

The Role of Drug Usage on Mixing Pattern Among
Cornell Undergraduates and Others

by

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**THE ROLE OF DRUG USAGE ON MIXING PATTERN AMONG
CORNELL UNDERGRADUATES AND OTHERS**

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ABSTRACT:

● The size of unmarked (not Cornell undergraduate) young people population at risk of contagious diseases can be estimated by mark-recapture method and thus the mixing matrix of incomplete data from a survey can be completed. By incorporating the information on drug usage, the size of young drug user population is estimated and different mixing matrices are explored with a set of estimated parameters. Results are compared to illustrate the effect of drug usage on mixing pattern.

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INTRODUCTION:

A survey of Cornell undergraduate social and sexual pattern was conducted in 1989. The data from respondents who did pair off in previous two months were analyzed with special interest. They were classified into different groups for each class: Af, all females; Am, all males; Df, female drug users; Dm, male drug users; Nf, female non-drug users; Nm, male non-drug users. Class 1 is freshman, Class 2 is sophomore, Class 3 is junior, Class 4 is senior, and Class 5 is others (unmarked). The population sizes of Af and Am are given. By mark-recapture methodology, the population sizes of other groups are estimated. The mixing pattern of the first 4 classes of respondents are known, but not

for the last class. By using two-sex mixing axioms in closed population, we can complete the mixing matrices with choice on average number of female partners for males in class 5, denoted by c_5 .

For different groups and genders, Figure 1 through Figure 6 present the mixing patterns from the first 4 classes, where the height is proportion; Figure 7 shows the average number of partners of the first 4 classes; Figure 8 presents the estimated population sizes for all 5 classes; Figure 9 and Figure 10 show the conditional mixing pattern of the last class (unmarked) with different choices of c_5 .

CONCLUSIONS:

- **About 20% of all dating active respondents are drug-users. So the DRUG group is a minority, hence the behaviors in ALL group in average number of partners, estimated population sizes, and mixing patterns are very similar to those in NODRUG group. In general, drug users have more partners than non-drug users do. Males tend to have more partners than females, except those of Class 5. Also male population sizes at risk are likely to be larger than those of females. Although the like-with-like preference is obvious for respondents of the first 4 classes, it is not always the case for**
- **individuals of Class 5, which depends on the choice of average number of partners.**

Figure 1. Dating Pattern of Females

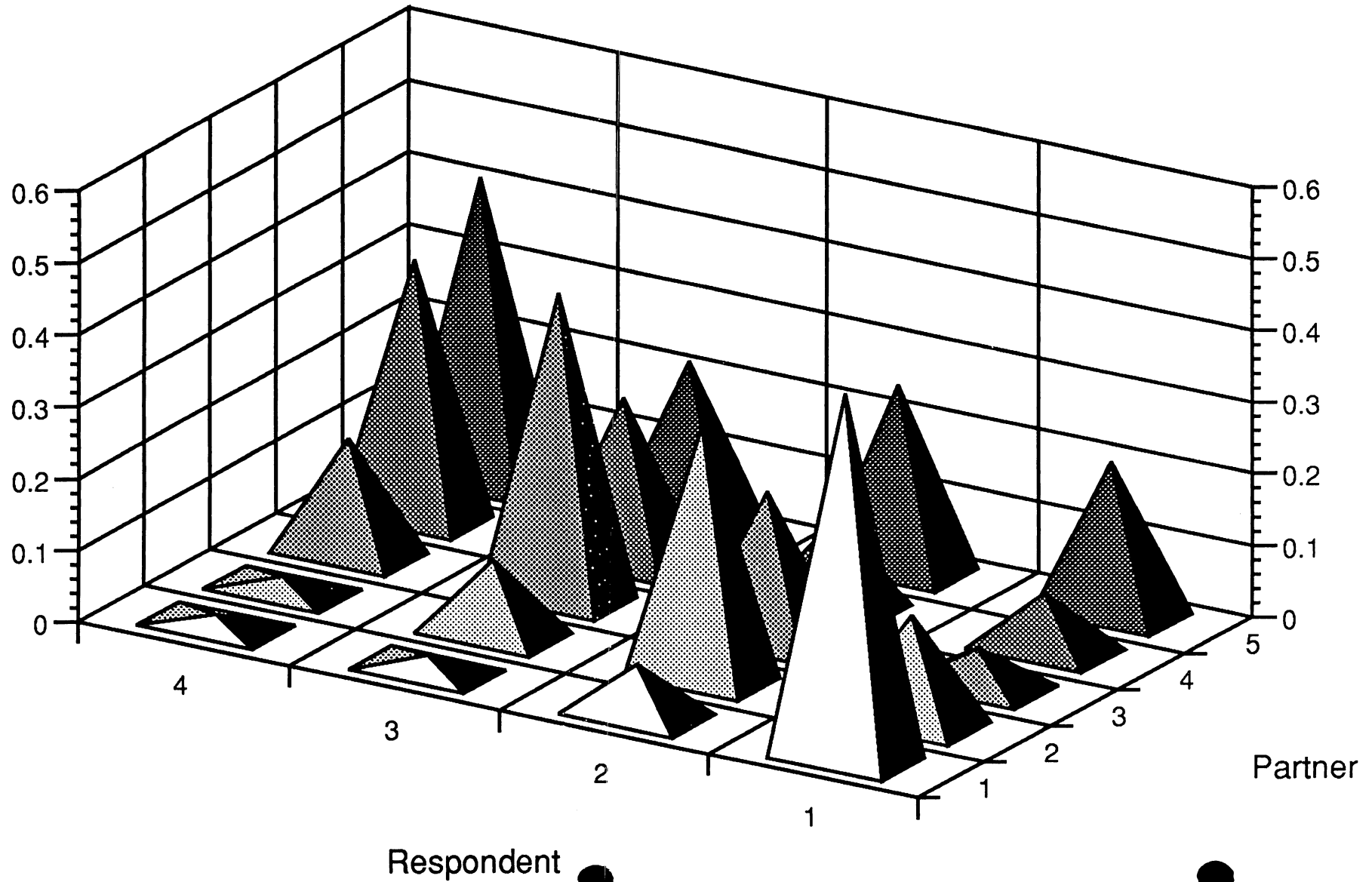


Figure 2. Dating Pattern of Males

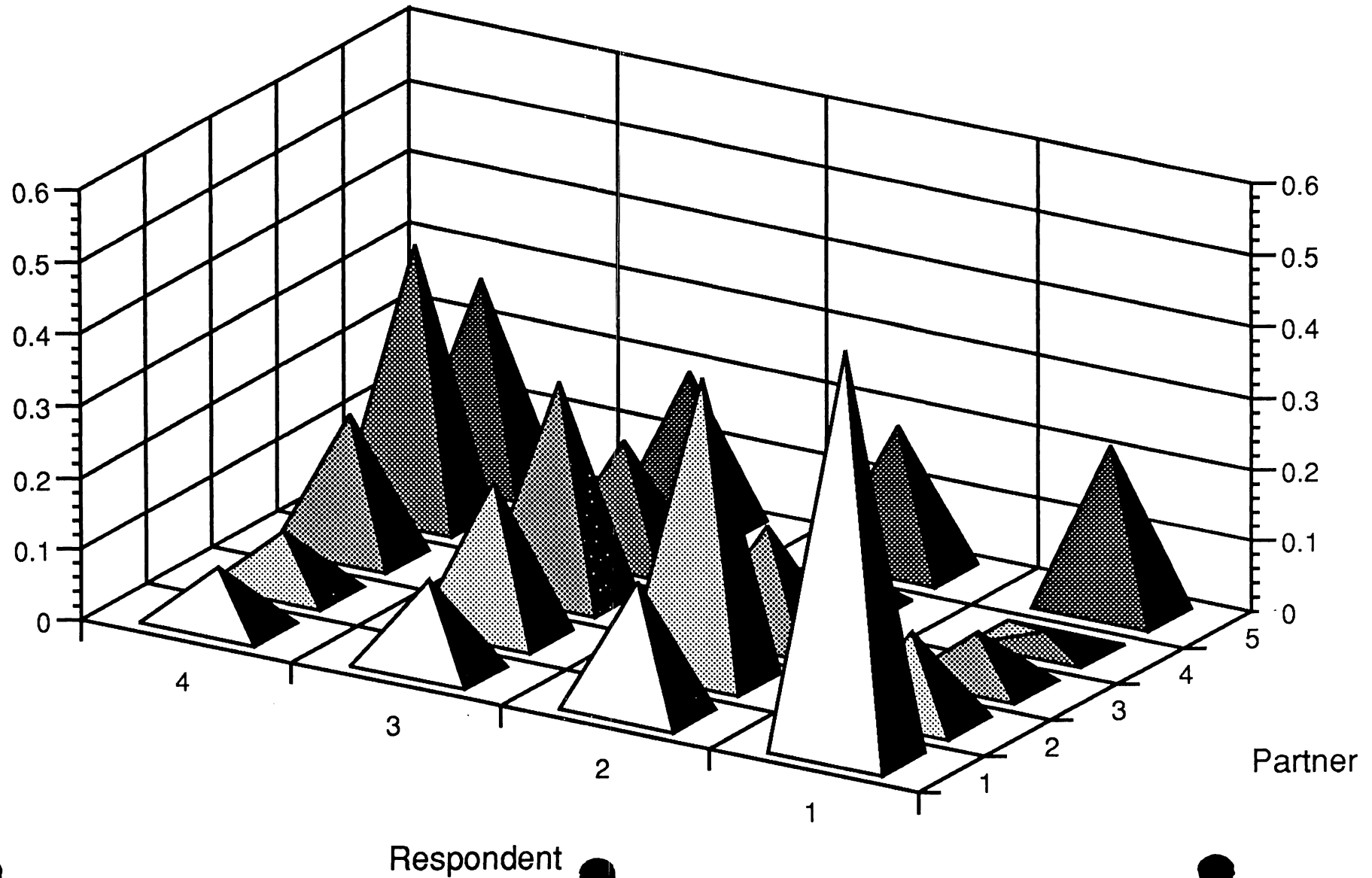


Figure 3. Dating Pattern of Female Drug Users

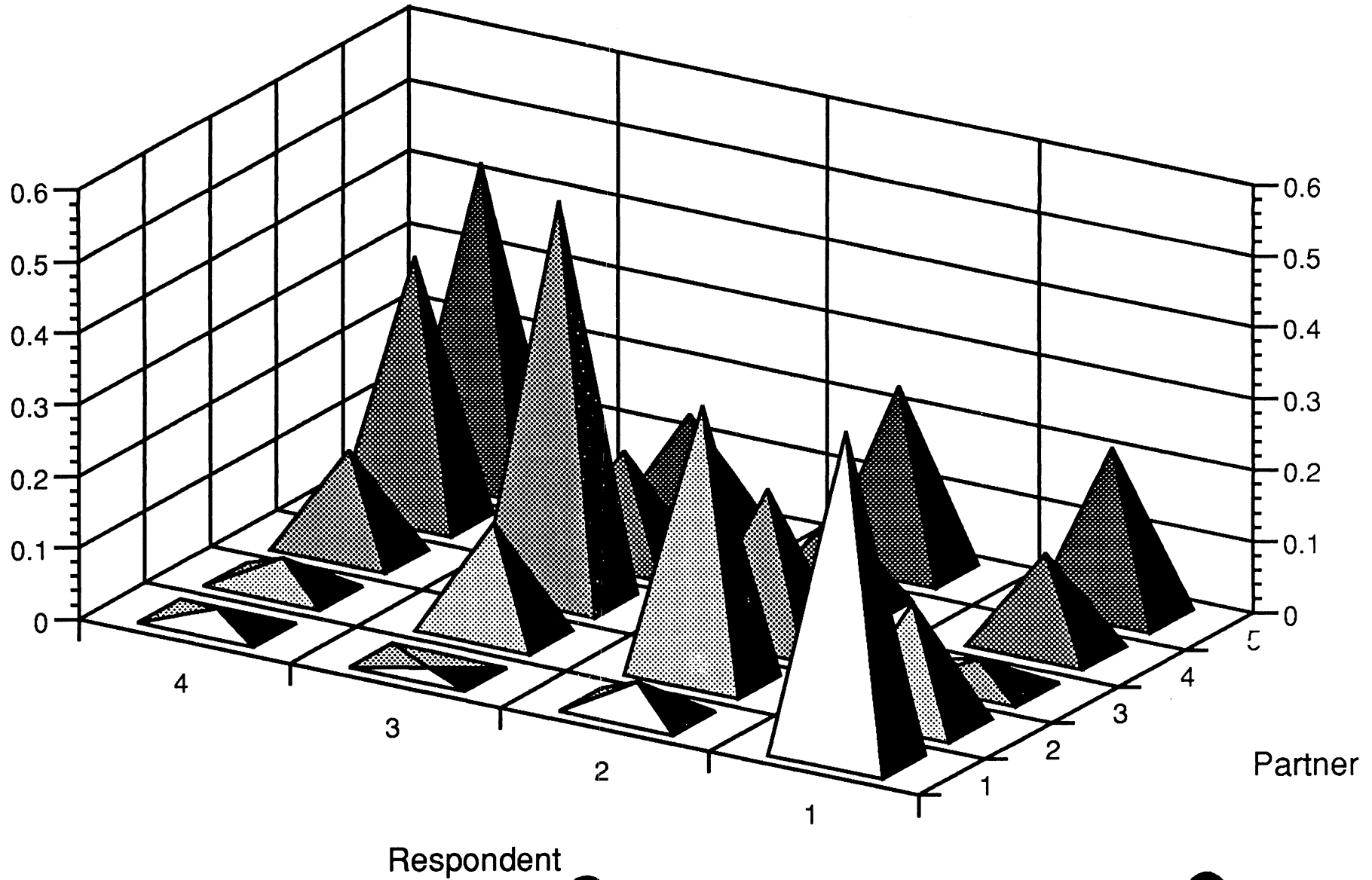


Figure 4. Dating Pattern of Male Drug Users

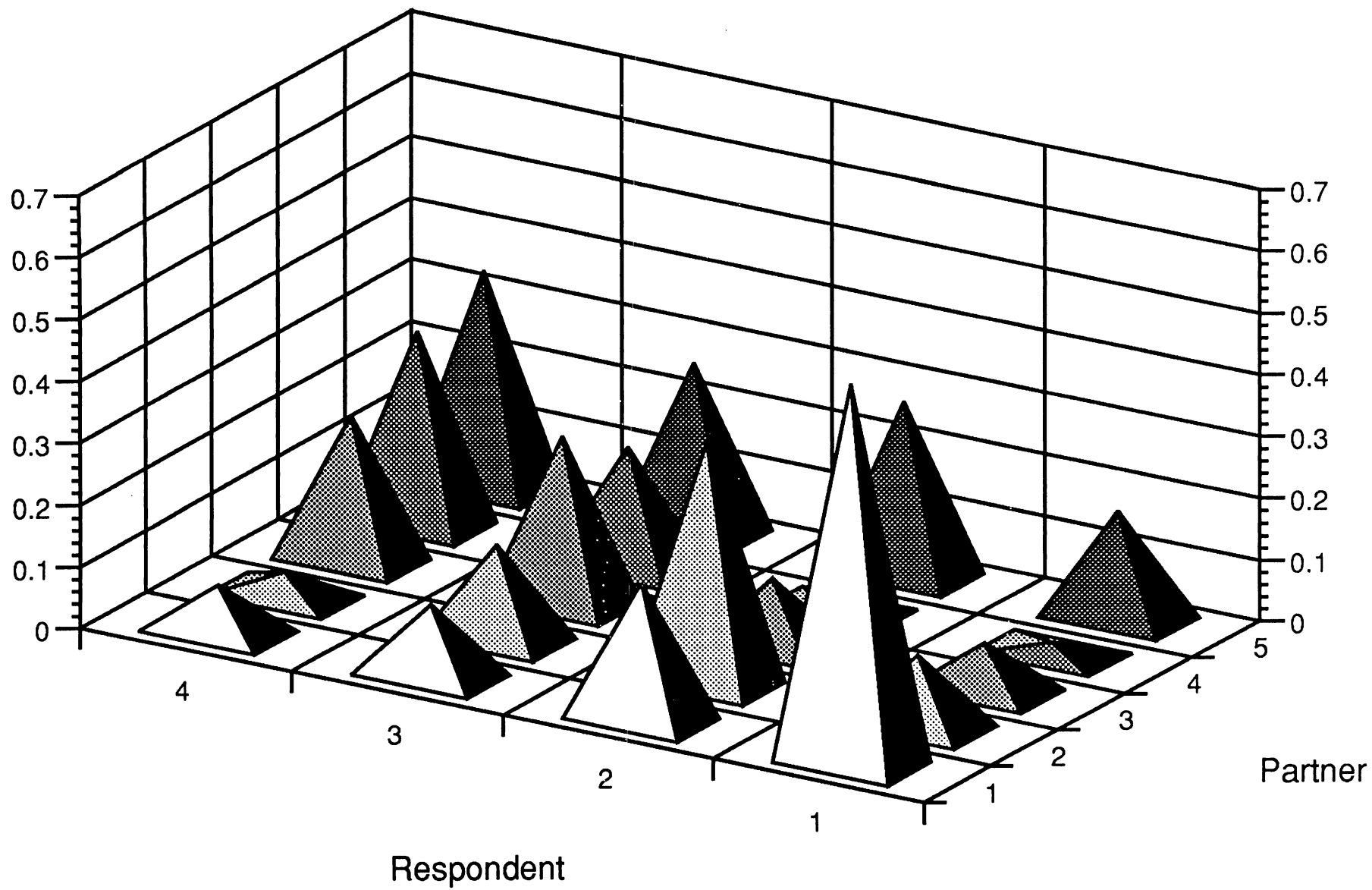


Figure 5. Dating Pattern of Female Non-Drug Users

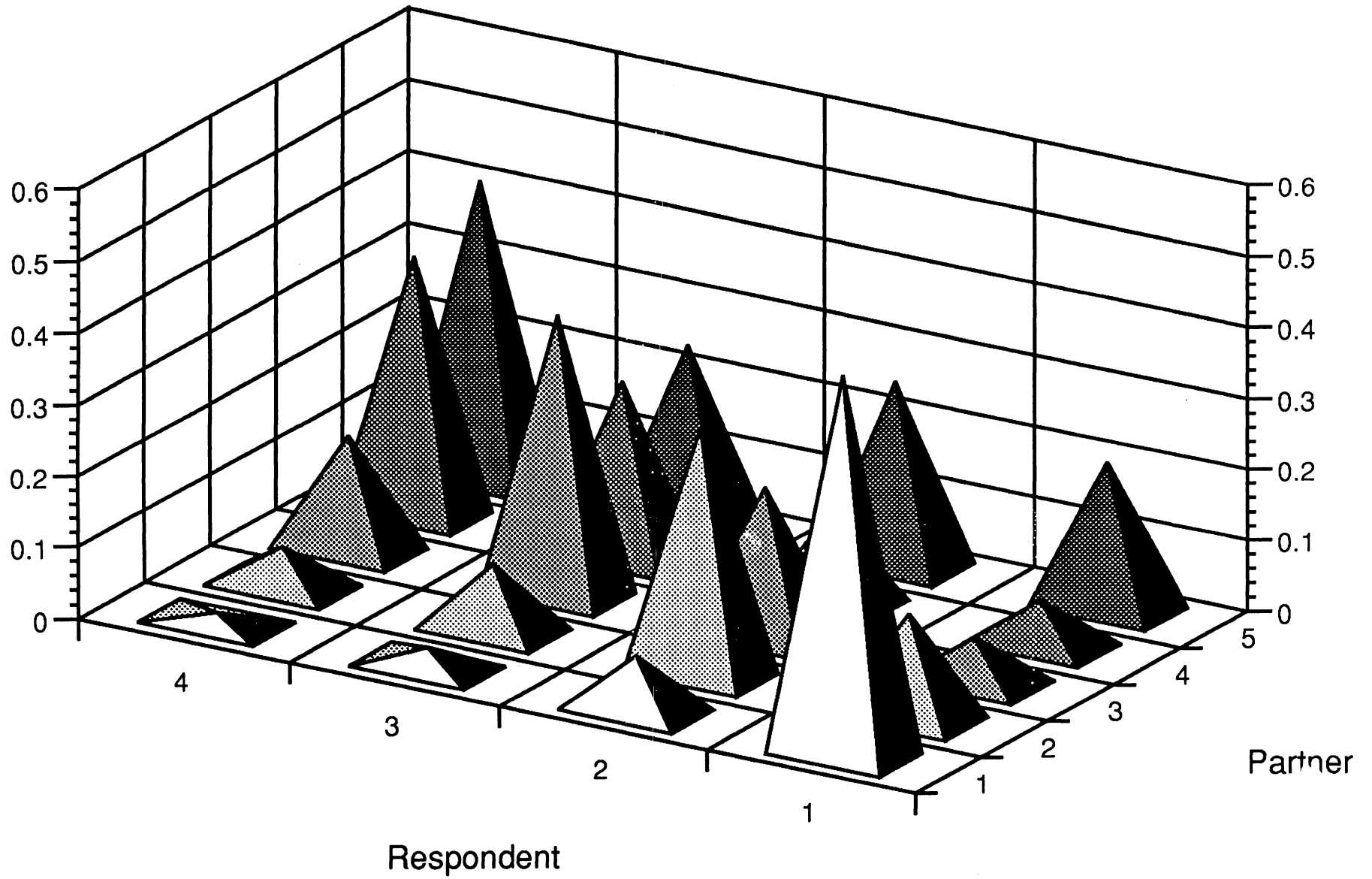


Figure 6. Dating Pattern of Male Non-Drug Users

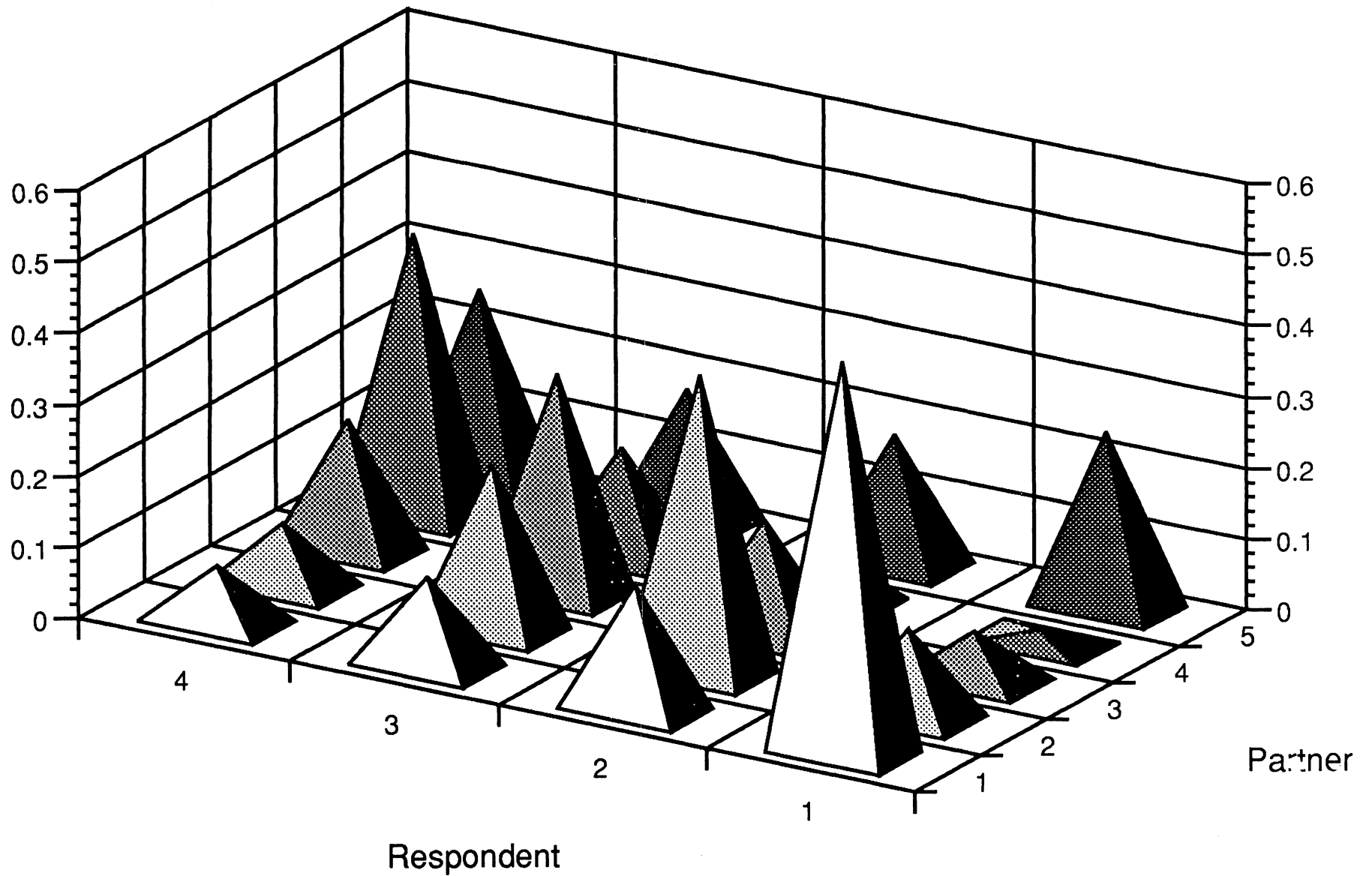
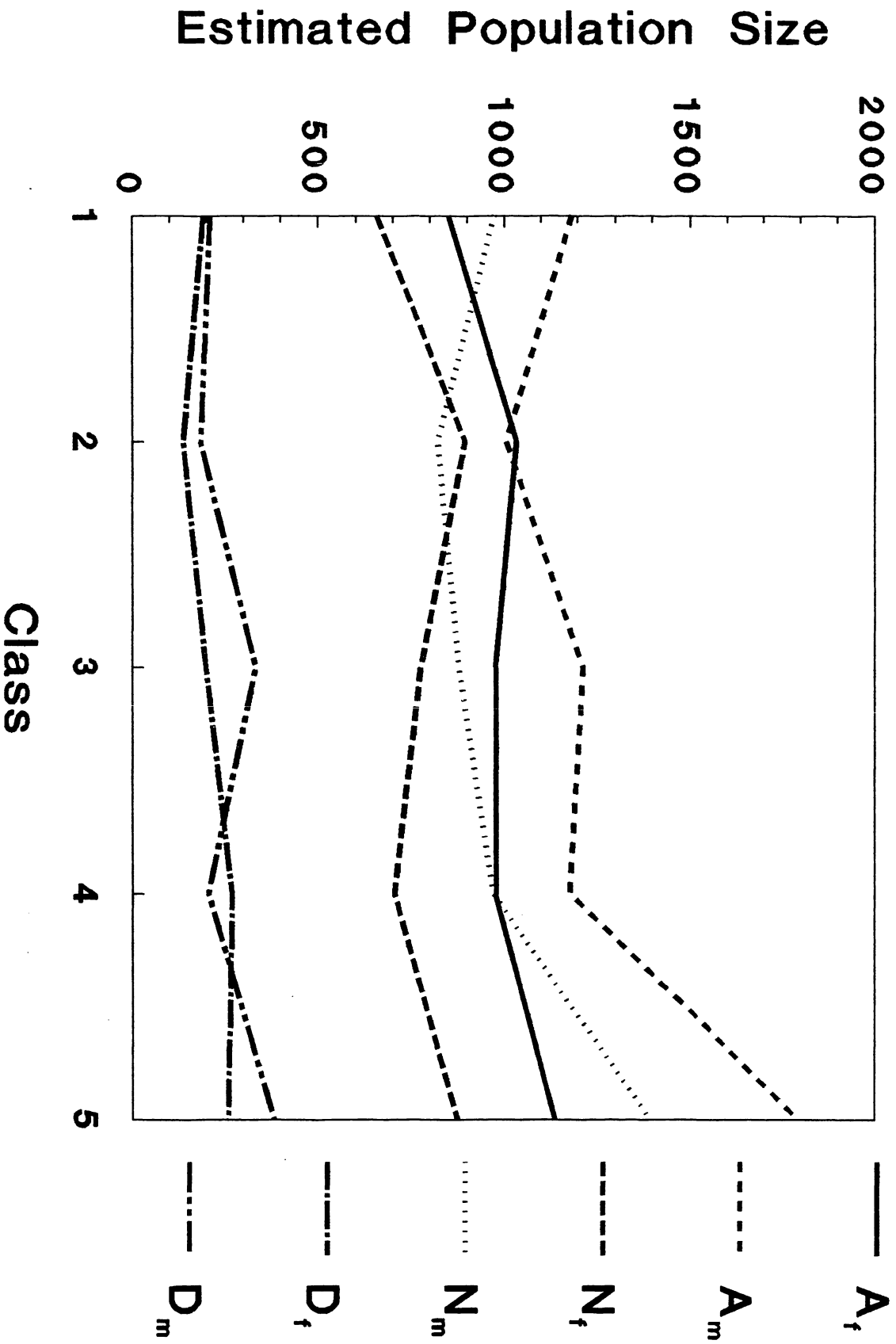
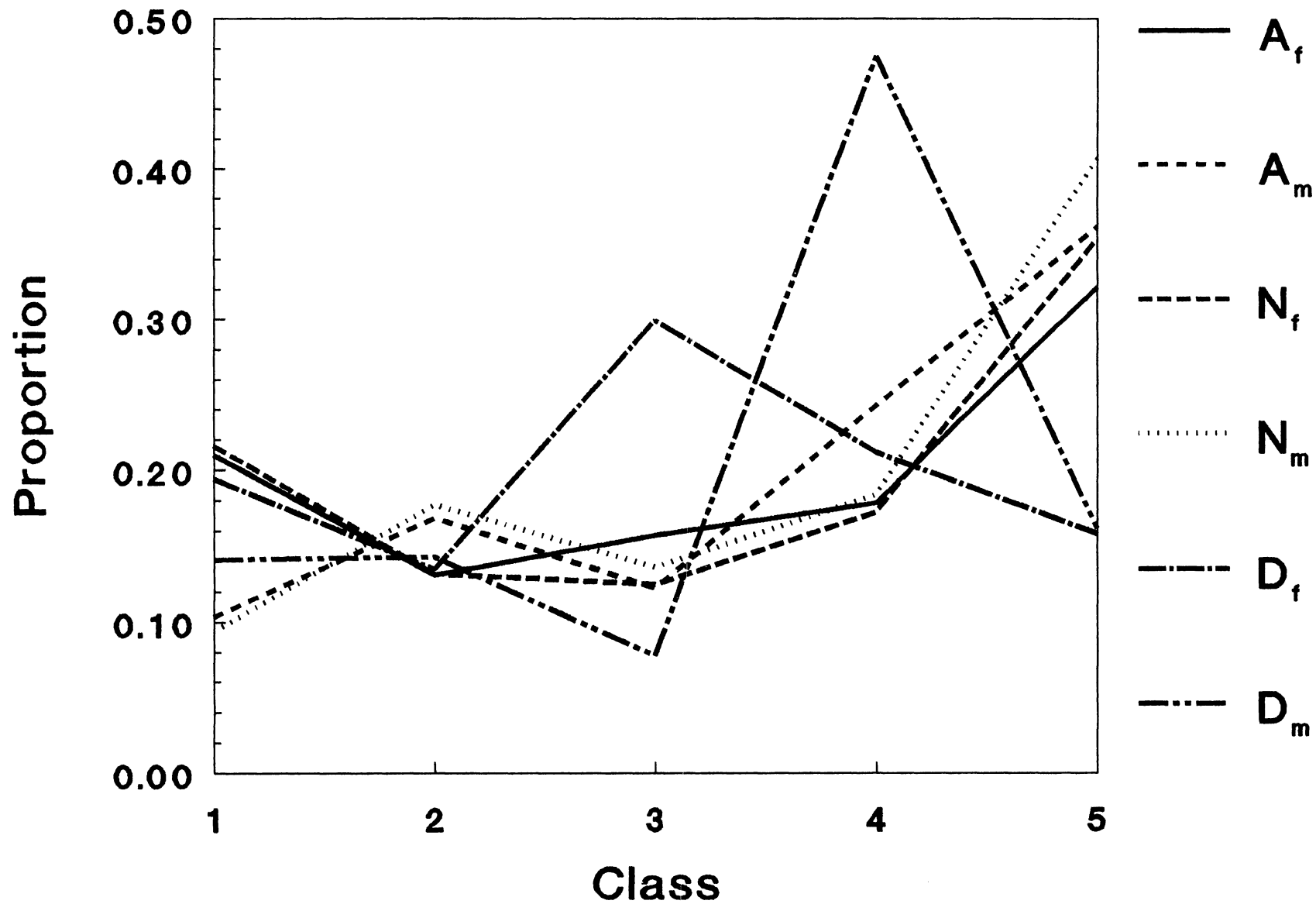


Figure 8: Estimated Population Size for Different Groups



**Figure 9: Conditional Mixing Patterns
of the Unmarked Class with Minimum c_5**



**Figure 10: Conditional Mixing Patterns
of the Unmarked Class with $c_5=2.5$**

