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Women's Work Status and Fertility: Macro and Micro Level Analysis in India and its Selected States

T'HE influence of various socio-economic and demographic factors on fertility have been extensively investigated in demographic literature. A complex set of factors including community level as well as individual level variables affect the childbearing desires and performance in a society. The influence of various socio-economic and demographic factors have been found affecting the levels of fertility through its one or the other proximate determinants. Just as much as the levels of fertility of any population are found to vary by differences in the socio-cultural and economic environments at the macro level, it is also found affected by the individual level characteristics of the women and her spouse within a given socio-cultural surrounding. Among such characteristics, the participation of the women in economic activities has been found to be an important factor having a bearing on the levels of fertility. With regard to the nature of relationship between women's work status and fertility, researchers have come out with conflicting results.

Unlike education of women which is found to have a strong negative effect on fertility, the effect of women's work participation on fertility is not uniform and seems to depend on the socio-economic conditions. It may be possible that women take up employment in order to reduce the economic burden caused by high fertility. In such situation women's work status and their fertility performance may be poorly correlated or even positive. It has also been observed that some women deliberately control their fertility in order to keep themselves employed in gainful economic activity and to improve their standards of living (Namboodri, 1964; Rodriguez and

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Cleland, 1980); a few enter into labour force to cope up with the burden of acquired higher fertility (Weller, 1968; Sweet, 1973). Some researchers have opined that both these effects could operate simultaneously (Stycos and Weller, 1967; Waite and Stolzenberg, 1976) and some social scientists believe that the commonly observed relationship between work force participation and fertility in a population is spurious and there are other factors which may influence fertility levels among working and non-working women (Mincer, 1973; Terry, 1975). Thus, different studies have come up with diverse conclusions regarding the relationship between female work participation and fertility. Studies conducted in developed countries have, generally, shown a negative association between women's employment and fertility, while in developing countries they have revealed conflicting results and are inconclusive on the nature of relationship (Freedman *et al.,* 1959; Bhargava and Saxena, 1984).

The relationship between the two variables in question may also turn out to be different while using different levels or unit of analysis for a given population. No specific attempts appear to have been made earlier to compare the nature of relationship between women's work status and fertility, separately at macro and micro levels, in the same population. It may be possible that the study of relationship between fertility and work status at micro level (individual woman) may not be consistent with the finding derived out of the analysis involving macro (aggregate) level variables. Though the aggregate level variables are the product of individual behaviour, in the present paper micro level refers to the data pertaining to the respondent in the National Family Health Survey, while the macro level refers to the data collected by Census or Sample Registration System, to estimate the parameters at the aggregate level of population. The article proposes to address this dimension by analysing the nature of relationship between female work force participation and fertility at macro and micro levels, and comparing the results for a given population.

The socio-cultural melieu in which women live, sometimes plays amore dominant role in influencing fertility than their individual level characteristics. The results of a study indicate that even illiterate women in Kerala had lower levels of fertility than their literate counterparts in Uttar Pradesh (Srinivasan, 1995). The importance of community level variables over the individual characteristics has assumed greater significance in the context of differential impact of family planning programmes on fertility in different states.

The specific objective of this paper is to study the nature of relationship between women's work status and fertility in India as a whole and in few selected states with different socio-demographic characteristics. The paper analyses the nature of relationship between economic status and fertility after controlling for a few important socio-demographic factors both at macro and micro level. An attempt has also been

made to assess the relative importance of work status of the women on fertility (as an individual level variable) combined with the norms prevailing in the society at the aggregate level (as macro level variable), by applying multivariate statistical technique.

The macro level analysis for India is based on state as the unit of analysis and district has been considered as the unit of analysis for selected states. The states of Kerala, Tamil Nadu. Goa, Madhya Pradesh and Bihar were selected to represent differential levels of socio-demographic conditions in the country. Micro level analyses have been carried out by analysing the individual level responses of the ever married women in National Family Health Survey. The analysis at macro level relates to the year l991 (or circa 1991), while for micro level it relates to the children ever born and the work status of the sample women in the year 1992-93.

Data Sources and Methodology

The study utilizes 1991 census data for the states and districts. The fertility estimates are taken from SRS, 1991 for 14 major states of India while the district level CBR have been obtained from the recent estimates of fertility at the district level by Mari Bhat which relates to the period 1984-90 (Mari Bhat, 1996). Though the estimate of fertility at the district level relates to the year around 1987, and no further estimates after this period is available. The reference period selected for the present study may reasonably be justified, as the main aim is to study the nature of relationship with the dependent variable and not the levels. The analysis at the individual level of women has been carried out using National Family Health Survey Data obtained from UPS, Bombay (NFHS, 1994).

The description of the variables at each level of analysis is provided as below:

At Macro Level

CBR = Crude Birth Rate (1991forthestatesandl984-90fordistricts)

FWPR = Female work participation rate, 1991

FLIT = Effective female literacy rate, 1991

At Micro Level

CEB = Children Ever Born to the women

WORK STATUS = Work status of the women

EDU = The level of educational attainment of the women

DURC = Duration of exposure to childbearing

COMM = A dummy variable representing community norms set either by governmental efforts or by evolution due to social development

The variable Work Status is derived from Q611 (whether the respondent is currently working) and Q616 (whether the respondent works at home or away from home) asked in the National Family Health Survey. Accordingly, the women were classified under three categories of' networking', 'working at home' and 'working away from home'. Such bifurcation of the working women may be considered as a strength of the data collected which would be helpful in explaining the behavioural changes in fertility thereby suggesting appropriate interventions. A dummy variable (COMM) has been introduced to represent the community level norm regarding childbearing process. It has been observed that the fertility transition of various successful states in India have not been due to a uniform set of factors (Srinivasan, 1995). In Goa, fertility reduction is achieved due to the 'bottom up' forces of the community brought out during the course of social development. On the other hand, fertility transition in Tamil Nadu is attributed mainly due to strong political will and governmental efforts and can be termed as 'top bottom' forces to influence fertility. Kerala is a state where these two forces have worked in a balanced form, while among demographically underdeveloped states like MadhyaPradesh and Bihar, these two factors seem to be very weak to bring about a significant fertility reduction. Accordingly, code 1 is assigned to all the women in the sample in Goa (bottom-up); 2 in Tamil Nadu (top-bottom); 3 in Kerala (balanced) and 4 in Madhya Pradesh and Bihar (others), to study the effect of aggregate level norms on fertility performance. The relative importance of individual and community variables have been analysed through a single statistical model. Such a combined analysis reflects the role of individual level characteristics of the women to influence fertility in the context of macro settings.

The nature of relationship between women's work participation and fertility (CBR) at macro level has been assessed by computing zero and higher order correlation coefficients. In the analysis at micro level the relationship is judged by using multivariate technique of Analysis of Variance (ANOVA) and generating Multiple Classification Analysis (MCA) tables. Multiple Classification Analysis is a technique for analysing interrelationship between several predictor variables and a dependent variable within the context of an additive model (Andrews, 1973). This technique helps to understand the effect of each predictor on the dependent

variable both before and after taking into consideration the effects of all other variables. MCA also provides the information of how all the predictors considered for the analysis are able to explain the variation in the dependent variable. The dependent variable has to be either in interval scale or in dichotomous, the predictors may be measured on nominal, ordinal or interval scale which is the advantage of this method over the traditional regression approach. In addition to that multicollinearity among the predictors does not pose any problem. However, the method assumes that there should not be significant interaction effects between the variables.

The analyses were carried out separately for India and for each selected states considering CEB as the dependent variable. In order to judge the real nature of relationship between the work status of the women and their fertility performance, the effect of education and the duration of marriage has been controlled by introducing the variables namely, EDU and DURC as covariates in the analysis. The similar analysis has also been carried out on a combined set of data from these five selected states in which the effect of the work status of women has been examined along with the macro level variable representing the community norms at aggregate level. All the results obtained for the present paper have been weighted as per the weights provided for each respondent.

Results

Macro Level Analysis

Table 1 brings out the extent and nature of relationship between women's work status and fertility at macro level in India as a whole and in its selected states. As far as the relationship between fertility level (CBR) and female literacy (FLIT) is concerned, the zero order correlation coefficients reinforce the close relationship between the two. It can be seen that all such coefficients turned out to be significant and in the expected direction which clearly indicate that higher levels of education of females help in reducing the levels of fertility. Regarding the nature of relationship between women's work participation and the levels of fertility, a uniform pattern was not observed (Table 1). These two variables seem to be unrelated for the country as a whole and in its rural areas, though the direction of the correlation coefficients came out as expected. On the other hand, a significant negative coefficient was observed for the urban areas of the country as a whole (-.4739) and for Madhya Pradesh (-.2629), while in all other cases, the zero order correlation coefficients were insignificant. The results apparently indicate that the women work participation in economic activities has no relationship with the levels of fertility.

TABLE 1: ZERO ORDER AND PARTIAL CORRELATION COEFFICIENTS BETWEEN SELECTED VARIABLES, IN INDIA AND THE SELECTED STATES, 1991

State	*Correlation Coefficient with CBR*	
	Zero order	*First order (controlling for FLIT)*
India		
FLIT	-.8320**	—
FWPR	-.2976	-.4982*
N= 14		
India Rural		
FLIT	-.7971**	—
FWPR	-.3060	-.5839**
N= 14		
India Urban		
FLIT	-.7577**	—
FWPR	-.4739*	-.1712
N = 14		
Kerala		
FLIT	-.6890**	—
FWPR	-.0496	-.7560**
N = 14		
Tamil Nadu		—
FLIT	-.4142**	-.2641
FWPR	.1016	
N=21		
Madhya Pradesh		
FLIT	-.6907**	—
FWPR	-.2629*	-.4230**
N = 45		
Bihar		
FLIT	-.7409**	—
FWPR	-.0971	-.1212
N= 42		

Note : Signif: ** -.001, * -.05

Table I also presents partial correlation (first order) coefficients after controlling for the effect of female literacy. When the effect of female education is controlled,

the results regarding the relationship between women's work participation and fertility are reversed. For India as a whole and its rural areas, the relationship between the two becomes significant which was not so in earlier analysis of the zero order correlation. For urban areas of the country, a significant relationship disappeared after adjusting for the effects of female education. The analysis revealed a negative relationship of women's work participation and fertility after eliminating the effects of female education in India and in the rural areas. It indicates that workingwomen tend to have lower levels of fertility at a given level of education.

The partial correlation analysis for the selected states also revealed interesting findings. In Madhya Pradesh, the relationship between female work participation (FWPR) and fertility (CBR) became strong after removing the effect of female education, as indicated by a higher magnitude of first order partial correlation coefficient than the observed zero order coefficient. Among rest of the states, only in Kerala a significant relationship between the two variables emerged after controlling for the effects of female literacy rate. The partial correlation coefficient came out to be -.7560 which showed a significantly strong relationship between women's work participation and the levels of fertility after adjusting for the effort of women's education. In Tamil Nadu and Bihar, no such relationship was observed though the first order coefficients turned out in negative direction with their higher magnitude than the zero order coefficients, after controlling for females education. Such an analysis was omitted for Goa as there are only two districts in the state.

Micro Level Analysis

At the micro level, a similar exercise was carried out with the help of multivariate statistical technique to study the nature of relationship between women's work status and their fertility performance after controlling for their levels of educational attainment and the duration of exposure to childbearing. Table 2 presents the mean number of children ever born (CEB) to all the women in sample as well as among women in different categories of the work status variable, for India as a whole and also separately for all the selected states. It is evident from Table 2 that the mean number of children born to women in Kerala was lowest (2.49) among these selected states. Tamil Nadu and Goa present nearly similar mean number of CEB (2.71 and 2.76 respectively). Consistent with the higher fertility conditions prevailing in Madhya Pradesh and Bihar, the mean children ever born in these states also came out to be 3.13 and 3.24 respectively. The mean CEB across different states came out as expected. However, as far as the mean CEB across different categories of work status variable is concerned, a consistent pattern did not emerge either in any

TABLE 2: MEAN NUMBER OF CHILDREN EVER BORN TO THE WOMEN IN INDIA, KERALA, GOA, TAMIL NADU, M.P. AND BIHAR, NFHS, 1992-93

State	*All Women*	*Not Working Women*	*Working at Home*	*Working Away*
India	3.09 (89771)	2.99 (60282)	3.30 (4642)	3.29 (24847)
Kerala	2.49 (4332)	2.44 (3217)	2.63 (194)	2.63 (921)
Goa	2.76 (3141)	2.72 (2176)	2.43 (118)	2.89 (847)
Tamil Nadu	2.71 (3948)	2.45 (2075)	2.85 (316)	3.03 (1557)
Madhya Pradesh	3.13 (6254)	2.99 (4172)	3.65 (330)	3.37 (1752)
Bihar	3,24 (5949)	3.07 (4440)	4.32 (133)	3.67 (1376)

Note: Figures in parentheses indicate number of ever married women.

of the selected states or in India as a whole. In all the cases, working women was observed with higher mean number of children ever born than their non-working counterpart women. This observed relationship between women's work status and their fertility performance may be spurious in nature. It may be possible that working women may form such a group which are exposed for a longer duration of childbearing or their educational level maybe lower than non-working women. In order to analyse the real nature of relationship between the two variables in question, it becomes necessary to control for such effects.

The relationship between educational level of the respondents and mean children ever born to them have also been analysed separately for each category of the women according to their work status with a view to find out the role of education on fertility performance. Table 3 brings outthe mean CEB cross-classified by educational level and work status of the women. It may be seen that the mean number of children born to women decreases with the increase in their educational attainment in each category of the work status variable. This again reinforces the dominant role of education behind fertility transition even at the micro level. The effect of education has to be adjusted for any meaningful analysis of fertility behaviour and work status of the women. Similarly, a fairly high correlation coefficient was observed between duration of exposure to childbearing and the CEB. For example, it turned out to

TABLE 3 : MEAN NUMBER OF CHILDREN EVER BORN ACCORDING TO WORK STATUS AND EDUCATIONAL ATTAINMENT OF THE WOMEN IN INDIA, KERALA, GOA, TAMIL NADU, M.P. AND BIHAR, NFHS, 1992-93

States	*Not Working*				*Working at Home*				*Working Away*			
	All	*Illiterate*	*Lit. upto Primary*	*Primary & above*	*All*	*Illiterate*	*Lit. upto Primary*	*Primary & above*	*All*	*Illiterate*	*Lit. upto Primary*	*Primary & above*
(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*	*(7)*	*(8)*	*(9)*	*(10)*	*(11)*	*(12)*	*(13)*
India	2.99 (60285)	3.41 (34233)	2.89 (12421)	2.02 (13631)	3.30 (4642)	3.65 (2820)	3.09 (1040)	2.29 (782)	3.29 (24848)	3.50 (19601)	2.83 (3013)	2.01 (2234)
Kerala	2.44 (3217)	3.88 (396)	2.88 (1206)	1.76 (1615)	2.63 (194)	3.34 (41)	2.96 (82)	1.83 (71)	2.63 (921)	3.33 (255)	2.79 (347)	1.89 (319)
Tamil Nadu	2.45 (2075)	2.84 (711)	2.67 (612)	1.89 (752)	2.85 (316)	3.06 (166)	2.82 (95)	2.25 (55)	3.03 (1557)	3.24 (1102)	2.74 (258)	2.18 (197)
Goa	2.72 (2176)	3.65 (621)	2.89 (726)	1.88 (829)	2.43 (118)	3.23 (26)	2.65 (34)	1.95 (58)	2.89 (847)	3.62 (410)	3.05 (149)	1.75 (288)
Madhya Pradesh	2.99 (4172)	3.19 (2861)	2.88 (669)	2.19 (642)	3.65 (330)	3.82 (237)	3.78 (54)	2.39 (39)	3.37 (1752)	3.49 (1557)	2.50 (122)	2.27 (73)
Bihar	3.07 (4440)	3.25 (3236)	3.04 (592)	2.15 (612)	4.32 (133)	4.42 (119)	3.65 (8)	3.25 (6)	3.67 (1376)	3.73 (1302)	3.26 (28)	2.22 (46)

Note: Figures in parentheses indicate number of cases.

be 0.6699 for the country as a whole and in all the selected states, the coefficient were more or less the same. Hence, the effect of child bearing duration also required to be controlled.

In order to study the exact nature of relationship between women's work status and their fertility, the effect of education and the duration of the exposure to childbearing have been controlled in multivariate statistical analysis. Table 4 brings out the results of multiple classification analysis carried out for India and for each of the selected state separately. To obtain the adjusted effect of work status, duration of childbearing period and the educational level of the women were introduced as covariates.

TABLE 4 : UNADJUSTED AND ADJUSTED MEAN NUMBER OF CHILDREN BORN TO WOMEN IN INDIA, KERALA, GOA, TAMIL NADU, M.P. AND BIHAR, MCA RESULTS, 1992-93

State/Variables + Category	*No. of Cases*	*Unadjusted*		*Adjusted for Independent+*	*Covariates*
		Dev 'n	*Eta*	*Dev 'n*	*Beta*
India					
Grand Mean = 3.088 Work					
Status**					
0 Not working	60282	-.10		.06	
1 Working at home	4642	.21		.00	
2 Working away	24847	.20	(.06)	-.15	(.05)
R squared = .457					
Kerala					
Grand Mean = 2.489 Work					
Status**					
0 Not working	3217	-.05		.06	
1 Working at home	194	.14		-.05	
2 Working away	921	.14	(.05)	-.18	(.05)
R squared = .475					
Goa					
Grand Mean = 2.756					
Work Status*					

0 Not working	2176	-.03		.04	
1 Working at home	118	-.32		-.10	
2 Working away	847	.13	(.14)	(-.08)	(.03)
R squared = .454					

Tamil Nadu
Grand Mean = 2.708

Work Status

0 Not working	2075	-.26		.04	
1 Working at home	316	.14		-.04	
2 Working away	1557	32	(.14)	-.08	(.02)
R squared = .439					

Madhya Pradesh
Grand Mean =3.130

Work Status**

0 Not working	4172	-.14		.01	
1 Working at home	330	.52		.23	
2 Working away	1752	.24	(.09)	-.06	(.03)
R squared = .495					

Bihar
Grand Mean = 3.239 Work

Status

0 Not working	4440	-.17		-.01	
1 Working at home	133	1.08		.16	
2 Working away	1376	.43	(.12)	.01	(.01)
R squared = .507					

Note: Signif: ** -.001, * -.10

The results indicate that only those women working out side home had a lower level of fertility in India as a whole. In Kerala, those women who were working either at home or away, had significantly lower levels of mean CEB for a given level of educational attainment and the duration of exposure to childbearing. The direction for these two groups of women was negative from the Grand Mean as compared to positive direction for non-working women in this state. Similarly, in Madhya Pradesh, only those women who were working outside the home had

significantly lower mean CEB than the other group of women. In all these cases, 48-50 percent of the variation in the dependent variable was explained by the women' s work status variable and the covariates. In Goa, the working women were found with lower mean CEB after controlling for the effects of covariates, though the relationship was significant only at 10% level of significance. In Tamil Nadu, though the working women were observed with lower mean CEB but the relationship could not turn out significant while in Bihar no clear pattern was seen in the mean CEB across different categories of the work status variable even after controlling for the effects of DURC and EDU.

Combined Analysis

Table 5 presents the result of MCA for the combined analysis of five selected states together and introducing COMM as the community level variable in the model. The work status of the women came out significantly affecting the mean number of CEB in negative direction even in the combined analysis at the micro level. The adjusted deviation from the grand mean came out in the negative direction for working category of this variable. The existence of a clearly visualized community norm, set either by bottom-up, top-bottom or by a balance of these two forces has also been observed affecting the mean number of children to the women of that particular community. The adjusted mean number of CEB for the first three categories of the COMM variable turned out significantly lower than the grand mean, while the fourth category of the variable (representing weak community effect, either from top or from bottom) showed a higher mean CEB than the grand mean. A much higher level of deviation for the fourth category of COMM variable in the positive direction indicate the prevalence of higher levels of fertility in the states of Madhya Pradesh and Bihar. The absence of any strong programme impact (from the top) or social development (from the bottom) have been the major cause of weak community effect. Coupled with this, there are evidences from studies (Srinivasan and Jejeebhoy, 1981) that the levels of natural fertility has increased after Independence, due to weakening of the socio-cultural barriers on fertility in the most of those states having low contraception prevalence rate.

In addition, the results also reflected the dominant role of community variable than the individual level characteristics of the women to influence their fertility performance in terms of higher magnitude of eta and beta coefficients. The unadjusted effect of the variable COMM came out in its expected direction even without adjusting for the effect of individual level characteristics for the women. The beta coefficient of this variable did not reduce much after adjustment for work status variable. On

the other hand, for work status variable this coefficient reduced to a larger extent after controlling for other individual level characteristics of the women and the community effect.

A comparison of the unadjusted and adjusted deviation of mean CEB from its grand mean also brought out interesting findings. For Tamil Nadu, where the top-bottom forces are dominant, adjustment of individual level characteristics did not result into a different deviation and both (adjusted and unadjusted) deviations from grand mean remained at the same level (-.22). This indicate the dominant role of community level variable (than the individual level characteristics) on individuals to influence their fertility behaviour.

TABLE 5 : UNADJUSTED AND ADJUSTED MEAN NUMBER OF CHILDREN BORN TO WOMEN IN COMBINED ANALYSIS OF SELECTED STATES, MCA RESULTS, 1992-93

Variables + Category	*No. of Cases*	*Unadjusted*		*Adjusted /or Independent + Covariates*	
		Dev'n	*Eta*	*Dev'n*	*Beta*
Grand Mean = 2.928					
Work Status**					
0 Not working 2 Working at home 3 Working away	15684	-.13	(.09)	.02 .07 -.06	(.02)
	1096	.26			
	6664	.27			
COMM**					
1 Bottom Top	3141	-.17		-.21	
2 Top Bottom	3948	-.22		-.22	
3 Balanced	4332	-.17		-.24	
4 Others	12203	.27	(.13)	.21	(.10)
Multiple *R* Squared Multiple *R*					.483 .695

Note: Signif: ** -.001.

Discussion

The results of relationship between women's work status and fertility, both at macro and micro levels revealed a consistent pattern. The unadjusted effect of work status on fertility indicated the non-existence of a clear relation between the two variables in both the levels of analysis. On the other hand, a similar pattern of the

effect of women's economic activities on their fertility performance emerged when the impact of other variables were controlled. In India as a whole, female work participation showed a significant negative impact on fertility after adjusting for the effects of female literacy at the macro level. The same finding of negative impact of women's work status on their fertility was also seen while analysing the data at micro level for India as a whole. Similarly, the adjusted effect of work status on fertility in the states of Kerala and Madhya Pradesh indicated a significant negative impact at both the levels of analyses, while for Tamil Nadu and Bihar the relationship was not significant at any level of analysis even after controlling for the effects of other variables.

In general, the results suggest that workingwomen have relatively lower levels of fertility than their non-working counterparts, even when the effects of education and the duration of their exposure to childbearing are controlled. In those cases where such finding does not hold true, certain other factors become important in order to explain fertility differentials between working and non-working women. For example, Bihar, which is a backward state not only in terms of demographic characteristics but also in terms of social and economic conditions, the women seem to enter into labour force, possibly, in order to reduce their economic hardships due to their higher levels of fertility. Coupled with this, due to less employment opportunities outside home, they tend to take up some kind of gainful activities while operating from home to support large family. This may be substantiated by the fact that the adjusted mean number of children ever born was higher for those women who were found working at home.

In Tamil Nadu, the dominant role of state (at the community level) propagating small family and offering good services become important to narrow the fertility differentials between working and non-working women. In such a situation the role of individual characteristics of the women contribute only marginally to influence their fertility performance. The combined analysis of all the selected states taking into consideration both the individual and the aggregate level variables into a single model suggests that the reproductive behaviour at the individual level is guided more by the prevailing societal norms and community pressures than by individual level socio-economic characteristics, as such.

Concluding Remarks

The nature of relationship between women's work status and their fertility has been explored in the paper. An attempt has been made to find out the relationship between the two variables after adjusting for the effects of important socio-

demographic factors, both at the macro and at the micro levels. The results suggest a negative relationship between women's work status and fertility in the analyses carried out for India as a whole, and for Kerala, Madhya Pradesh and Goa, while in other two of the selected states namely, Tamil Nadu and Bihar, no such relationship could emerge. The analyses carried out at different levels also brought out a similar pattern of the nature of relationship (or no relationship) between work status and fertility. The findings clearly indicate the role of economic participation ofthe women to bring about a favourable change in their reproductive behaviour. The policies to raise the status of women must include measures to enhance the economic empowerment of the women which would enable them to make appropriate reproductive choices.

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