Personal copy 17.09.09

ISSN 1022-7466

THE BANGLADESH JOURNAL OF PSYCHOLOGY

Volume 19 2001

A Journal of
The Bangladesh Psychological Association

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THE BANGLADESH JOURNAL OF PSYCHOLOGY

A Journal of the Bangladesh Psychological Association

Vol. 19 December, 2001

EDITORIAL BOARD

THE BANGLADESH JOURNAL OF PSYCHOLOGY
Volume 19, 2001

International Standard Serial Number: ISSN-1022-7466.
Listed in : Ulrich's International Periodicals Directory.
Distributed abroad: Swets Subscription Service, Lisse, Holland.

Printed at:
National Academy of Science and Technology (NAST)
85/A, Hossaini Dalan Road, Dhaka-1211.
Phone: 7300275.

Published by:
The Bangladesh Psychological Association
Department of Psychology
University of Dhaka
Dhaka- 1000
Bangladesh.

Price: Tk. 100.00 (Bangladesh)
U.S. $ 15.00 + postage (Abroad)

THE BANGLADESH JOURNAL OF PSYCHOLOGY

Vol. 19 December, 2001

Contents

The Bangladesh Journal of Psychology, 2001, Vol. 19: 1 -10

EYE MOVEMENTS AND VISUAL COGNITION IN READING – JAPANESE AND BANGLA

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166

ABSTRACT

The present study intended to see whether the writing systems (orthographic differences) influence the process of reading. Here we measured the size of saccadic eye movements and eye fixations during Japanese and Bangla text readings. The results show that Bangla text requires longer eye fixations and shorter saccades than those required by the Japanese text. Perhaps each word in Bangla carries more information than in Japanese and thus taking more time to process. The shorter saccade lengths of Bangla suggest that the informational density in the text determines how far the eye moves in each saccade. However, it is an open question whether the differences in informational density across languages are best thought of in terms of density of the meaning of visual information per character. Bangla writing system is so different from that of Japanese that it is hard to say which type of informational density is operating to produce the differences in reading. Perhaps both visual and semantic factors are contributing to the process.

Key words: Saccade length; fixation duration; lexical; phonological coding; lengh control; linguistic control

INTRODUCTION

It is well known that visual environment is an enormously rich source of information. Any approach to understanding visual perception must recognize that only a small part of the potential information is actually used. The visual axis of

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the eye is directed to a series of locations in the visual field, resulting in a continually changing sequence of images falling on the fovea. This changing sequence is the main, although not the only, process through which visual input is selected for cognitive visual task, such as reading. The eye movement provides an excellent on line behavioral measure of the cognitive processes underlying reading and visual cognition. Several studies (see Rayner 1998 for a review) dealing with text reading have been reported since those of Huey (1980) and Tinker (1958). Recent reviews of the role of eye movement and fixation during text reading indicate that a fixation duration analysis would be a useful tool for understanding cognitive processes during reading. Actually fixation duration relates to the temporal aspects of saccadic programming. The other measurement such as saccadic length is of interest although it is generally useful to relate the spatial aspects of the material being viewed. Fixation duration and saccade length change as a function of word frequency, word length, and contextual characteristics of the text. Other variables which influence eye movement in reading are semantic relationships between words, repetition effects, morphemic units, lexical ambiguity, phonological ambiguity, discourse factors and stylistic conventions and syntactic disambiguation. Parafoveal preprocessing which largely depends on the spread of visual attention across the near periphery is also found to be important.

It has also been noted that fixation duration depends on the time required for lexical access during reading (Osaka, 1992). However, lexical access may operate in parallel with other higher order preprocessing functions, including phonological coding. Fixation duration may also be related to the time allocated to this kind of processing. A normal eye movement record comprises a series of fixation and saccades. During each fixation the subjects extract the visual information that they process after which they make saccade to relocate the point of fixation elsewhere in the text. For all practical purposes, no visual information is extracted from the printed page during saccades; all visual information comes in during fixation. Why don't we see anything during saccade? First, the eye is moving so fast during a saccade that the image painted on the eye by a fixed stimulus would be a largely smear and thus highly unintelligible. However, we are not aware of any smear. Thus, there must be some mechanism suppressing the largely useless information that is "painted" on the retina during the saccade. One possible mechanism is central "anesthesia", when the brain knows that the eye is making a saccade. It sends out a signal to the visual system to ignore or attenuate all input from the eyes until the saccade is over. For many years, central anesthesia was accepted as the main mechanism by which information saccade was suppressed. However, more recent experiments indicate that a different

mechanism (masking) explains at least part of the suppression (Wolverton and Zola, 1983).

The present study is intended to see whether the writing system (orthographic differences) influences the process of reading. Do the characteristics of eye movements change when people read text, which uses other writing system?

The major problem associated with comparing saccade sizes in various languages is the unit of measurement to be used. It appears from the literature (Rayner, 1998) that the letter or character space may be the fundamental unit of measurement for English. However, there are no letters in many languages. For example, in Japanese and Chinese the characters stand for syllables or morphemes, or both. In such situations the researcher finds out the simple way to measure by "characters" (considering a letter is a character). Previous studies showed that the saccade length on an average is 8 characters in English and 5.5 characters in Hebrew (Rayner & Pollatsek, 1987), and 2 characters in Chinese (Stern 1978). Here the character is a morpheme rather than a word, so it is less than two words. The saccade length in Japanese is 3.6 characters (Ikeda & Saida, 1978), in Hirakana 5.2 characters and in Kanji- Hirakana mixed text 7.8 characters (Osaka, 1992). Japanese text is made up of morphemic characters (Kanji) and syllabic characters (kana) thus the measurements are less than 3.6 and 7.8 words respectively for those two types of character, since it often takes several characters to make a word.

The second measurement, fixation duration on an average is (a) for English readers: 220 msec. (Rayner & Pollatsek, 1978) and 230 msec, (Osaka 1992), (b) for Hebrew readers : 265 msec (Pollatsek et al. 1981), (c) for Chinese readers: 300 msec. (Shen 1927), (d) for Japanese Hirakana: 208 msec., and (e) for Kanji-Hirakana mixed text: 190 msec (Osaka, 1992).

In this study, eye movements were measured during natural salient reading and Japanese and Bangla (language of Bangladesh and a part of India) texts were used.

METHOD

Subjects: Six graduate students of Hokkaido University, 3 native Japanese and 3 native Bangladeshi, participated in this experiment. All had either normal or corrected to normal visual acuity. Japanese text was used for the native Japanese students and Bangla text was used for the native Bangladeshi students.

Materials: A sports news item (Soccer European cup final 2000) was taken from the Japanese newspaper and Bangla newspaper (same news appeared on the following day of the final match).

Apparatus: The materials were presented in white on black polarity on a 17 inch CRT display (NANAO Flex Scan E55 D) controlled by IBM PC AT compatible. Eye movements were recorded from both eyes with an eye mark recording system (NAC Eyemark Recorder EMR – 8 model ST- 560). This device has a resolution of better than 0.1 degree over 40 degree visual angle. A chin rest was used to minimize head movements. The eye movement recording system was calibrated prior to presentation to each subject. Viewing was binocular, and two dimensional eye movements sampled every 33 msec and stored for later off line analysis. Fixation duration and saccade were computed off line. The analysis procedures used here computed effective resolution for the data sets of each subjects separately, and the identification of saccade was determined (off line) statistically to a given data set.

Procedure: Following calibration (subject position for recording was adjusted) each subject was asked to read the text on the CRT screen silently from left to right. Eye fixations and saccades during reading were recorded in the experiment.

RESULTS

The findings of the present study have been summarized in Table 1 and Figures 1 to 4. The means of saccade fixation duration were 192 msec for Japanese and 266 msec for Bangla. The duration ranges from 170ms to 203ms for Japanese and 229 to 329 msec for Bangla. The fixation duration was longer for Bangla than that for Japanese. The frequency distributions for fixation time for Japanese and Bangla are shown in Figures 1 and 2. Actually fixation as short as 50 msec sometimes appeared in the eye movement record during reading Japanese and Bangla texts.

The mean saccade lengths were 6.80 characters for Japanese reader and 3.34 characters for Bangla reader (Table 1). This is in agreement with data for the Japanese text (Osaka, 1992). Therefore, the mean saccade length was longer for Japanese. The lengths of the saccade range from 4.78 to 8.01 characters for Japanese and 2.92 to 3.59 for Bangla. The frequency distributions for saccade lengths are shown in Figures 3 and 4.

DISCUSSION

The fixation duration on a word is generally considered as the measure of processing time. During each fixation the subjects extract the visual information they process after which they make a saccade to relocate the point of fixation elsewhere in the text. Fixation time primarily reflects lexical processing, but post access integration effects can have an effect as well. Linguistic factors influence the duration of a single long fixation. In the present study, it has been found that the fixation duration tends to be longer in Bangla than that in Japanese. Previous studies indicated that the fixation durations tend to be longer for readers of Chinese and Hebrew than for readers of English (Osaka, 1992) despite the fact that reading in these languages is slower when measured superficially.

Note that the unit of saccade length is not the degree of visual angle but the number of characters (detail result may be seen in Table 1).
Considering this fact of longer fixation duration in Bangla, it may be said that perhaps each word in Bangla carries more information than that in Japanese and thus taking more time to process.

In the present study the saccade length was found to be shorter in Bangla than that in Japanese. The shortest saccade length so far reported was found to be in Chinese (Stern, 1978). The saccade lengths are reported to be longer in Hebrew and English (Pollatsek et al., 1981). The shorter saccade lengths of Bangla in comparison to Japanese suggest that the informational density of the text determines how far the eyes move in each saccade. However, it is an open question whether the differences in informational density across languages are best explained in terms of the density of the meaning and the amount of visual information per character (measured perhaps by the numbers of strokes or line in the character). For Hebrew, the characters seem approximately of equal complexity to these of English, so the differences between Hebrew and English are more likely to be explained by differences in the amount of meaning in characters.

However, Bangla, Japanese and Chinese writing systems are so different from those of English and Hebrew that it is hard to say which type of informational density is operating to produce the differences in reading in these languages. Perhaps both visual and semantic factors are contributing to the process. Several studies of English and French have suggested that the saccadic eye movements during reading vary in size from moment to moment depending on text

Table 1: Means and SDs of saccade duration, saccade length per visual angle and character, and regression of saccade length for Japanese and Bangla

Japanese	Subjects			overall
	KK	MK	KY	
Mean duration time (msec)	202	170	203	192
SD of duration time	60	72	64	65
Mean saccade length per visual angle (degree)	4.88	5.19	4.85	4.97
SD of saccade length per visual angle	3.66	3.54	3.68	3.63
Saccade length per character	7.60	8.01	4.78	6.80
SD of saccade length per character	6.04	5.17	8.17	6.46
Regression saccade length	-6.78	-5.28	-5.96	-6.01
SD of regression saccade length	10.47	6.27	10.12	8.95
Percentage of regression	8%	8%	9%	9%
No. of fixation	109	107	112	109.33
No. of regression	9	9	10	9.33
Bangla	AH	NA	QZ	overall
Mean duration time (msec)	329	240	229	266
SD of duration time	224	125	114	154
Mean saccade length per visual angle (degree)	2.24	2.12	2.85	2.40
SD of saccade length	1.94	1.74	1.78	1.82
Saccade length per character	2.92	3.59	3.51	3.34
SD of saccade length per character	1.18	1.21	1.42	1.27
Regression saccade length	-1.53	-2.71	-2.10	-2.12
SD of regression saccade length	1.06	1.48	1.71	1.42
Percentage of regression	17%	13%	7%	0.12
No. of fixation	303	246	239	262.67
No. of regression	52	32	16	33.33

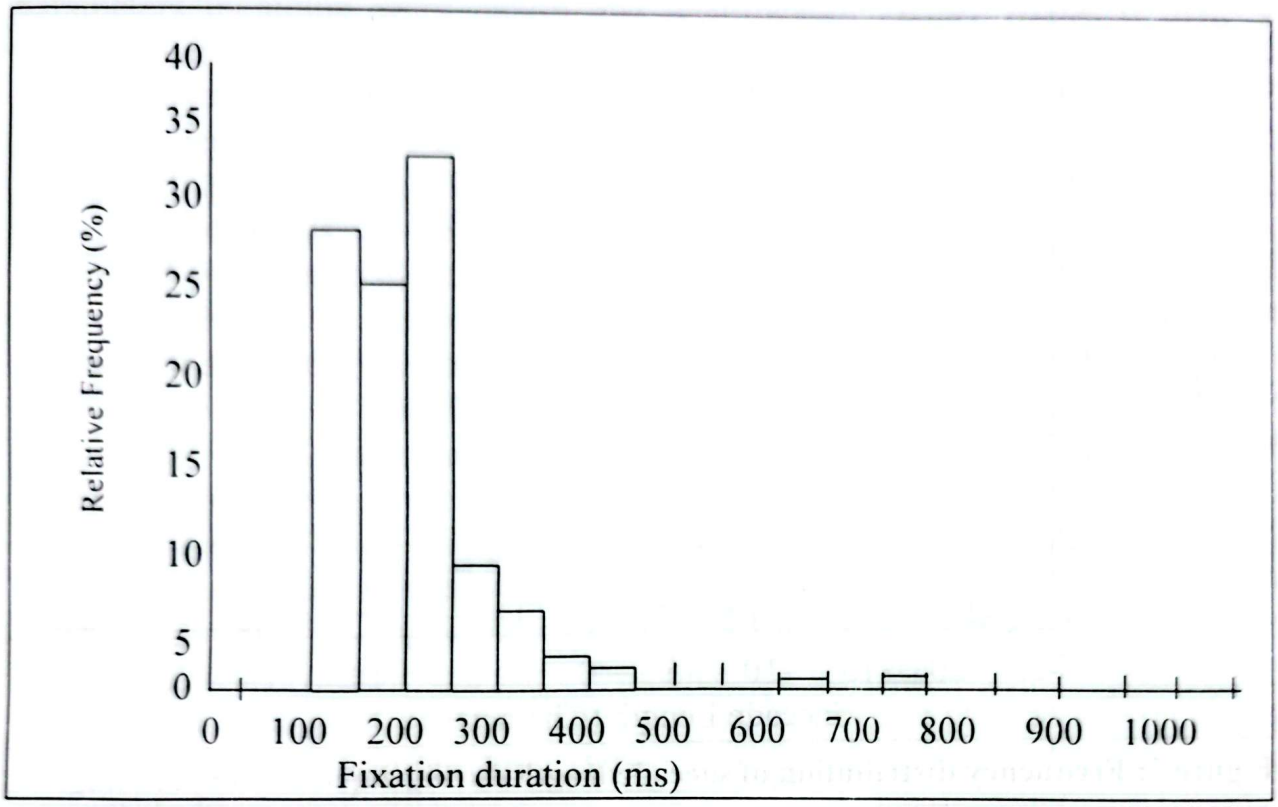

Figure 1: Frequency distributions of fixation duration during Japanese text reading.

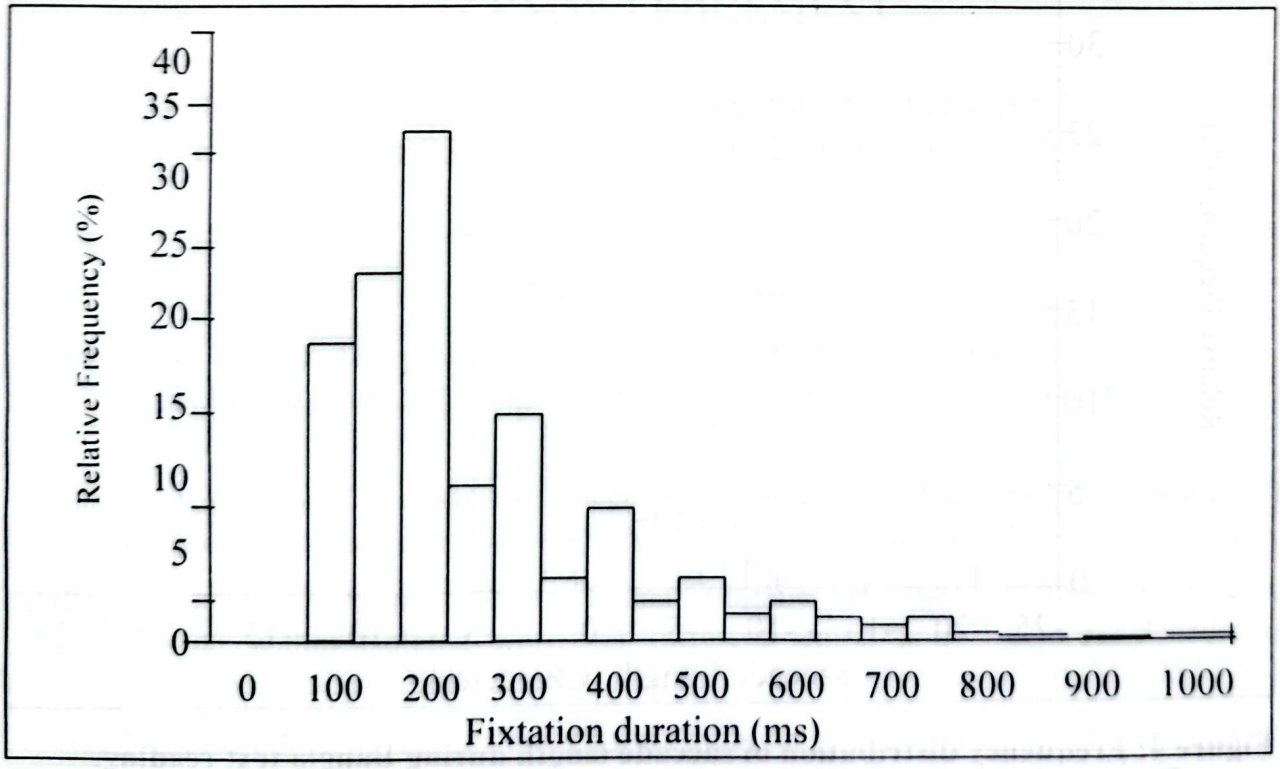

Figure 2: Frequency distribution of fixation duration during Bangla text reading.

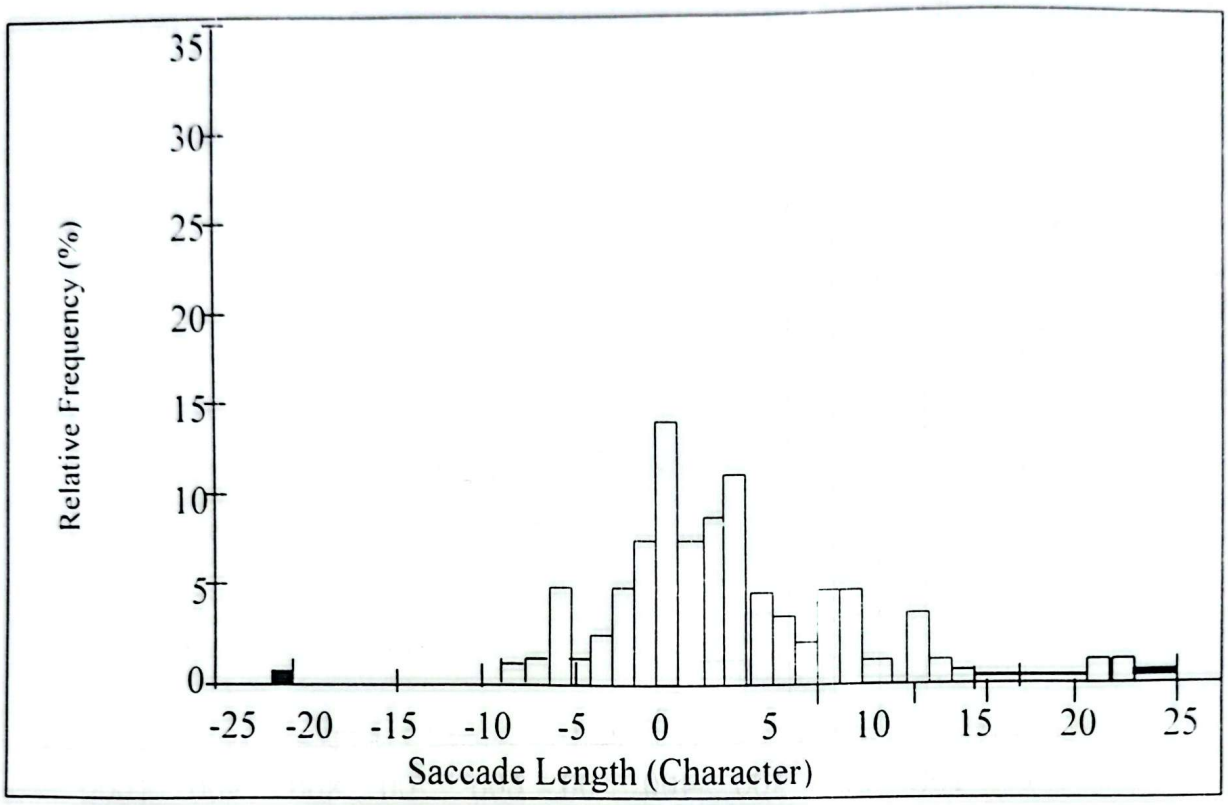

Figure 3: Frequency distribution of saccade length during Japanese text reading.

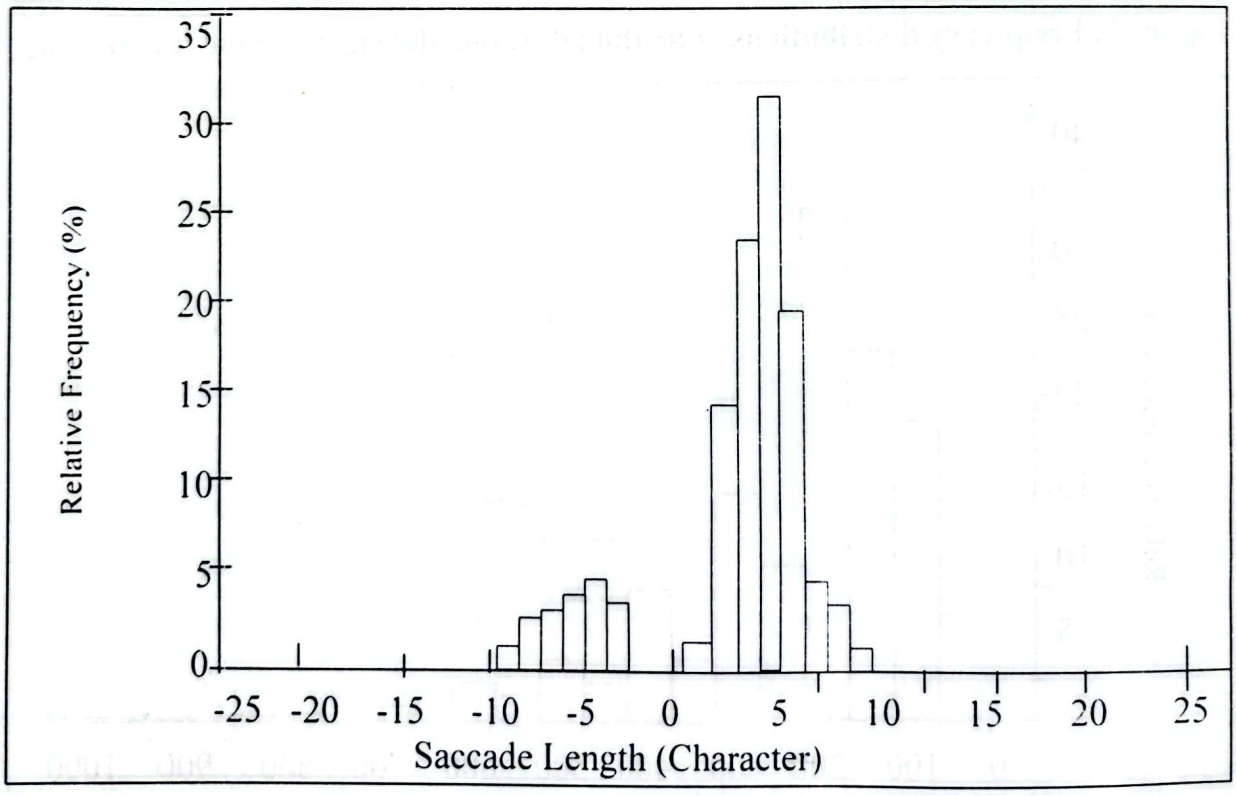

Figure 4: Frequency distribution of saccade length during Bangla text reading.

parameters including word length and identification of the words (O'Regan, 1980), Rayner and Pollatsek, 1987). O'Regan et al. (1984) proposed two models of eye movement control associated with saccade length. One is length control and the other is linguistic control model. According to the length control model, the eye adjusts its saccade length purely on the basis of information concerning the length of words, in the parafovea of the field of view. The second model, concerned with linguistic control, assumes that both purely visual information about the identity of characters and linguistic clues, such as information about words in the lexicon, are combined and used to constrain the number of choices that must be made in identifying the words. Thus, at each fixation, the process of combining visual and linguistic information defines a region of good perceptibility. The next saccade is programmed to lead the eye just beyond the current region. O'Regan distinguished perceptibility from visibility. The visibility of a given letter in a given position is the probability of reporting that letter without the use of linguistic constrains, whereas perceptibility depends on possible lexical, syntactic and semantic constrains. The second model of O'Regan i.e. the region of good perceptability as a product or the process of combining visual and linguistic information, seems to be a plausible explanation of the present study.

ACKNOWLEDGEMENT

The research was supported by an invitation grant from the Japan Society for the Promotion of Science (JSPS/FF2/99036.ID No. L 00501) to S.H. Mahmud.

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The Journal of Psychology, 2001, Vol. 19: 11-18

A STUDY ON ADOLESCENTS' LEVEL OF ASPIRATION

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171

ABSTRACT

The present study made an attempt to investigate the level of aspiration of adolescent girls of Calcutta City about higher studies and occupation. A total of 130 adolescent girls studying in class XII standard were selected randomly from seven English medium schools in Calcutta, four from north and three from south Calcutta. Findings revealed that most of the girls (99.2%) were ambitious and aspired to go for higher studies at least up to graduation. A large number of them aspired to complete post graduation (17.8%). doctorate degree (24.8%) and technical/professional education (16.3%). Leading a better life, getting a better job and gathering more knowledge about a subject were the main reasons behind higher studies. Fulfilment of parental expectation did not figure in the first three reasons behind aspiration of higher studies. Most of them (95.3%) also wished to be economically independent. Teaching was the most preferred profession followed by physician, administrator, reporter, engineer and psychologist. South and north Calcutta girls differed significantly with respect to some professions like physician ($p<0.01$).

INTRODUCTION

Adolescence is a phase for carrier development. The goals of adolescents are determined by the young person's innate capacities and by the pattern of relationships that has developed within the family. The cultural demands placed on the individual also determine the goals to some extent. Considering the importance of this phase in future life, many researchers have shown special interest to examine the adolescent's aspirations and expectations and the factors related to them.

Most of the researchers have found that middle-class parents as well as their children and adolescents have higher expectations and aspirations than parents and children of the lower social class (Bronfenbrenner, 1958; Wylie and Hutchins, 1967, Brook et al., 1974). The values of the peer group and the family with respect to education may also play a role in producing these observed differences in achievement between adolescents from lower and middle socio-economic backgrounds (Alexander and Eckland, 1975a).

Traditionally, boys have had higher occupational and educational aspirations than girls (Karmel, 1975). This probably reflects the fact that traditionally males have been favoured over females in most occupations. Parental aspirations have been found to be higher for sons than for daughters (Brook et al., 1974; Wylie and Hutchuins, 1967). Parents may have higher aspiration for their sons because they believe that the sons will eventually have to support a family. They have lower aspirations for girls because they think that girls will be married away and will be of no help to the parents. However, these concepts are changing fast.

Socio-economic level and family size have both been found to be associated with educational plans. The higher the social class, the smaller the family, the more likely it is that the individual will have high educational expectations (Bachman, 1970; Brook et al., 1974).

Peer groups also influence the trends and achievements of adolescents (Alexander and Eckland, 1975b). High school students and their best friends were asked how much education they expected to receive in a study by Kandel and Lesser (1969). The educational aspirations of the adolescents were positively related to those of their best school friends. Up to 1970s, several studies have been carried out abroad on adolescents' aspiration. But in India very few studies have been conducted on this issue. Hence, in the present study an effort was made to investigate the level of aspiration of adolescent girls of Calcutta City about higher studies and occupation.

METHOD

Sample

This cross-sectional study was carried out on 130 randomly selected adolescent girls, 53 from three English medium higher secondary girls' schools in south Calcutta and 77 from four English medium higher secondary girls' schools in north Calcutta. All the students were studying in class XII standard.

Instrument

A specially designed semi-structured questionnaire with both closed and open-ended items was used for the purpose of the present study. After ascertaining the face validity, the questionnaire was pre-tested in the field and finalized based on the feedback of pre-testing. The questionnaire consisted of two broad sections

viz., (I) demographic and socio-economic information, and (II) aspiration about higher studies and occupation.

Data Collection Procedure and Analysis

For collection of data from each of these schools, a prior appointment was made with the school authorities and accordingly data were collected through self-administration. Quantitative data were subjected to computer analysis while content analysis was carried out in case of qualitative data. Z-test was done to ascertain whether there is any significant difference between aspirations of south and North Calcutta students. The study was carried out between March and June 2000.

RESULTS

The present study explored the level of aspiration of adolescent girls of Calcutta City with respect to higher studies and choice of occupation. The findings of the study are presented below:

Demographic and Socio-economic Information

Most of the respondents (77.7%) irrespective of zone, belonged to 17-18 years of age group. So far as education of the respondents is concerned, 30.8, 53.8 and 15.4% of the respondents were studying science, arts and commerce respectively. Most of them had one sibling across the zone. About 24.0% of the respondents (30.2% in south Calcutta and 19.5% in south Calcutta) were the only child of their parents while 18.5 and 12.3% of them had two and three siblings respectively.

Data with regard to parental profiles revealed that more than 50% of the parents were graduate in general subjects while 13% fathers and 25% mothers studied up to higher secondary level. The percentage of higher and technical education was more among fathers compared to their female counterparts.

So far as occupation of the parents is concerned, the highest number of fathers (32.0%), irrespective of zone, were self employed while 18.7 and 12.5% of them were working in higher position in public and private sectors respectively. The remaining percentage of fathers was working as middle level employees in public and private sectors and as teachers. On the other hand, only 16.0% of the mothers were found to be employed.

Most of the students came from high-income group (60.0%) followed by middle income group (31.5%) and lower income (8.5%). More than three fourths of the respondents, irrespective of zone (75.4% in south Calcutta and 76.6% in north Calcutta), came from single family.

Aspiration about Higher Studies and Occupation

An overwhelming number of the respondents, irrespective of zone, were willing to go for higher studies (99.2%). So far as the level of higher education is concerned, 24.8, 17.8 and 17.1% of the respondents viewed that they would like to continue their studies up to doctorate degree, post graduation and graduation respectively. About 16.3% of them would like to pursue study in technical/professional subjects like Business Administration, journalism, engineering, medical, photography and computer (Table 1). About 24.3% frankly admitted that they were yet to decide about their future. In regard to post graduation and technical/professional education south and north Calcutta girls differed significantly ($P<0.05$ and $P<0.01$). South Calcutta girls would like to complete post graduation while north Calcutta girls would prefer technical education.

Table 1 : Level of Aspiration Regarding Higher Education

Higher Education	South Calcutta (N=52)		North Calcutta (N=77)		Total (N=129)	
	f	%	f	%	f	%
Graduation	8	15.4	14	18.2	22	17.1
Post Graduation (PG)**	14	26.9	9	11.7	23	17.8
Doctorate	16	30.8	16	20.8	32	24.8
Professional subjects*	3	5.8	18	23.4	21	16.3
Yet to decide	11	21.2	20	26.0	31	24.3

* Difference between south and north Calcutta students: *P<0.01; **P<0.05

The reasons behind going for higher studies were different as revealed in Table 2. Forty percent of the respondents stated that they would like to go for higher studies for leading a better life while 25.3, 23.8 and 10.0% of them viewed that acquiring further knowledge about a subject, getting a better job and fulfilling parents expectation were the main objectives of thinking about higher education. The remaining 3.0% would like to go for higher studies simply for self-satisfaction.

Table 2: Reasons Behind Higher Education (Multiple Response)

Level	South Calcutta (N=52)		North Calcutta (N=77)		Total (N=129)	
	f	%	f	%	f	%
For a better job	16	31.1	15	19.4	31	23.8
For leading a better life	19	35.8	33	42.8	52	40.0
To fulfil parents expectation	7	13.2	6	7.7	13	10.0
Further knowledge about a specific subject	13	24.5	20	25.9	33	25.3
Others i. e., self satisfaction**	-	-	4	5.1	4	3.0
Total	55	103.6	78	100.9	133	102.1

* Difference between south and north Calcutta students: **<0.05

Replying to a question which subject would they like to pursue in future, most of them in south Calcutta mentioned English while in north Calcutta Psychology got the maximum priority. Other subjects mentioned included Economics, Political Science, History, Computer, Mathematics, Biology, Accountancy, Home Management, Chemistry, Physics and Computer science. Surprisingly, very few students mentioned computer science.

The students who aspired to study English in future justified their choice by saying that it is a very interesting subject and they would like to know more about the subject. On the other hand, the students who expressed their interest to study Psychology in future argued that this subject would help them in leading a healthy life and also to help others through counseling.

Economics is the most wanted subject in this new millennium, it is also an interesting subject and the subject has good job market were the reasons stated by most of the students who expressed their interest to study Economics in future. The Students who mentioned other subjects could not justify their standpoint properly.

Occupational Aspirations

The majority of the respondents (95.3%) irrespective of zone, would also like to work after completion of their studies (Table 3).

Table 3: Aspiration Regarding Choice of Occupation

Occupation	South Calcutta (N=50)		North Calcutta (N=74)		Total (N=124)	
	f	%	f	%	f	%
Doctor*	-	-	13	17.6	13	10.5
Reporter	6	12.0	5	6.6	11	8.9
As available **	8	16.0	3	4.1	11	8.9
Administrative job**	8	16.0	5	6.6	13	10.5
Teacher	8	16.0	18	24.3	26	21.0
Engineer*	-	-	9	12.2	9	7.3
Psychologist*	8	16.0	1	1.4	9	7.3
Others	12	24.0	20	27.0	32	25.9

* N. B. Only 124 expressed willingness to work after study.
Difference between south and north Calcutta students: *<0.01; **P<0.05

So far as future occupation is concerned, the highest number of the respondents would like to opt for teaching profession (21.0%) followed by administrative job (10.5%), physician (10.5%), reporter (8.9%), engineer (7.3%) and psychologist (7.3%) (Table 3). About 9% of the students frankly admitted that their future choice of profession would depend upon market force as well as the availability of jobs. A good percentage of them (25.9%), however, stated a variety of occupations like designer, beautician, social worker, singer, dancer, photographer, painter, lawyer, geologist, airhostess, consultancy and acting. Here also south and north Calcutta girls differed significantly regarding some professions like physician ($p<0.01$), administrative job ($p<0.05$), engineering (p0.05) and psychologists ($p<0.05$).

DISCUSSION

Adolescence is a transition phase and also a phase of rapid development. In fact, this is the phase to build future career. That is why in the present investigation an attempt was made to understand the future level of aspiration of adolescent girls.

The findings of the present study give a clear hint of the changing outlook of adolescent girls of present generation with regard to their future career. It seems

that the adolescent girls of present generation are more ambitious and want to lead economically independent life. Most of the girls came from upper and middle class families. So far as the aspiration of middle and upper class children are concerned, similar findings have emerged from other studies (Brooke et al., 1974). They observed that leading a better life, finding a good job and to know more about a subject were the prime reasons behind higher studies as revealed by respondents. Fulfillment of parental expectation did not figure out in the first reasons behind higher studies.

The students who wished to study English, Psychology and Economics in future had clear vision behind their aspiration while the students who had choice for other subjects were somewhat confused i. e., they could not cite proper reasons behind their choice. This observation point to a need of career guidance and counseling in school.

Further, it seems that most of the girls want to be economically independent. Teaching is the most preferred profession followed by that of physician, administrative job, reporter, engineering and psychologist. Interestingly, a good number of students in north Calcutta were of the view that although they would like to study Psychology but would not like to accept it as a profession. A large number of them also mentioned other professions. With regard to choice of some professions south and north Calcutta students differed significantly with respect to professions like physician ($p<0.01$), administrative job ($p<0.05$), engineering job ($p<0.01$) and the job of a psychologist ($p<0.01$).

In a nutshell, it may be stated that most of the adolescent girls have an ambition to go for higher studies and also have an aspiration to be economically independent. It is recommended that another study with larger sample covering both rural and urban adolescents should be carried out to have a better picture about adolescent girls' future aspiration. It is also recommended that a *Career Guidance and Counselling Programme* be initiated in all schools to guide the adolescents in right direction as per their aptitude.

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The Bangladesh Journal of Psychology, 2001, Vol. 19: 19-27

JOB ATTITUDE OF HEALTH PROFESSIONALS AS A FUNCTION OF TYPE OF OCCUPATION, NATURE OF WORK-SCHEDULE AND PATTERN OF ORGANIZATION.

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150

ABSTRACT

The purpose of the study was to investigate whether job attitude — occupational stress, job involvement, and mental health — each varies as a function of type of occupation (doctors vs. nurses), nature of work-schedule (fixed schedule vs. rotating schedule) and pattern of organization (private vs. public). Interactions of the independent variables were also sought. A total of 178 professionals were randomly selected as a sample. Bangla versions of occupational stress index (Srivastava and Singh, 1981), job involvement questionnaire (Kanungo, 1982), and mental health questionnaire (Goldberg, 1972) were used to measure occupational stress, job involvement, and mental health respectively. Results showed significant main effect of type of occupation on job involvement ($F= 5.51$; $p<0.05$)- the nurses being more involved than doctors, and nature of work-schedule on mental health ($F = 4.028$; $p<0.05$)- the fixed schedule professionals having better mental health than those under rotating schedule. Neither two-way nor three-way interaction was found to be significant.

INTRODUCTION

In recent times awareness regarding health especially mental health of the people around the world is far greater than ever. This holds true for Bangladesh as well. To ensure health for all by the year 2006, government has been giving tremendous attention to the health sector e.g., setting up of about 13000 community clinics in different villages of the country. Privatization is given even more attention in order for faster economic growth and development. As a result, work schedule, organizational structure and so on starts to be remolded.

Organizational structure appears to contribute to the varied psychological state of the employee e.g., occupational stress, job involvement and mental health etc.

because of the differences supposedly existing between private and public enterprises. Solomon (1986) observed that private enterprises differ from public ones in a number of ways, for example. (i) policies that promote efficiency were significantly more prevalent in the private sector, (ii) satisfaction with job was significantly higher among private sector employees than those in the public sector and (iii) organizational climate was better in the private enterprise than in the public enterprise. Rodrick and Rahman (1997) reported better mental health among private sector employees than among public sector employee. Sharmin and Rahman (1999) reported similar findings in case of practicing doctors.

Shift- work, an important weapon of modern amenities, is in operation in health sector to provide general and emergency health services to the ailed round the clock. Despite its merits, a good number of studies have demonstrated the hazardous effects of shift- work on individuals, families and societies concerned. A review of literature shows that among the shift- workers, the rotators are the worst sufferers (Dahlgreen, 1978; Jamal, 1981). Carpentier and Cazamian (1977) have found shift- workers to have often reportedly complained of reduced opportunities for contact with their children.

Besides problems related to family life, shift- work has unwanted and unpleasant consequences in terms of health and well-being upon the employees (Carpentier and Cazamian, 1977; Harrington, 1978). Khaleque and Rahman (1982) in a study indicated that the rotators had more incidences of serious illness and hospitalization and more frequent consults of doctors than the fixed- shift workers did. Considering the consequences of shift-work, organizational structure on job-attitude, i.e., occupational stress, job involvement and mental health, the following objectives have been set forth: Whether

1) occupational stress varies as a function of type of occupation (doctors vs. nurses),
2) occupational stress varies as a function of nature of work-schedule (fixed vs. rotating),
3) occupational stress varies as a function of pattern of organization (private vs. public),
4) job involvement varies as a function of type of occupation (doctors vs. nurses),
5) job involvement varies as a function of nature of work-schedule (fixed vs. rotating),
6) job involvement varies as a function of pattern of organization (private vs. public),
7) mental health varies as a function of type of occupation (doctors vs. nurses),

8) mental health varies as a function of nature of work-schedule (fixed vs. rotating),
9) mental health varies as a function of pattern of organization (private vs. public) and
10) there is any interaction between the independent variables in terms of occupational stress, job involvement and mental health of the professionals.

Theoretically, the proposed study would help determine the general nature and extent of the effects of the above variables along with their interactional interrelationships, if any, in the health sector of Bangladesh. Further, the study would bring into focus the areas that need more positive attention and at the same time it would provide a diagnostic data-base for devising remedial measures for the problem areas detected.

METHOD

Respondents: A random sample of 178 health professionals- 51 working in fixed shift schedule and 127 working in rotating schedule- selected from 10 purposively selected hospitals and clinics in Dhaka city. The ranges of age, experience, and income of the respondents were 19-55 years, 0-29 years and Tk. 900-40,000 respectively. However, the mean age of the respondents was 30.60 years with a mean experience of 4.04 years and monthly income of Tk. 7647.61. The distribution of the respondents are shown below:

Table 1: Distribution of respondents by type of occupation and pattern of organization.

Pattern organization	Type of occupation		Total
	Doctor	Nurse	
Private	36	16	52
Public	48	78	126
Total	84	94	178

Measuring Instruments: The instruments used in the present study included
(i) Occupational Stress Index (Srivastava and Singh, 1981)
(ii) Job Involvement Questionnaire (Kanungo, 1982)
(iii) Mental Health Questionnaire (Goldberg, 1972)

Occupational Stress Index: The occupational stress index developed by Srivastava and Singh (1981) consists of 46 items with 5 alternative responses

('strongly disagree' to 'strongly agree') categories. Out of 46 items, 28 are 'true' keyed and 18 are 'false' keyed. The items relate to almost all relevant components of job life which cause stress in some way or other such as role overload, role ambiguity, role conflict, unreasonable group and political pressure, responsibility for persons, under-participation, powerlessness, poor personal relations, intrinsic impoverishment, low status, strenuous working condition and unprofitability. The reliability index ascertained by split-half (odd-even) method and Cronbach's alpha coefficient for the scale were found to be 0.93 and 0.90 respectively. Scores on occupational stress index were found to correlate highly with a measure of ill mental health (Srivastava and Singh, 1981). For scoring the true-keyed items, weights of 1,2,3,4, and 5 are assigned respectively for 'strongly disagree', 'disagree', 'agree', and 'strongly agree'. The scoring for the false-keyed is reverse. The possible range of scores on this index is 46-230, with high score as indicative of high stress. For the present study, a Bangla version of the index was used which was found to have high inter-judge agreement.

Job involvement Questionnaire: The job involvement questionnaire (JIQ) developed by Kanungo (1982) was chosen to measure job involvement. It consists of 15 items (including 4 filler items) to be answered by checking one of the 6 categories of response: strongly agree, mildly agree, mildly disagree, disagree, and strongly disagree that appear against each item. The possible range of scores on this index is 11-66. Higher score in the scale was indicative of more involvement. The Bangla version of JIQ (Khaleque, 1990) was used.

Mental Health Questionnaire: The Bangla version of general health questionnaire (GHQ-12) developed by Goldberg (1972) was used to measure mental health of the respondents. It is a self-administered screening test for detecting minor psychiatric disorders in general population. It is a Likert type scale of 12 items out of which 7 are true- keyed and 5 are false- keyed. For scoring the true- keyed items, weights of 0,1,2, and 3 are assigned for 'not at all', 'somewhat', 'to a considerable extent' and 'to a great extent' respectively. The scoring for the false- keyed is reverse. The possible range of score is 0-36. The higher the score the better the mental health. Banks et al. (1980) used it as an indicator of mental health in occupational studies and found it to have provided a useful estimate of mental health in employment and occupational problems. The development studies (Goldberg, 1972) showed high internal consistency (0.65), test-retest reliability (0.73) over a period of 6 months and validity in terms of a good linear relationship with clinical check-up records as the criteria (r=0.70). All versions of the scale also exhibited high correlation with one another.

Procedure: Data were collected from health professionals working in hospitals and clinics by administering a set of questionnaires consisting of all the three measuring instruments. The questionnaire also included some personal and socio-demographic queries, which were required to be filled in by respondents prior to the completion of the three questionnaires. Data from 178 respondents were thus collected.

RESULTS

To examine the effects of type of occupation (doctor vs. nurse), nature of work schedule (fixed schedule vs. rotating schedule), and pattern of organization (private vs. public) on occupational stress, job involvement and mental health, three- way analysis of variance was computed (Table 2 and 3).

Table 2: Summary of the three-way ANOVA for job involvement by type of occupation, nature of work- schedule and pattern of organization.

Sources of variation:	Sum of squares	df	Mean square	F
Type of occupation (A)	228.994	1	228.994	5.516 *
Nature of work- schedule (B)	44.422	1	44.422	1.07 Ns
Pattern of organization (C)	0.311	1	0.311	0.007 Ns
AXB	3.340	1	3.340	.080 Ns
BXC	99.031	1	99.031	2.386 Ns
CXA	7.679	1	7.679	0.185 Ns
AXBXC	2.128	1	2.128	0.051 Ns
Residuals (errors)	7547.412	170	44.396	
Total	7933.317	177	44.821	

*P<0.05; Ns = not significant.

Note: Mean Job involvement scores for doctors and nurses were 39.82 and 42.99 respectively.

The figures in the above table reveal that only the main effect for type of occupation was statistically significant ($p<0.05$). Neither the main effects for nature of work-schedule and pattern of organization nor were the two/three way interactions significant. That means, job involvement varied by type of occupation- the nurses being more involved than doctors (see footnote of Table 2).

Table 3: Summary of the three-way ANOVA for mental health by type of occupation, nature of work schedule and pattern of organization.

Sources of variation:	Sum of squares	df	Mean square	F
Type of occupation (A)	3.921	1	3.921	.149 Ns
Nature of work-schedule (B)	105.635	1	105.635	4.028*
Pattern of organization (C)	38.652	1	38.652	1.474 Ns
AXB	3.586	1	3.586	.137 Ns
BXC	.542	1	.542	.021 Ns
CXA	32.60	1	32.60	1.243 Ns
AXBXC	3.366	1	3.366	.128 Ns
Residuals (errors)	4700.792	170	27.65	
Total	4889.094	177	27.622	

*P<0.05; Ns = not significant.

Note: Mean mental health scores for fixed schedule professionals and rotating schedule professionals were 27.28 and 25.83 respectively.

The figures in the above table reveal that only the main effect for nature of work-schedule was statistically significant ($p<0.05$). Neither the main effects for type of occupation and pattern of organization nor were the two/three way interactions significant. That means, mental health varied by nature of work- schedule, the fixed- schedule professionals having better mental health than the rotators (see footnote of Table 3).

DISCUSSION

Significantly higher job involvement scores obtained in this study for the nurses reveal a very basic requirement for the development of sound and solid job-involvement. Generally, due to higher demands, medical doctors in our country have more alternative avenues for additional employment other than their primary organizations. Contrarily, the employment opportunity of nurses mostly remains restricted to a single organization. Consequent constancy of affiliation to a single organization naturally make them develop stable and solid sense of undivided belongingness and hence enable then to identify themselves strongly to a single organization. As a result, they feel devotedly committed to tap all their latent abilities to a highly integrated level for employing them to their jobs. Gradually, their continued service in a single job-situation with concentrated devotion make

them able to transcend the narrow domain of primary need-fulfillment and enable them to attend more heartily to the satisfaction of higher psychological needs such as achievement motive, self- esteem, self-actualization etc., that constitute the key-ingredients of job-involvement.

On the other hand, due to their affiliations to disparate organizations, doctors remain strongly somewhat barred from developing a compact and consolidated sense of belongingness to a particular organization. As a result of such free-floating kind of job-obligations, doctors are likely to develop relatively diluted sense of identity to a particular organization. Thus the diversities of job-situation and job-obligation presumably act as deterrent factors for the formation of an integrated sense of job-involvement. Though, highly superior professionals skills of the doctors are likely to generate a high level of personal pride in them, this is not often matched by an equivalent level of job-involvement in them possibly because of their diveded affiliation.

Better mental health of the health professionals working under fixed-schedule than those working under rotating schedule, observed in the present study, is what can be normally expected in keeping with the traditional normative work-system of human society. Rotating work-schedule not only means changes in ones meal and sleep-time habit but also entails serious break and disruption in ones socio-familial roles. The findings of another study also bear out this phenomenon of disruption in socio-familial relations of the professionals working under rotating schedule (Uddin, Huq and Mahmud, 2000).

Necessity to adjust to changes of physiological cycles, specially to the changes of sleep-pattern for the rotating shift professionals, gives rise to problems in circadian system, i.e. internal biological time-keeping system; while the demand to adapt to problems in socio-familial responsibilities created by the rotating shift is likely to give rise to serious conflict between professional and socio-familial roles. Shift-work involves periodic shuttle between day and nighttime work-schedule of the employees. However, for human beings, activity is usually concentrated in day- light hours, the night being given over to rest. Night work, therefore, induces patterns of behavior that are essentially unnatural.

Human beings are social creatures tied to domestic units of families. Social and domestic factors therefore, may become equally important or even more important than biological ones for development and maintenance of mental health. Circadian disruption is not the only source of shift-personnel's mental health problems. Disruption in child-care and household management tasks due to

rotating shift-schedules is likely to cause serious psychological strain. This is especially true in the context of our society where such responsibilities are considered to be among very basic and primary ones. The stress and strain caused by such disruptions are, therefore, highly likely to leave their damaging scars on mental health of the concerned professionals.

Finally, by way of caution, it should be mentioned that occupational stress, job-involvement, mental health and other related states are determined by an interplay of multiple closely linked variables pertaining to job-situation, time-schedule, category of profession, nature of organization, personality characteristics, culture and society etc. Results of particular studies, therefore, should always be considered to have been conditioned by a unique combination of a wide range of such variables. Since delineation of precise relationship of all the above variables tend to remain more elusive than certain, it is highly difficult to formulate plain generalizations and universal propositions from a few such studies.

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The Bangladesh Journal of Psychology, 2001, Vol. 19: 29-42

A COMPARATIVE STUDY ON VALUES OF TEACHERS AND STUDENTS OF JAPAN AND BANGLADESH

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ABSTRACT

The purpose of this study was to observe the similarities and differences in values of the Teachers and students of two oriental cultures: Japan and Bangladesh. The study aimed to assess and compare the values prevailing among the students and teachers of Universities in Japan and Bangladesh. The sample consisted of 238 students and 120 teacher. 119 undergraduate students from Hokkaido University, Japan and 119 undergraduate students from Dhaka University and Chittagong University, Bangladesh, were drawn as student samples. On the other hand 60 Teachers from Hokkaido University, Japan and 60 Teachers from Dhaka University and Chittagong University, Bangladesh were drawn as teacher samples. In order to identify the value preferences of the individuals a list of 10 values (pro-social, achievement, power over others, security, self direction, other worldliness, fatalism, narcissism, inner directedness and conservatism) were prepared. The first five values were functional and other five were dysfunctional in the context of national development. The results revealed that for Japanese students and teachers, preferences for functional values except narcissism were higher than dysfunctional values. And also for Bangladeshi students and teachers preferences for functional values were higher than the values of either between the student samples of Bangladesh and Japan or between the teacher samples of the said countries.

Key Words: Value, Teachers, Students, Japan, Bangladesh

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INTRODUCTION

Individual's attitudes, values and behavior are largely determined by the society in which he is brought up. So, there may be similarities and differences in these qualities within and between cultures. Behavioral scientists have interested in cross-cultural studies to evaluate the impact of attitudes and values on personal and social life. The present study was aimed to observe the similarities and differences in values of the Teachers and students of two oriental cultures: Japan and Bangladesh, in the context of national development.

Values or the value systems are a part of a person's integrated cognitive system, serving the function of developing, maintaining and enhancing the self. Values are also considered as relatively stable personality characteristics and are less susceptible to change with the change of the social situations (Thompson 1965).

Developmental process depends heavily on the successful integration of the values governing the citizen's family, community and nation (Ashford 1967). According to William (1968), human social behavior is the outcome of, physiological states and capacities of the organism, of the stimulus field to which it reacts, of the conceptual schemes within which it interprets its environment. The component of the conceptual scheme referred here is inseparably intertwined with one's value-system. Value system thus significantly affects individual's social behavior as an essential and important ingredient in the formation of a personalized perception of one's environment.

As observed by Sinha and Kao (1988) the question of an appropriate developmental paradigm and the place of values and socio-cultural circumstances specific to the country are extremely relevant in the Asian context. All countries of this region have embarked on their respective program of national development. But not every country has been successful; while some have shown economic miracles, others have lowest per capita income in the world. Each country has its own characteristic pattern of religion, social and economic institutions, a set of socio-cultural values and norm of behavior regulating personal and interpersonal existence.

It is reasonable to assume that the value-development relationship is interactive in nature rather than simply one causing the other. A two-way influence operates. While value acts as a factor in the success of development policies and programs, as a result of development, values also tend to get modified.

However not all values are equally potent and are of equal strength. Some are basic and deep-rooted in a culture, while others are peripheral in varying degrees. The values both accessible to manipulation and susceptible to modification are of strategic concern to those who wish to bring about development favoring changes in underdeveloped countries (Braibanti 1961). Sing (1975) found some behavior dispositions like- disapproval of material and worldly things, acceptance of the status quo, low aspirations, a pervasive sense of pessimism, conformity, passivity, particularism as great obstacles to economic development in India. Examined in the present day context of national development, they are considered as dysfunctional.

Sinha (1988) in a study identified certain belief system, values and modes of behavior that characterise Indian people and analysed their relevance to national development. The study showed some of the dominating values and dispositions to be dysfunctional in the present day context of national development. Lin feng (1988) in his survey of Chinese Modernisation and social values, concludes that both traditional ethical values and modern western human values are complementary and are factors in promoting socio-economic development. Udai Parek (1988) in his case study of Indonesia, discussed ten dimensions (viz. Fatalizm, Ambiguity tolerance, Contextualism, Temporalness, Collectivism. Particularism, Other-directedness, Androgyny, Power difference tolerance and use of power) of Indonesian culture and their relevance to development. Some of these dimensions were found to be dysfunctional for development.

Every national population is large enough to include some individuals who have quite spontaneously developed the qualities for quick adaptation to the requirements of modern world. In order to evaluate the impact of differences and similarities in attitude, values and behavior on personal and social life of individuals belonging to different communities, behavioral scientists are interested in cross- cultural research.

Much of the cross cultural studies have focused on the differences in personality, attitudes and values of the oriental and western people. Berrien (1966) used EPPS to assess the needs of American and Japanese students. This study has shown that American male students tended to score higher on needs for deference, achievement and dominance. Where as Japanese male students tended to score higher on need for abasement., change and endurance. American female students tended to score higher on deference, achievement and affiliation. Where as Japanese female students tended to score higher on need for endurance.

Kikuchi and Gordon (1966, 1970) used The Survey of Personal Values for cross-cultural comparisons between Japanese and American students. The result showed that the Japanese are less materialistically oriented than are the American students. American students have lesser need for change and diversity. On the other hand, The Japanese place a higher value on a well organized and routinized life and on systematic approaches to relatively well defined goals.

In a cross cultural study of interpersonal values Begum (1985) found that Bangladeshi student samples were more conforming and also less independent than Canadian students. It was also found that males scored higher on leadership and lower on benevolence than their female counterparts.
Chatterjee (1991) in a study with University student samples from Bangladesh and Canada found that perceptions of quality of life and life satisfaction were higher among Canadian samples than those among Bangladeshi samples.

The present study was undertaken to assess and compare the values prevailing among the students and teachers of University in Japan and Bangladesh.

METHOD

The Sample: The sample consisted of 119 undergraduate students of Hokkaido University, Japan and 119 undergraduate students of Dhaka University and Chittagong University, Bangladesh. The study also included 60 Teachers of Hokkaido University, Japan and 60 Teachers of Dhaka University and Chittagong University, Bangladesh.

Instrument:
Schedule for Value Preferences

In order to identity the value preferences of the individuals a list of 10 values were prepared for the study. The values were: **Achievement-** The basic need to develop and employ skills for obtaining from the physical and social environment those resources required to thrive for social recognition and admiration. **Security-** The basic need to survive physically and to avoid threats to the integrity of life. **Self- direction** - A preference for relying on one's independent capacities for analyzing situations and reaching decisions. **Pro-social-** A positive and active concern for the welfare of others. **Power over others-** need for dominance to have control over many regarding resources. **Fatalism-** Acceptance of the outcome in life as a function of fate. **Conservatism-** Wishing to keep things as they are. **Narcissism-** Urge for fulfilling personal gratification. **Inner-**

directedness- Ego-centeredness and lack of consideration for others. **Other worldliness-** More concern for spiritual life. In accordance with studies by Singh (1975) and Udai Parek (1988), five of these values were classified as functional (viz. pro-social, achievement, power over others, security and self- direction) and other five as dysfunctional (viz. other worldliness, fatalism, narcissism, inner-directedness and conservatism). in the context of national development.

The respondents were asked to rank these values in order of their felt importance. The schedule along with printed instructions is presented in Appendix A.
Scoring: Ranks (1,2,3 and so on) constituted the scores for each value. The mean of the rank number were used in the statistical analysis.

Procedure

The schedules for value preferences were administered by the authors on student samples in classrooms. The instruments were administered individually by the authors to teacher samples. The respondents were given a brief introduction to the schedule and printed instructions were read to them. The respondents were instructed to record their response and return it to the authors. The study was conducted during January-March 2001.

RESULTS

1. a) Value Preferences of Japanese and Bangladeshi Students

Value preferences from a cluster of functional values (FV) and dysfunctional values (DV) relevant to national development by Japanese and Bangladeshi students is presented in table 1. The Table shows the values preferred by Japanese and Bangladeshi students on the basis of mean scores of value preference ranks (i.e., 1 indicating most preferred and 10 indicating least preferred). Japanese and Bangladeshi students recorded their preferred values in ascending order.

For Japanese students, Self-direction (FV) was found to be the most preferred value followed by Narcissism (DV), Achievement (FV) Security (FV). Pro-social (FV), Fatalism (DV), Conservatism (DV), Power over other (FV). Inner-directedness (DV) and Other worldliness (DV), and it may be noted that for Japanese students preference for functional values was higher than dysfunctional values.

Among the Bangladeshi students the most preferred value was Achievement (FV) followed by Self-direction (FV) Pro-social (FV), Security (FV), Narcissism (DV),

Power over others (DV). This result shows that for Bangladeshi students also preferences for functional values were higher than dysfunctional values.

b) Ranks assigned to different values by Japanese and Bangladeshi Students

Table 2 shows the Ranks assigned to 10 values by Japanese students and Bangladeshi students. The table shows that except Security and Other worldliness Japanese students differ from their Bangladeshi counterparts in ordering the ranks.

c) Rank order correlation between Japanese and Bangladeshi Students value ranks

Kendell's Rank order correlation (Siegel 1988) was computed to examine the relationship between Japanese students value ranks and Bangladeshi students value ranks. The obtained value of correlation is presented in Table 3. The computed T shows that there is no significant correlation. In other words, the Japanese students disagree with the Bangladeshi students in their preference for values.

2. a) Value Preferences of Japanese and Bangladeshi Teachers

Value preferences from a cluster of functional values (FV) and dysfunctional values (DV) relevant to national development by Japanese and Bangladeshi Teachers are presented in table 4. The Table shows the values preferred by Japanese and Bangladeshi Teacher respondents on the basis of mean scores of value preference ranks (i. e., 1 indicating most preferred and 10 indicating least preferred). Japanese and Bangladeshi Teacher respondents recorded their preferred values in ascending order.

For Japanese Teachers, Self-direction (FV) was found to be the most preferred value followed by narcissism (DV), Achievement (FV), Pro-social (FV), security (FV). Other worldliness (DV) Fatalism, inner-directedness (DV), conservatism (DV) and power over other (FV). It may be noted that for Japanese Teachers preference for functional values was higher than dysfunctional values.

Among the Bangladeshi Teachers the most preferred value was Self-direction (FV) followed by Achievement (FV) Security (FV) Pro-social (FV), Narcissism (DV), Other worldliness (DV), Inner directedness (DV), Fatalism (DV, Conservatism (DV) and Power over others (FV). This result shows that for Bangladeshi Teachers preferences for functional values were higher than dysfunctional values.

Table 1: Values Preferred by Japanese and Bangladeshi Students Shown on the Basis of Mean Scores of Value Preference Ranks (Range 1 to 10). (Respondents' Ranked Value Preference in Ascending Order)

Rank on the basis of mean scores of values preferred	Japanese students	Bangladeshi Students
1	Self-direction(F) (3.05)	Achievement(F) (2.64)
2	Narcissism (D) (3.09)	Self-direction (F) (3.33)
3	Achievement (F) (3.76)	Pro-social (F) (3.84)
4	Security (F) (4.30)	Security (F) (4.02)
5	Pro-social (F) (4.95)	Narcissism (D) (4.87)
6	Fatalism (D) (6.39)	Power over others (F) (6.96)
7	Conservatism (D) (6.76)	Fatalism (D) (6.32)
8	Power over others (F) (7.37)	Inner-directedness (D) (6.87)
9	Inner-directedness (D) (7.45)	Conservatism (D) (7.71)
10	Other worldliness (D) (7.83)	Other worldliness (D) (7.93)

* ( ) = Mean scores of value preference ranks.
(F) = Functional values
(D) = Dysfunctional values.

Table 2: Ranks assigned to 10 values by Japanese and Bangladeshi Students

Values	Japanese Students	Bangladeshi Students
Self Direction	1	2
Narcissism	2	5
Achievement	3	1
Security	4	4
Pro-Social	5	3
Fatalism	6	7
Conservatism	7	9
Power over others	8	6
Inner-directedness	9	8
Otherworldiness	10	10

Table 3: Kendell's Rank order Correlation between Japanese and angladeshi Students value ranks.

No. of values	Correlation T	p-value
10	0.66	0.005*

*NS

b) Ranks assigned to different values by Japanese and Bangladeshi Teachers

Table 5 shows the Ranks assigned to 10 values by Japanese and Bangladeshi Teachers. The table shows except for Self-direction, Pro-social. Other worldliness, Conservatism and Power over others, the Japanese Teachers differ from their Bangladeshi counterparts in ordering the ranks.

c) Rank order correlation between Japanese Teachers' value ranks and Bangladeshi Teachers' value ranks

Kendell's Rank order correlation (Siegel 1988) was computed to examine the relationship between Japanese and Bangladeshi Teachers' value ranks. The obtained value of correlation is presented in Table 6. The computed T shows that there is no significant correlation. In other words, the Japanese Teachers disagree with the Bangladeshi Teachers in their preference for values.

Table 4: Values Preferred by Japanese and Bangladeshi Teachers Shown on the Basis of Mean Scores of Value Preference Ranks (Range 1 to 10). Respondents, Ranked Value Preference in Ascending Order.

Rank on the basis of mean scores of values preferred	Japanese students	Bangladeshi Students
1	Self-direction(F) (1.68)	Self-direction(F) (2.22)
2	Narcissism (D) (3.41)	Achievement (F) (3.31)
3	Achievement (F) (3.96)	Security (F) (3.75)
4	Pro-social (F) (4.36)	Pro-social (F) (4.01)
5	Security (F) (4.96)	Narcissism (D) (4.78)
6	Other worldliness (D) (6.31)	Other worldliness (F) (6.02)
7	Fatalism (D) (6.88)	Inner-directedness (D) (6.78)
8	Inner-directedness (F) (7.23)	Fatalism (7.57)
9	Conservatism (D) (8.08)	Conservatism (D) (8.44)
10	Power over others (F) (8.09)	Power over others (F) (8.56)

* ( ) = Mean scores of value preference ranks.
(F) = Functional values (D) = Dysfunctional values.

Table 5: Ranks assigned to 10 values by Japanese and Bangladeshi Teachers

Values	Japanese Teachers	Bangladeshi Teachers
Self Direction	1	1
Narcissism	2	5
Achievement	3	2
Pro-Social	4	4
Security	5	3
Other worldliness	6	6
Fatalism	7	8
Inner-directedness	8	7
Conservatism	9	9
Power over others	10	10

Table 6: Kendell's Rank order Correlation between Japanese and Bangladeshi Teachers value ranks.

No. of values	Correlation T	p-value
10	0.73	0.001 Ns

Ns = Not Significant

DISCUSSION

In the present study, value preferences from a cluster of functional values (FV) and dysfunctional values (DV) relevant to national development were shown by University students and teachers of Japan and Bangladesh. For Japanese students, Self-direction (FV) was found to be the most preferred value followed by narcissism (DV), Achievement (FV) Security (FV). Pro-social (FV), Fatalism (DV), Conservatism (DV), Power over other (FV), Inner-directedness (DV) and Other worldliness (DV), and it may be noted that for Japanese students preference for functional values was higher than dysfunctional values.

Among the Bangladeshi students the most preferred value was achievement (FV) followed by self-direction (FV) Pro-social (FV), Security (FV), narcissism (DV), power over others (FV) fatalism (DV), inner-directedness (DV), conservatism (DV) and other worldliness (DV). This result shows that for Bangladeshi students also preference for functional values was higher than dysfunctional values.

Both Japanese and Bangladeshi students preferred functional values as their priorities, with the exception of Narcissism, one of the dysfunctional values mentioned in this study. The Japanese students' most preferred value was Self direction, which signifies a person's independent capacitiy for analyzing situations and reaching decisions. These findings are supported by the study of Kikuchi and Gordon (1966, 1970), which mentioned that, the Japanese place a higher value on a well organized and routinized life.

The second most preferred value was Narcissism which relates to an urge for fulfilling personal gratification. Some of the social psychologists (Singh 1975, Sinha 1988) dealing with national development and behavior, regarded Narcissism as dysfunctional. Interestingly, Japan is a highly developed industrialized nation. It may be assumed that since the students of Japan do not need to strive for fulfillment of the basic needs, they develop the urge for fulfilling personal gratification. The ranking of other three functional values like

Achievement, Security and Pro-social above dysfunctional values showed their positive approach for national development.

The Bangladeshi students' most preferred value was Achievement followed by Self-direction. Preference for Achievement reveals the Bangladeshi students' need to thrive for social recognition and admiration. For the Japanese students Achievement is the third most preferred value. Preference for Self-direction as the second most preferred value showed the Bangladeshi students' determination to analyze the life situations and take independent decisions. The ranking of other two functional values like security and pro-social above dysfunctional values coincides with the preferences of Japanese counterparts. However preference for Narcissim as a first choice among dysfunctional values reveals their desire for fulfilling personal gratification like Japanese students. The sixth preference as compared to the eighth preference by Japanese students was power over others-which reveals the need for dominance or to have control over many regarding resources are higher for Bangladeshi students than that for Japanese students.

Japanese Students ranked dysfunctional value Fatalism as sixth preference. Whereas Bangladeshi students ranked Fatalism as seventh preference. The students of two countries also deffered by one rank in their preference for the vlaue of Inner-directedness. The Bangladeshi students ranked Conservatism as the ninth most preferred value. While Japanese students ranked it as the seventh most preferred value. Both Bangladeshi and Japanese students were found to rank Other worldliness as the last preferred value in this study.

In the second part of the present study, value preferences from a cluster of functional values (FV) and dysfuncitonal values (DV) relevant to national development by the University teachers of Japan and Bangladesh. Were shown. For Japanese Teachers, Self-direction (FV) was found to be the most preferred bvalue followed by narcissism (DV), Achievement(FV), Pro-social (FV), security (FV). Other worldliness (DV) Fatalism (DV), inner-directedness (DV), conservatism, (DV) and power over other other (FV). It may be noted that for Japanese Teachers preference for functional values was higher than dysfunctional values.

Among the Bangladeshi Teachers the most preferred value was Self-direction (FV) followed by Achievement (FV) Security (FV) Pro-social (FV), Narcissism (DV), Other worldliness (DV), Inner directed (DV), Fatalism (DV, Conservatism (DV) and Power over others (FV). This result shows that for Bangladeshi Teachers preference for functional values was higher than dysfunctional values.

Both Japanese and Bangladeshi teachers ranked Self- direction as the most preferred value. The common preference for the said value showed their independent capacities for analyzing situations and reaching decisions. However the Japanese teachers differ in their preference for the second most choice of values with Bangladeshi counterparts. Perhaps the fulfillment of the basic needs, leads to the development of the urge for fulfilling personal gratification in case of Japanese teachers. In ranking functional values Achievement, Security and Pro-social, teachers of both countries showed more or less similar preferences.

Another finding of the present study was the preference for the value of Other worldiness as the seventh and the sixth preference by Japanese and Bangladeshi Teachers respectively. They also showed more or less similar preferences pattern for the dysfunctional values viz. Fatalism, Inner directedness and Conservatism. Both Bangladeshi and Japanese Teachers were found to rank Power over others as the last preferred value in this study.

The present study though a small scale one, showed value preferences from a cluster of functional values (FV) and dysunctional values (DV) relevant to national development, by University students and teachers of Japan and Bangladesh. The findings showed that preferences for functional values were higher than dysfunctional values by the students and teachers of both the countries.

Most of the University students belong to middle and upper middle class families in Japan and Bangladesh. Strong orientation toward success and mobility are cultivated and transmitted by the upper and middle class families in both developed and developing countries. The family as the agent of initial socialization inculcates a positive attitude in its offsprings toward appropriate goals and value orientations and for enabling them to obtain appropriate placement in the social order (Laumann 1966). Along with the families, educational institutions encourage aspiration of achievement and success. University education generates spirit of initiative, self-help and mutual help. In this study it was found that University students of Japan and Bangladesh preferred values, which are conducive in the context of national development.

The professional commitment and role-playing outlined a special standing for the university teachers in the society. Teachers chose teaching as their profession by preference, rather than circumstantially. The teachers also take active interest in public affairs and exercise their rights and perform their duties as members of a community. In this study it was found that University Teachers of Japan and

Bangladesh preferred values, which are conducive in the context of national development.

It should be mentioned here that the samples studied in this study were not large enough to make conclusive statements. Further research with different strata of samples of these two countries is necessary. Future research would help to understand the impact of culture on values.

ACKNOWLEDGEMENT

The research was supported by an invitation grant from the Japan Society for the Promotion of Science (JSPS/FF2/99036. ID No. L 00501) to S. H. Mahmud.

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APPENDIX A

English Version of Schedule for Value Preferences

People have different views and opinion and the value of life is different for every individual. Please rank the following statements according to your choice- the most favored statement should be ranked as I, the next favored ranked as 2, and so on.

[] To participate in collective/social welfare activities.
[] To achieve success.
[] To have power and influence over others.
[] To think more about otherworldliness.
[] To depend on fate for the outcomes in life.
[] To lead a secure life.
[] To fix self- direction.
[] To enjoy life by pursuing one's own pleasure.
[] To think more about self.
[] To become conservative.

The Bangladesh Journal of Psychology, 2001, Vol. 19: 43-56

ATTITUDE OF PEOPLE TOWARDS ENVIRONMENTAL POLLUTION

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229

ABSTRACT

The study aims to investigate the attitude of Pakistani people towards environmental pollution. As a first step an ingenious measure, Environmental Pollution Scale (EPS), was developed. EPS, is a 4-point Likert Type scale comprises of 39 attitudinal items. EPS was administered to a representative sample of 210 men and women taken from urban (n=99) and rural (n=111) areas of Rawalpindi, Islamabad, Gujrat, and Multan cities of Punjab Province. Age of the respondents ranged from 18 to 55 years (M= 32.95, SD=11.44). They belonged to different SES groups. The item total correlation was computed to see the internal consistency of the scale, which showed that 39 out of 41 items were significantly correlated with the total score. Principal component analysis with oblique rotation was performed to see the factor structure of the scale. Three meaningful factors including mental tension/health hazards (17 items), problem management (11 items) and overcrowding/lack of resources (11 items) had emerged, which were significantly correlated with each other. Alpha reliability estimates of EPS and its subscales have shown that the instrument is highly reliable. Analysis of the data revealed significant gender differences. However, the effect of area of residence does not seem to be contributing much towards respondents' perceptions of the environmental pollution. Analysis of the responses by sex and rural-urban residence did not show any difference, but, in general, all were aware of the sensitivity of the issue.

INTRODUCTION

During the last three decades, there is growing sensitivity and awareness of the issue of environmental pollution. Researchers (Baverman, Applebaum & Davis, 2000) have termed the period of 1960,s and 1970's as the period of "contemporary environmentalism" when the public awareness of environmental problems were increasingly viewed as (1) being more complex in nature, often

stemming from new technologies (2) having delayed and difficult to detect effects, and (3) having consequences for human health and well being as well as for natural systems.

Since the beginning of environmental movement, social psychologists have attempted to understand the forces that lead people to be concerned about environmental issues (Schultz & Zelenzy, 1999). By definition "environmental attitudes" can be defined as a learned predisposition to respond consistently in favorable or unfavorable manner with respect to the environment. Environmental psychology examines the interrelationship between environment and human behavior (De Young, 1999). One of the important research area is the connection between global environmental issues and psychology (Evans, 1996). "Attitude towards pollution" as a research topic in environmental psychology, has remained a popular issue and been widely studied (e.g., Dunlap & Martig, 1995., Schultz, & Zelezny, 1999., Schwartz., 1992., Merchant, 1992., Noe & Snow, 1990). Like other attitudes (Ajzen & Fishbein, 1980) these attitudes are learned, generally consistent and evaluative in nature.

Individual's concerns for the environment and its preservation can best be described through "Biophilia Hypothesis" proposed by Kellert & Wilson (1993), which explains why people need to be involved with nature and its upkeep. They assert that... "the existence of a biologically based inherent human need is to affiliate with life and life like processes. All people are naturally inclined. In order to obtain an optional level of self-value, they have to have an affiliation with nature". Barry (1999) also supports it by saying that, "we have a relationship with the natural environment due to our genetic and evolutionary history".

Another view holds that the respect of the issue of environmental pollution comes from within, it is a state of mind or 'ecological consciousness' (Benammer, 1998). It is an attitude towards the world and other people, and alienation means ignorance and lack of respect for our experience. When we don't feel the value and goodness in ourselves, in others, and in the natural world, even well-meaning actions translate into "eco-chauvinism" and create a psychological pollution that grows into environmental pollution. Researchers have emphasized the 'ecologically correct' or 'ecologically wise' attitude (e.g., Troy, 2000) which has an apprectiation within ourselves, our actions, which communicates respect and benefit for the world (Darley & Gilbert, 1985., Dunlap & Van Liere, 1978., Schultz & Zelenzny, 1999., Troy, 2000). Peoples' attitude towards environmental problems are interchangeably identified as egoistic, social-altruistic or biocentric

(Stern & Dietz., 1994) egocentric, anthropocentric and ecocentric (Merchant, 1992) or social-altruistic, and anthropocentric (Schultz., & Zelezny, 1999).

APA division 34 on Population and Environmental Psychology emphasizes research in improving interactions between individual, environment and population. Amongst a number of targets, perceptions and congnitions and human responses to natural and technological hazards have gained serious research concern and attention (div 34 @ list.apa.org). Environmental psychology not only discusses the environmental attitudes and implications of environmental pollution but also emphasizes the environmental health. According to WHO report (1997) on National Environmental Health Action Plans... "environmental health includes those aspects of human health, including quality of life, that are determined by chemical, physical, biological, social and psychosocial factors in the environment. It also refers to correction and control of those factors in the environment that can adversely affect the health of present and future generation".

It has been rightly emphasized that besides application of appropriate technology, we should also gain insight from the psychological attitude of people across cultures, specifically, as cultural beliefs and vaues veary a lot across cultures. (Schultz, Zelenzy, Dalrymple, 2000., Schwartz, 1992). It is believed that sharing such attitudinal communication, openness and awareness to the gravity of issue would help understand the perceptions of environmental pollution. Specially, for an effective policy implementation public perception and involvement become all the more important (Barry, 1999., Danaher, 1996., Thompson & Barton, 1994., Kahn & Peter, 1999).

The report of World Bank says (1997) that publics' involvement in such a program would influence pollution management priority settings and would build support for reinforcement. It further says ... "publics' involvement in such efforts ensures that the project is relevant to local needs and responds to local concerns. Any successful pollution management project should place emphasis on improving consultations between government, individual and the public. Reasons of lack of public awareness and low participation to improve the environment could be lack of effective public information and education. Only a well-aware public on environmental issue can apply pressure" it asserts. Public involvement in such efforts is 'a social communication process', whereby individual citizen, NGO's, the private sector and other interested parties, participate with government at various levels in decision making". Successful participation involves an affective involvement of all the "main stakeholders", who are defined as ... "those affected by the outcome- negatively or positively – or those who can

affect the out come of a proposed intervention". To improve the environmental management, support and agreement among the agencies, government sectors, polluters and the public at large is required (World Bank, 1996).

A number of attitudinal measures of environmental pollution have been developed, such as the National Environmental Pollution Scale (Dunlap & Van Liere, 1978), Environmental Concern Scale (Weigel & Weigel, 1978), which examined attitudes towards more general ecological issues, The Ecology Scale (Maloney & Ward, 1973) which measures attitudes as well as knowledge, emotions and behaviour, Children's Environmental Attitude and Knowledge Scale: CHEAKS (Leeming, Dwyer, Bracken, 1995), and New Environmental Paradigm Scale, (Dunlap, Van Liere, Mertig, Howell, 1992). Kahn & Peter (1999) evaluated peoples' attitude towards nature on a sample of 24 black parents and their children. They were questioned about their relationship with nature and its importance in their family. Results indicated that 100% of the parents were aware of some environmental problems, 75% air pollution, 71% water problems, 67% garbage and 93% said that they helped or were willing to help the environment in some way.

Some cross-cultural studies of environmental attitudes have argued that environmental concerns is a set of attitudes that develops among wealthy people, once the more basic needs of food and safety and food are met (e.g., Buttel, 1992.). Such findings lead to a line of reasoning that unlike American and European countries, the Latin American should be lesser concerned about environmental issues. However, across contries studies showed entirely different relationship (Schultz & Zelenzy, 1999). In one such study Hispanic respondents were found to be more concerned about environmental issue compared to the non-Hispanic US respondents (Noe & Snow, 1990.). In a largest environmental survey of 24 countries Dunlap, Gallup & Gallup (1993) examined the attitudes of industrialized and developing nations. The answer to the most important problem facing the nation was enlisted by 11% of the US respondents and 29% of the Mexican and Latino respondents, who consistently answered the poll questions in a more pro-environmental manner. Relationship of percapita GNP and support of environmental protection found to have a strong negative correlation ($r = -.79$). These findings supported the notion that environmental concerns are universal (Dunlap & Mertig, 1995). The research on environmental attitudes has suggested that every culture holds pro-environmentalist attitude, although the gravity and sensitivity of issues could vary across-cultures, depending upon the economic conditions, problems of poverty, population growth and its ecology etc. Current research trends in environmental psychology show that noise, crowding, pollution

as well as natural and technological disasters have psycho-physiological health and cognitive implications (Evans, 1996). Concern of attitudinal studies on environment is to see the salience of issues like effect of environmental stressors on human performance and coping, their preferential environment, perception of the natural and built environment and the attitude towards major polluters (De Young, 1999., Gargling & Golledge, 1993., Kaplan & Kaplan, 1982., Stokols & Altman, 1987)

Compared to the efforts and attempts in other developing countries, we see that in Pakistan work done on environmental pollution is mainly exploratory and demographic in nature. Empirical research having psychological perspective is sparse. One of the barriers of a scientific study on environmental pollution could be the non-availability of valid and reliable indigenous measure, that could yied objective information.

Objectives of the Research

The study was carried out to meet the following objectives:

1. To develop an indigenous scale of environment pollution
2. To investigate the public's perception of the gravity of the issue of environmental pollution through an indigenous attitudinal measure.
3. To study the gender differences in the attitude towards environmental pollution.
4. To explore if any significant differences exist between attitudes of urban and rural population of Pakistan towards environmental pollution.

METHOD

Sample

The sample comprised of 210 participants (50% women) who volunteered to participate in the study. The sample included an equal number of men and women (urban=99; rural=111) taken from four major cities of Punjab province including, Rawalpindi, Islamabad, Multan, Lahore and Gujrat. Age range of the subjects was between 18-55 years (M=32.95, SD=11.44). The Ss. came from different SES (average monthly income= 14,458 Rs.), their educational level ranged from SSC to masters level.

Procedure

The data were collected with the help of an Indigenously developed 4-point Likert type Environmental Pollution Scale (EPS). The Scale comprised of total

thirtynine (39) statements. The EPS was divided into three factorially derived sub-scales namely, mental tension and health hazards. problem management and overcrowding/lack of resources. The sub scale of mental tension and health hazards consisted of seventeen items, whereas, the subscale of problem management and overcorowding/lack of resources consisted of eleven items each. The responses were arranged from "Strongly Agree", "Agree to Some Extent", "Disagree to Some Extent" and Strongly Disagree". Score of 1 was assigned to strongly disagree, whereas, score of 4 was assigned to strongly agree, scores of 2, 3 were associated with average degrees of agreement.

RESULTS

Development of Environmental Pollution Scale

Initial item pool of the scale was generated after the comprehensive literature review and consultations with the experts. Three focus groups of university students, academic and administrative staff comprising of 15-18 persons in each group were also conducted for item generation. A list of 41 statements was thus prepared, which was critically evaluated by a team of three psychometricians. The relevance and suitability of the items was judged critically. In order to determine the internal consistency of EPS, item total correlation was computed. For this purpose, we merged response categories of 1 and 2 as an indicator of agreement and 3 and 4 as an indicator of disagreement (see Table 1).

Construct Validity

The factor structure of EPS (having 41 items) was obtained on rotated factor matrix with principal component analysis on the correlation matrix of 210 respondents. The item with content relevance and factor loading of at least .30 were included in the factor. The satisfactory factors were those which had an eigen value of at last 1.00. Thus items numbered 5 and 36, which had a factor loading less than .3 were dropped after this analysis. Three meaningful factors on environmental Pollution emerged (see Table 2).

Based on the criteria of item inclusion, factor 1 contained 17 items related to affects which were more of psychological and physiological in nature. These include noise of traffic, loud speakers, horns, disorganized traffic, mental effects of noise, construction work and broken roads, dirty water, smoky air, dusty atmosphere and lack of greenery. Factor I was termed as mental tension and

Table 1: Item-total correlation of Environmental Pollution Scale (EPS) (N=210)

	Items	*r*	*p*
1.	In cities, the noise of traffic affects peace of mind	.358	.000
2.	Garbage on roads and streets disturbs one's temperament	.391	.000
3.	Lack of recreation opportunities causes mental conflicts	.479	.000
4.	Old (Prevailing) system of sanitation is a source of difficulty for people	.358	.000
5.	People do not know how to dispose off garbage	.249	.000
6.	Use of loud speakers cause mental tension	.413	.000
7.	Railway stations and airports situated in populated areas affect mental peace	.460	.000
8.	Recreation is necessary for one's mental health	.310	.000
9.	Noise of factories in residential area affects peace and comfort	.359	.000
10.	Higher number of children may cause tension for their parents	.325	.000
11.	Migration of rural peoples to cities is a serious environmental problem	.439	.000
12.	Unpaved ways create difficulty for public	.470	.000
13.	Unnecessary use of horn causes mental tension	.454	.000
14.	Lack of greenery may increase health risks	.557	.000
15.	Change of environment at times provides mental satisfaction	.444	.000
16.	Disorganized traffic creates mental pressure	.478	.000
17.	There are very few recreactional resorts in our country	.419	.000
18.	It is usually unbearable to listen to high pictched music	.403	.000
19.	Over flowing dirty water causes disturbance	.476	.000
20.	Our work efficiency gets affected by noise	.475	.000

21.	For their own betterment people create problems for others	.599	.000
22.	Over crowding may affect social relations	.504	.000
23.	Broken road increases irritability in pedestrians	.559	.000
24.	Excessive noise causes sleeplessness	.432	.000
25.	Noise generated in construction work increases mental exhaustion	.363	.000
26.	There are insufficient recreational activities for women	.336	.000
27.	Repeated digging of roads may cause serious problems	.356	.000
28.	The flowing of waste channels in cities causes tension for people	.425	.000
29.	Environmental problems are increasing due to lack of education	.436	.000
30.	III town planning is troublesome for city people	.457	.000
31.	Higher number of children affect interpersonal relations	.353	.000
32.	Helathly atmosphere increases personal efficiency	.488	.000
33.	Every one should work to keep the environment clean and green	.395	.000
34.	Over population is the root cause of environmental problems	.359	.000
35.	Use of dirty water may cause skin infections	.424	.000
36.	One's physical conditions affect his mental life	.366	.000
37.	Drinking unclean water causes stomach problems	.366	.000
38.	Smoky air may cause many diseases	.472	.000
39.	Dusty atmosphere causes many respiratory diseases	.369	.000
40.	Natural resources should be preserved at any cost	.395	.000
41.	Using chemical fertilizers in crops may cause health hazards	.494	.000

Table 1 indicates that all the items are significantly correlated with the total test scores.

Table 2: Factor loadings for corresponding items on EPS obtained on rotated factor matrix with principal component analysis*

Items	Factor I Loading	Items	Factor II Loading	Items	Factor III Loading
6	.565	28	.656	31	.699
32	.556	2	.644	11	.568
16	.532	4	.634	26	.551
13	.512	19	.614	3	.516
24	.505	33	.492	21	.511
37	.471	27	.471	7	.466
23	.467	15	.431	17	.447
39	.463	22	.431	34	.397
25	.454	9	.419	10	.390
38	.453	8	.410	40	.331
14	.453	12	.346	29	.304
18	.425				
35	.384				
41	.381				
1	.372				
20	.367				
30	.366				
Eigen values	5.78		2.47		1.88
% of variance	14%		6%		4%

* Note: Factor I = Mental Tension/Health Hazards
Factor II = Problem management
Factor III = Over crowding/lack of resource.

health hazards. The second factor concerned the problems of municipal management including garbage disposal, sanitation, road digging and unpaved roads, over-crowding, problem of factories. This factor had 11 items and it was termed as problem management. The third factor contained 11 items related to town planning including lack of recreation resorts, noise of railway stations/airports, issue of population growth, migration, insufficent recreation spots for women, lack of education, higher number of children, plantation, rest and recreational resorts and preservation of natural resources. This factor was labeled as overcrowding/lack of resources. Overall 24% of variance was attributed to these three factors. For this preliminary exploratory study, this analysis was supportive of the theoretical construct of environmental pollution.

Correlation between the total and the sub-scale ranged between ..43 to .87 (see Table 3). Alpha Coefficients for the sub-scales ranged from .72 to .87 (see Table 4).

Table 3: Correlation between total and sub-scales scores of Environmental pollution Scale (EPS) (N=210)

Subscales	Mental Tension/ Health Hazards	Problem Management	Over Crowding/ Lack of Resources	Total
Mental Tension/ health Hazards	1.00			
Problem Management	.57*	1.00		
Over Crowding/ Lack or Resources	.50*	.43*	1.00	
Total	.87*	.75*	.80*	1.00

$p<.00$

Values of the reliability coefficients of three scales ranged from .72 to .81 respectively. The final scale comprising of 39 items had alpha coefficients of .81, .75, and .72 respectively for each sub-scale whereas it was .87 for the total test.

Table 4: Reliability Estimates of Environmental Pollution Scale (EPS) (N=210)

Sub-scales	No of Items	Alpha Coefficients
Mental Tension/ Health Hazards	17	.81
Problem Management	11	.75
Over Crowding/Lack of Resources	11	.72
Total	39	.87

DISCUSSION

The analysis of subjects' attitude on three dimensions of Environmental Pollution Scale i.e., mental tension/health hazards, problem management, and overcrowding/lack of resources is performed on their scores of EPS as an effect of gender. For this purpose t-test was computed. Table 5 shows the mean scores, standard deviations and t-test for the scores of men and women on EPS scores.

Table 5: Means, Standard Deviations, and t-values* of Environmental Pollution Scale (EPS) for males and females (men = 105, women=105).

Scales	Gender	M	SD	*t*
Mental Tension/ Health Hazards	Men	71.91	8.62	1.11
	Women	70.58	8.84	
Problem Management	Men	49.40	4.79	1.56
	Women	48.30	5.42	
Over Growing/ Lack of Resources	Men	40.04	7.49	1.93*
	Women	38.07	7.34	
Total	Men	169.23	18.38	1.94*
	Women	164.38	17.87	

* df = 208, p< .05

The results in Table 5 show significant gender wise differences on EPS (t =1.94, df = 208, p< .05) in their attitudes towards environmental pollution. The factor of overcrowding also differentiates significantly between the two (t =1.93, df = 208, p<.05). As regards the gender sensitivity, the mean scores of men seems to be more favorable towards environment compared with women respondents. Rural urban difference in attitude was not significant, hence not reported here.

The results in Table 6 give the means, standard deviations, and t-value of the scores of urban and rural Ss. on three factors of EPS. Almost all rural and urban subjects ranging from 90% to 99% endorsed all individual items similarly and there was no significant difference among them about any item.

Table 6: Means, Standard Deviations, and t-values* of Environmental Pollution Scale (EPS) for urban and rural (urban =99, rural =111).

Scales	Urban/Rural	M	SD	*t*	*p*
Mental Tension/ Health Hazards	Urban	71.15	8.57	.15	ns
	Rural	71.33	8.93		
Problem Management	Urban	48.77	4.72	.15	ns
	Rural	48.93	5.51		
Over Growding/Lack of Resources	Urban	38.73	7.91	.24	ns
	Rural	39.36	7.10		
Total	Urban	166.40	17.63	.30	ns
	Rural	167.16	18.84		

*Note: *df= 208; ns = not significant*

CONCLUSION

The results have shown significant gender difference of perception of the issue of environmental pollution. These findings suggest interesting attitudinal dimensions. We are perhaps passing through that stage of awareness, when one is more conscious of personal freedom and rights. General sensitivity to our environmental heritage, specifically the preservation of our natural resources is still need to be inculcated in our culture. There is a need to address, how we are spoiling these resources mainly because of our ignorance towards the sensitivity of the issue. Water, plantation, woods, the natural life all are integral part of our life. Concerted efforts from the policy makers need to be incorporated for any effective plan. Involvement of public in any such environment friendly policy needs the highly favorable and ecological friendly attitude, specifically for preservation of our natural resources and reservoirs.

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The Bangladesh Journal of Psychology, 2001, Vol. 19: 57-68

CONSTRUCTION OF AN ATTITUDE SCALE FOR VOTING BEHAVIOR

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ABSTRACT

The present study aimed at constructing an attitude scale. Likert (1992) techniques were used. Items were selected from an item pool of 321 statements covering five (5) dimensions of voting behaviour. Cautions, as suggested by Wang (1952) and Edward and Kilpatric (1948) were followed while editing these items. Expert judges gave favourable judgements for 91 items which were used in a pilot study (N = 100). Sixty items having higher scores were selected from the pilot study. The items having negative correlation with the total score excluded. Only the items having significant positive correlation with total score were retained. Twenty six items out of 91 items were selected for the final scale (N= 320). The split half reliability was computed with odd and even numbers of these items. Reliability coefficient were 0.79 for pilot study (N=100) and 0.67 for the final scale (N=320). Applying Spearman Brown prophecy formula it rose to 0.82. Correlations of each dimension with the total scores was computed. Correlations ranging from 0.27 to 0.40 and 0.40 to 0.53 was found in cases of pilot study and final study respectively. A high positive correlation between five dimensions (inter-dimension) was indicative of its inter-item consistency (ranging from 0.27 to 0.68). The coefficient of correlation between two equivalent forms of the tests in the pilot study (N=100) was 0.79 and that of the final study (N=320) was 0.67.

INTRODUCTION

Social and political actions of all kinds are mediated through attitudes, and that consequently the study of nature, development and modification of attitudes is of fundamental importance to the development of scientific psychology of politics (Eysenck, 1963).

Attitudes were shown to be very similar in many ways to habits. Attitudes and habits are both learned modifications of the central nervous system; both are dispositions to act which cannot be observed directly; both concepts are

hypothetical constructs which required taking up with antecedent conditions and consequent behavior for their measurement; lastly denote persisting state of organism which are necessary, but not a sufficient condition for the evocation of any particular type of action.

It might of course, be said that intention to vote or not to vote is itself a psychological variable and should, therefore, be measurable (H.J. Eysenck, 1963). Upto a point this is true, but their are many outside factors which influence a person's actual behavior. There were various approaches to address the problem of voting behaviour.

Psychoanalytic theory conceives voting behaviour as an individual act which takes places within the individual's psyche and can be understood purely in terms of intra- individual psychological processes. But voting behavior involves emotional, motivational, socio-economic and political factors and it is a complex political socialization. Viewed from sociopolitical attitudinal approach, it is clear that decision to vote for a given party rest immediately on some psychological forces. The dimensions of socio-political attitudes appear to have the character of political orientations and psychological forces acting on the present decisions are influenced by ideological frame of reference. The over all participation of an individual in voting is determined by constellations of attitudes toward political life.

In political participation model of voting behavior it was assumed that the voting behaviour might emerge from political participation. Campbell and Miller (1954) have provided theoretical interpretation of voting act as a result of partisanship. To study voting hehaviour of an individual the primary task would be the identification of relevant factors relating to partisanship.

Campbell (1960) found in his theoretical analysis of voting behaviour that party identification constitutes an important field of forces that determine the actions of the individual in the form of positive or negative evaluation for a candidate belonging to a political party. Ideology provides a common thread here, running through various issues enabling the individual to make a common decision with other party members in their voting preference for the choice of a candidate.

Political socialization paradigm in voting behaviour attempted by Hyman (1959) pointed out that political socialization may be manifested in children through a large number of external agents. The constellation of ideological preference and

political orientation in children is determined through a compromise between conflicting ideologies and competing agents in the environment.

Review of relevant literature reveals that most of the studies of voting behaviour have utilized survey methods (Anderson et. al. 1965; Abramson et. al., 1982). A few studies have utilized content analysis (Ajzen, et. al., 1980) for explaining the pattern of voting behaviour. Alexander, F. (1959), tried to study emotional factors in voting behaviour, Ara et. al., (1986) empirically tried to find out psychological factors relating to voting behaviour. Bagozzi, R. P. (1981) found that attitudes reflect an intention and that intention can lead a person to behave in a certain way.

For a predictive study of voting behaviour, Ajzen et. al., (1973) indicated that, it might include attitudinal and normative variables as predictors of specific behaviours. A change in attitude of a person towards elements of politics occurs through his cognitive assessment of the situation as it is indicative of Festinger's (1959) Cognitive dissonance theory. Thus in a voting situation a person's structure of political attitude plays a prominent role. Cluster analysis by Fleishman, J. A (1987) revealed different types of political attitudes. Mass communications and political socialization (Garramore, 1986) helps to form these attitudes.

In a predictive study of voting behaviour using Lampert's pollimeter (1985) was assumed to be an insufficient step in location psychological dimensions. Recently some steps have been taken (Ara et. al, 1986) to reflect on the inherent predisposition's of the people in the act of voting. Inter-variable correlation's among some dimensions of voting behaviour was found significant in an investigation by Ara et. al., (1986). Campbell et. al (1966) showed that preference for a particular party is a significant determinant of voting. Narain (1972) also found that party identification was an important correlate of political activities including voting. Studies by Deshmukh et. al (1970), Mehta (1975) revealed that leadership image, election campaign and issue orientations might predispose voting attitudes of the people.

Although theoretical approaches relating to voting behaviour indicate that political orientation is necessarily closely associated with internal predispositions and inherent capacities of the individual. It might go along with external conditions and situational factors in the environment as well. Ziauddin, (1990) however, tried to integrate different approaches to voting behaviour and provided some methodological clues in the construction of an attitude seale. However, present investigator attempted to develop a measure called voting attitude scale using salient dimensions of voting behaviour such as partisan attitude, party

identification, leadership image, election campaign, and issue orientation in the sociopolitical context of Bangladesh. Descriptive analysis of election and voting without using psychological tests have been reported by many investigators (Hussain, 1976 Rashiduzzaman, 1979, Khan, 1982,Islam, 1988), in Bangladesh. These studies have reported data on various issues of election that were visible during election campaigning. The nature of partisan attitude, party identification and leadership Image have also been dealt with. But these descriptive analysis of elections may prove to be unreliable for prediction and as such lack the accuracy and objectivity of a scientific inquiry. To provide reliability and validity to the data for predicting voting behaviour the construction of a voting attitude scale in the context of Bangladesh was considered paramount. The major dimension covering the voting attitude scale were (i) partisan attitudes (ii) Party identification (iii) leadership image (iv) election campaign (v) issue oriented attitudes.

Partisan Attitude: The term partisan attitude has been conceptualized in this study as a set of favorable attitudes towards political party, its members and functioning having keen interest on party positions in different political activities and belief on the role of party as an agent of mass mobilization and social change.

Party Identification: The term party identification has been conceptualized as a set of attitudes which admits to one's adherence to or keeping allegiance with a political party where favorable attitudes towards its leaders and members provide material and moral supports to the cause of actions making himself responsible for its success and failure.

Leadership Image: The term leadership image has been conceptualized in this study as an extreme positive evaluation of only one's own party leaders who is sincerely admired for and perceived by others as a saviour of the down trodden, symbol of justice, predicator of faith and ideals.

Election campaign: The term election campaign has been conceptualized for the present purpose as a set of attitudes that approves propaganda as an effective tool in achieving political goals of wining election where mass media like radio, television, and newspapers are positively evaluated as tools of persuasive communication.

Issue oriented attitudes: The term issue oriented attitudes has been conceptualized as a set of attitudes in the individual relating to regional, national and international political controversies about some problems which await

solution by the contesting political parties addressing differently giving rise to attitudinal orientation about the issues.

In the light of above statements the investigator conceptualizes voting attitudes for the present study as follows: Voting attitude is conceived as (1) a favourable support for partisanship (2) as a positive evaluation about the activities of a political party and to think of himself as an active member of that party (3) as positive evaluation and extreme support for the party leader (4) as an emphasis on canvassing in favour of party candidates in election and (5) supportive of political issues for introducing party cohesiveness and mass mobilization.

METHOD

Techniques and Methods used

One advantage of Likert's method is that its reliability co-efficient can be computed with fewer number of items. Thurstone's method on the other hand, requires relatively more number of items. Likert method need lesser time for the administration than Thurstone's technique. Hence the investigator used, Likert technique for the construction of voting attitude scale. Five alternatives were given for each statement and the subjects were asked to choose between "strongly agree" to "strongly disagree". It was a scale with a rating device designed to reveal both the directions of an individual's stand on the statement.

Initial Item selection

The steps involved, gathering of a large number of statements relating to the dimensions of voting behaviour such as "partisan attitude", "party identification", "leadership image", "election campaign" and "issue oriented attitudes". A total of 321 statements were collected initially. The distribution of these statements was as follows: Partisan attitude= 49, party identification = 45, leadership image = 38, election campaign = 36, and Issue orientation = 42. Cautions, as suggested by Wang (1952), Edward and Kilpatric (1948) were taken while editing these statements.

Later, these statements were given to three teachers for scrutiny. The teachers were, one from the department of Bengali, one from Political science and the third was from the department of Psychology of the University of Rajshahi. The judges were requested to classify each statement according to its connotations. It was a dimension wise classification with a suggestion of the use of appropriate words from each of the judges. Psychological aspects of attitudinal measurement were

also given a priority for selecting each statement. By the methods of elimination, vague, ambiguous, irrelevant and unimportant items were discarded. Items which were prefered by each of the three judges were selected for the pilot study. The judges selected 91 common items of which 25 were from the dimension of partisan attitude, 23 from the dimension of party identification, 14 from leadership image, 13 from election campaign and 16 from issue orientation.

Pilot Study

The selected items were administered to an incidental sample of 100 post-graduate students of Rajshahi University. The subjects were equally divided into male and female. They were asked to respond to each item in a five point scale ranging from strongly agree to strongly disagree. The instructions given to the subjects were as follows: "Please find some statements about political issues. I think that these are relevant to our political problems. Please read these statements carefully and think about each statement. You will find five alternatives against each statement to put your opinion about these statements. Please express your opinion by putting a (✓) mark on any of the five alternatives given against each statement. These alternatives ranged from "strongly agree" to "strongly disagree". I am sure that you will find these statements interesting. Thank you for your cooperation".

The respondents took about half an hour to complete the task. Individual scoring was done carefully. Each favourable and positive statement directly expressed voting attitudes and each unfavorable and negative statement expressed non voting attitudes. Strong agreement with favourable items were given a score of 5(five) and strong disagreement was given a score of 1 (One). Scoring was reversed for unfavorable items. Thus strong agreement with unfavorable item was scored as one (1) and strong disagreement was given a score of five (5). The scores of each item reported by 100 Ss were summated for item selection. Thus for each item the scores ranged from (100x1) = 100 to (100 X 5) = 500.

Hence mid point was = $\frac{Highest\ score + lowest\ score}{2} = \frac{500+100}{2} = 300$

The scores above this midpoint was indicative of voting attitudes.

Item analysis

The voting attitude scale was constructed in Likert (1932) form: The investigator computed total scores of each subject. Then various techniques of eliminations

were used. According to criterion of test construction highest score was indicative of voting attitudes and lowest score was indicative of non-voting attitudes. The highest scores above mid-point (300) was considered a principle for selecting items in the initial stages. Sixty (60) items were selected having highest scores from the results of the pilot study.

In the second stage Likert's criterion of internal consistency was adopted. Investigator computed correlation between each item and the total score for finding out internal consistency of items. A given item was supposed to meet the criterion of internal consistency when the item score was correlated positively with the total score. A biserial correlation between each item score and total score was computed. Elimination of items was done on the basis of the strength of correlations. The highest possible score could be $91 \times 5 = 455$ and the lowest possible score for the same would be $91 \times 1 = 91$. An item meets the criteria of internal consistency if the item score correlates significantly with the total attitude score. The items with negative correlation were excluded. Again items which failed to attain level of significance of 0.01 were also excluded Following this principle of elimination, item nos. 2, 4, 5, 11, 12, 14, 22, 13, 25, 30, 32, 39, 40, 42,58, 60, 70, 72, 74, 83, 85, 87, 88, 89, 90, 91 were retained to be included in the final study.

Reliability of Voting Attitude Scale (VAS)

The split half method was used to find out the reliability of the scale. The split half reliability was computed with odd and even numbers of these 26 items (N= 100) scores in the pilot study and the correlation was found 0.79. Split-half reliability was again computed of the scores in the final study (N=320) with odd and even number of 26 item and correlation was found 0.67. After applying Spearman Brown Prophecy formula (Garrett and Woodworth, 1966), the coefficient was found to raise from 0.67 to 0.82 which was very high. Thus, it can be said that the voting attitude scale is highly reliable. The split half reliability of Voting Attitude Scale was also computed with the scores of final study as an additional measure of reliability on a large sample (N=320) of subjects.

To find out inter-item consistency correlations of each dimension with the total scores of final study were computed which ranged from 0.40 to 0.53 (table 1). Correlation of each dimension with total scores of pilot study was also computed and it ranged from 0.27 to 0.40.

Table 1: Showing Pearson's r of the scores of each dimension with the total scores of Voting Attitude Scale (both pilot and final study).

Dimension	r for pilot study N= 100	r for final study N=320
Partisan Attitude	0.40	0.48
Party Identification	0.36	0.53
Leadership Image	0.30	0.40
Election Campaign	0.29	0.41
Issue oriented Attitude	0.27	0.46

The correlation coefficient between each dimension and total scores of pilot study ranged from 0.27 to 0.40. The correlation coefficient of each dimension with the total scores was found higher in the final study than in the pilot study. Inter dimensional correlations were also computed in the pilot study which ranged from 0.27 to 0.68 (table 2). All the coefficients of correlations were in positive direction and achieved the level of significance either at 0.01 or 0.05 level.

Table 2: Showing inter-dimensional correlations with the scores of VAS in the pilot study (N= 100).

PA	PI	LI	EC	IO
PA	0.43**	0.42**	0.34*	0.68**
PI		0.35**	0.43**	0.28*
LI			0.29*	0.33*
EC				0.27*
IO				

*=P <0.05, ** =P <0.01

Note: PA = Partisan Attitude, PI = Party Identification, LI = Leadership Image, EC = Election campaign, IO = Issue orientated Attitude.

The high positive correlation between dimensions indicated the inter-item consistency of voting Attitude Scale. Thus, homogeneity of the scale was established. The coefficient of correlation between two equivalent forms of the test in the pilot study (N= 100) was 0.79 and that of final study (N=320) was 0.67. This high correlation in the final study is a further indication of the inter-item consitincy of the voting Attitude Scale. The VAS contains both negative and positive statements. The number of statements having positive and negative directions on each dimension is reported in Table 3.

Table 3: Showing the number statements having positive and negative direction on each dimension.

Dimension	Positive Direction	Negative Direction	Total
Partisan Attitude	5	2	7
Party Identification	4	2	6
Leadership image	4	1	5
Election Campaign	3	0	3
Issue Oriented Attitudes	3	2	5
Total =	19	7	26

Thus in the final shape the voting Attitude scale included 26 items.

DISCUSSION AND CONCLUSIONS

The main purpose of the study was to develop an attitude scale which could predict voting behaviour. Five dimensions emerged as relevant correlates of voting behaviour. These were partisan attitudes, party identification, leadership image, election campaign, and issue orientation. Relevant items were selected using appropriate methods.

Split half reliability of the two equivalent forms of the tests in the pilot and final study resulted in a significant positive correlation of 0.79 (N=100) and 0.67, significant at 0.01 and 0.05 level respectively. This high correlation in the final study was an indication of the high inter item consituny of the scale. A high positive correlation between dimensions (Inter-dimensional) also indicated the same type of reliability. Since the reliability of the scale is high, it is expected that the scale will also be valid if the scores are compared against actual voting performance.

It is to be pointed out that previous studies using direct questionnaires, the reports of which were subject to memory failure or internal distortion of facts about election (Campbell et al., 1960). However, scientists in western countries (Lampart, et. al 1985; Erickson, et. al 1987) used various psychological techniques to study voting behaviour. These studies provided some methodological devices which are inter-disciplinary in nature.

Moreover, in a given situation in addition to attitude, voting is dictated by a person's political socialization (Gore, 1963), which begins at home and schools in early years of our life (Hess, 1965, 67) through different agents of socialization (Hyman, 1959).

Although costs and values in the calculus of voting affects voting behaviour (Katosh, 1982), the personality and attitude correlates of political candidate preference (Kerpelman, 1968) plays a major role.

According Eysenck (1963) attitude, like stereotypes prejudge the issues by determining our set, our way of reacting to new facts and new experiences; attitudes like stereotypes give us an organized frame of reference which determines what we perceive and how we perceive it; these mental habits which, if aroused, determine our action.

It is concluded that political preferences in the form of attitudes may lead our factual thinking transformed into stereotypes resulting in stability and durability in our voting behaviour, as such disclosed newer avenues of research. Although the voting attitude scale was supposed to predict voting behaviour, it should be strengthened by including other situational information to enlarge its predictive power. Further studies should be conducted using more dimensions and varied samples encompassing a broader spectrum of our real life situations.

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The Bangladesh Journal of Psychology, 2001, Vol. 19: 69-77

Short Report

PSYCHOLOGICAL TESTS AND VIVA VOCE FOR THE SELECTION OF CIVIL SERVANTS IN BANGLADESH

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ABSTRACT

This is an analytical paper that critically examines the psychological tests and the viva voce used by the Bangladesh Public Service Commission for the selection of candidates for the superior services in Bangladesh. The paper gives a brief description of the beginning of psychological testing in Bangladesh and traces the different changes introduced by the PSC in the psychological tests, leaderless group discussion, and composition of the Viva Board and in the procedure of interviewing. The paper concludes by suggesting several steps to improve the quality of selection by the PSC.

INTRODUCTION

Psychological tests are standardized devices for the assessment of the psychological characteristics, such as intelligence, personality, motivation, emotion, etc., of an individual. In a competitive selection, especially for the superior services, candidates having higher intelligence and motivation, strong personality and stable emotionality, and stress tolerance ability and mental stamina are singled out. It is scientifically proven that the percentage of correct selection is higher if the selection is made using psychological test than without it, and the percentage of correct selection again is a function of the degree of validity and reliability of the test being used in the selection process. That is why, the use of psychological tests is a common practice in employee selection all over the world.

The Beginning of Psychological Testing in Bangladesh

Immediately after independence, the Government of Bangladesh started to reorganize the Bangladesh Public Service Commission (PSC) which was previously known as the East Pakistan Public Service Commission. In early 1972, Prof. A.Q.M.B. Karim of Dhaka University was appointed as the first Chairman

of the Bangladesh Public Service Commission. Professor Karim got very little time to reorganize the whole set-up of the Commission, when he had to conduct two competitive examinations in 1972, one for the freedom fighters and the other for the non-freedom fighters to fill up the vacancies in the superior services. These examinations were named as Special Superior Service Competitive Examinations (Annual Report, PSC, 1999). In 1976 and 1979, superior service examinations of 1600 marks each were conducted. In 1984 a competitive cadre service examination of 900 marks was conducted. Out of these 900 marks, 400 marks were allocated for four compulsory subjects and 200 marks for 2 optional subjects. In addition, there was a viva voce examination of 200 marks and a psychological test of 100 marks. The psychological test consisted of intelligence test and group discussion. Marks obtained in the psychological test were added to the marks obtained in the written tests to determine the merit order of the candidates.

Revisions in 1985

In 1985, the PSC introduced two important changes in the competitive examination system. First, total marks in the examination were increased to 1000. This practice is continuing till today. In the present system, 500 marks have been allocated for 5 compulsory subjects, 300 marks for 3 optional subjects and 200 marks for the viva voce. Among the compulsory subjects, each carrying 100 marks, are General Bangla, General English, Bangladesh Affairs, International Affairs, Elementary Mathematics and Everyday Sciences. In addition, each candidate is to select 3 optional subjects, each carrying 100 marks, out of 64 available subjects. After being qualified in the written test, a candidate had to sit for a written psychological test of 100 marks and to participate in a group discussion before they faced the general viva of 200 marks. The group discussion was conducted by psychologists.

The second change introduced by the PSC was not to add the marks obtained in psychological tests to determine the merit order of the candidates. This change was more critical as it adversely affected the purpose of psychological tests in the selection of candidates for the Superior Service in Bangladesh. Psychological tests including the leaderless group discussion (LGD) method, measure different dimensions of intelligence and personality, such as analytical power, quick grasp of a situation and decision making ability in critical and ambiguous situations, temperament, leadership quality etc. If the marks given on the basis of one's performance in the test along these characteristics are ignored, then there is no justification for giving the psychological tests to the candidates at all.

Abolition of LGD Technique

Leaderless group discussion (LGD) is a technique of selection in which 8-10 candidates are put in a leaderless group situation. The group is given a topic(s) for discussion. Two psychologists remain present but they do not participate in the group discussion. LGD is a very good technique to assess the candidate's depth of understanding of an issue, analytical ability, initiative in starting and leading a discussion, listening ability, tolerance, reasoning capacity and fluency of expression. The Public Service Commission abolished in 1986 the LGD technique as a means of assessing psychological traits on a flimsy group that it could not be used on so many candidates. In fact, LGD is to be used only on those candidates who have qualified in the written test.

Psychological Test or Mental Ability Test

The PSC has further changed the name of the psychological test. It is now called "mental ability test" (Annual Report, PSC, 1999). Although the nomenclature does not matter very much, but the term 'psychological test' is widely used now-adays and it is well defined and includes all tests which measure psychological traits such as intelligence, personality, motivation, emotion, etc. 'Mental ability', which the new test purports to measure, has not been operationally defined, nor the test spells out what dimensions of mental ability it will measure. The PSC has also described the methods of construction of the mental ability test, which are not scientific at al. The mental ability test of the PSC is a written test, which is prepared every year just like the question papers of other subjects without judging its validity and reliability. Moreover, it is not a standardized test. Therefore, its scientific status is doubtful.

World Bank and The PSC

Although the World Bank is a financial institution, it nevertheless advises the Government of Bangladesh almost on all affairs including the reorganization of the examination system in the Public Service Commission. According to the suggestion of the World Bank, the PSC appointed a special commission in 1996 to restructure and computerize its examination system. The commission published its recommendations in October 1997. Some of its recommendations were as follows:

1. The provision of examination on optional subjects should be abolished.
2. There should be 800 marks for written tests on: Bangla (Descriptive and analytical: 50 marks, Essay 50 marks), English (100 marks), Bangladesh

Affairs (objective 50, descriptive and analytical 50), International Affairs (50+50), Arithmetic Reasoning Test (objective 100), Mental Ability Test (objective 100), General Science and Technology (objective 100), General Social Science (objective 100) and 200 marks for Viva Voce. Thus, the total marks would be 1000 (written 800 and viva 200).

3. For technical cadres there should be 600 marks for six compulsory subjects (e.g. Bangla 100, English 100, Bangladesh Affairs 100, International Affairs 100, Arithmetic Reasoning Test 100, Mental Ability Test 100), and 200 marks for academic attainment, and 200 marks for viva.
4. The commission also recommended that there should be no separate psychological test, since 100 marks have been allocated for mental ability test (objective type). The Public Service Commission has accepted almost all the above recommendations.

The Viva Board and the Conduction of Interview

In January 2000, the PSC decided to introduce another change in the examination system. This time the PSC wanted that the number of members in the Viva Board should not exceed three. This decision was perhaps taken with the intention of excluding the psychologists from the Viva Board. According to the present rule, the Viva Board must comprise a member of the PSC, a departmental representative from the Government and a subject specialist. So, there will be no need for a fourth person (a psychologist) in the Board. In fact, there is no need for a subject specialist in the Viva Board for the Superior Service Competitive Examination. There were, however, certain difficulties to implement this decision to exclude psychologists from the Viva Board. First, there was a gazette notification from the PSC that there would be both written and oral psychological assessment. Secondly, the PSC invited senior psychologists from the University of Dhaka and the University of Rajshahi as well as from some colleges in April 2000 to seek their opinions on the issue of excluding the psychologists from the Viva Board. The psychologists present in the meeting not only opposed the idea of excluding psychologists from the Viva Board but also insisted that they should play an active role in the Board. Probably due to these two reasons, psychologists were not excluded from the Viva Board of the 20th BCS Examination.

Another significant change introduced by the PSC was that the psychologists even present in the Viva Board could not ask the candidates any questions. This decision of the PSC is not only unscientific but also humiliating to the psychologists present in the Board. The psychologists present at the Viva Board are to assess five important dimensions of personality of the candidates, namely

(1) problem solving ability, (2) understanding ability, (3) leadership ability, (4) dynamism, and (5) emotional maturity. How can a psychologist assess these characteristics of the candidates without actively participating in the process of the interview and without asking the candidates any question? In such a situation a psychologist cannot perform his professional duty with scientific acumen. Some examples will clarify this point. A psychologist present in the Viva Board of the 20th BCS Examination narrated his experience like this. One candidate was stammering while answering to the questions from the three members. The psychologist wanted to ascertain by asking the candidate a question whether he had the physical problem of stammering or not, but the Chairman of the Board did not allow him to ask any question. In a second case, a candidate was being interviewed for selection in the health service. Both the Government representative and the subject expert asked medical questions only and the Chairman of the Board did not ask any questions except a few on the personal life of the candidate. The psychologist was in a fix how to judge the personality traits of the candidate along the five dimensions mentioned earlier by simply observing the candidate. So, he desired to ask some questions to test how best the candidate could handle a patient in an emergency situation and how he would perform in the operation theatre. But the Chairman did not agree to this. After the interview, the psychologist asked the Chairman what was the logic behind not allowing him to ask the candidate any question. The Chairman could not show any rationale behind this decision and only said it was the decision of the PSC.

Thus, the decision of the PSC to assess the personality of the candidates by the psychologists without asking them any questions is unscientific and unfair. The conduction of interview at the Viva Board also needs critical examination since it carries 200 marks that determine the merit position of the candidates. The pattern of interview used by the PSC is highly unstructured. There is a possibility of biased scoring in case of unstructured interview. For example, racial, religious, and gender discrimination, and physical attractiveness might affect the scores in such interview. Research findings indicate that group differences in scores are higher for low-structure interview than for high-structure interview (Mack and Rainey, 1990; Motowidlo et al, 1992; Roth and Campion, 1992). The interview system followed by the Viva Board of the PSC is a consensus marking system. According to this system marks are given by the interviewers through discussion after the interview. This is unscientific. The Chairman of the Viva Board might influence other members to give certain marks to a favored candidate. In order to avoid this situation, members should give marks individually without being influenced by others. These marks given by the members individually can be averaged and awarded to the candidate. For further information on the status of

psychological testing procedure followed by the Bangladesh Public Service Commission, reference may be made to an article by S.M. Murshed, Hamida A Begum and Mahmudur Rahman (1996).

Application of Psychological Tests in Other Countries

As described above, the present position of the Bangladesh Public Service Commission regarding the assessment of intelligence and personality traits through psychological tests and psychological interviews runs contrary to the assessment procedures followed in selecting candidates for the superior services in other developed and developing countries of the world. Elaborate psychological tests including group discussion and specialized interviews by psychologists are employed all over the world for selecting candidates for superior service (Rahmat Ali, 2000). Table 1 provides a summary of the selection procedures employed for superior service examinations in different countries.

Table 1: Use of Psychological Tests in the Selection of Superior Services

Name of the Country	Procedures for Selection
England	Three-member-interview board, including psychologists. Group discussion.
Canada	Psychological test and group discussion.
Australia and New Zeland	Viva voce participated by psychologists.
Germany	Written test and viva voce participated by psychologists.
Spain, Italy	Standardized psychological tests.
Japan	Group discussion at three levels led by psychologists.
Malaysia and Singapore	Group discussion led by psychologists.
Pakistan	Psychological tests and group discussion led by psychologists.

Table 1 shows that the application of psychological tests (which are standardized, valid and reliable) is a common practice in the above mentioned 11 countries. Psychologists also play an active role in the selection process which means they also ask questions in the viva.

Current Status of Psychological Tests used by the PSC

In order to measure certain psychological characteristics and predict performances accurately, a psychological test must be valid, reliable, and standardized. Therefore, to be treated as a scientific instrument to measure psychological characteristics, a psychological test must satisfy three criteria, namely validity, reliability and standardization. A test is valid when it measures what it intends to measure. For example, a yardstick is a valid instrument for measuring the length of on object, but it is not a valid instrument for measuring weight. Similarly, an examination question paper which has been prepared by a professor of history to test the knowledge of history of the test-takers is a valid examination paper of history, but it will not be a valid test paper for assessing the knowledge of geography of the students. Thus, an intelligence test is a valid test when it contains items, which will measure intelligence and not anything else such as emotion or motivation.

A test is reliable if it yields consistent results on repeated applications. For example, if an intelligence test gives a score of an individual, say 110 today and 70 tomorrow, then it is not a reliable test of intelligence, because the same individual cannot have high intelligence today and low intelligence next day. The validity and reliability of a test are determined by trained psychologists through psychometric processes.

A test is first developed on a specified sample and then it is applied on a larger section of the population and a norm is developed. Thus, a test is said to be standardized when it has been applied on a larger section of the population and a norm has been developed and the population characteristics have been defined. For example, Weschler Intelligence Scale for Children is a valid, reliable and standardized test of intelligence for children with specified age limits. Similarly, Weschler Adult Intelligence Scale is also a valid, reliable and standardized test of intelligence for adults with specified age limits. With this background, let us now turn to the intelligence test (called mental ability test by PSC) used by the PSC. An examination of the mental ability test (generally known as I.Q. test) employed by the PSC reveals that it contains 150 items reflecting the following sub-tests/ or content areas.

The mental ability test of PSC of 1999 was constructed on an adhoc basis to test the intelligence of the BCS candidates. Its validity and reliability have not been determined and are not known. Neither it has been standardized, nor its norm has been established. So, the scientific status of the test is unknown, and therefore doubtful.

Table 2: Contents of Mental Ability Test of PSC (1999)

Areas	Number of items
(1) Pictorial reasoning (non-verbal intelligence items)	20
(2) Concealed figures (identifying concealed figures in a matrix)	20
(3) Mathematical reasoning	20
(4) Press test (matching test)	20
(5) Analogy	20
(6) Understanding Communication	20
(7) Impossibilities (finding out absurdities)	20
(8) Judgement and comprehension	10
Total items	150

CONCLUSION

Most of the changes, especially those regarding psychological tests, leaderless group discussion and viva-voce, introduced by the PSC are unscientific, because these are not based on findings of scientific studies. The psychological tests used by the PSC at the moment must be examined and checked by psychological experts. The validity and reliability of these tests must be verified and established. Secondly, the LGD should be reintroduced. Thirdly, steps should be taken to minimize biases at the Viva Board. The quality of interviewing may be increased by abolishing the consensus marking system, allowing members to mark individually and giving psychologists to play active role in the Viva Board as other members of the Board.

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