AN EXCHANGE-NETWORK APPROACH TO THAI SOCIAL ORGANIZATION

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Social-organization studies in anthropology have encountered very serious problems in recent years. Social-organization studies of Thailand encountered very similar problems years earlier for many of the same reasons. In fact, cases like that of Thailand brought social anthropology to a near crisis. Accordingly, successes in the study of Thai society are potentially of great importance to anthropology. I would like to address these issues rather generally, suggesting a strategy for solving one important set of problems.

The Nature and Source of the Problems

After World War II, a series of fundamental problems were recognized in anthropology. Ethnographers were turning away from the studies of tribal societies which had occupied their attention for the first half of the century. This occurred partly by choice. In fact, it represented in many ways a return to the broader definition of interests which characterized nineteenth-century anthropology. The change occurred partly by necessity, however, as primitive societies were rapidly disappearing. As anthropologists turned their attention to more complex societies, the methods and theories that had served them well in the study of primitive societies seemed less effective and provided little guidance for researchers. For instance, in peasant societies a great deal of the most interesting and important behavior had little to do with kinship--the ultimate social-anthropological disaster. As if that were not enough, anthropologists' intensive methods of field research became increasingly limiting, as studies of complex societies required more extensive research. This was necessary to encompass the diversity which characterized complex societies.

But it was not just the reorientation to complex societies that provoked intellectual dislocations. It also became increasingly clear that the functional/structural studies of primitive societies posed many more difficulties than had previously been imagined. Basically, theories did not fit the data as well as had been thought, and there was a great deal more internal cultural variation than had previously been recognized. Dissatisfaction grew over the inability of the structural/functional theories to take account of change and process. At a more nuts-and-bolts level, increasing numbers of studies were done in societies without unilineal kinship, and structural/functional anthropology had never been very successful dealing with such systems.

The upshot of all of this was an intellectual revolution of sorts in social anthropology after World War II in which Raymond Firth, Ward Goodenough, Edmund Leach, and others undertook a far-reaching theoretical critique which called into question the most basic assumptions of structural/functional anthropology.[1] Out of this turmoil came a number of the most influential currents in social anthropology in the last two decades, including transactional analysis, componential analysis, cognitive anthropology, and network analysis.

The place of Thailand in all of this is that Thai society posed in exaggerated form all of the problems which came to plague traditional ethnographic analysis. First, Thai kinship is bilateral, and to make matters worse it seems to be of little significance for many important facets of life. Second, investigators not only failed to find kinship groups, which were a crucial ingredient in the most successful kinship studies, but they failed to find any other kinds of groups as well. In the central region, even settlement patterns failed to produce clear groupings, since dwellings tended to be either scattered in the fields or strung out along rivers or canals.

In 1950, John Embree[2] concluded that there simply was not much regularity in Thai society, which he described as "loosely structured," a real triumph in putting a good face on a bad situation. His formulation is especially remarkable for attributing to Thai society the origins of all the difficulties which Firth, Goodenough, and others encountered elsewhere but had attributed to faulty method and theory. Thus, rather than arguing that faulty theory and method kept him from dealing adequately with individual variation in Thai behavior, Embree concluded that Thai behavior was especially variable. Embree's characterization of Thai society has colored

research there for thirty years now, although I think its influence has been overemphasized sometimes (for example, in J. Potter's recent book).[3] What does seem clear is that there is a general malaise in Thai social organization studies. Since 1950, most (but not all) of the best research in Thailand has concerned religion, economics, and other topics, and social organization has become a relatively neglected area of study.

In view of the similarities in the substance of the difficulties faced by anthropologists working in Thailand and those working elsewhere, it is not surprising to find that many of the methods devised to deal with these problems in Thailand parallel broader developments in social anthropology. Among the most important contributions to social organization, for example, is the social analysis included in Phillips's work on Thai peasant personality,[4] which focuses on interaction patterns in a way similar to a good deal of other recent anthropology. Similarly, Lucian Hanks's ideas on patronage and the entourage[5] have close parallels in the general anthropological studies of peasantry, in which a large literature developed on peasant coalitions, patrons, brokers, intermediaries, and so forth. Jack Potter's comparative analysis in the last chapter of his book[6] takes an essentially statistical view of social organization in which he informally identifies a number of dimensions of Thai social organization. I find this of particular interest, as it abandons the prevailing discrete-model approach (that is, Lévi-Strauss's mechanical models)[7] so characteristic of most anthropological, social-organization literature. Finally, probably the most significant recent contribution to social-organization studies of Thailand is the Sharp and Hanks volume,[8] which takes a historical look at Bang Chan, the most studied village in Thailand.

Nor is it surprising to find that general anthropological failures are paralleled in Thailand along with the successes. One major problem solved neither by students of Thai society nor by other anthropologists is that no method was developed which combined the anthropological mode of discrete structural analysis with current interests in individual decisions, exchange theory, and related topics. In general anthropology, the most important attempt to combine these objectives was the kind of network analysis developed by such people as J. A. Barnes, J. Clyde Mitchell, and Jeremy Boissevain.[9] The basic idea behind this kind of analysis was to examine how individual behavior was carried out within the constraints imposed on the actors by their social networks.

Although nothing taking precisely this network-analysis form was done in Thailand, Hanks's entourage ideas converge closely, as do other patronage approaches (for example, that of Van Roy).[10] Moreover, more recent extensions of network research, such as those pursued by Bruce Kapferer, focus on the transactional nature of the network ties, converging in many ways with work done much earlier in Thailand, such as that of Herbert Phillips.[11]

My own view of the anthropological network-approach is that it achieved a great deal but failed to solve a number of important problems, which were handled somewhat better by the older structural methods in cases where the kinship systems and other conditions allowed their successful application. The most important shortcoming of the social-network methods is, perhaps, that they produced no really satisfactory way of characterizing global properties of social networks and no general way of comparing "mechanical models" of network structure. To do this, a powerful and flexible formalism is needed, since the complexity of realistic social systems is far too great to be captured by verbal descriptions. Kinship analysis had provided a crude but effective way of doing this--for example, by characterizing a system as "unilineal," as having "matrilateral cross-cousin marriage," or as having a "segmentary lineage system." (Anyone who has tried to draw a diagram to show the kinship relations among all individuals in a village can testify that this procedure entails its own practical difficulties, however.) Sociometric diagrams have often been used in a similar way to capture patterns visually in social systems made of relations among individuals; for many purposes they are adequate, but they ultimately fail more seriously than the kinship procedures, since they provide no formal logical principles by which the patterns can be generally described, generated, compared, or transformed.

This is partly a technical problem on which a number of sociologists and anthropologists have worked in recent years.[12] In one such effort, over the past five years or so, Stephen Seidman and I have worked out a mathematical, computer-aided method for social-network analysis which in a very straightforward way is a formalization and generalization of the kinship methods used in the classic structural/functional analyses. These network methods potentially solve at least some of the technical problems which arise in Thai social-organization studies,[13] but it is doubtful that the methodological magic alone would have produced satisfying results in the difficult Thai case. I do not wish to discuss the details of our

network techniques here; rather, I wish to turn now to a brief consideration of some substantive issues, the solution of which would allow the productive use of the methods for the Thai case.

Preliminaries to a Study of Thai Exchange Networks

Two related questions have to be answered if the social-network methods are to be used productively for the Thai case. First, what relations and institutions will make appropriate and productive objects of study? Second, from what theoretical perspective can these relations and institutions be addressed?

I have argued that one of the most profitable places to look for structure in rural Thai society is in aid relations.[14] One reason is that many other things have proven to be bad choices, for example, general kinship relations. Similarly, cultivation techniques used by Thai farmers tend to fragment the society into many family units which are self-sufficient as regards labor for most of the year.[15] There is little local political organization.[16] The bureaucratization of Thai administration--which for several decades has been effective in the region where my work was done--has destroyed most of the apparently weak, local, political organization which did exist in the past. Even religious affairs provide surprisingly little structure for local social organization. In a word, these "standard" parameters of sociocultural investigation hold little promise as the focus of structural study of rural Thailand.

The more important reason for focusing on aid relations, however, is that it makes good empirical sense in terms of the logic of the social and cultural situation. All people, for example, need social resources for emergencies, for help when their economic activities go wrong, and for infrequent but normal events in the life cycle such as ordinations and funerals. For example, such personal ceremonies in Thailand are accompanied by elaborate preparations at which large numbers of friends, neighbors, and relatives give aid which is quite explicitly seen as a kind of generalized reciprocity. Although labor for most rice-cultivation tasks is recruited from the family or household, harvest and transplanting usually require additional hands. Extra-household labor traditionally was recruited by labor-exchange practices which still play a prominent, though less important, role today.[17] The importance of aid relations is seen in

the fact that many people *define* friendship in terms of aid obligations and attach great importance to it.[18] Kinship relations are also associated with important and widely recognized obligations to render aid, as is even village comembership.[19] I am suggesting, then, that aid relations provide an important unifying idea for studying Thai society.

The second question--that concerning choice of an appropriate theoretical focus--can also be approached by examining aid relations, since this topic allows the investigation to be anchored to a large body of social-exchange theory. The social-network aspect of exchange theory, which has received some attention in the tradition of kinship analysis, is central to my approach to rural Thai society. The most notable and relevant contributions are Lévi-Strauss's kinship studies[20] and various studies of ritual/economic-exchange systems.[21] Although there are important differences among the various structural exchange theories, all, regardless of cultural content, in some way focus on the ways and degrees that various basic exchange structures foster social solidarity, integration, efficiency, or other structural properties. With all of this in mind, I propose a study of social solidarity and integration of rural Thai society from the perspective of social-exchange theory, focusing on social relations which the Thai culturally construe as "aid." My discussion takes the form of a brief description of a project which Stephen Seidman and I are now beginning, presenting some preliminary results and some basic hypotheses along with some ethnographic background.

Ethnographic Background on Thai Aid Relations

The possibilities for analysis of aid relations are particularly rich for rural Thailand, since many activities that are culturally defined in an aid idiom would not necessarily be so defined elsewhere. In addition, many transactions that seem superficially to be unidirectional are culturally given properties of balanced reciprocities, often by being implicated in the popular Buddhist ideology of merit. For instance, not only do the people who help prepare for an ordination or wedding see themselves as helping, but they explicitly see the host as having at least partially reciprocated by providing them an opportunity to make merit; moreover, their continued presence throughout the ceremony provides an opportunity for the host to

make merit by feeding the guest. The existence of beggars is often justified by similar principles: they provide others an opportunity for making merit. Such cultural complexities as these bring to mind several problems associated with exchange and transactional modes of analysis which have recently received attention from many scholars.[22] Successful application of the exchange approach will require that a good deal of effort be devoted both to uncovering the cultural facts of the case and to modifying models of cultural reciprocity/exchange structures to reflect such complexities.

The kinds of aid relations which will occupy most of our attention are those associated with kinship and friendship. At the most general cultural level, not surprisingly, the more demanding the aid request, the closer the relationship of the person to whom one turns. The Thai can rank different kinds of kinsmen, friends, and neighbors with considerable consistency regarding their priorities for aid choices. The following principles underlie a generalized ranking: (a) consanguineal kin before affinal; (b) lineal kin before collateral; (c) older persons before younger; (d) "primary" kin before even close friends, and (e) "secondary" kin before mere neighbors and acquaintances.[23] Clearly, however, many contingencies enter into actual aid choices. Some of the most obvious include (a) age (children, for example, are poor sources for most types of aid), and (b) wealth and other resources of the prospective sources of aid. One especially important factor is that people tend to turn first to coresidents in the same household; by the same token, aid obligations diminish very rapidly with spatial distance.

It is clear that family composition has important effects on aid networks, since in general coresidents in the same household tend to choose each other. This means that the patterns in household composition are fundamental to understanding the aid networks. Networks seem to be dependent especially on various features of the household development cycle. These effects take on extra interest in view of the fact that there is a natural development cycle of aid relations which is analytically related to the domestic development cycle.[24]

The Thai aid-development cycle occurs as follows. A young man (say, in his twenties or thirties) is likely to turn first to his parents, who are well established and in their prime economic condition (say, in their forties or fifties). In middle age (forties or fifties), though, a man is less likely to turn to his parents, who are past their prime

(sixties or seventies), and may no longer be able to support themselves or may be deceased. His children, too, although adult and probably established in their own families, may be questionable sources of aid, since they are unlikely to be well established economically. So, although there is some chance of his turning to parents and/or children, the most likely and reliable source would probably be siblings, who would generally be well situated. Finally, at older ages (sixties or seventies), when most persons along with their siblings and friends become less productive economically, they tend to look to their children for aid. This cycle can, in fact, be seen to operate in my data on sociometric aid choices.[25]

The Thai family-development cycle is somewhat more complex. According to my data,[26] Thai family ideology tends to correspond more or less well with behavior, as a single offspring of a couple tends to stay with the parents after marrying and to inherit the house after the parents' death. The ideology is rather more complex than this, since ideally each daughter stays with the parents after she weds until the marriage of the next youngest, only the youngest staying permanently. This complex, removed, residence practice is realized rather irregularly, however, as far as I can tell from my data.

In any case, this form of family, which is called the "stem family" system, is found in many societies around the world and has been much studied. An important feature of it is that a given domestic unit goes through a more or less regular cycle, alternating between stem and nuclear phases. For instance, imagine that we have a man and woman living with their children. They form a "nuclear family." One child marries and comes to live with the parents, at which time the family changes from the nuclear to the stem phase of the cycle. It remains in the stem phase until the old people die, at which time it reverts to the nuclear phase, which continues until one of this couple's children marries and comes to live in the parental household. The length of the stem and nuclear phases depends on which child stays with the parents, on life expectancy, on age at marriage, on child spacing, and on a number of other social and demographic characteristics of the population.[27] The importance of these properties for our current purposes is that they all have profound effects on family composition--on family size, for example, and on the average length of time an individual is likely to spend in stem versus nuclear families. One particularly striking effect is on the proportion of domestic units which at any one time are in the stem phase (that is, the proportion of stem families in the population at a

given time). In one simulation study, changing only the identity of the child who stayed with the parents from first to last child changed the proportion of stem families from about 90 to 10 percent.[28] Clearly these family properties affect the probability that a person is coresident with a parent, and this, as we have seen, is a critical factor in individuals' aid choices.

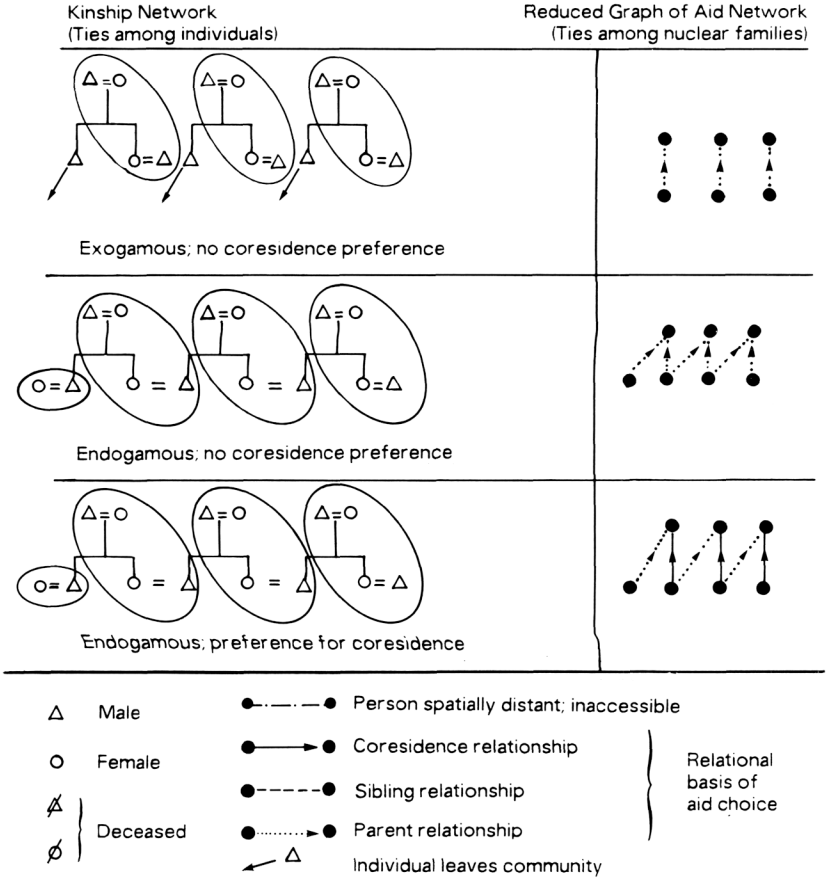
Effects of the Aid Cycle and Domestic Cycle on the Structure of Exchange Networks

Modeling the effects of the aid cycle is a complex undertaking. Before we can even begin we need a simple base-line expectation against which to measure the effects. Consider the following. Assume only the presence of stem families and information about endogamy or exogamy of marriages. It is easy to show that locally exogamous marriages result in a pattern of many small connected groupings in the population (small exchange "cliques"). Locally endogamous marriages tend to produce larger groupings due to the fact that aid relationships ramify to both affines and consanguines. This really just says that endogamy makes for more dense ties than exogamy. The principle is widely known, but making it explicit allows one to carry the idea further. For example, if we assume that the number of families in the population remains constant over time and that there is a strong preference for choosing persons who reside in the same household, then network-structural properties for the strongest aid relations converge with those of the exogamous case (see figure 1).

The complications introduced by the aid cycle are illustrated by comparing the effects of phase changes for populations with endogamous and exogamous marriage patterns. Consider the change from "young" to "middle age" in the small hypothetical population in figure 2. In this example, age structure is such that a middle-aged person's parents are deceased. The children are married, and one is living in the household, but they form rather weak aid choices since they are not yet well established socially or economically. For similar reasons, siblings are weak aid sources for young people.

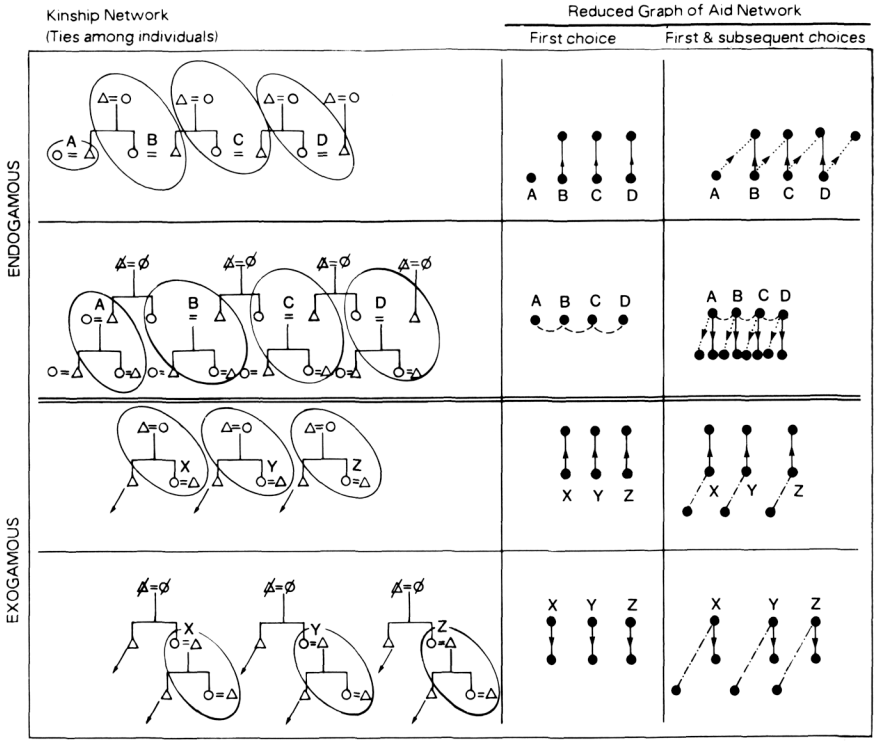
FIGURE 1

NETWORK EFFECTS OF CORESIDENCE PREFERENCE AND ENDOGAMY



Note: The groups of individuals within the circles are members of the same household units. Three aid relationships are shown where applicable in the reduced graphs: coresidence–based relationship, parent/child relationship, and sibling–based relationship. In the case where preference goes to coresidents, aid units (stem families) with strong internal ties are formed; the coresident choice "dominates" the parent choice, weakening ties to parents who are not coresidents. In a sense this case resembles the exogamous case more closely than the endogamous case with no coresidence choice. The sibling tie is not included in these aid networks, since parent choices suggest that young people and their siblings are too young to be good sources of aid.

FIGURE 2: COMPARISON OF PHASE CHANGE IN AID CYCLE ON ENDOGAMOUS AND EXOGAMOUS POPULATIONS



Note: See figure 1 for the key to the diagrams. For the case in which egos are "young" (top row and third row), sibling choices are not given since siblings are unlikely to be good sources of aid. In the endogamous case, they are the strongest choices at middle age, but they are spatially distant in the exogamous case. Note that all choices for the exogamous, middle-age case are very weak (children are too young to be good sources of aid).

In the exogamous case, siblings and one set of parents live in different communities and are weak aid sources because of spatial distance. Only the coresident ties are strong for young people. For middle-aged people, coresident children are weak sources, but stronger sources are unavailable, the only option being weak ties to spatially distant kin, to nonkin, and so on. The effect is to weaken the aid tie, but retain its general character, which stems from its basis in the coresident unit. In the endogamous case (that is, in populations with locally endogamous marriages), young people may make both coresident and noncoresident choices along with a number of much weaker sibling choices. With the phase change, strong parent-child components disappear altogether, to be replaced by strong sibling components and somewhat weaker child choices. Such processes in the aggregate produce very fluid global-network structures, since all of the strongest, basic, exchange-structural groupings (household groupings) are periodically dissolved, and new ones (dispersed sibling groupings internally linked by the weaker sibling relationships), are constituted on different principles. The issue can be seen as broadly analogous to the structural implications of matrilateral as opposed to patrilateral cross-cousin marriage practices according to Lévi-Strauss's kinship theory.[29] The constant flow of women in the same direction in the matrilateral case produces a "stronger" structure than that of the patrilateral case, in which the direction of the flow of women changes every generation (see figure 2).

Considering the effects of the family cycle allows a new set of issues to be addressed. For example, the presence of stem-family practices implies that all married children in excess of one must live elsewhere than in the parents' household. This fact, in combination with a strong preference for aid choices to coresidents in the same household, implies important network effects arising from changes in the number of children who remain in the population after marriage. In particular, an increase in the number of such children will not be reflected in an increase in size of connected groupings. Many small, isolated, more weakly connected groupings would be formed by the "excess" children. The effect on the exchange network is to form a smaller proportion of "tight" groupings in a more weakly connected, global structure.

A more interesting and complicated effect arises from varying the identity (by birth order) of the child who stays with the parents in the stem family. As we have seen, prior research has shown that changing the child that stays with the parents has profound effects

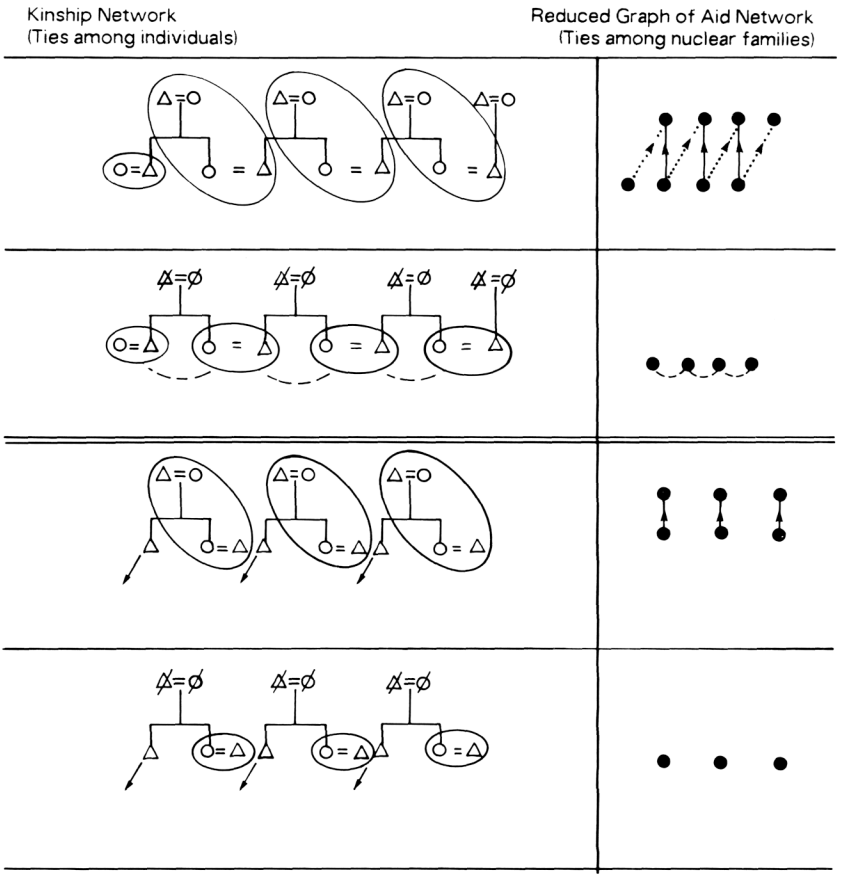
on the proportion of stem and nuclear families in the population, and on the average length of time that families spend in the stem and nuclear phases of the stem-family cycle. By affecting proportions of stem families, the difference in which child stays with the parents affects network structure as follows. When the first child stays, there is a high proportion of stem families, and, given a strong preference for coresident choices, small connected components with strong internal aid relations are frequent. If the last child stays, only large connected groupings (given endogamy) with weaker internal ties are present, irrespective of the preference for choosing coresidents, since there will be few coresidents.

Finally, life expectancy has effects on aid-network structure, mediated by *both* the aid cycle and the family cycle. For example, if life expectancy is extremely high, the network structure will be as described above. If life expectancy is extremely low, many new problems arise. For instance, if fathers die before children are married, the components induced by the family cycle will not form[30] and entirely new principles will have to be invoked to model the aid-network structure (for example, principles involving choice of friends, siblings, cousins, and others). Irrespective of the family-cycle component, younger people's aid resources will be truncated, and the absence of ties from old to young will make the overall structure far less dense (see figure 3).

The point of these examples is to illustrate the degree to which global properties of the aid networks depend upon the family cycle and the aid cycle. These varying structural properties of exchange networks are important because they are intimately related to different modes of integration, solidarity, and even conflict, as we know from structural (or in Ekeh's terms[31] "collectivistic") exchange theory. The connection is clear, for instance, in the contrast between the case in which the basic organizational principles are constant through time, producing continuity in the units, and the case in which there is periodic decomposition of the units and reconstitution on new principles (figure 2). The connection is also clear when structures with a strong hierarchical element (strong, directed, age-based choices) are compared with structures formed of egalitarian, symmetric relationships (compare figures 1 and 3). The varying size of units which are internally connected by strong ties is also of obvious importance (see figure 1).

FIGURE 3

EFFECT OF LOW LIFE-EXPECTANCY



Note: See figure 1 for the key to the diagram. The parents are deceased due to low life-expectancy in the second of each of the pairs of cases. In these cases it does not matter whether coresident choice is preferred, but there is a difference between the endogamous and exogamous cases. Sibling ties are present only in endogamous cases, but they are very weak since young people who would choose parents make less desirable aid sources than parents.

All of these examples are, of course, so simplified as to be in themselves unrealistic representations of actual communities. These models need to include more relations and larger populations, but more important, they need to take account of the fact that there is variation in individual behavior, and norms are never uniformly realized. For example, conditions such as endogamy or exogamy, which are assumed by the models, never occur uniformly throughout a population, and demographic properties of a population show complicated variations in, say, age at marriage, child spacing, and size of sibling groups. For that matter, the models need not be restricted to aid and kinship relations, since the network procedures are sufficiently general to accommodate any well-defined relation. Nevertheless, although no one of these illustrations is a realistic representation of a real community, each does represent a constituent process underlying the complex, aggregate, community structures in rural Thailand. The more elaborate network techniques allow the development of more complex models which articulate these and other processes to produce larger, more complex networks.

Conclusion

The ethnographic significance of this exchange-network approach stems from the fact that rural Thailand poses in an exaggerated form many of the problems which underlay major theoretical and methodological developments in anthropology during the 1950s and 1960s. Accordingly, solutions to analytical problems for Thailand have the potential to be helpful elsewhere. Our approach to Thai society is promising, I think, since our network techniques make it possible to use a set of ideas from exchange theory which have been extremely productive when used elsewhere--for example, in Lévi-Strauss's kinship theory. In the past, it has been difficult to apply these theories to Thailand and other places where kinship relations are not of overriding importance and formal groups are few. This has precluded applying many of the most productive ideas in anthropology to a wide variety of peasant societies and urban areas, which are not only of great academic importance to anthropologists, but also of considerable practical importance in the modern world. The application of structural exchange theory to Thailand holds promise of opening not only the way to a better

understanding of that country, but also to other applications of these important theoretical ideas.

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Notes

1. Raymond Firth, *Essays on Social Organization and Values* (London: Athlone Press, 1964); Ward Goodenough, "Residence Rules," *Southwestern Journal of Anthropology* 12 (1956): 22–37; E. R. Leach, *Political Systems of Highland Burma* (Cambridge: Harvard University Press, 1954).
2. John Embree, "Thailand--A Loosely Structured Social System," *American Anthropologist* 52 (1950):181–93.
3. Jack Potter, *Thai Peasant Social Structure* (Chicago: University of Chicago Press, 1976).
4. Herbert Phillips, *Thai Peasant Personality* (Berkeley: University of California Press, 1965).
5. Lucian M. Hanks, "The Corporation and the Entourage: A Comparison of Thai and American Social Organization," *Catalyst* 2 (1966):55–63; Lucian M. Hanks, "The Thai Social Order as Entourage and Circle," in *Change and Continuity in Thai Society*, edited by G. W. Skinner and A. T. Kirsch (Ithaca: Cornell University Press, 1975), 197–218.
6. Potter, *Social Structure*.
7. Claude Lévi-Strauss, *Structural Anthropology* (New York: Basic Books, 1963).
8. Lauriston Sharp and Lucian Hanks, *Bang Chan: Social History of a Rural Community in Thailand* (Ithaca: Cornell University Press, 1978).
9. J. A. Barnes, "Social Networks," Addison-Wesley Module in Anthropology, no. 26 (Reading, Mass.: Addison-Wesley,

1972); J. Clyde Mitchell, ed., *Social Networks in Urban Situations* (Manchester: Manchester University Press, 1969); Jeremy Boissevain, *Friends of Friends* (London: Basil-Blackwell, 1968).

10. Hanks, "Corporation"; Hanks, "Social Order"; Edward Van Roy, *Economic Systems of Northern Thailand* (Ithaca: Cornell University Press, 1971).

11. Bruce Kapferer, ed., *Transaction and Meaning: Directions in the Anthropology of Exchange and Symbolic Behavior* (Philadelphia: Institute for the Study of Human Issues, 1976); Phillips, *Personality*.

12. For example, see Douglas White, "Multivariate Entailment Analysis," mimeo, School of Social Sciences, University of California, Irvine; Peter D. Killworth and H. Russell Bernard, "A Model of Human Group Dynamics," *Social Science Research* 5 (1976):173-224; Ronald L. Breiger, "The Duality of Persons and Groups," *Social Forces* 53 (1974):181-90; Linton C. Freeman, "A Set of Measures of Centrality Based on Betweenness," *Sociometry* 40 (1977):35-41; Linton C. Freeman, "Q-Analysis and the Structure of Friendship," *International Journal of Man-Machine Studies* 12 (1980): 367-78; Stephen B. Seidman, "Clique-like Structures in Directed Networks," *Journal of Social and Biological Structures* 3 (1980):43-54; Stephen B. Seidman, "Structures Induced by Collections of Subsets: A Hypergraph Approach," *Mathematical Social Science* 1 (1981):381-96.

13. Brian L. Foster, "Formal Network Studies and the Anthropological Perspective," *Social Networks* 1 (1978):241-55; Brian L. Foster, "Minority Traders in Thai Village Social Networks," *Ethnic Groups* 2 (1980):221-40; Brian L. Foster and Stephen B. Seidman, "Network Structure and the Kinship Perspective," *American Ethnologist* 8, no. 2 (May 1981): 329-55; Brian L. Foster and S. B. Seidman, "A Strategy for the Dissection and Analysis of Social Structures," mimeo, Department of Anthropology, Arizona State University, 1979; Brian L. Foster and S. B. Seidman, *SONET-1: Social Network Analysis and Modeling System. Vol. 1. User's Manual* (Binghamton: State University of New York, Center for Social Analysis, 1978); S. B. Seidman and B. L. Foster, "A Note on the Potential for Genuine Cross-Fertilization between

Anthropology and Mathematics," *Social Networks* 1 (1978): 65–72; S. B. Seidman and B. L. Foster, "A Graph-Theoretic Generalization of the Clique Concept," *Journal of Mathematical Sociology* 6 (1978):139–54; S. B. Seidman and B. L. Foster, "The Use of Attribute Data in Network Modeling," paper presented to Conference on Structural Analysis, University of Toronto, 1978; S. B. Seidman and B. L. Foster, "SONET-I: Social Network Analysis and Modeling System," *Social Networks* 2 (1979):85–90.

14. Brian L. Foster, "Ethnicity and Economy: The Case of the Mons in Thailand" (Ph.D. diss., University of Michigan, 1972); Brian L. Foster, *Social Organization in Four Thai and Mon Villages* (New Haven: HRAFlex Books, 1977), 495.

15. Brian L. Foster, "Labor Groups in Thai Rice and Fishing Villages," *Human Organization* 34 (1975):381–89.

16. Lauriston Sharp, "Peasants and Politics in Thailand," *Far Eastern Survey* (New York) 19 (13 September 1959):157–61; Foster, "Ethnicity and Economy," 141–58.

17. Foster, "Labor Groups"; Brian L. Foster, "Socioeconomic Consequences of Stem Family Composition in a Thai Village," *Ethnology* 17 (1978):139–56.

18. Brian L. Foster, "Friendship in Rural Thailand," *Ethnology* 15 (1976):251–67; Foster, *Social Organization*; Steven Piker, "Friendship to the Death in Rural Thai Society," *Human Organization* 27 (1968):200–204.

19. Foster, "Ethnicity and Economy," 192–228.

20. Claude Lévi-Strauss, *Les Structures Elémentaires de la Parenté* (Paris: Presses Universitaires de France, 1949).

21. For example, Thomas Harding, *Voyagers of the Vitiaz Strait*, American Ethnological Society Monographs, no. 44 (Seattle: University of Washington Press, 1967); Marshall Sahlins, *Stone Age Economics* (Chicago: Aldine, 1972).

22. As in Kapferer, *Transaction and Meaning*.

23. Foster, "Ethnicity and Economy," 192–229; Foster, *Social Organization*, 496–502.

24. Foster, *Social Organization*, 504–12.

25. Ibid.
26. Brian L. Foster, "Change and Continuity in Thai Family Structure," *Journal of Anthropological Research* 31 (1975): 34–50.
27. Brian L. Foster, "Domestic Development Cycles as a Link Between Population Processes and Other Social Processes," *Journal of Anthropological Research* 34 (1978):415–41.
28. Brian L. Foster and S. B. Seidman, "Structural Variability in Stem Family Development Cycles: A Simulation Approach," *Behavior Science Research* 11 (1976):263–76; also see Foster, "Socioeconomic Consequences," and "Domestic Development Cycles."
29. Lévi-Strauss, *Les Structures*.
30. Foster, "Socioeconomic Consequences."
31. Peter P. Ekeh, *Social Exchange Theory: The Two Traditions* (Cambridge: Harvard University Press, 1974).

References

Barnes, J. A. "Social Networks." Addison-Wesley Module in Anthropology, no. 26. Reading, Mass.: Addison-Wesley, 1972.

Boissevain, Jeremy. *Friends of Friends*. London: Basil-Blackwell, 1968.

Breiger, Ronald L. "The Duality of Persons and Groups." *Social Forces* 53 (1974):181–90.

Ekeh, Peter P. *Social Exchange Theory: The Two Traditions*. Cambridge: Harvard University Press, 1974.

Embree, John. "Thailand--A Loosely Structured Social System." *American Anthropologist* 52 (1950):181–93.

Firth, Raymond. *Essays on Social Organization and Values*. London: Athlone Press, 1964.

Foster, Brian L. "Ethnicity and Economy: The Case of the Mons in Thailand." Ph.D. diss., University of Michigan, 1972.

_____. "Change and Continuity in Thai Family Structure." *Journal of Anthropological Research* 31 (1975):34–50.

_____. "Labor Groups in Thai Rice and Fishing Villages." *Human Organization* 34 (1975):381–89.

_____. "Friendship in Rural Thailand." *Ethnology* 15 (1976):251–67.

_____. *Social Organization in Four Thai and Mon Villages.* New Haven: HRAFlex Books, 1977.

_____. "Formal Network Studies and the Anthropological Perspective." *Social Networks* 1 (1978):241–55.

_____. "Socioeconomic Consequences of Stem Family Composition in a Thai Village." *Ethnology* 17 (1978):139–56.

_____. "Domestic Development Cycles as a Link Between Population Processes and Other Social Processes." *Journal of Anthropological Research* 34 (1978):415–41.

_____. "Minority Traders in Thai Village Social Networks." *Ethnic Groups* 2 (1980):221–40.

Foster, Brian L., and S. B. Seidman. "Structural Variability in Stem Family Development Cycles: A Simulation Approach." *Behavior Science Research* 11 (1976):263–76.

_____. *SONET–1: Social Network Analysis and Modeling System. Vol. 1. User's Manual.* Binghamton: State University of New York, Center for Social Analysis, 1978.

_____. "A Strategy for the Dissection and Analysis of Social Structures." Department of Anthropology, Arizona State University, 1979. Mimeo.

_____. "Network Structure and the Kinship Perspective." *American Ethnologist* 8, no. 2 (May 1981):329–55.

Freeman, Linton C. "A Set of Measures of Centrality Based on Betweenness." *Sociometry* 40 (1977):35–41.

_____. "Q–Analysis and the Structure of Friendship." *International Journal of Man–Machine Studies* 12 (1980):367–78.

Goodenough, Ward. "Residence Rules." *Southwestern Journal of Anthropology* 12 (1956):22–37.

Hanks, Lucian M. "The Corporation and the Entourage: A Comparison of Thai and American Social Organization." *Catalyst* 2 (1966): 55–63.

_____. "The Thai Social Order as Entourage and Circle." In *Change*

and Continuity in Thai Society, edited by G. W. Skinner and A. T. Kirsch, 197–218. Ithaca: Cornell University Press, 1975.

Harding, Thomas. *Voyagers of the Vitiaz Strait*. American Ethnological Society Monographs, no. 44. Seattle: University of Washington Press, 1967.

Kapferer, Bruce, ed. *Transaction and Meaning: Directions in the Anthropology of Exchange and Symbolic Behavior*. Philadelphia: Institute for the Study of Human Issues, 1976.

Killworth, Peter D., and H. Russell Bernard. "A Model of Human Group Dynamics." *Social Science Research* 5 (1976):173–224.

Leach, E. R. *Political Systems of Highland Burma*. Cambridge: Harvard University Press, 1954.

Lévi-Strauss, Claude. *Les Structures Elémentaires de la Parenté*. Paris: Presses Universitaires de France, 1949.

_____. *Structural Anthropology*. New York: Basic Books, 1963.

Mitchell, J. Clyde, ed. *Social Networks in Urban Situations*. Manchester: Manchester University Press, 1969.

Phillips, Herbert. *Thai Peasant Personality*. Berkeley: University of California Press, 1965.

Piker, Steven. "Friendship to the Death in Rural Thai Society." *Human Organization* 27 (1968):200–204.

Potter, Jack. *Thai Peasant Social Structure*. Chicago: University of Chicago Press, 1976.

Sahlins, Marshall. *Stone Age Economics*. Chicago: Aldine, 1972.

Seidman, Stephen B. "Clique-like Structures in Directed Networks." *Journal of Social and Biological Structures* 3 (1980):43–54.

_____. "Structures Induced by Collections of Subsets: A Hypergraph Approach." *Mathematical Social Science* 1 (1981): 381–96.

Seidman, S. B., and B. L. Foster. "A Note on the Potential for Genuine Cross-Fertilization between Anthropology and Mathematics." *Social Networks* 1 (1978):65–72.

_____. "A Graph-Theoretic Generalization of the Clique Concept." *Journal of Mathematical Sociology* 6 (1978):139–54.

_____. *SONET-1: Social Network Analysis and Modeling System.*

Vol. 2. Program Listings and Technical Comments. Binghamton: State University of New York, Center for Social Analysis, 1978.

_____. "The Use of Attribute Data in Network Modeling." Paper presented to Conference on Structural Analysis, University of Toronto, 1978.

_____. "SONET-I: Social Network Analysis and Modeling System." *Social Networks* 2 (1979):85-90.

Sharp, Lauriston. "Peasants and Politics in Thailand." *Far Eastern Survey* (New York) 19 (13 September 1950):157-61.

Sharp, Lauriston, and Lucian Hanks. *Bang Chan: Social History of a Rural Community in Thailand.* Ithaca: Cornell University Press, 1978.

Van Roy, Edward. *Economic Systems of Northern Thailand.* Ithaca: Cornell University Press, 1971.

White, Douglas. "Multivariate Entailment Analysis." School of Social Sciences, University of California, Irvine, n.d. Mimeo.