Table 4.16: Attitudes Toward Abortion and Premarital Sex

Attitude Toward Abortion	Attitude Toward Premarital Sex (1)	(2)	(3)	(4)
(1) Error	44	11	38	62
(2) (yes,yes,yes)	59	41	147	293
(3) (yes,yes,no)	23	11	13	27
(4) (yes,no,no)	27	8	16	27
(5) (no,no,no)	258	57	105	110

Note: For the column variable, (1) = Always Wrong; (2) = Almost Always Wrong; (3) = Sometimes Wrong; (4) = Not Wrong at All.

of abortion under a less severe situation. The first category of "Error" consists of respondents who do not neatly fall into the Guttman scale.

As is well known, Guttman scales yield only ordinal variables. That is, for our example, we only know that respondents in category (5) disapprove of abortion more strongly than those in category (4), and those in category (4) in turn disapprove of abortion more strongly than those in category (3), and so on. We do not know the relative distances separating the various categories. In addition, we do not know where the nonconforming respondents in category (1) belong.

Table 4.17: Estimated Scale Scores

	Row (Abortion)	Column (Premarital Sex)
(1)	0.075	−0.743
(2)	0.776	−0.127
(3)	−0.098	0.271
(4)	−0.155	0.598
(5)	−0.598	–

Clogg (1982) chose measured attitude toward premarital sex as an instrument in scaling the ordinal measure of the abortion attitude. To do this, Clogg applied the *RC* model to these data. We

replicated Clogg's results using an iterative ML estimation procedure implemented as a GLIM macro, which is available from this book's website. We normalize the model using the convention in Eq. 4.43, thereby restricting both the location and scale of the row and column scores and freeing up an association parameter β. The estimated model fits the data very well ($G^2 = 5.55$ for 6 degrees of freedom; $BIC = -37.81$). The estimated scores are given in Table 4.17, with β estimated to be 1.308, which means a strong positive association between attitude toward abortion and attitude toward premarital sex.

These estimated parameters are essentially the same as those reported by Clogg, although they appear to be different due to different normalizations. The estimated scores should be interpreted in terms of relative distances. For example, the respondents in the first row category ("Error") are estimated to approve of abortion less strongly than those in category (2) but more strongly than those in other categories. It is important to emphasize that a shift of categories would not affect the estimation of the *RC* model. That is, although the *RC* model presumes the ordinal scale of the row and column variables, it does not require the correct ordering of the categories. Estimation reveals such ordering. For our data in Table 4.16, the column categories are correctly ordered. The row categories are not.

4.6 Models for Multiway Tables

Most studies in social science are concerned with relationships among variables, for such relationships often reveal underlying social processes. Two-way tables are the most basic form of representation relating observed variables to each other. In the last two decades, social researchers have fruitfully applied the loglinear models presented in the preceding sections in analyzing associations in two-way tables.

However, two-way tables are inherently limited because they contain little information. For example, two variables may be associated due to their common association with a third variable. When the third variable is controlled, the partial association between the two variables may be nil. To test for such "omitted-variable bias," it is necessary to bring other dimensions into a multivariate study.