

## CHAPTER FOUR

### TEACHER CLASSROOM BEHAVIOUR AND TEACHER CHARACTERISTICS - ANALYSIS AND DISCUSSION -

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#### I. TEACHER BEHAVIOUR IN RELATION TO AGE, REGENCY OF TRAINING AND EXPERIENCE

In order to determine the relationship between the criterion variable (I/D and i/d ratios) and the independent variables - namely, age, recency of training and experience of the teacher the technique of partial correlation was applied whereby the association between the criterion and each one of the independent variables was ascertained after eliminating the effects of the remaining two independent variables.

Significance of the obtained partial r's was estimated through the procedure of conversion to Fisher's Z function in the manner described in 'Statistics in Psychology and Education' (Garrett, 1969, pp.414-415).

Summaries of the results of computation of  $r$ 's and partial  $r$ 's in respect of I/D's and i/d's are given in Tables II and III respectively.

The numerals used in the Tables as addresses of the variables are as follows:

1. denotes I/D or i/d, as the case may be
2. denotes Age
3. denotes Recency of Training
4. denotes Experience.

TABLE II  
SUMMARY OF PARTIAL CORRELATIONS (I/D's)

N = 174

Variables	Correlation	Partial Correlation
I/D - Age	$r_{12} = -.01$	$r_{12.34} = -.01394^*$
I/D - Recency of Training	$r_{13} = -.04$	$r_{13.24} = .06454^*$
I/D - Experience	$r_{14} = -.0$	$r_{14.23} = -.04117^*$

\* Not significant

TABLE III  
SUMMARY OF PARTIAL CORRELATIONS (i/d's)

N = 174

Variables	Correlations	Partial Correlation
i/d - Age	$r_{12} = -.05$	$r_{12.34} = -.02538^*$
i/d - Recency of Training	$r_{13} = -.06$	$r_{13.24} = -.00479^*$
i/d - Experience	$r_{14} = -.09$	$r_{14.23} = -.07321^*$

\* Not significant

Since the confidence limits of the true partial r's in all the cases lie on either side of zero there is no evidence to conclude that there is any significant relationship between the I/D and i/d criteria of teacher behaviour and teacher's age, recency of training and experience.

The implications of the lack of evidence to any association between age, recency of training and experience of the teacher on the one hand and the chosen criteria of his indirect behaviour on the other are that whether a teacher is young or old does not determine whether he is more indirect or less indirect; that whether a teacher is recently trained or remotely trained does not determine whether he is more indirect

or less indirect; and that whether a teacher is less experienced or more experienced does not determine whether he is more indirect or less indirect.

It follows that teachers, notwithstanding their age, recency of training and experience, are employing their verbal behaviour in the classroom such that their indirect influence is not appreciably affected by these factors. In other words, teachers use positive means of motivation and reward, as related to means of restraint, punishment and censure, both inclusive and exclusive of content orientation, regardless of their characteristics, age, recency of training and experience.

## II. TEACHER BEHAVIOUR IN RELATION TO SEX AND MARITAL STATUS

In order to determine the relationship between teacher behaviour (I/D and i/d ratios) and sex and marital status of the teacher the technique of Analysis of Variance - 2 x 2 Factorial Design was applied. The computation is in accordance with the procedure laid down in 'Statistical Principles in Experimental Design' (Winer, B.J., 1962, pp. 291-293).

Summaries of Analysis of Variance are given in Tables IV and V each Table being followed by discussion of the results.

TABLE IV  
SUMMARY OF ANALYSIS OF VARIANCE (LEAST  
SQUARES) - I/D's

Source of Variation	SS	df	MS	F
A Sex	.05231	1	.05231	*2.04176
B Marital Status	.00227	1	.00227	*0.0886
AB	.05166	1	.05166	*2.01639
Error	4.35622	170	.02562	

\* Not significant

### Discussion of Results

The Main Effects. In respect of the concept of I/D which is an index of the teacher's behaviour taking into account the emphasis on content, all the three 'F' ratios turn out to be 'not significant'. This means that the two means (of the criterion, namely I/D) of male and female teachers, averaged over both married and unmarried conditions, do not differ significantly. Similarly the two means (of the criterion namely I/D) of married and unmarried teachers, averaged over both males and females, do not differ significantly.

The Interaction Effects. The fact that the interaction mean square is not significant indicates

that the difference between the means of male and female teachers in the married group is not significantly different from the difference between the means of male and female teachers in the unmarried group. Hence, with a non-significant A B (sex and marital status) interaction, we can say that the A (sex) effect, the difference between the males and females, is 'independent' of B (marital status), that is, we have approximately the same difference between the means of males and females, regardless of their marital status.

Alternatively, we can say that the B (marital status) effect, the difference between the means of married and unmarried teachers, is 'independent' of A (sex), that is, we have approximately the same difference between the means of married and unmarried teachers, regardless of their sex.

The implications are that male and female teachers, irrespective of their marital status, do not differ significantly from each other in terms of indirect behaviour inclusive of content orientation. Also, likewise, married and unmarried teachers, irrespective of their sex, do not differ significantly from each other in terms of indirect behaviour inclusive of content orientation.

It follows that whether a teacher is female or male, regardless of the marital status, does not

determine whether she/he is more indirect (I/D) than the other and also that whether a teacher is unmarried or married, regardless of the sex, does not determine whether one is more indirect than the other. In other words, male teachers, whether married or not, employ indirect means of behaviour inclusive of content orientation in much the same manner as do female teachers, whether married or not. Similarly, married teachers, whether male or female, employ indirect means of behaviour inclusive of content orientation in much the same manner as do unmarried teachers, whether male or female.

TABLE V  
SUMMARY OF ANALYSIS OF VARIANCE (LEAST  
SQUARES) - i/d's

Source of Variation	SS	df	MS	F
A Sex	.21160	1	.21160	*4.06376
B Marital Status	.40833	1	.40833	**7.84194
AB	.02782	1	.02782	***0.53428
Error	8.85301	170	.05207	

\* Significant at .05 level  
\*\* Significant at .01 level  
\*\*\* Not significant

### Discussion of Results

The Main Effects. In respect of the concept

of  $i/d$ , which is an index of the teacher's behaviour, excluding the emphasis on content, we have, in the analysis of variance, the two main effects, one of sex and the other of marital status turning out to be significant, as borne out by significant 'F' ratios.

'F' ratio in respect of A (sex) is significant at .05 level of confidence. This significance tells us that the means for males and females, averaged over the levels of B (married and unmarried status groups) differ significantly. Examination of the means shows that males on an average are significantly more indirect (.59) than females (.55).

'F' ratio in respect of B (marital status) is significant at .01 level of confidence. This significance tells us that the means for married and unmarried teachers, averaged over the levels of A (male and female groups of teachers) differ significantly. Examination of the means shows that the unmarried teachers are on an average more indirect (.65) than married teachers (.55).

The Interaction Effects. The AB interaction (between sex and marital status) is not significant as borne out by a non-significant 'F'. The fact that the F is not significant indicates that the difference between the means of male and female teachers in the married group is not significantly different from the

difference between the means of males and females in the unmarried teacher group. So with a non-significant  $AB$  - (sex and marital status) interaction, we can say that the A (sex) effect, the difference between the means of males and females, is 'independent' of B (marital status), that is, we have approximately the same difference between the means of males and females, regardless of their marital status. Alternatively, we can say that the B (marital status) effect, the difference between the means of married and unmarried teachers, is 'independent' of A (sex), that is, we have approximately the same difference between the means of married and unmarried teachers, regardless of their sex.

The implications are that male teachers, irrespective of their marital status, are more indirect in terms of purely affective behaviour (i/d) than female teachers, irrespective of their marital status. And, unmarried teachers, whether male or female, are more indirect in terms of purely affective aspects of behaviour (i/d) than married teachers, whether male or female.

It follows that male teachers, regardless of their marital status, employ positive means of motivation and reward of purely affective nature as opposed to means of restraint and censure in a significantly greater degree than do female teachers, regardless of

their marital status. Also it follows that unmarried teachers, regardless of their sex, employ positive means of motivation and reward of purely affective nature as opposed to means of restraint and censure in a significantly greater degree than do married teachers, regardless of their sex.

### III. CLASSROOM BEHAVIOUR OF MALE AND FEMALE TEACHERS (STUDY OF MATRICES)

#### Comparison of Matrices

Since sex is a dichotomous variable the total of 174 teachers is divided into two groups, one of male teachers and the other of female teachers. There are 107 male teachers and 67 female teachers. Their individual matrices, on combination through the process of cell-by-cell addition, yield two composite matrices, one representing the male teachers and the other the female teachers. The two matrices are given in Figures 19 and 20.

	1	2	3	4	5	6	7	8	9	10	Total
1	20	1	-	4	13	2	1	1	4	6	52
2	1	641	245	555	609	213	16	844	135	343	3602
3	2	81	499	512	1018	76	10	140	50	331	2719
4	3	178	249	1661	557	244	51	5243	871	1418	10475
5	0	307	40	3066	41634	650	46	204	634	2092	48681
6	2	74	20	454	510	435	38	1000	93	661	3287
7	-	21	5	92	73	33	304	38	27	107	700
8	5	1899	1290	1940	1106	790	100	8478	299	1077	16984
9	8	240	286	443	815	234	46	103	1295	314	3784
10	3	160	85	1748	2346	610	88	933	376	8425	14774
Total	52	3602	2719	10475	48681	3287	700	16984	3784	14774	105058

FIGURE 19  
COMBINED MATRIX FOR MALE TEACHERS

	1	2	3	4	5	6	7	8	9	10	Total
1	8	-	-	9	5	1	-	1	2	5	31
2	2	269	147	394	221	118	11	812	89	136	2199
3	-	49	331	341	621	46	9	113	32	125	1667
4	1	93	59	1422	303	169	24	4318	579	1081	8049
5	5	74	11	1843	25938	333	23	135	250	1057	29669
6	-	40	13	365	233	414	36	634	67	426	2228
7	-	7	1	71	30	31	396	40	15	77	668
8	4	1484	864	2130	820	552	83	8524	269	660	15390
9	3	123	210	265	386	189	20	112	752	178	2238
10	8	60	31	1209	1112	375	66	701	183	6605	10350
Total	31	2199	1667	8049	29669	2228	668	15390	2238	10350	72489

FIGURE 20

COMBINED MATRIX FOR FEMALE TEACHERS

The Darwin's Likelihood Ratio Criterion as mentioned in Chapter III provides us a test to find out whether two or more matrices are significantly different from one another with regard to the sequential pattern of distribution of tallies in them. Darwin's test was carried out on the two matrices in Figures 19 and 20. The procedure of comparison is described in Chapter III.

Some significant stages in the calculation of the Standard score 'Z' are given below. Logarithms to the base 10 have been used.

The sum of products of the 100 cell frequencies and their logarithms for the matrix relating to male teachers.	400660.7486
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The sum of products of the 100 cell frequencies and their logarithms for the matrix relating to female teachers.	265145.0968
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The sum of products of the 10 row totals and their logarithms for the matrix relating to male teachers.	453064.4516
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The sum of products of the 10 row totals and their logarithms for the matrix relating to female teachers.	299731.2544
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$$X^2 = 1180.34392$$

$$Z = 35.211$$

The value of 'Z' is greater than the critical value of 2.58 and hence the null hypothesis is rejected at 0.01 level of confidence. The differences noticed are, therefore, held significant. This shows that the two matrices differ significantly.

### SOME GENERAL FEATURES

#### Total Time of Recorded Interaction

The total time of recorded interaction in the case of male teachers is about 88 hours while it is 60 hours in the case of female teachers. While this difference is, of course, partly due to the differential number of teachers in each group, it is also to some extent due to the occurrence of 'no verbal interaction' spells in the classroom. The 'no verbal interaction' spells arise when some non-verbal activity either pertaining to or not pertaining to the lesson occurs. These acts are to be disregarded in observance of ground rules and accepted conventions.

It is good food for thought that the male group as strong as 107 teachers could muster only 88 hours while their counterparts numbering 67 could harness as much as a total of 60 hours.

#### Per-Teacher/Per-Hour Interaction

The male teachers numbering 107 with a grand

total of 105058 tallied interaction events strike a dividend of 982 tallies per hour. The quotient for female teachers is 1082 tallies.

Since as per the scheme of observation each teacher was observed for a total of one hour the per-hour interaction quotients, again are the same as those cited above for the two groups.

It appears that females as a group could generate a clearly greater extent of interaction within a given time than would be the case with male teachers.

#### Vacant Cells

In the case of the matrix relating to the male teachers there are two cells left vacant. They are the cells (1-3) and (7-1). It is noteworthy that both these lie within the purview of teacher talk. Category 1 means 'acceptance of pupils' feelings', category 3 means 'acceptance of pupils' ideas' and category 7 signifies criticism. There has, therefore, been no sequence at all where the teacher appreciated and accepted students' idea following an acceptance of their feeling. All the 52 verbal events signifying appreciation of pupils' feelings, by the teacher (row one total) none was ever followed by his accepting and using the students' ideas. The other sequence drawing blank is (7-1) which shows that there has been no occasion whatsoever signifying teacher's criticism followed by his accepting students'

feelings. Perhaps this sort of sequence is unlikely to occur because the two events involved are in essence opposed to each other, one being positive and appreciative and the other negative and abusive.

Coming to the matrix relating to female teachers it is seen how there are six cells remaining vacant. As in the other matrix, here too all the six cells relate to teacher talk and are all transitions. The cells are (1-2), (1-3); (1-7), (3-1), (6-1), and (7-1). Category 2 stands for praise/encouragement, while category 6 signifies orders/commands. The first three cells indicate that there never was an occasion when teachers followed up their appreciation of pupils feelings with teacher praise, appreciation/acceptance of students ideas, or even criticism. And the last three cells denote that teachers' appreciation of pupils' feelings was never preceded by teachers' appreciation/acceptance of pupils' ideas, directions/commands or even criticism.

A point of particular interest is that both the two cells (1-3) and (7-1), which are the only two vacant cells as regards male teachers, are among the six vacant cells as regards female teachers.

The presence of vacant cells in the matrices indicates that the total tallies in them are distributed over the remaining loaded cells only. Hence, in the matrix relating to male teachers the total of 105058

tallies are distributed over as many as 98 cells and in the case of the female teachers the total of 72489 tallies are distributed in only 94 cells.

The Principal Components of Communication

There are three principal components comprising the classroom communication. They are teacher talk, student talk and silence/confusion (vide Figure 2).

Teacher talk in the case of male teachers works out to 66 per cent while student talk and silence/confusion are to the tunes of 20 and 14 per cent, respectively.

In the case of female teachers, teacher talk has occurred to the order of 62 per cent, student talk of 24 per cent and silence/confusion of 14 per cent.

In Table VI, the ratios of these three components for male and female teachers, both as observed and as expected in the light of Flanders' (1970) results are given.

TABLE VI  
PRINCIPAL COMPONENTS OF COMMUNICATION - SEX

Component	Male teachers (percentage)	Female teachers (percentage)	Flanders' results (Percentage)
Teacher talk	66	62	68
Student talk	20	24	20
Silence/confusion	14	14	12

It may be seen from the Table VI that though teacher talk is observed to occur more in classes under male teachers than under female teachers, the observed figures are marginally at least falling short of the expected measure. While student talk under male teachers meets the expectation on par, that under female teachers as observed is more by four per cent.

As regards the incidence of silence and confusion, the identical extent under both the groups of teachers is in excess of the expected measure. As we say that more of student talk in general is a welcome development so also we may say that silence and confusion, while sometimes necessary and sometimes undesirable but unavoidable, should in general not exceed the expected measure. When in excess evidently either of the other two components of communication would be affected which might have repercussions on the total communication pattern, which may not be wholly welcome.

#### Teacher Talk - Student Talk Balance

The relative proportion of teacher talk and student talk may be appreciated in their joint context. The index that is useful here is called teacher talk/student talk (T/S) ratio.

The teacher talk/student talk ratio in the case of male teachers works out to 3.34 while the ratio is

2.52 in the case of female teachers. The ratio, being an index of the extent of teacher talk in relation to student talk, while indicating its greater occurrence (3.34) under male teachers than (2.52) under female teachers implies that the relative teacher talk under male teachers was nearly one and half times more than that under female teachers. This, one feels, is as it should be in the light of the fact that the incidence of silence/confusion under both the situations is identical while student talk under female teachers is markedly more than under male teachers.

This means that students in classes with female teachers get relatively more opportunity to talk, respond, react and initiate than their counterparts in classes with male teachers. This is evidently because the female teachers talk less than do the male teachers.

#### Flexibility of the Communication - An Overall View

Flexibility of communication as mentioned earlier (pages 120-123) refers to the facility with which speakers shift from one category to another in the course of classroom communication. This will be the residual portion of interaction after the extent of sustained occurrence of events is deducted from the total interaction. Since the index, Steady State Ratio (SSR) refers to the sustained use of particular categories, (vide Figure 3) the extent of flexibility is in a way indicated

by SSR. A greater SSR would imply lesser flexibility in communication.

In the matrix representing male teachers the SSR is 60 per cent while in the case of the matrix relating to female teachers it is 62 per cent. SSR being slightly higher in the case of female teachers, it is surmised that the flexibility of interchange was, on the whole, slightly more in classes under male teachers.

#### Flow of Communication

Interruption to the flow of communication as indicated earlier (pages 123-125) is signified by the extent of occurrence of category ten. Category ten, in the case of male teachers has occurred to the extent of 14.06 per cent while in the case of female teachers it is to the extent of 14.27 per cent. There is not, therefore, much of difference in the extent of interruption to the flow of communication under the two situations. It follows that in classes with male teachers the extent of silence/confusion signifying interruption to the flow of communication is nearly equal to that in classes with female teachers.

#### TEACHER TALK

Different dimensions of teacher talk may be studied by analysing particular areas or cell clusters of the concerned matrix. Some useful dimensions are taken up below for discussion.

### Indirect Teacher Behaviour

As explained earlier (page 128), the two useful measures of indirect behaviour are I/D and i/d. The male teachers show an I/D of 0.24 (16848/69516) while their female counterparts exhibit a larger ratio of 0.26 (11946/44511). This index of I/D, again as a reiteration, conveys an idea of the teachers' indirect behaviour, the emphasis on subject matter being included. This index mirrors, therefore, teacher behaviour in its total setting.

On the other hand, the index of i/d, which is perhaps a more sensitive indicator of the actual social-emotional climate as generated by the teacher behaviour, excludes the emphasis on content and reflects the indirect behaviour through another but more significant angle. Categories 4 and 5 are excluded from the computation, since they are mostly bearing on content delivery.

The i/d ratio of the male teachers works out to 0.61 (6373/10360) while that in the case of female teachers works out to only 0.57 (3897/6793).

Thus, it is found that female teachers who are more indirect than the male teachers when the content orientation is taken into account (I/D) are less so than male teachers when the behaviour excluding the content emphasis is viewed purely in the light of the affective aspects of classroom climate (i/d).

It turns out, therefore, that male teachers comparatively are using the first three categories, one, two and three signifying acceptance of pupils' feelings, praising and encouraging and accepting their ideas in a greater measure than do the female teachers while the latter are using questions comparatively in a greater measure than do the male teachers.

#### Teacher's Response - Initiation Nexus

Teacher response (vide Figure 4) is indicated by categories 1, 2 and 3 which signify acceptance of pupils' feelings and ideas and praising/encouraging them. A measure of teacher response is Teacher Response Ratio (TRR) which is calculated as described earlier in page 129. The TRR ratio calculated for the two composite matrices under study work out to 62 per cent for male teachers and 57 per cent for females. It is to be gathered, therefore, that the male teachers on the whole are responding more to the pupils than are the female teachers.

Teacher questions (vide Figure 5) are a means of initiation. A measure of this initiation is called Teacher Question Ratio (TQR) which is calculated as shown earlier in page 129.

The TQR ratio calculated for the two matrices under review works out to 18 per cent for male teachers and 21 per cent for female teachers.

It is food for thought to discuss the TQR and TRR ratios of the two groups of teachers in the light of each other. The ratios are reproduced in Table VII.

TABLE VII  
TEACHER RESPONSE - INITIATION - SEX

Ratio	Male teachers (percentage)	Female teachers (percentage)
TRR	62	57
TQR	18	21

As one ruminates over the percentages one sees how the male teachers with a lesser 'question ratio' could establish larger 'response ratio' while the female teachers used more questions which perhaps kept the students responding to them to a greater extent than in the case of classes under male teachers. This mention of the obvious from the table does not mean that questioning as a technique should be eschewed; but then herein may lie a possible clue to the effective way of using questioning technique in the classroom.

Perhaps more often than not questions as put by teachers in the classroom are close-ended in that only short and expected answers are forthcoming. On the other hand if questions could be open-ended such that they set in motion original and constructive ideas on the part of students, the answers from the students would leave more

room for the teachers to be responsive and such a type of discussion is more likely to be bearing fruits. In ~~contradistinction~~ to this phenomenon of 'creative inquiry' would be the former exercise which might be called drill.

It is the significance of this phenomenon of creative inquiry which many a researcher probe as the nexus between teacher's initiation and response patterns of verbal behaviour (Buch and Santhanam, 1972).

Hence, if manoeuvred effectively, the questioning technique far from supplanting creative inquiry could serve as a launching pad for the latter to take off.

#### Instantaneous Teacher Response - Initiation Nexus

Teacher's acceptance of pupils' feelings and ideas and praising/encouraging them immediately following the pupil talk constitute Instantaneous Teacher Response (vide Figure 6) while teacher questions put in similar fashion (vide Figure 7) is known as Instantaneous Teacher Questioning. The relevant measures are Instantaneous Teacher Response Ratio (ITRR 89) and Instantaneous Teacher Question Ratio (ITQR 89) which are computed from a scrutiny of the relevant cell clusters in the rows 8 and 9 of the matrix, as described earlier in page 135.

While ITRR 89 is 76 for both the sets of teachers, there lies a contrast between them on ITQR 89

which is 55 for male teachers and 67 for female teachers. The Table VIII highlights both the similarity and the contrast.

TABLE VIII  
TEACHER INSTANTANEOUS RESPONSE - INITIATION - SEX

Ratio	Male teachers (percentage)	Female teachers (percentage)
TRR 89	76	76
TQR 89	55	67

When the above measures are viewed in the light of their prototypes certain interesting information emerges.

Male teachers who have been found to be 'responding' to pupils in a slightly greater degree than their female counterparts are seen to be 'instantaneously responding' to pupils in just equal measure only with female teachers. In other words, as regards the extent of responding to pupils at the point of cessation of their talk, the behaviour patterns of both male and female teachers are identical although male teachers respond, on the whole, in a slightly greater measure than the female teachers.

Female teachers who have been found to be putting questions to pupils in a slightly greater measure than

their male counterparts are again seen to be doing so, to even greater an extent at the time pupils stop talking. In other words, not only are female teachers putting questions in classroom communication, in general, more than the male teachers; but also they do so, particularly at the time pupils stop talking, more than the male teachers.

The use of questions by female teachers more plentifully and more strategically than the male teachers is self-evident.

#### Constructive Integration

As mentioned earlier (pages 135-136), constructive integration refers to accepting pupils' feelings and ideas and praising/encouraging them in an integrative manner, in classroom communication. It is computed from the total of tallies in the nine cells in rows 1, 2 and 3, columns 1, 2 and 3 (vide Figure 8).

The percentage of the constructive integration in the two master matrices works out to 1.4 in the case of male teachers and 1.1 in the case of female teachers. It turns out, therefore, that the male teachers could bank upon the social-emotional climate to a greater proportion of the total interaction than was the case with the female teachers.

The percentage of constructive integration with reference to the combined total of the first three

categories, calculated in a similar manner from the two master matrices work out to 23.4 and 20.7.

TABLE IX  
EXTENT OF CONSTRUCTIVE INTEGRATION - SEX

Index	Male teachers (percentage)	Female teachers (percentage)
Constructive integration with reference to total <u>interaction</u>	1.4	1.1
Constructive integration with reference to categories 1,2,3	23.4	20.7

From Table IX, it is evident that in the case of male teachers the extent of constructive integration is decisively more than in the case of their female counterparts.

Male teachers are thus found to be harnessing the social-emotional climate in classroom communication, to a greater extent than do the female teachers, by means of accepting pupils' feelings and ideas and praising and encouraging them. They ingeniously employ these motivating and rewarding verbal devices in such a way that they are well knit into the texture of classroom interaction. That involves transitions among these devices themselves. It is this kind of constructive integration behaviour that male teachers are found to be exhibiting more than the female teachers.

Vicious Circle

As discussed earlier (pages 137-138) the occurrence of teacher's orders/commands and criticism, signified by categories 6 and 7, respectively, in a vicious manner one leading to the other is called vicious circle. The incidence of the phenomenon is reckoned with based on the sum of tallies in the group of four cells 6-6, 6-7, 7-6 and 7-7 and is calculated as described earlier in page 138 (vide also Figure 9).

On a scrutiny of the composite matrix of the male teachers we see how the percentage of the incidence of the vicious circle with reference to the grand total in the matrix is 0.8 while the matrix relating to female teachers shows the percentage to be at 1.2. As in the discussions of the preceding point-namely, constructive integration, to measure the extent of vicious circle as percentage with reference to the two concerned category totals - namely, 6 and 7, rather than with reference to total interaction, would be desirable. The percentage of vicious circle with reference to the category 6 and 7 total, therefore, works out to 20.3 and 30.3 in the case of male and female teachers respectively. Table X highlights the contrast between the two groups of teachers on the occurrence of the phenomenon of vicious circle.

TABLE X  
INCIDENCE OF VICIOUS CIRCLE - SEX

Index	Male teachers (percentage)	Female teachers (percentage)
Vicious circle with reference to total interaction	0.8	1.2
Vicious circle with reference to categories 6 and 7	20.3	30.3

As is obvious from the Table X recourse to the direct categories of 6 and 7 by female teachers is decisively one and half times as much as it is in the case of male teachers. Perhaps the significance of this contrast is better appreciated when we recall how constructive integration as discussed earlier (see Table IX) was markedly more in the case of the male teachers.

In fact, in the case of female teachers incidence of vicious circle (30.3 per cent) is half as much more as the extent of constructive integration (20.7 per cent). With male teachers, however, the position is happily reversed and constructive integration (23.4 per cent) exceeds the vicious circle (20.3 per cent).

It is seen, therefore, that as between male and female teachers, female teachers are ordering/commanding and criticising pupils in a much greater measure than do

the male teachers. Also it is revealed that the female teachers use orders/commands and criticism more than acceptance of pupils' feelings, ideas and encouragement to them. On the other hand, the male teachers accept pupils' feelings, ideas and praise/encourage them in a greater measure than they order/command and criticise them.

#### Teacher Steady-State Talk

The event sequences observed to occur in a sustained fashion for spells of over 3 seconds each are coded in the diagonal cells. There are seven such steady-state cells signifying sustained teacher talk (vide Figure 10). The details have been discussed earlier (pages 138-141).

In the matrix representing male teachers the TSSR is 65.0 per cent while in the matrix representing female teachers it is 64.7 per cent. This clearly indicates that teacher talk in the case of both groups of teachers has been more sustained than transitional and that the extent of sustained occurrence of teacher talk is nearly identical in both situations.

Perhaps an analysis of the constituent parts of teacher steady-state talk would give out some significant information which may be a dimension of the contrast between male and female teachers' behaviour patterns in classroom.

The three principal constituents of teacher steady-state talk are constructive integration component, vicious circle component and content-oriented component.

In the matrix representing the male teachers the constructive integration component works out to 2.6 per cent (1160 out of 45194 tallies); that of vicious circle to 1.6 per cent (739 out of 45194 tallies) and that of content orientation to 95.8 per cent (43295 out of 45194 tallies).

In the matrix representing female teachers, the constructive integration component works out to 2.1 per cent (608 out of 28778 tallies), that of vicious circle to 2.8 per cent (810 out of 28778 tallies) and that of content orientation to 95.1 per cent (27360 out of 28778 tallies).

TABLE XI

## ANALYSIS OF STEADY STATE TEACHER TALK - SEX

Component	Male teachers (percentage)	Female teachers (percentage)
Constructive integration	2.6	2.1
Vicious circle	1.6	2.8
Content orientation	95.8	95.1

Table XI provides a clear summary of the contrast lying between the two groups of teachers as regards these

components of steady state teacher talk.

A further analysis of the content orientation component of steady state teacher talk may be a useful extension of the present discussion. There are two cells that make up the component. They are the cells 4-4 and 5-5, signifying sustained questioning and sustained lecturing, respectively. As can be expected it is the cell 5-5 which is vastly heavier than the cell 4-4 in both the composite matrices.

In the composite matrix representing male teachers the cell 5-5 has a build-up of 41634 tallies which is 92.1 per cent of the total steady state teacher talk while the cell 4-4 with a concentration of 1661 tallies accounts for 3.7 per cent of the total steady state teacher talk.

In the other matrix representing female teachers the cell 5-5 with a build-up of 25938 tallies accounts for 90.1 per cent while the cell 4-4 with a frequency of 1422 accounts for 4.9 per cent of the total steady state teacher talk.

TABLE XII  
CONTENT ORIENTATION IN STEADY STATE TEACHER  
TALK - SEX

Cell	Male teachers (percentage)	Female teachers (percentage)
Sustained lecture (Cell 5-5)	92.1	90.1
Sustained questioning (Cell 4-4)	3.7	4.9

The Table XII which churns out the contrast between the two groups of teachers shows that male teachers used greater percentage of their steady state talk for content delivery than is the case with their female counterparts. This preference for content delivery with the male teachers is evidently associated with lesser percentage of sustained questions than is the case with the female teachers.

This means that male teachers resort to lecturing in sustained fashion for spells of over three seconds each, to a slightly greater extent than their female counterparts. On the other hand, female teachers resort to questioning in a sustained fashion for spells of over three seconds each, to a greater extent than their male counterparts. In other words, the male teachers elongate spells of information giving more than do the female teachers while the latter elongate spells of questioning more than do the former.

A consistent preference for and a deliberate use of questions by female teachers is further evidenced.

#### Emphasis on Content

The Content Cross Ratio (CCR) is a measure of the concern with content. The introductory details regarding content cross (vide Figure 11) have been discussed earlier (pages 142-145). The CCR for the matrix relating

to male teachers works out to 56 per cent while that for the matrix relating to female teachers is 52 per cent. That means that the male teachers have laid more emphasis on content than has been <sup>the</sup> case with the female teachers.

The two principal component categories comprising CCR are those of teacher questions (category four) and teacher lecture (category five).

In the matrix representing male teachers questions (10475 tallies out of 105058) account for about 10 per cent while the corresponding percentage from the matrix representing female teachers (8049 tallies out of 72489) works out to about 11 per cent with reference to the matrix total.

Information delivery likewise is at 46 per cent (48681 out of 105058) for male teachers and at 41 per cent (29669 out of 72489) for female teachers.

TABLE XIII

CONTENT CROSS COMPONENTS - SEX		
Ratio/Component	Male teachers (percentage)	Female teachers (percentage)
CCR	56	52
Questions	10	11
Information delivery	46	41

Table XIII clearly shows that male teachers exhibited a relatively more concern for content and that this was mostly in the form of increased information delivery while in fact their 'questions' fell short of those of the female teachers. On the whole, 'questions' have been roughly one-fourth of the information delivery in the case of both groups of teachers.

The totality of the content emphasis may be conceived as composed of three segments - content emphasis buried in teacher talk, content emphasis in the context of student talk and content emphasis following silence/confusion.

Table XIV summarises the relative percentage figures for these three segments of content emphasis in the two matrices.

TABLE XIV

## CONTENT EMPHASIS SEGMENTS - SEX

Segment	Male teachers (percentage)	Female teachers (percentage)
Content emphasis buried in teacher talk	48	44
Content emphasis in the context of student talk	4	5
Content emphasis following silence/confusion	4	3

From the Table XIV, we gather that although there

are no appreciable variations between the two groups of teachers as regards the last two items, with regard to content emphasis buried in teacher talk the male teachers are found to be not only more concerned with content (as has been revealed earlier in Table XIII) but also such relative preference for content delivery is exhibited more in the context of teacher talk, (48 per cent) than in the case of female teachers (44 per cent).

#### The Use of Praise

Information relating to the use of praise (vide Figure 12) is reconstructed from a review of row two and column two. The details have been discussed earlier (pages 145-149).

As is obvious from the matrix relating to the male teachers, there are 3602 tallies in column 2 which is 3.4 per cent of the total. The total use of praise in the case of the female teachers has been (2199 tallies) 3.0 per cent.

The amount of praise/encouragement buried in the teacher talk itself is given by the seven cells in column 2 rows 1 through 7. Such praise/encouragement in the case of male teachers is (1303 out of 3602) 36.2 per cent and the segment of praise/encouragement that arose in direct reaction to student talk (2139 out of 3602) has been 59.4 per cent, while praise/encouragement given following silence/confusion (160 out of 3602) works out to 4.4

per cent.

In the case of the female teachers the respective percentages are 24.2 per cent, 73.1 per cent and 2.7 per cent.

In Table XV are summarised these percentages and a few other ingredients of praise as explained below.

TABLE XV  
ANALYSIS OF PRAISE/ENCOURAGEMENT - SEX

Descriptions	Male teachers (percentage)	Female teachers (percentage)
Total use	3.4 per cent (with refer- ence to total interaction)	3.0 per cent (with reference to total inter- action)
Praise buried in teacher talk	36.2	24.2
Praise/Encouragement in direct reaction to student talk	59.4	73.1
Praise/Encouragement following silence	4.4	2.7
Praise following pupil response	52.7	67.5
Praise following pupil initiation	6.7	5.6
Praise as launching pad for teacher talk	63.3	52.8
Praise as prompt to student talk	27.2	41.0
Praise leading to silence	9.5	6.2

Descriptions	Male teachers (percentage)	Female teachers (percentage)
Praise leading to pupil response	23.4	36.9
Praise leading to pupil initiation	3.7	4.0
Praise followed by teacher questioning	15.4	17.9
Praise followed by teacher lecturing	16.9	10.1

From the Table XV, it is seen how praise follows pupil response, in the case of female teachers in a larger measure (67.5 per cent) than in the case of male teachers (52.7 per cent). However, this relative position is somewhat interchanged in the case of praise following pupil initiation which is of a higher order (6.7 per cent) in the case of male teachers than in the case of female teachers (5.6 per cent).

On the whole, a larger percentage of praise etc. (63.3 per cent) has been used as the launching pad for further teacher talk by the male teachers than by the female teachers (52.8 per cent) (Row two, columns 1 through 7).

Perhaps, as might be expected in consequence of the previous revelation, a larger percentage of praise etc. has been used as prompt to student talk by female

teachers (41.0 per cent) than by male teachers (27.2 per cent) (Row 2, columns 8 and 9).

Silence following praise etc. has been observed to occur more (9.5 per cent) in the case of male teachers than in the case of female teachers (6.2 per cent) (cell 2-10).

On further scrutiny of row 2 in the matrices, as made in the table, it is clear that female teachers, in whose case we noticed a higher percentage of praise used as prompt to student talk, have a higher percentage of it (36.9 per cent) as prompting students' responsive talk than in the case (23.4 per cent) with female teachers. The same relative position between the groups of teachers persists in respect of praise leading to pupil initiation (cell 2-9) also, but to a marginal extent.

There can be no gainsaying the fact that praise/encouragement serves as an effective bait for student participation. Even the shy and the recalcitrant can be roped in by resourceful teachers if they ingeniously wield the wand of magic which is praise/encouragement. Care should, however, be taken to see that the use of praise does not become indiscriminate lest the teachers should make themselves the 'laughing stock' for the students. An exercise of deliberation and restraint should regulate the resort to praise for fruitful results.

A larger percentage (17.9 per cent) of praise etc. has been used by the female teachers as the context for questions than in the case of male teachers (15.4 per cent).

Male teachers whose faithful concern for content was obvious from a number of earlier indices, again are found using a larger percentage of praise (16.9 per cent) for buttressing content delivery than has been the case with female teachers (10.1 per cent).

#### Teacher Reaction to Student Statements

In the course of classroom interaction, teacher's immediate reactions to students' statements are conceptually significant. All such reactions are contained in the fourteen cells in rows 8 and 9, columns 1 through 7, as described (pages 149-153) and as illustrated (vide Figure 13), earlier.

Teachers' constructive reaction by way of appreciating their feelings, praising/encouraging them and accepting/clarifying their ideas, shown in the context of teacher-controlled student talk is gathered from the sum of cell totals in (8-1), (8-2) and (8-3) while such constructive reaction shown in the context of students' self-initiated talk, which reaction might be more far-reaching in their benign implications, is revealed by the sum of cell totals in (9-1), (9-2) and (9-3).

Whether teachers choose students' responsive talk or their self-initiated talk more as the context for questions may be an informative revelation while analysing cells (8-4) and (9-4). Likewise the context for content delivery can be probed with reference to students' responsive and self-initiated talk by examining the cells (8-5) and (9-5).

The use of categories six and seven (orders/commands and criticism) by their very nature is likely to be more significant when resorted to in the context of student talk, than otherwise.

Category six (orders/commands) occurs mostly as innocuous injunctions when teachers say 'stop', 'sit down', 'next' whereby they seek termination of a student's (again mostly responsive) talk. Student loud reading, by turns, and rapid short answer drill sequences are some of the instances in point. Criticism that follows students' responsive talk, though sometimes pertaining to such talk, on a fairly large number of occasions, is triggered by uncoded non-verbal occurrences in classroom, or even to verbal events that occurred earlier.

Teachers' non-encouraging and perhaps hostile attitude to students' self-initiated and free talk is best portrayed through the build-up in the cell (9-7) while their apathy towards students' free talk is indicated by the load in the cell (9-6) which sometimes is an

indication of the teachers' impatience of the students' unforeseen and free expressions.

In Table XVI are given the percentages of the different components of teacher's immediate reactions to student talk, which highlights the contrasts in this regard between male and female teachers. All the percentages given are with reference to the respective teacher talk totals.

TABLE XVI  
TEACHER REACTIONS TO STUDENT TALK - SEX

Component	Male teachers (percentage)	Female teachers (percentage)
Total immediate reaction (sum of 14 cells - Rows 8 and 9, columns 1 through 7)	13.2	16.0
Constructive reaction to students' responsive talk (cells 8-1, 8-2 and 8-3)	4.7	5.3
Constructive reaction to students' self-initiated talk (cells 9-1, 9-2 and 9-3).	0.8	0.8
Questions in the context of students' responsive talk (cell 8-4)	2.8	4.8
Questions following students' self-initiated talk (cell 9-4)	0.6	0.6
Content delivery in the context of students' responsive talk	1.6	1.8

Component	Male teachers (percentage)	Female teachers (percentage)
Content delivery following students' self-initiated talk	1.2	0.9
Orders and criticism following students' responsive talk	1.3	1.4
Orders and criticism in the context of students' self-initiated talk	0.4	0.5

From the Table XVI, it is clear that a larger percentage of teacher talk (16.0) in the case of female teachers has been by way of total immediate reaction to student statements than has been in the case of male teachers (13.2 per cent).

While the two groups of teachers stand on par with each other with regard to the extent of use of constructive integration in the context of students' self-initiated talk (0.8 per cent in both) they differ as regards its use in the context of students' responsive talk. The female teachers have spent more percentage (5.3) of their talk in this fashion than their male counterparts (4.7 per cent).

Likewise, the two groups of teachers make a 'draw' as regards the use of questions in the context of students' self-initiated talk (0.6 per cent in both);

but differ markedly as regards the use of questions in the context of students' responsive talk which has been 4.8 per cent in the case of female teachers and 2.8 per cent in the case of male teachers.

Their relative positions as regards content delivery in the two different contexts change, though not in a marked manner, between them. While the female teachers have had 1.8 per cent of their talk as the content delivery in the context of students' responsive talk the male teachers used a slightly lesser percentage - namely, of 1.6 per cent of their talk in such a sequence. It is these relative positions of theirs that interchange when the context of students' self-initiated talk comes.

Herein the male teachers have had 1.2 per cent of their talk taking off from students' self-initiated talk while the female teachers had only 0.9 per cent of their talk launched from students' self-initiated talk.

As regards the use of orders and criticism in the context of both types of student talk, on the whole, the two groups of teachers do not differ very widely although the female teachers consistently have shown a tendency for using more of orders and criticism in both situations than the male teachers (1.4 per cent is greater than 1.3 per cent and 0.5 per cent is greater than 0.4 per cent).

## PUPIL TALK

Pupil talk is recorded under only two categories, one representing their 'response' behaviour and the other 'initiation' behaviour. But then, because of the matrix technique of tabulation and analysis of observational data, rich information can be dug out of the matrix and this can add further dimensions to the study of teacher behaviour for it is, in the ultimate analysis, teacher talk that is responsible for student talk in a classroom setting and study of student talk, ipso facto, is an indirect probe of teacher talk only.

However, because of the strikingly fewer number of categories for recording pupil talk the amount of information that can be deciphered from the matrices is relatively limited. Certain conventional indices or dimensions of pupil talk lend themselves to easy calculation and aid interpretation.

### Pupils' Initiation

In a classroom setting, pupils' initiation is a significant phenomenon. Much of the relatively more constructive dialogue between the teacher and the students primarily involves pupils' 'self-initiated' talk keeping the teacher with having to 'respond' to the pupils. A very sensitive index that serves as a measure of such pupil initiation (vide Figure 14) is given by the

'Pupil Initiation Ratio (PIR)' which indicates the proportion of pupil talk judged by the observers to be acts of initiation.

On calculation, the PIR works out to 18 for male teachers and 13 for female teachers as shown in Table XVII.

Pupil initiation is a larger component of pupil talk under male teachers than under female teachers. This position seems consistent with the teachers' TRR ratios discussed earlier, which show greater response ratio on the part of male teachers (62) than female teachers (57).

#### Steady State Component

Analogous to TSSR (page 141) which reflects the tendency of the teacher to remain in the same category for spells of larger than 3 seconds is the index, Pupil Steady State Ratio (PSSR) (vide Figure 15) which is calculated as shown in page 158, by adding the frequencies in the (8-8) and (9-9) cells, multiplying the sum by 100, and dividing by all pupil talk tallies.

The PSSR's for male teachers and female teachers work out to 47 and 53 respectively, as shows in Table XVII.

TABLE XVII  
PUPIL TALK - SEX

Ratio	(under) Male teachers (percentage)	(under) Female teachers (Percentage)
PIR	18	13
PSSR	47	53

It is seen how pupils under female teachers show slightly greater capacity to extend their talk in the same category than their counterparts under male teachers. This, however, means that the former show lesser capacity for flexibility and mobility between categories than the latter.

#### Prompt to Pupil Talk

As noted earlier, it is perhaps teacher talk, more often than not, that is either immediately or ultimately responsible for pupil talk in the classroom. Hence it would be significant information to find out how the pupil talk is sometimes immediately prompted by teacher talk. The "immediate" prompt to pupil talk (vide Figure 16), as contained in teacher talk besides explaining the circumstances in which pupils began talking provides us a measure of the teacher's control over the generation of pupil talk.

The percentage of such pupil talk works out to

45 in the case of male teachers while it is 40 in the case of female teachers (Table XVIII). A greater percentage of pupil talk thus seems to be directly and immediately prompted by the male teachers than is the case with female teachers.

Perhaps more significant would be the information regarding how much percentage of pupil talk is of the 'self-initiated' type that is directly prompted by teacher talk.

The percentage of 'self-initiated' pupil talk in the context of teacher talk works out to 9 in the case of male teachers and 6 in the case of female teachers (Table XVIII). This indicates that pupil talk is more likely to be 'self-initiated' under male teachers than under female teachers.

As is clear from the percentages reproduced in Table XVIII not only do pupils under male teachers talk more in the context of teacher talk than their counterparts under female teachers but also the former are capable of more 'self-initiated' talk in immediate sequence to teacher talk than the latter.

TABLE XVIII  
PROMPT TO PUPIL TALK - SEX

Description	(under) Male teachers (percentage)	(under) Female teachers (percentage)
Pupil talk in the context of teacher talk	45	40
Self-initiated pupil talk in the context of teacher talk	9	6

It is also evident from the Table XVIII which analyses pupil talk in the 'context' of teacher talk that the self initiated component of such pupil talk is one-  
(9/45)  
fifth/ of the total such talk under male teachers while it is far lesser (6/40) under female teachers.

#### Sequential Patterns of Pupil Talk

Some significant sequential patterns of pupil talk could be identified on further anatomising the columns 8 and 9 in the matrices.

In Table XIX are given the percentage figures for the different sequences.

A probe of the rows 8 and 9 would yield information regarding the 'succeeding' sequences from pupil talk.

TABLE XIX  
SIGNIFICANT SEQUENCES OF PUPIL TALK - SEX

Sequence	(under) Male Teachers (percentage)	(under) Female Teachers (percentage)
Pupil responsive talk	81.8	87.3
Pupil responsive talk following teacher praise/encouragement	4.1	4.6
Pupil responsive talk following teacher questions	25.2	24.5
Pupil responsive talk following teacher directions	4.8	3.6
Pupil responsive talk following silence/confusion	4.5	4.0
Pupil self-initiated talk	18.2	12.7
Pupil self-initiated talk following teacher response	0.9	0.7
Pupil self-initiated talk following teacher questions	4.2	3.3
Pupil self-initiated talk following silence/confusion	1.8	1.0
Pupil self-initiated talk following teacher directions and criticism	0.6	0.5
Pupil self-initiated talk developing from pupil responsive talk	1.4	1.5
Pupil self-initiated talk receding into pupil responsive talk	0.5	0.6
Pupil responsive talk followed by silence/confusion	5.2	3.7
Pupil self-initiated talk followed by silence/confusion	1.5	1.0

As we commence the scrutiny first in respect of pupils' responsive talk, the first feature of marked contrast, is that of its extent under the two groups of teachers. Under female teachers there is more of responsive pupil talk (87.3 per cent) than under male teachers (81.8 per cent). This picture is understandably consistent with the relative measures of total 'initiated' talk of pupils which is strikingly more under male teachers (18.2 per cent) than under female teachers (12.7 per cent).

Teacher praise/encouragement led to 4.1 per cent of pupils' responsive talk under male teachers while the corresponding figure for female teachers is 4.6 per cent (cell 2 - 8). Teacher questions prompted 25.2 per cent of pupils' responsive talk in the case of male teachers while in the case of female teachers the corresponding percentage is 24.5 (cell 4-8).

Although there is thus no appreciable contrast between the two groups in respect of baiting pupils 'responsive talk' through questions, there is a marked difference as regards the amount of such pupil talk brought out by means of orders/commands (cell 6-8). While male teachers brought out 4.8 percentage of pupil talk in this way the female teachers' score is 3.6 per cent.

It may be mentioned here that most of the tallies in this cell are the result of the teachers 'ordering' loud reading from the text, 'turns' during such process,

directions in the course of rapid drill and other such instructions given in order to carry forward the class-room communication in the desired direction and manner.

The students under male teachers have had to redeem 4.5 per cent of their talk from silence/confusion as responsive talk while such a lot befell the students under female teacher to a smaller extent-namely, 4 per cent only (cell 10-8).

The amount of pupils' self-initiated talk in the context of teachers' constructive response, though very limited on the whole, shows a difference under the two sets of teachers. While 0.9 per cent of the pupil talk could flow forth from teachers' favourable responsive talk in the case of male teachers, pupils under female teachers could have only 0.7 per cent of their talk developing from teachers' responsive talk (column 9, rows 1, 2 and 3).

The extent to which questions could be put such as to evolve from the pupils their original and self-initiated talk is a point on which the two groups of teachers vastly differ. While only 3.3 per cent of all student talk was such self-initiated pupil talk emanating following questions from female teachers, the male teachers could have to their credit as much as 4.2 per cent of their pupils' total talk, to trigger through questions as their pupils' self-initiated talk (cell 4-9).

Pupils under male teachers retrieved as much as 1.8 per cent of their total talk as their self-initiated talk from silence/confusion while the corresponding figure for pupils under female teachers was 1.0 per cent.

Pupils' unpredictable and self-initiated talk, occurring in the context of directions and criticism from teacher could, to some extent, point to problems of classroom management.

Such self-initiated talk of pupils in the context of teacher directions and criticism, which is on the whole infinitesimal, is slightly more in the case of the pupils under male teachers (0.6 per cent) than in that of the pupils under female teachers (0.5 per cent) - (cells.6-9, 7-9).

Pupils' responsive talk perhaps under expert teacher behaviour patterns could develop into their self-initiated talk. Though the development is wholly of their own making, it cannot be that the teacher behaviour is not at least indirectly responsible for such a wholesome development.

Such a development in the case of pupils under male teachers was only 1.4 per cent while it could be 1.5 per cent under female teachers (cell 8-9). But the slightly superior position of the female teachers is lost to the male teachers in another but related aspect of sequential pattern. The female teachers allowed 0.6 per

cent of their pupil talk to degenerate from their self-initiated talk to responsive talk while the percentage is 0.5 for male teachers (cell 9-8).

The fluency and spontaneity of pupil talk could in some measure be judged from the extent to which silence/confusion trails pupil talk.

Pupils under male teachers had 5.2 per cent of their talk as their responsive talk followed by silence/confusion which is more than that with the pupils under female teachers - namely, 3.7 per cent (cell 8-10). A similar balance of relative positions between the two sets of teachers prevails with regard to the self-initiated talk of pupils followed by silence/confusion. While 1.5 per cent of pupil talk under male teachers was followed by silence/confusion, such pupil self-initiated talk trailing into silence/confusion under female teachers has been 1.0 per cent.

#### SILENCE/CONFUSION

##### The Context of Silence/Confusion

Analysis of the incidence of silence/confusion may not except to a limited extent, shed much light on the communication patterns in classroom situation, particularly because the provision of category ten covers both spells of silence and occurrence of confusion as also some classroom non-verbal activities like blackboard work done for

small spells of few seconds intermittently. But still a general perusal of the pattern of the incidence of the category ten may throw the sequences of teacher talk and pupil talk into some clearer perspective.

The context of silence/confusion (vide Figure 17) is studied by conceiving the occurrence of the phenomenon in three segments as follows. The computational details have been given earlier (page 161). In Table XX are given the percentages of silence/confusion in the three segments under the two sets of teachers.

TABLE XX  
THE CONTEXT OF SILENCE/CONFUSION - SEX

Segment	(under) Male teachers (percentage)	(under) Female teachers (percentage)
Silence/Confusion following teacher talk	33.6	28.1
Silence/Confusion following pupil talk	9.4	8.1
Sustained silence/confusion	57.0	63.8

It is seen from the Table XX that the largest segment of silence/confusion in both situations is that of its sustained occurrence. A strikingly greater percentage of silence/confusion was sustained in classes under female teachers than under male teachers.

In classes under male teachers both the other two

segments of silence/confusion - namely, that following teacher talk and that following pupil talk are more than has been the case in classes under female teachers. The amount of silence/confusion that trailed behind the male teachers' talk is strikingly more (33.6 per cent) than in the case of female teachers (28.1 per cent).

#### The Role of Silence/Confusion

While the distribution of tallies in column ten of the matrix would yield information regarding the events preceding the incidence of silence/confusion the distribution pattern in row ten would yield information regarding those that followed the incidence of silence/confusion.

The events following it as said earlier (page 164) do throw some light on the effects of the incidence of silence/confusion. The role played by silence/confusion can be probed herein (vide Figure 18).

In Table XXI are given the measures of silence/confusion, that served as the base for teacher talk and <sup>which</sup> that served as the base for pupil talk.

TABLE XXI  
THE ROLE OF SILENCE/CONFUSION - SEX

Description	(under) Male teachers (percentage)	(under) Female teachers (percentage)
Silence as base for teacher talk	34.11	27.64
Silence as base for pupil talk	8.86	8.54

34.11 per cent of silence/confusion has been the base for teacher talk in the case of male teachers while for female teachers it was 27.64 per cent. More of silence/confusion is thus seen to have preceded male teachers' talk than is the case with female teachers.

As for cushioning pupil talk it has played again slightly greater role in the case of pupils under male teachers where the percentage is 8.86 while those under female teachers had used 8.54 per cent of silence/confusion to precede their talk.

#### IV. CLASSROOM BEHAVIOUR OF MARRIED AND UNMARRIED TEACHERS (STUDY OF MATRICES)

##### Comparison of Matrices

As in the case of the variable 'sex', the variable 'marital status' of the teacher is also dichotomous and hence the total of 174 teachers may be divided into two groups of married and unmarried teachers. There

are 140 married teachers and 34 unmarried teachers constituting the sample. Their individual matrices have been combined such that they yielded two Master Matrices one representing married and the other unmarried teachers. The matrices are given in Figures 21 and 22. (on the next page ).

Darwin's Likelihood Ratio Criterion test was applied to the two matrices with a view to ascertaining whether or not the sequential distributions contained in them are significantly different.

Some of the stages in the calculation of the standard score 'Z' are in given below. Logarithms to the base 10 are used.

The sum of products of the 100 cell frequencies and their logarithms for the matrix relating to married teachers	565612.0409
The sum of products of the 100 cell frequencies and their logarithms for the matrix relating to unmarried teachers	113811.2381
The sum of products of the 10 row totals and their logarithms for the matrix relating to married teachers.	635505.5164
The sum of products of the 10 row totals and their logarithms for the matrix relating to unmarried teachers	130821.8813

	1	2	3	4	5	6	7	8	9	10	Total
1	21	1	-	12	8	3	-	1	3	8	57
2	3	762	307	729	668	286	23	1328	168	386	4660
3	2	107	581	649	1257	100	12	165	66	370	3309
4	4	235	241	2416	728	343	63	7497	1115	1947	14589
5	6	314	44	3912	54686	823	59	274	751	2470	63339
6	2	103	25	672	624	713	63	1380	129	884	4595
7	-	24	5	130	93	55	639	60	30	147	1183
8	7	2653	1635	3150	1548	1124	151	13935	439	1429	26071
9	4	276	381	560	985	329	54	167	1731	392	4879
10	8	185	90	2359	2742	819	119	1264	447	12424	20457
Total	57	4660	3309	14589	63339	4595	1183	26071	4879	20457	143139

FIGURE 21

COMBINED MATRIX FOR MARRIED TEACHERS

	1	2	3	4	5	6	7	8	9	10	Total
1	7	-	-	1	10	-	1	1	3	3	26
2	-	148	85	220	162	45	4	328	56	93	1141
3	-	23	229	204	382	22	7	88	16	86	1057
4	-	36	67	667	132	70	12	2064	335	552	3935
5	7	67	7	997	12996	160	10	65	133	569	15011
6	-	11	8	147	119	136	11	254	31	203	920
7	-	4	1	33	10	9	61	18	12	37	185
8	2	730	519	920	378	218	32	3067	129	308	6303
9	7	87	115	148	216	94	12	48	316	100	1143
10	3	35	26	598	606	166	35	370	112	2606	4557
Total	26	1141	1057	3935	15011	920	185	6303	1143	4557	34278

FIGURE 22

COMBINED MATRIX FOR UNMARRIED TEACHERS

$$\chi^2 = 1575.18535$$

$$Z = 42.741$$

The value of Z thus turns out to be greater than the critical value of 2.58 and so the null hypothesis concerning the sequential distributions in the matrices is rejected at 0.01 level of confidence. This shows that the two matrices differ significantly. This verdict of 'significant differences' supplies a rational basis to attempts at probing the distribution patterns of tallies in the two composite matrices under study for revelatory insights into their comparative features.

### Matrix Interpretations

#### Some General Features

On a preliminary scrutiny of the two matrices, some contrasting features of a general nature surface up. We take note of the fact that under the group of married teachers there are 140 teachers while the unmarried teachers are 34 in number constituting the sample. This uneven composition though inconsequential to the interpretations made thereon attracts the notice of the reviewers.

#### Total Time of Recorded Interaction

Perhaps the one aspect that is directly affected by the number of teachers observed is the total time of recorded interaction. Due to the widely differing number of teachers constituting the two groups the total time of recorded interaction in the case of married

teachers (about 119 hours) is far in excess of that of the unmarried teachers (about 29 hours). Incidentally it may be mentioned that the relatively small number of unmarried teachers in the sample owes its origin to the difficulty in getting such type of teachers. Teachers mostly are found to be married and so unmarried teachers have been hard to get. Celibacy with the teaching fraternity, is perhaps a near - rarity.

Since total time of recorded interaction makes due allowance for discounting the spells of 'no interaction' occurring in classroom situations, the number of teachers observed cannot wholly be causal for the differences noted in the total time of recorded interaction. But then, the ratio of their total periods in this regard (119:29 which is nearly 4:1) compares consistently with the ratio of numerical strength (140:34 which is also about 4:1).

#### Per-Hour/Per-Teacher Interaction

Since each teacher was observed for one scheduled hour the quotient of 'per hour' and 'per teacher' interaction can be got by dividing the total time of interaction recorded by the number of teachers involved.

The per hour/per teacher interaction in terms of tallies works out to 1022 tallies in the case of

married teachers and 1008 tallies in the case of unmarried teachers. This position obviously does not show any appreciable difference though one may note that in classes under married teachers the communication has been marginally faster.

#### Vacant Cells

In the matrix representing married teachers there are three cells having fallen vacant. They are (1-3), (1-7), and (7-1). It is noteworthy, though not unusual, that all these cells belong to the realm of teacher talk. Category 1 means acceptance of pupils' feelings; category 3 means acceptance of pupils' ideas and category 7 signifies criticism.

In the matrix relating to unmarried teachers there are as many as eight cells lying vacant, again all falling within the jurisdiction of teacher talk. They involve categories 1, 2, 3, 4, 6 and 7. It may be noted that category 2 stands for praise; category 4 for questions; and category 6 for orders/commands. The cells are (1-2), (1-3), (1-6), (2-1), (3-1), (4-1), (6-1), and (7-1). Out of these eight cells, it may be noted that two cells - namely, (1-3) and (7-1) are figuring in the other matrix while the third cell (1-7) just carries only one tally in the matrix relating to unmarried teachers.

Of the vacant cells in the case of married teachers the loss to constructive integration area of the matrix is only one cell - namely, the cell (1-3) while similar loss in respect of the matrix relating to the unmarried teachers is of a higher order. There are four such cells-namely, (1-2), (1-3), (2-1), and (3-1). As such this loss of as many as four cells to the 'constructive integration' cluster of nine cells is a profound deprivation of emotional integration for the pupils in classes under unmarried teachers.

On the whole, it is noteworthy how all the vacant cells in both the matrices under study involve category one with the result that the cells lie either in row one or in column one. This implies that category one has not been fully harnessed. This lapse, however, need not always provoke any sense of grief since some of the vacant cells involving criticism etc. far from causing concern may cause a sigh of relief to be heaved. If we can, however, by implication hazard any value judgment in this regard we may note with grief that the vacant cells in the region of constructive integration constitute an under-utilization by the teachers of the possible emotional-social integration in the classes. Naturally, therefore, the vacant cells involving criticism etc. would call for no elegy from analysts.

### Principal Components of Communication

Yet another general feature of communication pertains to the relative extents of the three principal components of the interchange in classroom - namely, teacher talk, student talk and silence/confusion (vide Figure 2). An overall review of the relative measures would perhaps set a frame of reference for a subsequent fuller and deeper analysis and interpretation.

Teacher talk (vide Table XXII) has been 64.1 per cent by married teachers and 65.0 per cent by unmarried teachers. Pupil talk in classes under married teachers has been 21.6 per cent while it has been to a slightly greater extent of 21.7 per cent in classes under unmarried teachers. As for silence/confusion the component has been 14.3 per cent in the case of married teachers and 13.3 per cent in the case of unmarried teachers.

As for the differences, in terms of total incidence, amongst the components between the two groups of teachers, there is no appreciable variation calling for comment. The small differences in respect of teacher talk and silence/confusion are too marginal to warrant any profound discussion. But then, this is not to say there are no significant differences lying buried beneath this seemingly similar surface situations. A perusal of the cell-load patterns of distribution would serve to focus the differences in a clearer manner.

In Table XXII are given the percentage occurrences of the three components along with the expected measures in the light of Flanders' (1970) results.

TABLE XXII  
PRINCIPAL COMPONENTS OF COMMUNICATION -  
MARITAL STATUS

Component	Married teachers (percent- age	Unmarried teachers (percent- age	Flanders' results (percent- age
Teacher talk	64.1	65.0	68
Pupil talk	21.6	21.7	20
Silence/Confusion	14.3	13.3	12

It is seen how the teacher talk in both the cases is short of the expectation while student talk again in both the cases is marginally in excess of the expectation. While silence/confusion is also more than the expectation, in both situations, the excess is of a greater order in the case of married teachers.

#### Teacher Talk - Student Talk Balance

The Ratio of Teacher talk - Student talk (T/S ratio) gives us a crude estimate of the relative incidence of these two principal components of communication.

The T/S ratio for married teachers is 2.96 while the ratio for unmarried teachers is 2.99. The ratio being not a very sensitive index does not indicate any appreciable variation between the two groups of teachers in this respect. However, the difference indicates that students in classes with married teachers get more opportunity to respond, react and initiate than their counterparts in classes with unmarried teachers.

#### Flexibility of Communication

As mentioned earlier (pages 120-123) the ten steady-state cells signify the sustained occurrence for spells of more than three seconds of events and hence Steady-State-Ratio (SSR) computed on the combined load in the ten cells (vide Figure 3) with reference to the total interaction is a measure of the flexibility of speakers in the classroom, in terms of communication mobility from one category to another. An unusually high SSR would reveal an extraordinarily low flexibility, since the remaining combined load in the other transition cells would be at a low mark.

The SSR is 61.4 per cent in the case of married teachers and 59.0 per cent in the case of unmarried teachers. Hence, though slightly different, unmarried teachers show greater capacity for manoeuvring flexibility in classroom communication than married teachers, on the whole.

### Flow of Communication

Incidence of category 10, as mentioned earlier (pages 123-125), signifies interruptions to the flow of communication.

The total incidence of category ten is to the extent of 14.29 per cent in the case of married teachers while it is 13.29 per cent in the case of unmarried teachers. This superficial review of the total occurrence of silence/confusion cannot lead us to any significant conclusions since much more depends upon the constituent and sequential nature of the incidence of category ten.

However, as the initial picture turns out, the flow of communication on the whole has been more hindered in classes under married teachers than that under unmarried teachers by reason of greater extent of incidence of silence/confusion in the former situation.

### TEACHER TALK

A review of the tally build-up in the relevant areas of the matrix for an appreciation of the several dimensions of teacher talk is a necessary exercise in any matrix study.

### Indirect Teacher Behaviour

As in the study of sex so also here in the case of marital status the computation of the

conventional I/D and i/d ratios has been done based on the two combined matrices of married and unmarried teachers.

The unmarried teachers have shown I/D ratio of 0.27 which is more than the I/D ratio of 0.24 shown by married teachers. This means that when emphasis on content is included in the concept of indirectness the unmarried teachers show greater indirect influence than married teachers.

The unmarried teachers again consistently steal the show over their married counterparts with a larger i/d ratio of 0.66 which is in excess of the married teachers' i/d ratio of 0.58. The verdict here, therefore, is that on purely the social-emotional plane also (which excludes the emphasis on content) the unmarried teachers show a consistently greater tendency for indirect influence.

It implies that unmarried teachers use more questions, accept the feelings and ideas of pupils more and also praise/encourage them more than do the married teachers.

#### Teachers' Response - Initiation Nexus

As described earlier (pages 128-129) the concepts of Teacher Response (vide Figure 4) and Teacher Questioning (Vide Figure 5) are significant

giving rise to the measures, Teacher Response Ratio (TRR) and Teacher Question Ratio (TQR) respectively.

Our frame of reference, as has been the case earlier with regard to sex, consists of the two overall ratios, TRR and TQR.

Within this framework, the one striking feature that calls for comment is that with both the groups of teachers their 'response' has been overwhelmingly greater than their 'initiation'. But then, on reflection it seems that this perhaps may just be a usual thing since our 'initiation' concept here includes only 'questions' while in fact there are still other categories of teacher talk which are of 'non-response' type and which may serve as initiation.

In Table XXIII are given the relative measures in percentage of the two ratios for the two groups of teachers.

TABLE XXIII  
TEACHER RESPONSE - INITIATION - MARITAL  
STATUS

Ratio	Married teachers (percentage)	Unmarried teachers (percentage)
TRR	58.1	66.8
TQR	18.7	20.8

The 'response' on the part of unmarried teachers (66.8 per cent) is decidedly larger than that on the part of the married teachers (58.1 per cent). Again consistent with this comparative picture of TRR, their positions with regard to TQR show that unmarried teachers have used more questions (20.8 per cent) than has been the case with married teachers (18.7 per cent). On the whole, therefore, unmarried teachers use more questions, accept pupils' feelings and ideas more and praise/encourage them more than do married teachers.

Again consistent with their higher I/D ratio, the unmarried teachers here are showing higher TRR. As for i/d ratio it goes without saying that the TRR index has to be consistent with it since computationally it is the same as the latter except that the TRR is computed as a percentage.

#### Instantaneous Teacher Response - Initiation Nexus

The phenomena of teacher response and teacher questioning occurring in immediate sequence to pupil talk (vide Figures 6 and 7) known as Instantaneous Teacher Response Ratio (TRR 89) and Instantaneous Teacher Question Ratio (TQR 89) respectively, are very significant and are computed as described earlier (page 135).

The earlier position of the unmarried teachers vis-a-vis their married counterparts as regards the

overall indices of TRR and TQR remains unaltered even in respect of the 'Instantaneous' indices, TRR 89 and TQR 89 as revealed in the Table XXIV.

TABLE XXIV  
TEACHER INSTANTANEOUS RESPONSE - INITIATION -  
MARITAL STATUS

Ratio	Married teachers (percentage)	Unmarried teachers (percentage)
TRR 89	74.9	80.4
TQR 89	59.4	64.3

Here again, it is the unmarried teachers who come out with a greater percentage of TRR 89 (80.4) than their married counterparts (74.9). This relative position in regard to 'instantaneous' response prevails also in respect of their 'instantaneous' questioning influence. The TQR 89 of the unmarried teachers is 64.3 per cent while that of the married teachers <sup>is</sup> only 59.4 per cent, indicating that the unmarried teachers put up a larger percentage of instantaneous questioning behaviour at the cessation of pupil talk than the married teachers.

#### Constructive Integration

As mentioned earlier (pages 135-136), constructive integration refers to accepting pupils' feelings and **ideas** and praising/encouraging them in an

integrative manner in classroom communication. It is computed from the total of tallies in the nine cells in rows 1, 2, and 3, columns 1, 2, and 3 (vide Figure 8).

The unmarried teachers score marginally over their married counterparts as regards the extent of 'constructive integration' as computed with reference to the total interaction. Their percentages are 1.43 and 1.24 for the unmarried and married teachers respectively. But then, the extent of constructive integration, computed in the more sensitive context of the combined occurrence of categories one, two and three only, the position is reversed, again marginally, between the two groups of teachers. While the married teachers record a score of 22.22 per cent, the unmarried teachers score 22.12 per cent.

Table XXV contains these percentages.

TABLE XXV

EXTENT OF CONSTRUCTIVE INTEGRATION - MARITAL STATUS

Index	Married teachers (percentage)	Unmarried teachers (percentage)
Constructive integration with reference to total interaction	1.24	1.43
Constructive integration with reference to categories 1, 2, and 3	22.22	22.12

On the whole, both married and unmarried teachers accept pupils' feelings and ideas, praise/encourage them in an integrative manner, to nearly identical degrees.

### Vicious Circle

As illustrated (vide Figure 9) and described earlier (pages 137-139) the phenomenon of vicious circle connotes the mutually transitional and sustained use of orders/commands and criticism.

It is recalled how the unmarried teachers' performance, as evident through 'constructive integration' was, at best, nearly identical with that of their married counterparts.

The performance of the unmarried teachers in respect of 'vicious circle', however, provides a conclusive evidence to their distinctly 'indirect' behaviour vis-a-vis their married counterparts.

TABLE XXVI

#### INCIDENCE OF VICIOUS CIRCLE - MARITAL STATUS

Index	Married teachers (percentage)	Unmarried teachers (percentage)
Vicious circle with reference to total interaction	1.02	0.63
Vicious circle with reference to categories 6 and 7	25.44	19.63

As is clear from the Table XXVI the unmarried teachers are guilty of vicious circle only to the extent of 0.63 per cent with reference to total interaction while the corresponding figure for married teachers is 1.02 per cent. The incidence of vicious circle, computed even with reference to the two categories of six and seven also substantiates this revelation. While the married teachers here committed 25.44 per cent of their total use of categories six and seven by way of 'vicious circle' the unmarried teachers have had only 19.63 per cent as the corresponding figure.

It is clear, therefore, that married teachers use far greater extent of orders/commands and criticism in classroom communication than do the unmarried teachers. It follows that students in classes with unmarried teachers are not subjected to restraint and censure so much as their counterparts in classes with married teachers are.

#### Teacher Steady State Talk

When the teacher, in the course of his talk, remains in one and the category like, for example lecture, praise and so on, such steady state talk described (pages 138-141) and as illustrated (vide Figure 10) earlier is studied by computing the ratio called Teacher Steady-State Ratio (TSSR).

In the case of the matrix representing married teachers the Teacher Steady-State Ratio (TSSR) is 66.1 per cent while it is 63.9 per cent in the case of the matrix relating to unmarried teachers. The relatively larger TSSR of the married teachers indicates that their classroom communication has been relatively slower and less flexible than in the case of the unmarried teachers.

A further comparative scrutiny of the constituent parts of the Steady-State Talk is made available from Table XXVII.

TABLE XXVII  
ANALYSIS OF STEADY STATE TEACHER TALK -  
MARITAL STATUS

Component	Married teachers (percentage)	Unmarried teachers (percentage)
Constructive integration	2.28	2.69
Vicious circle	2.26	1.38
Content orientation	95.45	95.92

The relative measures of the three parts of steady state talk under the two situations evidently do not suggest any marked contrast between them since the differences are apparently very small.

One striking feature, however, of similarity is that in both cases the content orientation part of the

steady state talk (cells 4-4 and 5-5) claims the lion's share of the total such occurrence.

In the case of constructive integration part (cells 1-1, 2-2 and 3-3), and 'content orientation' part the unmarried teachers, however, show slightly increased percentages (2.69 is greater than 2.28 and 95.92 is greater than 95.45).

The unmarried teachers have completely adjusted this excess, quite predictably, by way of a correspondingly lower percentage of vicious circle part wherein their figure is 1.38 while that of the married teachers is 2.26.

In the Table XXVIII are given the percentages of the cell frequencies in the two concerned cells constituting the content orientation part of the teachers' steady state talk.

TABLE XXVIII

CONTENT ORIENTATION IN STEADY STATE TEACHER  
TALK - MARITAL STATUS

Cell	Married teachers (percentage)	Unmarried teachers (percentage)
Sustained lecture (Cell 5-5)	91.42	91.23
Sustained questioning (Cell 4-4)	4.03	4.68

The Table XXVIII provides us a clue to the general picture painted by the previous Table XXVII in this regard. While according to the previous table it transpired that the unmarried teachers put up more of content oriented steady state talk than their married counterparts in Table XXVIII the source for such a relatively higher percentage is spotted.

The unmarried teachers while in fact show a lesser percentage of sustained lecture (91.23) than the married teachers this short-fall is far exceeded by their higher percentage of sustained questioning (4.68 per cent) than in the case of married teachers (4.03 per cent).

In other words, the unmarried teachers used more sustained questions and the married teachers more sustained 'content delivery'.

#### Content Emphasis

As described earlier (pages 142-145) the emphasis on content is reconstructed by computing the measure called Content Cross Ratio (CCR) (vide also Figure 11).

Content emphasis is to a greater extent prevalent in classes under unmarried teachers as is evident from Table XXIX than in classes under married teachers as is evident from the relative measures of the Content Cross Ratio (CCR).

TABLE XXIX  
 CONTENT CROSS COMPONENTS - MARITAL STATUS

Ratio/Component	Married teachers (percentage)	Unmarried teachers (percentage)
CCR	54.44	55.27
Questions	10.19	11.47
Information Delivery	44.24	43.79

CCR for married teachers is 54.44 per cent while it is 55.27 per cent for unmarried teachers.

Though this is the general picture of CCR, as for the principal components of the content emphasis, there is a different situation as regards each of the two components. While questions are in the case of unmarried teachers to a greater extent (11.47 per cent) than in the case of married teachers (10.19 per cent), as regards information delivery, it is the married teachers whose emphasis is more (44.24 per cent) than that of the unmarried teachers (43.79 per cent).

Unmarried teachers appear to be using lesser content delivery and more questions as compared to married teachers. On the whole, however, the unmarried teachers appear to be laying more emphasis on content than their married counterparts.

By way of appreciating the occurrence of

content emphasis better, the phenomenon may be construed as obtaining in three different contexts. They are content emphasis buried in teacher talk, content emphasis in the context of student talk and content emphasis following silence/confusion.

Table XXX summarises the relative percentage figures for the three segments of content emphasis.

TABLE XXX  
CONTENT EMPHASIS SEGMENTS - MARITAL  
STATUS

Segment	Married teachers (percentage)	Unmarried teachers (percentage)
Content emphasis buried in teacher talk	46.51	46.91
Content emphasis in the context of student talk	4.36	4.84
Content emphasis follow- ing silence/confusion	3.56	3.51

On the whole, the picture presented by the Table XXX does not suggest any marked differences, between the two groups of teachers in respect of any of the three segments.

Unmarried teachers have had to deliver content following silence/confusion to a slightly lesser extent

(3.51 per cent) than in the case of married teachers (3.56 per cent).

In the case of the other two segments, however, it is the unmarried teachers whose scores are higher than those of their married counterparts. The unmarried teachers' content emphasis buried in their own talk was to the extent of 46.91 per cent while similar emphasis in similar context by the married teachers is to the slightly lesser extent of 46.51 per cent. Likewise, it is the unmarried teachers' content emphasis in the context of student talk which has been slightly more (4.84 per cent) than in the case of married teachers (4.36 per cent).

#### The Use of Praise/Encouragement

The use of praise/encouragement (vide Figure 12) is reviewed by an analysis of the row and column two, as mentioned earlier (pages 145-149), which stands for this type of teacher talk.

The details relating to the total use of praise/encouragement as also the sequential manner of use of praise/encouragement are given in Table XXXI.

TABLE XXXI  
ANALYSIS OF PRAISE/ENCOURAGEMENT - MARITAL  
STATUS

Description	Married teachers (percentage)	Unmarried teachers (percentage)
Total use	3.25 (with refer- ence to total interaction)	3.32 (with refer- ence to total interaction)
Praise buried in teacher talk	33.17	25.32
Praise/encouragement in direct reaction to student talk	62.85	71.60
Praise/encouragement follow- ing silence	3.96	3.06
Praise following pupil response	56.93	63.97
Praise following pupil initiation	5.92	7.62
Praise as launching pad for teacher talk (row two, columns 1 through 7)	59.61	58.19
Praise as prompt to student talk (cell 2-8 and 2-9)	32.10	33.65
Praise leading <sup>to</sup> silence (cell 2-10)	8.28	8.15
Praise leading to pupil response	28.49	28.74
Praise leading to pupil initia- tion	3.60	4.90
Praise followed by teacher questioning	15.64	19.28
Praise followed by teacher lecturing	14.33	14.19

It is evident from the Table XXXI that it is the unmarried teachers whose total use of praise/encouragement is greater than that of the married teachers. While married teachers had 3.25 per cent of the total interaction as their praise/encouragement the corresponding figure in the case of unmarried teachers is 3.32 per cent.

As we scan the relative measures, segment-wise, of praise/encouragement we notice how this relatively greater extent of use of praise/encouragement on the part of the unmarried teachers is solely resulting from its segment of praise/encouragement in direct reaction to student talk. The unmarried teachers have come out with 71.60 per cent of their total use of praise/encouragement, in the immediate context of student talk while the married teachers have used only 62.85 per cent of their total use of praise/encouragement in immediate reaction to student talk.

In the case of the other two segments of praise/encouragement, however, the unmarried teachers' scores lag behind those of their married counterparts. The married teachers could have 33.17 per cent of praise/encouragement buried in their own talk; but unmarried teachers have had only 25.32 per cent of their praise/encouragement in the context of their own talk.

As regards praise/encouragement following silence/confusion again it is the married teachers whose

score is 3.96 per cent while that of the unmarried teachers is 3.06 per cent.

On further examination, it turns out that the comparatively greater percentage of use of praise/encouragement in the context of student talk by the unmarried teachers has been more following students' responsive talk than that following their self-initiated talk. This, however, is the same situation in the case of married teachers also.

Unmarried teachers have used praise/encouragement after students' responsive talk to the extent of 63.97 per cent while the married teachers' score is 56.93 per cent. There is a difference of 7.04 (63.97 - 56.93) while the difference as regards the use of praise/encouragement in the context of students' self-initiated talk, between the two groups of teachers is 1.70 (7.62 - 5.92).

Yet another dimension to the analysis of the use of praise/encouragement is the 'exit' transitions from 'praise/encouragement'. This is obviously to be done with reference to the row two. While the first seven cells in row two, columns 1 through 7 constitute teacher talk transitions the next two cells (cell 2-8 and 2-9) stand for student talk transitions. Exit transitions from praise/encouragement to silence/confusion are indicated in the cell 2-10.

On an analysis of the two matrices under study,

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as is evident from the Table XXXI it turns out that it is the married teachers who have used a greater percentage of praise/encouragement as launching pad for further teacher talk to take off from, since they have used 59.61 per cent of praise/encouragement for this purpose while their unmarried counterparts have used a slightly lesser percentage - namely, 58.19.

On a cross examination we find therefore that it is the same married teachers who, as seen earlier used praise/encouragement in the context of teacher talk to a greater extent (33.17 per cent) than their unmarried counterparts (25.32 per cent). Hence, the married teachers, as compared to unmarried teachers not only used greater percentage of praise/encouragement in the context of teacher talk, but also used it to a greater extent so as to serve as the context for further teacher talk. However, a point of significance is that the relative difference, as between the two groups, in the use of praise/encouragement 'in' the context of teacher talk (33.17 per cent - 25.32 per cent = 7.85 per cent) is far more than the difference in its use 'as' the context for further teacher talk (59.61 per cent - 58.19 per cent = 1.42 per cent).

In the case of use of praise/encouragement 'as' the context for silence/confusion, likewise, the married teachers<sup>have</sup> had 8.28 per cent which is slightly more than that for the unmarried teachers whose figure is 8.15 per cent. This marginal difference (8.28) per cent - 8.15 per

cent = 0.13 per cent) again goes well with the similar marginal difference in their use of praise/encouragement 'in' the context of silence/confusion which is (3.96 per cent - 3.06 per cent = 0.90 per cent).

The use of praise/encouragement as a prompt to student talk has been to a greater extent at the hands of unmarried teachers than married teachers. The unmarried teachers used the bait of praise/encouragement to 33.65 per cent to fish out student talk while their married counterparts spent up only 32.10 per cent of their praise/encouragement for the purpose. Thus not only have the unmarried teachers used more praise (than the married teachers) to prompt student talk but also they follow up student talk with praise/encouragement, as seen earlier, to a greater extent (71.60 per cent) than is the case on the part of the married teachers (62.85 per cent).

The break-up figures of the amount use of praise/encouragement as prompt to student talk lay bare the constituent structure thereof.

On an examination of the frequency build-up in the cells (2-8) and (2-9), signifying praise leading to pupil response and praise leading to pupil initiation respectively, in the two matrices we find how the unmarried teachers steal the show over their married counterparts in respect of both types of student talk and how the difference is greater as regards the use of praise/

encouragement to prompt students' self-initiated talk (4.90 per cent - 3.60 per cent = 1.30 per cent) than when it is used to prompt students' responsive talk (28.74 per cent - 28.49 per cent = 0.25 per cent).

An interesting revelation emerges when the use of praise/encouragement 'as' the context of teacher talk is probed further and the cells (2-4) and (2-5) are studied.

Though on the whole, as seen earlier, the married teachers used slightly higher percentage of praise/encouragement for launching further teacher talk such higher use is exhibited only in respect of content delivery. The married teachers have used praise/encouragement as context for content delivery to the extent of 14.33 per cent while the unmarried teachers have used it to the slightly lesser extent of 14.19 per cent.

However, as regards the use of questions in the context of praise/encouragement, the unmarried teachers score 19.28 per cent while the married teachers' score is 15.64 per cent only.

Hence on an overall review of the cells (8-2), (9-2) and (2-4) it is seen how the unmarried teachers have been not only to a greater measure responding to student talk with praise/encouragement but also have been following up their praise/encouragement with questions, rather than content delivery, to a greater extent, than the married teachers.

### Teacher Reaction to Student Talk

As described (pages 149-153) and as illustrated (vide Figure 13) earlier, teacher's immediate reactions to student talk are strategically significant. Such reactions are contained in the rows 8 and 9, columns 1 through 7.

Table XXXII contains the details of analysis of teacher reactions to student talk. Unmarried teachers reacted more (15.61 per cent) to student talk, on the whole, than did the married teachers (14.01 per cent). This comparatively larger extent of teacher reaction on the part of the unmarried teachers is echoed in the case of two aspects - namely, constructive reaction and questions. As for content delivery and orders and criticism it is the married teachers who have reacted more than the unmarried teachers as discussed below.

Unmarried teachers' constructive reaction to students' responsive talk is 5.61 per cent while the corresponding figure for the married teachers is only 4.68 per cent. Similarly, the formers' constructive reaction to students' self-initiated talk is 0.93 per cent while the latter's score is 0.72 per cent.

TABLE XXXII  
TEACHER REACTION TO STUDENT TALK - MARITAL STATUS

Component	Married teachers (percentage)	Unmarried teachers (percentage)
Total immediate reaction (sum of 14 cells rows 8 and 9, columns 1 through 7)	14.01	15.61
Constructive reaction to students' responsive talk	4.68	5.61
Constructive reaction to students' self-initiated talk	0.72	0.93
Questions in the context of students' responsive talk	3.43	4.13
Questions following students' self-initiated talk	0.61	0.66
Content delivery in the context of students' responsive talk	1.68	1.69
Content delivery following students' self-initiated talk	1.07	0.96
Orders and criticism following students' responsive talk	1.38	1.12
Orders and criticism in the context of students' self-initiated talk	0.41	0.26

Unmarried teachers used questions more than the other group, in the context of both students' responsive as well as students' self-initiated talk. While the married teachers put questions following pupils' responsive talk to the extent of 3.43 per cent the unmarried teachers did so to 4.13 per cent. Questions in the context of students' self-initiated talk, on the part of married

teachers were only 0.61 per cent while in the case of unmarried teachers they have been to the extent of 0.66 per cent.

As regards content delivery following students' responsive talk there can hardly be any comment since the relative measures are almost identical (1.68 per cent and 1.69 per cent).

As for content delivery in the context of students' self-initiated talk, there is, as mentioned earlier, something to munch. Here, it is the married teachers who have delivered more content in the context of students' self-initiated talk (1.07 per cent) than the unmarried teachers (0.96 per cent).

Orders and criticism alike, have been given by married teachers in a greater measure, following students' responsive as also self-initiated talk than by the unmarried teachers.

Orders and criticism given by married teachers following students' responsive talk is 1.38 per cent and those given by the unmarried teachers is 1.12 per cent. Orders and criticism resorted to by married teachers in the context of students' self-initiated talk is 0.41 per cent and those resorted to by their unmarried counterparts is only 0.26 per cent.

## PUPIL TALK

Next in the order of consideration of classroom communication comes pupil talk which is coded in terms of only two categories, eight and nine. Discussions of some important dimensions of pupil talk follow.

Pupil Initiation and Pupil Steady State Talk (Vide Figures 14 and 15)

Pupil talk under the two groups of teachers is analysed and the measures of two indices are given in Table XXXIII.

TABLE XXXIII  
PUPIL TALK - MARITAL STATUS

Ratio	(under) Married teachers (percentage)	(under) Unmarried teachers (percentage)
PIR	15.8	15.4
PSSR	50.6	45.4

Pupil Initiation Ratio (PIR) is 15.8 per cent in the case of married teachers while it is 15.4 per cent in that of unmarried teachers indicating the lack of any marked difference between the two groups of teachers. The pupil Steady State Ratio (PSSR), however, in the two situations shows some noteworthy difference. The pupils in classes handled by married teachers put up a Steady State

talk of 50.6 per cent while those in classes handled by the unmarried teachers put up only 45.4 per cent as sustained talk. This means that pupils under unmarried teachers show a greater degree of flexibility for movement to and from other categories rather than to remain in the same category.

It is contextually significant here to recall the relative TSSR's of the two groups of teachers, cited and discussed earlier. The married teachers' TSSR is 66.06 per cent while that for the unmarried teachers is 63.94 per cent which indicates that unmarried teachers have been more flexible in communication than their counterparts. Now it turns out likewise that only the pupils under the unmarried teachers show greater propensity for flexibility than their counterparts under the married teachers. Could it be that as are the teachers so would be the pupils, as regards flexibility in communication? Perhaps, yes; because it is the teachers who guide and steer classroom communication.

#### Prompt to Pupil Talk

As described earlier (pages 158-159), an analysis of the events preceding pupil talk, especially those of teacher talk yields a clue to the extent of control wielded by the teacher over the generation and nature of pupil talk.

In Table XXXIV is analysed the prompt to pupil

talk (vide Figure 16).

TABLE XXXIV  
PROMPT TO PUPIL TALK - MARITAL STATUS

Description	(under) Married teachers (percentage)	(under) Unmarried teachers (percentage)
Pupil talk in the context of teacher talk	41.9	45.7
Self-initiated pupil talk in the context of teacher talk	7.3	7.9

Pupil talk prompted by and arising in the context of teacher talk is 45.7 per cent under unmarried teachers while that under married teachers is trailing behind at 41.9 per cent. The lead maintained by the unmarried teachers in this overall respect over their married counterparts (45.7 per cent - 41.9 per cent = 3.8 per cent) is far greater than that maintained by them in respect of pupil's self-initiated talk done in the context of teacher talk (7.9 per cent - 7.3 per cent = 0.6 per cent).

On the whole, therefore, the unmarried teachers seem to have manoeuvred their talk in such a way that a decidedly greater percentage of pupil talk, than has been the case under married teachers, could arise in immediate sequence to their talk.

Sequential Patterns of Pupil Talk

Some of the significant sequential patterns of pupil talk under the two groups of teachers are given in Table XXXV.

On preliminary scrutiny it turns out that the total occurrence of students' responsive talk under married teachers (84.2 per cent) is slightly lesser than that (84.6 per cent) under the unmarried teachers. Just as this difference is marginal so also is the difference as regards the total occurrence of students' self-initiated talk which under the unmarried teachers is 15.4 per cent and under married teachers is 15.8 per cent.

TABLE XXXV  
SIGNIFICANT SEQUENCES OF PUPIL TALK - MARITAL STATUS

Sequences	(under) Married teachers (percentage)	(under) Unmarried teachers (percentage)
Pupil responsive talk	84.2	84.6
Pupil responsive talk following teacher praise/encouragement	4.3	4.4
Pupil responsive talk following teacher questions	24.2	27.7
Pupil responsive talk following teacher directions	4.5	3.4
Pupil responsive talk following silence/confusion	4.1	5.0
Pupil self-initiated talk	15.8	15.4

Sequences	(under) Married teachers (percentage)	(under) Unmarried teachers (percentage)
Pupil self-initiated talk following teacher response	0.8	1.0
Pupil self-initiated talk following teacher questions	3.6	4.5
Pupil self-initiated talk following silence/confusion	1.4	1.5
Pupil self-initiated talk following teacher directions and criticism	0.5	0.6
Pupil self-initiated talk developing from pupil responsive talk	1.4	1.7
Pupil self-initiated talk receding into pupil responsive talk	0.5	0.6
Pupil responsive talk followed by silence/confusion	4.6	4.1
Pupil self-initiated talk followed by silence/confusion	1.3	1.3

The frequency concentrations in individual cells/cell clusters are examined in the following paragraphs.

The amount of pupils' responsive talk occurring in the context of teachers' praise/encouragement, (cell 2-8) is slightly more (4.4 per cent) in the case of unmarried teachers than under married teachers (4.3 per cent). It is recalled here that this cell (2-8) has earlier been examined in the context of analysis of the use of praise and the discussions therein were with

reference to the total use of praise/encouragement by the two groups of teachers whereas here obviously the discussions are with reference to total pupil talk.

Pupil responsive talk following teacher questions (cell 4-8) gives a clear verdict of higher percentage of occurrence in classes handled by unmarried teachers (27.7 per cent) than in those under married teachers (24.2 per cent).

This discovery when appreciated in the context of the earlier finding that it has been again the unmarried teachers who reacted with questions to pupils' responsive statements to a greater extent than in the case of married teachers points to the possible recourse to drill in the classroom communication episodes under unmarried teachers. This is not <sup>to</sup> say that drill could not have been in classes under married teachers. But then, the evidence is suggestive of a greater extent of drill situations under unmarried teachers.

Pupils have been responding to teachers' orders/commands (cell 6-8), in a greater measure under married teachers (4.5 per cent) than under unmarried teachers (3.4 per cent).

Pupils' responsive talk following silence/confusion (cell 10-8) occurs to a greater extent (5.0 per cent) under unmarried teachers than it does under married

teachers (4.1 per cent).

On the other hand, however, as regards the pupils' responsive talk followed by silence/confusion (cell 8-10) it is the married teachers who show a greater percentage (4.6 per cent) than their unmarried counterparts (4.1 per cent).

Pupils' self-initiated talk following teachers' constructive responses (cells 1-9, 2-9 and 3-9) is slightly greater in the case of unmarried teachers (1.0 per cent) than in the case of married teachers (0.8 per cent).

Pupils' self-initiated talk in answer to questions from unmarried teachers, likewise, is of a greater order (4.5 per cent) than that in answer to questions from married teachers (3.6 per cent).

Pupils' self-initiated talk that has had to be redeemed from silence/confusion (cell 10-9) has been to the extent of 1.5 per cent in the case of unmarried teachers and to a slightly lesser extent of 1.4 per cent in the case of married teachers. However, silence/confusion following pupils' self-initiated talk (cell 9-10), under both the groups of teachers is identical at 1.3 per cent.

Likewise, the extent of pupils' self-initiated talk in the context of directions and criticism from teacher (cells 6-9, 7-9) has not been markedly different between the two groups of teachers. Such self-initiated

talk of the pupils has occurred to the extent of 0.6 per cent under unmarried teachers and to 0.5 per cent in the case of married teachers.

Transitions between pupils' responsive and self-initiated talk under the two groups of teachers present some food for thought. In the case of both groups of teachers the quantum of transitions from pupils' responsive to self-initiated talk has been more than the other way round.

As between the two groups, category eight to category nine transitions (cell 8-9) have occurred to the extent of 1.7 per cent under unmarried teachers while such occurrence is to the extent of 1.4 per cent under married teachers. The reverse transitions (cell 9-8) have been to the extent of 0.6 per cent and 0.5 per cent respectively.

#### SILENCE/CONFUSION

##### The Context of Silence/Confusion

The total extent of silence/confusion, as has earlier been discussed under 'General Features' is 14.29 per cent under married teachers and 13.29 per cent under unmarried teachers, computed with reference to the respective total interaction.

In what follows are discussed the analytical details of the incidence of silence/confusion in the two

situations under study.

In Table XXXVI are given the relative measures of the three segments of silence/confusion under the two groups of teachers which serve to highlight the context of silence/confusion (vide Figure 17). The computational details are given earlier (page 161).

TABLE XXXVI  
THE CONTEXT OF SILENCE/CONFUSION - MARITAL  
STATUS

Segment	(under) Married teachers (percentage)	(under) Unmarried teachers (percentage)
Silence/confusion following teacher talk	30.4	33.9
Silence/confusion following pupil talk	8.9	9.0
Sustained silence/confusion	60.7	57.1

Occurrence of silence/confusion following both teacher talk and pupil talk has been to greater extents under unmarried teachers than under married teachers. The difference is more marked with regard to that following teacher talk where the percentages are 33.9 and 30.4 for the unmarried and married teachers respectively.

Silence/confusion following pupil talk, however, under the two groups of teachers does not present any

marked difference. It is 9.0 per cent in the case of unmarried teachers and 8.9 per cent in the case of married teachers.

This balance of relative positions changes as regards sustained occurrence of silence/confusion. While the steady state incidence of silence/confusion has been to the extent of 60.7 per cent under married teachers it has been only to the extent of 57.1 per cent under unmarried teachers.

#### The Role of Silence/Confusion

A scrutiny of the pattern of distribution of tallies in row ten reveals the information about the events that followed the incidence of silence/confusion. The role played by it (vide Figure 18) is thus investigated and the details are presented in Table XXXVII. The computational details are given earlier (page 164).

TABLE XXXVII  
THE ROLE OF SILENCE/CONFUSION - MARITAL  
STATUS

Role	(under) Married teachers (percentage)	(under) Unmarried teachers (percentage)
Silence as base for teacher talk	30.90	32.23
Silence as base for pupil talk	8.36	10.57

In the case of married teachers, 30.90 per cent of silence/confusion has served as the launching pad for teacher talk while the corresponding figure for unmarried teachers is 32.23 per cent.

Again the pupils under unmarried teachers used 10.57 per cent of silence/confusion as the base for their talk while their counterparts used 8.36 per cent as the base for their talk.

Both the unmarried teachers and their students have had silence/confusion preceding their talk in a greater measure than is the case with the married teachers and their students respectively.

Discussion of the load in the cell (10-10) figures earlier and is hence not included in this Table.