G Model
SON-1049; No. of Pages 9
ARTICLE IN PRESS
Social Networks xxx (2017) xxx–xxx
Contents lists available at ScienceDirect
Social Networks
journal homepage: www.elsevier.com/locate/socnet

Revisiting asymmetric marriage rules

Philippe Ramirez [a,*], Stéphane Legendre [b]

[a] Centre d' Etudes Himalayennes, CNRS, F—94800 Villejuif, France
[b] Institut de Biologie de l'Ecole Normale Supérieure (IBENS), CNRS, INSERM, Ecole Normale Supérieure, PSL Research University, F—75005 Paris, France

ARTICLE INFO

Article history:
Available online xxx

Keywords:
Matrimonial patterns
Generalized exchange
Directed graph
Asymmetric relation
Random matrices
Individual-based model

ABSTRACT

Although generalized exchange remains an emblematical model of alliance theory, characterizing matrimonial systems as pertaining to this model is tricky. The necessary condition of generalized exchange is the deliberate preference for asymmetric exchanges. Given a marriage dataset, can we determine whether the observed pattern is due to the realization of a social norm enjoining symmetric or asymmetric exchange or is the result of random processes? Here, relevant probabilities and indexes are established in the framework of graph theory, and are validated using a demographic individual-based model. The methods are applied to three datasets from the literature, allowing to assess with great confidence that the observed marriage configurations were not random.

1. Introduction

Ethnographic investigation in social anthropology proceeds by the identification of patterns that one deems characteristic of norms and practices and whose internal structure as well as links to other domains of social life are then analysed (Hammersley and Atkinson, 2007). For the ethnography of kinship, these patterns are noticeable features of kinship relationships, descent, affinity and alliance. The present article concerns the status of alliance patterns observed within genealogies and matrimonial data collected in the field. We wish to draw attention on a critical question and suggest methodological procedures to deal with it: under what conditions is it reasonable to consider that patterns of relationships displayed by a particular matrimonial system reflect intentional designs, in other words the realization of preferences by the actors? We shall consider the case of asymmetric alliance patterns, i.e. noticeable orientations within series of marriages occurring among several descent groups (clans, lineages, . . .).

The conformity of practices to norms touches to important theoretical issues in the anthropology of kinship (see e.g. Fliche, 2006). Up to what point are asserted norms followed in practice? What then is the status of a norm: a model, a mental representation of the society, or a rule intended at the regulation of marriages? When patterns seemingly conforming to the norm are actually perceived in a set of practices, are they really the effect of an intentional application of the norm or are they produced randomly?

These questions also concern the interpretation of ethnographic material from other domains. Malinowski (1926, p. 120) questionned the propensity of anthropology to portray 'native law as the whole truth'. Indeed, the ethnography of kinship is particularly vulnerable to a major epistemological bias, the overvaluation of 'beautiful systems'. Ethnographers tend all the more to cherish beautiful systems when they originate from the discourse of the informants. The sophistication of kinship systems, be they terminologies or alliance structures, exerts a fascination that induces a depreciation of the contingencies of actual practices.

Modalities of alliance have been the object of an abundant literature. One of the modalities whose seductive form has attracted most attention and induced many debates is the one that Claude Lévi-Strauss called 'generalized exchange' and which before him was described by Dutch anthropologists as 'asymmetrical connubium' (vi-Strauss, 1949, 1969; vi-Strauss, 1949, 1969; Josselin de Jong, 1980). Based on a 'prescription' of marriage with explicit categories of kin (e.g. Mother's Brother's Daughter, MBD), generalized exchange consists in the circulation of women among descent groups according to an oriented cycle of alliances. Numerous writings have debated with sophisticated arguments mostly on the interpretation of the norm and, less often, on its realization (Needham, 1958b, 1962; Leach, 1951) (Lévi-Strauss, 1969, XVII ff.) (Parkin, 1990; Hage and Harary, 1996).

For Leach (1945, p. 68), circulating connubium has no 'practical reality'. Needham (1957) showed that the connubium exists in Eastern Sumba but did not involve all the descent groups. Although reported as a norm in numerous Southeast-Asian societies, generalized exchange is far less documented at the level of actual marriages. The pure form, by which all marriages would follow the

* Corresponding author.
E-mail address: philippe.ramirez@cnrs.fr (P. Ramirez).

https://doi.org/10.1016/j.socnet.2017.09.004
0378-8733/

Please cite this article in press as: Ramirez, P., Legendre, S., Revisiting asymmetric marriage rules. Soc. Netw. (2017), https://doi.org/10.1016/j.socnet.2017.09.004

model, has never been found. In several cases where signs of a cyclic orientation seemed to emerge from the data, the relevance of such signs have been put into question (Leach, 1951; Ackerman, 1964). In effect, before considering the cyclicity of exchanges one should reflect on one of its necessary conditions, asymmetry, or the non-reciprocity of marriages among groups taken in pairs (using the terminology of network theory presented below, by 'cyclicity' we mean here a cycle of length at least 3, not a cycle of length 2 which corresponds to reciprocity). Assessing asymmetry out of a raw census of marriages is not an easy task. Obviously, no one expects to find a system that would contain exclusively asymmetrical relationships. But where should the threshold be set, beyond which a relevant sign of intentional preference for asymmetry could be confirmed?

The identification of asymmetry out of real data has been the object of a surprising debate in Volumes 66–67 of American Anthropologist (1964–65), focusing on an instance of generalized exchange among the Purum of Manipur (North-East India) reported by Das (1945) and widely commented by Needham (1958a). Among the several issues at stake, the novel one was about the definition of asymmetric alliances. Which alliances should be counted as asymmetric and how much was needed to decide that people actually preferred them? (Ackerman, 1964; Geoghegan and Kay, 1964; Needham, 1964). Although graph theory was already developing at that time (e.g. Harary, 1969), providing tools directly applicable to such problems, in the American Anthropologist debate, the arguments for or against the Purum asymmetry were built solely on the interpretations of matrices. The debate took a polemical and much confuse turn and finally some authors went as far as completely disqualifying the subject (Wilder, 1964), pretending that a matrimonial model should not be interpreted in the light of its possible realization – a position formerly adopted by Lévi-Strauss (1969, p. 193) and Leach (1945), although more carefully. This position gained momentum in the three following decades, culminating in full-fledged rejection of kinship studies by some scholars (e.g. Schneider, 1984).

We do not believe that practices can be evacuated in such a way. The logical outcome would be that in all cultural domains, discourses have no links with practices. We definitely agree that matrimonial norms pertain to other cultural domains than uniquely to the regulation of marriages, but we postulate that matrimonial choices are neither random nor determined uniquely by casual strategies. There exists regularities that can be detected using a methodical exploration of matrimonial corpuses. This standpoint seems to be increasingly assumed around the works of White, Read and the Kintip group (White, 1999; Read, 1998; Hamberger et al., 2011). A recent important contribution by Roth et al. (2013) proceeded from a question very similar to ours, about the role of chance in shaping matrimonial corpuses. It suggested to 'compare empirical alliance networks with a random baseline'. The variety of descriptors, and the sophisticated formalization of Roth et al. (2013) form a rich tool, particularly suited to the exploration of large corpuses. Here we consider in details a single feature, asymmetry, and simple methods to analyze its occurrence in the shallower corpuses collected during preliminary surveys.

We consider a social group partitioned into a number n of classes. Marriage of a girl from class i with a boy from class j creates a matrimonial relation from i to j, denoted $i \to j$. By *marriage* we mean the union of two individuals whereas by *matrimonial relation* we mean the relation between two classes i and j that is created when there is at least one marriage involving a girl from i and a boy from j. Matrimonial relations create alliances between classes. By *alliance* between class i and class j we mean that there exists either a single matrimonial relation $i \to j$ or $j \to i$, or that both relations $i \to j$ and $j \to i$ are present. In the later case, a single alliance corresponds to two matrimonial relations: in social network analysis (Wasserman and Faust, 1994), such a dyad is known as a *mutual*.

We assume exogamy: a girl cannot marry a boy from her own class. Although endogamous marriages are often recorded, we have dismissed them for simplicity, an option that does not alter our results significantly. The asymmetry rule stipulates that if the marriage of a girl from i with a boy from j has occurred (with $i \neq j$), no girl from j will be allowed to marry with a boy from i. A matrimonial relation from class i to class j is said *asymmetric* when we have $i \to j$ and not $j \to i$. It is *symmetric* when $i \to j$ has a counterpart $j \to i$ in the reverse direction. Similarly we speak of asymmetric and symmetric alliances.

In this study, we first compute the probability of a given configuration containing symmetric and asymmetric matrimonial relations, assuming that matrimonial relations occur at random. A statistical test allows to assess whether the degree of asymmetry of an observed configuration should be attributed to chance. The applicability of the formula to real data is validated by a demographic individual-based model. We also consider asymmetry in the set of individual marriages and define an asymmetry index for this set. The relevance of this index is tested using the demographic model together with the generation of random marriage matrices.

Asymmetry in matrimonial relations and in the set of individual marriages are two distinct notions. Asymmetry in marriages necessitates the knowledge of the number of marriages between classes whereas asymmetry in matrimonial relations can be based on more fuzzy information, e.g. 'girls from class i tend to marry with boys from class j whereas girls from class j tend not to marry with boys from class i'. Nevertheless, when the number of marriages is known, it provides information about the existence and direction of matrimonial relations, e.g. many more marriages from i to j than from j to i suggests the asymmetric matrimonial relation $i \to j$.

Our methods are applied to three observed marriage datasets from the literature, allowing to assess if these configurations should be attributed to a random process or to the deliberate application of a social norm.

2. Combinatorial study

The situation is usually described (e.g. Hamberger et al., 2011) by a directed graph with n vertices labeled $1, 2, \ldots, n$ representing the classes. An arc $i \to j$ joining vertex i to vertex j represents a matrimonial relation from class i to class j. The exogamy rule means that the directed graph does not have loops.

A directed graph with n vertices is conveniently described by its adjacency matrix, a (0,1)-matrix $\mathbf{A} = (A_{ij})$ of size $n \times n$ such that entry (i, j) is 1 when there is an arc from vertex i to vertex j and 0 otherwise. By the exogamy rule, the diagonal entries of $\mathbf{A}$ are 0.

To study asymmetry in the set of individual marriages, we use a weighted directed graph having the same vertices: there exists an arc $i \to j$ only when the number W_{ij} of marriages of girls from class i with boys from class j is nonzero. The integer $W_{ij} > 0$ is then associated with the arc. By the exogamy rule, $W_{ii} = 0$.

2.1. The probability of a given configuration of matrimonial relations

Let us assume that there are k matrimonial relations, among which a are asymmetric. The adjacency matrix $\mathbf{A} = (A_{ij})$ has k nonzero entries. Asymmetry of the relation $i \to j$ means that if $A_{ij} = 1$ $(i \neq j)$ then $A_{ji} = 0$. Symmetry means that both $A_{ij} = 1$ and $A_{ji} = 1$. The non-diagonal entry pairs (A_{ij}, A_{ji}) of the adjacency matrix are in number $\frac{n(n-1)}{2}$. They are of the form (0,0) (no relation), (0,1) or (1,0) (asymmetric relation), or (1,1) (pair of symmetric relations, i.e., symmetric alliance). The k–a symmetric relations come in pairs.

Please cite this article in press as: Ramirez, P., Legendre, S., Revisiting asymmetric marriage rules. Soc. Netw. (2017), https://doi.org/10.1016/j.socnet.2017.09.004