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Statistical Analysis of Some Socioeconomic Factors Affecting Age at Marriage among Males in Kogi State, Nigeria

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Abstract

This study is aimed at investigating the relationship between age at marriage and educational attainment, religion and cultural background among males in some parts of South –Western Nigeria. A saturated one-way and two-way model was proposed for the study. Level of educational attainment and religion was established to have significant relationship with age at marriage while senatorial differences do not have any statistical significant relationship with age at marriage in the area surveyed.

Key words: Model, Saturated, Marriage, Senatorial, One-way, Two-way, Effect.

Introduction

Marriage, whether for the educated, unlearned, rich or poor is a universal phenomenon in every society. It is a social institution legally ratified for uniting a man and a woman in a special form of mutual dependence, often for the purpose of establishing and maintaining a family (Blossfeld and Timm 2003; Kalmijin 1991a, 1991b Ultee and Luijkx 1990). Patterns of who marries whom have implications for the formation of families, the maintenance of boundaries between groups, the extent of inequality among families, and the intergenerational transmission of social and genetic traits(See. Cavalli-Sforza and Feldman 1981; Epstain and Gutman 1984; Fernandez and Rogerson 2001; Johnson 1980; Kalmijin 1991a, 1991b; Mare 1991)

The analysis of marriage data has been neglected by statisticians and demographers until a relatively late stage in the development of the subject. In the earlier stages of population study interest was focused on mortality, and the techniques for measuring mortality and fertility. Deaths were studied by means of age-specific mortality rates, and it was to be expected that when the analysis of fertility became the centre of interest, similar techniques would be employed. Fertility rates were regarded as a function of the age distribution of the female population, and age-specific fertility rates, combined into gross and net reproduction rates, became the principal tool of replacement and fertility analysis. A number of the early students of fertility were biologists by training, or had a biological outlook, and so tended to stress biological rather than socioeconomic influences on fertility. This method would be legitimate in societies in which all females marry or cohabit shortly after puberty and where no attempt is made to control fertility within marriage. Under those circumstances, the age distribution of the female population will be the primary and principal determinant of human fertility. However, in the last two decades, many papers has been written on female age at marriage as a major determinant of total fertility. This paper thus focuses on modeling some socioeconomic factors affecting age at marriage among males in Kogi State, Nigeria. The rest of the paper is organized as follows: section two is based on the data and methodology used in the study, section three discusses the results and discussion of findings while section four is the conclusion of the study.

2.0 Data and Methodology

Kogi State Nigeria is made up of three major ethnic groups these are the Igalas, Ebiras and the Okuns. The research is aimed at finding out whether cultural, Religion and educational differences among these groups has any effect on the age at which their men marry. Data for the study were obtained through primary source of data collection. Questionnaires were administered in three senatorial districts making up Kogi State. 600 responses were obtained. Age was classified into three groups: The data were coded and represented as follows:

'0' for 1 – 29 years, '1' for 30 – 39 years and '2' for 40 and above.

Similarly educational level was classified into three groups:

'0' for respondents with no education, '1' for secondary education and '2' for higher degree.

Religion was classified into three, '0' for traditional, '1' for Islam and '2' for Christian. Also zone classified into three which are East Igala zone = 0, central Ebira zone = 1 and the west Okun zone = 2.

Regression analysis was mainly used in the study. We analyzed data containing more than two categorical variables by using log-linear procedure. SPSS 17 edition was used for cross tabulations of data and in estimating the parameters of the models.

3. Results and Discussion

3.1 Results of the Cross Tabulations

We break down 3 x 3 x 3 x 3 table 3 (Age * Edu * Rel *Zone) to different contingency tables of different sizes.

Results in Table1 shows that out of 149 males that got married less than 30 years of age. 50 of them have no education, which is about 33.56%, also the chi-square shows that if p value is less than α value then there is significance relationship between the two categorical variables under consideration. With the p value obtained in the cross-tabulation between husband age and level of education, we discover that the age at marriage is related to the level of education. Likewise, table 2 reveals that 149 (24.83%) people married between 0 and 29 years of age, 406 (67.67%) married between 30-39 years of age and 45 (7.5%) married at 40 years and above. Out of those that got married between 0 – 29, 18 of them are traditional worshiper, 82 of them are Muslim while 49 of them are Christian. Also among those that got married at age above 40, we have only one of them as traditionalist, 21 of them as Muslim and 23 of them as Christian with cross-tabulation and the result of chi-square age of male at marriage is associated with religion. However, the result of age and zone shows that age of male at marriage is not associated with zone (Table 3). From the cross-tabulation and the chi-square result obtained we discovered that Age at which Men got married is affected by their religion and senatorial zone.From the cross tabulation and the result shown in Table 6, age at which male traditionalist get married is not affected by education while for the Muslims and Christians, it is affected by education.

3.2 Results of the Saturated Models

In this section, we want to see whether any of the three factors; Education, Religion and zone is a function of the age at which both male and female got married. In doing this we are going to employ the chi-square test for goodness of fit. We must be careful as two-way and multi-way contingency tables use a chi-square statistics to test hypothesis of independence, there are some critical differences in the use of chi-square tests. The use of a chi-square test for independence in two-way contingency table is testing the hypothesis that observed values differ significantly from the value of the expected due to chances. In the use of a chi-square test, rejection of the null hypothesis indicates that the two variables in the model are not independent of each other or that they are somehow related to each other.

Multi-dimensional contingency tables use a chi-square for goodness of fit in which a restricted model is compared with a saturated model to determine whether there is a significant difference between the two models, that is whether the restricted model is parsimonious or not. The saturated model contains all of the variables being analyzed and all the possible relationship between these variables where as restricted model contains a subset of the possible relationship between the variables in the saturated model. In the use of a chi-square test, a failure to reject the null hypothesis indicates that there is no difference between the restricted and saturated model. The lack of difference indicated model that does fitting (parsimonious) restricted model that does not differ from the saturated model.

In this case, we shall select the more parsimonious (restricted) model because it can and will still explain the data equally well as the saturated model which possesses former relationships between variables. We achieve this through the use of backward selection procedure (Hierarchical log-linear modeling) of the log linear models.The procedure begins with the saturated model for both male and female age at marriage with the designs.

Design=Constant + Age + Edu +Rel + zone + Age x Edu +Age x Rel + Age x Zone + Edu x Rel + Edu x Zone + Rel x zone +Age x Edu x Rel + Age x Rel x Zone + Age x Edu x Zone + Edu x Rel x Zone + Age x Edu + Rel + Zone, denoted by:

$$\ln (M_{ijkl}) = \mu + \lambda_i^{Age} + \lambda_j^{Edu} + \lambda_k^{Rel} + \lambda_l^{Zone} + \lambda_{cj}^{Age/Edu} + \lambda_{ik}^{Age/Rel} + \lambda_{il}^{Age/Zone} + \lambda_{jk}^{Edu/Rel} + \lambda_{jl}^{Edu/Zone} + \lambda_{kl}^{Rel/Zone} + \lambda_{ijk}^{Age/Edu/Rel} + \lambda_{ijl}^{Age/Edu/Zone} + \lambda_{ikl}^{Age/Rel/Zone} + \lambda_{ijkl}^{Age/Eedu/Rel/Zone}$$

where μ, is the logarithm of the overall mean.

The likelihood ratio and the Pearson chi-square for this model is zero, this signifies that it is a perfectly fitting model. In the test of significant for the k-way effects it was discovered that elimination of the 4th order and third order with probabilities .9984 and .8452 are not significant. This shows that the particular effect has no contribution to the saturated model at 5% level of significance. However, the 2-way and 1-way effects have a significant contribution. The Test also confirmed that all the two-way and one-way factors should be retained in the saturated model (Table 8).

Now the best model has the generating class denoted as :

$$\ln (M_{ijkl}) = \mu + \lambda_i^{Age} + \lambda_j^{Edu} + \lambda_k^{Rel} + \lambda_l^{Zone} + \alpha\lambda_{ij}^{Age/Edu} + \lambda_{il}^{Age/Zone} + \lambda_{jk}^{Edu/Rel} + \lambda_{jl}^{Edu/Zone} + \lambda_{kl}^{Rel/Zone}$$

4. Conclusion

The results from the analysis in this study show that there is a statistical relationship between age at marriage and level of education attainment among males in Kogi State, Nigeria. Religion equally played a significant role in determining age at marriage for men in Kogi State, Nigeria. The result of the cross tabulation between age and zone indicates that there was no age differential at marriage among the three zones. That is to say that the probability of getting married at any particular age is equally likely among the three zones. However, most interestingly is the result of the cross tabulation between educational level and religion which was significant. The study shows that Islam gives preference to early marriage than other religions. Therefore religion can be seen as a major determinant of age at marriage among males in Kogi State, Nigeria.

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Appendix 1

Table 1: Cross Tabulation of Age and Educational Level

Crosstab

Count

		HEDUC			
		0	1	2	Total
HAGI	0	50	68	31	149
	1	36	191	179	406
	2	3	6	36	45
Total		89	265	246	600

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Squ	89.962[a]	4	.000
Likelihood Ratio	86.059	4	.000
Linear-by-Linear Association	72.669	1	.000
N of Valid Cases	600		

a. 0 cells (.0%) have expected count less than !
minimum expected count is 6.68.

Table 2: Cross Tabulation of Age and Religion

Crosstab

Count

		HRELI			
		0	1	2	Total
HAC	0	18	82	49	149
	1	10	174	222	406
	2	1	21	23	45
Total		29	277	294	600

Chi-Square Tests

	Value	df	ˢymp. Sig (2-sided)
Pearson Chi-S	35.658[a]	4	.000
Likelihood Rati	32.876	4	.000
Linear-by-Line Association	22.544	1	.000
N of Valid Cas	600		

a. 1 cells (11.1%) have expected count le
minimum expected count is 2.17.

Table 3: Cross Tabulation of Age and Senatorial Zone

Crosstab

Count

		ZONE			Total
		0	1	2	
HAGE	0	57	35	57	149
	1	129	117	160	406
	2	13	18	14	45
Total		199	170	231	600

Chi-Square Tests

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Squa	5.806[a]	4	.214
Likelihood Ratio	5.639	4	.228
Linear-by-Linear Association	.341	1	.559
N of Valid Cases	600		

a. 0 cells (.0%) have expected count less than 5. Th minimum expected count is 12.75.

Table 4: Cross Tabulation of Age, Educational Level and Senatorial Zone

Chi-Square Tests

ZONE		Value	df	Asymp. Sig. (2-sided)
0	Pearson Chi-Square	37.949[a]	4	.000
	Likelihood Ratio	35.971	4	.000
	Linear-by-Linear Association	27.703	1	.000
	N of Valid Cases	199		
1	Pearson Chi-Square	37.830[b]	4	.000
	Likelihood Ratio	34.096	4	.000
	Linear-by-Linear Association	27.587	1	.000
	N of Valid Cases	170		
2	Pearson Chi-Square	27.642[c]	4	.000
	Likelihood Ratio	29.514	4	.000
	Linear-by-Linear Association	22.450	1	.000
	N of Valid Cases	231		

a. 1 cells (11.1%) have expected count less than 5. The minimun expected count is 1.44

b. 1 cells (11.1%) have expected count less than 5. The minimun expected count is 2.96.

c. 1 cells (11.1%) have expected count less than 5. The minimurr expected count is 2.36.

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Table 5: Cross Tabulation of Age, Religion and Senatorial Zone

Chi-Square Tests

ZONE		Value	df	Asymp. Sig (2-sided)
0	Pearson Chi-Sq	14.640[a]	4	.006
	Likelihood Ratio	14.711	4	.005
	Linear-by-Linear Association	12.155	1	.000
	N of Valid Cases	199		
1	Pearson Chi-Sq	17.082[b]	4	.002
	Likelihood Ratio	14.046	4	.007
	Linear-by-Linear Association	3.345	1	.067
	N of Valid Cases	170		
2	Pearson Chi-Sq	16.141[c]	4	.003
	Likelihood Ratio	15.853	4	.003
	Linear-by-Linear Association	11.069	1	.001
	N of Valid Cases	231		

a. 2 cells (22.2%) have expected count less than 5. expected count is .91.

b. 2 cells (22.2%) have expected count less than 5. expected count is .85.

c. 4 cells (44.4%) have expected count less than 5. expected count is .42.

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Table 6: Cross Tabulation of Age, Educational Level and Religion

Crosstab

Count

HRE		HEDUC 0	1	2	Total
0	HA(0	16	1	1	18
	1	4	3	3	10
	2	1			1
	Total	21	4	4	29
1	HA(0	23	40	19	82
	1	11	97	66	174
	2		2	19	21
	Total	34	139	104	277
2	HA(0	11	27	11	49
	1	21	91	110	222
	2	2	4	17	23
	Total	34	122	138	294

Chi-Square Tests

HRELI		Value	df	Asymp. Sig. (2-sided)
0	Pearson Chi-Squa	8.086[a]	4	.088
	Likelihood Ratio	8.144	4	.086
	Linear-by-Linear Association	3.355	1	.067
	N of Valid Cases	29		
1	Pearson Chi-Squa	52.438[b]	4	.000
	Likelihood Ratio	51.348	4	.000
	Linear-by-Linear Association	37.798	1	.000
	N of Valid Cases	277		
2	Pearson Chi-Squa	21.603[c]	4	.000
	Likelihood Ratio	22.256	4	.000
	Linear-by-Linear Association	18.203	1	.000
	N of Valid Cases	294		

a. 7 cells (77.8%) have expected count less than 5. The m expected count is .14.

b. 1 cells (11.1%) have expected count less than 5. The m expected count is 2.58.

c. 1 cells (11.1%) have expected count less than 5. The m expected count is 2.66.

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Table 7: Cross Tabulation of Men's Age, Educational Level, Religion and Senatorial

Chi-Square Tests

HRELI	HEDUC		Value	df	Asymp. Sig. (2-sided)	Exact Sig. (2-sided)	Exact Sig. (1-sided)
0	0	Pearson Chi-Square	4.164[b]	4	.384		
		Likelihood Ratio	4.150	4	.386		
		Linear-by-Linear Association	2.939	1	.086		
		N of Valid Cases	21				
	1	Pearson Chi-Square	.444[c]	1	.505		
		Continuity Correction[a]	.000	1	1.000		
		Likelihood Ratio	.680	1	.410		
		Fisher's Exact Test				1.000	.750
		Linear-by-Linear Association	.333	1	.564		
		N of Valid Cases	4				
	2	Pearson Chi-Square	.444[c]	1	.505		
		Continuity Correction[a]	.000	1	1.000		
		Likelihood Ratio	.680	1	.410		
		Fisher's Exact Test				1.000	.750
		Linear-by-Linear Association	.333	1	.564		
		N of Valid Cases	4				
1	0	Pearson Chi-Square	.216[d]	2	.898		
		Likelihood Ratio	.218	2	.897		
		Linear-by-Linear Association	.088	1	.766		
		N of Valid Cases	34				
	1	Pearson Chi-Square	5.993[e]	4	.200		
		Likelihood Ratio	6.502	4	.165		
		Linear-by-Linear Association	1.203	1	.273		
		N of Valid Cases	139				
	2	Pearson Chi-Square	10.151[f]	4	.038		
		Likelihood Ratio	10.416	4	.034		
		Linear-by-Linear Association	.041	1	.839		
		N of Valid Cases	104				
2	0	Pearson Chi-Square	2.582[g]	4	.630		
		Likelihood Ratio	2.602	4	.626		
		Linear-by-Linear Association	.126	1	.723		
		N of Valid Cases	34				
	1	Pearson Chi-Square	1.996[h]	4	.737		
		Likelihood Ratio	1.853	4	.763		
		Linear-by-Linear Association	.049	1	.825		
		N of Valid Cases	122				
	2	Pearson Chi-Square	.593[i]	4	.964		
		Likelihood Ratio	.600	4	.963		
		Linear-by-Linear Association	.019	1	.890		
		N of Valid Cases	138				

a. Computed only for a 2x2 table

b. 7 cells (77.8%) have expected count less than 5. The minimum expected count is .29.

c. 4 cells (100.0%) have expected count less than 5. The minimum expected count is .25.

d. 3 cells (50.0%) have expected count less than 5. The minimum expected count is 3.56

e. 3 cells (33.3%) have expected count less than 5. The minimum expected count is .52.

f. 2 cells (22.2%) have expected count less than 5. The minimum expected count is 4.93.

g. 6 cells (66.7%) have expected count less than 5. The minimum expected count is .18.

h. 3 cells (33.3%) have expected count less than 5. The minimum expected count is .98.

i. 3 cells (33.3%) have expected count less than 5. The minimum expected count is 1.67.

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Table 8: To test that k-way and higher order effects are zero.

K	DF	L.R	Prob	Pearson	Prob
4	16	4.234	.9984	4.039	.9988
3	48	38.136	.8452	41.576	.7319
2	72	260730	.0000	450.877	.000
1	80	1024.856	.000	1377480	.000