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*The Xavánte in Transition: Health, Ecology, and Bioanthropology in Central Brazil*

Carlos E. A. Coimbra, Jr., Nancy M. Flowers, Francisco M. Salzano, and Ricardo V. Santos

# The Xavánte in Transition

*Health, Ecology, and Bioanthropology  
in Central Brazil*

Carlos E. A. Coimbra Jr.  
Nancy M. Flowers  
Francisco M. Salzano  
and  
Ricardo V. Santos

*Ann Arbor*

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*To the Xavánte*



## *Series Introduction*

The series *Linking Levels of Analysis* focuses on studies that deal with the relationships between local-level systems and larger, more inclusive systems. While we know a great deal about how local and larger systems operate, we know much less about how these levels articulate with each other. It is this kind of research, in all its variety, that *Linking Levels of Analysis* is designed to publish. Works should contribute to the theoretical understanding of such articulations, create or refine methods appropriate to interlevel analysis, and represent substantive contributions to the social sciences.

Rarely has the linkage between a local population and the larger forces that affect their adaptability been as thoroughly explicated as in this book. The authors bring together sophisticated understanding of indigenous South America, medical anthropology, biological anthropology, and social anthropology within an explicitly political-economic context that makes the local human conditions richer and more complex than if they only had been treated ethnographically, medically, or economically. The research underlying the book pulls together work over decades by several investigators and collaborations by the authors for more than a decade.

The Xavánte of Central Brazil have been of interest to outsiders for a long time. They resisted contact for a very long time, gaining fame for their fierceness, and for the past fifty years have reluctantly engaged in interethnic relations, with high, even devastating, costs. As with so many other indigenous populations the mortality from introduced diseases left them a shadow of themselves both biologically and culturally. Thus, the Xavánte give us a well-documented window into the experience of many other ethnicities throughout lowland South America that are much less well chronicled. Most indigenous groups are poorly known, particularly their health status and their demographic history. This study of a Xavánte population begins to correct this situation. It documents the changing demography, ecology, and economy of one of

the surviving populations. They have managed better than many others in coping with rapidly changing conditions, and they provide insight into the more effective ways to survive.

The book is also an important contribution of the “new” biological anthropology. In another book in this series, Alan Goodman and Thomas Leatherman (1999) provided us with a set of studies that integrated considerations of political economy with those of human biology to show that much of what had passed in the previous years for adaptability (or not) was a product of the poverty and exploitation experienced by the subjects of study, rather than inherently a biological process of adaptation. The authors of this book were represented in that volume, and in this book they extend that analysis to a book-length study that is more complete in its analysis of ecology, health, disease, and demography in their full political and economic contexts. This is human biology with a social conscience.

It is my hope that this book will inspire readers to consider how complex human environmental relations are, how heavy the costs can be to a population, and what we might do to make this transition less fraught with the danger of biological and cultural extinction.

Emilio Moran, Series Editor



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## *Foreword*

*On 22 and 23 July 2002, Carlos E. A. Coimbra Jr. and Ricardo V. Santos went to Etéñitépa to present The Xavánte in Transition: Health, Ecology, and Bioanthropology in Central Brazil and to discuss it with the community. Tsuptó, the village chief, made the following comments.*

In former times, in those days, our health and the foods we ate were more traditional than they are today. There were not so many sicknesses. We were very strong and resistant because of the way we ate. At that time there wasn't the interference that there is today, the interference of the whites. At that time there was no tuberculosis, no diabetes; at that time there were none of the sicknesses that we see today. Now we have them all. These sicknesses are not from our village; they are not from other Indian populations. I think they are because of interference from outside. I think that the diseases that the Indian populations are suffering from are brought by the whites. Many things have changed. So, compared with former times, there are many more kinds of diseases. Our organisms, our bodies, the bodies of our children, can't stand up to all this; they can't resist. Because these are not our sicknesses. They come from outside.

About the work of research, I think the research team has to relate to the community; the team has to like what it is doing. We don't see that very often. The health teams that come to the village, they come to treat a particular sickness, just that one time; then they go away. I think that what is affecting our health, what is damaging it, these things that come into the village from outside, have to be investigated. It is very important to understand what is going on. The things that are brought in make garbage that builds up and takes time to clean away. We don't know how to deal with this. About those influences that come from away, those sicknesses from away that are prejudicing the village, the community — it is about those things that research should be done.

The research that has already been done has helped a lot, even if it

is over the long term. But we see this as an example of how we can find out what is damaging the health of the village, what may damage it in the future. So that instead of letting it do damage, we can avoid it. We also see research as a way for people outside to learn about our lives. We have health problems that people outside don't know about, so they don't look for solutions. Because at present, the diseases that Indian populations suffer from are not being dealt with. Well, I think these things should be studied in more depth so that if solutions for these things that are happening can be found, they will be.

Tsuptó Bupréwen Wairi, chief of the village  
Etéñitépa, Terra Indígena Pimentel Barbosa

## *Preface and Acknowledgments*

Sometimes fortuitous encounters in our lives may start us along paths that take us a great distance, involve relationships that last for years, and, if we are fortunate, give us great personal and intellectual pleasure. This book is the result of such a meeting. The idea for a multidisciplinary research project among the Etéñitépa Xavánte bringing together perspectives from biological anthropology, human ecology, and public health was born in 1988 from a casual conversation between Carlos Coimbra Jr. and Nancy Flowers during a break between sessions of a seminar on biological anthropology in Belém, Pará. Soon after, the idea was discussed with Ricardo Santos and Francisco Salzano, who immediately joined the project. Authors' names in this book appear in alphabetical order.

For some twenty-five years Flowers has been doing research, especially in human ecology and anthropological demography, among the Xavánte. In 1976 and 1977, Flowers lived at Etéñitépa for fourteen months. Flowers's research was part of a project, Human Ecology in Central Brazil, planned and coordinated by Daniel Gross. According to the design of the project, Flowers, with two other graduate students from the City University of New York, spent a year in different Indian villages of Central Brazil, Dennis Werner with the Kayapó-Menkrangnotí and Madeline Ritter with the Canela (Ramkókamekra), collecting data for the comparative project as well as their dissertations.

Throughout the 1980s, Coimbra and Santos were involved in research in medical-biological anthropology and epidemiology among indigenous peoples in the Brazilian Amazon. Both based their doctoral dissertations, defended at Indiana University, Bloomington, on research carried out among the Gavião, Surui, and Zoró, Tupí-Mondé-speaking groups who live on reservations near the boundary between the states of Mato Grosso and Rondônia. Both Coimbra and Santos are interested in understanding how the health and biology of Amazonian indigenous peoples are affected by contact and increasing interaction with the Brazilian national society.

Francisco Salzano has been working since the 1950s with indigenous peoples in Brazil and other South American countries. He initially worked with the Kaingáng in southern Brazil and shortly after, in the early 1960s, did research among the Xavánte. In the following years this research was extended to a number of different groups, chiefly from the Amazon region, in collaboration with a large number of colleagues from both Brazil and abroad. Particularly noteworthy was a joint project that involved the Department of Human Genetics, School of Medicine, University of Michigan, and the Departamento de Genética, Universidade Federal de Rio Grande do Sul. These studies were conducted over a period of four decades, contributing in a significant way to knowledge of the genetics of Amerindian tribal populations.

In our early discussions of our Xavánte project it became clear that we all had a particular interest in studying the ways through which socioeconomic and environmental changes affect the health, biology, and ecology of indigenous peoples. Aspects of the Xavánte experience, including their history and patterns of interaction with non-Indians, offered a unique opportunity for this kind of research. An unusual and interesting aspect of the Xavánte is the considerable time depth of historical references to them. Based on these documents we can draw a reasonably detailed picture of interaction between the Xavánte and the Brazilian national society over the past two and a half centuries.

Another advantage was that some members of the team had already done fieldwork among the Xavánte. Both Flowers and Salzano did research with the group that now lives on the Pimentel Barbosa reservation. Work could be done in the same community where previous research was carried out, making it possible to compare data collected at different times in the recent history of the group. Moreover, two anthropologists, David Maybury-Lewis and Laura Graham, had made ethnographic studies of the group at different periods.

The first fieldwork of Coimbra and Santos among the Xavánte was in May and June of 1990, when they made a field trip to Etéñitépa with Flowers. At that time they collected many of the data that we present here. But they and Flowers returned to Etéñitépa many other times, and over the period of their research they developed very warm relations with the Xavánte. During the years of the project it attracted a growing number of people. At the beginning of the 1990s Coimbra and Santos both began to work actively as teachers and advisers in the master's and doctoral programs of the Escola Nacional de Saúde Pública (ENSP, National

School of Public Health) of the Fundação Oswaldo Cruz (FIOCRUZ), in Rio de Janeiro. Rui Arantes, Silvia Gugelmin, Rubens Ianelli, Maurício Leite, Silvana Pose, and Luciene Souza, who were students in that program, chose to do their graduate research among the Xavánte, focusing on a number of different topics, such as the epidemiology of infectious and parasitic disease, nutrition, demography, and human ecology. Working with these collaborators, as well as other students doing research on indigenous health (Ana Lúcia Escobar and Eliana Diehl) at the Escola Nacional de Saúde Pública, has been an extremely enriching experience, both in personal terms and from the opportunity given us to build a collective body of knowledge. Looking back, we can see that research training has become an important aspect of the project, which we did not anticipate when it began.

The building of modern laboratory and computing facilities at Salzano's Genetics Department at the Federal University of Rio Grande do Sul in Porto Alegre has made possible the detailed genetic study of the samples collected in the 1960s and 1990s at both the protein and DNA levels. Molecular investigations of these samples are still being performed while this book is being written.

We certainly would not have been able to carry out our research among the Xavánte without financial assistance from many different sources. For the 1990 field trip we had the support of the Wenner-Gren Foundation for Anthropological Research (grant to Nancy Flowers and Carlos Coimbra Jr.). Activities between 1992 and 1995 were largely made possible through a fellowship granted to Ricardo Santos from the John D. and Catherine T. MacArthur Foundation. Throughout the project we had the constant support of the Fundação Oswaldo Cruz, which both directly and indirectly provided resources. The FIOCRUZ program PAPES—Programa de Apoio à Pesquisa Estratégica em Saúde (Program to Support Strategic Research on Health)—provided important financial support, often at times when we had no other funding.

Writing a book with eight hands naturally requires many, many meetings. Flowers came to Brazil for various lengths of time in 1992, 1994, 1996, and 2000 for further fieldwork and data analysis as well as for writing articles and the book itself. Her trips were funded by the Conselho Nacional de Desenvolvimento Científico e Tecnológico (CNPq, National Council for Scientific and Technological Development), the Fundação Oswaldo Cruz, the Fulbright Commission, and the Fundação de Amparo à Pesquisa do Rio de Janeiro (FAPERJ, Rio de Janeiro Foundation for the

Support of Research). Throughout the Xavánte project, Coimbra, Salzano, and Santos held research fellowships from the CNPq. Postdoctoral fellowships awarded to Coimbra and Santos by the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (CAPES, Council for Postgraduate Study) made it possible for Coimbra to spend twelve months in 1998 and 1999 at the Anthropology Department of the University of Massachusetts at Amherst, and for Santos to spend the same period of time at the University of Massachusetts and the Program in Science, Technology and Society of the Massachusetts Institute of Technology. Finally, CNPq and CAPES gave fellowships to the graduate students of the Escola Nacional de Saúde Pública who carried out research with the Xavánte. The studies in population genetics of the research group coordinated by Salzano at the Universidade Federal do Rio Grande do Sul, in Porto Alegre, were supported by the Programa de Apoio a Núcleos de Excelência (PRONEX, Program in Support of Excellence), CNPq, the Fundação de Amparo à Pesquisa do Estado do Rio Grande do Sul (FAPERGS, Rio Grande do Sul Foundation for the Support of Research), and the Financiadora de Estudos e Projetos (FINEP, Agency of Studies and Projects).

Beyond direct support for our research, we received indirect support in a number of ways. The laboratories of the Instituto Oswaldo Cruz, of the Escola Nacional de Saúde Pública and the Hospital Evandro Chagas, all linked to the Fundação Oswaldo Cruz, analyzed biological samples collected at Eténñitépa and provided consumable supplies. We thank Cláudio Daniel-Ribeiro, Ricardo Lourenço de Oliveira, Wilson Souza, Bodo Wanke, and Clara Yoshida. Analyses were also made at the Instituto Evandro Chagas, the Instituto de Medicina Tropical de São Paulo, and the Hospital da Universidade de Brasília. We thank the following colleagues from these institutions: Monamaris M. Borges, Alexandre C. Linhares, Ronan Tanus, and Amélia P. A. Travassos da Rosa.

As must be the case with a project that involves so many researchers, the list of people whose assistance and collaboration we should like to acknowledge is a long one. Collectively, we should like to thank Aduino Araújo, Michael Brown, Regina Lana Costa, Carlos Fausto, Maj-Lis Föllner, Laura Graham, Daniel Gross, Paulo Sabroza, and Sheila Mendonça de Souza. As well as their friendship, some of these colleagues gave us comments that have greatly enriched our analyses. The support of Emilio Moran, editor of the Linking Levels of Analysis series



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The research on which this book is based would not have been possible without the collaboration and enthusiasm of the Xavánte themselves. At each of our visits to Etéñitépa we came before the *warã*, or men's council, to explain what we intended to do and also to present the results of research to date. This dialogue was always very helpful to us. We hope that our research and the parallel activities that are developing from it have benefited and will benefit the Xavánte. We have not designed our research to be only of academic value. Among the Xavánte that we should like to thank in particular are Suptó, Roberto, Sereburã, Barbosa, Agostinho, Paulo, and Jamiro. We have decided to assign the royalties from this book, and from any future edition in Portuguese, to the Etéñitépa community.



## *Abbreviations*

AIH	Autorização de Internação Hospitalar (Authorization for Hospitalization)
ARI	acute respiratory infection
ASFR	age-specific fertility rate
BCG	vaccine against tuberculosis, prepared from a weakened strain of tuberculosis bacteria named BCG – bacille Calmette-Guérin, for the French scientists who developed the product
BMI	body mass index
CAPES	Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Council for Postgraduate Study)
CBR	crude birth rate
CDR	crude death rate
CEDI	Centro Ecumênico de Documentação e Informação (Ecumenic Center for Documentation and Information)
CIMI	Conselho Indigenista Missionário (Missionary Council for Indigenous Affairs)
CNPq	Conselho Nacional de Desenvolvimento Científico e Tecnológico (National Council for Scientific and Technological Development)
CPI	Centro de Pesquisa Indígena (Center for Indigenous Research)
DMFT	decayed, missing, filled teeth
DSEI	Distrito Sanitário Especial Indígena (Special Indigenous Health District)

DTP vaccine	vaccine to protect against diphtheria, tetanus, and pertussis
ENSP	Escola Nacional de Saúde Pública (National School of Public Health)
EPF	endemic pemphigus foliaceus, or fogo selvagem
EVS	equipe volante de saúde (mobile health team)
FAPERGS	Fundação de Amparo à Pesquisa do Rio de Janeiro (Rio de Janeiro Foundation for the Support of Research)
FAPERJ	Fundação de Amparo à Pesquisa do Estado do Rio Grande do Sul (Rio Grande do Sul Foundation for the Support of Research)
FBC	Fundação Brasil Central (Central Brazil Foundation)
FINEP	Financiadora de Estudos e Projetos (Agency of Studies and Projects)
FIOCRUZ	Fundação Oswaldo Cruz (Oswaldo Cruz Foundation)
FUNAI	Fundação Nacional do Índio (National Indian Foundation)
FUNASA	Fundação Nacional de Saúde (National Health Foundation)
HBV	hepatitis B virus
HLA	human leucocyte antigen
IBAMA	Instituto Brasileiro do Meio Ambiente e Recursos Naturais Renováveis (Brazilian Institute of the Environment and Renewable Natural Resources)
IBGE	Instituto Brasileiro de Geografia e Estatística (Brazilian Institute of Geography and Statistics)
IBP	International Biological Program
IMR	infant mortality rate
ISA	Instituto Socioambiental (Socioenvironmental Institute)

MF	Médicins sans Frontières (Doctors without Borders)
NCHS	National Center for Health Statistics
NCI	Núcleo de Cultura Indígena (Center for Indigenous Culture)
NGO	nongovernmental organization
NIDDM	non-insulin-dependent diabetes mellitus
ORT	oral rehydration therapy
PAHO	Pan American Health Organization
PAPES	Programa de Apoio à Pesquisa Estratégica em Saúde (Program to Support Strategic Research on Health)
PEM	protein-energy malnutrition
PNSN	Pesquisa Nacional Sobre Saúde e Nutrição (National Survey of Health and Nutrition)
PRODEAGRO	Projeto de Desenvolvimento Agro-Ambiental de Mato Grosso (Project for the Agro-Environmental Development of Mato Grosso)
RIHGB	<i>Revista do Instituto Histórico e Geográfico Brasileiro (Journal of the Brazilian Historical and Geographical Institute)</i>
SPI	Serviço de Proteção aos Índios (Indian Protection Service)
STD	sexually transmitted disease
SUS	Sistema Único de Saúde (Unified Health System)
SUSA	Serviço de Unidades Sanitárias Aéreas (Service of Airborne Health Units)
TFR	total fertility rate
UNI	União das Nações Indígenas (Union of Indigenous Nations)
WHO	World Health Organization
WWF	World Wildlife Fund



## *Guide to Pronunciation of Xavánte Words*

We have not attempted to reproduce the phonetics of the Xavánte language. The orthography is currently under discussion. In the pronunciation of Xavánte words as they are written in the text, the consonants *p*, *b*, *t*, *d*, *m*, *w*, and *h* are pronounced as they are in English. To pronounce the affricate sounds *ts* and *tz*, raise the tongue to the roof of the mouth just before making the English sounds *s* or *z*. The letter *r* is a tap; the tongue momentarily touches the roof of the mouth.

*a* is pronounced like the *a* in *father*

*e* is pronounced like the *e* in *eight*

*é* is pronounced like the *e* in *men*

*i* is pronounced like the *ee* in *meet*

*o* is pronounced like the *o* in *open*

*ö* is pronounced like the *oeu* in the French word *boeuf*

*ó* is pronounced like the *ou* in *bought*

*u* is pronounced like the *oo* in *shoot*

~ indicates the nasalization of a vowel

Two vowels together indicate a long vowel, as in *ii*

*ñ* is pronounced like the *ny* in *canyon*

An apostrophe (') indicates a glottal stop

The spelling of the names of indigenous peoples and languages in Brazil follow the Associação Brasileira de Antropologia (Brazilian Association of Anthropology) 1953 convention, according to Rodrigues (1986).