

Preface

This book presents a data-rich case study across time of the Aydınlı nomads (Yörük) in Southeast Turkey. We use longitudinal network analysis to develop theory and test ethnographic hypotheses pertinent to our case study, which is based on long-term field research by Johansen. In the course of our analysis of these case materials we also develop new theoretical models for an explanation of elements of social organization which are common to the Middle East. Models of this type open new possibilities for the study of how dynamical complexity theory relates to issues in social organization. Some of the models we develop, for example, are applicable to a broad range of lineage-based societies with a well established right to marry close lineage mates such as FBD.¹

The paradigm we present for new types of kinship, network, and ethnohistorical analysis can also serve as an instructional manual for network analysis. We provide guides to methods for use in conjunction with historical and ethnographic studies involving data on kinship and marriage networks. It is also a guide for how to test certain kinds of network-based hypotheses and theories in the domain of social organization. Here, vantage points on the dynamics of social behavior are achieved by attention to such data as the reports people give of the sequence of their marriages and the associated changes that result in their social networks. Social ties are not immutable but change with sequences of births, child rearing, deaths, divorce, conflicts, or other social, personal, or environmental events. These sequences are shaped in the context of relationships set down earlier. The data we present, supplemented by analysis of written and oral texts and the ethnographer's observations, are also transformed in the research process by visual renderings and network analyses of social organization. This is especially evident in our presentation of marriage or alliance structure, descent groups, relevant cohesive groupings, and leadership factions as they are seen to change with time.

In the network approach, the temporal perspective allows us to visualize and assess the complex relationships that arise in the unfolding of ethnographic narratives about social networks, including genealogies and what is said about these relationships. In this manner we try to meet the demands of Holy when he reminds us that "we need to pay more systematic attention to people's own models and conceptualizations if we are to

advance our understanding of the constitutive relationship between their marriage preferences and other elements of the . . . reality” (1989:2). Network analysis is compatible with the general frameworks of cognitive anthropology as well as ethnohistory.

To clarify more precisely the principles and dynamics of social organization, anthropologists will benefit from new understandings that result from combining genealogical, narrative, and network data in specific case studies. Network analysis is not employed here as a means to abstract structure from the flux of social behavior so as to derive the constants. Rather, it is a means to embed observed and narrated changes in behavior and social discourse within their larger social contexts. The relationship of social organization to changing life histories and understandings about cultural rules appears tighter when we focus on the unfolding of peoples’ behaviors and their thinking about social action: The broader and changing social context frames our viewing of individual actors’ decisions. We show how social networks operate dynamically among the contexts in which people operate. People, by their statements and actions, also change their networks and those very contexts that are the arenas for their own and other people’s activities.

Field anthropologists are often aware intuitively of one of the analytic principles of this book, namely, that a close observation of social behavior—and what that behavior entails as a signal of preference, avoidance, or intention—challenges us, in a context where the language and culture are known, to a closer reading of what people say through the vehicle of language. The study of behavior is complementary to the study of verbal expressions. This book will show that, to the extent that norms governing social relations and the more detailed rules of how norms are used in

practical life can be inferred from social behavior, to look at behavior in actual networks and the contexts that define the range of possible choices in behavior gives results that are more precise and reliable than participant observation alone.

The grounding themes developed here echo those of Schweizer

Languages of Behavior. A key assumption of this study is that preferences and social rules can be inferred from actual behavior made in a network context; i.e., from knowledge of the network background of possible choices as a system of constraints, and, of course, some knowledge of the cultural background. This provides, using some of the new forms of network analysis in combination with an ethnographer’s understanding of indigenous knowledge systems, a means to read and understand the language of behavior.

(1996, 1997), who presented the advantages of the network approach in the context of a history and critique of ethnology. His work illustrated the benefits of a dynamical network approach by way of a few well-chosen examples but without incorporating as we do here new concepts from graph theory that underlie and extend the network approach. He showed an evolving social hierarchy for positions of power in a Chinese village after the Maoist Revolution, for example, by successive graphs of the relations among actors involved in positions of power. In a second example, a network analysis of the !Kung, he reexamined an emergent social hierarchy in ritual exchange in which an egalitarian ideology contrasts with social hierarchy evident in the relations of exchange. His unfortunate death in 1999 was not only a personal loss to each of us but also a setback to the reemergence of network anthropology.

The approach taken in this book and its relevance for anthropology goes well beyond Wasserman and Faust's (1994) presentation of standard types of network analysis in the social sciences. Our work also adopts ethnographic and graph-theoretic perspectives pursued by Hage and Harary (1983, 1991, and 1996) in which graph theory is used to define and formalize new concepts directly relevant to ethnology. White's presentation of new software and computational possibilities for the analysis of large-scale networks, which began with White and Jorion (1992), also goes beyond the ethnographic vignettes of Hage and Harary that relied on manual rather than computer-driven analysis and so required rather small examples of networks. We draw here on other parts of graph theory that derive from work by White and colleagues, such as concepts of relinking, structural endogamy and structural cohesion, to study emergent forms of cohesion applicable to social groups and institutions and to dynamic phenomena in social organization.

The present monograph is the product of an ongoing collaboration. Johansen and White met and began a dialogue on her case study of the Turkish nomads nearly a decade ago. Many exchanges on her case study produced contributions to our developing analytic methods as the advantages and possibilities of network analysis and theoretical constructs became more obvious to us. In the process we discovered what we take to be a new analytic paradigm that we might call *network kinetics*. The paradigm is of potential interest in social, cultural, and physical anthropology, archaeology, and social- and ethnohistory. Because of this we felt it important to present aspects of this new paradigm didactically as they emerged in the detailed analyses of the Turkish nomads case study.

This book is not an ethnography as such—for that see Johansen (2004). Only partial results of Johansen's fieldwork are given, as needed,

to provide data and background for the network analysis. It explores the rich case study of Aydınlı nomads (Yörük) in Southeast Turkey. Results of our analysis should allow readers a deeper understanding of a nomadic clan embedded in a larger intersocietal framework and of the complexity of sociopolitical organizations of rural Turkey in the last centuries. We show how this case is relevant to understanding aspects of social organization in the Middle East. The ethnography of Johansen and computer analysis of White are combined to visualize and explore intricate social processes using genealogical and other fieldwork data. “We” is used or implied in the many statements and interpretations of ethnographic details that were worked out together, where our use of the computer-drawn genealogies and references to individuals in the genealogies have been crucial to observing further patterns in the ethnographic data. The reader should bear in mind that the fieldwork is that of Johansen and the computer analysis that of White. Further, our narrative “we” is also used as a didactic means to include the reader in the process of analysis and discovery. We raise an explicit dialogue about how to integrate ethnography and computing.

This book is dependent on a thoroughgoing use of the genealogical method. One of the book’s main contributions is to enhance our ability to trace not only the ethnogenesis of the nomad clan, from its origins in the late eighteenth century, but also the movement of clan peoples back and forth from nomadism to sedentism as the clan grew in size. This resulted in a numerical preponderance of the descendants of the nomadic clan settling or resettling in sedentary villages. Whether this process during the most recent period is also resulting in the dissolution of the clan as a nomadic society will also pose a series of question for analysis.

The book will be successful if it helps to orient a new generation of ethnographers, if only in part, to change some of the ethnographic practices for systematizing, analyzing, and reporting their data. The advantages are evident given the availability of analytic concepts and computer software for network analysis of the relational data collected in case studies. The book also sheds light on form and flow in cultural systems:

Imagine . . . that cultural phenomena are in constant flux, that they can be envisioned as inter-related flows in space through time of material, labor, and messages articulated by individual actors. These definitions of channels, and of the points where they interact, may be thought of as places, groups, institutions and the like, but they cannot be explained without reference to the flows. When these flows maintain the same arrangements through time despite changing conditions in the broader environment, we can speak of ‘robustness’. When the

arrangement of flows is changed in response to changing conditions, we speak of 'resilience'. To what extent these two intuitively apprehensible verbal concepts can be subsumed under a single formal construct is an area of debate. (Henry Wright 2003)

Organization of the Chapters

The interlocking of ethnography and computing appears in the basic structure of the book. To link the two levels but keep them distinct, we introduce explicit hypotheses because our findings in the analytic sections may then be independently checked by the ethnographer and the ethnographer's statements may be independently checked by the analysis. The analytic sections of the book are accompanied by working hypotheses (numbered within each chapter) that are tested and cross-validated with network methods and qualitative and quantitative analyses. To clarify key analytic concepts when first introduced, definitions are provided and the Glossary may be consulted when they are later used in the analysis. In the chapter summaries we recap some of the main arguments and findings, followed by Further Readings.

The book is organized to deal with the more general issues first, in Chapters 1 and 2. Chapter 1 provides an introduction to network analysis in relation to ethnography. We argue that network analysis can play two different and complementary roles. One is an auxiliary role of deepening ethnography by providing greater reliability and precision, and formulating and testing hypotheses about phenomena that are ordinarily treated in ethnography and accessible to the ethnographer. The other role is in discovery and exploration of new phenomena that are not otherwise accessible to the ethnographer except through network analysis. Here we examine the crucial contribution of network theory in identifying structural properties that emerge out of social interaction and that have effects, often quite dramatic when they involve sudden changes, on further development of the network and its actors, emergent groups, rules, roles, and processes. This provides another potential level of theory in anthropology, one that we refer to as network kinetics, in which process models are formulated through a series of hypotheses that need to be tested in order to begin to understand social dynamics and the value of the time element in ethnography. The issues here are ones that relate to complexity theory and other findings in the sciences of complexity that now crisscross the disciplines (White 2002a). Hence we provide here and in the Glossary some of the fundamental definitions and propositions on which these approaches are grounded. Within this framework, we focus

on issues of social organization that are nonetheless quite general. We explain why and how the concepts of emergent groups, rules, roles, and processes fit within ethnography and, through the vehicle of network analysis, in the complexity sciences generally. This chapter is intended for students, ethnographers, and teachers of ethnography, as well as complexity scientists in any field of study.

Chapter 2 narrows the focus to present some basic concepts and methods for representation and analysis of large-scale kinship networks and to provide a compact graphical representation of the endogamous members of the clan and their relationships. This too is a chapter for readers at all levels since it presents and explains the crucial role not only of networks and graphs but also of a special type of graph—the p-graph—that is useful for the study of cohesion (emergent groups) in genealogical networks. The coding of data for analysis is explained, along with the variables available for analysis and a sample of the data that shows the format. Costs and benefits of computer analyses that build on new modes of representation are discussed.

Chapter 3 gives a brief ethnographic summary relevant to how the data were collected and to some of the topics that will be explored in the network analysis. A few of the topics covered are history and demography, the fieldwork, multiple levels of group membership and group names, economics, kinship—lineages, inheritance, and FBD marriage—, Islam, and leadership.

Chapter 4 introduces the theoretical background in anthropology for some of the questions addressed in the book, situating them within our first look at problematic issues that are raised by the case study itself. These are the problems raised by lineage and descent theory, alliance theory, and segmented lineage structure. Our argument develops into an alternative theoretical approach complementary to descent as well as alliance theory while incorporating parts of those of other frameworks. After the introductory sections on descent and alliance, the chapter develops the main arguments, hypotheses, and more detailed methodology for subsequent chapters. FBD marriage is the first problematic of the ethnography: the right to marry the FBD, such as occurs in the Middle East, as an element of a mixed marriage strategy that alternates between lineage exogamy and lineage endogamy.

Chapters 5 through 10 are devoted to major problems of analysis, moving again from the general to the more specific ethnographic problems. Chapter 5 begins with a review of network models needed to analyze ethnographic studies that involve kinship and marriage networks. To understand social interaction in context and its effects on emergent forms

of social organization, we begin with the concepts of complexity and fractality. General theoretical models of small worlds and network navigability are applicable to decentralized networks and to understanding social organization in our study and in similar forms of organization in the Middle East. Models of complex small worlds for segmented lineages of generalized “Arab” type are explored that are built on reciprocity, codes of honor and trust, and the navigability of strong ties in networks. We explore the use of different forms of simulation (agent-based models, demographic simulations, and baseline models that control for the demographics of a given empirical case) to illuminate general as well as specific network properties. Picking up where Chapter 2 left off, we develop further analytic concepts and measures that will be used in later chapters. They will often be of help in understanding social context in making ethnographic interpretations. We introduce concepts and questions that help to orient the analysis of our case study.

Chapters 6 through 10 focus more specifically on dimensions of social organization in the case study that are common in other societies. The large cohesive units that emerge with the genesis of the group, that hold it together, and that begin to dissolve as the group breaks up are treated in Chapter 6. Chapter 7 treats the role of marriage as a dynamic element in social organization in general and in kinship organization in particular. Opportunities and constraints offered by demographic variables that change quantitatively but can produce structural effects and tipping points for dramatic historical change are analyzed in Chapter 8. This chapter also treats more concretely the first problematic of FBD marriage, building on issues taken up in Chapter 4. Chapter 9 takes on the dynamics of leadership. Finally, discoveries motivated by considering the evolution and meaning of networks as relational structures are treated in Chapter 10, followed by the conclusion.

Structural cohesion, introduced in Chapter 6, is the second major problematic of the case study after those of Chapter 4. A central thesis is that in many Middle Eastern societies, marriages create the social cohesion of lineage, clan, and larger groupings. The analysis begins with an explanation of how genealogical, biographical and other ethnographic data may be combined in an analysis of how social cohesion relates through a predictive model to shifting group memberships, migration, political office-holding, and demographic processes. For simplicity, we restrict ourselves at first to the kinship networks and the dynamics of marriage. Analyses 1 and 2 present the counts of people, marriages, and generations, and discuss the fit between network patterns and cultural rules. A first instance is how the ethnographer classifies generational lev-

els in kinship systems compared to how a computer might classify generations and how the cultural prescriptions that stem from the Qur'an such as same-generation marriages rules. As against uniformity of rules and behavior we take up problems of cultural and behavioral variability.

The central hypotheses presented in Chapter 6 and tested in Analyses 3-6 concern structural cohesion in the clan and in the network of nomad tribes, as contrasted with links between nomads and villagers. A key finding is that of the inverse relation between out-migration and structural endogamy. We look at the root or roots of clan cohesion in statements of belief and historically in forms of structural cohesion. A field report on these themes is deepened by computer analyses of marital re-linkings by generations, lineages, and tribes.

Chapter 7 presents a third problematic of the book that links the network-based theory of navigable small worlds, introduced in Chapter 5, to network structure and dynamics in a society with endogamous segmented lineages. Tests of the relevant models and properties of marriage networks constitute the thrust of Analyses 7-9. An ethnographic overview of social rank, marriage, and migration supplements and forms the background for these analyses. The fractally segmented lineage structure involves a dynamic of simultaneously shedding population through emigration and of integration of segments through structurally endogamous marriages. In Analysis 7 we look at multiple levels of network organization—families, lineage segments, and lineages—and we find evidence of strong-tie networks linking families and sublineages through reciprocal marriage alliances. Further, we find that these strong-tie linkages constitute a network of trust and intimacy that has the properties of a small world. These networks of reciprocal (strong) and nonreciprocal (weak) marriage ties, operating at the level of lineages and sublineages, have two cross-cutting facets. One facet is that more intense exchanges occur between neighboring lineages ordered by a highlands-lowlands continuum (remote-regionally integrated) and the other consisting of subsets of 3-4 lineages that have network neighborhoods consisting of all mutually reciprocal marriage ties and span the poles of this continuum to create a small world of very low-distance strong-tie paths between all pairs of nodes in this network.

Analysis 8 shows that marriages are focused around egalitarian beliefs that betrothal must involve spouses of the same generation and roughly the same age and status equivalence in reciprocal exchanges between sublineages. These principles are also consistent with those articulated in the Qur'an, although there is local variation in the network in

how they are applied. Analysis 9 shows how power-law distributions of the full diversity in types of marriage match precisely the properties of both a self-organizing complex system and a small world. This small world is navigable through strong ties and balanced on the verge of decoupling while creating at the same time an integrated exchange system through marriage exchange and marital relinking. The implications of this chapter are expanded by White and Houseman (2002) in their theory of strong-tie networks that operate as self-organizing systems.

Chapter 8 presents a fourth problematic, more methodological and historical: What is the sensitivity of our methods of network analysis, and those of the ethnographer, to temporal changes? Can we evaluate the robustness of a social network in maintaining its arrangements for the flow of personnel and materials in the face of changing conditions? Can we evaluate its resilience by means of changing organizational arrangements in response to changing conditions? Can we identify changes in the dynamics that generate the surface arrangements of social organizations? Can we identify emergent organizational structures and new rules of behavior? Focusing on kinship and marriage, Analyses 10-12 supplement those of the previous chapter to show in a precise form the changing frequencies of marriage types, and those noticed by the fieldworker, and to test hypotheses about interpreting these changes. The field anthropologist's impression that social cohesion through intermarriages was in decline during the twentieth century, for example, was corrected in critical ways by computer analysis.

Chapter 9 presents a fifth problematic of the relation between decentralized leadership and network cohesion created through the dynamics of marital relinking and processes of wealth accumulation at the family level. We begin with a review of Fredrik Barth's (1953) hypotheses about the dynamics of nomadic social structures. Analyses 13-17 develop hypotheses and analysis that test increasingly complex aspects of how leadership emerges out of decentralized networks and processes, and concludes with a surprisingly simple account of the typical ways the variants of these complex processes unfold. It is also one that leaves open the less predictable aspects of individual agency.

Chapter 10 presents a sixth problematic that builds off the ability to characterize the structure and dynamics of networks as graphs that change through time in contrast to observable behavioral dynamics and the changing attributes of persons. One of the contributions of this reflection on structure and dynamics is our hypothesis about a previously unnamed form of clan organization with a loose and flexible system of interpersonal ranking based on respect for age and experience. We show

how clan organization of this type, including flexible rankings without a strict hierarchy that stifles innovation, allows each family line to bring capable members forward in promoting alternative adaptations to nomadism. We call attention to characteristics found in many societies for which we suggest a unifying concept, that of the endoconical clan. This model offers an alternative to the more rigid ideas fixed in the literature of segmentary lineage systems as contrasted with conical clans based on hereditary rank. A dynamic graph-theoretical analysis shows how the clan structure changes through time, and the graphic analyses support the field data on leadership and clan structure. More can be said here about the model of the endoconical clan as a useful backdrop to issues of leadership presented in the previous chapter.

A final evaluation of the results of this study, in Chapter 11, completes the book. We reevaluate the strengths and weaknesses of a network approach, identifying dynamic processes and how they generate organizational adaptations. We also evaluate theoretical and methodological orientations to complexity and self-organized criticality thresholds and distributions that help to model dynamic processes in social organization.

The Glossary at the end of the book defines the concepts that we employ from the diverse domains of anthropology (kinship, social roles), sociology (social networks, norms), graph theory (graphs, networks) and complexity theory (fractals, power laws) as well as hybrid domains such as network concepts for kinship (structural endogamy, p-graphs, exocohesion). Footnotes to terms in the Glossary provide instructions on the use of computer programs such as Pgraph, Pajek, UciNet, and Commercial software. References are given in the footnote on p-graphs on where to access software for application to other cases, and other types of datasets.

For those interested in further exploring our results and the data on which our analyses are based, we have published the nomad genealogies at <http://eclectic.ss.uci.edu/~drwhite/TurkishNomads> on the Internet. We hope this will encourage others to identify new opportunities for research and analysis of social organization.

Acknowledgments

Johansen's first fieldwork for the ethnographic case was supported by a student grant from the Deutscher Akademischer Austauschdienst. Her subsequent fieldwork was carried out as a member of the Ethnographic Museum of Hamburg, the Institute of Ethnology at Cologne University, and while lecturing at the University of Istanbul. Her warmest thanks go to the members of the Aydınlı clan for their great hospitality and their readiness to answer her innumerable questions, even those out of the ordinary. By disclosing their view on the problems of life and frankly telling the ethnographer all their stories and traditions they have provided the basic material for this book. Additional data for the genealogy of the clan were contributed by Ali Küçükaydın, member of the Turkish Parliament. Additional data for the genealogy of the clan were contributed by Ali Küçükaydın, member of the Turkish Parliament.

White's data preparation, analysis, and early drafts for this book were supported by a National Science Foundation Award (SBR-931003, "Network Analysis of Kinship, Social Transmission and Exchange: Cooperative Research at UCI, UNI Cologne, CNRS Paris 1993-1995") with matching grants to Thomas Schweizer from the Alexander von Humboldt Transatlantic Cooperation Program. A 1996-1998 Leibniz award to Thomas Schweizer supported collaborative research in conjunction with a prior Humboldt Award to White. The international collaborations among French, German, and American social scientists involved in this area of ethnohistory and mathematical social science were furthered by Clemens Heller and the Maison des Sciences de l'Homme of Paris, the Ministry of Research and Technology in France, the Maison Suger under Jean-Luc Lory, Alain Degenne of the French CNRS, and François Hèran of the French INED. The larger project involved collaboration with Thomas Schweizer (Humboldt Award co-PI), Paul Jorion (MSH, Paris), and Michael Houseman (CNRS and EPHE, Paris). White's later participation in this research was supported by a UCI Faculty Senate Fellowship and the Institute for Ethnology at the University of Cologne. Later analyses were done under White's 1999-2001 NSF Award (BCS-9978282, "Longitudinal Network Studies and Predictive Social Cohesion Theory").

We are thankful to Aparna Rao and Michael Schnegg for suggestions for improving readability, to Phillip Gulliver for detailed constructive criticism of content, to Lilyan Brudner-White and Michael Houseman for extensive editorial suggestions and ideas for phrasing introductions and conclusions, to Lin Freeman for the HTML program that allowed Figures 2.2-2.5 to be printed, to Laurel Holloway for copy editing, and to Mark

Granovetter and Duncan Watts for commentaries on ideas about small world models and the weak and strong tie hypotheses. We are indebted to Jean-Pierre Eckmann for explaining his methods of studying local curvature in large-scale networks and to his feedback on applying these methods to kinship networks in our Analysis 7 on the dynamics of marriage exchanges.

White is appreciative of the invitations that allowed time for extensive writing and editing of this book: those of Maurizio Gribaudo and Hervé Le Bras to join the research team of the Laboratory of Demographic History at the Ecole des Hautes Etudes en Science Social (Paris) as visiting professor for one month each year, 2000-2002; and of François Hèran to join the visiting researchers at the Institut National des Etudes Démographiques (INED) in 2002, where some of the ideas in this book were tried on diverse audiences, and to present a early version of this work at his INED workshop (1997). Lilyan A. Brudner-White gave unstinting support to this project, and Scott D. White's shared interest in the dynamics of social networks has been a constant source of stimulation. David Lane, Murray Leaf, and Michael Houseman provided invaluable critiques and suggestions for Chapter 1 and Jean Pierre Eckmann did the same for Chapter 7.

Further Reading

Johansen (2004) provides an ethnography of the Aydinli nomads written in a popular style. Introductions to network analysis are given by Schweizer (1996) for German and Schweizer (1997) for English speakers. White and Houseman (2002) provide a review of the links between anthropology and complexity theory, including an expansion of themes discussed in this book. White (2002c) provides a general overview of the links between network analysis and complexity theory across the sciences, with special emphasis on the social sciences (anthropology, economics, history, political science, and sociology).

Notes

1. We use the letters F, B, S, H for the male roles in the nuclear family and M, Z, D, W for those of females so that compound relations such as father's brother's daughter (FBD) are more easily designated.