Sexual Mixing Patterns among Age and Educational Groups in China

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Background:
Over the last three decades, China has undergone profound socioeconomic transformations and opening to the outside world. These transformations have induced significant changes and variations in sexual norms and behaviors and in the social context of sexual partnering. Age at marriage is increasing; premarital and extramarital sex are becoming increasingly common; and the demand and supply of commercial sex are growing. Many factors determine an increasing number of sexual unions arising from relationships other than marriage. In addition, sexually transmitted diseases (STDs) have made a comeback after their virtual eradication under Mao period. Although China is still in the early stages of an HIV/AIDS epidemic, concerns are great that the epidemic may soon spread to the general population via heterosexual transmission. Patterns of sexual mixing and the structure of sexual partnering significantly determine high risk practices and variation of infection across population groups. Thus, studying sexual mixing patterns across different types of sexual relationships in China is important and timely.

Data:
This paper relies on data from the Chinese Health and Family Life Survey, the most recent and comprehensive survey on sexual behavior in China to identify key attributes of sexual mixing by age and education and compare the patterns across two different types of sexual relationships. CHFLS is a national stratified probability survey of the Chinese adult population ages 20-64. The survey covers a wide range of topics: childhood sexual contact, intimate partner violence, forced sex, sexual harassment, body image concerns, sexual well-being, risk behaviors, marital history and extramarital partnership history. The survey provides valuable information about the demographic and social characteristics of the respondents and limited ones for the partners. Thus, it makes possible the aggregately statistical analyses of matching pattern between them. In this survey, 5000 individuals were initially selected. 3821 of them including 1905 males and 1916 females completed the interview and 3426 provided a urine sample yielding a 69% participation rate.

   The two different types partnerships, the primary relationship and the secondary sexual relationships, are distinguished by three criterions: duration, timing and intimacy. The primary sexual relationship is a "*current*" relationship that has lasted "*for more than 6 months*" and "*the most intimate one*". The secondary sexual relationship is a relationship that lasted "*for more than a month*", "*other than the current spouse/partner(*the primary one*)*". In fact, 95% of the reported primary partnerships are marital relationships. Preliminary data examination also reveal that 82% of Chinese population have only one type of the relationships and about 10% of them have both types of relationships.

Methods:
   In the analysis, we use log-linear models. Among different types of log-linear models, we construct and select models according to theoretical assumptions and model fits.

In terms of age mixing, we first construct a mixing matrices between male age groups and female age groups. The age interval is five years. To capture the mixing patterns indicated by the mixing matrices, we use a model that consists of two sets of interaction parameters to explain the attracting forces between different age groups of male and female. First, a linear parameter captures how mating chance increases as the age difference approaches zero. Second, another set of parameters captures gender differences in mating chance across age groups. Mathematically, the model is defined as:

$$\log F_{ij} = u + u_i^M + u_j^F + c_{ij} + \beta k_{ij}$$

where u_i^M and u_j^F denote the main effects (from the marginal distribution) of male age group and female age group; c_{ij} is a categorical variables that groups interactions parameters into different categories according to their distance from the diagonals; β is the linear parameter associated with k_{ij}; k_{ij} is a newly created variable that represents the age difference between male age group and female age group.

For educational mixing, the mixing matrix is constructed within 6 educational levels of and female. To describe the mixing pattern, we chose the *crossing parameters model*. This model assumes that two persons need to cross the barrier, their educational difference in order to have sexual partnership. Each educational level has a certain level of difficulty to cross. The model attempts to find out which educational levels are serious "barriers" for sexual mixing. A mathematical representation of the model is:

$$\log F_{ij} = u + u_i^M + u_j^F + c_k d_k \quad ;$$

$d_k = 1$ if (eduM) $< k$ and eduF $>= k$) or if (eduF $< k$ and eduM $>= k$), otherwise $d_k = 0$;
$k = 2, 3, 4, 5, 6$.
where c_k is the coefficients associated with crossing parameters d_k.

Results:
Results show that age homogamy exists in both primary and secondary sexual relationships, although such homogamy is stronger in the primary sexual relationship. In terms of age mixing, the tendency that men choose younger women and women choose older men is stronger in the primary relationship. Interestingly, people who have both a primary and a secondary partner are consistent in partner selection in terms of age.

Likewise, educational homogamy exists in both types of relationships. On average, educational barrier is higher in the primary than in the secondary relationship. People who "cross" educational boundaries, tend to cross the same educational boundary in both relationships.

Our results suggest that there are more social constraints in the selection of one's primary partner than in the selection of one's secondary partner. These findings may also carry important public health implications, because the spread STDs and HIV is smaller when the selection of partners is assortative in terms of groups defined by demographic and social traits. Since the analyses find homogamy among age and educational mixing and people are consistent in terms of their choice in the primary relationship and in the secondary relationship, the implication for public health is positive.