

Kinship, Class, and Community

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Chapter 10 for: Sage Handbook of Social Networks
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1. Introduction: Kinship networks and cohesion. Social cohesion is the basis of mutual responsibility and well-being in human societies (Council of Europe 2009), the way that people are assimilated into them, how groups hold power, stratify and manage the flow of resources. Kinship networks in the civil societies of nation states, in contrast to smaller-scale societies, are far too rarely studied as a basis of social cohesion. Networks, the social tissues of our lives, are only partially visible to us, thus we fail to see how these are wrapped and embedded in larger networks. This review of kinship network analyses presents evidence of how fundamental differences in the forms of marital cohesion have profoundly different effects over a wide range of social phenomena, regional scales and diverse cultures.

A *kinship network* is composed of relations of parentage (parent-child *arcs*, oriented by time) and couples (e.g., marriage). The nodes in an Ore-graph (Ore 1960) are individuals; or, in a P-graph (White and Jorion 1992), couples and individuals. The latter embeds the matrimonial or parental couple relation *within* the appropriate nodes: A person from a parental node family of orientation joins one or more partners to form their own parental-couple node(s) (families of procreation). This makes it easy to trace matrimonial circuits, where one or more couples have common ancestors (see Hamberger et al. 2009c) so the last in their series of marriages (ordered in time), or a single marriage, *relinks* the families that were already linked. It is these relinking circuits that create kinship cohesion through marriage. Ore-graphs have to separate the cohesiveness of parent-child 3-cliques (mother-father-child) from the broader of cohesiveness of shared ancestries, which is directly captured by P-graph circuitry. To reconcile these differences Harary and White (2001) defined a P-system as a parental (kinship) network that orders the inclusion relations, at multiple levels of embedding, of individuals, marriage, nuclear family, descent lines and cohesive groups. People are in one or more family, one or more marriage, and embedded in groups of higher levels of organization. The higher-order analyses of kinship networks offer integrative perspectives that are more veridical as to how individuals and communities are connected, one that also takes into account how different kinds of groups are embedded in one another.

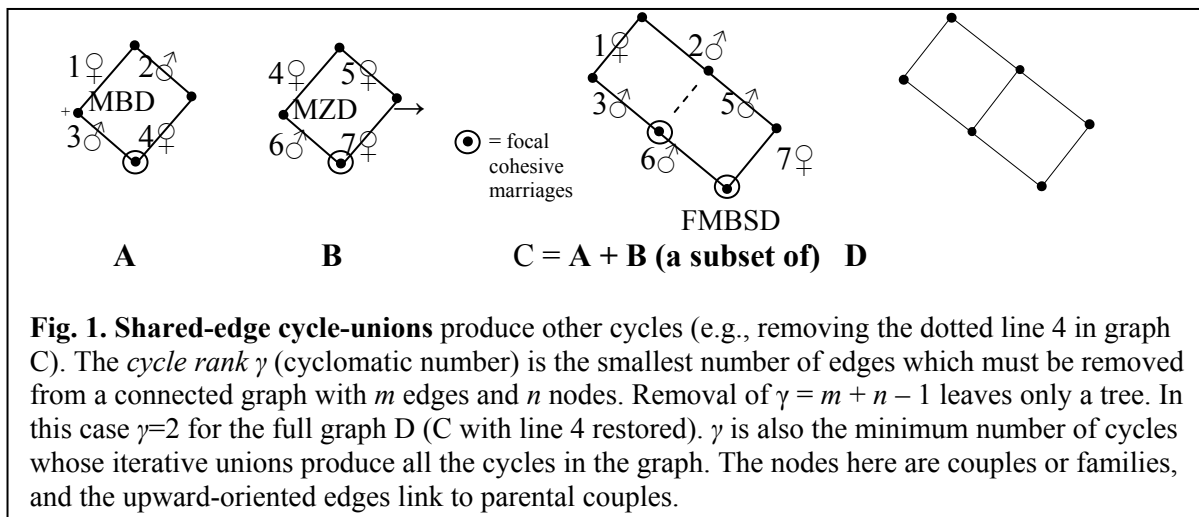
New ways of imaging and analyzing kinship networks as objects in their own right, with tens to millions of people, make it possible to see social phenomena in ways that open a new

series of sociological and anthropological questions. Findings of 40-odd case study kinship network research collaborations among anthropologists and fellow scientists that use these new approaches give unexpected insights about “big structures” and “large processes” (Tilly 1984). These result from viewing marriage and descent, community, class and other topics through the new lens of kinship cohesion created through marriage. Some of these main results are presented here in regional and historical terms to give a sense of spread and variation in social structure. Methods used are developed and reviewed in White and Jorion (1992) and Hamberger et al. (2009c). The most important of these in terms of kinship translates as bounded structural endogamy (White 1997) that derives from the general sociological concept of structural cohesion (Moody & White 2003). These methods may prove especially useful in new studies needed to gauge the effects of globalization on kinship networks and the new ways in which kinship networks are implicated in constructions of social class, ethnicity, migration, social movements, and other large- as well as small-scale social phenomena.

1.1 Relinking Theorem 1 and measures of cohesion. Barring sibling unions, marriage cohesion or *relinking* is unavoidable in human populations that are not undergoing population collapse. **Proof.** There are fewer ancestors as we go back in time, given an intergeneration population growth ratio $k \geq 1$. For N living people, the number of their *personal* ancestors relative to the current population grows exponentially each generation back: $N/1, 2N/k, 4N/k^2, \dots, N(2^{g-1})/k^{g-1} = N(2/k)^{g-1}$ for successive ancestral generations $g=1,2, \dots m$. For the theorem to hold, $k < 2$. ■ Thus local populations of sufficient size will have many cohesive marriages.

Theorem 2. When the number of (ancestral, m) links in a network surpasses the number of (kinship, n) nodes in a network with c components, the *cycle rank* $\gamma = m + n - 1$ of ancestral links—those involved in relinking marriage cycles, as in Fig. 1—will overlap. Here, in P-graph notation, focal marriages A and B (temporally lowermost nodes where the couple represented by the node were already related *before* the marriage) are shown to have ancestral male♂ or female♀ links that lead to common ancestors (two or more couples could also have several common ancestors by which they are relinked). Keeping track of those links we see that couple A (persons 3 and 4) have a MBD marriage and B (6 and 7) a MZD marriage. (In a

P-graph the numbered lines represent individuals, offspring of their parental node and members of their family(ies) of procreation). Wife 4♀ however, is M of 6♂, so these two cohesive marriages overlap by sharing a common arc. Adding the arcs and nodes of two cycles and removing their overlap is a *graph-union*, as shown for marriage C, where a new matrimonial circuit is created (6-3-1-2-5-7-1) by the A-B union. Cohesive marriage cycles with ancestral overlaps, as in graph D, form *bicomponents* with two or more independent paths between every pair of nodes. This forms a unit of *structural endogamy*.



1.2 Reconceptualizing endogamy: Segregation and cohesion. Mapping the skeleton of kinship networks begins with generative genealogical relationships. Demographers, historians, geneticists, genealogical societies, Mormon baptismal projects and GEDCOM databases, social registers and many other sources provide massive amounts of genealogical data. They come with varying amounts of other data of variable quality and supplementary contextual data. Anthropologists collect genealogical data of high quality about communities, with protected or historical personal identities, dense ethnography, narrative, or household survey data.¹

Speaking of endogamy, sociologists think of intermarriage within or between social units as defined by attributes that specify loci of endogamy (community, territory, occupational group, level of wealth, or combinations thereof). This leads to a fractured view of social

¹ <http://kinsource.net/kinsrc/bin/view/KinSources>

structure, a myriad of separate attribute-defined groups with varying degrees of overlap depending on the regions studied or how samples are drawn. Surprisingly, endogamy has rarely ever been *defined in terms of the boundaries of emergent network entities* although it is always assumed that endogamous marriages do somehow constitute themselves in this way. But how? One approach is the “segregation measure” game of finding which individual attributes best partition networks to detect endogamous groups. Another is “community detection” (a literature inaugurated by Girvan and Newman 2002) based on the questionable assumption that communities must be separately partitioned according to maximum density within and minimum density between groups. These are segregative (even segregationist) models. The real world is not so categorical: communities overlap, social modules and roles intersect, individuals are members of multiple communities, and social formations are complex. What “kinds” or aspects of networks actually *define endogamy* rather than merely correlate densities of endogamy with varying subgroups defined by attributes or partitions?

The bicomponent answer to the question of endogamy (White 1997) offers a clearly defined and demarcated form of cohesion within a kinship network. A *bicomponent* of a (kinship) network is a (induced) subgraph with a maximal node-set $\langle S \rangle$ wherein (1) every pair of nodes is multiply connected through paths among nodes in S that have no common intermediaries; (2) these are the *units of structural endogamy*; (3) they conform to a minimal definition of *structural cohesion* (White and Harary 2001), connectivity-2; and (4) they are a *maximal unit of biconnectedness*. Bicomponents don't *partition* a network but may *overlap*, and a higher multipath measure k of *structural k-cohesion* allows more overlap. Bicomponent computation is subquadratic (Gibbons 1985), accomplished in networks of unlimited size.

Similarly, a *cohesive marriage* (marital relinking) is a smaller set $\langle S \rangle$ of nodes in a kinship network, one that includes one or more husband-wife pairs and some of their common ancestors, for which the induced subgraph $\langle S \rangle$ (nodes in S and all edges between them) in the network is a *cycle* (White and Jorion 1992; White 1997, White 2004, see also Hamberger et al. 2009c). These are *minimal units of biconnectedness* in that: (1) every node in a cycle has degree 2, density is minimal; (2) a cycle is only disconnected by removal of 2 or more

nodes; (3) every pair of nodes is connected by two paths that have no common intermediaries, that is, by one or more cycles.

Given that overlaps of marriage cycles form other cycles, as illustrated in Fig. 1, at sufficient population scale (by theorem 1), these will form bicomponents composed of overlapping cohesive marriages, each of which has well defined boundaries in the population.

Empirically, deeper and more accurate memory of fatherhood and motherhood as ancestral ties through will expand and densify marriage bicomponents.

1.3 Bicomponent scale. We do not see much marital cohesion or structural endogamy (marriage within varying degrees such as those of cousinhood) within the extended families or kindreds of European societies. This is a consequence of the stamping out of polygamy by the Christian church during the Middle Ages and the prohibition of marriages up to 6th canonical degree kin. These proscriptions reduced the internal marital cohesiveness of corporate kinship groups and tended to destroy corporate kin groups altogether for all but nobilities, royalties, and merchant elites. “This influence was [most] profound when the Christian church was backed by the state” (Korotayev 2003:12).

Historical and ethnographic background of world kinship networks. The influence on features of kinship by world religions – Christian, Islamic, Hinduist, Hinayana and Vajrayana Buddhist (and the extent to which cultures traditionally combined in different proportions Mahayana Buddhism and Confucianist ideology (or varied in the intensity to which Christianity or Islam were combined with local religions that were not world-scale) – was studied Korotayev and Kazankov 2002; Korotayev 2003, 2004). Once they had coded the 1472 societies of Ethnographic Atlas (Murdock 1967) for world religion (Latin *religio* = bonds), they found, for the complex societies of Eurasia, that clusters of societies with similar features, purely on the basis of kinship, were extremely well discriminated by world religion. Kinship “systems” have the capacity, then, to be spread, diffuse, and extend cohesion through marriage practices. They have the ability to form large-scale subcontinent-level systems in terms of world religion, and form smaller and more variable patchworks in areas of non-world religions. Lévi-Strauss (1949), for example, identifies huge contiguous areas of matrimonial “dual organization,” and regional axes of directed exchange such as brothers-in-law among whom the marriages involve members of one gender moving in a coordinated direction to join their spouses, often counterbalanced by flows of gifts, obligations or status. Other ethnographers (Leach 1954 and subsequent Cambridge scholars) have found that oscillations between directed asymmetric and cyclical exchange along these axes may coordinate with oscillations between the opening (asymmetric exchange) and closing (marriage cycles) of trade routes.

Still, in proximal times and social spaces, at moderate and large territorial scales, and with sufficiently dense sampling, we expect and see structurally endogamous communities in localities all over the world, and local contrasts in varying proportions of emigrants and

immigrants and those who marry locally and those who do not. Within multigenerational community kinship networks today, bicomponent cohesion is dissipating in later generations with globalization higher rates of outmigration so that larger frameworks for study are needed to see the effects on more broadly distributed cohesion.

1.4 Scalability and organization. Every pair of new descendants that marry in a bicomponent enlarge their structurally endogamous community when they marry although it may be reduced by the forgetting of ancestors. It is easy for the sizes of structurally endogamous communities to grow large and for smaller, denser communities to combine into a larger bicomponent with decreased density. As members of relatively dense socially contiguous communities (territorial, religious, class, etc.) migrate away from their home communities, or marry exogamously, local boundaries of structural endogamy may shrink, altering their local densities.

Features of kinship, however, do not so easily diffuse through marriage. Kinship is linked to beliefs about social rights, privileges, and expectations. The founding charter of Judaism establishes equal rights of younger sons and the sanctity of mothers as the transmitters of the covenant (as discussed for Fig. 2 below); the charter of church Christianity the sanctity of the married monogamous couple; the charter of Arabic kinship as modified by Islam establishes limits of polygamy and the right of daughters to inherit half-shares relative to brothers. But kinship establishes an interlock of networks at three levels: the actual ties of marriage and parentage; the separate calculus of the kinship terms; and the role relations established by the moral expectations associated with the kin-naming calculus (“mother,” “sister,” etc). These normative but individualized expectations (support, love, mediated competition, etc.) apply to particular persons within the marriage and parentage network. The first two levels have separate generative structures for their respective networks: concatenations of actual ties as social networks and concatenations of terms as semantic networks. The social ties have their units of network cohesion bounded by bicomponents; the terminological ties have their limits of extension, while the third is the mediated outcome of interaction, memory, language, and emotion. Kinship interactions within a community do not establish a kinship “system” that is somehow culturally shared through proximity and diffusion but a pragmatic systematicity

Leaf (2007) both stronger and restrictive: an *organization* with established members and succession, interlocking roles and expectations, ways of doing things, and ways of adjusting rights, obligations, and differences.. It is within communities and organizations, or concrete social institutions where people interact more intensively that “cultures” of shared meanings are formed in beliefs, cognition, the reading of expression, behaviors, and components of structure and dynamics in social and kinship networks. Tacit acceptance through usage of the terminology for kin *and* the behavioral interaction within the network of actual parentage and marriage relations solves the coordination problem – who is whom to who and how to collaborate or compete under mediated supervision – for the organization. The boundaries of these organizations, ranging from corporate groups to loose kindreds and even social classes linked through marriage, are tighter and often more exclusive than the well defined boundaries of structural endogamy. Kinship *organizations*, however, are much less permeable and more resilient than the scalability of bicomponents would suggest.

1.5 Sociological and historical examples. Given their organizational characteristic, disjoint communities with the same organization and terminology easily recognize one another as “the same,” spatially extensible “zones” of structural similarity that do not blend gradually but have discrete boundaries. The simplest way to present the relevance of large-scale kinship network analysis for historical and ethnographic sociology – class, community, ethnicity, politics, and economy – is to take different regions and religions such as Middle Eastern Hebrews and Muslims, European origin Christians, South Asian Buddhists Australia of the Dreamtime.

2. Structural endogamy with co-descendant relinking (Middle East).

2.1 Religion and relinking in an historical Canaanite lineage. One variant of bicomponent endogamy, along with specific organizational features, is exemplified in Fig. 2, from the Old Testament example used by White and Jorion (1992:456) to show how to construct and analyze kinship networks using P-graphs in relation to historical narratives. In Fig. 2 males are shown as solid lines, and those with several wives (Terah, Abram, Lot, Esau, Isaac) have multiple lines connected by a horizontal line below their parental-node. Dotted lines are for

females, solid circles mark the singles or couples, and the large circles mark the line of patrilineal succession to leadership.

The story behind the lineage in 2.1. The narrative of this lineage of founders of monotheism is often called “the Patriarchs and Matriarchs,” the latter renowned for establishing a line of male succession that passes to younger sons, not the elder ones, and recognizing that Judaic religious descent passes through mothers not fathers. This new pattern of succession, arranged by mothers (the Matriarchs), occurs with lineage-mate arranged marriages of their youngest sons to women in their patrilineage. Marrying women of one’s patriline also conveys a double ancestry to one’s children, who receive the religious, cultural and lineage tradition from both the mother and the father. The change of mythological themes from the pre- to post-Abramic narratives include greater equality for lineage-endogamous women (the Arabic FBD marriage-right, see below) and younger sons favored by their mothers over eldest sons with exogamously political marriages (succession by the most able rather than the eldest). This pattern reoccurs among Hebrew religious elite and Sumerian, Berber, Maronite, Druze and Arabic lineages over and again for a period of four thousand years (Adams 1966:81, Korotayev 2000:403), up to today, often coinciding with lineage corporations (and is also found among the Merina of Madagascar and other scattered societies, see Barry 1998, 2008).

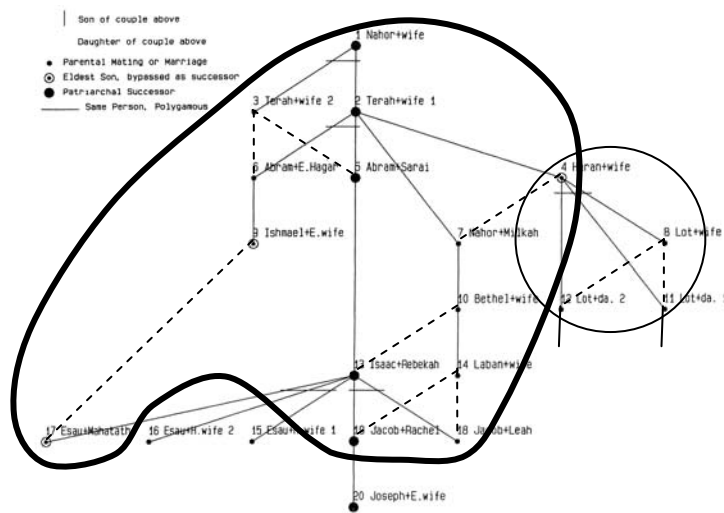


Fig. 2: Marriage and Succession in the Genesis genealogy

The message of this religious-founders network narrative is also marked out by the difference between the nodes in the large bicomponent, marked out within the thick lasso, excluding Lot, versus the smaller encircled bicomponent in which Lot’s incestuous fatherhood through his daughters occurs “cohesively.” Thus moral boundaries symbolized by the immorality of drunkard Lot (with his daughter perishing in Sodom in the Biblical story and wife then turned to salt [salty tears?]) are reflected by limits to endogamy and the exclusion of his descendants in later generations from the larger bicomponent. Thus, the bicomponent added to the original Fig. 2 of White and Jorion (1992:456) clarifies what they called the network “core” of the Canaan genealogy, where the structural endogamy focuses around marriage within a single patrilineage. White et al.’s (1999) *index of relinking* for Fig. 2 showed marriages in the large bicomponent (structurally endogamous group) were at 64% of maximum (7/11) as contrasted with 56% when lineage-member couples *outside* the bicomponent are included.

Hebrew and Islamic social organization, as noted for the “founder” genealogy in Fig. 2, stem from the same root, with Ishmael as an ancestor of Mohammed. They have kinship patterns that have continued and been embellished in various ways

for over four thousand years. Network data from a long-term ethnographic field study (Johansen and White 2002) provides a Turkish case that derives historically from implantation of this system by Arab conquest (although Sunni Turks, with fewer simultaneous marriages, Sunni Arabs, Shi'a Persians, etc., have variant marriage customs, polygyny being more common in rural areas, there are some broad similarities).

2.2 Arab lineages and endoconical clans. An endoconical clan is one where cohesion is generated by marital relinking through remembered ties, like those in Fig. 2, that go back to a “founder core” of common ancestral roots extending from a compact bicomponent of common ancestors. As defined by White and Johansen (2005:xxxiv), “a loose and flexible system of interpersonal ranking based on respect for age and experience” “allows each family line to bring capable members forward in promoting alternative adaptations.” Their monographic study of an Arabized Turkish nomad clan, one of the clans of Aydınlı, shows a social organization very similar to that discussed for the Old Testament lineage core of Patriarchs and Matriarchs. The scale at which endogamy is viewed here, however, is expanded from a single lineage to a set of lineages integrated by structural endogamy that now includes both marital relinking within and *between* lineages and, at a much lower density, to taking wives from outside clans and smaller, less sustainable families moving out through migration to towns. Families with more siblings and siblings-in-law are more competitive because they have more allies.

Historical background to 2.2. The unusual and distinctive feature of Arabized and Arabic lineages, which Korotayev (2000) has traced out to show correspondence to the limits of the Arabic conquests, is matrimonial relinking within the patriline. These are male rights to marry with lineage members like FBD rather than obligations (hence the frequency of exercise of these rights will vary). The lineage segment that is cohesively reinforced, when this right is exercised, varies according to whether the wife shares a patrilineage ancestor two-five generations back (i.e., first, second, third, or fourth-cousin patrilineal parallel marriage). This creates, and does so throughout the entire Arabic and Arabized zone, a whole series of fractally cohesive marriages generated by marriages at different depths and branches of these deep patrilines. (The leadership of classical tribes or clans usually has genealogical scrolls recording ancestries; but these lines are memorized in stylized ways in both classical and non-classical leading tribal families). The ways that different lineages can be welded together ancestrally again create fractal patterns of ties between lineage pairs or triples. Marriages that family *a* has made with *b* and *b* with *c* may be reciprocated, *c* to *b* and *b* to *a*, forming broadcast strong-tie chains of reciprocated ties across pairs, triples, and so forth *between the lineages of these families*. These reciprocated ties may be repeated between same or different branches of the same lineages, or cast anew. White and Johansen found that in the Aydınlı clan of some 2,000 people (counting ancestors plus others who had settled in towns), these chains formed a navigable network of hubs (White and Houseman 2002) that connected everyone in the village by strong (that is, reciprocated) ties. This contrasts with Granovetter’s (1973) “strength of weak ties” model where strong ties tend to cluster while the weak ties form the only navigable long-range paths. The strong ties of the endoconical clan thus form a kind of invisible social-highway system, with routes composed of reciprocated ties that provide meeting places for others at different points along the chain, places to get

to know more intimately the men and women not only from the ally but the ally's allies who often visit and thus meet in intermediary families. Ideally, every reciprocally-linked pair of families on these chains, allies due to the reciprocated exchanges, had relations of intimacy and mutual trust. In Middle Eastern merchant and commercial networks, kinship "highways" of this sort also provide a large part the most common ties for transacting business (Berkowitz et al. 2006). The Aydınlı society, then, like many in the Arabic region, is a segmentary lineage system (see Peters (1967) for another classic segmentary lineage study) with sub-corporations affiliated with clans and lineages at every fractal level claiming rights over resources and property through relations of trust based on in-married, lineage-endogamous women who are important members who exercise rights in the corporation, and out-married reciprocal relinking between units at all fractal levels (clan-clan, lineage-lineage, sublineage-sublineage, et cetera). Women who marry in from other lineages, to the extent they have reciprocal and repeated marriages, are considered allies and have lineage sisters who are also allies, and are in some sense able to negotiate for their home lineage, if it is allied, thereby gaining greater rights and privilege in their husband's lineage. In a segmentary system with reciprocal alliances at all these fractal levels, the response to an outside opportunity or threat can begin at one place and spread over time, scaling up to a level that will depend on the magnitude of opportunity or threat. When crimes or offenses are committed, revenge can be mobilized if compensation is not forthcoming, at levels of cooperation that will adjust to the extent of the opposition; and similarly in mobilizing for new cooperative opportunities. Leadership in this context, as among the Aydınlı, can be emergent, with reputation for performance gaining adherence—often for a lifetime—by people's willingness to come to deliberative council in the emergent leader's home. Moreover, this form of organization, very different from Europe, is one that has been used effectively in business, business corporations that involve kinship, and in short and long-range mercantile trade. It is in this manner that Jewish trading families spread as an ethnic kin-linked diaspora throughout Islamic territories and then into Europe and elsewhere. White and Johansen (2005) explicate how network analytic methods are mobilized to study kinship and complexity in this Judeo-Arabic context.

2.3. "Preference signatures" and genealogical networks of the Greek Gods. The possibility of "preference signatures" left by the relative frequency of each type of relinking marriage in kinship networks was investigated by White and Houseman (2002). They rank-

ordered kin-type frequencies for each of dozens of empirical kinship networks for two types of marital relinking: (1) marriage with consanguineal relatives such as FBD or MBD (more generally: *co-descendant marriage* between co-descendants of a common ancestor) and (2) relinking *co-affinal marriage* among multiple descent lines, such as BWB (sister exchange) or ZHZ (brothers marry sisters) in 2-family relinkings. Fitting these distributions by simple regression to power-law versus exponential curves (unaware of better procedures, such as to use normalized cumulative probabilities and bootstrap statistics for curve-fitting), they discovered two dominant sortings of societies:

A. Societies with a predominance of co-descendant marriage showed a power-law ranking of co-descendant marriage-type frequencies, indicative of preferential choice, and an exponential ranking of co-affinal marriage-type frequencies, expected where there are no preferences (i.e., random differences in frequencies)

B. Societies with a predominance of co-affinal marriage showed the reverse.

Thus, the overall preference (frequency) for *co-descendant versus co-affinal marriage* tends to correlate with a preference among the marriage types in the preferred class of cohesive marriage types. Within each class, societies might have a similar ranking of preferences, such as FBD as the leading co-descendant marriage preferences.

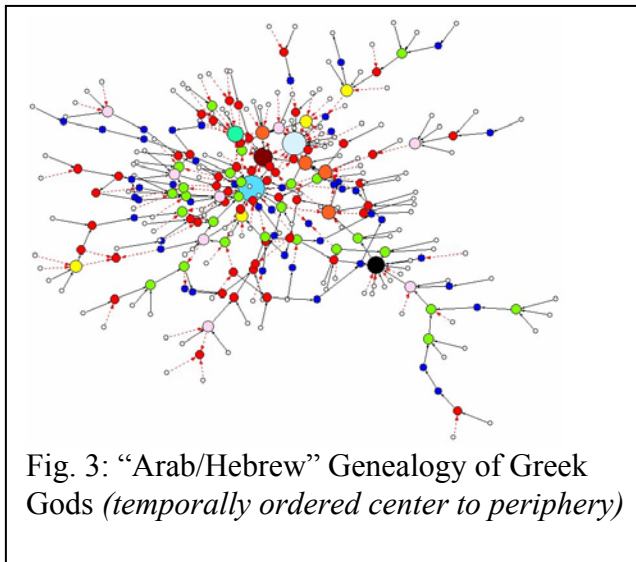


Illustration. A subsequent finding, unpublished, is quite amazing: analysis of the genealogical network of the Greek gods (Newman and Newman 2003) shows a preference gradient matching that of Aydinlı clan marriages and some other Arabized or Arabic societies, including the gradient first-preference for FBD (see also Barry 2008). Little is known about the social organization of pre-classical Greeks as tribal societies, but this gives a clue. Obviously, western ideas about the “Origins of Democracy” in Greek city states should take into account the earlier foundations of Greek societies: “in the archaic period, as in the late bronze-age, Greece belonged to the single cultural and intellectual circle of the Near East,” and the names of Greek gods had Hebrew roots (Sealey 1976: 29). More

generally, kinship network analysis may have potentials for historical reconstruction.

3. Structural endogamy with co-affinal relinking (e.g., the Christian west). Here, social class tends to be constituted as distributed marital cohesion and elite pedigrees.

3.1 The Christian west. A more horizontal view of kinship ties, with the idea of co-affinal *relinking* and more specific *renchaînement* between pairs of families, was invented and studied by Jolas et al. (1970) as a form of social integration in peasant villages in France and elsewhere in Europe. This has been found to be common in European, Christian, and many other societies where intermarried ancestral lines are relinked by marriage but not by marriage to blood kin. Across many studies, we find that relinkings go beyond local alliances through overlapping ancestries to also form horizontal cycles of intermarriages that repeatedly overlap to form larger cohesive units. When they are large and cohesive social formations they may be entwined with community, social class, or ethnicity.

3.2 Genealogy and pedigree. Many studies of kinship are concerned with pedigree and lineage or lines of vertical descent. This is also a social concern of many elites in establishing boundaries and social identities. Lloyd Warner's Yankee elite ethnographies (1941-1959; 1949) echoed this obsession. Descent group corporations were then the dominant concern of the descent theory school of British anthropology. Warner, one of the foremost ethnographers of an American city, viewed church and voluntary associations as the two great institutional organizations of the U.S., one religiously divisive, the other integrative through special interests. In his "beautiful, static, organized community" description, however (John Phillips Marquand in the novel, *Point of No Return*, describing the work of Warner's character, Malcolm Bryant), he neglected not only social change and disorganization but the organizational role of kinship and marriage in the formation of social class and social strata.

3.3 Social class. Max Weber, like most theorists of social class, was not blind to marital relinking: his two basic characteristics of class were endogamy (*social* class; often conflated with prestige hierarchies) and differential access to life chances or access to productive wealth (*economic* class, acquired through inheritance, or achievement indexed by income distinctions).

Some large cohesive formations based on marital relinkings are generationally shallow, with large multiply-connected sets of siblings or cousins and no need to go back more than two generations in finding the multiconnected ties among overlapping cycles of affines.

Ethnographic Examples for 3.3. Brudner and White (1997) used P-graph and P-systems analysis to move from Jolas et al.'s (1970) more local view of relinking to a network view and to an analysis of how those couples who relinked with one another in an Austrian farmer villager formed a giant bicomponent that constituted most (about half) of the community. Further, they showed it was within the bicomponent, whose members inherited land, "in which propertied marriages were an instrument of class formation" (1997:175), citing Rebel's (1983) distinction between economic and social class in Austrian farming villages. Thus marital relinking at the scale of the entire community was a core feature of the social construction of class as constituted in part by cohesively overlapping relinking marriage cycles. Following White (1997), who coined the term structural endogamy for the boundaries of network cohesion created by marriages, they showed that the coefficient of covariation between bicomponent membership and "stayers" in the community who inherited parental land and property was highly significant statistically even if underestimated ($R^2 = .29$) because a minority of the community who were "stayers" were not interviewed. Interviewing more permanent residents in the community could only have had the effect of magnifying the size estimate for the structurally endogamous group since the exceptions to the hypothesis were almost all those of heirs with missing endogamous links, including the un-interviewed. Simulation analysis (White 1999) supported the conclusion that marriage relinking among sibling sets occurs far more than expected by chance. The Turkish nomads study by White and Johansen (2005), with more complete data, also found a "stayer – structural endogamy" correlation coefficient R^2 of .90. Here the "stayer" category includes the *larger* families who are more successful in competition for resources. This suggests a Brudner-White type of correlation at the community level that could be very widespread and include many non-European cases.

Analyzing systemic relinking among Guatemalan colonial elites, Casasola (2001) and Casasola and Alcántara (2002) showed that both aspects of class elites, social and economic, were recognized family by family by experts in this historical period and as identified concomitantly through network analyses of relinking. Like Brudner and White (1997), these studies showed conformity between the social (endogamously bounded) and economic (wealth and property transmission) aspects of Weberian class. In a direct test of the cohesion/class hypothesis for a society with co-affinal relinking White (2009) reexamined the San Juan Sur (Turrialba, Costa Rica) farmer village data of Loomis and Powell (1949) and found that higher levels of structural cohesion (Moody and White 2003) in kinship visiting patterns among family households correlated with villager judgments of higher social class.

Further examination of structural endogamy and social class (Fitzgerald 2004) found distinct strata of structural endogamies within the Bevis Marks (Sephardim) Synagogue in London at the levels of crafts people and office workers (horizontal adjacent generation relinking) and elites (generationally deeper relinking), as his teacher Berkowitz (1975, 1980) had suspected. In contrast, Widmer et al. (1999) found deep ancestral (vertical) relinking and relinking between family lines in among the Geneva Scientists of the 17th-19th centuries.

3.4 Challenges to pluralism. Once relinkings are analyzed to show the extent of interfamily cohesion at different class levels, the pluralistic theory of interest groups can be challenged

by ones that explore how interfamily ties intersect to cohesively integrate a social class with interest groups and diverse political office holding, directorships, and other leadership roles. Systematic use of kinship network data, in the manner of analyzing horizontal social cohesion, can provide a basis for the study of power elites, as Berkowitz suggested (1975, 1980). Here, the identification of cohesive groups provides a basis for causal modeling of historical contingencies. For comparative politics, Doyle (2005) finds the White and Johansen (2005) P-graph framework to provide for “detailed assessment of highly decentralized self-organizing local governance structures” in Central Asia and “unparalleled examination of sub-national political behavior,” and European politologists have since begun to do so. Studies of Mexican power elites by Alcántara (2001) and Gil and Schmidt (1996, 2005) show the interlock of political power and kinship/marriage networks. Kuper's (2006) P-system study of the families of Bloomsbury found maritally cohesive groups that supported the great English scientific families (e.g., the Darwin-Wedgewood families) and mounted some of the great English scientific, political, and literary projects of the 19th and early 20th centuries.

4. Sidedness and Sections. Moieties are a form of matrimonial dual organization that divides a maritally cohesive group into two sides that exchange spouses, that is, into sides that are mutually exogamous but more globally endogamous.

4.1 Dual organization, divides, sides, and cognatic sides. The view that exogamous exchanges between marital moieties must be based on principles of residence or descent (e.g., Fox 1977:175-207) needed to create clear-cut named oppositions of local groups (e.g., patrilocal) or (patri- or matri-) lineages assumes that others lack the relational logics for understanding their own networks. This fits the view that kinship terminologies consistent with dual organization – “egocentric” use of kinterms that systematically distinguish one side, “lines of relatives I can marry,” from the other side of unmarriageable relatives – do not entail “sociocentric” organization. The balance theorem of signed graphs (Harary 1953), however, applied as a principle of network organization, explains the conditions under which cognition and behavior do converge in this way for egocentric and sociocentric relational classes. It shows for a context of structural endogamy how the consistent individual *practice* of marital

sidedness by is coterminous with marital sidedness as a network outcome. The study of empirical kinship networks in the examples below shows that this cognitive-behavioral-network convergence is very common.

Empirical Examples for 4.1. Divides and sides were defined for P-graphs by White and Jorion (1996:287-288) solely in terms of principles of balance in signed networks and independently of rules of descent or named moieties. In a P-graph, if links of opposite gender are signed + and – then *divides* exist in a single generation connected by sibling and sibling in law links if the product of signs in marriage cycles is positive. Divides were found to be statistically significant² for the Anuta of Polynesia (Houseman and White 1996). *Sides* extend the principle of balance to marriage cycles across all generations in the network and were found to be statistically significant ($p < .0001$) by Houseman and White (1998b) for all nine societies in ‘Dravidian Amazonia,’ a region where most societies have sided egocentric categories in their kin-terms with published genealogies but no named moieties or dual descent group organization and four other cases from elsewhere with Dravidian kin-terms but no moieties. In these 13 cases, “imperfect” sidedness error rates of 1-7% matched “imperfect” locally sided behavior. Structural cohesion, dual opposition in local and global “balance,” and local marriage cycles or “types” of marriage come together in a single package (in a way that is easily tested with empirical kinship networks) where egocentric kin-terms and marriage behavior are linked to more global network structure.

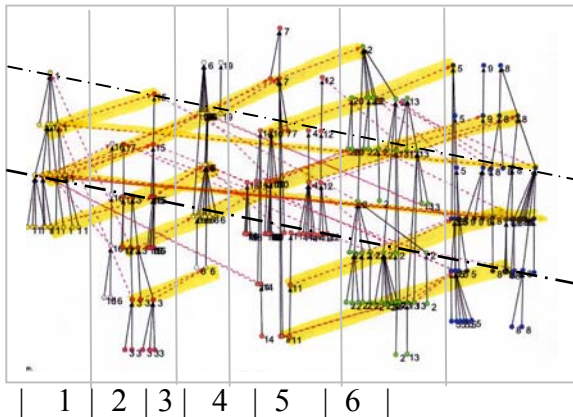
Especially troubling to ethnographers is the occurrence of “sidedness” (supposedly based on descent) in complex Eurasian state societies that are cognatic, lacking descent groups, and with monogamy or limited polygyny and inheritance divided between sons and daughters. Leach’s (1961) Sinhalese village ethnography put an end to British descent-based theory of kinship corporations by showing that Pul Eliyan productive systems were egocentrically organized and based on marriage alliances. He could not find the coda, however, as to how conflicts and alliances were organized. Houseman and White (1998a) coded his detailed genealogies into P-graphs to test whether Sinhalese two-sided (Dravidian) egocentric kinterms were associated with martially sided networks in absence of unilineal descent groups, and found that couples linked through common ancestries combined women marrying between opposing sides formed by male succession to ownership. Absent a male heir, however, daughters would receive through cognatic inheritance the normally male-transmitted residential compound, fields, and irrigation ditches. The exceptions were ‘diga’ marriages (residence with the wife), in which the device to reconcile the contradictions with sidedness was to choose the husband in these cases from a distant village whose sidedness was discounted. Rather than marrying from the “side” of the father, children took their side from the mother’s compound.

4.2 Generations. Generations in a kinship network are often thought of, alternatively, as relative to ego, as roughly contemporaries (assuming men and women marry as close to the same age), or as having a different average time-span for males and females depending, for example, on how early females marry or have children relative to me, and late men go on

² In a random graph half the chromatic number $\gamma = m + n - 1$ of independent cycles are expected to have a negative product of signs, so an appropriate test is given by the binomial theorem. The Par-side Program (White and Skyhorse 1996(2002)) calculates statistical significance as a departure from randomness in the frequencies of balanced and unbalanced cycles.

having children relative to women. The Alyawarra of the central Australian desert (Denham and White 2005), as a result of two years fieldwork by Denham, have one of the most complete datasets on kinship networks, actual ages, and use of kinship terminology. Women's average age at childbirth is only $\frac{2}{3}$ ^{rds} that of men so that men's generational time span is 150% longer and slower than women. In any society where a more extreme spousal-age difference is present, this will create chains of wife's brothers that move forward in time in half-generation increments (and backward for sister's husbands).

Empirical Examples for 4.2. The Alyawarra take siblings and siblings-in-law to define their *generations*, so that generations are most definitely not contemporaries. In Fig. 4 the two diagonal dash-dotted lines connect marriages in the age-slanted generations of WB chains (WBWBWB...) with vertical solid lines for the patridescent lines of sons and dotted lines veering from the vertical, diagonally down and left, following a recurrent pattern of MBD-type marriage, and those veering to the right breaking this pattern with other kinds of marriage.



The brother/sister age-to-marriage variations in vertical heights of lines in Fig. 4 closely approximate true age, so age-differences can be read off the figure. When arranged by classificatory descent lines, (1-6 for men in Fig. 4), it is possible in this P-graph to see patterns of marriages, all of which are consistent with the marriageable-category memberships of the kinship terminology. In many marriages, the wife is older than the husband (e.g., widow marriage), or much younger (e.g., alternating generation, like MBDDD). The age-slant averages $\frac{2}{3}$ ^{rds} generations per WB link.

Fig. 4: Alyawarra age-slanted alternating sibling and sibling-in law generations (main female lines shaded and two)

4.3 Sections. A section system like the marriage classes of the Alyawarra is a matrimonial organization that gives different members of the nuclear family and their spouses — father, mother, children, and children's spouses— four 'section' names that govern their marriages and identities of their offspring. Governing pairs of names create a permutation group where each parental pair creates a children's and their spouses' pair (Weil 1949). The naming pairs are doubly *sided*, with intersecting male and female sides, and marriages only with their opposites. Sides are not *descent groups* considering that the section names in both male and female names alternate between generations. This creates an equivalence of alternating

generations wherein one can only marry *within the generation* (normally composed of sibling and sibling-in-law chains) or a generation twice removed.

Empirical Example for 4.3. Alyawarra have four sections, each divided into two subsections, and the data show a nearly perfect correspondence between marriage behavior and sections/subsection memberships. In indigenous Australia, where 4-, 6-, and 8-section systems (or simple sidedness) are nearly universal, ethnographers have tried to model kinship networks as if they had symmetries and regularities beyond the permutation group governance of marital sections. Nearly every mathematical model of Australian kinship network have exaggerated their symmetries. Kinship network analysis e.g., in P-graphs, allows them to be considered as complex relational systems rather than marriage prescriptions for categorical descent lines of men and women. Fig. 4 is perhaps the only actual-age marriage pattern diagram of an Australian society in existence. Denham et al. (1979) explored the puzzle of how the age difference between spouses would affect marriage within one's (or an alternate) generation and proposed an idealized double helix model where classificatory lines of females in the MBD diagonal would pass through six classificatory male descent groupings and then cycle over back to the first of these groups, continuing indefinitely while only coded for a finite number of generations in the kinship terminology. Yet, in this small-scale society the possibilities for continuity, like a generation that wraps around from the right side to the left in the next *alternating* generation, are not filled in. There are too few people. In Fig. 4 there are many breaks where WB links are missing and the WB link pattern does not recur for all the patriline. Rather than "fill in" imaginary links, as in a double helix model, it is better to consider how such a system works on the ground: When residence is virilocal, with men in the male line living together, then a MBD marriage, within a *parallelogram of female shaded lines bounded left and right by adjacent classificatory male lines*, will link to another group in which one's MB is resident and one's wife was born. In the struggle for survival, this MB group will be a potential place to visit, and an obvious source for exchange and balancing out resources. The neighboring group in turn may have a similar MB group, to which ego could be redundantly linked through his wife as a MMBDD relative. In life on the ground, these two-step linkages to a neighbor's and a neighbor's neighbor's groups are sufficient for survival and correspond to the short chains of single or double MBD links in the diagram, where empirical pulses of one or two successive MBD marriages sum to 18 in all.

Having temporally-ordered time series data is of enormous value in SNA even using heuristic placement of generations (a standard option in Pajek: White 2008a) and age-difference adjustment that can be done in the absence of known dates of birth, marriage, death and other events. (Temporal marriage-date adjustments can be made for FZD marriages, for example, which entail same-age for husband and wife, while MBD does not; MBDDD entails wives' average marriage at half or less the age of their husband). Knowing approximate generations, age-differences between individuals, and rough temporal intervals of contemporaneity is a major advantage to kinship SNA because we can permute marriages randomly or with rules of prohibition (e.g., against marrying prohibited relatives), or with probabilistic biases for *contemporaneous* men and women whose marriages could have been different, like musical chairs. Valid estimates of marriage *preferences or aversions/prohibitions*, can be made with statistical controls explained below, as deviations as against this random "musical chair" baseline ("random rewirings," in the vocabulary of SNA).

5. Simulations: Structure and agency. Permuting only the element of who women marry (alternately, the men) in each generation or contemporaneous period limits the permuted choices to only those marriage opportunities indexed by actual marriages in that generation.

This holds constant the demographic composition of descent groups in the male (or alternately, female) lines, the numbers of sons and daughters in each nuclear family, and thus all other structural and demographic features of the observed marriages. The resulting frequencies for each type of marriage (those resulting from the permuted marriages, all else constant), compared with the actual marriage-type frequencies, gives appropriate measures of preference or aversion (prohibition) for each type of marriage (White 1999, 2008b). These can be *departures from the controlled simulation frequencies*, either for sizes of bicomponents or for/against specific types of marriage. This allows a separation of structure and agency by means of empirical criteria. Such measures can also include inferential statistics that improve and refine these results by positing a probabilistic model of choices over the target set of marriage types, using bootstrap simulation to generate probability distributions evaluated against the data.

Ethnographic Example for 5. For separating structure and agency, structural “signals” that come from limitations of context need not be interpreted in terms of decision-making agency. Table 1 gives an example. Here, the ethnographer (Schweizer) recorded four types of cohesive marriage (FBD, MBD, FZDD, ZD) among the 19 marriages of Muslim elites in a Javanese village (Sawahon), compared to commoners who had only one such marriage (White and Schweizer 1998). Is this a difference in marriage preferences or cultural rules or strategies for the two groups? Each group was partitioned into generations, and marriages in each group and generation were randomly rewired. No marriage frequency was found to significantly differ in frequency from those of random marital rewirings, that is, controlling for difference in the sizes of the groups and thus noting the smaller size of the elite group. In marrying within its status group, each such group will require a proportionate number of spouses, but in a smaller group descended from a common ancestor there will be more co-descendant marriages among the marriages if marriage choices are random. The result would have been different if the elites chose to avoid co-descendant marriages, but they did not. Nor did they prefer them, similar to the commoners, assuming that head had *status endogamy*, preferring to choose spouses from their own group.

Table 1. Marriage Type Comparisons between Javanese Muslim Elites (MusElite) in Dukah Hamlet versus Dukah Commoners (DhC) (White 1999:13.2 Table 7)

| Muslim Elite vs. Dukah DhCom | Presence of the marriage for this kin type | | Absence of the marriage for this kin type | | Fisher Exact test | Marriage types | 3-way Fisher test * |
|---------------------------------------|--------------------------------------------------|--------|-------------------------------------------------|--------|----------------------|-------------------|---------------------------|
| | Actual | Simul. | Actual | Simul. | p= | type | p= |
| 1:MusElite | 1 | 0 | 4 | 3 | .625 | FBD | |
| * DhCom | 0 | 1 | 9 | 12 | .591 | " | 1.00 |
| 2:MusElite | 1 | 2 | 2 | 3 | .714 | MBD | |
| * DhCom | 1 | 0 | 11 | 16 | .429 | " | 1.00 |
| 3:MusElite | 2 | 1 | 3 | 2 | .714 | FZDD | |
| * DhCom | 0 | 0 | 11 | 0 | n.a. | " | 1.00 |
| 4:MusElite | 0 | 1 | 6 | 7 | .571 | ZD | |
| * DhCom | 0 | 0 | 18 | 24 | n.a. | " | 1.00 |
| Tot MusElite | 4 | 4 | 15 | 15 | 1.00 | All | 1.00 |
| Tot DhCom | 1 | 1 | 49 | 52 | 1.00 | " | 1.00 |

* This compares the difference between entries within two 2x2 cross-tabs, controlling for the marginal totals of each (White, Pesner and Reitz. 1983). Given the number of each type of marriage and the numbers in each group, none of these pairs of fourfold tables differ as between the two groups.

The Austrian village case (3.2, 3.3) studied by Brudner and White (1997) provides another example where controlled (“musical chairs”) simulation answered the question: In the competition for heirships how do we know whether some farm family children *choose* to relink or whether relinking occurred by chance? Couldn’t the relinking be the product of a random assortment of marriages, relative to inheriting, some relinking in a giant random component and others not? Permuting women’s marriage in each generation, in the current and each historical generation surveyed, showed that relinking occurred far more frequently than by chance at single, double, and triple generational depths (i.e., relinking among sets of siblings or cousins in the village) but far less frequently than by chance for relinkings at greater generational depths. It is obvious that relatives at shallow depths would know each other, and could self select and marry endogamously, excluding relinking with noninheriting members of their sets. Further, it is among the sibling and cousin sets that there is competition for parental inheritances that are not yet decided. Thus, we can conclude that the statistical evidence favors intentional or implicit and strategic decision making, while relinking fails the test for randomness.

6. Institutional and cohesion analysis. Greif (2006, 2009) treats social networks in the context of embedded decision making and historical context to derive an analysis of economic institutions. The systems of co-descendant marriage preferences in my section 2 fall, in his terms (2009), into the “collectivist belief system” societies, which is segregated (the individually socially and economically interacts with members of a specific group), while the systems of co-affinal marriage preferences in my section 3 fall into the “individualistic belief system” societies, in which social structure is integrated, economic transactions are conducted among people of different groups, enforcement is achieved through specialized organizations (courts), and self-reliance is highly valued. The contrast suggests to Greif that the individualistic system may be more economically efficient in the

long run. The networks he considers include family relationships, but not kinship networks writ large. He fails to take into account that European kinship networks have a marriage structure that facilitates stratified social classes and dominance by elites. That is very different from systems in which lineages and clans compete and each may have its elites that not only cooperate within groups but have broadcast strong-ties for cooperation and exchange. Greif's conclusions may be premature.

The endoconical clans of section 2 have very high marital relinking indices within their bicomponents (Aydınli 66% and 64% for Canaan) and a power-law spread of ties that balances intensive relinking for close relatives with a broadcast links with distant ones. Up close these look like segregative networks but in fact, in Greif's terms, the "social structure is integrated, economic transactions are conducted among people of different groups, enforcement is achieved through specialized organizations," the difference being that it is not only courts but kinship norms of reciprocity and punishment that are operative. The class-stratified farming village of Feistritz of section 3 has a 48% relinking index, and 60% among farmstead heirs. Counter-intuitively, the Australian Alywarra have the lowest index of relinking, 23%, in consequence of the fact that polygynous local family groups are large, but the precious kinship ties between local groups are spread thin, as befits a low-density scarce-resource society, integrating the Aranda linguistic neighbors of the Alywarra into their bicomponent as well as the Alywarra themselves.

7. Overview and Conclusions. Attention to the type of evidence presented here—on how class, political and religious formations are related to the types and boundaries of marital cohesion and structurally endogamous groups in the kinship networks of different societies—was predicated on expectations from previous research about the effects of cohesive blocks in social formations. This research (motivated by findings *from* kinship studies) examined the effects of variable highest-levels of cohesion of individual, family, or firm for the cohesive blocks to which they belong within network of various sorts. Moody and White (2003) showed (1) strong effects of levels of cohesion of individual students in their friendship blocks on their reports of attachment to high school and (2) how the cohesive strengths of co-

memberships in the cohesive blocks of business alliances align with similarities in the choices of firms in their political party alliances of firms in party politics. The problem of structure and agency for this kind of research finding is disorienting to many social scientists. Does membership in a cohesive group “cause” an individual or firm to alter attitudes or choices? Do similar choices or attitudes “cause” homophilous affiliations? Is the causation circular? Powell et al. (2006) et al., using the Moody-White measurement of structural cohesion, looked at time-lagged effects. They showed that choice of partners for strategic collaborations in the biotech industry were heavily predicated from year to year by level of cohesion in the cohesive blocks to which potential partners belonged the year before but decisions driven by cohesion may be matters of intent (which entails that actors perceive differences in cohesion). For kinship, in the most telling case where bicomponent (more cohesively integrated) members of a farming community tended to be those who inherit productive property, which same first? Knowledge that one is an heir, then the cohesively “local” marriage, or the “local” marriage first, disposing the parents to favor one child over another? In both the biotech and the farming examples, compared to a simulated baseline for “those eligible,” convergences of structure (cohesion) and decision to partner occurred empirically, but were they determined by agency, structural context or both? A good example is the contrast within the Indonesian Muslim village (Sawahana) between the relatively few rich elites and the majority of poor commoners. There, the expectation was that *marriage choice* was within one’s status group or class, but the simulation, controlling for status endogamy, showed no difference in marriage *structure* given that marriage to a relative was far more probable by chance in a smaller group with common ancestry than in a larger group with more distributed ancestry.

What we find from kinship data is that preferences or proscriptions in monogamous Christian societies *not to marry a relative* creates horizontal co-affinal relinking at a sufficient spatial scale (given theorem 1) and this *stratum* forms the basis of social class. This is no surprise in the Weberian view, where endogamy is the social tendency in class formation, while inheritance and consolidation of wealth through status endogamy is the economic tendency. This is true for the farming community at a scale of 500 people, half of whom on average, within each sibling group, inherit property and practice structural endogamy within the village, while the other half tend to marry outsiders and emigrate or take up a nonfarming

occupation. This is also true for large-scale national societies on the scale of millions, where not only do subsets of elites (political, intellectual, scientific, occupational) practice structural endogamy within the social class they generate by these choices but as a corollary, as a maritally cohesive group, they wield joint influence over political parties, governance, economic power and industrial ownership. Similarly, for some countries, such as England, for the class strata of laborers, particularly those who wield particular skills. There is thus a hereditary component to social and economic class transmission, and these two aspects weld together through *structural endogamy cum inheritance*, the combined engine of both structure and agency.

Composed within the kinship network, marriage choices (which include the universalistic aspect including the possibility of *leaving one's group*) in the context of structural endogamy are *particularistic* as to whom one marries, i.e., to someone at a particular distance or position within the social network. In societies where *it is commonly a relative who is married*, we westerners are more apt to ascribe *prescription* or *normative preferences* in marriage. The use of tools for *marriage census* frequencies of different types of marriage (described as cycles or marriage motifs, such as MBD), however, reveals characteristic probability distributions (White and Houseman 2002), ones that are basically Zipfian (balancing more of the distant marriage types of lower individual frequency against fewer of the close marriage types of higher individual frequency) for either the co-affinal or the co-descendent overall marriage structures or “preferences”.

In many co-descendent marriage Middle Eastern clan structures (like the Aydınlı, the Old Testament Patriarchs and Matriarchs, or the mythical clan of Greek Gods), marital cohesion also distributes widely, as in co-affinal Christian marriage and class systems, but with an important difference: rather than “strength of weak ties,” the broader networks are welded by “navigable strong ties” created through reciprocity between local kinship units with large size inequalities due to polygyny and fecundity. Here too, as with the Aydınlı, those outside the structurally endogamous cores of communities are more likely to emigrate to cities (structure or agency?).

It is no surprise, then, that the embeddedness structure of kinship groups, integrated by marital cohesion at varying scales, marks out distinctive types of *social organization* with different scalings of structure, and that these organizations are interlocked with large-scale class, clan and inter-clan, caste and intercaste formations (always linked by divisions of labor and occupations), and with political structure, religion, and religious organization. This also provides kinship frameworks, for politologists like Doyle (2005), for “examination of sub-national political behavior... the study of comparative politics ... [and] of inter-governmental organizations, non-governmental organizations, or transnational advocacy networks with state government infrastructure”. Korotayev (2003) and my sections 2-4 show that multiple features of kinship, and network forms of marital cohesion are closely interlocked with specific historical religions and regions.

For kinship, Weil (1949) was the first to understand that kinship structures are relations among marriages and groups and not just among people, and that even core relational structures, like sections, are easily transformed (e.g., to subsections, and back to sections). How cohesive units in kinship networks are connected to kinterms, norms, and prototypical role expectations are part of the views of social organization discussed by Firth (1951) and Leaf (2007). Variant kinship networks not only serve as fundamental platforms for historically specific forms of social organization but exhibit general regularities that derive from how they engage with specific network principles (e.g., sidedness and balance principles). These support variant social processes, like the effect of horizontal stratification implied by co-affinal marriage relinking on a stratified mode of social class formation (Brudner and White 1997). By considering how selection processes affect changes in network structure in a population, rather than taking Firth’s idealized approach to structure, we can study how network structures, organization and agency interact dynamically at different scales. We have the tools, such as P-graphs, Ore-graphs, P-systems, Pajek (Batagelj and Mrvar 1998, 2008), Puck (Hamberger et al. 2009a,b,c), R (White 2008a,b,c) and the statistical software (Butts 2008, Handcock et al. 2008) to do so in a way that changes the landscape of our understanding of the “social” in the social sciences. Bank on the fact that with global financial meltdown of the growth economy, kinship, like ecological sustainability, will be more important in peoples’ lives than ever.

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