speech was minutely studied and the vocabulary effect of one language on the other was observed. Diplomatic
phrases and syntax were affected to a very small extent in
the later years but pronunciation, morphology and word
formation remained unaffected. On the whole, German was
more affected than English. Leopold mentioned the advantage
of bilingualism for Hildergard - "disregard of form in
favour of content was probably favoured by bilingualism." (94:181)

According to Leopold the bilingual child was likely
to pay more attention to the things referred to, the
situations and actions described and the ideas expressed
than to the phonetic forms pronounced. Bilingualism tends
"to break down the intimate association between form and
content." (94:187)

Leopold said,

Hildergard never clung to words as monolingual
children are often reported to do. She did not insist
on the exact wording ... I attribute this attitude of
detachment from words confidently to bilingualism. (94:187-18

Here fathers might be charged with being biased and
selective in their observations. They might notice positive
and praiseworthy aspects of development and turn a blind
eye to the negative side of their children. Hussen and
Conger (120) have also pointed out these flaws in
biographies.

According to Hussen (119) biographies are biased
selection, unreliable recording, inefficient gathering and
processing of data and unwarranted interpretation.

Despite all this, the impact of biographies on further scientific researches is quite obvious. They are responsible for exciting widespread interest in the scientific study of children.

Empirical Studies in which Bilingualism was Found to Have No Effect upon Intelligence

The studies in this category consist of those which found that bilinguals and monolinguals were of equal performance in verbal and non-verbal intelligence tests.

Pintner (130) compared 256 bilingual and monolingual children from the third and fourth grades of a New York City school in the Pintner Non-Language Test. The children were divided into foreign and American groups. The foreign group consisted of Italians, Germans and Poles but the number of German and Polish subjects was small.

When separate nationality groups were compared, the median Mental Ages on the Pintner Non-Language Test for the Germans and Poles were above the median Mental Age for the Americans; whereas, the median Mental Age for the Italians was below that of the Americans. For all the foreign children combined, the median Mental Age was the same as that of the Americans on the test.
In studying the percentage of foreign children who reached or exceeded the nation verbal age of the American group, Hintner found no difference between the foreign group as a whole and the American group on the Hintner Non-Language Test.

The results indicated that exposure to a second language was not detrimental to the performance on the non-verbal intelligence test.

Feingold (48) conducted an investigation to study the effects of bilingualism on verbal intelligence. Two groups were selected. One was a first generation immigrant group and the other consisted of native-born, "Anglo-Saxon" Americans. The immigrant group consisted of English, Scots, Jews, Germans, Italians, Swedes, French, Irish, Poles, and coloured. The Army Alpha Test was administered after some modification. 567 high school students were taken as the subjects for study in one public high school of Hartford, Connecticut. The socio-economic level of the subjects from various racial groups was reported to be approximately the same. The test was given to all the children on entering school; two years later to all those who became lower juniors; and again the next year to all seniors in the senior year. Feingold stated that the mental differences between American-reared children of foreign races and children of Anglo-Saxon origin, whether judged by
freshmen or by junior scores, were too small to be significant. As the average IQ of the Italian freshmen was 97, compared with an average IQ of 103 both for the Americans (native born) and for the Jewish group. The average IQ of the Italian seniors was 96 compared to the American native-born seniors' average IQ of 100 and the Jewish seniors' average IQ of 96.

Barry (37) pointed out that the variables which might affect intelligence were not controlled. In addition, the number of children in each racial group, with the exception of the American native-born which numbered 264 and the Jewish group which numbered 146, was far too small to warrant any significant conclusions.

Marsie (38) tested 656 American-born Japanese children ranging in age from 10 to 15 years and a non-selected sampling of American children of the same ages on the Army Beta Test, a non-verbal test. When the strictly rural children were excluded, there were 500 children to whom English was the more familiar language and whose scores could be adequately compared with the American groups on which the norms for the two intelligence tests, which were administered, were based.

The mean scores of the two racial groups of the 10 and 11 year old subjects were practically identical on the Army Beta Test. Here the Japanese variability was greater. At
year 12, the Japanese subjects were superior to the Americans in the symbol-right and number-comparison tests and in the tests dealing with space relations. The Americans at the 12-year level were superior to the Japanese in the picture completion test.

The author pointed out that though the differences in general mental capacity were slight, the Japanese subjects were inferior to the children of American and Northern European parentage in mental processes involving memory and thinking based upon concrete visually-presented situations of a non-verbal character and in mental processes involving acuity of visual perception and recall and tenacity of attention.

According to Harrie the majority of his cases were taken from the less desirable residential sections of the cities and towns in California which might lead one to suspect the advisability of comparing the Japanese subjects with the American subjects on whom the tests were standardized.

Murdock, Maddow and Berg (118) investigated the relationship between intelligence and the acquisition of English among Jewish girls in Grade 7. The Otis Scale-Advanced Examination, the Thorndike Word Knowledge Test and the International Test were administered to 149 school girls, aged 11 to 13. The girls were divided into three categories with the help of a questionnaire. These linguistic groups
were: (i) all Hebrew speakers, (ii) both language speakers and (iii) all English speakers. Correlations between the questionnaire and the verbal intelligence and attainment tests differed very little from those between the language scale and the non-language test.

The level of mental ability of the subjects in verbal and non-verbal tests was related to the predominance of the use of English in the home. There was no causal relationship between bilingualism and poor mental ability.

Lester (97) conducted research to see the results by administering performance tests to foreign-born children and to check the advisability of using such tests in the sectioning of children in school system. The subjects of the study consisted of a retarded group of 26 first grade children, 18 of whom came from homes where Polish was always spoken and eight of whom were English-speaking monolinguals.

The 1916 Revision of the Stanford-Binet Scale and several performance tests were administered to all the subjects. The performance tests included the Saguin Form Board, the Maze and Foal, the Knox Cube, the Healy Form Board, A, the Koh's Block Design, and the Porteus Maze. These performance tests were administered as group tests.
The average Stanford-Binet IQ for the foreign group was 80.5 and that for the English-speaking groups was 61. The correlation co-efficients between the average mental ages achieved by the foreign groups on the Performance Tests and on the Stanford-Binet scale range from .28 to .60. The foreign group was superior to the English-speaking group on the Nealy and Knox Cube tests.

The results of this study could not be generalized as the number of the subjects was small and unequal in each language group. The administration of the performance test as group tests may have invalidated the results of this study.

Ladd (89) compared English-speaking groups with foreign-speaking groups in the Haggerty tests. The groups were equated for chronological age and non-language mental ability. A comparison between an English-speaking group and a foreign-speaking group who spoke Hebrew in the home, showed that the part-Jewish group had an average 14 six points higher than the English-speaking group in the Haggerty Test and two points higher in the Non-Language Test. The entirely Jewish group had an average IQ five points higher than the English group on the Haggerty Test and three points higher in the Non-Language Test.

The results clearly showed that there was no significant difference between the English-speaking and the foreign-speaking groups.
Hoffman (66) conducted research on 69 Jewish and 25 Italian children from Grades 5 and 6. Hoffman's Bilingual Schedule, the Otis Intermediate Test (Verbal) and the Pintner Non-Language Test were administered to the subjects. The correlations between Hoffman's bilingual schedule and the Otis Intermediate Test were .24 for the Jewish group and -.35 for the Italian group. The bilingual group was divided into "high" and "low" bilinguals and compared. The results showed that both groups were equal on verbal and performance tests and it was certain in this research that bilingualism was not handicapping.

Hill (63) undertook a study to find out the effect of bilingualism upon the measured intelligence of children of Italian parentage. Bilingual children of the first, third and sixth grades in a New Jersey elementary school were matched with monolingual children in respect of chronological age, sex, mental age, IQ, and socio-economic status. Bilingualism was determined by means of a questionnaire of Italian language background, a test of comprehension of spoken Italian, three tests of Italian word meaning and additional information given by the visiting teacher of the school.

On the first grade level, 36 bilinguals were compared with 36 monolinguals on the language and non-language sub-tests of the Stanford-Binet Scale. Results showed that the monolinguals were superior to the bilinguals on those
tests "involving a moderate understanding of the English language", whereas the bilinguals were superior to the monolinguals on the tests involving "an extremely high degree of efficiency of understanding and use of the English language."

On the third grade level 36 bilinguals were matched with 36 monolinguals. The Haggerty Intelligence Test, Beta I was used to match the groups as to mental age. The Fintner Non-Language Test, List 8 of the Morrison-McCall Spelling Scale, and the Wittmer Cylinder Test were administered on these groups.

On the sixth grade level 50 bilinguals were compared with 50 monolinguals. The Otis Self-Administering Examination, Form A, List 8 of the Morrison-McCall Spelling Scale, the Army Beta Group Examination and the Wittmer Cylinder Tests were given to the groups.

Results showed that the Italian children who heard and spoke Italian at home and the Italian children who heard and spoke English at home were equal in scores on verbal, non-verbal and performance tests. According to Hill, the effect of bilingualism on the measured intelligence of Italian children who hear and speak Italian at home, may be disregarded.
One thing should be noted here in this research which Barcy (37) has also pointed out. It is that since the bilinguals and the monolinguals had been matched with respect to mental age, differences in intelligence test scores could not be expected between them at each respective level.

Arsanian (6) conducted research to determine the relationship between bilingualism and the measurement of mental development. The research was confined to the study of the intelligence and social background of bilingual children. Their ages ranged from 9 to 14. 1,152 American-born Italian and 1,196 American-born Jewish were taken from public schools in New York City.

Bilingualism was measured by the Hoffman Bilingual Schedule with seven additional questions from the Lima score Card to measure socio-economic status. Age-grade status was determined by comparing the age and grade location of the subjects with the model age-grade status of children in all the elementary schools in New York City. The relation was found between bilingualism and age, age-grade status, sex and socio-economic status for each of the racial groups which were studied and comparisons of the results were made for the two experimental groups. The relationship between intelligence as measured by the Piattner Non-Language Test and the Spearman Visual Perception Test, Part I, and age,
sex, race and socio-economic status, were also determined.

On the basis of Hoffman Bilingual schedule the children were divided into high and low bilingual groups at each age level from 9 to 14 years and for each ratio-racial group separately. These groups were equated as to age, socio-economic status and sex. Then differences were discovered between the mental development of low and high bilingual children in each ratio-racial group.

Thirty-eight bilinguals were matched with 39 monolinguals person for person, as to race, sex, socio-economic status and age in months to determine difference in intelligence. The Pintner Non-Language Test and the Spearman Visual Perception Test, Part I, were used.

The investigator found that the extent of bilingualism did not vary significantly from age to age in the groups and ages which were studied. There was no significant difference between the bilingual background of boys and girls taken separately, in either of the main experimental groups. There was a correlation coefficient of -.20 between bilingualism and socio-economic status; a correlation of 0 between bilingual status and age-grade status for the Jewish group and of 0.20 between bilingual status and age-grade status for the Italian group.

Sex differences in intelligence were not statistically significant. The correlation between intelligence and
socio-economic status was positive, slightly varying between .038 and .140.

Using the Pearson Coefficient of Correlation, the investigator found no relationship between bilingualism and intelligence. When the socio-economic status was held constant by the partial correlation technique, there was no change. As far as the measurement of mental ability was concerned, there was no difference between the low and high bilingual groups.

When 53 bilinguals and 54 monolinguals were matched, person for person, as to race, sex, socio-economic status and age in months, no difference was found between these two language groups as to intelligence or age-grade status.

The investigator concluded that bilingualism did not affect favourably or unfavourably the mental development of the children ranging in age from 9 to 14 years.

In spite of the fact that Arsenian’s research was not very reliable, Barcy (37) criticized it on the ground that the abstract and symbolic relation between higher thought processes was not possible without the mediation of verbal symbols. Since Arsenian had not used any verbal test, it was not possible to extend his results to “mental development.” His findings could be interpreted as pertaining rather to performance in non-verbal intelligence tests than to “mental development.”
while concluding, the investigators remarked that, in so far as the population which was studied and the tests which were used in this investigation were concerned, the relationship between intelligence and bilingualism was "practically zero."

They were also of the view that "in other populations, particularly non-Jewish and in younger ones, it is possible that a higher negative relationship between bilingual status and verbal intelligence may exist." (132:259)

Barke and Williams (16) undertook research in which Welsh-speaking bilinguals and English-speaking monolinguals showed an insignificant difference on the Flutner Non-Language Test.

Jones (76) compared ten-year-old urban bilingual children with the same age urban monolinguals in a series of tests comprising a progressive scale of verbal ability. The tests ranged from non-language and concrete verbal material to highly abstract verbal material at the upper end of the scale. A questionnaire was also administered to check the linguistic background. Results did not reveal any statistically significant difference between the bilinguals and the monolinguals.

Stark (165) compared 271 bilinguals and 271 monolinguals in general intelligence. The bilinguals were taken from five "all Irish schools" and the monolinguals from four
"non-all Irish schools" in the city of Dublin. Their age ranged from 10:0 to 12:0 years. They were given the Dawson Mental Tests, which are group intelligence tests and the Passalong Test, which is an individual performance test.

An Irish translation of the Dawson Mental Test, Form B, was made and it has a correlation of .84 ± .02 with the English form of the test. The Irish form was given to the bilinguals and the English form to the monolinguals. A difference in mean score of five points in favour of the monolinguals was found at ages 11 and 12. The differences in mean score between the two language groups at earlier ages were found to be negligible.

Forty-one subjects from each group were compared in the Passalong Test and there was no difference in performance between the bilinguals and the monolinguals.

The results of this research could not be considered so authentic as Jarcy (37) criticized it due to some flaws. He writes:

... aside from selecting subjects of the same age range who attended primary schools in one city, the variables such as socio-economic status, sex and degrees of bilingualism, which might have affected the results, were not adequately controlled. (37:23)

Havighurst and Hilkevitch (63) tested the intelligence of 570 Indian children aged between 6:0 and 15:0 years in several Indian tribes in the plains and southeast of the
United States. The Arthur Point Performance Scale, (Shortened Form), was administered by seven trained examiners. The Hopi subjects performed better than the norms of the white children on whom the full Arthur Scale had been standardized. The children from other Indian tribes were approximately at the norms of the white children. The authors stated that the Indian children could do about as well as white children on a performance test of intelligence.

In the same research, 30 boys and girls of the Sioux tribe were given the Kuhlmann-Anderson Test in addition to the Arthur Point Scale. The results corroborated the above findings; that a performance test was more valuable in the educational placement of Indian children than an English verbal intelligence test.

Narco (37), while reviewing the results of this study, pointed out that it must be kept in mind that results on a shortened form of the Arthur Scale were compared with the norms on the full Arthur Scale. Moreover the number of children in the Sioux tribe who were given verbal and performance tests of intelligence was very small and the degree of bilingualism was not noted.

Spearl (166) conducted research to investigate the effect of bilingualism upon the measurement of intelligence at the American International College. A "survey group" of 6
bilinguals and an "intensive study group" of 32 bilinguals were matched with corresponding numbers of monolingual students with respect to sex, age and intelligence as measured by the Heimwe-Nelson Test of Mental Ability. The intensive study group was matched with the control group on the basis of socio-economic status. Every bilingual subject was required to have learned the two languages at or before entrance into the first grade of elementary school.

The 1937 revision of the Stanford-Binet Intelligence Examination, Form L, was administered on the experimental and control groups. The result showed that there was no statistically significant difference between these groups. A slight inferiority on five of the verbal items of the scale was shown by the bilingual students. However, this slight verbal handicap was not sufficient to affect significantly the mean scores of the bilinguals on the entire scale.

Bacry (37) pointed out that as the two language groups were matched on the Heimwe-Nelson Test of Mental Ability, it might be expected that the differences in their performance on the 1937 revision of the Stanford-Binet would not be significant.

Havighurst, Sunther and Pratt (64) conducted research to study the results on the Goodenough Draw-a-Man Test. 325 Indian children, aged 6 through 11 years, were taken from several Indian tribes in the southwest of the United States.
The Indian children received higher scores than a group of 66 white children of a small mid-western city. The mean I. of the white children was 101.2 whereas the mean Is of the nine Indian groups ranged from 102 to 117.

The authors concluded that the Indian children - especially boys - do well on the test which does not include any necessary use of language. The degree of bilingualism was not noted in this study.

Jones (78, 80) conducted two researches in 1953 and in 1959. He found the same result: there was no significant difference between bilinguals and monolinguals on the non-verbal intelligence tests. In the research of 1953, bilinguals were Welsh-speaking and monolinguals English-speaking. Their performance was equal in mean score and variability.

James (71) investigated the difference between bilingual children and monolingual children on Cattell's Scale I, Non-Verbal Test. The age range of the children was from 8 to 11 years. The groups were equal socio-economically. The classification of the children into bilinguals and monolinguals was made initially by the Headmaster. Hoffman's Bilingual Schedule, after some modification, was administered to both groups in English. Form B was administered to bilinguals in Welsh and to monoglots in English.
Results were converted into IQs and there was no significant difference in intelligence between the two groups in either administration of the test.

Kittell (86) gave the California Short Form Mental Maturity Test to 81 bilingual and 41 monoglot children. The groups did not differ significantly in either mean non-verbal mental ages or total mental ages. Kittell drew the conclusion that the third grade bilingual children did not differ significantly as a group in total mental age from the monoglots.

**Summary.** The general conclusions which emerge from the above mentioned researches suggest that those researches are in the majority in which bilinguals and monolinguals do equally well on non-verbal intelligence tests, while those in which bilinguals and monolinguals do equally well on verbal intelligence tests are in a minority.

Pintner's (130) results after combining Italian, German and Polish children indicated that the exposure to a second language was not detrimental to the performance on the Pintner Non-Language Test. Reingold (48) concluded as a result of his investigation, that the mental differences as measured by the Army Alpha Test, between the American-reared children of foreign races and the American-reared children of Anglo-Saxons, was too small to be considered significant. According to Jarcy (37) results of this
research could not be conclusively significant as the variables which could affect intelligence were not controlled and in addition, the number of children, in each racial group, with the exception of two groups was very small. While the Japanese students of Varisie's investigation performed practically with the same level as did the American students on the Army Beta Test, Bardoch, Laddow and Berg (118) concluded that the level of mental ability of (i) all Hebrew-spoken, (ii) both language spoken, and (iii) all English-spoken was related to the predominance of the use of English in the home on the Otis scale Advanced Examination, the Thorndike Word Knowledge Test and the International Test. There was no causal relationship between bilingualism and poor mental ability. Lester (97) found no significant difference between the performance of a group of Polish bilinguals and a group of English monolinguals on the 1916 revision of the Stanford-Binet Scale or on a group of performance tests. The results of this study could not be generalized as the number of the subjects was small. The administration of the performance test as group tests might have also invalidated the results. Ladd (89) concluded that there was no significant difference between English-speaking monolinguals and Hebrew-speaking bilinguals on the Haggerty Delta Test. The groups were
equated for chronological age and non-language mental ability. Hoffman (66) found that "high" and "low" bilinguals were equal on the Otis Intermediate Test and the Peabody Non-Language Test. Hill (65) found no significant differences between the performance of Italian bilinguals and monolinguals on the Peabody Non-Language Test, the Otis Self-Administering Examination, the Stanford-Binet Scale and the Army Beta Group Examination. It must be noted that Hill matched his groups with respect to mental age on other verbal intelligence tests before he began his investigation. Arsenian (8) found no significant differences between the performances of high and low bilinguals or between monolinguals and bilinguals on the Peabody Non-Language Test or on the Spearman Visual Perception Test. In comparing the results of high and low Jewish bilinguals, Peabody and Arsenian (132) found no significant differences between the scores received by the two groups on the Peabody Intelligence Test. Barke and Williams (16) undertook a research in which Welsh-speaking bilinguals and English-speaking monolinguals showed no significant difference on the Peabody Non-Language Test. Jones (75) found no significant difference between bilinguals and monolinguals on the tests ranging from non-language and concrete verbal material to highly abstract verbal material. Stark (168) found no significant difference
between bilinguals and monolinguals on the Kusbalong Test. The variables such as socio-economic status, sex and degree of bilingualism were not adequately controlled. Havighurst and Hilkevitch's (63) findings indicated that Indian bilinguals could do as well as the white children on a performance test of intelligence. The bilingual and monolingual college students of Spoores (166) investigation did not differ significantly in their performance on the 1937 revision of the Stanford-Binet Scale. However, it must be noted that the investigator had previously matched his groups on the basis of scores achieved in the Henmon-Nelson Test of Mental Ability. Havighurst, Gunther and Pratt (64) concluded that Indian children could be expected to do well in a test of intelligence like the Goodenough Draw-a-Man Test which is a non-verbal. Jones (78, 80) found that there was no significant difference between bilinguals and monolinguals on the non-verbal intelligence tests. James' (71) investigation indicated that there was no significant difference between bilinguals and monolinguals on Cattell's Scale I. Instructions in the case of bilinguals were given in Welsh and that of monolinguals in English. Kittell (86) concluded that bilinguals and monolinguals did not differ on the California Short Form Mental Maturity Test.
Empirical Studies in which Bilingualism was Found to Have a Favourable Effect Upon Intelligence

The studies in this category consist of those which found that bilinguals were superior to monolinguals in the performance of verbal and non-verbal intelligence tests.

Saville and Hughes (40) tested 1,694 Jewish and non-Jewish children ranging in age from 8½ to 14½ years by the Northumberland Test of Intelligence. Results, as reported by the authors, revealed that the Jewish boys showed on the average a superiority of about one year in intelligence, while the girls showed an average superiority of slightly less than a year, as compared to the non-Jewish children.

It could be guessed that the Jewish children might have been superior in initial mental ability to the non-Jewish children.

The authors themselves admitted that the Jewish children's socio-economic status was higher than the non-Jewish children's. One must regard the findings with caution as these variables were not controlled which might account for the results.

Burke (15) undertook an investigation to compare the general intelligence of children in certain bilingual and monolingual schools in South Wales. The author applied the term bilingual to "schools in which the mother tongue is used
almost exclusively with the younger children but a second language becomes progressively the chief medium of instruction in the upper classes." (15:237)

395 bilingual children were selected from three mixed bilingual schools near the mining district of South Wales where Welsh is the dominant language. In answer to a questionnaire, 86.2 percent of the children replied that they spoke Welsh at home.

302 children were taken from two schools in a mining district of the same country. In this district, English was the dominant language in school and at home but there was a compulsory 45-minute Welsh lesson in each of these schools every day. In answer to a questionnaire, only 3.4 percent of the boys and 3.9 percent of the girls replied that they spoke Welsh at home. The age of both the groups ranged from 10 to 14 years. The home environment of the bilinguals was "slightly superior" to that of the monolinguals.

The Vintner Non-Language Intelligence Test and the Northumberland Standardized Test were administered. The author stated that the Northumberland Test, which is a verbal test of intelligence, was used chiefly as a check upon the non-verbal test.

Results showed that in the case of the Northumberland Test, the monolinguals had an average superiority of .8 of a
year whereas on the Weintner Non-Language Test, the bilinguals had an average superiority of .44 of a year. Performance of the boys on the non-verbal test was superior to that of the girls in both language groups. Barke was of the view that girls' inferiority might have been due to lack of interest in the material.

While concluding the results, Barke advocated the use of a non-verbal test of intelligence in the following words:

All that can be claimed is that we have here an indication that bilingual children will not prove inferior to monolinguals (with a similar social environment) in an improved intelligence test from which the linguistic element is excluded ... It is indicated that under conditions of bilingualism, intelligence tests of a non-verbal nature should be used in preference or in addition to those in which success is conditioned by linguistic ability. (15:249-250)

Seidl (150) conducted an investigation to determine the effect of bilingualism on intelligence when tested by verbal and non-verbal tests. 120 bilinguals and 120 monolinguals were selected all of whom were American-born but of Italian descent, from the public schools of the same general area of New York City. Their ages ranged from 8 years, 6 months to 11 years 3 months. The two groups were equated in age. A questionnaire was used to divide the subjects into linguistic groups. The parents'
occupations were determined with the help of the Goodenough Revision of the Barr-Taussing Scale. The match was not person for person, as the median for the monolingual group was in the skilled labour classification and the median for the bilingual group was in the semi-skilled labour classification.

A statistical analysis of the results showed that the bilinguals were superior to the monolinguals on the Arthur Point Scale of Performance Tests. The average IQ of the bilinguals was 100.41 as against an average IQ of 96.21 for the monolinguals. In verbal test the opposite was the case.

Barry (37) stated that Seidl had not given any reason for the higher scores of bilinguals on the Arthur Scale.

Stark (168) conducted research to measure the general intelligence of 271 bilinguals from five "all-Irish schools" and 271 monolinguals from four "non-all-Irish schools" in the City of Dublin. Their age ranged from 10 to 12 years. The Dawson Mental Tests of group intelligence tests were administered. An Irish translation of the Dawson Mental Test, Form B, was made and it was found to have a correlation of .84 ± .02 with the English form of the test.

When the Dawson Mental Test, Form A, was administered in English to 104 monolinguals and to 65 bilinguals who had been selected at random from the original language groups
who had received the Dawson Mental Test, Form B, a comparison of mean scores showed the bilinguals age 10 to be superior to the monolinguals of the same age by 13 points. At age 11, the mean scores of the bilinguals was seven points higher than the mean scores of the monolinguals. Both of these differences were found to be statistically significant.

As a result of these findings, Stark concluded that children of "innate verbal facility" may find early bilingualism an asset to their mental development.

The variables such as socio-economic status, sex and degree of bilingualism were not adequately controlled. This might affect the results of this study.

Darcy (35) conducted research to investigate the effect of bilingualism on the intelligence of children. Children were matched for age, number, socio-economic status and sex. 212 American children of Italian parentage ranging in age from 2 years 6 months to 4 years 6 months were selected. A rating scale was used to classify the children into bilinguals and monolinguals. Out of the 212 subjects, 106 were selected for the monolingual group and 106 for the bilingual group.

Both the monolingual and bilingual groups were divided into four age levels, each covering six months of chronological age and there was a person-for-person matching in each group at each age level as to sex and also as to socio-economic
status as determined by paternal occupations. The Goodenough Revision of the Barr-Taussing Scale was applied to classify the fathers' occupations.

The 1937 Revision of the Stanford-Binet Scale, Form L was used as the verbal test and the Atkins Object-Fitting Test Form A as the non-verbal test.

When the difference in the mean IQ's on the Atkins Object-Fitting Test was determined for both language groups, a statistically significant difference was found in favour of the bilingual group. The mean IQ of the 106 monolinguals on this test was 88.95 with a standard deviation of 13.17 whereas the bilinguals obtained a mean IQ of 97.50 with a standard deviation of 15.30. The differences in mean IQ's were consistently in favour of the bilinguals when the two language groups were divided according to age and sex as well as when the age groups and sexes were combined.

This research was well designed as most of the variables such as age, number, sex and socio-economic status were controlled.

Darcy (16) conducted another research with 235 bilingual, Puerto Rican children to determine the effects of bilingualism on verbal and non-verbal intelligence test. They were taken from the 5th and 6th grades in two public elementary schools. Their ages ranged from 10 years 4 months to 14 years 10 months. Spanish was spoken and heard in their
homes and English at school. The Pintner General Ability Test, Verbal Series, Intermediate Test, Form B and the Pintner General Ability Test, Non-Language Series, Form K, were administered.

Results showed that the bilinguals obtained significantly higher marks on the non-verbal test than on the verbal test.

Louis Lereu and Suzanne Kohut (96) conducted a study to compare the monolinguals and bilinguals on a verbal task and to correlate their verbal learning performances with intelligence and social adjustment.

The monolingual and bilingual groups of a parochial school were selected. Twenty-eight were boys and thirty-two girls. Their age ranged from 9 to 11 years. Thirty were bilinguals and thirty monolinguals. Bilinguals were from first generation Americans.

The language background of the children was estimated by a "Bilingual Questionnaire". They were matched in chronological age, intelligence, sex and socio-economic status.

Tools used in the study were (i) Columbia Mental Maturity Scale to assess intellectual level, (ii) Roger's Test of Personality Adjustment to estimate social adjustment, and (iii) Micro Utterance-Association Test, a verbal learning task involving seven Hebrew characters presented visually and auditorily.
Results showed that the bilingual children were superior to the monolinguals on Micro Utterance-Association Test. They appeared to have more potential for verbal ability. The authors pointed out that the findings of their study were quite contrary to most of the past researches which did not acknowledge the linguistic capacity of bilinguals and showed the inadequacy of bilinguals in language acquisition and development.

Correlation was found between intelligence and verbal ability in the case of monolinguals and not in the case of bilinguals. The authors pointed out that although it is recognized that personality factors usually affect verbal learning, in the case of this study the social maladjustment factor was not related to the Micro Utterance-association Test (verbal test) in either group. They assumed that this might be due to the fact that both groups were homogeneous in their social maladjustment score and were within the average range for social maladjustment as reported by Rogers' norms.

Peal and Lambert (127) conducted a study to examine extensively the effects of bilingualism on the intellectual functioning of children and to explore the relations between bilingualism and school achievement and students' attitudes to the second language community.
Ten year old children from six Montreal French schools were selected without taking into consideration the school grade. All schools were classified as middle class by the school commission.

The degree of bilingualism was determined by 'Word Association Test', 'Word Detection Test', 'Vocabulary Test', and 'Subjective Self-Rating Score' after some modification.

One hundred sixty-four subjects were selected for study, 75 monolinguals and 89 bilinguals, 96 boys and 68 girls. They were matched on socio-economic class, sex and age.

(i) Lavoie-Laurand-Desu Group Test of General Intelligence, (ii) Raven Progressive Matrices Test (sets A, Ab, and B), and (iii) Thurstone Primary Mental Abilities (Space, Figure-Grouping, Perception, Number and Verbal Meaning) were administered.

Results showed that the bilingual group performed significantly better than the monolingual on verbal as well as non-verbal intelligence tests. The authors point out that on none of the subtests did the monolinguals exceed the bilinguals.

The authors were of the view that a child after experiencing two languages, becomes intellectually flexible, superior in concept formation and has a more diversified set of mental abilities.
Their attitudes towards English Canadians were significantly healthier as estimated by the Attitude-to-English scale. Their parents had positive views about learning the second language.

Arguing from the large sample results, the authors stated that their bilinguals instead of suffering from 'mental confusion' or a 'language handicap' were profiting from a 'language asset.'

**Summary:** The above quoted researches, where bilinguals showed superiority over monolinguals on the verbal and non-verbal intelligence tests, are not many in number.

Davies and Hughes (40) found that the mean scores of Jewish bilinguals were superior to those of non-Jewish monolinguals on the Northumberland Test of Intelligence. The authors pointed out that the results must be viewed with caution as the socio-economic status of Jewish children was higher than that of the non-Jewish children.

Barke (15) showed that bilinguals performed better than monolinguals on the Pintner Non-Language Test but that the opposite happened on the Northumberland Test. In the case of Seidl's (150) research, the results tend towards those of Barke. Bilinguals were superior to monolinguals on the Arthur Point Scale of Performance Tests and inferior on the verbal intelligence test. Stark (168) concluded that the Irish bilinguals were getting higher scores than the
monolinguals on the Dawson Mental Tests of group intelligence tests. Darcy's (35) findings showed significant difference in favour of the bilinguals on Atkins Object-Fitting Test. This research was well designed as most of the variables such as age, number, sex and socio-economic status were controlled. The same trend exists in another research by Darcy (36). Puerto Rican bilinguals obtained significantly higher marks than the monolinguals on the non-verbal test of intelligence. Louis Leraa and Suzanne Kohut (96) found that first generation American bilinguals showed superiority over the monolinguals on Micro Utterance-Association Test. The variables like age, intelligence, sex and socio-economic status were well controlled to make the results more conclusive. Peal and Lambert (127) found that their bilingual group performed significantly better than their monolingual group on verbal as well as non-verbal intelligence tests.

Empirical Studies in which Bilingualism was Found to Have An Unfavourable Effect Upon Intelligence

The studies in this category consist of those, which found that bilinguals were inferior to monolinguals in the performance of verbal and non-verbal intelligence tests.
Brown (26) studied 951 children of nine different nationalities. Their parents were foreign-born. The Stanford-Binet Test was administered to the children. The author found that bilingualism created some difficulty in testing these children.

According to Barcy (37):

... In general, pupils who had attended an American school for one or two years received no lower scores on the Stanford-Binet Scale than they received when this scale had been translated into their native tongues. (37:26)

In this investigation, some of the children who were fairly proficient in English speech had mental ages from 6 to 16 months higher when tested by the Stanford-Binet scale in their native tongues than in English.

Barcy pointed out that the translation of Stanford-Binet Scale was not an equivalent of the scale in English.

Piéron and Keller (133) conducted an investigation. The children in the kindergarten, first, and second grades of three schools located in Youngstown, Ohio, were divided into an English-speaking group and a foreign group. On the basis of parents' nationalities, the children's language classification was made. The English-speaking group included the American-white, Negro, English, Canadian, Scotch, Irish, and Welsh populations while the foreign group consisted
mainly of children of Italian and Spanish parentage. 367 children were in the English-speaking group and 674 children in the foreign group.

A special revision of the 1916 Stanford-Binet Intelligence Scale was given to all the subjects. This special revision was prepared and administered by the Service Bureau of Youngstown having correlation of .97 with the 1916 Stanford-Binet Intelligence Scale. The average IQ of the English-speaking group on this revised Binet Scale was 92 while the average IQ of the foreign group was 84.

The Pintner Non-Language Group Test was administered to the second grade children in one of these schools. On this test, the English-speaking group obtained an average IQ of 109 whereas, the foreign group got an average IQ of 103. Seventy-three percent of the children in the English-speaking group and 82 percent of the children in the foreign group made higher IQ's on the Pintner Non-Language Test than on the Binet Revision.

A series of performance tests including Healy Construction Puzzle, the Wittmer Cylinder Test, the Pintner Cube Test and the Mare and Foal Test were administered to a group of children who were given the 1916 Revision of the Stanford-Binet Scale. The correlations between the Binet and the performance tests were .64 for the English-speaking group and .48 for the foreign group.
The authors concluded that children from homes in which a foreign language was spoken, received lower scores on revisions of the Stanford-Binet scale than they did on tests in which a minimum of English is used.

Saer (145, 146) undertook a series of experimental investigations to determine the effect of bilingualism on the measurement of intelligence. 1400 children from 7 to 12 years of age were taken from five rural and two urban districts in Wales. In six of these districts Welsh was the mother tongue but the children of rural districts learned English at school while those of the urban districts learned English at school and English was also the language of their play activities. The seventh was a rural district in which English was the mother tongue. Information concerning the socio-economic background, home language and age of each child was obtained but no attempt was made to match monolinguals with bilinguals with respect to these factors.

The 1916 Stanford-Binet Scale and those tests in the 1911 Binet Scale and Burt’s Revision which had been omitted from the Stanford Revision, were given to all the subjects. Those tests were translated into Welsh for those whose mother tongue was Welsh. The author was of the view that the mother tongue is the best oral medium by which a just estimate of a child’s mental capacity can be gained.
The results on these tests indicated that median IQ of the urban bilingual group was 100 while that of the urban monolingual group was 99; the rural bilingual group median IQ was 86 as compared with the rural monolingual group whose median IQ was 96. The author stated that the monolinguals in the rural districts were superior to the bilinguals but there was little difference between the performances of urban monolinguals and bilinguals. He further suggested that the inferiority of rural bilinguals became consistently greater in degree with each year, from 7 to 11 years of age. He explained this trend in terms of the conflict and "mental confusion" encountered by the bilingual children. He considered this conflict a result of having Welsh as the language of play and English as the school language. He regarded it as a conflict between the child's "self-regarding sentiment or positive self-feeling" and his "negative self-feeling or instinct of submission." On the other hand, urban bilinguals were not handicapped due to the "Cathartic Influence" which was the result of using English as the play language.

Jones (76) made an analysis and found significant differences between the mental ages of urban and rural monolinguals and bilinguals in favour of the urban groups. He further criticised Saer's explanation of the inferiority
of the rural bilinguals in terms of the "mental confusion" arising from the conflict of "negative and positive self-feelings." According to Jones the verbal inferiority of the rural bilinguals might be due to the premature introduction of English as a medium of instruction to Welsh-speaking children who were not familiar with the language when they entered school. Jones inferred that Saer's inquiry indicated not so much retardation in the intelligence of rural bilinguals, as retardation in scholastic and linguistic attainment. Hurt (26) was of the view that linguistic ability and linguistic attainment exerted upon these tests a special and positive influence of their own.

West (191) had also remarked that the superiority of the rural, English-speaking group was due to the following reasons:

1. Great opportunities for the development of the English language
2. Availability of a large number of inexpensive books
3. Utilization of better methods of instruction in English than in Welsh.

West drew two conclusions from Saer's results. First, it was a disadvantage to be educated through a foreign medium; and, secondly, it was an advantage to have one of
the major languages, like English as one's mother tongue. As rural bilinguals were inferior in both English and Welsh, it was likely that this led to lower assessments of their verbal intelligence. Smith (161) and Roman and Mead (121) had also reported the verbal inferiority of rural children. These results might suggest that the more intelligent people had moved to the urban areas.

Saer's study was a pioneer attempt to discover the effects of bilingualism on verbal intelligence, and it served to point out the need for ascertaining the reasons for the differential performance of the two groups in urban and rural areas. The numbers were large enough to make a fairly representative distribution of intelligence in the two groups. However, Saer did not apply any statistics and the study was not well-controlled.

Saer (147) conducted another study with 939 students from the University College of Wales. A verbal intelligence test was administered. The results of this investigation corroborated the findings at school level; a "clear superiority of the rural monolinguals over the rural bilinguals." But Jones' (76) statistical analysis did not confirm these findings. Jones reported that no statistically significant difference between rural monolinguals and rural bilinguals was present. Saer's contention of the "mental confusion" being of a permanent nature was not confirmed.
He also reported that the rural and urban monolinguals had not shown any statistically significant difference; but in the case of urban and rural bilinguals a statistical difference existed in favour of the urban group, though to a lesser extent than in the case of the school children. This might be due to selective migration to the towns.

Colvin and Allen (33) tested 50 American and 50 Italian children who were attending grades five to eight in the public schools of Providence, Rhode Island. The average chronological age of the American group was 13.12 years and of the Italian group 13.11 years. The average pedagogical age of the Americans was 11.77 and of the Italians 12. School records indicated equal intelligence. All the subjects were given the National Intelligence Test and the 1916 Stanford-Binet Scale. The average IQ on the Stanford-Binet for the American group was 92 while the Italian group received an average IQ of 91 on this scale. A very slight difference was found in favour of the Americans. On the National Intelligence Test, the Americans received an average IQ of 89 and the Italians an average of 74. Here the difference is greater and in the same direction i.e. in favour of the Americans. The Italian group scored lower in the group test of verbal intelligence due to their linguistic deficiency. Their lesser difference in the Binet
was due to the fact that the items in the test did not have so much linguistic content. It was most likely that the considerable difference between the groups might be due to the highly verbal nature of the National Intelligence Test, with respect to the weight which is to be given to the linguistic factor. When viewing the intelligence test results, the authors state that:

while verbal ability may raise intelligence scores in some instances above the level of the actual intelligence of the person examined, its most marked effect is noted under the condition when the lack of such a facility unduly lowers such scores. (3313)

Fintner (130) conducted an investigation to determine whether or not verbal group tests are a valid measure of the intelligence of foreign children. The National Intelligence Test, Scale A, Form I and the Fintner Non-Language Test were administered to 286 children from the third and fourth grades of a New York City school. The children were divided into foreign and American groups. The foreign group consisted of Italians, Germans and Poles though the number of German and Polish children was too small to have any consequence.

Results indicated that all the medians fell below the American median when compared on the National Intelligence Test.
items, according to Farmer these were the items which called
for mental processes involving memory and abstract thinking
based on meanings or concepts represented by the verbal
symbols of the English language.

The author cautioned against attaching much importance
to the language handicap in the interpretation of the low
scores. He stated, "It must not be overlooked that the
existence of a pronounced language handicap may in itself be
indicative of a lack of capacity to master the language
adequately." (39:84)

As all the sample did not have equal opportunities
to master the English language, the author suggested that
I's derived from it should be accepted with extreme caution
as indices of innate differences.

Even though the socio-economic status of the Japanese
children was lower than that of the Americans, the author
considered that this need not have influenced the difference
between the verbal scores of these groups.

Wang (185) conducted a study at Ohio State University
in which he paired native-born white students with 34
Chinese students, 158 Negroid students, and 45 Russian
students with respect to college attended, class, sex and age.
Ohio State University Intelligence Test was administered on
all the subjects.
The results showed that the native-born subjects averaged nine steps above the Chinese in the General Information test. In the number series of the test, the Chinese averaged 6.5 steps above the native-born subjects. There were no outstanding differences between the scores of the Russians and native-born white students or between the scores of the Negroes and native-born white students.

Yang stated that the inferiority of Chinese was due to the language difficulty and in the case of Negroes and the Russians, the language factor did not appear to be an appreciable one. The author, while admitting that his subjects were selected and not representative of these racial groups in the country at large, concluded that:

One should not draw any definite conclusion concerning the relative intelligence of racial groups not thoroughly Americanized and Americans, unless there is some control of the language factor. Non-verbal or performance tests might be more equally valid for several or all races. (185:106)

The cultural and linguistic background of the different racial groups was not inquired into, otherwise the extent of their inferiority might have come to light.

Wead (111) tested 276 American-born, Italian children and 160 American children from grades 6 to 10 in several New Jersey public schools. The Vitek Group Intelligence Test, form A and B, was given and the results were compared with the norms. Biographical data for the Italian
subjects were collected which included such information as the languages spoken in the homes, the dates of immigration of the parents and their social status. Only .05 percent of the group were comparable to the average American child's parents in socio-economic status. Since a correlation coefficient of .62 was found between forms 1 and 2 of the Otis Group Intelligence Test, the results of Form A only were used in the analysis.

The difference between the mean indices of brightness on Form 1 of the Otis Group Intelligence Test for the American and Italian groups was 17.33 in favour of the Americans. Only 6 percent of the Italians exceeded the median index of brightness of the Americans and only 7 percent of the Italians exceeded the median 11 of the Americans.

When the Italians were classified into four social status groups, it was found that only 12 children or .05 percent of the group could be classified as fully comparable with the average American child in the community. According to A. D. this factor as well as the language factor and the length of time the fathers had spent in the country, affected the scores of the Italian children. He states that classification of foreign children in schools where they have to compete with American children on the basis of group intelligence test results alone, is not a fair evaluation of the foreign child's innate capacity.
According to Carey since this investigation did not control those factors, other than the language factor, which may have had some influence on the scores of the Italian children, it is impossible to conclude just how much weight the language factor had in lowering the scores of the foreign group.

Jamieson and Sandiford (70) tested approximately 760 Indian children in southern Ontario. All the children could speak English but not with the facility of native-born white children of corresponding social status. It was also found that 45 percent of the children could speak an Indian dialect and many of the remaining 55 percent could understand, although they could not speak the dialect. On the Chapman socio-economic scale, the children received an average score of 13 against a norm of 56.

The National Intelligence Test, Scale 1, Form 1, the Pintner-Cunningham Primary Mental Test, the Pintner Non-Language scale and the Pintner-Atterson Achievement scale were administered.

The Indians were found to have a median IQ of 50 on the National Intelligence Test, whereas the median IQ of white Americans was 100. The Indian pupils who used English exclusively obtained averages of 5.6 points higher than did those who habitually used an Indian language. Results from the Pintner Non-Language Test indicated that the Indian children
were only 3 points inferior to normal white children who were monolinguals; in fact, equal to the performance of other English-speaking children. In the performance test, however, the Indian children were even more inferior, being 7.5 points below the white children. In the Pintner-Cunningham Primary Mental Test, they obtained a median of 77.9 which is attributed, in part, by the authors to the fact that the instructions were given in English and they may not have understood them all.

The authors stated that the results pointed to a severe language handicap on the verbal tests since the monolinguals surpassed the bilinguals on all tests except the Pintner-Patterson scale of Performance Tests, and the difference between the two groups in this test was not so significant as the differences between the two groups on the other three tests.

Higg(141) studied the results of one of the St. Louis testing programmes to determine the effect of a language handicap upon the results of intelligence and achievement tests. The children who were tested were in grades three to eight of the public schools of St. Louis. The foreign children were identified by their answers to the question, "What foreign language is spoken in your home?". The tests used are the National Intelligence Test, Scale A, Form I; the Thorndike-McCall Reading Test, Form I and the Woody-McCall Arithmetic Fundamental Test, Form I.
For the purpose of this section, however, this review will be confined to a report of the differences in the results on the National Intelligence Test between the 3,130 native-born white children and the 140 Italian children. The median IQ of the native-whites was 104.85 while that of the Italian group was 91.43. This showed a significant difference in favour of the native-born whites on this intelligence test. According to Riggs, the lower performance of the 'foreign group' was due to their linguistic deficiency. Riggs did not take into account the social status of the groups nor other variables controlled to any great extent in the study. This should be kept in view while concluding the results of this study.

Pintner (131) tested 430 children in grades 1A and 1B in three elementary schools in New York City. The Pintner-Cunningham Primary Mental Test and the Pintner Primary Non-Language Test were administered. Nationality was the criterion used to divide the children into two groups—the English-speaking and the foreign-speaking. Foreign-speaking children were from Italian, Bohemian and Jewish parentage.

In School A, the mean score of the Italian-speaking bilingual group, on the Pintner-Cunningham Test, was 8.3 points less than the mean score of the monolingual group. In terms of standard deviation, the bilingual group was .89
below the monolingual group. On the Pintner Non-Language Test, however, the bilingual group had a mean score only 4.02 points lower than the mean score of the monolingual group and in terms of standard deviation, the bilingual children on this test were .31 below the monolinguals.

In School B, where the second language was Bohemian, the bilingual group exceeded the monolingual group on both the tests.

In School C, the bilingual group and the monolingual group performed equally. According to Pintner, this might be due to the fact that no real division existed in the language background of the pupils in this school.

Pintner's studies tend to indicate the same conclusion, i.e., the bilinguals were inferior to the monolinguals in the verbal tests.

Barcy's (37) criticism is quite appropriate as neither the nationality groups nor the language groups were matched as to socio-economic status and there was only a very general and subjective determination of bilingualism.

Pintner's findings corroborated his earlier investigations (133, 130) indicating the inferiority of the bilingual in verbal intelligence tests.

Barke (15) conducted research to compare the general intelligence of children in certain bilingual and monolingual schools in South Wales. The author applied the term bilingual
Schools in which the mother tongue is used almost exclusively with the younger children but a second language becomes progressively the chief medium of instruction in the upper classes. (15:437)

Three hundred ninety-five bilingual children were selected from three mixed bilingual schools near the mining district of South Wales where Welsh is the dominant language. In answer to a questionnaire, 86.2 percent of the children replied that they spoke Welsh at home.

Three hundred two children were taken from two schools in a mining district of the same country. In this district, English was the dominant language in school and at home but there was a compulsory 45-minute Welsh lesson in each of these schools every day. In answer to a questionnaire, only 3.4 percent of the boys and 3.9 percent of the girls replied that they spoke Welsh at home. The age of both the groups ranged from 10 to 14 years. The home environment of the bilinguals was "slightly superior" to that of the monolinguals.

The Fintner Non-Language Intelligence Test and the Northumberlaid Standardized Test were administered.

The monolingual performed better than the bilinguals on the verbal test whereas in the case of the non-verbal test the bilinguals were better than the monolinguals. Barks attributed the inferior performance of the bilinguals on the verbal test to "Linguistic difficulties."
Bartho’s research is valuable because he used a non-verbal test in addition to a verbal test to see the performances on both type of tests.

Mitchell (114) conducted a research to see the effect of bilingualism upon the thinking process when, in a non-verbal test, instructions were given in the first and in the second language. Two hundred thirty-six Spanish-speaking pupils in grades one to three were taken from a public school in Minnesota. The Otis Group Intelligence Test was administered in English and in Spanish to all the subjects. The mean IQ which was obtained from the Spanish testing was greater in each of the three grades than the mean IQ which was secured from the English testing. For the three grades combined, the mean IQ was 9.28 points higher when the test was administered in Spanish.

The author concluded that bilingual children worked under a serious handicap, especially in the lower grades of the elementary school. The difficulty was considered to be "general language handicap" rather than one in any specific phase of intelligence which the tests measured. The results showed poor performance of bilinguals on non-verbal tests when the instructions were given in the second language.
Eidel (1950) conducted an investigation to determine the effect of bilingualism on intelligence when tested by verbal and non-verbal tests. The 1916 revision of the Stanford-Binet scale was used as the verbal test of intelligence and the Arthur Point Scale of Performance Tests as the non-verbal scale. One hundred twenty bilinguals and 120 monolinguals were selected, all of whom were American-born but of Italian descent, from the public schools of the same general area of New York City. Their ages ranged from 9 years 6 months to 11 years 5 months. The two language groups were equated in age. A questionnaire was used to divide the subjects into linguistic groups. The parents' occupations were determined with the help of the Soodemough Revision of the Barr-Taussing Scale. The match was not person for person, as the median for the monolingual group was in the skilled labour classification and the median for the bilingual group was in the semi-skilled labour classification.

A statistical analysis of the results showed that the monolinguals were superior to the bilinguals on all verbal tests. The average IQ of the monolinguals in the Stanford-Binet Scale was 96.25 as against the average IQ of 91.61 for the bilinguals.

In the performance tests the case was the opposite. The average IQ of the bilinguals on the Arthur scale was 100.41 as against an average IQ of 96.20 for the monolinguals.
Seidl stated that if the Arthur scale was presumed to be a valid measure of intelligence, then both groups would have about equal native intelligence and the inferiority of the bilinguals on the verbal test could be assigned to their language handicap.

Barke and Williams (16) tested 54 bilinguals and 100 monolinguals, ranging in age between 10 years 6 months and 11 years and 6 months. The following tests were administered:

1. The 1932 Mental Survey Test of the Scottish Council for Research in Education (administered in both - English and Welsh)

2. The Northwestern Standardized Tests of General Intelligence, 1925 Series

3. Non-Language Mental Tests by Tintner

4. The Thorndike Test of Word Knowledge, Form A (administered in Welsh) and Form B (administered in English).

The bilinguals were inferior to the monolinguals in the verbal test given in their second language. There was no significant difference between the two groups when tested by the non-verbal tests. When both groups were given a verbal test in their mother tongue, the difference was even more marked in favour of the monolinguals. The bilinguals
were found inferior in both languages. The bilinguals' inferiority in the mother tongue suggested that since they received instruction at school through English, their requisite knowledge and vocabulary of the first language was insufficient for success in the test.

Harcy (35) wanted to discover the effect of bilingualism on the intelligence of boys and girls of pre-school age. Factors like age, number, socio-economic status, and sex were controlled. Two hundred twelve American children of Italian parentage ranging in age from 2 years 6 months to 4 years 6 months were selected. Out of this number, 127 subjects were selected from the children attending 10 nursery schools in the boroughs of Brooklyn and Manhattan in New York City and 85 subjects from the siblings of children who, at the time of selection, were attending a public school in the borough of Brooklyn. Out of the 212 subjects, 106 were selected for the monolingual group and 106 were classified as bilingual group. A rating scale was used to determine the language background of the subjects. If the child heard and spoke Italian at home always or most of the time and he heard and spoke English outside the home always or most of the time, he was considered bilingual. On the other hand, if the child heard and spoke only English at home and spoke only English outside the home and heard English outside the home always or almost always, he was classified as monolingual
as far as language factor was concerned.

Both the monolingual and the bilingual groups were divided into four age levels, each covering six months of chronological age and there was a person for person matching in each group at each age level as to sex and also as to socio-economic status as determined by paternal occupations. Classification of fathers’ occupations was made by the Goodenough Revision of the Carr-Irwin scale.

The 1937 Revision of the Stanford-Binet Scale, Form L was administered as the verbal test and the Blocks Object-Fitting Test, Form A as the non-verbal test.

The mean IQ of the 106 monolinguals was 98.59 with a standard deviation of 11.47 whereas, the mean IQ of 106 bilinguals was 90.85 with a standard deviation of 11.37 on the Stanford-Binet Scale. The differences in mean IQ’s on this test were also consistently in favour of the monolinguals when the two language groups were divided according to age and sex as well as when the age groups and sexes were combined.

As the bilinguals and monolinguals were matched for number, sex, socio-economic status and age, lower scores of the bilinguals on the Stanford-Binet might show their linguistic inferiority.

Results of this study could be considered as conclusive as the variables affecting intelligence were well-controlled.
Porterier (134) conducted research to study the results on the Ohio State Psychological Test, Form 21, the Hennon-Nelson Tests of Mental Ability, the Terman-McNemar Mental Ability Test and the Iowa Silent Reading Test. These were administered to seniors in the Heart Mountain Relocation Project near Cody, Wyoming, in 1943, 1944 and 1945 respectively.

With respect to the bilingualism of the sample the author states that as majority were first generation Japanese-Americans, the Japanese language may be spoken in their homes, in their social contacts and moreover in their religious life.

Two hundred seniors were in each year. In respect of the distribution of scores, the measures of central tendency and of variability, the centile ratings and the size of the respective groups were very similar for the three years, the 1945 group was used for comparison with the high seniors of all the schools in Wyoming.

The median and quartile scores on the Ohio State Psychological Test for the Heart Mountain seniors were found to be consistently lower than those for all seniors in the State of Wyoming. The median score for the Heart Mountain seniors corresponded to the 47th percentile on the high school senior norms for the Ohio State Psychological Test while the median score for all the Wyoming high school seniors for the same year ranked at the 55th percentile.
The median IQ on the Homan-Selbyon test for the Heart Mountain seniors was 97.61 which is in the lowest quartile of the norms for this test. Only 25 percent of these students were above average on the basis of the norms of the test. The median score on the Homan-Chamber test is equivalent to a mental age of 14 - 16 and only 25 percent of the group had a mental age of 17-2 which is approximately the average chronological age of high school seniors.

The Iowa Silent Reading Test shows that one-half of the Heart Mountain seniors had a reading level in the lowest 35th percentile and that the upper 25 percent had a centile rating of only 64 or above on the Iowa Reading Test. Portinier was of the view that the reading inferiority may have served as a handicap to the students when they took the verbal tests of mental ability.

Jarsie (38) and Yoshiooka (194) had shown the same results in their researches and Portinier confirmed that the Japanese were handicapped in all the tests, most probably because of the verbal nature of these tests.

As the sample was large enough, some weight may be given to these results.

Christine Smith and Lowley (163) conducted an investigation into the effect of Gaelic-English bilingualism on performance in mental tests on behalf of the Scottish Council for Research in Education. A preliminary survey of the test
performances of bilingual children of Lewis, an island in the Hebrides, was conducted. Their ages ranged between 6 and 12 years. Cattell's Non-Verbal Intelligence Test, (Forms A and B), was administered. Form A was administered with the instructions in English, and Form B with the instructions in Gaelic. Results indicated that a statistically significant difference was found between the scores obtained in the two forms of the test in favour of the B, or Gaelic Form. This increase was over and above the allowance which Cattell would attribute to a practice effect. This means that the second language had not improved to the extent of the first language.

The Bangor Survey (13) was undertaken to provide norms for standardized intelligence tests for Welsh-speaking children. About 3,000 children were selected in primary and secondary schools between the ages of 10 and 11 from the county of Caernarvonshire. A bilingual questionnaire was constructed on the pattern of the Hoffman Bilingual Schedule. Subjects were classified into various linguistic groups according to the predominance of Welsh or English in their home environments. Jenkins' Scale of Non-Verbal Mental Ability was administered to the subjects in either English or Welsh depending on the language most familiar to them. Results showed that increasing familiarity with Welsh was
a handicap. Jones (79) statistically analysed this data and found highly significant overall differences between the four linguistic groups at ages 10 and 11. At both ages it was confirmed that increasing familiarity with English was profitable. In the Bangor Survey, only the linguistic background of the subjects was taken into account. Jones made a further analysis by taking into account the socio-economic level of the groups as determined by parental occupations. He stated:

The significant differences in average scores on the non-verbal test of intelligence observed on this occasion arise, apparently, as much from occupation as from linguistic variations between groups. (79, 40)

Jones inferred this conclusion from the fact that the differences were insignificant in bilingual schools but were not so in Welsh schools in rural areas, from where 80 percent of the data in the survey were derived.

The results of this survey, if viewed in the light of occupational differences between linguistic groups, suggested that the evidence was inconclusive with respect to the effects of bilingualism on intelligence. The initial mental ability of the two groups might not have been comparable due to social class differences between them.

Jones and Stewart (62) tested 516 bilingual children from three Welsh-speaking, rural areas and 326 monolingual
children from an English-speaking area. Their ages ranged between 10 years 6 months and 11 years 6 months. A bilingual questionnaire was administered to the bilinguals to see the extent to which Welsh was used outside school. The bilinguals and the monolinguals had a "similar environment", tested by a social questionnaire, Jenkins' scale of Non-Verbal Mental Ability and the Coloured Mental Ability test, which involved reading but not writing, were given to both the groups; in English to the monolinguals and in Welsh to the bilinguals. In the raw scores of both the tests, the bilinguals showed a significant inferiority by comparison with the monolinguals.

The authors stated:

... the bilingual children were significantly inferior to the monoglot children, even after full allowance had been made for the initial difference in the non-verbal test. (B218)

The authors regarded the inferiority of the bilinguals in the verbal test as a linguistic difficulty. This research paved the way for further researches by Welsh psychologists. Subsequently, Jones attempted to find out the reasons for this inferiority.

For this purpose Jones (78) carried out a research in which two randomly selected groups - an English-speaking group and a Welsh-speaking group - were tested. A language
questionnaire was used to classify them into bilinguals and monolinguals. The number of subjects was 115 and their ages ranged between 10.0 and 12.0 years.

The following verbal and non-verbal tests were administered to see the difference between bilinguals and monolinguals:

1. Jenkins' Scale of Non-Verbal Mental Ability
2. The Moray House Intelligence Test, 42
3. Reading Tests:
   a. Schonell's Graded Reading Vocabulary Test. (Mechanical Reading)
   b. Watts-Vernon Silent Reading Test. (Reading Comprehension)
4. Schonell's Silent Reading Test, m. (Test A.4).

The non-verbal test was administered in Welsh to the bilingual group and in English to the monolingual group. The other two tests were given entirely in English to both groups. Results showed that no difference was found between the two groups in mean intelligence or in variability of scores in the non-verbal tests. Highly significant differences were observed in favour of the monolingual group in both the verbal intelligence test and the silent reading test. Jones tentatively suggested that:
... this 'residual' difference was attributable to the fact that the bilingual children, as a result of their environment both in and out of school, have not yet acquired the ability to 'think in English' with an adequate degree of facility and accuracy. (75:117)

According to Jones this deficiency might be the result of attaching importance to the "passive rather than the active aspect" of English as a second language. When the test was given in Welsh, Jones found no significant difference between the scores of verbal and non-verbal tests. Jones attributed this to the assumption that the bilinguals were not handicapped in verbal thinking if the test was given in the bilinguals' first language. Barke and Williams' (16) results were contrary to this. They found that the bilinguals were even more inferior to the monolinguals if tested in their own language.

These contradictory results would suggest that the groups studied by Jones, and by Barke and Williams might have a different cultural level in their homes and hence in their general intelligence, or a difference in the extent of their exposure to English in their environment.

In Jones' study, although reading ability had a considerable influence on the verbal test scores of the bilinguals there were other possible factors, like the method of acquiring the second language, which could account for the inferiority of the bilinguals' verbal test scores.
Altus (3) selected a sample of dull bilingual Mexican children and English-speaking monolingual. They were matched for age, sex and performance in the Wechsler Intelligence Scale. The author administered the verbal and non-verbal sections of the Wechsler Intelligence Scale to observe the different patterns of scores in both groups. Results showed a highly significant mean difference of 17 IQ points in favour of the monolinguals on the verbal section. A close correspondence was found between the verbal and the performance IQs of the English-speaking group. Results of the verbal sub-tests showed the superiority of the monolinguals over the bilingual group.

Altus concluded that the bilingual group was retarded in verbal skills.

Anastasi and Cordova (6) tested 176 Puerto Rican boys and girls in New York City. The children were taken from grades 6 to 8 of a parochial school. They came from a relatively low socio-economic level. Cattell’s Culture Free Intelligence Test was administered. One half of the group received test instructions in English during the first testing session (Form A), and in Spanish during the second testing session (Form B). The order of the languages was reversed for the other half of the group. Split-half reliabilities of Forms A and B in the English and Spanish
versions ranged from .64 to .92. The authors reported that speed played a negligible part in the scores obtained. A marked improvement in the second session, regardless of language was indicated and an improvement in the Spanish-English order in the girls was observed. The overall performance fell much below Cattell's test norms. The authors stated,

Among the reasons for such a discrepancy are the very low socio-economic level of the Puerto Rican children, their bilingualism which makes them deficient in both languages, their extreme lack of test sophistication and their poor emotional adjustment to the school situation. (6:17)

It could be concluded from the results that the scores of the bilinguals in either language were inferior to the test norms. The authors indicated that the language deficiency was responsible for the inferiority of the bilinguals. A marked improvement in the second testing indicated that they became more familiar with the test situation and the language used for the instructions did not affect their performance.

Jones (79) conducted an investigation to find out the relation between intelligence and reading ability. He tested 642 boys and 611 girls with Jenkins' Scale of Non-Verbal Mental Ability in addition to a Reading Test. Subjects were classified into English-speaking and Welsh-speaking
by a questionnaire. The age of the children ranged between 10:10 and 11:0 years. An analysis of variance of the raw scores in the non-verbal test yielded highly significant differences in favour of the monolinguals. The socio-economic factor was not taken into account but the author stated that there was no reason to believe that the groups differed significantly from each other in respect of socio-economic or scholastic conditions.

In the Welsh Joint Education Committee survey, 1954, Jones et al (63) tested 749 children in order to compare the educational attainment of bilinguals and monolinguals in relation to their intelligence and linguistic background. Jenkine's Scale of Non-Verbal Mental Ability and a series of attainment tests were administered to the subjects, who were classified into groups of Welsh, Mixed Welsh, Mixed English and English children by a linguistic background questionnaire. Highly significant differences were observed among these linguistic groups in the non-verbal test. While stating the results of these two researches Jones (81) cautioned:

... one would hesitate at this stage to draw from them the conclusion that bilingualism as such is a disadvantage in a non-verbal test situation. It is evident that the results need closer examination, particularly with reference to certain sociological variables which are known to influence test performance. (81:37)
Kittell (56) compared 63 bilingual and 41 monolingual, elementary school children in the verbal and non-verbal sections of the California short form Mental Maturity Test, (1953, B form). The sample was taken from grade 3. The mean age of the bilinguals was 8 years 8.08 months, while that of the monolinguals was 8 years 8.39 months. The bilingual children belonged to parents of several nationalities. Parents' occupations of both groups were determined. The mean mental age achieved in the language section of the test by the monolinguals was significantly higher than that of the bilinguals. The two groups did not differ in non-verbal mental age. The mental age of monolingual children with middle class parents was higher than that of the bilinguals, whose parents belonged to middle or low-class occupations. Kittell also observed that no significant differences were found between the two groups in mean reading ability nor did reading ability affect the differences between the two groups in the mental ages achieved in the language section of the test.

In spite of the fact that the number of children in Kittell's research was small, the results were suggestive in so far as the author reported a significant difference between the groups in verbal mental ages, while no significant difference was found in non-verbal mental ages. One thing
which should be noted is that the bilingual group was taken from different nationalities. A number of investigators had discovered differing effects of bilingualism on children from different nationalities; e.g. Italians and Jews. It was quite certain that the combination of groups from different social and cultural origins might obscure the effect of bilingualism.

Lewis (98) adopted some of the data of a survey and classified it into different linguistic groups. A significant difference, (equal to about 8 IQ points), was found between bilinguals and monolinguals. Lewis considered that this difference might be due to the fact that the test was a timed one and that the group was unequal with respect to urban-rural differences. The verbal factor might also be responsible for the difference between the two groups. Lewis mentioned the results of Morgan's (115) investigation, where Raven's Progressive Matrices was used without a time limit and there was no difference between the result of bilinguals and monolinguals. Morrison (117) also inferred from his results that the bilinguals having to make a choice between two languages and possibly trying to use both on occasions, tended to be slightly slower at thinking than the monolinguals and were thus penalized on all timed tests.
Since Lewis had not controlled the socio-economic factor, it was likely that the different results might have been due to this factor. Jones (81) was also of the same opinion and criticized Lewis' research on the ground that, underlying the broad urban-rural differences, there might have been basic socio-economic differences amongst the groups compared. He further explained this problem by referring to the 1951 Bangor Survey in which the results indicated that monolingual and bilingual children of comparable socio-economic status did not differ significantly.

Lewis' classification of the subjects was restricted to a much narrower range of scores in the questionnaire. Subjects were divided into two groups 'Welsh' and 'English'. Since there were no cut off points in the original questionnaire, Lewis divided the groups by applying his own cut off points. This approach has been criticized by Jones (81). He writes that a language questionnaire is but an imperfect instrument, hardly suitable for discriminating between the finer shades of linguistic background. It would appear therefore that broad linguistic classifications were more realistic and consequently more informative for practical purposes than any attempt to separate pupils into linguistically homogeneous sub-groups, artificially defined within excessively narrow limits of questionnaire scores.
in London, Alleyne (2) presented evidence that bilinguals were significantly inferior to monolinguals on Raven's Progressive Matrices Test. Banks and Sinha (14) stated that this test was not culture free as claimed by its author. Care must, therefore, be taken in drawing conclusions. Bilinguals might be penalized due to their being from a different culture. Further analysis revealed that these differences were substantially reduced in the case of native-born bilinguals and monolinguals. This suggested the operation of cultural influences which added to the inferiority.

Hasan (61) conducted a study to assess the effects of bilingualism on the performance of Pakistani school girls in (i) The Central Institute of Education Individual Scale of Intelligence, (ii) Burt's Graded Reasoning Test, (iii) Burt's Arithmetic, (iv) Free Composition Test and (v) Teachers' Rating of Intelligence, with varying lengths of contact with the second language and to discover the correlation between the degree of bilingual background and performance in these tests.

The bilingual girls and the monolingual girls were matched for age, non-verbal intelligence and occupational and economic level of their fathers. The girls were from an urban community and from the same national group, namely Pakistani.
The bilingual girls were selected from St. Mary's Convent High School and the monolingual girls from the Government Girls High School. The medium of instruction in the Convent was English and the first language of these bilingual girls was either Urdu or one of the regional languages of West Pakistan. In the government school the medium of instruction was Urdu and the first language of the monolinguals was also Urdu.

The bilingual and monolingual girls were taken from Class VI, VII and VIII in each school. The following age groups within each corresponding class from both the schools were selected:

Class VI ... ... 10:00 to 11:11 years
Class VII ... ... 11:00 to 12:11 years
Class VIII ... ... 12:00 to 13:11 years.

The language background was estimated by Hoffman's Bilingual Schedule.

Results showed that with the exception of arithmetic scores in Class VIII, on all the four tests the performance of bilinguals of all the three classes fell below that of the monolinguals. Furthermore, with the exception of verbal reasoning, the trend was to larger differences in the earlier classes. The extent of the verbal handicap appears to decrease with increase in school class. But in spite of the fact that differences were considerably reduced with
increasing classes, they were still statistically significant. The research showed that linguistic difficulties were not overcome entirely by the children who had received instruction in English for nearly seven years.

Lambert and Macnamara (1972) conducted a study to discover the effect of a year's learning exclusively in a foreign language on the linguistic and mental development of first-grade children.

Raven's Progressive Matrices was selected as the instrument best suited to control and assess the intelligence of the experimental and the control groups. On the basis of this test, the groups were equated in the first month of schooling.

One of the objectives of the study was to assess the intelligence of the children in order to determine whether any change occurred in measured intelligence after one year's study in the second language.

Raven's Progressive Matrices Test (Forms A, AB and B) was administered in June to compare the experimental class with the control groups.

The results showed that the experimental group appeared to be held back in their measured intelligence.

The authors appeared to be cautious in drawing the conclusion as the inferiority of the experimental group was to one control group and not to the other one.
The authors suggested that researches should be carried on in the second and third year of schooling in French in order to determine whether the existing trend found after one year becomes more pronounced or diminished.

Summary: The general trend of the preceding researches suggests that the majority of bilinguals were penalized when their intelligence was estimated by the verbal tests inspite of the fact that—with the exception of very few researches—they had almost equivalent scores to the monolinguals on the non-verbal tests of intelligence. There are relatively few studies which have indicated an inferiority of bilingual children on the non-verbal intelligence tests.

Brown’s (20) investigation indicated that pupils who had attended an American school for one or two years received no lower scores on the Stanford-Binet Scale in English than when the scale was translated into their mother tongue.

Pintner and Keller (133) reported significantly lower scores for the bilinguals of their investigation on a specially revised edition of the 1918 Stanford-Binet Scale. Sauer (145, 14) found that rural bilinguals in Maine were inferior on verbal intelligence tests to urban bilinguals and also to urban and rural monolinguals. Colvin and Allen (33) found the Italian subjects of their investigation inferior to the American subjects in their performance on the Stanford-Binet Scale and on the National Intelligence Test. While Pintner (130)
found no significant difference between the mean mental ages of the combined foreign groups and the American group of his investigation on the Pintner Non-Language Test, so small a percentage of the foreign groups reached the median mental age of the American group on the National Intelligence Test that he concluded that caution should be taken when measuring the intelligence of foreign children solely by verbal tests of intelligence. The Japanese students of Barsie's (38) investigation were inferior to American students on the Stanford-Binet Scale, but the scores of the two language groups on the Army Beta Scale were found to be practically identical. Wang (185) found that the Chinese students of his investigation ranged 9 points below the native-born subjects on the Ohio State University Intelligence Test. The American subjects of Head's (111) investigation made higher scores than the Italian subjects on the Otis Group Intelligence Test. The performance of the bilingual Indians of Jamieson and Sandiford's (70) investigation was superior to that of the monolinguals on the Northumberland Intelligence Test, the Pintner-Cunningham Primary Mental Test, and the Pintner Non-Language Test. Rigg (141) found that the performance of Italian children was significantly inferior to that of native-born white children on the National Intelligence Test. Pintner's (131) Italian bilingual subjects
received significantly lower scores than the monolingual subjects on the Fintner-Cunningham test. Barke's (15) findings indicated that the Welsh bilinguals were inferior to the English monolinguals on the Northumbeland Standardized Test, whereas, the monolinguals showed inferiority to the bilinguals on the Fintner Non-Language Test. Mitchell (114) found that the Spanish bilinguals of his investigation worked under a serious handicap especially in the lower grades of the elementary schools when instructions on the Otis Group Intelligence Test were given in the second language. The Italian bilingual subjects of Seid's (150) investigation received significantly lower scores than the monolinguals on the 1916 Revision of Stanford-Binet Scale, whereas the bilinguals were significantly superior to the monolinguals on the Arthur Point Scale of Performance Tests. Barke and William (16) found that bilinguals were inferior to monolinguals on the verbal test whether given in the first or second language. But in the case of the non-verbal test both the groups were equal. The pre-school bilingual subjects of Narcy's (35) investigation made lower scores than the monolingual subjects on the Stanford-Binet Scale and significantly higher scores than the monolinguals on the Atkins Object-Fitting Test. Portenier (134) found the bilingual Japanese high school seniors of his study to be significantly
below the norms on several verbal tests of intelligence. Smith and Lowley (163) found that the Gaelic-English bilinguals were inferior if the test was given in the second language. The Bangor Survey (13) showed that Welsh bilingualism was a handicap on Jenkins' Scale of Non-Verbal Mental Ability. Jones and Stewart (82) found that in the raw scores of Jenkins' Scale of Non-Verbal Mental Ability and Cotswold Mental Ability Test, the Welsh-speaking bilinguals showed a significant inferiority in comparison with the monolinguals. In another research of Jones (78) bilinguals and monolinguals performed equally on the non-verbal test but highly significant differences were observed in favour of the monolinguals on both the verbal intelligence tests. Altus (3) showed that the bilinguals were inferior to the monolinguals in the verbal section of the Wechsler Intelligence Scale. The over-all performance of Anastasi and Comiova's (5) bilinguals fell much below Cattell's test norms. Jones' (79) investigation revealed that an analysis of the variance of the raw scores on the non-verbal test yielded highly significant differences in favour of the monolinguals. While summing up the results, Jones et al (83) found that bilingualism was disadvantageous on Jenkins' Scale of Non-Verbal Mental Ability. Kittell (86) found that the bilinguals were inferior to monolinguals on the verbal section of the California Short Form Mental Maturity Test and in the case of non-verbal
section of this test both the groups were equal. Lewis' (98) results showed that a significant difference existed between bilinguals and monolinguals. The difference was in favour of the monolinguals. Alleyne (2) found that bilinguals were significantly inferior to monolinguals on Raven's Progressive Matrices Test. Hasan (61) found that bilinguals' performance was poorer than monolinguals on all the four tests. Lambert and Macnamara (92) showed that the experimental group appeared to be held back in their intelligence on Raven's Progressive Matrices.

From the foregoing researches concerning the effect of bilingualism upon intelligence, it can be seen that bilinguals are penalised mostly when intelligence is tested by the verbal intelligence tests and not mostly when intelligence is tested by the non-verbal intelligence tests.

Empirical Studies in which Bilingualism was Found to Have no Effect Upon Achievement

The studies in this category consist of those which found that bilinguals and monolinguals performed equally on the achievement tests.

Manuel (105) carried out an investigation on Puerto Rican bilingual school children in order to assess the relative degree of mastery in parallel English and Spanish
scholastic attainment tests. The average scores in the English and Spanish versions of the specialized reading tests (natural sciences and social studies), did not differ from one another. Puerto Ricans did equally well in these tests in the Spanish and English versions.

Jones et al (1933) divided 679 subjects into Welsh, Mixed Welsh, Mixed English, and English children, on the basis of their scores in a questionnaire. A Mechanical Arithmetic Test was administered to the four groups and there was no significant difference between them. The authors concluded: "This is hardly surprising, since the fundamental processes involved in this particular task may be carried out effectively with very little use of language as such." (83:25)

These findings were in line with those of the majority of American investigations. It might be concluded from the results of this research that bilinguals and monolinguals of similar mental ability did not differ appreciably in school performance when the bilinguals started the second language at an early age.

James (71) compared monolingual and bilingual children of 6 to 11 years of age in their school subjects. The assessment of scholastic attainments was based on teachers' estimates. Hoffman's Bilingual Schedule, after some modification, was used to identify the bilinguals and monolinguals.
Further confirmation of bilingualism and monolingualism was made by conversation with the subjects. On the basis of parental occupation socio-economic background was estimated.

Results showed no statistically significant difference between the groups in the school subjects.

Jones (80) studied the differences of bilingual and monolingual groups with an average chronological age of 10 years in Burt's Northumberland Standardized Tests of English (1925 Series). The socio-economic background of both groups are similar.

The performance of both groups revealed no statistically significant difference in the test. Jones inferred therefore that:

Welsh speaking children who had come under the influence of early bilingualism in urban areas were not inferior to monolingual children in similar areas in respect of attainment in English. (80:20)

Kittell (56) compared bilinguals and monolinguals in the California Reading Test and the California Mental Maturity Test. Eighty-three bilingual boys and girls and 41 monolinguals were taken from grade 3. There was no difference between bilinguals and monolinguals in mean scores on the Reading Test (t = .42) but the monolinguals showed superiority in the mean verbal mental age of the California Mental
Maturity Test. The differences in reading ability remained insignificant when scores were adjusted, by applying Analysis of Co-variance, to take account of the differences in verbal mental age. No sex differences were found in the mean reading scores. Rittle inferred that bilingualism was not detrimental to reading ability.

Though the linguistic background of the subjects was not inquired into this study, nevertheless had special significance due to its other factors being controlled.

Lambert and Macnamara (92) conducted a research to assess the impact of a year's study done exclusively in a foreign language on the linguistic and mental development of first-grade child. The experimental group was compared with normally trained French-speaking children in the development of French skills and with normally trained English-speaking children in English skills.

The experimental group was also compared with a control group in a non-linguistic subject. The subject chosen was mathematics.

The experimental group and the control groups were selected from comparable middle class neighbourhoods.

Since the number of students was small, it was considered imperative by the investigators to equate the experimental and controlled groups in intelligence and in
socio-economic status. Raven's progressive matrices was selected to assess the intelligence of the groups. The socio-economic status was determined by the methods developed by Bloom, Bave and Self.

The following measures were used to assess the linguistic skills in both the languages and numerical skill in mathematics:

1. The Peabody Picture Vocabulary Test in which a child is required to match a word presented orally to one of the four illustrations.

2. Speaking skills in English. A story of 'The Lion and the Rat' was narrated by an adult and the child was asked to retell the story immediately afterwards.

3. Word association analysis in English and French. Fifty-one words were pronounced to the child and he was asked to say the very first word that came to his mind when he heard each "stimulus word."

4. Reading skills in French; word discrimination, and sentence comprehension.

Results showed that in comprehending spoken English, the experimental group had no difficulty as compared with the control group.
With regard to the skill of speaking English, the experimental group was as competent as the control group in over-all expression, enunciation, rhythm and intonation. The word association in English came as rapidly to the experimental group as to the control group. On the tests of word discrimination, sentence comprehension and word order in French, both the groups were equally efficient.

Children in the experimental group scored better than the children in the control group in the ability to associate the sound and printed form of French words.

Their verbal associations in French were, as was the case in English, given as rapidly as those of the children in the control group and these were no more irrelevant or idiosyncratic in their content.

When compared with both English and French control classes, the experimental children did just as well in tests designed for pupils who had followed a standard first grade programme of mathematics. They performed in either language as well as both types of control group.

In spite of the fact that the findings were quite conclusive, the investigators interpreted the results with caution. They pointed out that the sample was small and suggested that the same children should be followed for a longer time to determine whether the trends found after one year of schooling in French becomes more pronounced or
diminished and that new groups of children starting this experimental type of first grade training should also be examined to increase confidence in this research.

Summary: Samuel (105) found that the Puerto Rican bilingual school children performed well in parallel English and Spanish scholastic attainment tests. Jones et al (83) indicate that there was no significant difference between Welsh bilinguals and English monolinguals on the Mechanical Arithmetic Test. James' (71) result showed no statistically significant difference between bilinguals and monolinguals in the school subject. Jones (80) inferred that the performance of Welsh bilinguals and English monolinguals revealed no statistically significant difference on Curt's Northumberland Standardized Test of English. Kittell (86) found no difference between bilinguals and monolinguals in mean scores on the Reading Test. Lambert and Macnamara, (92) showed that there was no difference between bilinguals (experimental group) and monolinguals (control group) in comprehending spoken English as well as in over-all expression, enunciation, rhythm, intonation and word association. Both the groups were also equally efficient on the tests of word discrimination, sentence comprehension and word order in French.
Empirical studies in which bilingualism was found to have a favourable effect upon achievement

The studies in this category consist of those which found that bilinguals were better than monolinguals in the performance of achievement tests.

Davies and Hughes (40) undertook an investigation to determine what differences were observed between Jewish and non-Jewish children in intelligence, English and arithmetic. 1894 children whose ages ranged from 8 to 14 years, were taken from three carefully selected London schools. The Northumberland Standardised Tests in Intelligence, English and Arithmetic were administered. To control variables:

The three schools in which the study was made were chosen in an attempt to rule out differences due to variations in school teaching and home training, except in so far as these latter are due to racial customs and traditions. (40:136)

The degree of bilingualism was not inquired into.

The results showed that the Jewish children were markedly superior to the non-Jewish children in the two groups which were studied. The Jewish group was found to be one year ahead of the non-Jewish group in arithmetic and one and a half years ahead of the non-Jewish group in English. At the same time, the Jewish girls were one year ahead of the non-Jewish girls in English and slightly less than a year ahead of the non-Jewish girls in arithmetic.
Differences in cultural level, initial mental ability and age were not taken into account. The superiority of the bilinguals in the attainment test should also take into account these variables.

Schiller (148) conducted a study to assess the difference of two groups in verbal ability, in the basis of a questionnaire 395 elementary school children were divided into two linguistic groups. The groups were matched for age, parentage, schooling and socio-economic environment. The verbal tests consisted of vocabulary, analogies, sentence completion and reading.

The results showed that the Jewish children were superior to the non-Jewish children in the performance of the tests used in the study.

Spoerl (166) conducted a study to determine the effect of bilingualism upon the measurement of intelligence and upon the academic achievement of selected groups of students at the American International College. A "survey group" of 60 bilinguals and an "intensive study group" of 32 bilinguals were matched with corresponding numbers of monolingual students with respect to sex, age, and intelligence as measured by the Wechsler-Bellevue Test of Mental Ability. Groups were also matched on the basis of socio-economic status. The bilinguals spoke two languages in childhood at or before entrance to the first grade.
The Purdue Placement Test in English and the Nelson-Denny Reading Test, in addition to the Stanford-Binet Intelligence Examination, Form I were given to both groups. Records of the subjects' academic achievement throughout their school careers were also studied.

Results showed that there was no significant difference between the groups on Stanford-Binet but in the case of the Purdue Placement Test in English, bilingual children received higher scores than the monolingual children. A study of the records of academic achievement revealed that the bilingual children had done consistently better academic work than the monolingual children at every level above that of Junior High School. Spearl considered that this superiority of the bilinguals might be a compensatory drive arising from their general insecurity, which was created by poor rapport with their environment.

It was apparent that if there was any confusion either in academic attainment or verbal adjustment in childhood, it had been established by the first year of college.

Terman (174) was also of the opinion that children who had learned another language before learning English were handicapped for three or four years in the vocabulary scores compared with monolinguals. After that there was no
difference, particularly at the mental age of 12:0. Vocabulary and mental age went aside by side.

The results of Spoenl were inconclusive because the superiority of the bilinguals might be attributed to their higher initial intelligence or to their motivation and persistence.

Malherbe (103) conducted an investigation in South Africa to assess the relative difference in the scholastic attainments of those children who were taught in the "home-language" and those who were taught in the "wrong medium", this means the language not used at home. The bilingual children taught in the "wrong medium" progressed in the content subjects, arithmetic, geography and history, as they went to higher standards. Differences between bilinguals and monolinguals in arithmetic, (mechanical and problems), vanished by standard VI and in geography by standard VII. Bilinguals even became one year superior to monolinguals by standard X. The combined scores of bilingual groups in English and Afrikaans were reported to be appreciably higher than those of the monolingual groups in English or in Afrikaan. Malherbe inferred,

... a clear advantage in favour of the bilingual school as regards language attainment in both English and Afrikaans at all intelligence levels ... the greatest gain for the bilingual school is registered in the case of the lower intelligence groups. (103:62-63)
The author suggested that a bilingual home background and greater familiarity with the second language at the school level increased the hindrances to the academic success of bilinguals. As English and Afrikaans were both currently used in day-to-day South African life, bilinguals found no difficulty "because their whole linguistic experience was made use of." (103:64)

Foul and Lambert (127) conducted a research to study the effects of bilingualism on the achievement of children. Ratings were obtained from the teachers to know how well each child did in school in relation to the others in his class. The teacher rated each child along a five-point scale in terms of his achievement in general, in French and in English if this happened to be one of his subjects. Marks were also obtained in French that each child got in dictation, reading, and composition.

Results indicated that the bilingual children who were of the same age as the monolinguals were in a higher grade. The bilinguals' achievement in English as well as in school work in general was also significantly better than the monolinguals' in spite of the fact that both the groups were equal in socio-economic background.

The authors attributed this superiority of the bilingual in school achievement to their verbal ability.
According to the investigator the achievement of the bilinguals in English was related to intelligence.

The overall school achievement of the bilinguals depended upon the verbal skills and those of the monolinguals, or non-verbal skills.

Summary: Davies and Hughes (40) results showed that the Jewish bilinguals were superior to the non-Jewish monolinguals in English and arithmetic. Schiller's (148) Jewish bilinguals were superior to non-Jewish monolinguals on the verbal tests consisting of vocabulary, analogies, sentence completion and reading. Speerl (156) found that the bilinguals did consistently better than the monolinguals in academic achievement. Malherbe (103) indicated that the bilinguals progressed more than the monolinguals in arithmetic, geography and history as they went to higher standards. Peal and Lambert (127) found that the bilinguals' achievement in English as well as in school work in general was significantly better than that of monolinguals.
Empirical Studies in Which Bilingualism was Found to Have an Unfavourable Effect Upon Achievement

The studies given below show that bilinguals are inferior to monolinguals in the performance of achievement tests.

Saer (145) conducted a series of experimental investigations during which a comparison of bilinguals and monolinguals was made in vocabulary and composition in addition to the intelligence tests. The total number of the children was 1400. Their age ranged from 7 to 12 years. Five rural and two urban districts in Wales were selected for the data collection. In six of these districts Welsh was the mother tongue, but the children of the rural districts learned English at school while those of the urban districts learned English at school and English was also the language of their play activities. The seventh was a rural district in which English was the mother tongue. Information concerning the socio-economic background, home language, and age of each child was obtained but no attempt was made to match monolinguals with bilinguals in respect of these factors.

A vocabulary test consisting of a 100 word list from Anwyl's Welsh Dictionary was given to the children. In the rural districts a sharp rise was noticed at the age of 10 years in the range of the children's vocabulary in both
English and Welsh. Monolingual English-speaking children in rural districts showed a most considerable rise in vocabulary at eight years of age and the bilingual group showed it at the 10-year age level. In the case of both urban monolinguals and bilinguals the sharpest rise occurred between 9 and 10 years. The mean range of vocabulary of monolingual children was higher than that of the bilinguals in both English and Welsh.

In a composition test in which the children were asked to write about a dream and also about anything they liked best, it was found that the bilinguals showed greater clarity and correctness when writing in Welsh than when writing in English. The author points out that the mental confusion occurs in bilingual children more often than in the monolinguals.

Smith (162) confirmed these results which showed that the bilinguals were linguistically inferior in both languages. Jones (76) was also of the view that Saer's inquiry indicated not so much retardation in the intelligence of rural bilinguals as retardation in scholastic and linguistic attainment. West (191) remarked that the superiori of rural English-speaking children was explicable in terms of the greater opportunities for the development of English. A large number of inexpensive books, a more extensive vocabulary and better methods of instruction were available in
English than in Welsh. He further suggested that it was a
disadvantage to be educated through a foreign medium and an
advantage to have one of the major languages, like English,
as one's mother tongue.

It appears that had the position of both languages
been the same, it was likely that the bilinguals would not
have lagged behind in acquiring them.

Smith (157) undertook an investigation in South Wales
to study the attainments of bilingual and monolingual subjects
from 8 to 11 years of age. They were attending four rural
schools. Four tests were administered:

1. Two free composition exercises of fifteen
minutes duration each
2. The Whipples Word Building Test
3. A mutilated passage test consisting of two
fables, from each of which fifteen words were
omitted
4. An analogies test of twelve items.

The children were tested three times within a period
of two years at intervals of one year, from class III upto
class VII.

The results in the four schools were summarized and
averaged. The monolinguals were superior to the bilinguals
on all the four tests.
Smith further pointed out that the monolingual children between 8-11 years of age made better progress than the bilingual children in their power of expression, their choice of vocabulary and their accuracy of thought.

The superiority of the monolinguals was revealed more by some tests than by others.

In comparing the coefficients of correlation between the tests, the investigator found that the free composition and mutilated passage tests were more reliable than the word-building and analogies.

The investigator concluded that bilingualism seemed to be an intellectual disadvantage under the organization of schools in South Wales at the time of study.

The merit of Smith’s study lay chiefly in the fact that it attempted to study longitudinally the relative progress in school performance of bilinguals and monolinguals. Tests, used in the study measured linguistic ability in addition to general mental ability. The “intellectual disadvantage” of bilinguals might be interpreted in terms of a linguistic disadvantage. Since the groups were not matched for age, socio-economic status or general ability, the results could not be so conclusive. The statistical significance of differences was also not indicated. The scoring of the composition was subjective and no variabilities were calculated for individuals. The results of this research were in agreement with those of Saer.
A survey was conducted in Puerto Rico (191) on 69,000 school children from the fifth grade onwards. The Stanford Achievement Test was administered to the children in English and Spanish. English as a second language was taught from the first grade, and from the fifth grade it became the medium of instruction for all the school subjects except one. The results of these children in the English version were inferior to the norms of the United States. In the case of the Spanish version, though the results were superior to some extent, they were still lower than the American norms.

Though the results of this survey suggested the language inferiority, some flaws were obvious which might have been responsible for this inferiority. For example teaching methods might have been defective and the time allotted for the language learning might have been insufficient.

West (191) conducted an investigation to find out the relative levels of verbal comprehension and expression of Bengali school children when, in one case, part of a lecture was delivered in English, and in the other case, in Bengali.

Subjects were taken from the pre-matriculation class of a government school in Bengal. They were divided into two sections. One section was given the lesson in the first part of the period in Bengali and in the second part of the
period in English, and the case was reversed for the other section — first the section was taught in English and, in the second part of the period, in Bengali. One thing was strictly observed, that the answers to questions during the lessons were made in the language through which instruction was being given. The percentage of questions correctly answered by the boys was taken as a measure of the effectiveness of the lesson. A mean difference of 31.3 percent was observed in favor of the Bengali presentation.

A similar lesson experiment was repeated with a different lesson and this time all answers to questions were written in Bengali. The mean difference was reduced to 20.6 percent in favor of Bengali answers.

West attributed this lack of adequate comprehension and expression in English to the incorrect methods used by the bilinguals in learning the foreign language. He emphasized that reading should be the first of the four language skills: (reading, understanding of speech, speaking and writing). Vildumec (183) criticized this view and stated:

"To first introduce a foreign language through reading may be a psychologically admissible way with highly educated adults, but never with an average child, who should hear the foreign words, pronounce them, see them and write them in one and the same lesson. (183:73)"

Results were indicative of a linguistic handicap in the comprehension of the second language.
Caldwell et al. (26) conducted research on the difference between 623 Spanish-American and Anglo-American monolingual children in essay type and objective type examinations. The performance of the Spanish-American children was inferior to that of the Anglo-Americans in both the tests. The difference between the groups was very prominent in the essay type test. The author pointed out that this prominent difference was due to the fact that the essay-type test required recall of vocabulary while the objective-type test called for the recognition of vocabulary.

The results showed that a deficiency of language was operating in the case of the Spanish-American children.

Jamieson and Sandiford (76) tested the intelligence and scholastic achievement of Southern Ontario Indians. 717 Indians were selected and given the following tests:

1. B.C. Test in the Fundamentals of Arithmetic
2. Ayres-Burgess Silent Reading Test
3. Ayres Spelling Scale
4. B.C. Spelling Test: Writing
5. Ayres-Gettysburg Writing Scale.

The authors reported that the Indians were inferior to white pupils in the performance of the tests. They were also inferior in intelligence. On the spelling scale and the writing scale, the Indian children produced results much inferior to U.S. Grade norms. In their ability to perform
the fundamental operations of arithmetic, Indian pupils of a given grade obtained results approximately equal to those obtained by white pupils who were classed one grade lower.

Rigg (141) conducted research to determine the effects of the language handicap on achievement tests with 8,130 native-born "American whites and 1,849 foreign" children from grades 3 to 8. The test results investigated by Rigg were obtained in a St. Louis Programme. The Thorndike-McCall Reading Test, Form I and the Woody-McCall Arithmetic Fundamental Test, Form I were used. A questionnaire was also used to classify the "foreign" and "American" groups. The type of questions asked were: "What language is spoken in your home?" The performance of the "foreign" group was lower than that of the "native" group in the reading test. Rigg attributed this inferiority to the verbal deficiency but in the case of Italian children results in the arithmetic test were also low which could not be accounted to the language factor.

The number of subjects was large enough to give some weight to this research and moreover the distribution of initial mental ability in the two groups was likely to be representative.
In the Bureau of Education Report (125) Paranjpe compared the marks of two types of students in History and English. One type of students got instruction through the medium of English and the other through the mother tongue. 7,036 roll numbers were taken from the Bombay University Matriculation Examination in 1929. By examining the results the author concluded that in both the subjects, History and English, those students fared well who had had instruction through their mother tongue.

It is possible that in this study variant factors, such as the difference in the marking systems, in the methods of instruction, in the educational standards of the schools and in the mental ability of the two groups, might have affected the results.

McCarthy (108) compared the mean length of sentences used in English by 14 bilingual children with those used by monolingual children. The median percentile rank of the biculturals was 40 which was slightly below the central tendency of the group as a whole.

Smith (159) wanted to discover the effect of learning two languages simultaneously - one reading from left to right and the other from top to bottom. Two forms of a Reading "Direction" Test were designed for the research and
administered to 206 first and second grade children in Hawaii. Gates' Primary Reading Test was also given to the children. Smith reported that the Reading Direction Test showed a significant correlation with ability in reading as measured by different reading tests. It was observed that children studying two languages at the same time showed greater variability in performance, lower reading test scores and more confusion of reading direction than those studying only one.

Laid (59) attempted to examine the relation between reading ability and the "foreignness" of linguistic background. Three hundred fifteen subjects were selected from grades 3 to 5 of three public schools in New York City. Children were divided into three categories on the basis of a three-item questionnaire:

1. 149 cases spoke and heard English in the home.
2. 55 cases spoke English but heard the foreign language from their parents.
3. 79 cases spoke and heard a foreign language.

When the foreign-speaking groups were equated with the English-speaking group for chronological age and for scores in the Pluhmer Non-Language Mental Age Test, it was reported that the reading age declined as the foreign language background of the group increased.
As the groups were made up of a mixture of several nationalities these differences, though consistent, were unreliable.

When the Jewish-speaking children, created as before, were compared with the English-speaking group, the former obtained lower reading ages than the latter, although differences were not significant. The entire foreign-speaking group of Jewish children in this case obtained higher scores than the part-foreign-speaking Jewish group both in reading and in the Haggerty Intelligence Test (verbal) of mental ages. Again, the differences were statistically significant.

The results showed that there was some consistent relationship between foreign language background and poor achievement in reading. The author herself conceded that "... the relation is so small that it is easily obscured by other conditions such as small sampling, a two grade range, or a small difference in chronological or mental age." (69:49)

Fritz and Tanken (50) conducted a research in which they tested 201 pupils from Grades 7 - 9 in the New Stanford Achievement Test, Form V. A questionnaire was used to divide the children into two groups, one usually foreign-speaking and the other only English-speaking. The bilingual children scored lower on an average in the English language sub-test of the achievement test compared with the monolinguals.
The advantage in favour of the latter was not as great as in the non-English section of the test (history, geography, hygiene, arithmetic, reasoning, and comprehension). The two groups were not matched for age, mental ability and socio-economic level. Twelve pairs of pupils from the two groups were matched for grade, age, mental ability and home environment and the results showed that the English-speaking group excelled the foreign-speaking group by about five times as many points in the English as in the non-English sections of the achievement test.

The sample of matched subjects was very small. However, the research proved valuable as the author suggested remedial teaching in the specific elements of English for the handicapped foreign pupils.

Marks and Williams (16) tested 54 Welsh bilinguals and 100 monolinguals, ranging in age between 10 1/2 and 11 1/2 years. In addition to intelligence tests, Thorndike's test of word knowledge, form I (in Welsh), and form II, (in English), was administered. The difference between the bilinguals and the monolinguals in the non-language test was "insignificant" but the inferiority of the bilingual children appeared in the verbal test given in the second language. A more distinct difference was shown when both the groups were tested in their mother tongue. The authors confidently drew the conclusion that the bilinguals were inferior in both the
languages. The cause of their inferiority in English might be that the bilinguals were taught in school through the medium of English and their requisite knowledge and vocabulary of the first language were insufficient for success in this test. The results were in line with the findings of Baer (145) with rural bilingual children.

Smith (154) conducted an investigation on progress in the mastery of English by children of different racial antecedents in Hawaii. The conversations of 1,000 children were recorded. Their ages ranged from 10 months to 6 years 6 months. The results were analyzed in terms of several criteria such as frequency of errors, mixed sentences, length of sentences, degree of egocentricity shown, number of negative sentences, number, function, and form of questions, parts of speech, and inflection of words.

The effects of race, sex, parental background, home influence, order of birth, residence, and kindergarten attendance on the mastery of English were examined. The results showed that the bilinguals were seriously retarded in the use of English, a retardation not compensated for by a greater advancement in other languages used. The mean number of words per sentence used by the bilingual children was less than that of the monolingual English-speaking children. Some improvement in the length of a sentence was found where only one language was used by the adults in the home. Smith
observe that the intelligibility of bilinguals was lessened if the two languages were not acquired from different sources. She also found out that the linguistically mixed areas produced bilinguals who were not handicapped. Kindergarten attendance helped in the acquisition of the second language. More exposure to the English language, which was the second language, was profitable for the bilinguals. She found a high correlation between high socio-economic status and mastery of English with longer sentences. Her own subjects belonged to the lower socio-economic scale.

Smith's study confirmed her previous findings about the effect of bilingualism on the child's spontaneous conversation. Verbatim records of children's conversation were made by her:

Indications are that the bilingual child uses a shorter sentence, not only in English but also in the combined language, than does the monolingual child; and unless the home language is predominantly English, he may continue to confuse the two languages in the same sentence until school age. (151:1693)

Smith's research was of interest on account of its intensive analysis of the errors of speech of a large number of pre-school children in terms of several objective criteria. She suggested that the factors which were considered to be related to the better mastery of English should be followed up by further studies.
Malherbe (103) studied the effects of varying media of instruction on scholastic performance in standards IV to X. The groups were divided into two and named by Malherbe as the "Wrong Medium Group" and the "Unilingual Group" respectively. The first group got instruction at school in a language which was not its home language, (English or Afrikaans) while the second group got instruction in its home language. Twelve standardized tests of scholastic achievement were administered to the subjects in their respective school languages.

Results in Arithmetic, Geography and History revealed that the "Wrong Medium" group was inferior at the elementary stages. Malherbe reported that this difference vanished in Arithmetic at Standard VI, and in Geography at Standard VII. As the students' familiarity with the second language increased, deficiency in the tests started vanishing. Since experience with both the languages was so common in the socio-cultural environments of children in South Africa, the linguistic backgrounds of both groups were of an equal level in both languages.

Malherbe's study was unique of its type as the effects of varying media of instructions on scholastic performance was investigated.
Portenier (134) conducted research on the difference
between 200 Japanese-American high school seniors in Wyoming
and American seniors from the district. He administered,
(i) Halogen-Nelson tests of mental ability; (ii) Ohio State
University Psychological test; (iii) for Achievement Mental
Ability tests; and (iv) the Iowa Silent Reading Test.

The results showed that the bilinguals were inferior
in all the verbal tests in comparison with the average
American high school seniors. Judging from the fact that
the median for the subjects fell in the 32th percentile in
the Reading Sub-test of the Ohio State University Psychological
Test, Portenier attributed this poor performance of the
bilinguals in verbal tests to their linguistic inferiority
in reading.

The study suffers from the drawback that the cultural
and linguistic backgrounds of the subjects were not assessed.

Though initial mental ability was not checked either,
yet - due to the large number of subjects - it might be
inferred that bilingualism was responsible for their inferiority
in the verbal tests.

Smith (162) compared the vocabularies in Chinese and
English of 30 bilingual children of Chinese ancestry. The
ages of the children ranged between three and six years.
Vocabulary was measured by Smith's Vocabulary Test, given
on one day in English and on the next day in Chinese. Subjects
were found inferior in either language. Then the vocabulary of the two languages was added together, only one sixth of the children exceeded the norms for monolingual children. Smith concluded that only a superior bilingual child was capable of attaining the vocabulary norms of monolingual and that a name in one language for a large number of concepts was more desirable than two names, one in each language, for a smaller number of concepts. Smith stressed the point that only those children should be taught the second language who were linguistically superior.

The results of this study confirmed Smith's previous findings with respect to the retardation of the bilingual child in the mastery of English.

The data was limited and there was the possibility that the difficulty level of the English and Chinese forms of the vocabulary test might not have been equal.

Jones (77) conducted research into the relationship of the language handicap of Welsh-speaking children to their reading ability. One hundred seventeen children were selected from five schools. Their age ranged from 10:10 to 12:0 years. Schonell's Graded Reading Vocabulary Test and the Watts-Vernon Silent Reading Test were given to the children. The results of both tests were combined to get a reading age for each pupil. The data revealed a steady rise in reading age from the lower to the higher levels of ability,
indicating the importance of intelligence in the acquisition of reading ability in the second language. Jones estimated that the mean reading age of the Welsh-speaking pupils whose non-verbal IQs fell below 90 was about 2½ years lower than their mean chronological age; pupils whose IQs fell between 90 and 110 had a mean reading age of about one year lower than their mean chronological age; and those whose IQs were 110 or more had a mean reading age which corresponded to their mean chronological age. Finally, a comparison was made of their scores in 'Mechanical Reading' and 'Reading Composition.' A significant difference was found in four out of five schools and in all the schools taken together. Jones considered that acquired skill was transferred to reading in the second language, as mechanical reading had already been mastered in the mother tongue.

This research was continued by Jones (179) in his later investigations, where monolinguals showed superiority to bilingual children in Schonell's 'slight reading test,' but (Test .4), though both groups were equal in the non-verbal test.

Jones' study indicated that a reading disability of bilingual children in English partly accounted for their poor standing in verbal intelligence tests.
Manuel (105) conducted a study to assess the difference in English and Spanish of Puerto Rican bilingual school children. The tests, (inter alia revised by the Educational Testing Service, Princeton, New Jersey and called Cooperative Inter-American Tests), were constructed to have parallel English and Spanish tests. Measured by a general reading test, the ability of third grade pupils to read English was approximately two years below their ability to read Spanish and in the last year of high school three years below. The average pupils of the 12th grade were reported to read English about as well as the average pupil of the 9th grade read Spanish. The lag of English behind Spanish was observed to be similar for pupils of urban, rural and private schools.

The average scores in the English and Spanish versions of the specialized reading tests, (Natural Sciences and Social Studies), did not differ considerably from one another. However, in the English usage test it was reported that the average 12th grade pupil had not quite reached the level in English usage that the average 6th grade pupil had reached in Spanish. The level of a Puerto Rican pupil in English reading was reported to fall 2 to 3 grades below that of a United States English-speaking pupil.

Manuel's findings suggested a marked linguistic handicap in English usage and reading. It should be noted
that the mean ages of the Puerto Rican children in each grade were not necessarily comparable to those in the United States. Direct comparison between Puerto Rican and United States children was not relevant.

From the results it could be suggested that the Puerto Rican children were linguistically inferior in English. Differences in the methods of reading and the regularity of school attendance might have also affected the results.

In 1955, Jones (79) conducted research which confirmed his earlier findings. 2,365 children were classified into four linguistic categories, (Welsh, Mixed-Welsh, Mixed-English and English), on the basis of a language questionnaire and Teachers' Estimates.

The Welsh group was found to be significantly inferior to the other groups in both the tests, the Watts-Vernon Silent Reading Test and the Jenkins' Scale of Non-Verbal Mental Ability. The Welsh group remained significantly inferior in English reading though all the groups were statistically matched in intelligence. Jones found that this was primarily due to insufficient opportunity to acquire aural and oral skills in the second language, both within the schools and in the out of school environment. He suggested that English reading should be postponed for children of limited intellectual ability until they have
acquired sufficient oral and aural skills. All the three studies by Jones suggested that bilinguals were handicapped in reading ability.

Jones et al. (83) tested 749 children between 10 and 11 years of age from primary schools in two counties in Wales. The following attainment test were given to the children, in addition to a linguistic background questionnaire and Jenkins' Non-Verbal Test of Mental Ability, in order to compare certain aspects of the educational attainments of Welsh children in relation to their intelligence and linguistic background:

a. Schonell's Basential Mechanical Arithmetic Test, Form A
b. Schonell's Basential Problem Arithmetic Test, (Form A, given in English to all groups; Form B given in Welsh to Welsh groups and in English to English groups)
c. Schonell's Silent Reading Test, B. (N.4)
d. Moray House English Test, 201.

The Welsh groups were also given a test in Welsh usage and a test in Welsh comprehension.

On the basis of the linguistic background questionnaire, the subjects were divided into four linguistic groups, (Welsh; Mixed-Welsh, Mixed-English and English), and the scores obtained in the different tests were studied.
accordingly. The attainment test scores were adjusted in order to allow for differences between groups in non-verbal intelligence. The following findings were reported by the authors, with respect to the English and Welsh tests:

Performance of predominantly Welsh-speaking children in English reading and usage is not equal to that of predominantly English and Mixed-English groups. The Mixed-Welsh group, however, does not compare unfavourably with the English groups in this respect. The level attained by the Mixed-Welsh group in Welsh reading and usage is significantly lower than that of the predominantly Welsh group at this stage. (83:27)

There was no significant difference between the linguistic groups in the Mechanical Arithmetic Test, but the English group performed better than the other groups when the problem Arithmetic Test was given in English. The authors considered that the language factor was affecting performance in the Problem Arithmetic Test and not in Mechanical Arithmetic.

The differences between the groups in the English comprehension and usage test were due to the fact that the English and Mixed-English groups used the English language in their homes whereas the Welsh and Mixed-Welsh groups did not use English in their homes, though the older children had received formal instruction in it from an early age.

The Welsh group performed better than the Mixed-Welsh in both the Welsh tests. The Welsh and Mixed-Welsh groups
showed a greater improvement in the English version, (form A),
of the Problem Arithmetic Test than the English and Mixed-
English children in both forms A and B in English. The
authors suggested that as the Welsh group and Mixed-Welsh
group received instructions in English in the subject of
Arithmetic, their inferiority in the Welsh version might
have been due to this reason. Incomparability of the two
versions in English and Welsh was another explanation. The
Mixed-Welsh group showed a greater improvement than the
Welsh group when the test was given in English. Results
showed the varying linguistic experiences of the groups.

The research proved to be valuable as an objective
measure of the linguistic background of the subjects and
because rigorous statistical techniques were employed in
the evaluation of its results. It was obvious that the
bilinguals were suffering from reading disability in the
second language.

Lewis (95) investigated the differences in attainment
between primary schools in Mixed-Language areas in Wales. 375
ten-year-old pupils from 16 primary schools in mixed-language
areas in Wales were given attainment tests in English,
(Comprehension and Usage), and Arithmetic, (Mechanical and
Problem), in addition to a non-verbal test and a questionnaire
for assessing their linguistic background.
The tests were the following:

a. Schonell's Silent Reading Test. B, (Test N.4)

b. Moray House English Test. 21, (M.H.E.21)

   i. Schonell's Essential Mechanical Arithmetic Test. (Form A)

   ii. Schonell's Essential Problem Arithmetic Test. (Form B)

c. Jenkins' Scale of Non-Verbal Ability. (N.V.E.A.1947)

d. Welsh Linguistic Background Scale.

Differences among the schools were considerable. These differences were related to corresponding differences in intelligence, (this relationship being noticeably less in the case of mechanical arithmetic), but could not be fully accounted for this. A linguistic background index was formulated to assess the "Welsh-ness" of the background of the school groups. Schools whose attainments in English, adjusted for intelligence, were markedly high, were observed to have low linguistic indices (and vice versa). Lewis reported that this tendency was strong in both English tests, especially usage. In Arithmetic, the tendency for high adjusted attainments to be associated with low indices (and vice-versa), was only slight. Lewis concluded:
Linguistic background may thus be regarded as an important factor with respect to those school differences of attainment in English which are not accounted for by intelligence. With regard to the corresponding attainment differences in arithmetic, the linguistic background is of less importance, further research being necessary to decide whether the slight tendency observed is real. (198:59)

Results showed that there was a relationship between bilingualism and low attainment in English, but the relationship was slight between bilingualism and arithmetic. Results shown by American workers like Colvin and Allen (33), Darie (38), Wang (165) and Mead (111) were also the same. Numerical ability as measured by number series in verbal intelligence tests, was the least affected by linguistic background.

Norman and Mead (121) conducted research to study the effects of bilingualism on the performance of Spanish American subjects in Wmmon's Dile range of picture vocabulary test. One hundred fifty subjects between 17 and 19 years were selected. Hoffman's bilingual schedule was given to measure the extent of experience of the subjects with the foreign language. The groups were sub-divided into smaller groups of fifty each, according to chronological ages of 17, 16 and 19 years respectively.

The results indicated the inferiority of the bilinguals as compared with the test norms, even though the use of
language was minimized. It neither called for reading nor for an oral response. The authors tentatively suggested that the differential decline of the Spanish-Americans in verbal ability could be attributed both to the relatively earlier termination of their education and to their poor reading experience as compared to the Anglo-Americans.

Alleyne (2) compared 102 bilinguals with 102 monolingual in intelligence and attainment tests. Both the groups were matched for age, sex and socio-economic status. The test battery used was constructed by Kemp and comprised:

a. English attainment:
   i. English Comprehension test
   ii. Spelling Ability Test

b. Arithmetic attainment:
   i. Mechanical Arithmetic
   ii. Arithmetic Reasoning.

Alleyne's item analysis of the verbal intelligence test scores had indicated that the inability to read quickly in English might have militated against the bilinguals - and more particularly the foreign bilinguals - on these items.

The attainment tests were administered as timed tests. A verbal test with a time limit makes great demands on a subject's reading skill and intimate experience with the
language of the test. It is likely that the results of the attainment tests given by Alleyne were affected by this.

Lambert and Macnamara (92) have attempted to discover the effect of a year’s study exclusively in a foreign language on the linguistic and mental development of first grade children. The experimental group was compared with normally trained French-speaking children in the development of French skills and also with normally trained English-speaking children in English skills.

In some skills of French and English, the experimental group was indistinguishable from the control groups but in the following measures the experimental group showed inferiority to the control groups:

1. Word knowledge in English, requiring reading skill in English
2. Word discrimination in English, requiring auditory and visual discrimination
3. Reading skills, comprehension of sentences and passages in English
4. Speaking skills in French, a French film entitled "Le Loup et le Poissons" is narrated by an adult. The child’s retelling of the story was analysed for (a) overall expressive ability, (b) grammatical error, (c) fautes de liaison and (d) rhythm and intonation.
In the first three skills of the English language, the experimental class clearly fell below the English control which was considered reasonable by the investigators as the experimental group had no formal training in English.

With regard to speaking skills in French, the experimental class was definitely poorer than the control group in reconstructing a story in terms of overall expression, error of grammar and liaison, rhyming and intonation.

It was concluded that one year's study in a foreign language impeded some of the skills in English and French.

Summary: Saer (145) showed that the mean range of vocabulary of bilinguals was inferior to that of the monolinguals. Mental confusion occurred in bilingual children more often than in the monolinguals. Smith (157) found that the bilinguals were inferior to the monolinguals on all the four tests of attainments. A survey (171) in Puerto Rico indicated that the performance of bilinguals in the English as well as the Spanish version of the achievement test was poor as compared with the norms of the United States. West's (191) bilinguals felt lack of adequate comprehension and expression in English. Caldwell et al (25) found that the performance of the Spanish-American bilinguals was inferior to that of the Anglo-Americans on essay type and objective type examinations. The results of Jamieson and Sandiford's (70) investigation revealed that the Indian
bilinguals were much inferior to U.S. Grade norms on the Spelling scale and the Writing scale. Higg (141) indicated that the performance of the "foreign" group was lower than that of the "native" group in the reading test. By examining the results, Paranjpe (125) concluded that in History and English, those students were inferior who had had instruction through a foreign language. McCarthy (108) showed that the median percentile rank of the bilinguals was below the central tendency of the group as a whole. Smith (159) found that the children studying two languages at the same time showed greater variability in performance, lower reading test scores and more confusion of reading direction than those studying only one. Ladd (69) showed that there was some consistent relationship between foreign language background and poor achievement in reading. Fritz and Hanken (50) found that the bilingual children scored lower on an average in the English language sub-test of the achievement test compared with the monolinguals. Harte and Williams (16) found that Welsh bilinguals were handicapped whether Thorndike's Test of Word Knowledge was given in English or Welsh. Smith's (161) results showed that the bilinguals were seriously retarded in the use of English. Waltherbe (103) found that the bilinguals were inferior to monolinguals in Arithmetic, Geography and History at the elementary stages.
Portenier's (134) investigation revealed that the bilinguals were inferior in all the verbal tests in comparison with the average "American" high school seniors. Smith's (162) bilingual children of Chinese ancestry were found inferior in either language on Smith's Vocabulary Test. Jones (77) found that Welsh bilinguals' performance was lower on Schonell's Graded Reading Vocabulary Test and Watts - Vernon Silent Reading Test. Manuel (105) found that Puerto Rican bilinguals fell 2½ to 3 grades below United States English-speaking children in English Reading. Jones' (79) Welsh bilinguals were significantly inferior to English monolinguals on the Watts - Vernon Silent Reading Test. Jones et al (83) showed that the predominance of Welsh language was related to inferiority. Lewis' (98) results showed the same trend. There was a relationship between bilingualism and low attainment in English, but relationship was slight between bilingualism and arithmetic. Norman and Mend (121) showed the inferiority of the bilinguals whose results were compared with the test norms. Alleyne (2) indicated that the bilinguals were inferior to monolinguals in the attainment tests. Lambert and Macnamara's (92) experimental group (bilingual) showed inferiority in reading, auditory and comprehension skills of English as well as in the skill of speaking French.
Views and Empirical Studies In which Bilingualism has been found to have a favourable effect upon emotional adjustment

The effect of bilingualism upon emotional adjustment is a problem worth investigating. In spite of the fact that it is not directly related with the present research, some of the views and researches for and against are given below keeping in view their importance.

Views. Weinreich (189) stated the views of those who contended that bilingualism developed emotional difficulties and second-rate character. They claimed that children developed stuttering and left-handedness. Moreover, they suffered from poverty of concepts, superficiality and laziness and materialism.

Weinreich very forcefully contradicted all these alleged evil effects of bilingualism on a child's emotional life and argued that if this were true, then bilingual people would be stupid, impractical and less adjusted than unilingual people. All the other defects which coincided with bilingualism as stated by other investigators were very appropriately accounted for by Weinreich. For example, he said that stuttering and hoarseness might be due to an insufficient command of the language, and to the tension caused by it. He added that emotional maladjustment could be due to social
frustration, family disharmony or cultural conflicts. Another possibility considered by him was that a child's inefficiency in his native language adversely influenced his proficiency in the second language. This might have caused introversion, shyness or aggressive anti-social behaviour.

According to him, poor teaching, poor schools, the hostile attitude of society, and religious or political antagonism might also be responsible for emotional maladjustment.

Leopold (95) suggested that strong personalities would be able to overcome whatever conflicts arose due to bilingualism.

Soffietti (164) was of the opinion that emotional difficulties arose from biculturalism and not from bilingualism. Sometimes emotional problems arose from a conflict between ways of life, beliefs, customs, value systems and not necessarily from a conflict between language systems.

Empirical Studies. Pintner and Arsenian (132) tested 469 native-born, bilingual, Jewish children from Grades VI and VII in a New York public school to assess the effects of bilingualism on school adjustment. The pupils' Portrait Questionnaire and Hoffman's Bilingual Schedule were given to the subjects. Correlations between the two sets of scores were practically zero. Analysis of the distribution of scores in the pupils' portraits showed that they were similar to those given as tentative norms. "High" and "Low"
bilingual groups, (identified by Hoffman's Bilingual Schedule), revealed no statistically significant difference. The authors reported:

..... to the extent that the pupil's portrait represents the pupil's adjustment to school, teacher, other pupils, self and family, bilingualism, as measured by the Hoffman schedule, presents no handicap. (132:262)

The conclusions cannot be generalized as the study was conducted with only one racial and cultural group - the Jews.

It may be presumed from the results that the Jewish bilinguals, due to some cultural and historical reasons, are more adaptable to their environment. This view has been repeatedly emphasized by many writers.

Views and Empirical Studies In which Bilingualism was Found to Have an Unfavourable Effect Upon Emotional Adjustment

Views. Jensen (73) in his article on bilingualism, pointed out that to think-in one language and speak in another would create mental confusion and uncertainty, particularly if the child was inefficient in one language. Bilingualism would be an additional burden for a child of normal ability. In the process of learning he would be
fatigues, he would lose his interest not only in language learning but in other subjects as well. If he had a weak personality the frustration of ineffective communication would be very harmful for him. Children in such cases lose self-confidence and indulged in extreme introversion, shyness and aggressive anti-social behaviour. Feelings of arrogance, contempt, hatred, avoidance and rejection towards the parents would be developed. At an early stage the bilingual might lack group identification and character formation.

In another article Jensen (72) pointed out that emotional maladjustment might be due to poor teaching, poor schools, the hostile attitude of society towards a group, religion, politics or social antagonism, besides bilingualism.

Empirical Studies. Smith (158) conducted a study of the speech development of five bilingual children belonging to the same family. These children had resided at different periods of their infancy and childhood in China and the U.S.A. She noted an interference with language when a child started speaking the second language. A low IQ and a low vocabulary were reported of one of the five children, though later on a rise was noted in both IQ and vocabulary as the child forgot one of the two languages.
which attributed this temporary linguistic disability to emotional causes and argued that "such a change causes enough mental confusion to a child, when he finds words that have heretofore produced results no longer do so, to cause him to tend to cease further attempts at speech for a time." (158:187)

She suggested that this confusion was likely to arise from learning two languages during pre-school years.

In 1937, Travis, Johnson and Shover (178) surveyed 4,627 public school children in East Chicago, Indiana. One hundred twenty-six stutterers were found and the majority of them were bilinguals, not monolinguals. It was also noticed that 20 percent of the bilingual stuttering group had started stuttering at the time of the introduction of a second language. Moreover it was also pointed out by the investigators that this did not establish any causal relationship. Other observers had commented on the relationship of bilingualism to irregular speech rhythms due to the bilinguals' search for appropriate speech responses.

Sperel (165) conducted research to study the relationship of emotional maladjustment and bilingualism. Sixty-nine bilingual freshmen were matched with a control group of monolinguals for age, sex and ability in a verbal intelligence test. The Bell Adjustment Inventory showed a greater maladjustment of the bilinguals and moreover, a large number of
withdrawn from the college. The personnel officer was also mostly consulted by bilinguals on account of their personal problems.

Spoerl suggested that the poor adjustment of the bilinguals might be due to their lower standing.

A second group of 33 bilinguals was closely matched with a control group of monolinguals for age, sex, verbal intelligence and socio-economic status. The following measures of emotional adjustment were employed for this group:

1. The Allport Vernon Study of Values
2. Bogardus Test of Social Distance
3. Modified Kent-Rosanoff Association Test
4. Thematic Apperception Test.

The results revealed that the bilinguals were relatively more maladjusted. The author concluded that the bilingual students' emotional maladjustment was a reaction to social frustration, especially due to family disharmony and cultural conflicts and that the cultural conflicts were further complicated by a bilingual environment. These emotional maladjustment symptoms should not, therefore, be attributed solely to bilingualism.

Brossard (18) studied the impact of bilingualism on social relations and attitudes. He got some introspective reports from which he drew the conclusion that the majority
of the bilinguals experienced an added strain on account of the double linguistic task - to shift gears, as it were, from one linguistic level to another.

Bilinguals themselves felt that bilingualism was a great hindrance in the development of self-confidence, especially during adolescence. The ridicule of peers and family tension were reported, and a number of "protective devices" were developed; such as a restrained manner of speech, or an excessive concern to use meticulous English, or inconspicuous behavior or an avoidance of home. Immense resentment was felt for the second language.

Bossard's research emphasizes the impact of bilingualism on the individual's personal-social relations, and, at a broader level, it shows the problem of the immigrants, cultural adjustment, where language may be the dominant factor.

Basso, Blanton and Blanton and others (17) suggested a correlation between bilingualism and stuttering. The German scholar, Henss (189) seemed to agree with this idea as well.

The above mentioned favorable or unfavorable effects of bilingualism upon emotional adjustment are related with the socio-cultural setting in which bilingualism occurs. Therefore the views and results of the researches could only be interpreted with reference to the context.
CHAPTER III

METHODOLOGY AND PROCEDURES

In the previous chapter a fairly extensive survey has been made concerning no effect, favourable effect and unfavourable effect of bilingualism upon the intelligence and achievement of the children. In the following chapter a description of the procedures used in the selection of samples and instruments is given under sub-headings.

Sample

The study was designed to discover the effects of bilingualism and monolingualism upon the intelligence and achievement of children at 10th and 6th class levels. The bilingual children were taken from schools where the medium of instruction is English; and the monolingual children from schools where the medium of instruction is Urdu.

The following figure gives an outline of the sample:
Figure 1 shows that the total sample consists of 400 children who were taken from two types of schools. Two hundred children were from schools where the medium of instruction is English and 200 children from ones where the medium of instruction is Urdu. As the comparison was to be made at the primary and secondary levels, between bilinguals and monolinguals; and between boys and girls among bilinguals and monolinguals, each group was kept equal in number with 50 children.
it should also be pointed out that the administration of the tests, at the primary level, was started in class 5 and at the secondary level in class 9. Class 5 was taken as primary education is completed at this stage and class 10 should have been taken for secondary level but it was not available for research purposes. Since, test administration children at both the stages were promoted one class. Children of class 5 were promoted to class 6 and those of class 9 to class 10.

Lahore proper was selected as both types of schools are found there. Moreover, it was presumed by the investigator, after some discussion with educationists that the bilingual and monolingual children, being from the same urban community must enjoy the same type of general educational facilities. Socio-economic and educational background of the bilinguals and monolinguals was not controlled as it was beyond the reach of the investigator due to social context of the culture in which the research was conducted. As utilitarian and prestige value is attached to the English language in Pakistan, the English medium schools have become very popular. But due to higher fee and other expenses only rich people can afford to send their children to this type of schools.
However inspite of all this the investigator has tried to select those schools which are not far apart on this factor. It was also observed that the schools included in the research should have the following factors common:

1. A general educational standard
2. Well-trained teaching staff
3. Selected students only are being admitted
4. Parallel educational pressure on the students as both types of students were appearing in the Matriculation examination held by the Board of Intermediate and Secondary Education
5. Pleasant attitude of the teacher towards the students
6. General facilities in the teaching and learning process
7. Spacious school buildings.

Before the selection of schools was made the investigator approached the headmasters and the headmistresses of the English and Urdu medium schools and inquired into the linguistic proficiency of the students, particularly at 10th and 6th class levels, and their objectives in regard to the English and Urdu languages. The heads of the English medium schools told the investigator that their objective in teaching both the languages is to give students equal command. According to their own opinion in both the languages
they have achieved their objective to a great extent. The students during their school time use English, Urdu and any of their regional languages with equal proficiency.

The headmasters and headmistresses of the Urdu-medium schools told the investigator that though English is taught as a compulsory subject, yet its speaking, understanding, reading and writing aspects are not improved to the extent shown in the national and regional languages. The children do not use the English language in their daily conversation and particularly not during their school time.

The total sample was drawn from the following schools:

1. St. Anthony's School
2. Cathedral School
3. The Convent of Jesus and Mary
4. Government Central Model School No. 1
5. Madrasa-Tul-Sanat

Bilinguals were taken from the first three schools where the medium of instruction is English. Monolinguals were taken from the last three schools where the medium of instruction is Urdu.

The following table gives the number of children, taken from each school.
<table>
<thead>
<tr>
<th>Schools</th>
<th>English Medium</th>
<th>Urdu Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. St. Anthony's School</td>
<td>38  21</td>
<td>-  -</td>
</tr>
<tr>
<td>2. Cathedral School</td>
<td>20  29</td>
<td>30  20</td>
</tr>
<tr>
<td>3. Convent of Jesus and Mary</td>
<td>-  -</td>
<td>20  30</td>
</tr>
<tr>
<td>4. Government Central Model School</td>
<td>50  50</td>
<td>-  -</td>
</tr>
<tr>
<td>No. 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Madrasa-Tul-Banat</td>
<td>-  -</td>
<td>50  35</td>
</tr>
<tr>
<td>6. Lady Maclagan School</td>
<td>-  -</td>
<td>-  15</td>
</tr>
</tbody>
</table>

| Total                               | 100 100       | 100 100     |

As Table 2 shows the total number of the boys is 100 at the secondary level and 100 at the primary level, and in the case of the girls it is also 100 at secondary level and 100 at primary level.
It should also be pointed out from Table 2 that the sample of fifty children in most of the groups was taken from more than one school as some of the children had to be dropped on account of the non-availability of the full information required for research purposes. Some of them were not taken due to their linguistic background assessed by Hoffman's Schedule and in the case of age, extreme cases were dropped keeping in view the influence of the age factor. These factors were responsible for reducing the number of children. In the schools from which fifty children were taken, the number of students was larger although procedures for selection were the same in all the schools.

The investigator personally visited the selected schools and requested their heads to allow her to test the students for a post-graduate research project concerning the effects of bilingualism and monolingualism upon the intelligence and achievement of the children. The importance of the problem was explained to them. They were assured that the research was not in any way connected with an official or governmental inquiry.

It was also made clear that all information concerning the students and their parents would be treated confidentially. The responses from the schools were very encouraging and considerable cooperation was extended by the staff and students.
of all the schools throughout the research. The teachers always showed an interest and provided all the needed facilities to the investigator. The students were also very enthusiastic. Arrangements for testing were always made after consultation with the teachers concerned.

Criteria for the Selection of the Subjects

As the bilingual and monolingual students in this research were studying in the schools of Lahore proper, it was assumed that they belonged to the same urban community, with similar national and cultural backgrounds, studying in equivalent grades in their English-medium and Urdu-medium schools, no special procedure was used to match them for (a) school class, (b) urban rural differences, and (c) racial and cultural differences.

Sources Used to Obtain Information on Age

Information about age was obtained from the school record and confirmed by the Proforma (Appendix B) filled in by the parents. They were assured that their information would be kept strictly confidential. It was requested that they should give correct information for the sake of research.
purposes. The majority of parents confirmed the dates of birth taken from the school record but a few gave different dates. In such cases the final decision was made on the basis of information given by the students concerned.

The following tables 3 and 4 give a full perspective of the age range of the sample.

**TABLE 3. AGE RANGE OF 10TH CLASS STUDENTS**

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>13-0</th>
<th>14-0</th>
<th>15-0</th>
<th>16-0</th>
<th>17-11</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilingual</td>
<td>Boys</td>
<td>2</td>
<td>14</td>
<td>23</td>
<td>8</td>
<td>3</td>
<td>50</td>
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<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Girls</td>
<td>-</td>
<td>14</td>
<td>25</td>
<td>9</td>
<td>2</td>
<td>50</td>
</tr>
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<td></td>
</tr>
<tr>
<td></td>
<td>Boys</td>
<td>2</td>
<td>14</td>
<td>23</td>
<td>10</td>
<td>2</td>
<td>50</td>
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</tr>
<tr>
<td></td>
<td>Girls</td>
<td>-</td>
<td>14</td>
<td>25</td>
<td>9</td>
<td>2</td>
<td>50</td>
</tr>
</tbody>
</table>

**Table 3 shows that the age range at the 10th class extends from 13 years to 17 years. Most of them are in 15 – 15.11 age group.**

*Y means Year
M means Month
<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>Y. M.</th>
<th>Y. M.</th>
<th>Y. M.</th>
<th>Y. M.</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>10 - 0</td>
<td>11 - 0</td>
<td>12 - 0</td>
<td>13 - 11</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>10 - 11</td>
<td>11 - 11</td>
<td>12 - 11</td>
<td>13 - 0</td>
<td></td>
</tr>
<tr>
<td>Bilingual</td>
<td>Boys</td>
<td>4</td>
<td>30</td>
<td>13</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monolingual</td>
<td></td>
<td>5</td>
<td>32</td>
<td>12</td>
<td>1</td>
<td>50</td>
</tr>
<tr>
<td>Bilingual</td>
<td>Girls</td>
<td>6</td>
<td>26</td>
<td>15</td>
<td>3</td>
<td>50</td>
</tr>
<tr>
<td>Monolingual</td>
<td></td>
<td>4</td>
<td>23</td>
<td>19</td>
<td>4</td>
<td>50</td>
</tr>
</tbody>
</table>

Table 4 shows that the age range at the 6th class level is from 10 to 14 years. Most of them are in 11.0 - 11.11 age group.

As Tables 3 and 4 show age appears to be quite controlled. Students lying in each age range are approximately equal.

*Y means Year
M means Month
Sources used to vital information about socio-economic and educational background

The socio-economic and cultural background of the children is usually assessed by the occupational and educational level of the parents; or by that of the guardian when the father is not alive.

In western countries, socio-economic scales of a refined type such as 'the Goodenough revision of the Barr-Taussing scale' and the 'Index of status characteristics' have been largely used for research purposes. Occupational gradation varies in accordance with the socio-economic and cultural pattern of each society, which depends upon the utilization of its material and human resources. Pakistan is not industrially so advanced. It has a different occupational set up. Scales used in the western countries may not be applicable here.

Hassan (61) has used in her research the socio-economic classification of the Central Institute of Education in India (30). She considers the occupational grouping as representative of the cultural level of the homes. This scale in this respect was, therefore, considered suitable for the present research by the investigator. Occupation along with income is taken into consideration at the time of classification.
Categories employed for the classification of socio-economic status are as follows:

<table>
<thead>
<tr>
<th>Occupational Categories</th>
<th>Numerical Scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Professionals</td>
<td>...</td>
</tr>
<tr>
<td>Semi-Professionals</td>
<td>...</td>
</tr>
<tr>
<td>Retail Traders and Clerks</td>
<td>...</td>
</tr>
<tr>
<td>Skilled Labourers</td>
<td>...</td>
</tr>
<tr>
<td>Semi-Skilled Labourers</td>
<td>...</td>
</tr>
<tr>
<td>Manual Labourers</td>
<td>...</td>
</tr>
</tbody>
</table>

Professionals: In this category are included fathers who have received higher professional training in a specialized subject and who hold responsible governmental or non-governmental positions. Apart from high executives and civil servants, this category includes doctors, professors, lecturers, engineers, architects, judges, lawyers, editors and journalists as well as owners of businesses employing 200 or more workers and managers with more than 200 persons under their authority.

Semi-Professionals: This category includes those with lower professional training, such as accountants, contractors, exporters, commission agents, landlords, army officers, police officers, trained high school teachers, managers with 50 - 200 under their authority, and owners of businesses employing 50 - 200 employees.
Retail Traders and Clerks: These fathers have not had a university education and include clerks, lower class office workers, teachers without specialized training, insurance agents, reporters, store-keepers and auctioneers, managers or owners of small businesses (6 or more employees), are included in this grade, as well as the inspectorial or supervisory staff of the businesses concerned.

Skilled Labourer: This includes all persons doing work at a manual level which requires special skill. This includes draughtsmen, steno-typists, mechanics and telegraphists.

Semi-Skilled Labourers: Included in this class are caterers, confectioners, tailors, carpenters, drivers, gold-smiths, black-smiths, barbers, dairy keepers. Although skill is necessary for these professions, it is of a less academic kind than that required for the "skilled labourer."

Manual Labourers: This group includes the lower class workers like peons, porters, cleaners, washermen, masons, farmers, painters and dairymen. (61:334-36)

In educational categories, lines of demarcation are drawn and the parents' education is put into five categories along with sub-groups. These categories start from 'No Education' to 'Professional Education.'
Information about the socio-economic background of the children taken from the school record was considered inadequate, as changes might have occurred in the occupational level of the parents since the time of admission. A proforma (appendix B) regarding the occupations of the father and the mother and their education and income was prepared. Proformas were sent to the parents through the children who brought them back after being filled. Though it was stated that this information would not be disclosed to anybody and would be kept confidential and used only for research purposes, some of the parents refused to give information the first time. The investigator had to send the same proforma a second time with a separate request and an explanation to the parents. Out of the whole sample only six parents finally refused to give information. These six students were dropped from the sample.

At the time of comparison boys of Class 10 and Class 6 were combined as were girls of Class 10 and Class 6. The tables give quite a clear picture of how bilingual boys and girls, and monolingual boys and girls, compare with each other individually and collectively in respect of socio-economic and educational background.

The following tables, therefore, give a full perspective of the socio-economic and educational background of the bilingual and monolingual children.
Table 5. Data Regarding Father’s Occupation

<table>
<thead>
<tr>
<th>Father’s Occupation</th>
<th>Bilingual Children</th>
<th></th>
<th>Monolingual Children</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys 10th-4th</td>
<td>Girls 10th-4th</td>
<td>Total</td>
<td>Boys 10th-4th</td>
</tr>
<tr>
<td>Professionals</td>
<td>60.0</td>
<td>66.0</td>
<td>63.0</td>
<td>36.0</td>
</tr>
<tr>
<td>Semi-Professionals</td>
<td>28.0</td>
<td>27.0</td>
<td>27.5</td>
<td>31.0</td>
</tr>
<tr>
<td>Retail Traders and Clerks</td>
<td>12.0</td>
<td>7.0</td>
<td>9.5</td>
<td>30.0</td>
</tr>
<tr>
<td>Skilled Labourers</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Semi-Skilled Labourers</td>
<td></td>
<td></td>
<td></td>
<td>2.0</td>
</tr>
<tr>
<td>Manual Labourers</td>
<td></td>
<td></td>
<td></td>
<td>1.0</td>
</tr>
</tbody>
</table>

Table 5 shows that the parents of the bilingual children, both boys and girls, tend to be of decidedly higher socio-economic groups than those of the monolingual children, both boys and girls.
Table 6 indicates that when the scores of the socio-economic background of the bilingual and monolingual children are analysed statistically, results tend to go in the same direction as in the previous Table No. 5 where comparison is made in percentages. The value of t indicates that the difference between the two groups is statistically significant at .01 level.
Table 7 indicates that the fathers of the bilingual children, both boys and girls, tend to be decidedly better educated than those of the monolingual children, both boys and girls.
<table>
<thead>
<tr>
<th>Mothers' Education</th>
<th>Bilingual Children</th>
<th></th>
<th>Monolingual Children</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys = 100</td>
<td>Girls = 100</td>
<td>Total</td>
<td>Boys = 100</td>
</tr>
<tr>
<td></td>
<td>%</td>
<td>%</td>
<td>%</td>
<td>%</td>
</tr>
<tr>
<td>No Education</td>
<td>4.0</td>
<td>5.0</td>
<td>4.5</td>
<td>17.0</td>
</tr>
<tr>
<td>School education (Primary, Middle, Matric, Oriental Languages)</td>
<td>58.0</td>
<td>55.0</td>
<td>56.5</td>
<td>74.0</td>
</tr>
<tr>
<td>College education (Inter, B.A., B.Sc.)</td>
<td>32.0</td>
<td>39.0</td>
<td>35.5</td>
<td>9.0</td>
</tr>
<tr>
<td>Post-Graduate Education (M.A., Ph.D.)</td>
<td>6.0</td>
<td>1.0</td>
<td>3.5</td>
<td>-</td>
</tr>
<tr>
<td>Professional Education (LL.B., B.B.B.5.)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 8 shows that the mothers of the bilingual children, both boys and girls, tend to be decidedly better educated than those of the monolingual children, both boys and girls.
It could be summarized that the socio-economic and educational background of the bilingual children, both boys and girls is decidedly more favourable than that of the monolingual children, both boys and girls.

Sources Used to check the Linguistic Background of Bilingual and Monolingual Children

1. Headmasters and Headmistresses

2. Hoffman's Bilingual Schedule (66).

Initial information about the linguistic background of bilingual and monolingual children was requested from the headmasters and headmistresses of the selected schools. They told the investigator without hesitation that the students who studied in the English medium schools were bilingual, to the extent that they use English and Urdu or one of their regional languages with equal proficiency during their school hours. This is the objective of their educational planning. The students of the Urdu medium schools are monolingual to the extent that they use Urdu or one of their regional languages during school time. Though the English language is taught to them as a compulsory subject, they do not use it in any field of their life.
It has been generally recognized by educators, psychologists, and linguists that the evaluation of the intelligence and achievements of children can only be made successfully in the light of their linguistic background.

Yang (185) states that it is inadvisable to draw any definite conclusion about the intelligence of the groups without controlling the language factor.

Keeping in view this fact, the investigator sorted out the scales which were the Word Association Test (90), the Word Detection Test (91), the Peabody Picture Vocabulary Test (44) and the Subjective Self-Eating Score (127).

But as English and Urdu differ in forms of expression, morphology, grammar, phonology, script and vocabulary, it was not possible to make a scale of parallel proficiency entailing comparable difficulty in both languages. Due to these difficulties, the idea of assessing the extent of proficiency in both the languages was not feasible.

The most widely used method of assessing bilingualism is to study the extent of the exposure to the second language. This has been done by the use of a questionnaire which may determine the second or the first language background of an individual. If the second language is dominant, an understanding of it is assumed and an assessment of the first language is made. Though this method is not a direct assessment of
proficiency in the two languages, it is very popular with American, Welsh and other researchers. The following are the investigators who have used language questionnaires to divide children into different categories. Rigg (141), Ladd (89), Fritz and tanken (50), Schiller (148), Seidel (150), Jones and Stewart (82), Jones (78), Jones (73), Jones et al (83), Lewis (98) and Louis Lorge and Suzanne Kohut (96).

**Hoffman Bilingual Schedule.** Hoffman's Schedule is a test of bilingualism developed to furnish a quantitative measure of bilingual background. In the present research, Hoffman's Bilingual Schedule (Appendix A) was used. This questionnaire has been used in most of research projects which have attempted to measure objectively bilingual background. Arsenian (8), Pintner and Arsenian (132), James (71) and Norman and Mead (121) have used it in their researches. Hassan (61) has shown its suitability for Pakistani children by applying it in her research.

Hoffman (66) reports for this questionnaire a validity coefficient of .73 ± .03 based on the scores of 82 Jewish bilingual children and the ratings on a scale of 0 to 10 given by a Principal of the Hebrew School where the schedule was administered. Hoffman (66) again reports a co-efficient of .82 ± .03 between the bilingual scores of 52 Italian children and ratings on a scale of 1 to 8 of an Italian
interviewer who visited the children's homes. A reliability coefficient (split halves) of .84 is reported (when corrected by the use of the Spearman Brown formula \( r \approx .92 \)).

In the present research, even though the bilinguals' familiarity with English was assumed, since they received instruction in English and further supported by the heads of the schools, yet the extent to which these subjects made use of their own languages, (Urdu or any of their regional languages) in their activities out of school had to be investigated.

This questionnaire consisted of sixteen questions, comprising altogether 37 items for determining experiences out of school with languages other than English. Not only the 'expressive', or speaking, but the 'impressive', or learning and reading aspects of the child's linguistic background were considered. Seven questions were added which were totally concerned with the students' person. A schedule and its instructions (Appendix C) were translated into Urdu. The questions which were added in the schedule were as follows:

1. Do you read the newspaper in a language other than English?
   
   Never - Sometimes - Often - Mostly - Always

2. Do you read books (besides text books) and magazines in a language other than English?
   
   Never - Sometimes - Often - Mostly - Always
3. Do you write letters in a language other than English?

Never - Sometimes - Often - Mostly - Always

4. Do you receive letters in a language other than English?

Never - Sometimes - Often - Mostly - Always

5. Do you listen to radio programmes in a language other than English?

Never - Sometimes - Often - Mostly - Always

6. Do you see films in a language other than English?

Never - Sometimes - Often - Mostly - Always

7. Do you like to see television programmes in a language other than English?

Never - Sometimes - Often - Mostly - Always

Administration and Scoring. The procedures used in administering and scoring the questionnaire were those used by Hassan (61).

It has already been mentioned that the test administration was started from class 5 at the primary level and from class 9 at the secondary level. When Hoffman's Schedule was to be administered, all sections of these two classes were selected from each English medium and Urdu medium school taken in the sample.

Before presenting the questionnaire to the students the investigator assured them that they were not going to have any test or examination but were merely being asked to
Supply information about how often they or different members of their family or friends used their own language in different situations. On the first page of the questionnaire the subjects wrote their name, class, father’s name, profession and education, mother's education, names of brothers and sisters, their age and education, the number of languages other than English spoken by them as well as by their parents and also if they spoke English at all. The rest of the questions were explained repeatedly by the investigator and read out one by one and the students were asked to fill them in as they were read out by the investigator. It was made clear to the students beforehand that they were to underline only one of the answers to each question. The meaning of 'never', 'sometimes', 'often', 'mostly' and 'always', were explained; 'often' meaning half the time, 'sometimes' less than half the time, 'mostly' more than half the time.

Originally class 5 was given the schedule as a group but the researcher soon realised that the majority of the children had failed to understand the questions. They asked many questions in the middle of the test which created a lot of disturbance. Finally it was decided to administer it individually. As an individual test the first page was filled in by the students themselves in the group, but the rest was filled in by the investigator after questioning each student.
individually. In the case of individual questioning no
ambiguity was noted. If there was any doubt, it was resolved
by the investigator, cross-questioning the student at the
time of the interview. The children of class 9 were given
the schedule as a group (test) and inspite of the fact that
the questions were repeated several times, 20 percent of
the students had to be questioned individually when answers
were found to be ambiguous or omitted.

Scoring: In scoring this schedule, numerical values
of 0, 1, 2, 3 and 4 were given to 'never', 'sometimes',
'often', 'mostly' and 'always' respectively, as underlined
for each answer. The numerical total was divided by the
total number of items attempted and then expressed in
percentages which constituted the child's bilingual score.

The upper and lower limits of the scores were fixed.
This was done in consultation with the language experts in
the field.

The range of the scores in the English medium schools
was set between 35 and 70 and in the Urdu medium schools
from 60 to 100. Hoffman's Schedule is constructed in such
a manner that extreme scores on both the ends indicate
monolingual tendency in either language. Whereas middle
scores indicate predominance of bilingualism. Accordingly,
children from the English medium schools obtaining scores
below 35 and above 70 were dropped because it meant that
they were using only one language most of the time. Below 35 were the children who used English most of the time and above 70 were the children who used Urdu most of the time. Similarly, children from the Urdu medium schools obtaining scores below 50 were dropped from the monolingual group on the grounds that such a score meant that they were very close to bilinguals in using both the languages, English and Urdu. The students dropped were only four or five percent from both type of groups. Regional language was a common factor among bilinguals and monolinguals. Approximately hundred percent children wrote that they know Panjabi as well as Urdu.

Considerations of Language in Testing the Bilingual Children

At the time of test administration, two questions arise:

1. In which language should test be given?
2. In which language should instructions for the test be given?

These two questions arise because, in general, the acquisition of the two languages is not made with equal facility by bilinguals. There is a lack of agreement on this point. Some researchers consider that the tests and
instructions should be given in the first language. They take it for granted that the bilinguals are more proficient in the first language. The results of their researches are given below.

Saer (145, 146, 147) translated the tests into the Welsh language for those who used Welsh as their mother tongue. Darcy (37) states that according to Saer, "the mother tongue is the best oral medium by which a just estimate of a child's mental capacity can be gained." (37:23) He presents an example of an investigation where bilinguals were asked to write a composition on a dream or anything else they chose. It was found that the bilingual children showed greater clarity and correctness when writing in Welsh, which was their mother tongue, than when writing in English.

In the Pintner-Cunningham Primary Mental Test, the bilinguals obtained lower scores than the monolinguals. This was attributed in part by Jameison and Sandiford (70) to the fact that the instructions were given in English and they may not have understood them.

Mitchell's (114) results corroborate the above findings. He conducted research to determine whether an intelligence test administered in English was a fair estimate of a child's IQ when the child thought in a language other than English. The mean IQ which was secured from testing in Spanish was greater in each of the three grades than the
mean in which was secured from testing in English.

Jones (78) while stating the conclusions of his investigation stated that bilinguals were not handicapped in verbal thinking if the test was given in the bilinguals' first language.

There are other researchers who are not particular whether tests and instructions should be given in the first or in the second language. They state that the language for the test and instructions should be selected on the basis of linguistic proficiency. Researchers like Brown (20), Jones and Stewart (82), Jones (78) and Morgan (115) during their researches gave instructions for the tests in the language most familiar to the subjects.

It should be pointed out here that even though it is presumed generally that bilinguals are more familiar with their first language, the case of bilingual children who study in foreign-medium schools may differ. Barke and Parry Williams' (16) bilingual children received instruction at school through English and their requisite knowledge and vocabulary of the first language was insufficient for success in the test.

Bilingual children in the present research studied Urdu as a compulsory subject and English was their medium of instruction. The investigator, therefore, conducted a
pilot study to assess the familiarity of the bilingual children with English and Urdu and then selected the language for test instructions. As the test administration for research purposes was to be started from class 9 at the secondary level and from class 5 at the primary level, this pilot study was made on these two classes. Koh's Block Design Test was administered to 40 bilingual children, 20 from class 9 and 20 from class 5. Half the students from each class were given instructions in English and half in Urdu. The sample was small, but the results appeared conclusive and showed the expected bias. The following is the table which summarizes the results.

<table>
<thead>
<tr>
<th>Instructions given in Language</th>
<th>Class</th>
<th>N</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>9th</td>
<td>10</td>
<td>43.60</td>
<td>20.40</td>
<td>1.49</td>
<td></td>
</tr>
<tr>
<td>Urdu</td>
<td>9th</td>
<td>10</td>
<td>61.60</td>
<td>17.80</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>5th</td>
<td>10</td>
<td>13.40</td>
<td>9.30</td>
<td>6.7</td>
<td>.01</td>
</tr>
<tr>
<td>Urdu</td>
<td>5th</td>
<td>10</td>
<td>22.40</td>
<td>6.6</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 9 shows that at class 9, the difference between the means is not statistically significant even at .05 level. It means that at class 9, there is no statistical difference between the scores of bilingual children who are given instructions in English and those who are given instructions in Urdu.

At class 5, the difference between the means of the two groups is statistically significant at .01 level as the value for t at .01 level for 18 degrees of freedom is 2.88, in favour of the group which is given instructions in Urdu.

On the basis of these results, it was decided that the bilingual children at the secondary level, would be given instructions in English on Raven's Progressive Matrices, Burt's Arithmetic Test and Koh's Block Design Test. Bilingual children, at the primary level were given instructions on all the tests in Urdu except for Burt's Arithmetic Test where English was used as the terminology of Arithmetic Test. Monolinguals were given all the tests and instructions in Urdu at secondary as well as primary level. The Scholastic Aptitude Test was given in Urdu to both types of groups at both levels. As it was standardised in Urdu, translation into English for bilinguals was not possible. Burt's Arithmetic Test is available in both languages, (English and Urdu); English for bilingual children.
and Urdu for monolingual children. Raven's Progressive Matrices and Koh's Block Design Test are non-verbal tests and as the Scholastic Aptitude is a verbal test in Urdu only, there is no language problem. The problem of instructions was solved by the pilot study.

Before describing the salient features and the nature of the tests used in the present research and how they were administered and scored, some of the views of the investigators will be presented first since these were kept in view at the time of selecting the tests.

In the present research as the effect of bilingualism upon intelligence was to be determined, the question arose as to what type of intelligence tests should be used. For this purpose the researcher had to review the following results.

Results in Favour of Using Non-Verbal Tests

Colvin and Allen (33) conclude from the results of their investigation in which the National Intelligence Test and the 1916 Stanford-Binet Scale were applied to 50 children of native born parentage and 50 children of Italian parentage. The criticism of the verbal factor is justified and it is stated:
While verbal ability may raise intelligence scores in some instances above the level of the actual intelligence of the person examined, its most marked effect is noted under the condition when the lack of such a facility unduly lowers such scores. (33:3)

Wang (195) conducted a research at Ohio State University. He paired native born white students with 34 Chinese students, 158 Negroid students and 45 Russian students with respect to college attended, class, sex, and age. All subjects were given the Ohio State University Intelligence Test. As a result of his investigation, Wang concludes:

One should not draw any definite conclusion concerning the relative intelligence of racial groups not thoroughly Americanized and Americans, unless there is some control of the language factor. Non-verbal or performance tests might be more equally valid for several small races. (185:106)

Havighurst and Hilkevitch (63) draw the same conclusion: by stating that Indian children do about as well as white children on performance tests of intelligence. Thirty boys and girls of the Sioux tribe were given the Kuhlman-Anderson test in addition to the Arthur Point Scale. The results corroborated the above findings; that a performance test is more valuable in the educational placement of Indian children than an English verbal intelligence test.

Havighurst, Gunther and Pratt (64) studied the results on the Godemough Draw-a-Man Test which was administered
to 325 Indian children. While concluding the results, the authors report that Indian children are not inferior to white children in the case of performance on the non-verbal test where the use of language is not made necessary.

Burt (26) statistically demonstrates that about one half of the gross score obtained in the Binet test is attributable to school attainments and that linguistic ability and linguistic attainments exert a special and positive influence of their own on these scores.

Hassan (61) states that the selection of a non-verbal test of intelligence to measure the general intelligence of bilinguals and monolinguals is a valid step. The use of verbal intelligence tests in the mother tongue and in the second language may give different results. The Binet test is considered generally to measure scholastic attainment in addition to general intelligence.

Results in favour of Using Both Verbal and Non-Verbal Tests

Some of the researchers, as a result of their investigations, have recommended that both, verbal and non-verbal tests, should be used in order to be more conclusive in testing the intelligence of the children.
Pintner (130) conducted a study to find out whether or not a verbal group test is a valid measure of the intelligence of foreign children. The National Intelligence Test, Scale A, Form I and the Pintner Non-Language Test were used for this purpose.

The author while reviewing the results of his investigation states that caution should be taken in drawing conclusions concerning the intelligence of foreign children when verbal tests of intelligence are used as the sole criterion of measurement.

Barke (15) used during his investigation, the Northumberland Standardised Test (a verbal test of intelligence) chiefly as a check upon the non-verbal test, i.e the Pintner Non-Language Intelligence Test. The author, while comparing the general intelligence of pupils in certain bilingual and monolingual schools in South Wales, states:

All that can be claimed is that we have here an indication that bilingual children will not prove inferior to monoglots (with a similar social environment) in an improved intelligence test from which the linguistic element is excluded ... it is indicated that under conditions of bilingualism, intelligence tests of a non-verbal nature should be used in preference or in addition to those in which success is conditioned by linguistic ability. (15:249-50)

Garcy (36) appears to be more conclusive in his argument. He suggests that the administration of both verbal and non-verbal tests of intelligence would yield a
more valid picture of the intelligence of bilingual people than the administration of either one of them alone.

Darcy (37) comes down more heavily in favour of using the verbal tests. While criticising the results of Armenian research on the ground that the abstract and symbolic relations between higher thought processes are not possible without the mediation of verbal symbols. Since Armenian has not used any verbal test, it is not possible to extend his results to 'mental development'. His findings can only be interpreted as pertaining to performance in non-verbal intelligence tests rather than to 'mental development'.

Darcy (37) again states:

It might be questioned whether visual perception and the six factors which are measured by the Pintner Non-Language Test are adequate measures of that which is generally defined as intelligence. Certainly most psychologists would insist that the verbal factor is an important one in measuring intelligence and therefore this study or any study of its kind, should include, though not limit itself to a recognized intelligence test of a verbal character in order to give the whole picture. (37:47)

Garrison, Kingston and McDonald (53) further strengthen this point in favour of the verbal tests in other words. They point out:
The development of language approximates the development of intelligence and is usually regarded as one of the best indices for evaluating intellectual growth and development. (53:96)

It is further elaborated that as the children mature mentally, they become better able to deal with abstract concepts, and use the many word symbols of their language that make the formation of abstract concepts possible.

Piaget (128) while emphasizing the close relationship of language and thinking, states that the language and thought of the child are aspects of the cognitive process, and the intellectual processes of the child can only be seen through his language.

According to McCandless (107) intelligence may be defined as the problem solving ability of an individual, which depends on being able to handle abstractions. The children who possess this ability to a high degree are those who are verbally and numerically efficient. Anything affecting the use of words probably has an effect on intelligence.

Results in Favour of Using Individual Tests

Colvin and Allen (33) state that an individual test constitutes a more accurate measure of intelligence than a group test.
Darcy (37) supports this view while evaluating Arsenian’s conclusions and states:

...the use of group intelligence tests, when intelligence is the variable to be measured in a study may be criticised, since it is recognized generally that individual intelligence tests are a far more valid measure of intelligence as it is measured at the present time. (37:49)

So in the light of these variant arguments, the four tests used in the present research were selected.

**Instruments of Measurement**

The instruments of measurement which were employed in the present research are the following:

1. Scholastic Aptitude Test (149)
2. Raven’s Standard Progressive Matrices (137)
3. Burt’s Arithmetic (Written Graded Test: Problem) (27:469-71)

**Scholastic Aptitude Test.** Scholastic Aptitude Test (149) is a group test. It was devised to get an estimate of the level of intellectual functioning of a person. It is available in three scales. The present study employed Scale I for Class VI and Scale III for Class X. These scales have essentially the same content and differ only
in the level of complexity and abstractness. These scales contain four types of items which require similar mental functioning to that needed in school work:

1. **Verbal Ability**
2. **Numerical Reasoning**
3. **Logical Reasoning**
4. **General Knowledge.**

1. **The Verbal Ability items** are designed to estimate the child's capacity for understanding concepts, the meaning of words and his level of language development. These are also a measure of his ability to generalize and to think constructively.

2. **Numerical Reasoning items** assess the child's understanding of numerical concepts and his ability to deal with quantitative materials. The items are also a measure of the child's ability to reason with numbers and to deal intelligently with quantitative materials.

3. **Logical Reasoning items** assess the thinking and reasoning ability of a child, applying the methods of induction and deduction. These items are analogies, syllogisms and inferences.

4. **The General Knowledge items** like any general intelligence tests, measure the child's general knowledge related to everyday problems and understanding of the environment.
The scales contain multiple choice items, each offering the examinee four choices. The student has to read the stem of the item and then select from the four choices offered, the one he thinks is correct. There is only one correct choice for each item. Scale I has consumable test booklets, but scale III has re-usable test booklets with separate answer sheets. Scale I contains 60 items and Scale III 70 items.

Each scale takes one hour, though the actual working time allowed is exactly 45 minutes. Fifteen minutes are spent on distributing the test and giving directions.

As stated in the Manual (104) the validity of the Scholastic Aptitude Test is judged by determining the extent to which these tests predict the students' success in their academic work. The average validity co-efficient of Scale I is .41 for boys and .61 for girls and that of Scale III is .45 for boys and .64 for girls when the test scores are correlated with the final examination marks.

The average reliability co-efficient is .89 of Scale I and .90 of Scale III by the split-half technique. The Scholastic Aptitude Test is one of the first series of psychometric devices developed and standardised in Pakistan. It can be used for a variety of educational purposes.
The results of Zaki (195) who administered the Scholastic Aptitude Test, Scale I (149) to the fourth and fifth grades show that the validity coefficients of the test when raw scores are correlated with the raw scores of Raven's Test range between .45 and .70, the higher coefficients being for Junior Model Schools, (upper socio-economic status), groups.

The Odd-even reliability of the test, she reports, is .78.

Below are the tables which present the validity and reliability of the Scholastic Aptitude Test estimated by the investigator in the present research.

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>Class</th>
<th>Number</th>
<th>r</th>
<th>P</th>
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<tbody>
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<td>Boys</td>
<td>10th</td>
<td>50</td>
<td>.30</td>
<td>.05</td>
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<td>.33</td>
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### Table 12. Correlations Between Raw Scores of Scholastic Aptitude Test and SAT Scores of Class Ten and Six

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<th>F</th>
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<td>50</td>
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<td>.34</td>
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<td></td>
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<td>50</td>
<td>.35</td>
<td>.01</td>
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<tr>
<td>Average</td>
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<td></td>
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<td>-</td>
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<td>.33</td>
<td>.05</td>
</tr>
<tr>
<td>Bilingual</td>
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<td>.43</td>
<td>.01</td>
</tr>
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<td>.22</td>
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### Table 13. Correlations Between Raw Scores of Scholastic Aptitude Test and School Marks

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>Class</th>
<th>Number</th>
<th>r</th>
<th>F</th>
</tr>
</thead>
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<td>Boys</td>
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<td>50</td>
<td>.71</td>
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</table>
Table 14. Reliability of intelligence group test corrected by N = 30 given to groups 10 and 6.

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>Class</th>
<th>N</th>
<th>Reliability Coefficient</th>
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<td>Monolingual</td>
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<td>10th</td>
<td>50</td>
<td>.94</td>
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<td>.94</td>
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<td>.97</td>
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<td>6th</td>
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<td>.82</td>
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</table>

Tables 10, 11 and 12 show that in the case of concurrent validity the average correlations are .30 and .52 when the Scholastic Aptitude Test is correlated with Raven's Progressive Matrices, .56 and .69 when the Scholastic Aptitude Test is correlated with Burt's Arithmetic and .29 and .27 when Scholastic Aptitude Test is correlated with Koh's Block Design Test at classes 10 and 6 respectively.
Comparatively low averages of the correlations between Scholastic Aptitude Test and Roh's Block Design Test on Table 12 might be due to the fact that the nature of both the tests is different from each other. The former is a verbal group test and the latter is a performance individual test.

When the Scholastic Aptitude Test is correlated with the marks in Table 13, the validity coefficient is .40 and .71 for class 10 and 6 respectively.

In the case of reliability, the range is from .82 to .97 in Table 14.

The validity and reliability computed by the investigator compare quite satisfactorily with that reported from the manual.

Administration and Scoring of Scholastic Aptitude Test. The investigator followed strictly the directions and scoring procedures prescribed in the manual. She made herself thoroughly familiar with the procedures and other contents of the manual before administering the tests.

Standard Progressive Matrices. Standard Progressive Matrices (167) consists of sixty problems divided into five sets of twelve. Each problem is in itself self-evident and the difficulty level progresses step by step. The order of the tests provides the standard training in the method of working. The five sets offer five opportunities for grasping
the method and hence five progressive assessments of a person's intellectual capacity. In order to keep the students interested and free from fatigue, the figures in each problem, according to Raven, "are boldly presented, accurately drawn and as far as possible pleasing to look at." (137:1)

The scale assesses the whole range of a child's intellectual development from the time a child is able to apprehend the idea of finding a missing piece to complete a pattern and has the capacity to form comparisons and reason by analogy, without this being unduly exhausting. The total scores of a child give an index of his intellectual capacity, whatever his nationality or education may be. Raven calls this scale a test of observation and clear thinking. Moreover, each problem in the scale is really the "mother" or "source" of a system of thought; that is why it is called "Progressive Matrices." Raven states that this scale is used internationally for comparative purposes.

According to Shipley (153) this scale is a non-verbal intelligence test. It measures Spearman's 'g' factor. There are five problems arranged in series by order of difficulty. As the content is confined to highly abstract material which is not acquired in classroom or general experience, it is generally presumed that what is being
measured is concerned more directly with 'native' abstract intelligence and less with academic achievement, educational opportunities or cultural background than is the case with most tests of general intelligence.

Progressive Matrices in the present research was used as a group test. According to Raven, the order of the problems provides the standard training in the method of working and the scale could be used either as an individual or as a group test. He further points out that a group test seems to provide a more reliable sample of a person's output of intellectual activity during the test.

As regards time, Raven states that the Progressive Matrices can be used without a time limit in order to assess a person's maximum capacity for observation and clear thinking or with a time limit to assess his speed of accurate intellectual work. The emphasis is on an untimed capacity test which according to Raven is more useful and appropriate than a test in which a person is working against time.

Morrison (117) has also recommended the removal of the time limit particularly in groups such as the present ones'. He reports while concluding,
An interesting minor result, confirmed in both Scotland and Wales, is that the only well-known intelligence test without a time limit, namely Raven's Matrices, appears to be the most suitable for bilingual children, who show less retardation as compared with monoglots in this test than in any other intelligence test. This test is also less influenced by the linguistic background than any other so far tried. This is probably due more to the absence of a time-limit than anything else. (117: 288-289)

Lewis (98) mentions the results of Morgan's investigation, where Raven's Progressive Matrices was used without time-limit and where there was no difference between the results of bilinguals and monolinguals.

So keeping in view the results, the test was used without a time limit, in the present research.

Reviewing the test Wechsler (188) says:

This test consists of a graded series of logically designed patterns, (Matrices), serving to measure what the author calls 'innate educative ability, educative intelligence', or simply 'education.' The themes of the successive sets of subjects are (a) continuous patterns, (b) figure analogies, (c) progressive alternation of patterns, (d) permutation of figures, and (e) resolution of figures into constituent parts. (188:257-59)

Wechsler reports two limitations of this test, (1) the problems measure general intelligence through a single modality of performance and (2) this scale has a low ceiling.

Findings of this scale are congruent with those of most other sensory and perceptual motor tasks.
According to Anastasi (4) this scale developed in Great Britain by Raven was designed as a measure of Spearman's 'g' factor, for which it has won popularity in Britain and America among great psychologists.

Vernon (182) states:

In 1938 Penrose and Raven issued their progressive Matrices (1,84) which test reasoning by means of abstract diagramatic problems from the level of defective adults or 8 year children up to superior adults. This was adopted as the basic intelligence test by the Army and Navy personnel selection departments in 1941 and applied to several million recruits before the end of the war. (184:179)

Some investigators are suspicious about the validity of Progressive Matrices when applying it to groups varying in background. For example Banks and Sinha (14) report that this test is not culture free as claimed by its author. Chaudhri's (31) results showed the same bias when testing Pakistani children. Results showed that the Pakistani performance on Matrices was much below the British standard. Only 11 percent of Pakistani children scored above the British median. Matrices proved to be a test of considerable difficulty for the Pakistani children. He further emphasizes that these results cast doubts about the effectiveness of the Matrices test as a measure of the intelligence of Pakistani children. It might be well to use Matrices with greater scepticism about its freedom from cultural influences,
It may not be permissible to assume that geometrical matrices are entirely culture free. As reported validity is .27 when matrices is correlated with teachers' ratings and .43 when with Ramat's Binet. Reliability co-efficient is .75 when the groups are combined. According to Chaudhri (31) validity and reliability of the test are lower than those generally reported in Western studies. Keir (85) with London children in 11 - 13 years age range and Banks and Sinha (14) with the age range 10 - 11 years, reported correlation .62 and .54 respectively between matrices and Binet. Keir (85) after using the split-half technique reported .76 co-efficient of reliability and after two years interval test retest reliability is .64. Banks and Sinha (14) reported a split-half corrected co-efficient of .86, an analysis of variance co-efficient of .90 and a Kuder-Richardson co-efficient.91. The reliability, co-efficient of Chaudhri (31) compares fairly well with Keir's results but is relatively lower than reported by Banks and Sinha (14) and the majority of the Western investigations.

Burke (23) lists about fifty studies in England, fourteen in America and ten elsewhere and reports its popularity among researchers.

According to Burke (23) re-test reliability in groups of older children and adults (homogeneous in age), ranges between .70 and .90. Correlations with both verbal and
performance tests of intelligence range between .40 and .75 tending to be higher with the performance than with the verbal tests.

According to Raven (137) this test has a re-test reliability varying with age from .83 to .93. It correlates .86 with the Herman-Serrill scale and has been found to have a 'g' saturation of .82.

The results of Zaki (195) who administered the Standard Progressive Matrices, Sets A, B, C, D, and E to the fourth and fifth grades, show that the validity coefficients range between .45 and .70, with higher coefficients for Junior Model Schools (upper socio-economic status), when raw scores on the test are correlated with raw scores on the Scholastic Aptitude Test.

The odd-even reliability of the test reported by her is .72.

Shabnam Jamal (69) used Coloured Progressive Matrices, Sets A, B and C on children studying in European and Corporation types of schools at primary level. The results show that this test is statistically valid for students of higher socio-economic status who study in the European-type schools. The coefficient of correlation between the raw scores of Raven's Coloured Progressive Matrices Test and the consolidated teacher's ratings is almost zero i.e. .10 for all the students of Corporation schools and quite significant
i.e., .32 for all the students of European-type schools. In the same way, the co-efficient of correlation between the raw scores of Raven's Coloured Progressive Matrices Test and this Test was low i.e., .10 for all the students of the Corporation types of schools and quite significant i.e., .61 for all the students of the European types of schools.

In this study the odd-even reliability co-efficient of this test is found to be .68.

The following tables show the validity and reliability co-efficients of Raven's Progressive Matrices estimated by the investigator.

### Table 15. Correlations between raw scores of Raven's Progressive Matrices and Albert's Arithmetic at Class 10 and 6

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>Class</th>
<th>Number</th>
<th>r</th>
<th>P</th>
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<tr>
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### Table 16. Correlations Between the Scores of Raven's Progressive Matrices and Koš's Block Design Test at Class 10 and 6

<table>
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<th>Group</th>
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<th>Class</th>
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### Table 17. Correlation Between Scores of Raven's Progressive Matrices Test and School Marks

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<th>Class</th>
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<th>P</th>
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</tr>
<tr>
<td>Monolingual</td>
<td>Boys</td>
<td>6th</td>
<td>50</td>
<td>.56</td>
<td>.01</td>
</tr>
<tr>
<td>Group</td>
<td>Sex</td>
<td>Class</td>
<td>N</td>
<td>Reliability Coefficient</td>
<td>Odd vs. Even Item</td>
</tr>
<tr>
<td>----------------</td>
<td>------</td>
<td>-------</td>
<td>----</td>
<td>-------------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Bilingual</td>
<td>Boys</td>
<td>10th</td>
<td>50</td>
<td>.95</td>
<td></td>
</tr>
<tr>
<td>Monolingual</td>
<td></td>
<td>10th</td>
<td>50</td>
<td>.68</td>
<td></td>
</tr>
<tr>
<td>Bilingual</td>
<td>Girls</td>
<td>10th</td>
<td>50</td>
<td>.85</td>
<td></td>
</tr>
<tr>
<td>Monolingual</td>
<td></td>
<td>10th</td>
<td>50</td>
<td>.96</td>
<td></td>
</tr>
<tr>
<td>Bilingual</td>
<td>Boys</td>
<td>6th</td>
<td>50</td>
<td>.95</td>
<td></td>
</tr>
<tr>
<td>Monolingual</td>
<td></td>
<td>6th</td>
<td>50</td>
<td>.97</td>
<td></td>
</tr>
<tr>
<td>Bilingual</td>
<td>Girls</td>
<td>6th</td>
<td>50</td>
<td>.96</td>
<td></td>
</tr>
<tr>
<td>Monolingual</td>
<td></td>
<td>6th</td>
<td>50</td>
<td>.96</td>
<td></td>
</tr>
</tbody>
</table>

The tables 15 and 16 indicate that in the concurrent validity, the average correlations between Raven's Progressive Matrices and Hutt's Arithmetic are .41 and .43, between Raven's Progressive Matrices and Koh's Block Design Test are .53 and .44 and in Table 10, between Raven's Progressive Matrices and Scholastic Aptitude Test are .30 and .52 at classes 10 and 6 respectively.
When Raven's Progressive Matrices is correlated with the school marks in Table 17 the validity coefficient is .35 and .56 for classes 10 and 6 respectively.

The range of reliability of this test is from .68 to .97 in Table 16.

Administration and Scoring of Standard Progressive Matrices. Directions and scoring procedures of this test were taken from the Guide to the Standard Progressive Matrices (137). The investigator followed them as strictly as possible. The students were informed about the nature and objectives of the test before they were given the test booklets and the answer sheets. In spite of the fact that there was no restriction on the number of students to be tested as a group test, the investigator never administered the test to more than forty students at a time.

Instructions for this test were constructed in Urdu (Appendix H). Some of the changes were also made in the answer sheet. (Appendix K)

Hurt's Arithmetic Graded Written Test. This test of arithmetic may be divided into graded and uniform tests and by a cross division into individual and group tests. A completely oral test is necessarily an individual test and a written test may be a group test. In arithmetic, the range or scope of attainment is best measured by test-material graded in difficulty. According to Hurt (27) the individual
Tests are 'mental arithmetic' as the child works the sum 'in his head'. A group test in mental arithmetic may be carried out by distributing printed question-sheets, with blank spaces opposite each question for the child to insert the answer. Written work is not attempted with children before the mental age of 7 (standard I).

In the present research, Burt's Arithmetic Graded Written Test is used. The children would tend to work the problem sums mentally with the series for age 7. But as the test is definitely an examination in paper work, the children should be left to read the questions for themselves and no matter how simple the computation, they should display all their working. At each age which starts from 7 to 14, five sums in 'problem' form are given. These demand in order that the circumstances of the question may be rightly visualised and a suitable process rightly selected with a wider play of imagination and a deeper exercise of reasoning as they progress. This test was considered suitable for the present research as according to Burt (27) the problem arithmetic embodies the reasoning process which is the supreme manifestation of intelligence.

Hassan (61) made some modifications in this test in order to administer it to Pakistani children. Proper names of persons and places and Pakistani weights, measures and currency were substituted for the English ones. In some
cases, the name of a familiar object was substituted in place of one which was unfamiliar to Pakistani children. An Urdu translation of the same test was made for monolingual children. The investigator had to change annas into paisas for the purposes of the present research. The change in the coins was made by the Government of Pakistan and it seemed probable that, though the old concept of the coins is familiar to the children, it might confuse them if not changed. Instructions for the test were constructed in Urdu and English. (Appendix F)

It has been pointed out by Burt (27) that the child should not be given problems which are allocated to his own chronological age and if the child's mental age is totally unknown, it may be advisable first to work upwards from the series three or four years below his chronological age, giving problems from each year until the child fails. In the present research, the students were given forty questions and asked to attempt as many as they could.

In the case of time, Burt (27) states that mental arithmetic is an activity which is much impaired by fatigue. More than ten or fifteen problems at one sitting will seldom be expedient. The test in the present research was given as an untimed test. During the testing a break of fifteen minutes was given after one and a half hour's work. Two
and a half hours was the approximate time taken by the children.

Burt (27) has not mentioned the validity and reliability of this test. The investigator has tried to assess the validity and reliability of the test in the following tables:

**Table 19. Correlations between the Numerical Arithmetic Test and Koh's Block Design Test at Classes 10 and 6**

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>Class</th>
<th>Number</th>
<th>r</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bilingual</td>
<td>Boys</td>
<td>10th</td>
<td>50</td>
<td>.31</td>
<td>.05</td>
</tr>
<tr>
<td>Monolingual</td>
<td></td>
<td>10th</td>
<td>50</td>
<td>.33</td>
<td>.05</td>
</tr>
<tr>
<td>Bilingual</td>
<td>Girls</td>
<td>10th</td>
<td>50</td>
<td>.34</td>
<td>.05</td>
</tr>
<tr>
<td>Monolingual</td>
<td></td>
<td>10th</td>
<td>50</td>
<td>.54</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td></td>
<td></td>
<td>.46</td>
<td></td>
</tr>
<tr>
<td>Bilingual</td>
<td>Boys</td>
<td>6th</td>
<td>50</td>
<td>.26</td>
<td>-</td>
</tr>
<tr>
<td>Monolingual</td>
<td></td>
<td>6th</td>
<td>50</td>
<td>.21</td>
<td>-</td>
</tr>
<tr>
<td>Bilingual</td>
<td>Girls</td>
<td>6th</td>
<td>50</td>
<td>.23</td>
<td>-</td>
</tr>
<tr>
<td>Monolingual</td>
<td></td>
<td>6th</td>
<td>50</td>
<td>.45</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Average</strong></td>
<td></td>
<td></td>
<td></td>
<td>.27</td>
<td></td>
</tr>
</tbody>
</table>
Table 19 indicates that in concurrent validity, the average correlations between Burt's Arithmetic Test and Koh's Block Design Test are .46 and .27, in Table 11 between Burt's Arithmetic Test and Scholastic Aptitude Test are .36, .69 and in Table 15 between Burt's Arithmetic Test and Raven's Progressive Matrices Test are .41 and .43 at classes 10 and 6 respectively.

With the exception of one average correlation, .27, between Burt's Arithmetic Test and Koh's Block Design Test at class 6, all the others are quite significant.

When Burt's Arithmetic Test is correlated with the final examination marks in Table 20, the validity coefficient is .39 and .58 for classes 10 and 6 respectively.

The reliability coefficient of this test is .89 in Table 21.
Administration and Scoring of Burt’s Arithmetic Test.

The researcher followed fully the directions and scoring procedures given by Burt (27). The arithmetic test, being more sensitive to varying circumstances such as fatigue or strain etc., as corroborated by Burt was always started in the first period and continued till the students finished work on it. During the testing a break of twenty minutes was given after one and a half hours work. The answer sheets, with answers and working were taken from the students and blank papers were provided after the break. Hassan (61) administered the test over two days, but in this research it was given in one day to lessen the chances of cheating. The children were asked to read the questions themselves but, in rare cases, if some words were not clear to the students, they were read out by the investigator.

Koh’s Block Design Test. This test was selected for this research as its performance tests are ones in which problems are presented in a concrete or practical form and the problem of language is reduced to the minimum.

Alexander (1) has pointed out the function and nature of performance tests by stating that performance tests are measures of intelligence in which there is a practical task to be done which involves and stresses thinking rather than more manual dexterity.
Koh (27) states:

If intelligence involves the following mental operations, analyzing, combining, comparing, deliberating, completing, discriminating, judging, criticizing and deciding, then the block design tests may, with justice, be said to call upon the functioning of intelligence and to that extent they are a measure of that mental capacity. (87:175)

Vernon (181), Macneakin (102) and a number of other workers have proved this test a fair index of intelligence, whereas performance tests are not generally considered adequately discriminating at the higher level.

Koh’s Block Design Test is an individual performance test which measures the general intelligence of the children. It is a timed test. Each item of the test is performed within a limited time. Alexander (1), Harshak (106), Chaudhri (31) and Fature (47) reported the high validity and reliability of this test. Macneakin (102) states a correlation of co-efficient of .53 with a group of 277 Scottish children, validated by comparison with the Binet. Bahatia (12) shows a co-efficient of .53 with 10 - 16 years old Indian children from public schools with a group of 255 civil service candidates. Vernon (181) reports a saturation of about .60 for the Kohs - Millebrook Block Test. Goughrey Thomson (176) used the results obtained by Macneakin (102) with nearly a thousand Scottish children who were given the Binet and a battery of performance test, and finds a 'g' -
saturation of over .641 for the Koh's when the 'simple summation' method of factor analysis is used. Burt's (24) re-analysis of the same data yields for Koh's a 'g' saturation of .640, (general factor method), and .604, (group factor method). Alexander (1), reports a 'g' factor loading of .697 for this test when it forms part of a battery of performance tests and the Binet given to 100 women.

Chaudhri's (31) research shows the least cultural differences with Koh's Block Design Test. He correlated Koh's with the two external criteria of intelligence, i.e., teachers' ratings and the Bombay-Karnatak revision of the Stanford Binet to validate the test. Correlations obtained between teachers' ratings and Koh's is .55 and between the Bombay Karnatak revision of the Binet and Koh's is .72.

Chaudhri (31) reported Macneakin's correlation, which was .56 for children with an age range of 10 - 12, and Bahatia's correlation, which was .46 with children in the range of 11 - 16 years, between Koh's and Binet.

Chaudhri (31) reported reliability coefficients of Koh's by using the Kuder-Richardson technique: for the whole, .92; for the literate, .92; for the illiterate, .91; for the urban, .85 and for the rural, .94.

Chaudhri (31) wrote that according to Vernon (180), Guilford (56) and other psychologists, it is generally agreed that the figure obtained for a reliability co-efficient
should be .90. Considered on this criterion the reliability coefficient of Koh's given by Chaudhri is above .90, except in the urban group in which it is slightly lower.

Table No. 22 below shows the validity of this test estimated by the investigator.

**Table 22. CORRELATION BETWEEN RAW SCORES OF KOH'S BLOCK DESIGN TEST AND SCHOOL MARKS**

<table>
<thead>
<tr>
<th>Group</th>
<th>Sex</th>
<th>Class</th>
<th>Number</th>
<th>r</th>
<th>R</th>
</tr>
</thead>
<tbody>
<tr>
<td>Monolingual</td>
<td>Boys</td>
<td>10th</td>
<td>50</td>
<td>.78</td>
<td>.01</td>
</tr>
<tr>
<td>Monolingual</td>
<td>Boys</td>
<td>6th</td>
<td>50</td>
<td>.19</td>
<td>-</td>
</tr>
</tbody>
</table>

Table 22 shows the validity co-efficient, .78 at class 10 and .19 at class 6. The former is quite significant but the latter though positive is not significant.

The averages of concurrent validity are .29 and .27 in Table 12 when Koh's Block Design Test is correlated with Scholastic Aptitude Test, .53 and .44 in Table 16 when it is correlated with Raven's Progressive Matrices and .46 and .27 in Table 19 when it is correlated with Burt's Arithmetic Test.

Some of the low correlations might be due to the fact that Koh's Block Design Test being performance, does not
have the elements found in other verbal tests with which it is correlated.

In the case of reliability, the split-half method was not possible to this test as the items are limited. The test-retest method was not applied due to the shortage of time.

Administration and Scoring of Kohl's Block Design Test. The procedure for administration and scoring was that given by Alexander (1). The test administration took half an hour for each child. This was the last test to be taken.

Instructions for the test were constructed in Urdu and English (Appendix G).

Procedures Applied in Administering All The Four Tests

1. Before administering the tests the investigator always made arrangements by consulting the teacher concerned.

2. The students were informed one day before the test was administered.

3. The investigator had one assistant for group testing to keep control over the students. This duty was usually assigned to the class teacher.
4. The tests were never administered to a group of more than 40 students at a time.

5. The tests were administered in the morning before break.

6. The booklets were always checked before the administration of the tests. Booklets with missing pages, faint writing, wrong binding or other disturbing elements were removed.

7. The students were supplied with sharp pencils and erasers. A few extra pencils were kept so that if any student broke the lead he was provided with a new one.

8. Directions were always read out clearly, slowly and with due emphasis; and if necessary, repeated.

**Physical Conditions**

1. The rooms used for testing were airy, clean, well-lighted and devoid of extrinsic visual and auditory stimuli.

2. The rooms were large enough to accommodate the desired number of students. Very often the hall of the school was utilized.
3. The room used for testing was always away from any noise and disturbance.

4. The seats were arranged sufficiently far apart from one another to prevent cheating. The students faced the person in charge.

5. Comfortable seats and tables were provided to accommodate the booklets and answer sheets conveniently.

6. Space was left so that the supervisor could pass easily between the students without disturbing them.

**Attitude of the Subjects**

Though it was a new experience for the students to undergo such a type of test, after knowing the nature and significance of the tests, they seemed quite satisfied and worked on them enthusiastically. Nearly all the students continued to work on the tests until the investigator stopped them.
Sequence of Test Administration

The tests were administered in the following order:
1. The Scholastic Aptitude Test (149)
2. The Standard Progressive Matrices (167)
3. Burt's Arithmetic Graded Written Test, Problems (27)
4. Koh's Block Design Test (87)

Achievement

The Board of Intermediate and Secondary Education was approached by the researcher with a view to obtain the annual results of those students who had taken all the four tests - Scholastic Aptitude Test, Standard Progressive Matrices, Burt's Arithmetic and Koh's Block Design Test. All children appeared in the Matriculation Examination held in 1968.

Validities and Reliabilities

An attempt has been made to find out the validity and reliability of the tests used in the present research.

Test Validity: The first question which is raised about the test is the extent to which it measures what it actually proposes to measure. Different psychologists and
staticians have signified the importance of validity and have defined it thus:

Guildord (57) presents his views about the validity of a test: "In crudest terms we say that a test is valid when it measures what it is presumed to measure." (57:461)

He further stresses that validity is a highly relative concept.

Thorndike and Hagen (177) state: "Validity refers to the extent to which a test measures what we actually wish to measure." (177:160)

Garrett and Woodworth (52) and Anastasi (5) repeat the same concept in other words. According to them, the validity of a test depends upon the fidelity with which it measures what it purports to measure.

In the present research, concurrent validity and predictive validity are estimated:

a. Concurrent validity is estimated by inter-correlating the four tests used in the research.

b. Predictive validity is estimated by correlating the four tests with the final examination total marks.

Product Moment method was used to compute the co-efficients of correlation.
Test reliability: Reliability appraises the consistency of the test. Burt (23), conceived reliability of any measurement as the ratio of the true to the true total variance.

Guilford (57) defines it in the same way. He says:

The reliability of any set of measurement is logically defined as the proportion of their variance that is true variance... Reliability is of a certain instrument applied to a certain population under certain conditions. (57:436)

Garret et al (52) states in other words: "A test score is called reliable when we have reasons for believing the score to be stable and trustworthy." (52:337)

Thorndike and Hagen (177) report:

Reliability has to do with accuracy and precision of a measurement procedure. Indices of reliability give an indication of the extent to which a particular measurement is consistent and reproducible. (177:160)

According to Anastasi (5) "test reliability is the consistency of scores obtained by the same person when retested with the identical test or an equivalent form of the test." (5:28)

In the present research, calculation of reliability was made by the split-half and test-retest methods. The test-retest method would have been better but the time available was only sufficient to complete one testing of the five hundred children. Only one group of fifty children
was tested twice on three tests - the Scholastic Aptitude Test, Raven's Progressive Matrices and Satt's arithmetic. The split-half method was used on the Scholastic Aptitude Test and Raven's Progressive Matrices for all the groups at both the levels - class 10 and 6.

In the case of Koh's Block Design test, the split-half method was not possible as the items of the test are limited. The test-retest method could not be used due to the shortage of time.

The Spearman Brown Prophecy Formula was used for correction.

The following tables exhibit the averages of intercorrelations among the four tests used in the present research at classes 10 and 6.
<table>
<thead>
<tr>
<th>Tests</th>
<th>1 Scholastic Aptitude Test</th>
<th>2 Raven's Progressive Matrices Test</th>
<th>3 Kurt's Arithmetic Test</th>
<th>4 Koh's Block Design Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Scholastic Aptitude Test</td>
<td>.</td>
<td>.30</td>
<td>.56</td>
<td>.29</td>
</tr>
<tr>
<td>2. Raven's Progressive Matrices Test</td>
<td>.</td>
<td>.</td>
<td>.41</td>
<td>.53</td>
</tr>
<tr>
<td>3. Kurt's Arithmetic Test</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.46</td>
</tr>
<tr>
<td>4. Koh's Block Design Test</td>
<td>.</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>
TABLE 24. RELATIONSHIPS BETWEEN TESTS AT CLAS. 6

<table>
<thead>
<tr>
<th>Tests</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scholastic Aptitude Test</td>
<td>.62</td>
<td>.69</td>
<td>.27</td>
<td></td>
</tr>
<tr>
<td>Raven's Progressive Matrices Test</td>
<td></td>
<td>.43</td>
<td>.44</td>
<td></td>
</tr>
<tr>
<td>Burt's Arithmetic Test</td>
<td></td>
<td></td>
<td>.27</td>
<td></td>
</tr>
<tr>
<td>Koh's Block Design Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

On the whole, the estimated validities and reliabilities are quite high. This gives support to the belief that these four tests with appropriate adaptation may be usefully employed to assess Pakistani children.
CHAPTER IV
ANALYSIS AND RESULTS

This chapter is devoted to the analysis and interpretation of the results obtained during the course of study through Scholastic Aptitude Test, Raven's Progressive Matrices, Burt's Arithmetic and Koh's Block Design Test at classes 10 and 6 and the Matriculation examination at class 10. Hypotheses were tested by finding the significance of difference between the means of groups in terms of t-test and in division wise comparison, Chi-square, Test was used.

Symbols and Abbreviation

A number of symbols and abbreviations have been used in the tabulation of the results and application of certain statistical methods. These symbols and abbreviations are presented below:

Group I designates bilingual boys from English medium schools (St. Anthony and Cathedral schools).

Group II designates monolingual boys from Urdu medium schools (Central Model School No.1).
Group B designates bilingual girls from English medium schools (Convent of Jesus and Mary and Cathedral Schools).

Group D designates monolingual girls from Urdu medium schools (Sadraba-Tul-Banat and Lady Maclagan school).

Bil designates bilinguals.

Mon designates monolinguals.

SAT designates Scholastic Aptitude Test.

Raven's designates Raven's standard Progressive Matrices.

Burt's designates Burt's Arithmetic Test.

Koh's designates Koh's Block Design Test.

\( \text{N stands for number} \)

\( \text{SD stands for the standard deviation of the sample} \)

\( \text{t stands for the ratio of a deviation from the mean of the sample distribution to the standard error of that distribution.} \)

\( \text{p stands for level of significance.} \)

\( \text{- stands for no significance.} \)
Differences between Bilinguals and Monolinguals in Intelligence

Table 25 shows the ranges, means, standard deviations and t-values of the raw scores of 10th class combined groups of bilinguals (boys and girls) and monolinguals (boys and girls) on SAT, Raven's, Burt's and Koh's.

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>bil. (A+C)</td>
<td>100</td>
<td>7 - 63</td>
<td>35.60</td>
<td>17.37</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td>Mon. (B+G)</td>
<td>100</td>
<td>8 - 63</td>
<td>34.75</td>
<td>15.32</td>
<td>.46</td>
<td></td>
</tr>
<tr>
<td></td>
<td>bil. (A+C)</td>
<td>100</td>
<td>14 - 57</td>
<td>43.91</td>
<td>7.65</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raven's</td>
<td>Mon. (B+G)</td>
<td>100</td>
<td>12 - 56</td>
<td>36.70</td>
<td>11.91</td>
<td>5.29</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>bil. (A+C)</td>
<td>100</td>
<td>11 - 32</td>
<td>19.19</td>
<td>4.28</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burt's</td>
<td>Mon. (B+G)</td>
<td>100</td>
<td>6 - 29</td>
<td>15.96</td>
<td>5.75</td>
<td>4.50</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>bil. (A+C)</td>
<td>100</td>
<td>2 - 110</td>
<td>36.90</td>
<td>21.91</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td>Mon. (B+G)</td>
<td>100</td>
<td>2 - 83</td>
<td>23.50</td>
<td>16.61</td>
<td>4.98</td>
<td>.01</td>
</tr>
</tbody>
</table>
Table 25 shows that the difference between bilinguals (Group A+C) and monolinguals (Group E+D) is not statistically significant on BIT whereas on Caven's, Curt's and Koh's, differences are significant at .01 level in favour of the bilinguals (Group A+C).

Table 26 presents the ranges, means, standard deviations and t-values of the raw scores of 10th class bilingual and monolingual girls on BIT, Caven's, Curt's and Koh's.
Table 26. Range, Mean, Standard Deviation and t-value of the raw scores of 10th class bilingual and monolingual girls

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>Bil. (C)</td>
<td>50</td>
<td>20 - 63</td>
<td>37.80</td>
<td>9.33</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (D)</td>
<td>50</td>
<td>6 - 55</td>
<td>24.10</td>
<td>9.64</td>
<td>7.22</td>
<td>.01</td>
</tr>
<tr>
<td>Raven's</td>
<td>Bil. (C)</td>
<td>50</td>
<td>33 - 57</td>
<td>44.60</td>
<td>5.97</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (D)</td>
<td>50</td>
<td>12 - 50</td>
<td>33.30</td>
<td>11.65</td>
<td>6.11</td>
<td>.01</td>
</tr>
<tr>
<td>Burt's</td>
<td>Bil. (C)</td>
<td>50</td>
<td>11 - 30</td>
<td>18.44</td>
<td>4.04</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (D)</td>
<td>50</td>
<td>3 - 21</td>
<td>12.06</td>
<td>3.95</td>
<td>7.97</td>
<td>.01</td>
</tr>
<tr>
<td>Koh's</td>
<td>Bil. (C)</td>
<td>50</td>
<td>6 - 110</td>
<td>36.10</td>
<td>21.85</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (D)</td>
<td>50</td>
<td>2 - 54</td>
<td>19.40</td>
<td>12.45</td>
<td>4.69</td>
<td>.01</td>
</tr>
</tbody>
</table>

Table 26 indicates that the mean differences of bilingual and monolingual girls are statistically significant at .01 level on SAT, Raven's, Burt's and Koh's. It means that the performance of bilingual girls is decidedly better than that of the monolingual girls on all the four tests.

With the exception of SAT, direction of the results is the same in Table 25, where combined groups are compared.
Table 27 presents the ranges, means, standard deviations and the t-values of the raw scores of 10th class bilingual and monolingual boys on SAT, Raven's, Burt's and Koh's respectively.

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>BIL (A)</td>
<td>50</td>
<td>7 - 60</td>
<td>33.70</td>
<td>11.00</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.02</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Mon. (B)</td>
<td>50</td>
<td>14 - 86</td>
<td>45.40</td>
<td>12.22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIL (A)</td>
<td>50</td>
<td>14 - 56</td>
<td>43.22</td>
<td>9.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raven's</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.53</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mon. (B)</td>
<td>50</td>
<td>12 - 56</td>
<td>40.10</td>
<td>11.17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIL (A)</td>
<td>50</td>
<td>11 - 32</td>
<td>19.94</td>
<td>4.39</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burt's</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>0.09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mon. (B)</td>
<td>50</td>
<td>9 - 29</td>
<td>19.86</td>
<td>4.48</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>BIL (A)</td>
<td>50</td>
<td>2 - 84</td>
<td>37.70</td>
<td>21.93</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2.31</td>
<td>.05</td>
<td></td>
</tr>
<tr>
<td>Mon. (B)</td>
<td>50</td>
<td>2 - 85</td>
<td>28.10</td>
<td>19.57</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 27 reveals that the difference is significant at .01 level on SAT in favour of the monolingual boys whereas on Koh's difference is significant at .05 level in favour of the bilingual boys. But on Raven's and Hurt's differences between the means of bilingual and monolingual boys are not statistically significant.

It means that the performances of bilingual and monolingual boys are to the opposite directions on SAT and on Koh's but to the same direction on Raven's and Hurt's.

It could be ascertained from Tables 25, 26 and 27 that with the exception of SAT on which monolingual boys show superiority bilinguals are not inferior on any one of the tests at 10th class level.

Table 28 presents the ranges, means, standard deviations and t-values of the raw scores of 6th class combined groups of bilingual (boys and girls) and monolingual (boys and girls), on SAT, Raven's, Hurt's and Koh's.
Table 28 shows that the differences between the means of bilinguals and monolinguals are statistically significant at .01 level on SAT and Raven’s and at .05 level on Burt’s but on Koh’s, difference is not statistically significant.
It could be pointed out that the bilinguals are superior to the monolinguals on all Raven's and Burt's but in the case of Koh's they show equal performance at 6th class level.

Table 29 presents the ranges, means, standard deviations and t-values of the raw scores of 6th class bilingual and monolingual girls on SAT, Raven's, Burt's and Koh's.

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>Bil.(C)</td>
<td>50</td>
<td>22 - 57</td>
<td>47.00</td>
<td>7.20</td>
<td>3.89</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon.(G)</td>
<td>50</td>
<td>12 - 56</td>
<td>39.20</td>
<td>10.10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raven's</td>
<td>Bil.(C)</td>
<td>50</td>
<td>22 - 50</td>
<td>32.80</td>
<td>10.51</td>
<td>4.44</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon.(G)</td>
<td>50</td>
<td>9 - 51</td>
<td>22.80</td>
<td>11.96</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burt's</td>
<td>Bil.(C)</td>
<td>50</td>
<td>2 - 24</td>
<td>9.92</td>
<td>4.19</td>
<td>4.87</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon.(G)</td>
<td>50</td>
<td>1 - 14</td>
<td>6.32</td>
<td>3.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td>Bil.(C)</td>
<td>50</td>
<td>2 - 50</td>
<td>13.40</td>
<td>11.19</td>
<td>1.14</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Mon.(G)</td>
<td>50</td>
<td>2 - 61</td>
<td>11.40</td>
<td>9.82</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 29 shows that the differences between the means of bilingual and monolingual girls are statistically significant at .01 level on SAT, Raven's and Kurt's but difference on Koh's is not statistically significant.

It could be stated that the bilingual girls show superiority to the monolingual girls in the performance of three tests - SAT, Raven's and Kurt's but they are equal on Koh's at the 6th class level. Direction of the results is exactly the same in Table 28 where combined groups are compared.

Table 30 presents the ranges, means, standard deviations and t-values of the raw scores of 6th class bilingual and monolingual boys on SAT, Raven's, Kurt's and Koh's.
**Table 30. Range, Mean, Standard Deviation and t-Value of the Raw Scores of 6th Class Bilingual and Monolingual Boys**

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>Std</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>Bil.(a)</td>
<td>50</td>
<td>22 - 58</td>
<td>44.64</td>
<td>8.11</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon.(b)</td>
<td>50</td>
<td>16 - 58</td>
<td>45.40</td>
<td>9.71</td>
<td>0.42</td>
<td>-</td>
</tr>
<tr>
<td>Raven's</td>
<td>Bil.(a)</td>
<td>50</td>
<td>10 - 49</td>
<td>29.36</td>
<td>10.74</td>
<td>1.38</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Mon.(b)</td>
<td>50</td>
<td>11 - 54</td>
<td>26.20</td>
<td>12.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burt's</td>
<td>Bil.(a)</td>
<td>50</td>
<td>3 - 20</td>
<td>9.26</td>
<td>3.60</td>
<td>1.01</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Mon.(b)</td>
<td>50</td>
<td>4 - 19</td>
<td>10.06</td>
<td>4.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td>Bil.(a)</td>
<td>50</td>
<td>2 - 53</td>
<td>14.70</td>
<td>12.89</td>
<td>1.13</td>
<td>-</td>
</tr>
<tr>
<td></td>
<td>Mon.(b)</td>
<td>50</td>
<td>2 - 57</td>
<td>11.90</td>
<td>11.72</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 30 shows that differences between the mean of bilingual and monolingual boys are not statistically significant on SIT, Raven's, Kurt's and Koh's. It could be attributed that both the groups performed equally on all the four tests at 6th class level.

From Tables 26, 29 and 30, it could be ascertained that bilinguals are not inferior on any one of the tests at class 6.

Differences Between Bilinguals and Monolinguals in Achievement

Table 31 presents the ranges, means, standard deviations and t-values of the marks of combined bilinguals (boys and girls) and monolinguals (boys and girls) in the subjects of English, Urdu and Social Studies in the Matriculation Examination of the Board of Intermediate and Secondary Education held in 1968.
<table>
<thead>
<tr>
<th>Subject</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hindi (A+C)</td>
<td>95</td>
<td>37</td>
<td>-128</td>
<td>100.27</td>
<td>15.81</td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>4.43</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Hindi (B+D)</td>
<td>95</td>
<td>10</td>
<td>-132</td>
<td>82.71</td>
<td>35.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urdu</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>5.06</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Hindi (A+C)</td>
<td>95</td>
<td>13</td>
<td>-114</td>
<td>82.08</td>
<td>18.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Studies</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.42</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hindi (B+D)</td>
<td>95</td>
<td>4</td>
<td>-79</td>
<td>45.58</td>
<td>15.02</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 31 shows that the differences between the means of two groups are statistically significant at .01 level in favour of bilinguals (B+C) in English and in favour of monolinguals (M+N) in Urdu but in the case of Social Studies difference is not statistically significant.

Table 32 presents the ranges, means, standard deviations and t-values of the marks of 10th class bilingual and monolingual girls in the subjects of English, Urdu and Social Studies in the Matriculation Examination of the Board of Intermediate and Secondary Education held in 1968.

**Table 32. Range, Mean, Standard Deviation and t-Value of the Marks of 10th Class Bilingual and Monolingual Girls**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>B+C</td>
<td>45</td>
<td>37 - 128</td>
<td>110.28</td>
<td>15.24</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M+N</td>
<td>45</td>
<td>10 - 116</td>
<td>54.06</td>
<td>27.47</td>
<td>12.01</td>
<td>.01</td>
</tr>
<tr>
<td>Urdu</td>
<td>B+C</td>
<td>45</td>
<td>12 - 114</td>
<td>83.56</td>
<td>22.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M+N</td>
<td>45</td>
<td>43 - 109</td>
<td>80.67</td>
<td>15.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social Studies</td>
<td>B+C</td>
<td>45</td>
<td>10 - 74</td>
<td>42.89</td>
<td>11.51</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>M+N</td>
<td>45</td>
<td>4 - 73</td>
<td>41.22</td>
<td>18.07</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 32 shows that the difference between the means of two groups is statistically significant at .01 level in English but in Urdu and Social Studies differences are not statistically significant.

It could be stated that bilingual girls show superiority over monolingual girls in English and in the case of Urdu and Social Studies both perform equally. With the exception of Urdu, direction of the results is the same in Table 31 where combined groups are compared.

Table 33 presents the ranges, means, standard deviations and the t-values of the marks of 10th class bilingual and monolingual boys in the subjects of English, Urdu, Physics, Chemistry, Mathematics and Social Studies in the Matriculation Examination of the Board of Intermediate and Secondary Education held in 1968.
TABLE 33. RANGE, MEAN, STANDARD DEVIATION AND t-VALUE OF THE MARKS OF 10TH CLASS BILINGUAL AND MONOLINGUAL BOYS

<table>
<thead>
<tr>
<th>Subject</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Bil. (A)</td>
<td>50</td>
<td>63 - 112</td>
<td>95.10</td>
<td>14.35</td>
<td>4.67</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (B)</td>
<td>50</td>
<td>59 - 132</td>
<td>109.30</td>
<td>16.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urdu</td>
<td>Bil. (A)</td>
<td>50</td>
<td>35 - 105</td>
<td>80.70</td>
<td>13.59</td>
<td>4.55</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (B)</td>
<td>50</td>
<td>50 - 138</td>
<td>108.30</td>
<td>23.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physics</td>
<td>Bil. (A)</td>
<td>47</td>
<td>19 - 89</td>
<td>54.10</td>
<td>13.36</td>
<td>4.13</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (B)</td>
<td>47</td>
<td>30 - 89</td>
<td>65.20</td>
<td>12.67</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chemistry</td>
<td>Bil. (A)</td>
<td>47</td>
<td>35 - 79</td>
<td>58.20</td>
<td>11.32</td>
<td>7.79</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (B)</td>
<td>47</td>
<td>37 - 93</td>
<td>76.60</td>
<td>11.61</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mathematics</td>
<td>Bil. (A)</td>
<td>50</td>
<td>29 - 96</td>
<td>76.40</td>
<td>16.08</td>
<td>3.35</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (B)</td>
<td>50</td>
<td>53 - 100</td>
<td>85.80</td>
<td>11.55</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Social</td>
<td>Bil. (A)</td>
<td>50</td>
<td>9 - 79</td>
<td>42.40</td>
<td>15.22</td>
<td>2.74</td>
<td>.01</td>
</tr>
<tr>
<td>Studies</td>
<td>Mon. (B)</td>
<td>50</td>
<td>12 - 70</td>
<td>49.60</td>
<td>10.69</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 33 shows that the differences between the means of two groups are statistically significant at .01 level on all the subjects in favour of the monolingual boys.

It could be interpreted that the monolingual boys perform decidedly better than the bilinguals boys in the subjects of English, Urdu, Physics, Chemistry, Mathematics and Social Studies in the Matriculation Examination of the
Board of Intermediate and Secondary Education held in 1968. Direction of the results in the case of girls in Table 32 is different. Bilingual girls are superior to monolingual girls in English and equal in Urdu and Social Studies.

Tables 34, 35, 36, 37, 38, 39 and 40 present results of Chi-Square test in division-wise comparison in the subjects of English, Urdu and total marks in the Matriculation Examination of the Board of Intermediate and Secondary Education held in 1968.

**TABLE 34. CHI-SQUARE OF THE MARKS IN ENGLISH OF BILINGUAL AND MONOLINGUAL GIRLS IN THE MATRICULATION EXAMINATION**

<table>
<thead>
<tr>
<th>Educational Status</th>
<th>Bil. (Group C)</th>
<th>Mon. (Group D)</th>
<th>Degree of Freedom</th>
<th>Chi-Square Value (Observed)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Division Marks more than 60%</td>
<td>41</td>
<td>7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Division Marks from 45% to 59%</td>
<td>3</td>
<td>8</td>
<td>3</td>
<td>53.58</td>
<td>.01</td>
</tr>
<tr>
<td>3rd Division Marks from 33% to 44%</td>
<td>-</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failure</td>
<td>1</td>
<td>17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>45</strong></td>
<td><strong>45</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 34 shows that the difference is statistically significant in favour of the bilingual girls in the subject of English.

Table 35. Chi-Square of Long Varn in English of Bilingual and Monolingual Boys in the Matriculation Examination

<table>
<thead>
<tr>
<th>Educational Status</th>
<th>Bil. (Group A)</th>
<th>Mon. (Group B)</th>
<th>Degree of Freedom</th>
<th>Chi-Square (Observed)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks more than 60%</td>
<td>33</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Division</td>
<td></td>
<td></td>
<td></td>
<td>2</td>
<td>9.04</td>
</tr>
<tr>
<td>Marks from 45% to 59%</td>
<td>16</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks from 33% to 44%</td>
<td>1</td>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50</strong></td>
<td><strong>50</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 35 reveals that the difference between the two groups in the subject of English is statistically significant. Monolingual boys show superiority to bilingual boys. In the case of girls bilinguals show superiority to monolinguals in Table 34.
Table 36 shows that the difference between bilingual and monolingual girls in the subject of Urdu is not statistically significant. Performance of both the groups is equal in this subject.
Table 37. Chi-square of the marks in group of bilingual and monolingual boys in the matriculation examination

<table>
<thead>
<tr>
<th>Educational Status</th>
<th>Bilingual (Group A)</th>
<th>Monolingual (Group B)</th>
<th>Degree of Freedom</th>
<th>Chi-Square Value (Observed)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks more than 60%</td>
<td>15</td>
<td>37</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks from 45% to 59%</td>
<td>30</td>
<td>10</td>
<td>2</td>
<td>19.8</td>
<td>.01</td>
</tr>
<tr>
<td>3rd Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks from 33% to 44%</td>
<td>5</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>50</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 37 indicates that the difference between the bilingual and monolingual boys in the subject of Urdu is statistically significant. Monolingual boys show superiority to bilingual boys.

It could be stated that the direction of the results in Tables 34, 35, 36 and 37 is exactly the same as when t-test is used on the marks of these subjects in Tables 32 and 33 respectively.
Table 38 shows that the difference between the two groups is statistically significant. Performance of bilinguals is better than that of the monolinguals in the total marks of matriculation examination.

*Students fail in one or two subjects. They have to appear only in these subjects and not in all to pass the examination.
<table>
<thead>
<tr>
<th>Educational Status</th>
<th>Bil. (Group C)</th>
<th>Mon. (Group D)</th>
<th>Degree of Freedom</th>
<th>Chi-Square Value (Observed)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks more than 540</td>
<td>20</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks from 405 to 539</td>
<td>16</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3rd Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks from 280 to 404</td>
<td>2</td>
<td>9</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Failures</td>
<td>3</td>
<td>13</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Compartments</td>
<td>4</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>45</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 39 shows that the difference is statistically significant in favour of bilingual girls in the total marks of Matriculation Examination.

Direction of the results is the same as in the combined group in Table 38.

*Students fail in one or two subjects. They have to appear only in these subjects and not in all to pass the examination.
Table 40 reveals that the difference between the two groups is statistically significant. Monolingual boys are superior to bilingual boys in the total marks of Matriculation Examination.

Direction of the results is not the same in the case of girls and combined groups. Bilinguals are superior to monolinguals in the total marks.
sex differences in intelligence

Table 41 shows the ranges, means, standard deviations and the t-values of the raw scores of 10th class bilingual boys and girls on SAT, Raven's, Burt's and Koh's.

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>Bil.(A)</td>
<td>50</td>
<td>7 - 60</td>
<td>33.70</td>
<td>11.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bil.(C)</td>
<td>50</td>
<td>20 - 63</td>
<td>37.80</td>
<td>9.33</td>
<td>2.01</td>
<td>.05</td>
</tr>
<tr>
<td>Raven's</td>
<td>Bil.(A)</td>
<td>50</td>
<td>14 - 56</td>
<td>43.22</td>
<td>9.05</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bil.(C)</td>
<td>50</td>
<td>33 - 57</td>
<td>44.60</td>
<td>5.97</td>
<td>0.91</td>
<td>-</td>
</tr>
<tr>
<td>Burt's</td>
<td>Bil.(A)</td>
<td>50</td>
<td>11 - 32</td>
<td>19.94</td>
<td>4.39</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bil.(C)</td>
<td>50</td>
<td>11 - 30</td>
<td>18.44</td>
<td>4.04</td>
<td>1.78</td>
<td>-</td>
</tr>
<tr>
<td>Koh's</td>
<td>Bil.(A)</td>
<td>50</td>
<td>2 - 84</td>
<td>37.70</td>
<td>21.93</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Bil.(C)</td>
<td>50</td>
<td>6 - 110</td>
<td>36.10</td>
<td>21.85</td>
<td>0.04</td>
<td>-</td>
</tr>
</tbody>
</table>
It could be pointed out from Table 41 that sex difference is statistically significant at .05 level on SAT in favour of the girls and in the case of Raven's, Burt's and Koh's there is no statistically significant difference between the performance of boys and girls at 10th class.

Table 42 presents the ranges, means, standard deviations and the t-values of the raw scores of 10th class monolingual boys and girls on SAT, Raven's, Burt's and Koh's.

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>Mon.(B)</td>
<td>50</td>
<td>14 - 66</td>
<td>45.40</td>
<td>12.22</td>
<td>9.67</td>
<td>.01</td>
</tr>
<tr>
<td>Raven's</td>
<td>Mon.(B)</td>
<td>50</td>
<td>6 - 55</td>
<td>24.10</td>
<td>9.64</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon.(B)</td>
<td>50</td>
<td>12 - 56</td>
<td>40.10</td>
<td>11.17</td>
<td>2.98</td>
<td>.01</td>
</tr>
<tr>
<td>Burt's</td>
<td>Mon.(B)</td>
<td>50</td>
<td>12 - 50</td>
<td>33.30</td>
<td>11.65</td>
<td>4.48</td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td>Mon.(B)</td>
<td>50</td>
<td>2 - 29</td>
<td>19.86</td>
<td>4.48</td>
<td>10.99</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon.(B)</td>
<td>50</td>
<td>3 - 21</td>
<td>12.06</td>
<td>3.95</td>
<td>2.35</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>Mon.(B)</td>
<td>50</td>
<td>2 - 85</td>
<td>29.10</td>
<td>19.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon.(B)</td>
<td>50</td>
<td>2 - 54</td>
<td>19.40</td>
<td>12.45</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 42 shows that the differences between the means of monolingual boys and girls are statistically significant at .01 level on SAT, Raven's and Burt's and at .05 on Koh's in favour of boys.

It could be concluded that in the case of monolinguals, boys show superiority over girls on all the four tests - SAT, Raven's, Burt's and Koh's at 10th class level. Whereas in the case of bilinguals condition is different. Bilingual girls are superior to bilingual boys on SAT and equal on other three tests at class 10.

Table 43 shows the ranges, means, standard deviations and t-values of the raw scores of 6th class bilingual boys and girls on SAT, Raven's, Burt's and Koh's.
Table 43 shows that there is no statistically significant difference between bilingual boys (Group A) and girls (Group C). Both groups performed equally on SAT, Raven's, Burt's and Koh's.

It could be stated that sex differences do not exist among bilinguals on all the four tests at 6th class level. With the exception of SAT, direction of the bilinguals' results is the same at 10th class level.
Table 44 presents the ranges, means, standard deviations and the t-values of the raw scores of 6th class monolingual boys and girls on SAT, Raven's, Burt's and Koh's.

### Table 44. Range, Mean, Standard Deviation and t-Value of the Raw Scores of 6th Class Monolingual Boys and Girls

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>Mon. (B)</td>
<td>50</td>
<td>16 - 58</td>
<td>45.40</td>
<td>9.71</td>
<td>3.55</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (D)</td>
<td>50</td>
<td>12 - 56</td>
<td>38.20</td>
<td>10.58</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (B)</td>
<td>50</td>
<td>11 - 54</td>
<td>26.20</td>
<td>12.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raven's</td>
<td>Mon. (D)</td>
<td>50</td>
<td>9 - 51</td>
<td>22.80</td>
<td>11.96</td>
<td>1.71</td>
<td>-</td>
</tr>
<tr>
<td>Burt's</td>
<td>Mon. (D)</td>
<td>50</td>
<td>4 - 19</td>
<td>10.06</td>
<td>4.31</td>
<td>4.96</td>
<td>.01</td>
</tr>
<tr>
<td>Koh's</td>
<td>Mon. (D)</td>
<td>50</td>
<td>1 - 14</td>
<td>6.32</td>
<td>3.13</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (B)</td>
<td>50</td>
<td>2 - 57</td>
<td>11.90</td>
<td>11.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (D)</td>
<td>50</td>
<td>2 - 61</td>
<td>11.40</td>
<td>9.82</td>
<td>0.23</td>
<td>-</td>
</tr>
</tbody>
</table>
Table 44 shows that the differences between the groups are statistically significant at .01 level on SAT and Burt's in favour of boys and not significant on Raven's and Koh's.

It means that in the case of monolinguals when comparison is between Group B and Group D, boys are superior to girls on SAT and Burt's and of equal magnitude on Raven's and Koh's at 6th class level. At 10th class level, difference is consistently in favour of boys on all the four tests.

It could be summed up that among bilinguals with the exception of SAT where 10th class girls show superiority to boys, there is no sex difference at both the stages. But among monolinguals, different is the case i.e. with the exception of Raven's and Koh's where there is no sex difference at class 6 boys show superiority to girls at both the stages.

Sex Differences in Achievement

Table 45 shows ranges, means, standard deviations and t-values of the marks of bilingual boys and girls in the subjects of English, Urdu and Social Studies in the Matriculation Examination of the Board of Intermediate and Secondary Education in 1968.
It could be pointed out from Table 45 that sex differences exist statistically at .01 level in the subject of English, in favor of the girls but in the subjects of Urdu and Social Studies there is no statistically significant difference between the boys and girls among bilinguals. In the case of four tests direction of the results is the same at class 10. Girls are superior to boys on SAT but both are equal on other three tests.
Table 46 presents ranges, means, standard deviations and t-values of the marks of monolingual boys and girls in the subjects of English, Urdu and Social Studies in the Matriculation Examination of the Board of Intermediate and Secondary Education in 1968.

<table>
<thead>
<tr>
<th>Subject</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Mon. (B)</td>
<td>50</td>
<td>59 -132</td>
<td>109.30</td>
<td>16.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (D)</td>
<td>45</td>
<td>10 -116</td>
<td>54.06</td>
<td>27.47</td>
<td>11.80</td>
<td>.01</td>
</tr>
<tr>
<td>Urdu</td>
<td>Mon. (B)</td>
<td>50</td>
<td>50 -138</td>
<td>108.30</td>
<td>23.74</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (D)</td>
<td>45</td>
<td>43 -109</td>
<td>80.67</td>
<td>15.71</td>
<td>6.75</td>
<td>.01</td>
</tr>
<tr>
<td>Social Studies</td>
<td>Mon. (B)</td>
<td>50</td>
<td>12 -70</td>
<td>49.60</td>
<td>10.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (D)</td>
<td>45</td>
<td>4 -73</td>
<td>41.22</td>
<td>18.07</td>
<td>2.71</td>
<td>.01</td>
</tr>
</tbody>
</table>

Table 46 shows that the differences between the means of Group B and Group D are statistically significant at .01 level in English, Urdu and Social Studies.
It should be pointed out here that sex differences in monolinguals are in favour of the boys in the subjects of English, Urdu and Social Studies at 10th class level. At 10th class level direction of the monolingual girls' results is the same on all the four tests as well.

It could be stated that in the case of bilinguals sex difference exists in the subject of English in favour of the girls but in the subject of Urdu and Social Studies, boys and girls are of equal level. In the case of monolinguals, when Group B is compared with Group D, differences are in favour of the boys in the subjects of English, Urdu and Social Studies in the Matriculation Examination of the Board of Intermediate and Secondary Education held in 1968.

Tables 47 and 48 present results of Chi-Square test in division-wise comparison of the total marks in the Matriculation Examination of the Board of Intermediate and Secondary Education in 1968.
Table 47. Chi-Square of the Total Marks of Bilingual Boys and Girls in the Matriculation Examination

<table>
<thead>
<tr>
<th>Educational Status</th>
<th>Bil. (Group A)</th>
<th>Bil. (Group C)</th>
<th>Degree of Freedom</th>
<th>Chi-Square Value (Observed)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Frequency</td>
<td>Frequency</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1st Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks more than 540</td>
<td>20</td>
<td>20</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2nd Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks from 405 to 539</td>
<td>25</td>
<td>16</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>3rd Division</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marks from 290 to 404</td>
<td>4</td>
<td>2</td>
<td></td>
<td></td>
<td>4</td>
</tr>
<tr>
<td>Failure</td>
<td>1</td>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Departments *</td>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>50</td>
<td>45</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 47 indicates that the difference is not statistically significant between bilingual boys and girls in the total marks of Matriculation Examination.

*Students fail in one or two subjects. They have to appear only in these subjects and not in all to pass the examination.
Table 48 shows that the difference is statistically significant in favour of the monolingual boys in the total marks of Matriculation Examination.

It could be stated that direction of the results is the same in all the subjects in the case of 10th class monolingual boys and girls, with the exception of Raven's

*Students fail in one or two subjects. They have to appear only in these subjects and not in all to pass the examination.*
and Koh's where 6th class boys and girls are equal in intelligence superiority of monolingual boys is quite evident in intelligence as well as in achievement at both the stages. Whereas in the case of bilinguals with the exception of SAT and English where 10th class girls show superiority to boys, both are equal in intelligence as well as in achievement at both the levels.
CHAPTER V
SUMMARY, FINDINGS, AND DISCUSSION, AND RECOMMENDATIONS

Summary

Statement of the Problem. The research was designed to investigate the effects of bilingualism and monolingualism upon the intelligence and achievement of children.

Sub-Problems:
1. To identify bilingual and monolingual children
2. To compare age of bilingual and monolingual children
3. To compare the socio-economic status and educational level of parents of the bilinguals and monolinguals children
4. To compare the intelligence of bilinguals and monolinguals at 10th class level
5. To compare the intelligence of bilingual girls and monolingual girls at 10th class level
6. To compare the intelligence of bilingual boys and monolingual boys at 10th class level
7. To compare the intelligence of bilinguals and monolinguals at 6th class level
8. To compare the intelligence of bilingual girls and monolingual girls at 6th class level
9. To compare the intelligence of bilingual boys and monolingual boys at 6th class level
10. To compare the achievement of bilinguals and monolinguals at 10th class level
11. To compare the achievement of bilingual girls and monolingual girls at 10th class level
12. To compare the achievement of bilingual boys and monolingual boys at 10th class level
13. To compare the intelligence of bilingual boys and girls at 10th class level
14. To compare the intelligence of monolingual boys and girls at 10th class level
15. To compare the intelligence of bilingual boys and girls at 6th class level
16. To compare the intelligence of monolingual boys and girls at 6th class level
17. To compare the achievement of bilingual boys and girls at 10th class level
18. To compare the achievement of monolingual boys and girls at 10th class level.

**Hypotheses.**

1. There is no difference between bilinguals and monolinguals in intelligence at the 10th class level.
2. There is no difference between bilinguals and monolinguals in intelligence at the 6th class level.

3. There is no difference between bilinguals and monolinguals in achievement at the 10th class level.

4. There is no difference between bilingual boys and bilingual girls in intelligence at 10th class level.

5. There is no difference between monolingual boys and monolingual girls in intelligence at 10th class level.

6. There is no difference between bilingual boys and bilingual girls in intelligence at 6th class level.

7. There is no difference between monolingual boys and monolingual girls in intelligence at 6th class level.

8. There is no difference between bilingual boys and bilingual girls in achievement at 10th class level.

9. There is no difference between monolingual boys and monolingual girls in achievement at 10th class level.
Procedures and methodology. Sample: Lahore proper was selected as English medium and Urdu medium schools are found there.

The total sample was drawn from the following schools:

1. St. Anthony's School
2. Cathedral School
3. The Convent of Jesus and Mary
4. Government Central Model School No. 1
5. Madrasa-Tul-Banat

Bilinguals were taken from the first three schools where the medium of instruction is English. Monolinguals were taken from the last three schools where the medium of instruction is Urdu.

The following figure gives an outline of the sample:

```
TOTAL

400

Bilinguals

200

Boys
100

Girls
100

Monolinguals

200

Boys
100

Girls
100

50 50 50 50 50 50 50
10th 6th 10th 6th 10th 6th 6th
```
Figure 1 shows that the total sample consisted of 400 children who were taken from two types of schools. Two hundred children were from schools where the medium of instruction is English and 200 children from ones where the medium of instruction is Urdu. As the comparison was to be made at the primary and secondary levels, between bilinguals and monolinguals and between boys and girls among bilinguals and monolinguals, each group was kept equal in number with 50 children.

Tools. Information on age was obtained through (a) school records and (b) a proforma (Appendix B).

Information about the children's socio-economic and educational backgrounds was obtained by the same proforma (Appendix B).

The language background of the children was estimated by Hoffman's Bilingual Schedule. (66)

The intelligence of the children at secondary and primary levels, was tested by the tests given below:

1. Scholastic Aptitude Test (149)
   This is a group verbal test

2. Raven's Standard Progressive Matrices (137)
   This is a group non-verbal test

3. Burt's Arithmetic (Written Graded Test Problems) (27)
   This is a group test.
4. Koh's Block Design Test (87)

This is an individual performance test.
Achievement of the 10th class children was tested by taking the results from the Board of Intermediate and Secondary Education, Lahore. For the 6th class children there was no standardised test or any other common basis like matric results.

Findings and Discussion

Abbreviations used during discussion:
S means superior
I means inferior,
ND means no difference
V means level of significance.

Below are given the results in the light of the hypotheses.

Hypothesis No. 1:
There is no difference between bilinguals and monolinguals in intelligence at the 10th class level.
<table>
<thead>
<tr>
<th>Test</th>
<th>Bilinguals</th>
<th>Monolinguals</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>No</td>
<td>No</td>
<td>1</td>
</tr>
<tr>
<td>Raven's</td>
<td>0</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Burt's</td>
<td>0</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Koh's</td>
<td>0</td>
<td>1</td>
<td>.01</td>
</tr>
</tbody>
</table>

The above results show that hypothesis is supported on SAT but not on Raven's, Burt's and Koh's. The equal performance of bilinguals and monolinguals on SAT where language is involved has been supported by only a very few related researches, e.g. Murdock et al (118), Ladd (89), Hoffman (66) and Jones (76).

On the other hand researches where bilinguals have been found to be superior on the non-verbal intelligence tests are numerous and could be quoted in support of the results on Raven's and Koh's where bilinguals showed better performances than monolinguals e.g. by Pintner and Keller (133), Lester (97), Pintner (131), Seidl (150) and Morrison (116).

The results on Burt's are also in line with those of Calvin and Allen (33), Darrie (36), Bead (111), Rigg (141), Jones et al (83) and Hasan (61). According to these investigators, language is the least affecting factor in arithmetic. They point out that numerical ability, as measured by number series in verbal intelligence tests, is not influenced by linguistic background.
It may be pointed out, however, that SAT is a purely verbal test (the language used being Urdu) and this may be responsible for the equality of bilinguals with monolinguals. Otherwise in the case of Raven's, Burt's and Koh's the better performance of bilinguals appears to be quite an authentic proof of their intellectual superiority to monolinguals.

Hypothesis No. 1 was also tested separately in respect of girls and boys.

<table>
<thead>
<tr>
<th>Test</th>
<th>Bilingual Girls</th>
<th>Monolingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>S</td>
<td>I</td>
<td>.01</td>
</tr>
<tr>
<td>Raven's</td>
<td>S</td>
<td>I</td>
<td>.01</td>
</tr>
<tr>
<td>Burt's</td>
<td>S</td>
<td>I</td>
<td>.01</td>
</tr>
<tr>
<td>Koh's</td>
<td>S</td>
<td>I</td>
<td>.01</td>
</tr>
</tbody>
</table>

The above results indicate that all the four tests do not support the hypothesis. The differences between bilingual girls and monolingual girls on Raven's, Burt's and Koh's are the same as in the case of the combined groups, whereas on SAT the results favour bilingual girls instead of revealing no difference as in the case of the combined groups. This may be interpreted in many ways. It is possible that on the whole, bilingual girls are intellectually superior to monolingual girls as the former have also maintained their superiority in verbal test. It
is also possible that the bilingual girls receive better instruction in Urdu. The result may also indicate that girls suffer no detrimental effect by studying two languages. It should also be mentioned that the socio-economic and educational background of the bilingual girls was higher than that of the monolingual girls, and this in itself may account for their better performance.

<table>
<thead>
<tr>
<th>Test</th>
<th>Bilingual boys</th>
<th>Monolingual boys</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>I</td>
<td>S</td>
<td>.01</td>
</tr>
<tr>
<td>Raven's</td>
<td>No</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>Burt's</td>
<td>No</td>
<td>No</td>
<td>-</td>
</tr>
<tr>
<td>Koh's</td>
<td>S</td>
<td>I</td>
<td>.05</td>
</tr>
</tbody>
</table>

The above results show that hypothesis is supported on Raven's and Burt's but not on SAT and Koh's. The results of the boys on SAT, Raven's and Burt's do not agree with those of the combined groups nor with the sub-groups of the girls. Only the results on Koh's show the superiority of both bilingual girls and boys.

It was said that the bilingual girls' superiority on SAT may be as a result of better teaching. This argument may be reversed here in the case of bilingual boys who receive instruction in Urdu which is not of the same quality as that given to monolingual boys. The inferiority of the
bilingual boys on SAI may also be due to the fact that the test is not given in the language in which they study. Urdu is studied only as a language and it is probable—as Jameison and Sandiford (70), and Barke and Parry Williams (16) have stated—that since bilinguals receive instruction at school through English, the knowledge and vocabulary of their first language may be insufficient for success in the test. Some of the investigators e.g. Brown (20), Saer (146), Mitchell (114) and Jones (78) considered that the tests should be given in the first language. They take it for granted that bilinguals are more proficient in the first language. In the present research, when Urdu is not the language through which they have been studying for the last ten years, the inferiority of the bilinguals in the verbal test may be due to their linguistic inferiority. In verbal intelligence tests the poorer performance of bilinguals due to linguistic inferiority is very common e.g. the researches conducted by Colvin and Allen (33), Saer (147), Varsie (38), Wang (185), West (191), Head (111), Jameison and Sandiford (70), Rigg (141), Yoshioke (194), Barke (15), Soretier (134), Hasan (61), and Lambert and Macnamara (92).

It may also be mentioned here that the superiority of monolingual boys on SAI and their equal performance on Raven's and Burt's is maintained inspite of the fact that
they are inferior in socio-economic and educational background. This factor does not appear to have any detrimental influence in the case of monolingual boys, but may have in the case of monolingual girls.

Hypothesis No. 2:

There is no difference between bilinguals and monolinguals in intelligence at the 6th class level.

<table>
<thead>
<tr>
<th>Test</th>
<th>Bilinguals</th>
<th>Monolinguals</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>5</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Raven's</td>
<td>5</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Burt's</td>
<td>5</td>
<td>1</td>
<td>.05</td>
</tr>
<tr>
<td>Koh's</td>
<td>No</td>
<td>No</td>
<td>—</td>
</tr>
</tbody>
</table>

The above results show that hypothesis is supported on Koh's but in the case of SAT, Raven's and Burt's, it is rejected.

Bilinguals are superior on Raven's and Burt's (just as the bilinguals were in the combined group of 10th class children). On SAT, bilinguals are superior, although this was not the case with the combined older group.

Ordinarily one would expect equal performance of both the groups, yet the results of the younger group (i.e. the 6th class children) showed that the bilinguals were superior. This needs some explanation, particularly when the test in question is in Urdu. It is possible that their exposure to
Urdu is such that they score better than the monolinguals. In the case of Koh's bilinguals and monolinguals are equal in intelligence, and the superiority of the bilinguals in the first three tests may be due to their intellectual superiority. It can be definitely stated that bilingualism has a beneficial influence on performance in the tests at 6th class level.

Hypothesis No. 2 was also tested separately in respect of girls and boys.

<table>
<thead>
<tr>
<th>Test</th>
<th>Bilingual Girls</th>
<th>Monolingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>S</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Raven's</td>
<td>S</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Burt's</td>
<td>S</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Koh's</td>
<td>No</td>
<td>No</td>
<td>-</td>
</tr>
</tbody>
</table>

The above results show that the hypothesis is supported only on Koh's and not on SAT, Raven's and Burt's. The results on all the four tests are of the same kind as those of the 6th class combined groups. The same arguments which were presented in the case of the combined groups therefore be given here as well. There is no need to repeat them.
<table>
<thead>
<tr>
<th>Test</th>
<th>Bilingual Boys</th>
<th>Monolingual Boys</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Raven's</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Burt's</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td>No</td>
<td>No</td>
<td></td>
</tr>
</tbody>
</table>

The above results show that the 6th class boys present an entirely new picture, i.e., the hypothesis is supported on all the four tests. In the light of this it may be stated that bilingualism has no detrimental effect since the performance of the bilingual boys is the same as that of the monolingual boys on all the four tests.

In the case of Koh's the results are the same as in the combined as well as the separate groups at the 6th class level. In the other tests, however, the direction of the results is quite changed when the combined 6th class results are compared to those of the separate groups. When compared with the 10th class boys, the results on Raven's and Burt's are exactly the same, whereas in the case of SAT the 6th class bilingual boys - unlike the 10th class bilingual boys - are not inferior to the monolingual boys. It may be argued that the 6th class bilingual boys have only been exposed to English for the last five years i.e., the period they have spent in school, whereas the exposure of the older group has been much longer. Another point worth
remembering is that in Pakistani urban culture, contact with the English language is less than with the national language. The national language is mostly used in the home, street and business. Because of this, young bilingual children may not show any detrimental effect by being exposed to English.

The equal performance of bilingual and monolingual boys on SAP can be supported by the results of some investigators, e.g. Murdock et al (118), Ladd (89), Hoffman (66) and Jones (76). According to their results bilinguals and monolinguals do not differ in verbal intelligence tests. In the same way the equal performance of the bilingual and monolingual boys on Raven's and Koh's is in line with the results of many related researches, e.g. by Neingold (48), Jarsie (38), Hoffman (66), Hill (65), Armenian (8), Havighurst, Gunther and Pratt (64). The equal performance of the bilinguals and monolinguals in the non-verbal test of intelligence is very common in related researches.

Hypothesis No. 3:

There is no difference between bilinguals and monolinguals in achievement at the 10th class level.
<table>
<thead>
<tr>
<th>Subjects</th>
<th>Bilinguals</th>
<th>Monolinguals</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>3</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Urdu</td>
<td>1</td>
<td>3</td>
<td>.01</td>
</tr>
<tr>
<td>Social Studies</td>
<td>Ms</td>
<td>Ms</td>
<td>-</td>
</tr>
<tr>
<td>Comparison in division</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total marks</td>
<td>3</td>
<td>1</td>
<td>.01</td>
</tr>
</tbody>
</table>

The above results show that the hypothesis is justified in Social Studies but is rejected in English and Urdu and in the total marks.

The superiority of the bilinguals in the subject of English and in the total marks, and the equal performance of bilinguals and monolinguals in Social Studies clearly indicate that bilingualism is beneficial and not a handicap. Some of the researches by Davies and Hughes (40), Spoerl (166), Malherbe (103), Jones et al (83), James (71) and Peal and Lambert (127) corroborate these results. It may be stated that the academic performance of the bilinguals may have been affected by their superiority in intelligence.

The inferiority of the bilinguals in the subject of Urdu may be due to the fact that the instruction they receive

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*1st Division Marks 60%
2nd Division Marks 45%
3rd Division Marks 33%*
in Urdu is not of the same standard as that they receive in English. Moreover they may not be exposed to Urdu in school to the same extent as are monolinguals.

Hypothesis No. 3 was also tested separately in respect of girls and boys.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Bilingual Girls</th>
<th>Monolingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>2</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Urdu</td>
<td>N0</td>
<td>N0</td>
<td>-</td>
</tr>
<tr>
<td>Social Studies</td>
<td>N3</td>
<td>N3</td>
<td>-</td>
</tr>
</tbody>
</table>

Comparison in Divisions:

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Bilingual Girls</th>
<th>Monolingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>3</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Urdu</td>
<td>N3</td>
<td>N3</td>
<td>-</td>
</tr>
<tr>
<td>Total Marks</td>
<td>3</td>
<td>1</td>
<td>.01</td>
</tr>
</tbody>
</table>

The above results show that the hypothesis is justified in Urdu and Social Studies but rejected in English and in the total marks. The results in the subjects of English and Social Studies as well as the total marks, are in the same direction as they were for the combined groups, whereas the results for Urdu - instead of showing the superiority of the monolinguals as in the case of the combined

---

*1st Division Marks 60%
2nd Division Marks 45%
3rd Division Marks 33%
groups - show no difference between the bilingual and monolingual girls. The superiority of the bilingual girls both in the total marks and in the subject of English, as well as their equal performance in Urdu and Social studies, may prove that bilingualism does not have an adverse effect in the case of girls. The position is very similar in the case of intelligence tests i.e. with the exception of one comparison where the 6th class bilingual and monolingual girls showed equal performance, i.e. on Koh’s, the bilingual girls were superior on all the four tests at both the stages. On the other hand a similar type of research conducted in Pakistan by Hasan (61) has shown opposite results i.e. bilingual girls were handicapped as compared to monolingual girls in verbal intelligence, verbal reasoning, composition and—in the case of younger girls—in arithmetic also.

It has already been mentioned that the poorer socio-economic and educational background of monolingual girls may affect their intelligence. It can also be said that their poorer performance particularly in the total marks raises doubts about the school factor as well.

Socio-economic and educational background, as well as schools, are the factors which the investigator should have controlled. But on account of the social context of the culture in which this research was conducted, however, they were beyond control.
The higher socio-economic people send their children to the English medium schools and lower socio-economic people to the Urdu medium schools. This attitude may be mostly due to the financial reason as in the English medium schools fee is higher, compared with Urdu medium schools. To control the school factor was also not possible. There is no school where both the mediums are prevalent.

The results of the monolingual girls may be more conclusive since another group of one hundred monolingual girls taken from the Pilot School Wahdat Colony (50 for each stage) showed approximately the same results (Appendix A). With the exception of SAT on which the 10th class monolingual girls were superior, the comparisons on all the tests and at both the stages showed that the monolingual girls were inferior in intelligence.
<table>
<thead>
<tr>
<th>Subjects</th>
<th>Bilingual Boys</th>
<th>Non-Bilingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>1</td>
<td>8</td>
<td>.01</td>
</tr>
<tr>
<td>Urdu</td>
<td>1</td>
<td>8</td>
<td>.01</td>
</tr>
<tr>
<td>Physics</td>
<td>1</td>
<td>8</td>
<td>.01</td>
</tr>
<tr>
<td>Chemistry</td>
<td>1</td>
<td>8</td>
<td>.01</td>
</tr>
<tr>
<td>Mathematics</td>
<td>1</td>
<td>8</td>
<td>.01</td>
</tr>
<tr>
<td>Social Studies</td>
<td>1</td>
<td>8</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Comparison in divisions</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>English</td>
<td>1</td>
<td>8</td>
<td>.01</td>
</tr>
<tr>
<td>Urdu</td>
<td>1</td>
<td>8</td>
<td>.01</td>
</tr>
<tr>
<td><strong>Total Marks</strong></td>
<td>1</td>
<td>8</td>
<td>.01</td>
</tr>
</tbody>
</table>

The above results show that the hypothesis is not supported in all the school subjects as well as in the total marks. These results present an entirely new picture, totally disagreeing with those of the combined groups as well as of the sub-groups of the girls.

The inferiority of the bilingual boys supports many previous researches. The results in the subjects of English and Urdu are in line with those of Jaer (145) in Welsh and English, Barke and Williams (16) in Welsh and English and Smith (162) in Chinese and English.

*1st Division Marks 60%  
2nd Division Marks 45%  
3rd Division Marks 33%
In mathematics the poor performance of the bilingual boys may be due to numerical ability since language is the least affecting factor as has been shown by Colvin and Allen (33), Jarsie (38), Head (111), Ugg (141) and Jones et al (83). The overall poor performance of the bilingual boys, however, gives the impression that language may be affecting the whole of their academic results. Smith (157), Jamieson and Sandford (76), Fritz and Simon (50), Porentier (134), Norman and Mead (121) and Hasan (61) have also shown that language is the main cause of the inferiority of bilinguals in achievement tests.

Here language appears to be the main factor since, in the four intelligence tests, the bilingual boys were inferior only on the test (SAT) where language is involved. The superiority of the bilingual boys in socio-economic and educational background seems to have no positive effect when instructions are given in the foreign language, as claimed by Secroly and Begand (42), Sirkin (156), McNemar (110), Livesey (99), Johnson (75), Tyler (179) and Burt (27). They should have surpassed monolingual boys in intelligence and achievement on account of their superior background, but the language factor appears to be the main obstacle in their way. At this stage, it may also be mentioned in support of monolingualism that in spite of the fact that monolingual girls are substantially inferior on all the four tests as
well as on the total marks, they remained equal in the subjects of Urdu and Social Studies. Moreover, the second group of monolingual girls showed superiority to the bilingual girls in the verbal intelligence test (WVT) at 10th class level. (Appendix :)

Judging from the socio-economic and educational backgrounds of the monolingual girls it can be inferred that the admission procedure in their schools is not so selective as is in the other schools included in the present research and that the attitude of their parents towards their education is not so healthy and encouraging. If this were not the case, there is every possibility that they would have achieved the same standard of education as the monolingual boys. In the Proposal for a New Education Policy 1969, the attitude of the general masses has been very appropriately stated.

... Parents, particularly those who are not well-to-do, consider the cost of a girl's education as a waste while that of a boy's is regarded as an investment. This is natural, as a boy is expected to become an earner while a girl is not. (112:42)

Hypothesis No. 4:

There is no difference between bilingual boys and bilingual girls in intelligence at 10th class level.
<table>
<thead>
<tr>
<th>Test</th>
<th>Bilingual Boys</th>
<th>Bilingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>I</td>
<td>S</td>
<td>.05</td>
</tr>
<tr>
<td>Raven’s</td>
<td>ND</td>
<td>ND</td>
<td></td>
</tr>
<tr>
<td>Burt’s</td>
<td>ND</td>
<td>ND</td>
<td></td>
</tr>
<tr>
<td>Koh’s</td>
<td>ND</td>
<td>ND</td>
<td></td>
</tr>
</tbody>
</table>

The results show that the hypothesis is supported on Raven’s, Burt’s and Koh’s but not on SAT.

SAT is a verbal test and thus reveals the linguistic superiority of the girls. The superiority of girls over boys in those tests of intelligence where language is predominant has also been demonstrated by Freeman Franks (49), McCarthy (109), Tyler (179), Wechsler (187), Anastasi (4), Peal and Lambert (127) and Garrison et al (53).

In the case of mathematical and reasoning abilities, it is generally presumed—and has in fact been shown by Freeman Franks (49), Wechsler (187) and Anastasi (4)—that boys are superior; in the present research, however, bilingual boys and girls are equal in these abilities. This means that bilingual girls receive equal encouragement in the development of these abilities. This may be due to their higher socio-economic and educational background, where boys and girls may be given equal attention by their parents.
Hypothesis No. 5:

There is no difference between monolingual boys and monolingual girls in intelligence at 10th class level.

<table>
<thead>
<tr>
<th>Test</th>
<th>Monolingual Boys</th>
<th>Monolingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>8</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Raven's</td>
<td>6</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Surt's</td>
<td>6</td>
<td>1</td>
<td>.01</td>
</tr>
<tr>
<td>Koh's</td>
<td>7</td>
<td>1</td>
<td>.05</td>
</tr>
</tbody>
</table>

The results show that the hypothesis is not justified on any one of the four tests.

The superiority of boys in mathematical and reasoning processes has been demonstrated by Freeman Franks (49), Wechsler (187), Anastasi (4) and Vernon (182), although in the case of a verbal test (SAT), the performance of the monolingual boys was the reverse of what was expected. It is generally believed - and is in fact supported by the findings of some of the psychologists and educationists mentioned on page 309 - that girls are more advanced than boys in linguistic ability and show over all superiority on a number of verbal intelligence tests. In the case of bilinguals, the findings of these educationists and psychologists are confirmed. In the case of monolinguals, however, the boys are superior even on the test where language is involved. It is quite obvious that the monolingual boys are superior to monolingual girls intellectually. This
seems to account for the difference.

Hypothesis No. 5:

There is no difference between bilingual boys and bilingual girls in intelligence at 6th class level.

<table>
<thead>
<tr>
<th>Test</th>
<th>Bilingual Boys</th>
<th>Bilingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
</tr>
<tr>
<td>Raven's</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
</tr>
<tr>
<td>Burt's</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
</tr>
<tr>
<td>Koh's</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
</tr>
</tbody>
</table>

The above results show that the hypothesis is fully supported on all the four tests.

No differences due to sex were revealed in intellectual functioning, reasoning process and numerical abilities as measured by Raven's, Koh's and Burt's respectively, even though Freeman Franks (49), Tyler (179), and Anastasi (4) have pointed out that these are the abilities in which boys usually excel. With only one exception, all the comparisons between bilingual boys and girls at the 10th class as well as at the 6th class level reveal that both are equal on all the four tests. The exception is the comparison on SAT at the 10th class level where girls show superiority to boys.

Hypothesis No. 7:

There is no difference between monolingual boys and monolingual girls in intelligence at 6th class level.
<table>
<thead>
<tr>
<th>Test</th>
<th>Monolingual Boys</th>
<th>Monolingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>S</td>
<td>I</td>
<td>.01</td>
</tr>
<tr>
<td>Raven's</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
</tr>
<tr>
<td>Burt's</td>
<td>S</td>
<td>I</td>
<td>.01</td>
</tr>
<tr>
<td>Koh's</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
</tr>
</tbody>
</table>

The above results show that the hypothesis is supported on Raven's and Koh's but is not supported on SAT and Burt's.

In spite of the fact that the monolingual boys and girls are equal in intelligence as measured by Raven's and Koh's, the girls were inferior on SAT and Burt's where verbal and numerical abilities are predominant. In the same way when monolingual girls were compared with bilingual girls at 5th class level, they were equal in intelligence as measured by Koh's but inferior on SAT, Raven's, and Burt's.

However, since the monolingual girls and boys are equal in intelligence and also in socio-economic and educational background, it is possible that the inferiority of the girls on SAT and Burt's may be due to verbal and numerical abilities which may have not been developed by the school.

**Hypothesis No. 8:**

There is no difference between bilingual boys and bilingual girls in achievement at 10th class level.
<table>
<thead>
<tr>
<th>Subjects</th>
<th>Bilingual Boys</th>
<th>Bilingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>I</td>
<td>3</td>
<td>.01</td>
</tr>
<tr>
<td>Urdu</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
</tr>
<tr>
<td>Social Studies</td>
<td>ND</td>
<td>ND</td>
<td>-</td>
</tr>
</tbody>
</table>

Comparison in divisions

Total Marks
ND  ND  -

The results show that with the exception of English, the hypothesis is justified in respect of Urdu, Social Studies and total marks.

The superiority of girls in English has been supported by McCarthy (109), Tyler (179), Wechsler (187), Anastasi (4), Vernon (182) and Peal and Lambert (127). They assert that girls are more advanced than boys in language development. Although the general superiority of boys in Social Studies is attested by Terman (175), Tyler (179) and Anastasi (4), the comparison between the bilingual boys and girls shows that the girls are equally proficient in this subject.

To sum up, it can be said that as far as the performance of bilingual boys and girls is concerned, they are approximately equal at both 6th and 10th class levels in intelligence and in achievement at the 10th class level with the exception

*1st Division Marks 60%
2nd Division Marks 45%
3rd Division Marks 33%
of the 10th class girls, superiority in the subject of English and on IT.

It is possible that the absence of differences due to sex factors among bilinguals is on account of their higher socio-economic and educational background. The girls may have been equally encouraged in their studies by their parents as were the boys, and this would help them to keep abreast of the boys in intelligence and achievement.

Hypothesis No. 9:
There is no difference between monolingual boys and monolingual girls in achievement at 10th class level.

<table>
<thead>
<tr>
<th>Subjects</th>
<th>Monolingual Boys</th>
<th>Monolingual Girls</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>S</td>
<td>I</td>
<td>.01</td>
</tr>
<tr>
<td>Urdu</td>
<td>S</td>
<td>I</td>
<td>.01</td>
</tr>
<tr>
<td>Social Studies</td>
<td>S</td>
<td>I</td>
<td>.01</td>
</tr>
<tr>
<td>Comparison in Divisions*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total Marks</td>
<td>S</td>
<td>I</td>
<td>.01</td>
</tr>
</tbody>
</table>

The results show that the hypothesis is not justified in respect of any of the subjects. The nature of the results is exactly the same as it was in the case of the four tests at 10th class level. The inferiority of the monolingual

*1st Division Marks 60%
2nd Division Marks 45%
3rd Division Marks 33%
girls to the monolingual boys appears to be constant, whereas in the case of the bilinguals the results are mostly the reverse. The girls are superior in the subject of English and in the verbal test but equal in the other subjects and tests.

It can be definitely stated on the basis of these results that monolingual girls are consistently inferior in intelligence and achievement when compared with bilingual girls or monolingual boys, particularly at the 10th class level.

At the 6th class level, equal performance of monolingual boys and girls on Raven's and Hunt's and that of bilingual and monolingual girls on Koh's give an idea that they would not be so inferior at the secondary level as is the present older group. This minor improvement in intelligence in the case of 6th class monolingual girls may have been due to school or parents encouragement. It is probable that importance of girls' education may have started to be realised.

Some of the factors such as socio-economic and educational background, school and sex should be kept in view in drawing conclusions from the results. If it is assumed that socio-economic and educational factor affects as Decroly and Degand (42), Sirkin (156), McNemar (110), Liversay (99), Stewart (170), Johnson (75), Tyler (179) and Burt (27) have demonstrated that a high socio-economic
and educational background has a favourable effect and a poor one an unfavourable effect, in the present research, inspite of the fact that the monolingual boys are less privileged than the bilingual boys, the socio-economic and educational factor appears to have little detrimental influence on their performance in the four tests and on their achievement in the Matriculation Examination. In the case of the monolingual girls, however, their poorer socio-economic and educational background may be a factor which has had an unfavourable effect, since they showed almost constant inferiority in intelligence at 10th and 6th class level and in achievement in the Matriculation Examination.

This factor does not, however, appear to be the only one. When boys and girls were compared in intelligence and achievement, their socio-economic and educational background was approximately equal both in the case of bilinguals and in that of monolinguals. As far as bilinguals are concerned, there is approximately no sex differences due to sex in either intelligence or in achievement. In the case of monolinguals, however, the boys are noticeably superior both in intelligence and in achievement. It is possible that besides socio-economic and educational background, school and sex factors may have been responsible for lowering the performance of the monolingual girls. The education
which they have received in school may not have been of such a high standard, while the attitude of their parents towards education may also have been discouraging. In the Proposals for a New Education Policy 1969, the attitude of the general masses has been very aptly described:

... Parents, particularly those who are not well-to-do, consider the cost of a girl's education as waste while that of a boy's is regarded as an investment. This is natural, as a boy is expected to become an earner while a girl is not. (112:42)

**Brief Summary of the Findings.** If the apparent difference in results between the sexes is discounted bilingualism appears to be neither detrimental to intelligence at either stage nor to achievement — with the exception of Urdu at 10th class level.

If the sexes are considered separately, and girls taken first, bilingualism appears neither detrimental to intelligence at either stage nor to achievement at 10th class level. Secondly in the case of boys, bilingualism does not appear to be detrimental to intelligence at either stage (except on SAT at 10th class) but detrimental in achievement at 10th class level.

When the sexes are compared first among the bilinguals, boys and girls appeared equal in intelligence at both the stages except on the results of SAT on which the 10th class girls showed superiority to the 10th class boys. In achievement
the direction of the results is exactly the same, boys and girls appear equal at 10th class - except in English in which the girls appear superior to the boys. Secondly, in the case of monolinguals, the direction of the results differs, the boys appear superior to the girls in intelligence at both the stages leaving aside the results of Raven's and Koh’s tests on which the 6th class boys and girls appear equal. In achievement the boys remained superior to the girls throughout at 10th class level.

Educational Implications of the present research for Pakistan

The investigator presents some suggestions regarding the educational implications of the results derived from the present investigation.

Discounting differences in results between the sexes, bilingualism appears neither detrimental to intelligence at either stage nor to achievement - except in Urdu at 10th class level.

Considering the sexes separately, to take the girls first, bilingualism appears neither detrimental to intelligence at either stage nor to achievement at 10th class level. Secondly considering the boys, bilingualism appears not to be detrimental to intelligence at either stage
(except on SAT at 10th class level) but detrimental to achievement at 10th class level.

To compare the sexes, first in the case of bilinguals, boys and girls appear equal in intelligence at both the stages except on the results of SAT on which the 10th class girls showed superiority to the 10th class boys. In achievement the direction of the results is exactly the same: boys and girls are equal at 10th class except in English in which the girls appear superior to the boys.

Secondly, in the case of monolinguals the direction of the results differs: the boys appear superior to the girls in intelligence at both the stages discounting the results of Raven's and Koh's tests on which the 6th class boys and girls appear equal. In achievement the boys remained superior to the girls throughout at 10th class level.

In the light of these results, as a whole and in the case of girls in particular, bilingualism may be praised; in the case of boys, however, it does seem to lead to educational retardation.

In the case of girls, the superiority of bilinguals in intelligence and achievement suggests that bilingualism is beneficial for girls and it may be suggested that learning through a foreign language is not detrimental. At the same time, however, the consistent inferiority of the monolingual girls suggests that they may have been neglected in
intellectual and educational development. Here the attitude of their parents who are socio-economically and educationally lower and more particularly the standard of the Urdu-medium schools need special attention. If monolingual boys with the same standard of socio-economic and educational background could put up a good performance particularly in achievement, why cannot the girls if they are properly treated and encouraged in their studies. In the case of bilinguals, the girls were at an equal level with the boys in intelligence and in achievement and in fact showed superiority on SAT and in the subject of English due to their linguistic efficiency. Nevertheless, keeping in view all these aspects which raise some questions regarding the inferiority of monolingual girls, the beneficial effect of bilingualism may be cautiously asserted.

In the case of boys, however, the results may be more conclusive since the bilingual boys, although not retarded on the non-verbal tests, showed remarkable inferiority on the verbal test and in the matriculation examination. If language becomes a handicap in a verbal intelligence test and in the school subjects, it presents evidence in support of the view that bilingualism constitutes retardation. The findings are in line with the view that school instruction carried out in a foreign language produces
worse results than when the mother tongue is used as the medium of instruction.

It may be pointed out that in the case of girls, the beneficial effect of bilingualism upon intelligence and achievement may be because girls in general are linguistically superior. In the case of boys, the detrimental effect of bilingualism in the case of verbal intelligence and the Matriculation Examination may be because boys in general are linguistically inferior.

As the results for girls and boys are different, it becomes difficult to conclude one way or the other whether bilingualism has a favourable or unfavourable effect. It is evident therefore that further researches will be needed to ascertain the relative merits of bilingualism and monolingualism upon intelligence and achievement.

Recommendations

1. More researches of the present type should be conducted both in urban and rural areas in order to substantiate its findings. In particular they should be conducted in Sind and in the N.W.F.P. where there are other regional languages.
2. A further research with a bigger sample may provide more conclusive results.

3. Different tests for measuring intelligence should be used.

4. In the present research, achievement at the 10th class level was tested by taking the results of the students in the Board of Intermediate and Secondary Education's Matriculation Examination as there was no standardized achievement test available. It would be better if achievement tests were to be standardized on Pakistani children in order to make the results more reliable and valid.

5. The effect of socio-economic and educational background upon intelligence and achievement should also be checked.

6. The attitude of the parents regarding the education of their children should also be examined.

7. In order to deal with the problem more seriously a longitudinal research needs to be conducted. If this were done, many variables could be controlled.

8. The effect of bilingualism upon the intelligence and achievement of students at higher secondary and university levels should be examined to determine whether differences between bilinguals and monolinguals subsequently diminish or become more pronounced.
9. Different methods of teaching English are being used in Pakistani schools but no research has so far been undertaken to discover their relative effectiveness.

Acquisition of English in relation to its relative effectiveness of the indirect (translation) method and the direct method needs to be assessed with special reference to the age, intelligence, verbal ability and motivation of the subjects.

10. Researches into the optimum age for starting to learn a second language should be conducted, with special reference to pronunciation, reading, comprehension and writing.

11. The effect of bilingualism upon emotional adjustment needs to be assessed. There is a great controversy on this issue. Some authorities suggest that bilingualism leads to a "marginal personality" or a denationalized or mentally deranged and uprooted person. Others suggest that contact with two languages contributes to the formation of a more tolerant and "world minded" personality. Both these suggestions need to be substantiated by relevant research.

12. Investigations should also be undertaken to determine whether learning a second language facilitates the learning of a third language.
13. finally, it is necessary that all the varying aspects of bilingualism should be thoroughly examined by conducting linguistic, psycholinguistic, psychological, sociological and educational research studies. These studies, although apparently divergent in purpose and scope, are all essentially complementary to an understanding of bilingualism. A joint approach would be of immense use. Without a joint inter-disciplinary and co-ordinated effort, the problem of bilingualism will not be solved properly. It is, therefore, imperative that the complex problem should be dealt with by a multi-dimensional approach.


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80. ______, Bilingualism and Intelligence, Cardiff, 1959.


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149. Scholastic Aptitude Test for Classes IV, V, and VI, Scale I and IX and X Scale III Test Development Project, Research Wing, Institute of Education and Research, University of the Punjab, Lahore, West Pakistan, 1964, 15 pp.


174. German, A., "The Vocabulary Test as a Measure of Intelligence", *Journal of Educational Psychology* 9:452-466, 1918.


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APPENDIX
RESULTS OF MONOLINGUAL GIRLS FROM PILOT GIRLS SCHOOL, CHAUDHAT COLONY, LAHORE

Monolingual girls of Group C were taken from Pilot Girls School, Chaudhat Colony, Lahore. Results of this Group (C) are compared in the following tables with Group B as well as with Group D at both the levels.

Table 49 presents the ranges, means, standard deviations and the t-values of the raw scores of 10th class combined groups of bilinguals (boys and girls) and monolinguals (boys and girls) on SAT, Raven's, Burt's and Koh's.

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>BIL. (A+C)</td>
<td>100</td>
<td>7 - 63</td>
<td>35.60</td>
<td>10.37</td>
<td>5.29</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (B+E)</td>
<td>100</td>
<td>14 - 66</td>
<td>43.85</td>
<td>11.63</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raven's</td>
<td>BIL. (A+C)</td>
<td>100</td>
<td>14 - 57</td>
<td>43.91</td>
<td>7.65</td>
<td>3.87</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (B+E)</td>
<td>100</td>
<td>12 - 56</td>
<td>39.05</td>
<td>9.90</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burt's</td>
<td>BIL. (A+C)</td>
<td>100</td>
<td>11 - 32</td>
<td>19.19</td>
<td>4.28</td>
<td>3.10</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (B+E)</td>
<td>100</td>
<td>3 - 29</td>
<td>17.08</td>
<td>5.27</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td>BIL. (A+C)</td>
<td>100</td>
<td>2 - 110</td>
<td>36.90</td>
<td>21.91</td>
<td>4.27</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (B+E)</td>
<td>100</td>
<td>2 - 89</td>
<td>24.70</td>
<td>18.31</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 49 reveals that the difference between the means is statistically significant at .01 level on SAT in favour of the monolinguals (Group 81) but on Raven's, Burt's and Koh's differences are significant at .01 level in favour of the bilinguals (Group 8C).

Table 50 presents ranges, means, standard deviations and t-values of the raw scores of 10th class bilingual and monolingual girls on SAT, Raven's, Burt's and Koh's.

**TABLE 50. RANGE, MEAN, STANDARD DEVIATION AND T-VALUE OF THE RAW SCORES OF 10TH CLASS BILINGUAL AND MONOLINGUAL GIRLS**

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>Bil. (C)</td>
<td>50</td>
<td>20 - 63</td>
<td>37.80</td>
<td>9.33</td>
<td>2.23</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>Mon. (E)</td>
<td>50</td>
<td>20 - 63</td>
<td>42.30</td>
<td>10.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raven's</td>
<td>Bil. (C)</td>
<td>50</td>
<td>33 - 57</td>
<td>44.60</td>
<td>5.97</td>
<td>7.33</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (E)</td>
<td>50</td>
<td>13 - 53</td>
<td>34.00</td>
<td>8.30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burt's</td>
<td>Bil. (C)</td>
<td>50</td>
<td>11 - 30</td>
<td>18.44</td>
<td>4.04</td>
<td>4.68</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (E)</td>
<td>50</td>
<td>3 - 24</td>
<td>14.32</td>
<td>4.77</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td>Bil. (C)</td>
<td>50</td>
<td>6 - 110</td>
<td>36.10</td>
<td>21.85</td>
<td>3.85</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (E)</td>
<td>50</td>
<td>2 - 89</td>
<td>21.30</td>
<td>16.24</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 50 shows that the difference between the means is statistically significant at .05 level on SAT in favour of the monolingual girls but at .01 level on Raven's, Burt's and Koh's in favour of the bilingual girls.

Table 51 presents the ranges, means, standard deviations and t-values of the raw scores of 6th class combined bilinguals (boys and girls) and monolinguals (boys and girls) on SAT, Raven's, Burt's and Koh's.

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>sd</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>Bil.(A+C)</td>
<td>100</td>
<td>22 - 58</td>
<td>45.37</td>
<td>8.52</td>
<td>2.60</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>Mon.(K+K)</td>
<td>100</td>
<td>11 - 58</td>
<td>41.90</td>
<td>10.25</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raven's</td>
<td>Bil.(A+C)</td>
<td>100</td>
<td>10 - 50</td>
<td>30.98</td>
<td>10.69</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon.(B+B)</td>
<td>100</td>
<td>6   - 54</td>
<td>24.60</td>
<td>11.41</td>
<td>4.09</td>
<td>.01</td>
</tr>
<tr>
<td>Burt's</td>
<td>Bil.(A+C)</td>
<td>100</td>
<td>2   - 24</td>
<td>9.59</td>
<td>3.92</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon.(B+B)</td>
<td>100</td>
<td>2   - 19</td>
<td>8.92</td>
<td>4.14</td>
<td>1.18</td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td>Bil.(A+C)</td>
<td>100</td>
<td>2   - 53</td>
<td>14.40</td>
<td>11.83</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon.(B+B)</td>
<td>100</td>
<td>2   - 57</td>
<td>10.30</td>
<td>9.58</td>
<td>2.69</td>
<td>.01</td>
</tr>
</tbody>
</table>
Table 51 shows that the differences between the means of two groups is statistically significant at .05 level on SAT and at .01 level on Raven's and Koh's in favour of bilinguals (A+C) but on Burt's difference is not statistically significant.

Table 52 indicates the ranges, means, standard deviations and the t-values of the raw scores of 6th class bilingual and monolingual girls on SAT, Raven's, Burt's and Koh's.

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bil. (C)</td>
<td>50</td>
<td>22 - 57</td>
<td>47.00</td>
<td>7.20</td>
<td>4.76</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td>Mon. (E)</td>
<td>50</td>
<td>11 - 56</td>
<td>38.90</td>
<td>9.89</td>
<td>4.67</td>
<td>.01</td>
</tr>
<tr>
<td>Raven's</td>
<td>Bil. (C)</td>
<td>50</td>
<td>11 - 50</td>
<td>32.80</td>
<td>10.51</td>
<td>4.67</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (E)</td>
<td>50</td>
<td>8 - 52</td>
<td>23.00</td>
<td>10.49</td>
<td>2.99</td>
<td>.01</td>
</tr>
<tr>
<td>Burt's</td>
<td>Bil. (C)</td>
<td>50</td>
<td>2 - 24</td>
<td>9.92</td>
<td>4.19</td>
<td>2.38</td>
<td>.05</td>
</tr>
<tr>
<td>Koh's</td>
<td>Mon. (E)</td>
<td>50</td>
<td>2 - 30</td>
<td>8.70</td>
<td>6.40</td>
<td>2.38</td>
<td>.05</td>
</tr>
</tbody>
</table>
Table 52 shows that the differences between bilingual and monolingual girls are statistically significant at .01 level on SAT, Raven's, and Burt's and at .05 level on Koh's.

It may be stated that with the exception of SAT at 10th class level the direction of the results is approximately the same when the monolingual girls of Group B are compared with bilingual girls of Group C at both the levels on the four tests.

Table 53 shows ranges, means, standard deviations and t-values of the raw scores of 10th class monolingual boys and girls on SAT, Raven's, Burt's and Koh's.
<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mon. (B)</td>
<td>50</td>
<td>14 - 66</td>
<td>45.40</td>
<td>12.22</td>
<td>1.34</td>
<td></td>
</tr>
<tr>
<td>SAT</td>
<td>Mon. (C)</td>
<td>50</td>
<td>20 - 63</td>
<td>42.10</td>
<td>10.78</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (Bj)</td>
<td>50</td>
<td>12 - 56</td>
<td>40.10</td>
<td>11.17</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raven's</td>
<td>Mon. (B)</td>
<td>50</td>
<td>13 - 53</td>
<td>34.00</td>
<td>6.30</td>
<td>3.10</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (B)</td>
<td>50</td>
<td>9 - 29</td>
<td>19.86</td>
<td>4.48</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burt's</td>
<td>Mon. (C)</td>
<td>50</td>
<td>3 - 24</td>
<td>14.32</td>
<td>4.77</td>
<td>5.99</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (Bj)</td>
<td>50</td>
<td>2 - 85</td>
<td>20.10</td>
<td>19.57</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td>Mon. (K)</td>
<td>50</td>
<td>2 - 89</td>
<td>21.30</td>
<td>16.24</td>
<td>1.89</td>
<td></td>
</tr>
</tbody>
</table>

Table 53 reveals that the difference between the means of monolingual boys and girls is not significant on SAT and Koh's but significant at .01 level on Raven's and Burt's in favour of boys.

In the case of SAT and Koh's in spite of the fact that the differences between the means of monolingual boys and girls are not statistically significant, means of the boys are greater than girls. Keeping in view this tendency it could
be stated that the results are to the same direction as were between Group B and Group C at 10th class level.

Table 54 shows the ranges, means, standard deviations and the t-values of the raw scores of 6th class monolingual boys and girls on SAT, Raven's, Burt's and Koh's.

**Table 54. Range, Mean, Standard Deviation and t-Value of the Raw Scores of 6th Class Monolingual Boys and Girls**

<table>
<thead>
<tr>
<th>Test</th>
<th>Group</th>
<th>N</th>
<th>Range</th>
<th>Mean</th>
<th>SD</th>
<th>t</th>
<th>df</th>
</tr>
</thead>
<tbody>
<tr>
<td>SAT</td>
<td>Mon. (B)</td>
<td>50</td>
<td>16 - 58</td>
<td>45.40</td>
<td>9.71</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (E)</td>
<td>50</td>
<td>11 - 56</td>
<td>38.90</td>
<td>9.89</td>
<td>3.32</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (H)</td>
<td>50</td>
<td>11 - 54</td>
<td>26.20</td>
<td>12.06</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raven's</td>
<td>Mon. (B)</td>
<td>50</td>
<td>6 - 52</td>
<td>23.00</td>
<td>10.49</td>
<td>1.42</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mon. (E)</td>
<td>50</td>
<td>4 - 19</td>
<td>10.06</td>
<td>4.31</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Burt's</td>
<td>Mon. (B)</td>
<td>50</td>
<td>2 - 14</td>
<td>7.60</td>
<td>3.54</td>
<td>3.12</td>
<td>.01</td>
</tr>
<tr>
<td></td>
<td>Mon. (E)</td>
<td>50</td>
<td>2 - 57</td>
<td>11.90</td>
<td>11.72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Koh's</td>
<td>Mon. (E)</td>
<td>50</td>
<td>2 - 30</td>
<td>8.70</td>
<td>6.40</td>
<td>1.69</td>
<td></td>
</tr>
</tbody>
</table>
Table 54 shows that the difference between the means of two groups is statistically significant at .01 level on SAT and Brun's in favor of the boys but not statistically significant on Raven's and Koh's.

These results are also exactly to the same direction as are when monolingual girls of Group 0 are compared with monolingual boys of Group 8 at 6th class level.
APPENDIX II
PROFORMA

سمعتم والدے،

بہبہ پروفیسر نے ایک تعقیف کا قہار کا ہے - جسکا مقدس اسم بھی

گی زمین استعمال کا موٹھے کرا ہے - اول وہ بہی جو مرت ایک زبان (آردو)

سجھے اور پھر دیتی ہیں - دوم وہ بہی جو دو زبان (آردو اور انگریزی) بھی بنی اور

سجھے ہیں - اس تعقیف کو زیادہ موثر بنانے کی لئی بہ طرح میں کہ دوسری گروپوں

کی جیسی کہ مالی اور تعلیمی پیس محسور کو مسکنر رکھا جائی اس لئی آپ کا تعاون

ہیں جیسا - آپ کی فراہم کریں تعلیمی معلومات کو محسوب راز میں رکھا جائی جا سکتا

(1)

والد ما سرپرست گی تعلیم -

(2)

والدہ کی تعلیم -

(3)

والد ما سرپرست گی ماحاکا لڑی - مختلف زاس حس سے لڑی تجارتی ذرائع

(4)

والدہ کی ماحاکا لڑی -

(5)

والد ما سرپرست گی پشہ اور معدہ -

(6)

والدہ کی پشہ اور معدہ -

(7)

سوا کہ تو جنیاح والی بھی کی صحیح عمر -

(8)

سما حمیل لودی

بہبہ سکالر بہبہ پروفیسر فیض
APPENDIX C

QUESTIONNAIRE ON BILINGUAL BACKGROUND

Total answered ________
Score ________________

Name ___________________________ Girl/Boy

School __________________________

Class __________________________

Date of Birth ______ Age ______ Place of Birth ______

Father's Guardian's Occupation ______ Monthly Income ______

Father's Education ____________

Mother's Education ____________

Brothers:

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>School</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

Sisters:

<table>
<thead>
<tr>
<th>Name</th>
<th>Age</th>
<th>School</th>
<th>Class</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>
Does your father understand English? ___ Yes ___ No

Name all the languages your father understands:

Name all the languages your mother understands:

Name all the languages you understand (besides English)

Date: ____________ 

Examiner: __________

In all the following questions please underline only that answer which seems most correct to you.

1. Do the following speak to you any language other than English?

   a. Father
      Never    Sometimes     Often     Mostly     Always
   b. Mother
      Never    Sometimes     Often     Mostly     Always
   c. Brothers & Sisters
      Never    Sometimes     Often     Mostly     Always
   d. Relatives
      Never    Sometimes     Often     Mostly     Always
   e. Playmates & Friends
      Never    Sometimes     Often     Mostly     Always

2. Do you speak to the following any language other than English?

   a. Father
      Never    Sometimes     Often     Mostly     Always
   b. Mother
      Never    Sometimes     Often     Mostly     Always
   c. Brothers & Sisters
      Never    Sometimes     Often     Mostly     Always
   d. Playmates & Friends
      Never    Sometimes     Often     Mostly     Always
3. Does your father speak to the following any language other than English?
   a. Mother
      Never Sometimes Often Mostly Always
   b. Brothers & Sisters
      Never Sometimes Often Mostly Always

4. Does your mother speak to the following any language other than English?
   a. Father
      Never Sometimes Often Mostly Always
   b. Brothers & Sisters
      Never Sometimes Often Mostly Always

5. Do your brothers and sisters speak to the following any language other than English?
   a. Father
      Never Sometimes Often Mostly Always
   b. Mother
      Never Sometimes Often Mostly Always

6. Do the following read any newspaper in any language?
   I. a Father
      Yes or No
   b. You (yourself)
      Yes or No
   c. Mother
      Yes or No

II. If answer is 'YES' how often do they read any newspaper in language other than English?
   a. Father
      Never Sometimes Often Mostly Always
   b. Mother
      Never Sometimes Often Mostly Always
   c. You (yourself)
      Never Sometimes Often Mostly Always

Write down on these lines the names of the newspapers which any of the above read in a language other than English?

__________________________________________

__________________________________________

__________________________________________

__________________________________________
7. Do the following read any books in any language?

I. a. Father ... Yes or No
b. Mother ... Yes or No
c. You (yourself) Yes or No

II. If answer is 'YES' how often do they read any books in a language other than English?

a. Father Never Sometimes Often Mostly Always
b. Mother Never Sometimes Often Mostly Always
c. You (yourself) Never Sometimes Often Mostly Always

Write down the names of the books in a language other than English which any of the above have read this past year on these lines:


8. Do the following write any letters in any language?

I. a. Father ... Yes or No
b. Mother ... Yes or No
c. You (yourself) Yes or No

II. If the answer is 'YES' how often do they write any letters in a language other than English?

a. Father Never Sometimes Often Mostly Always
b. Mother Never Sometimes Often Mostly Always
c. You (yourself) Never Sometimes Often Mostly Always

9. Are letters written in a language other than English received in your home? Never Sometimes Often Mostly Always
10. Do the following go to see films being shown in a language other than English?
   a. Father
   b. Mother
   c. You (yourself)

11. Are radio programmes which are given in a language other than English listened to in your home?

12. Do you do your thinking in a language other than English?

1. Do you read the newspaper in a language other than English?

2. Do you read the books (besides text books) and magazines in a language other than English?

3. Do you write letters in a language other than English?

4. Do you receive letters in a language other than English?

5. Do you listen to the radio programmes in a language other than English?

6. Do you see the films in a language other than English?

7. Do you like to see the television programmes in a language other than English?
حمل شده جوابات

کل صبر

اسم

لوازم

درخواست

سکول

شلخ

سیکس

نتاج بهداشتی

جایی بهداشتی

والد یا سربیش یا پشه

والد یک تعلیم

والد تی تعلیم

پیشیار

جامع

سکول

ضرع
کا آپ کے والد اکھراتی سمجھتے ہیں؟ کیا آپکے والد ہاگہز کے سمجھتے ہیں؟

2- عام وہ زیادہ لکھنے جو آپکے والد سمجھتے ہیں
3- عام وہ زیادہ لکھنے جو آپکے والد سمجھتے ہیں
4- عام وہ زیادہ لکھنے جو آپ اکھراتی چکے مذہب سمجھتے ہیں

مصدر: نیال سوانی کے سے مرہٹ کین کے کچھ دوسرے روہانی وسی بات کہنے کے

درست معلومات دیکھیں -

5- کا مصدر: نیال لوا، آپ سے اکھراتی کی مذہب چکی دوسرے روہانی وسی بات کہنے کے؟

الف- والد ————————— کچھ نہیں کچھ اکثر زیادہ تر ہمیشہ
ب- والد —————————
ج- معاشرے و بینس —
ر- رشید دار ————
ہ- کچھ دوسرے روہانی وسی
2- کا آپ میں زیادہ نہیں لگتے لیکن کی اگر نہیں کی دوسرو زبان میں بات کریں؟

- والد
  - کبھی دوسرو زبان میں بات کریں
  - کبھی دوسرو زبان میں بات کریں
  - کبھی دوسرو زبان میں بات کریں

- بھائی
  - بھائی

- ج
  - بھائی

- د
  - بھائی

3- کا آپ میں مہاوت دینے کے لیے اگر نہیں کی دوسرو زبان میں بات کریں؟

- والد
  - کبھی دوسرو زبان میں بات کریں
  - کبھی دوسرو زبان میں بات کریں
  - کبھی دوسرو زبان میں بات کریں

- بھائی
  - بھائی

- ج
  - بھائی

- د
  - بھائی

4- کا آپ میں مہاوت دینے کے لیے اگر نہیں کی دوسرو زبان میں بات کریں؟

- والد
  - کبھی دوسرو زبان میں بات کریں
  - کبھی دوسرو زبان میں بات کریں
  - کبھی دوسرو زبان میں بات کریں

- بھائی
  - بھائی

- ج
  - بھائی

- د
  - بھائی
اگر جواب ہیں، میں مرتبہ وہ اخبار اخباری کی دیوے دوسی زبان

میں پہلی کیسے?

اگر جواب ہیں، میں مرتبہ وہ اخبار اخباری کی دیوے دوسی زبان

میں پہلی کیسے?

اگر جواب ہیں، میں مرتبہ وہ اخبار اخباری کی دیوے دوسی زبان

میں پہلی کیسے?

اگر جواب ہیں، میں مرتبہ وہ اخبار اخباری کی دیوے دوسی زبان

میں پہلی کیسے?

اگر جواب ہیں، میں مرتبہ وہ اخبار اخباری کی دیوے دوسی زبان

میں پہلی کیسے?

کیا مذکرہ ذیل لکھی ہوئی قسم کی کتاب ہے کسی بھی زبان میں پڑھا ہے?

اگر جواب ہیں، میں مرتبہ وہ اخبار اخباری کی دیوے دوسی زبان

میں پہلی کیسے?
<table>
<thead>
<tr>
<th>اله</th>
<th>والد</th>
<th>کیمی دنی</th>
<th>کیمی کیمی</th>
<th>اکثر زبان</th>
<th>تر</th>
<th>حسین</th>
<th>ب</th>
<th>والدہ</th>
<th>کیمی دنی</th>
<th>کیمی کیمی</th>
<th>اکثر زبان</th>
<th>تر</th>
<th>حسین</th>
<th>ج</th>
<th>آپ (خد)</th>
</tr>
</thead>
</table>

ہیچ ہیں ان کتابوں کی طرح کتابوں جو ملکے پر لگے ہیں: لوگوں سے سب سے کمی جو ایک ہی بیوی میں

کی مدد کی اپنی زبان سے کبھی کبھی سال بڑی مہنے

| کیا ممکنہ نہیں لودا: کسی بھی زبان میں خط لکھنے حسین؟
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>الب</td>
<td>والد</td>
<td>کیمی</td>
<td>دنی</td>
</tr>
<tr>
<td>والدہ</td>
<td>کیمی</td>
<td>دنی</td>
<td>بسی</td>
</tr>
<tr>
<td>آپ (خد)</td>
<td>کیمی</td>
<td>دنی</td>
<td>بسی</td>
</tr>
</tbody>
</table>

اگر ہر جواب غیر صوبہ سے نہیں ہو تو بہتر گفتگو مرتبا کی ہے خاتمہ ایک ہی بیوی کی مدد کے

کسی اپنے زبان میں لکھنے حسین؟

<table>
<thead>
<tr>
<th>الب</th>
<th>والد</th>
<th>کیمی دنی</th>
<th>کیمی کیمی</th>
<th>اکثر زبان</th>
<th>تر</th>
<th>حسین</th>
<th>ب</th>
<th>والدہ</th>
<th>کیمی دنی</th>
<th>کیمی کیمی</th>
<th>اکثر زبان</th>
<th>تر</th>
<th>حسین</th>
<th>ج</th>
<th>آپ (خد)</th>
</tr>
</thead>
</table>

کسی گم کر اپنی کی دوزی دوسروں زبان میں خاتمہ آئے حسین؟

کیمی دنی | کیمی | کیمی | اکثر | زبان | تر | حسین |
کا مبینجے نیلے لو؟ اسی ظہور دیکھی جانے میں جو اگنی کے

علاوہ دوسرے پیمانے میں ہونے؟

الفا - والدہ --- کئی تھے کبھی کبھی اکثر زیادہ تر حیثیت

ب - والدہ ---

ج - آپ (خود)

کا آپ کہ گھر رہنے میں اپنی مراکز سے جانے میں جو اگنی کے حذو

دوسرے پیمانے میں ہونے

کبھی دوسرے کبھی کبھی اکثر زیادہ تر حیثیت

کا آپ اگنی کے حذو دوسرے پیمانے میں سوہتے ہوئے ہیں؟

کبھی دوسرے کبھی کبھی اکثر زیادہ تر حیثیت

کا آپ اخبار اگنی کے حذو دوسرے پیمانے میں پلٹتے ہوئے ہیں؟

کبھی دوسرے کبھی کبھی اکثر زیادہ تر حیثیت

کا آپ صاحب کتابوں کے حذو کتابوں اور رسالے اگنی کے حذو دوسرے

پیمانے میں پلٹتے ہوئے ہیں؟

کبھی دوسرے کبھی کبھی اکثر زیادہ تر حیثیت
کہ آپ خاندین اکثریتی کی مدد دوسری زبان میں لکھتے ہو؟

کہیں دیکھا کہیں کہیں اکثر زیادہ دیکھتے ہیں؟

کہ آپ آئی دیو میں پیج یزیم اکثریتی کی مدد دوسری زبان میں سیکٹر میں؟

کہیں دیکھا کہیں کہیں اکثر زیادہ دیکھتے ہیں؟

کہ آپ فلم اکثریتی کی مدد دوسری زبان میں دیکھتے ہیں؟

کہیں دیکھا کہیں کہیں اکثر زیادہ دیکھتے ہیں؟

کہ آپ غولمندار میں اکثریتی کی فتح دوسری زبان میں پیج یزیم دیکھتے ہیں؟

پھر کہیں میں؟

کہیں دیکھا کہیں کہیں اکثر زیادہ دیکھتے ہیں؟
سے بہتے جیسے سے بہت ملے ہوٹا جانی گی اور دیکھا جانی گی کہ

الجھاں دکھ ایک جیسے دیکھیں ہیں ہو دیکھیں ہیں اک جلوس جالی

کا اور جوابات جیسے سے لکھوائے جاگی، لوئے خاص طور پر ہے ہیں ہو جاتا جانی گیا

کہ کبھی دیکھیں، کبھی کہیں کبھی دیکھیں۔ اکھا، زیادہ تر اکھا، دریں سے اکھا، بہت اکھا

ہی جیسے لکھ کیے ہوئے ہیں جیسے اکھا جانی گی تاکہ جب ہو جاتے جانی گی اکھا، جب

پھر جانی گی۔ اکھا، میں ہو ہیں جب ہو جانی گیا کہ کبھی دیکھیں۔ کا مطلب

کہ اکھا ہو جانی گیا۔ اکھا خود کو بھی بھی جانی گی اکھا کبھی کہ جانی گی:

کہ اکھا ہو جانی گیا کہ اکھا دیکھیں۔ اکھا زیادہ تر اکھا زیادہ تر اکھا

کہ اکھا ہو جانی گیا کہ اکھا دیکھیں۔ اکھا زیادہ تر اکھا زیادہ تر اکھا

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کہ اکھا ہو جانی گیا کہ اکھا دیکھیں۔ اکھا زیادہ تر اکھا زیادہ تر اکھا
کہیں نہ - گھمیں کہ ہم نہ ہوئیں پہلے سے ہم، لکھا دوہا ہے - قائم بہر
ہوئی بھی کی ہے جب - اپنے کا وہ ہے ہر یہ ہی متین، بہت جہاں کہ ہے جب
کہ ہے ہیں۔ اسی بہت ستھن اپر وہ خاکے تک جوہر انتہار کرتے ہوئے
بناء کا - اس مصفح کی اپس کے حسہ پر اپس پر ہونا ہے جسکا کہہ حسہ
اگر ہر یہ جاگہا ہے - دیوی کی شکورِ خصص (س) اور اس کی دیوی کی ڈھان، ابادار، کریک بنیاتاگا ( خالی)
چکہ مس وہہ میں تو آئے مسی - نہیں سیمہ کو ہر اسی کریک - جس کا کہ صوفہ صر
اور مسی میں کی خالی کہ مس میں تو آئے مسی نہیں سیمہ کو ہر اسی صوفہ کو ہری خسی
کرتا - صفر 2 یہ مسلسل آپا کا خالی حس - ہے بنی اپس اور ان کی طبع بہت
آباجا نہ مسی میں کو ہر مسی کرنا - آپ مسی میں خصص پر اپس اپس اپس اپس اپس رہننے کو
اگر بھی مسی میں پر اپس اپس اپس اپس اپس اپس اپس رہننے کو
سطح کا حل بھیبو سمجھ آجاتا
- مسلسل 2 یہ مسی میں خصص پر اپس اپس اپس اپس اپس الرننے کو
اب آپ جوائی قائم بہر 8 یہ ہی کہ مسی میں ہو (1) ایک کی کہ ہے ہم ہم کہ
اب آپ جوائی قائم بہر 8 یہ ہی کہ مسی میں ہو (1) ایک کی کہ ہے ہم ہم کہ
کہ ہے ہم ہم کہ ہے ہم ہم
دسوا مسی میں انتہا جب ہے قائم بہر ہیں مسی میں خصص دکھیتے دکھیتے کہ
سمحت انتہا کر
- گھسی کی کتاب کی مس میں خصصح پر اپس اپس اپس اپس اپس اپس اپس
کہ دیوا گھسی کہ - آپ ہر مسی میں مسی کریک مسی میں کہ ہم ہم خصصح پر اپس اپس اپس اپس اپس اپس اپس
جوال١٨ م٠ ۰۳۷۶ لکھی ۔

شروع شروع جنہیں جنہیں اکھو آلہ لکھی گئی لکھی تو لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں لکھی تو نہیں
## Appendix E

**Record: Raven's Standard Progressive Matrices**

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**Date:** روز یکشنبه ۱۳۱۶

**Score:** پنجاه و سه
Appendix I

Instructions for Multiple-Choice Test

Each of you has got the question paper and simple sheets. You should not write anything on the question paper. You should do the working of the questions on the simple sheets by giving number to each question. You should do all the questions with full consideration. Working of the questions should be fully done. Even simple questions should be done with working. There is no time limit for this test.
APPENDIX C

INSTRUCTIONS FOR THE KOH'S BLOCK DESIGN TEST

The examiner will show the wooden cubes to the subject by saying: "Here are 16 wooden cubes of one inch dimension each. All are painted in the same way, with one face red, the second blue, the third white, the fourth yellow, the fifth half red and half white and the sixth half blue and half yellow."

Then the examiner will say "I have some designs on the cards which I will show you one by one. You will have to make the same design with the help of these cubes. You should try to make the design as quickly as possible, because your scores depend upon the time you take in making the design.

The first design will be shown to the subject and he will be asked to start the work.

If he fails then he would be asked to try again till he succeeds (in the first design). After the first one, there is a time limit for each design.
 להיות هناك بعد عمر ضوئه نار ورrete امصدر ضوء كاملاً...