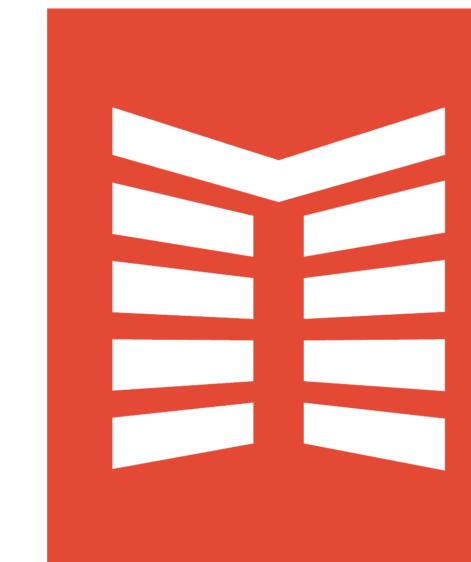


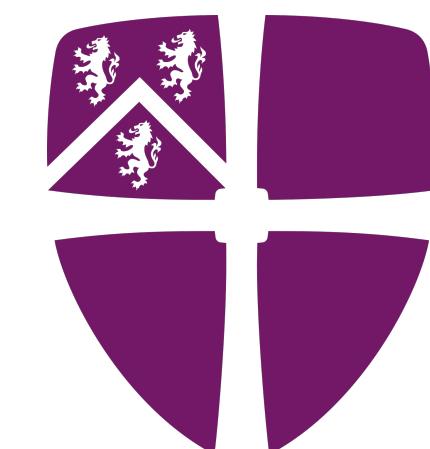
Teaching is a distinct form of social learning among hunter-gatherers

Friends of IAST conference

Zachary GARFIELD, Research Fellow
Sheina Lew-Levy, Durham University
27 June 2022



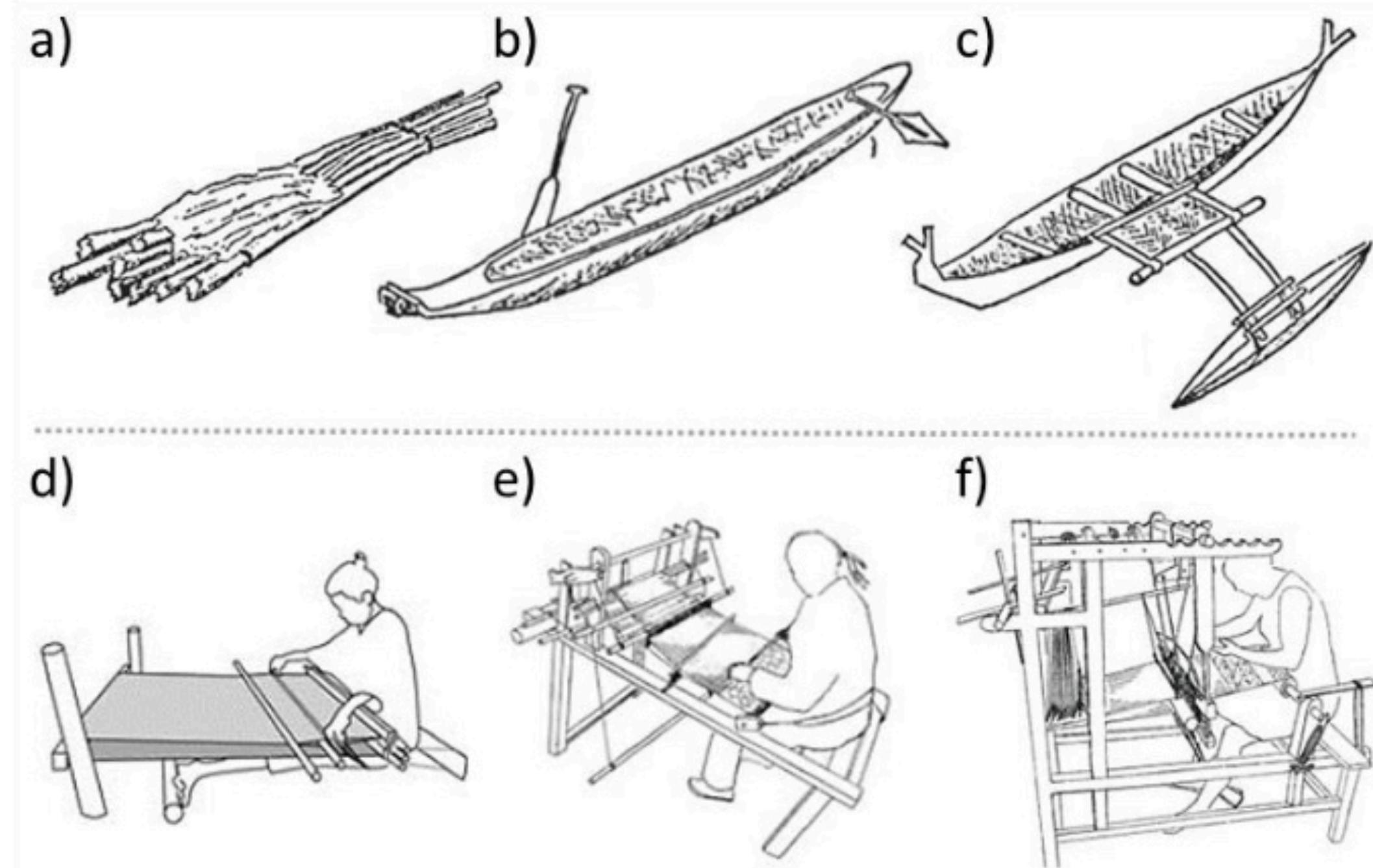
**Institute for
Advanced
Study in
Toulouse**



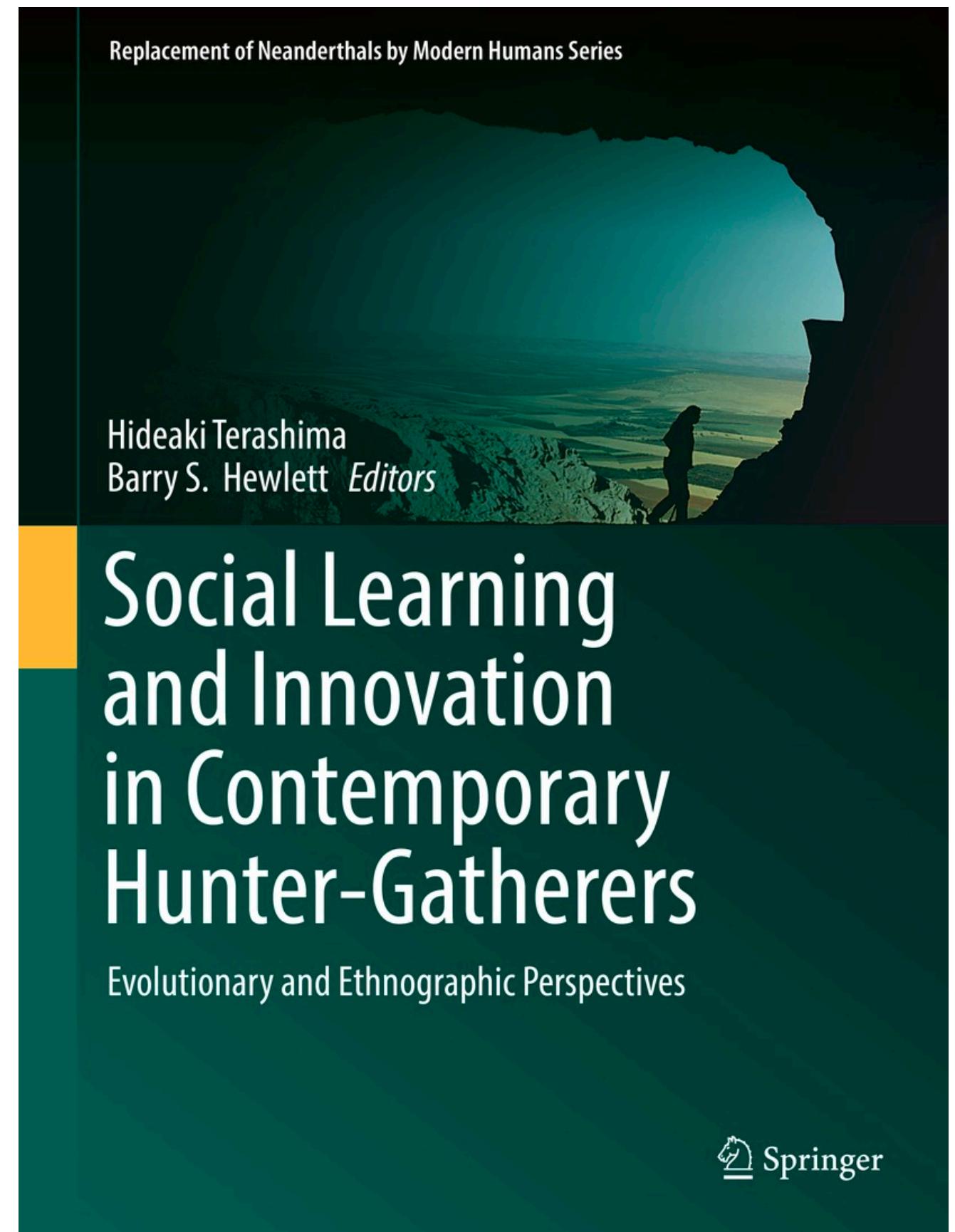
**Durham
University**

Social learning is very important

Acquisition of information is influenced by observation of, interaction with another individual



Leroi-Gourhan (2012)



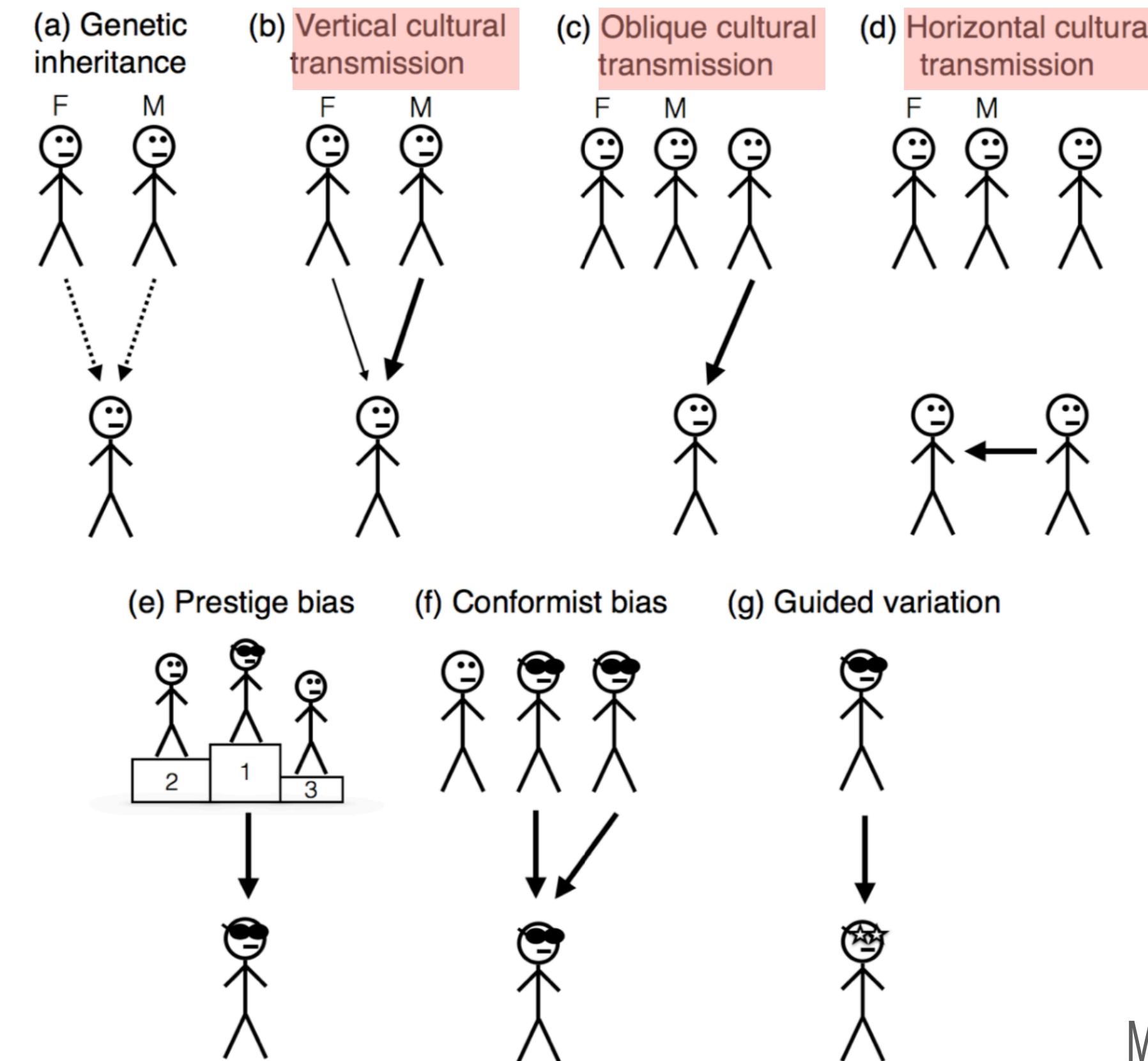
Social learning is very important

Acquisition of information is influenced by observation of, interaction with another individual

Modes of social learning:



Aka mother & child
© Barry Hewlett



Mesoudi (2018)

Social learning is very important

Acquisition of information is influenced by observation of, interaction with another individual

Processes of social learning:

Observation and imitation



Social learning is very important

Acquisition of information is influenced by observation of, interaction with another individual

Processes of social learning:

Collaborative learning



Social learning is very important

Acquisition of information is influenced by observation of, interaction with another individual

Processes of social learning:

Local enhancement



Images from Chabu land, © Zach Garfield

Social learning is very important

Acquisition of information is influenced by observation of, interaction with another individual

Processes of social learning:

Stimulus enhancement

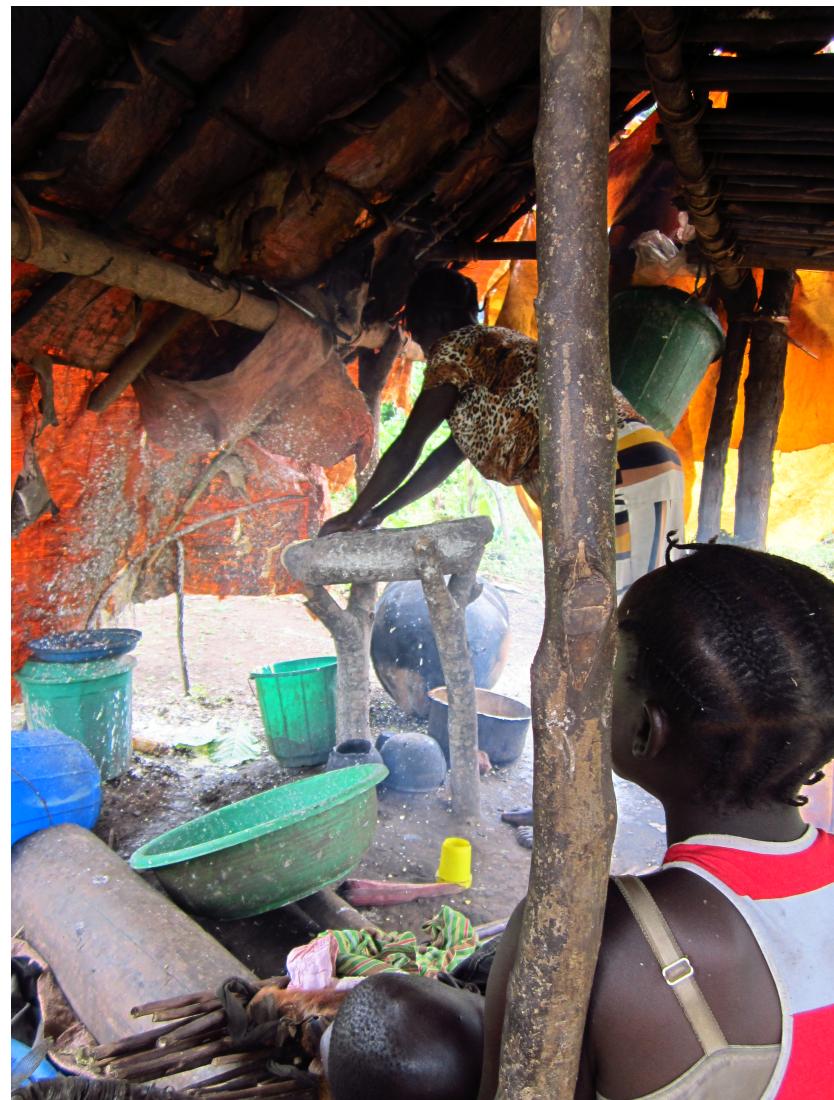


Social learning is very important

Acquisition of information is influenced by observation of, interaction with another individual

Processes of social learning:

Teaching



What is the role of teaching in human evolution?

PART B

Cultural Context of Human Development
and Education

17

Cultural Learning and Learning Culture

ANN C. KRUGER
MICHAEL TOMASELLO

THE ROLE OF ADULTS IN CHILDREN'S LEARNING

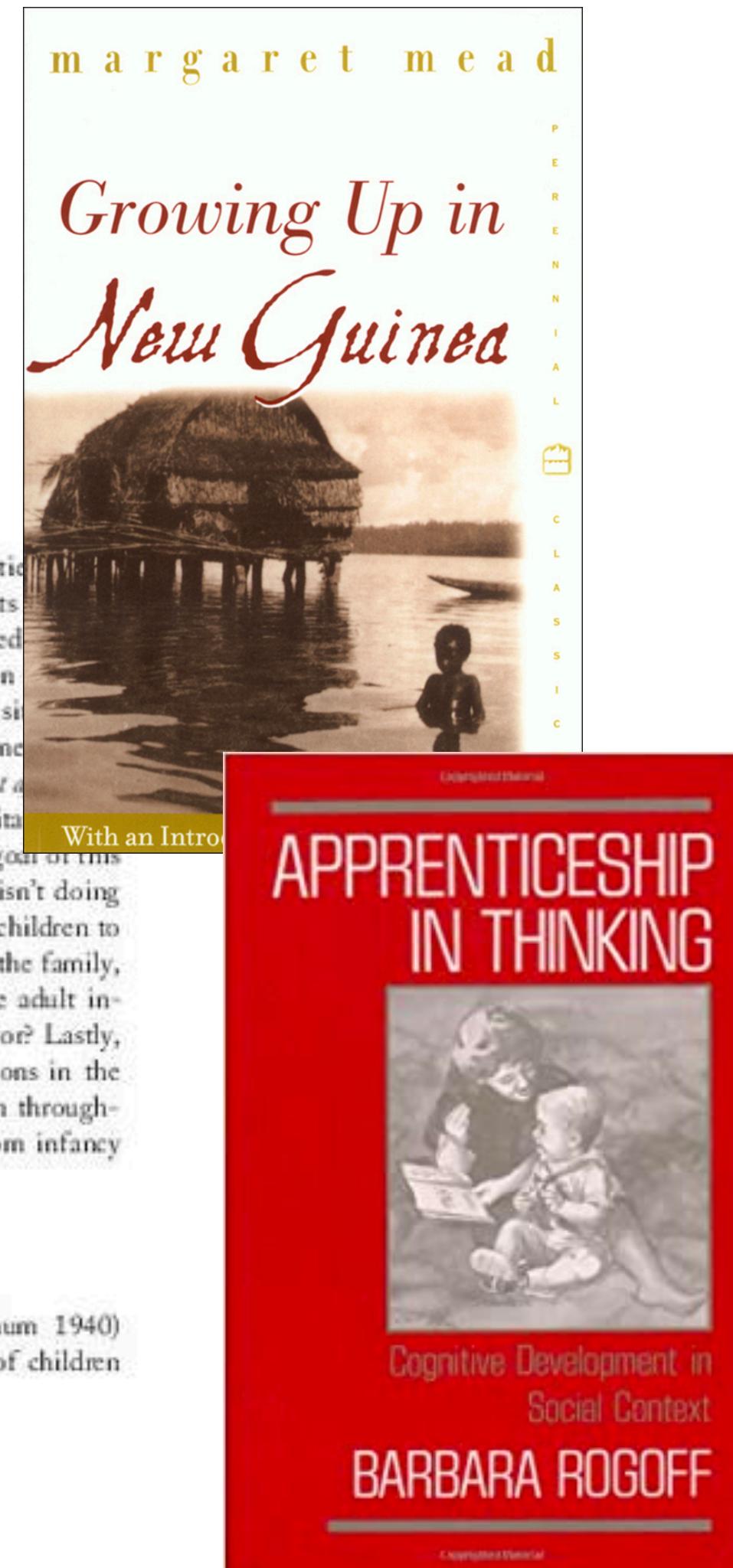
David F. Lancy and M. Annette Grove

Anthropologists who study children in traditional societies universally note the absence or great rarity of adults' intervention in children's learning. Children are encouraged to learn on their own. This chapter teases out those instances where, in the absence of adults, independent learning is not sufficient. In some situations, adult intervention—usually falling short of "teaching"—is deemed necessary. The chapter focuses on four very general issues. At what age is a child targeted for a course correction or intervention to facilitate her development and socialization? What is the substance or goal of this intervention? What should the child be doing that he or she isn't doing already? As we shall see, two very broad goals are to socialize children to "fit in" and to facilitate the child's becoming a contributor to the family, providing a return on the family's investment. How does the adult intervene? What strategies are used to change the child's behavior? Lastly, what general principle or theory guides these course corrections in the individual's path through childhood? These themes are woven throughout the chapter, which is organized to follow the child from infancy through adolescence.

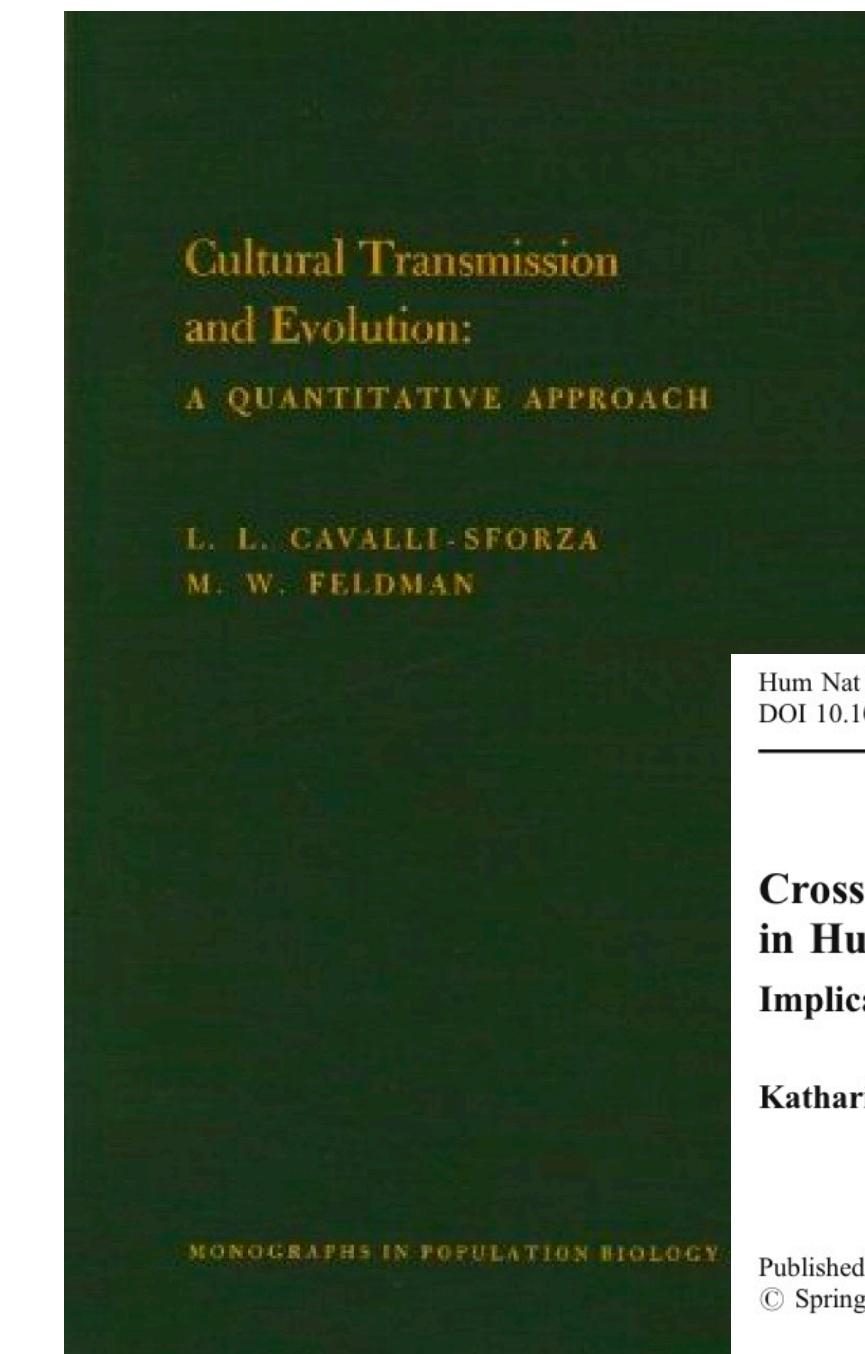
The Absence of Teaching

Early ethnographic studies of childhood (Fortes 1938; Raum 1940) noted, with some degree of wonder, the near total absence of children

145



Lancy & Grove (2010), Mead (1930), Rogoff (1990)



Kruger & Tomasello (1996), MacDonald (2007), Cavalli-Sforza & Feldman (1981)

The universals and cultural variations of human development have been the focus of fruitful study by anthropologists for decades. In recent years psychologists also have directed their attention, long overdue, to understanding development in cultural context. There are striking differences among psychologists, however, in the approaches they take to culture and development. Most markedly, Cole (1989) distinguishes two very different theoretical perspectives on cultural psychology and its approach to human development. In one perspective the focus is on culture as a collective enterprise (e.g., Gauvain, in press; Shweder, 1990; Super and Harkness, 1986). There is no need in this view for focusing on the individual development of individual children since all important forms of learning are socially distributed; children simply become more skillful over time at participating in various collective activities (Lave and Wenger, 1991). Indeed, in some versions of this more sociological view of cultural psychology the focus on the cultural collective is so strong that there is really no justification for reference to the development of individuals at all: "Individual, interpersonal, and sociocultural processes constitute each other and cannot be separated" (Rogoff, Chavajay, and Matusov 1993, p. 533).

traditional view, it is often the case that they are seen as bringing to the child their internal knowledge, which is unique and不可分离的 to that child.

Hum Nat (2007) 18:386–402
DOI 10.1007/s12110-007-9019-8

Cross-cultural Comparison of Learning in Human Hunting Implications for Life History Evolution

Katharine MacDonald

Published online: 4 October 2007
© Springer Science + Business Media, LLC 2007

Abstract This paper is a cross-cultural examination of the development of hunting skills and the implications for the debate on the role of learning in the evolution of human life history patterns. While life history theory has proven to be a powerful tool for understanding the evolution of the human life course, other schools, such as cultural transmission and social learning theory, also provide theoretical insights. These disparate theories are reviewed, and alternative and exclusive predictions are identified. This study of cross-cultural regularities in how children learn hunting skills, based on the ethnographic literature on traditional hunters, complements existing empirical work and highlights future areas for investigation.

Keywords Cultural transmission · Human evolution · Hunting · Learning · Life history

What does the ethnographic record tell us about social learning among hunter-gatherers?

A Cross-Cultural Analysis of Hunter-Gatherer Social Learning

Zachary H. Garfield, Melissa J. Garfield, and Barry S. Hewlett

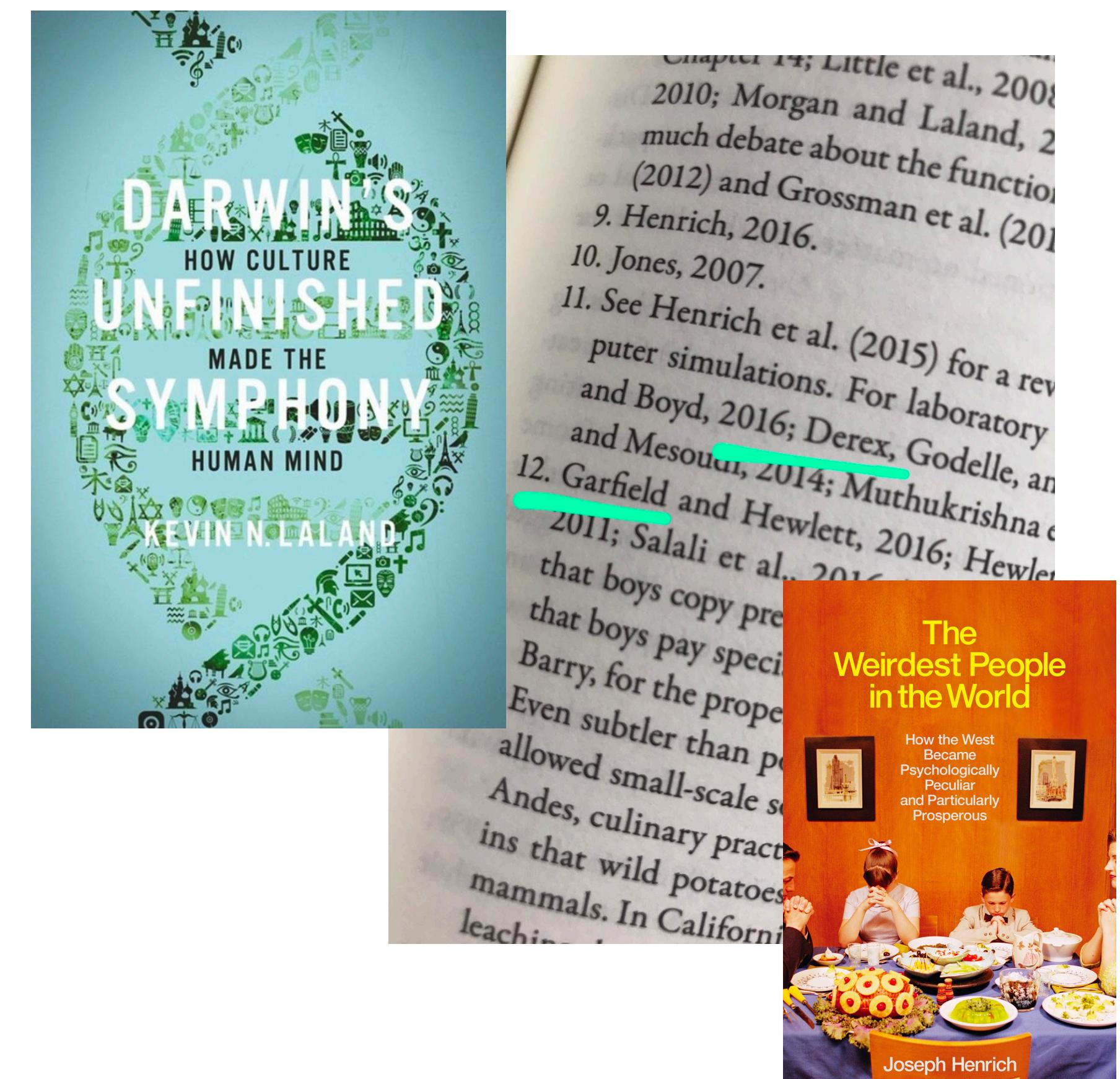
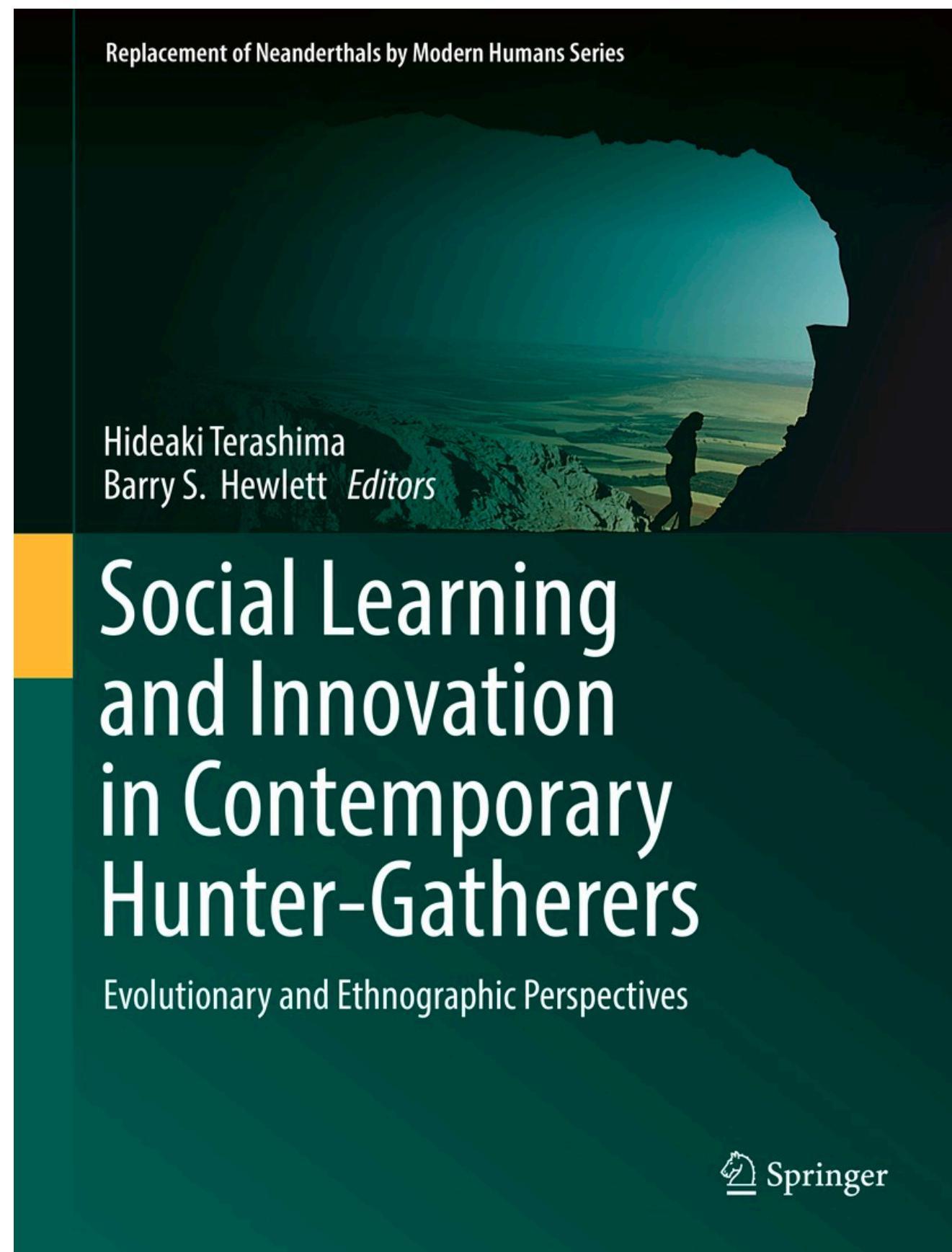
Abstract

Social learning among hunter-gatherers has been widely discussed in the literature and authors often draw on ethnographic cases to support theoretical models. In this study we report on the cross-cultural occurrence of various modes and processes of social learning in distinct cultural domains from the ethnographic record. To our knowledge this is the first systematic, cross-cultural study of hunter-gatherer social learning. We rely on the sample of hunter-gatherers in the electronic Human Relations Area Files (eHRAF) to generate our source of ethnographic texts. We have coded and analyzed 982 ethnographic texts from 23 diverse societies. Oblique and vertical transmission appear at similar rates. Various forms of teaching are the most common processes of social learning and account for more than half of all coded texts. Vertical and oblique social learning are predominantly characterized by teaching, whereas horizontal social learning is primarily through collaborative learning. Approximations of age reveal a general developmental pattern in which social learning of miscellaneous skills characterizes infancy, subsistence skills dominate early and middle childhood, and the social learning of religious beliefs are most frequent during adolescence. Across development we identify a reduction in the importance of vertical transmission in favor of oblique transmission, for subsistence skills in particular. These results highlight the importance of teaching in the ethnographic record of hunter-gatherer social learning and provide a systematic, cross-cultural, framework for theoretical models to rely on.

Keywords

Hunter-gatherers · Human Relations Area Files · Social learning · Cultural transmission · Teaching

2



Garfield et al. (2016)

The evolution of teaching and social learning

A current issue in the bio-social sciences

The Life History of Learning Subsistence Skills among Hadza and BaYaka Foragers from Tanzania and the Republic of Congo

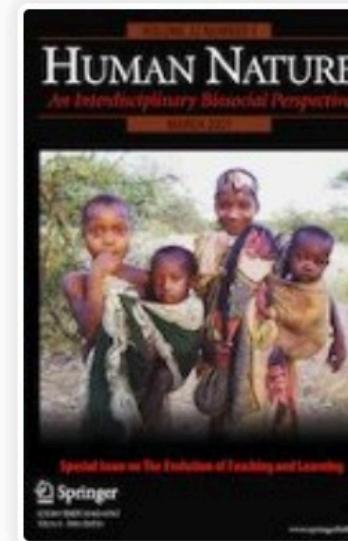
[Sheina Lew-Levy](#), [Erik J. Ringen](#), [Alyssa N. Crittenden](#), [Ibrahim A. Mabulla](#), [Tanya Broesch](#) & [Michelle A. Kline](#) 

[Human Nature](#) 32, 16–47 (2021) | [Cite this article](#)

1846 Accesses | 6 Citations | 10 Altmetric | [Metrics](#)

Abstract

Aspects of human life history and cognition, such as our long childhoods and extensive use of teaching, theoretically evolved to facilitate the acquisition of complex tasks. The present paper empirically examines the relationship between subsistence task difficulty and age of acquisition, rates of teaching, and rates of oblique transmission among Hadza and BaYaka foragers from Tanzania and the Republic of Congo. We further examine cross-cultural variation in how and from whom learning occurred. Learning patterns and community perceptions of task difficulty were assessed through interviews. We found no relationship between task difficulty, age of acquisition, and oblique transmission, and a weak but positive relationship between task difficulty and rates of teaching. While same-sex transmission was normative in both societies, tasks ranked as more difficult were more likely to be transmitted by men among the BaYaka, but not among the Hadza, potentially reflecting cross-cultural differences in the sexual division of subsistence and teaching labor. Further, the BaYaka were more likely to report learning via teaching, and less likely to report learning via observation, than the Hadza, possibly owing to differences in socialization practices.



Volume 32, issue 1, March 2021

Special Issue on The Evolution of Teaching and Learning

Issue editors

Helen Elizabeth Davis, Alyssa N. Crittenden & Michelle Scalise Sugiyama

13 articles in this issue

Childhood Teaching and Learning among Savanna Pumé Hunter-Gatherers

Mismatch between Foraging and Postindustrial Societies

[Karen L. Kramer](#) 

[Human Nature](#) 32, 87–114 (2021) | [Cite this article](#)

375 Accesses | 6 Citations | 22 Altmetric | [Metrics](#)

Abstract

Research in nonindustrial small-scale societies challenges the common perception that human childhood is universally characterized by a long period of intensive adult investment and dedicated instruction. Using return rate and time allocation data for the Savanna Pumé, a group of South American hunter-gatherers, age patterns in how children learn to become productive foragers and from whom they learn are observed across the transition from childhood to adolescence. Results show that Savanna Pumé children care for their siblings, are important economic contributors, learn by doing rather than by instruction, and spend their time principally in the company of other children. This developmental experience contrasts with that of children in postindustrial societies, who are dependent on adults, often well past maturity; learn in formal settings; and spend much of their time in the company of adults. These differences raise questions about whether normative behaviors observed in postindustrial societies are representative of human children. This comparison also identifies

The evolution of teaching and social learning

A current issue in the bio-social sciences



Michael Gurven, University of California Santa Barbara

Title: Optimizing the timing of pedagogy across the human life course

Abstract: The evolutionary biologist W. D. Hamilton famously showed that the force of natural selection declines with age, and reaches zero by the age of reproductive cessation. However, in social species, the transfer of fitness-enhancing resources by post-reproductive adults increases the value of survival to late ages. While most research has focused on intergenerational food transfers in social animals, here I consider the potential fitness benefits of transferring information ("pedagogy") and investigate the ecological contexts where pedagogy is likely to occur. Although the evolution of teaching is an important topic in behavioral biology and in studies of human cultural evolution, few formal models of teaching exist. Here, I present a modelling framework for predicting the timing of both teaching and learning across the life course. Under a broad range of conditions, optimal patterns of information transfer in a skills-intensive ecology often involve post-reproductive aged teachers. I then present preliminary empirical tests of the model among human subsistence populations. Multi-stage pedagogy in the context of extended juvenility and multigenerational cooperation may have played an important role in shaping our evolved human life history.

What does the ethnographic record tell us about social learning among hunter-gatherers?



Garfield et al. (2016)

**Is teaching distinct from other
processes of social learning?**

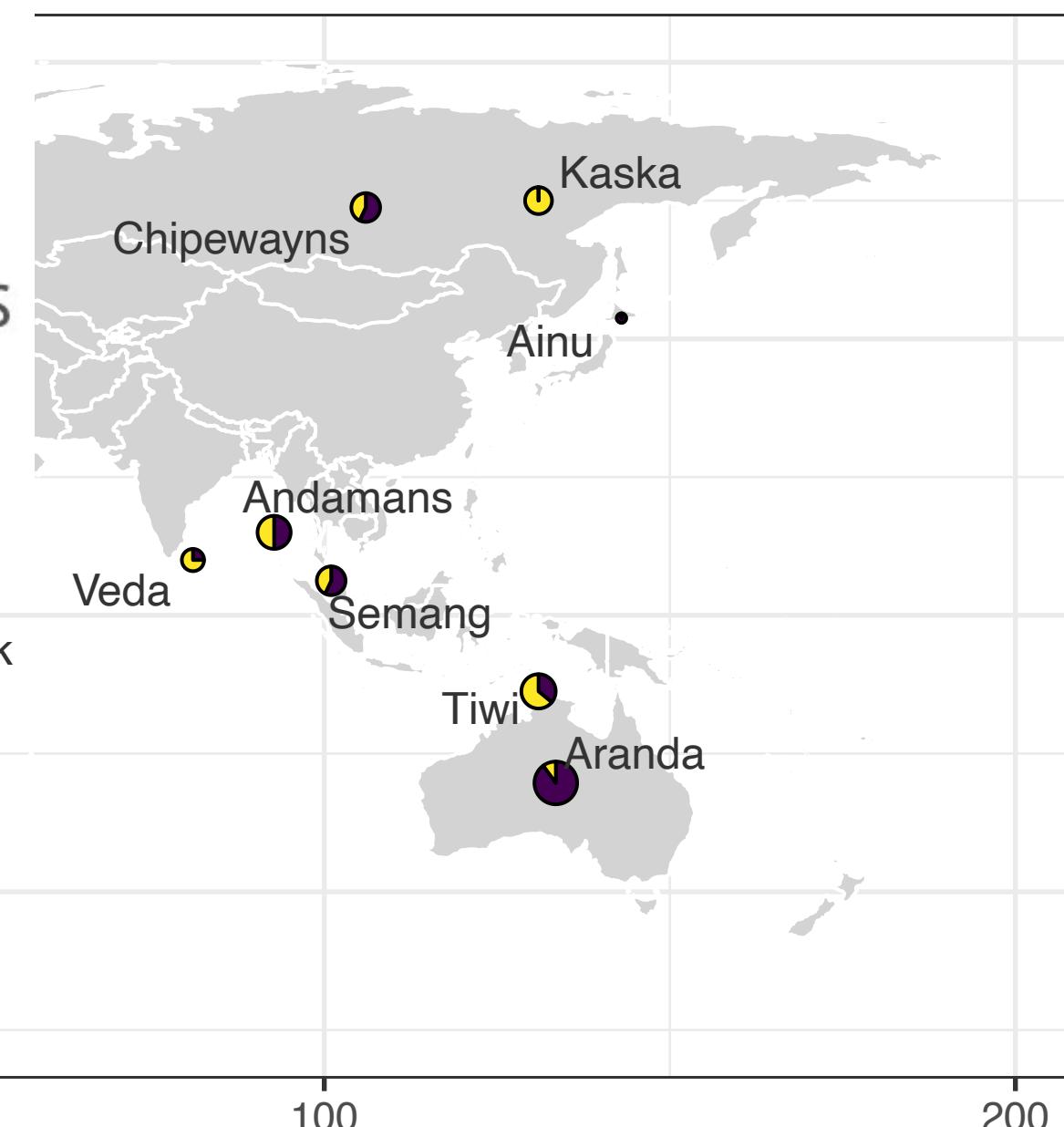
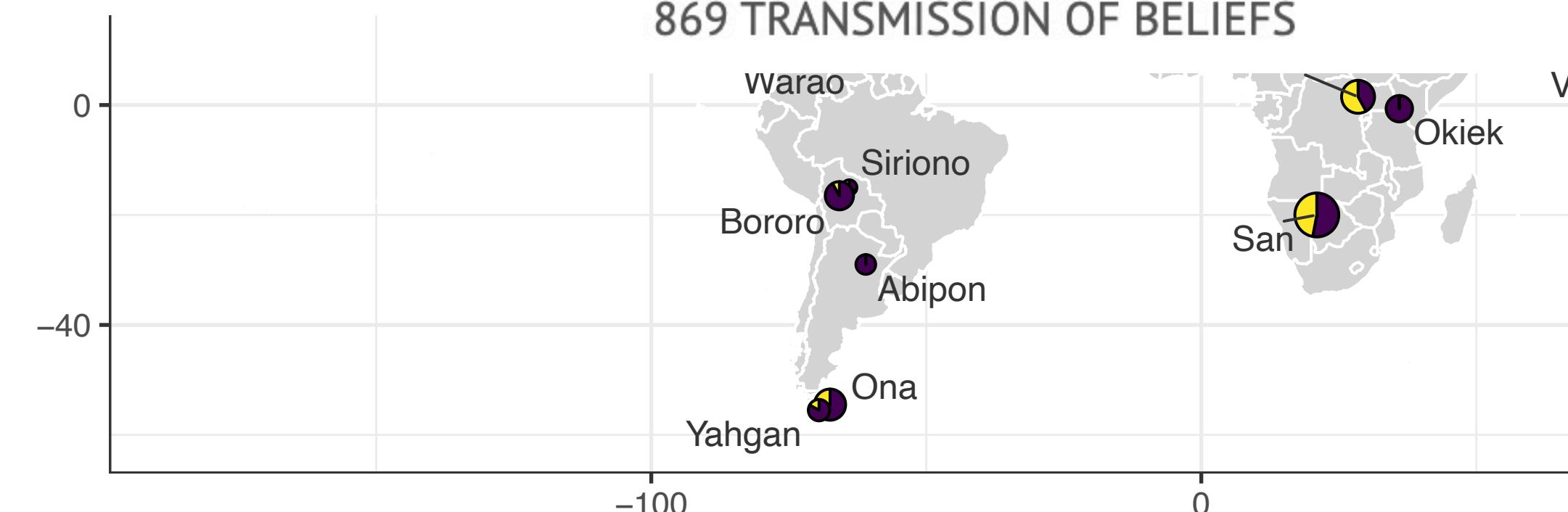
The hunter-gatherer social learning data

A systematic cross-cultural sample

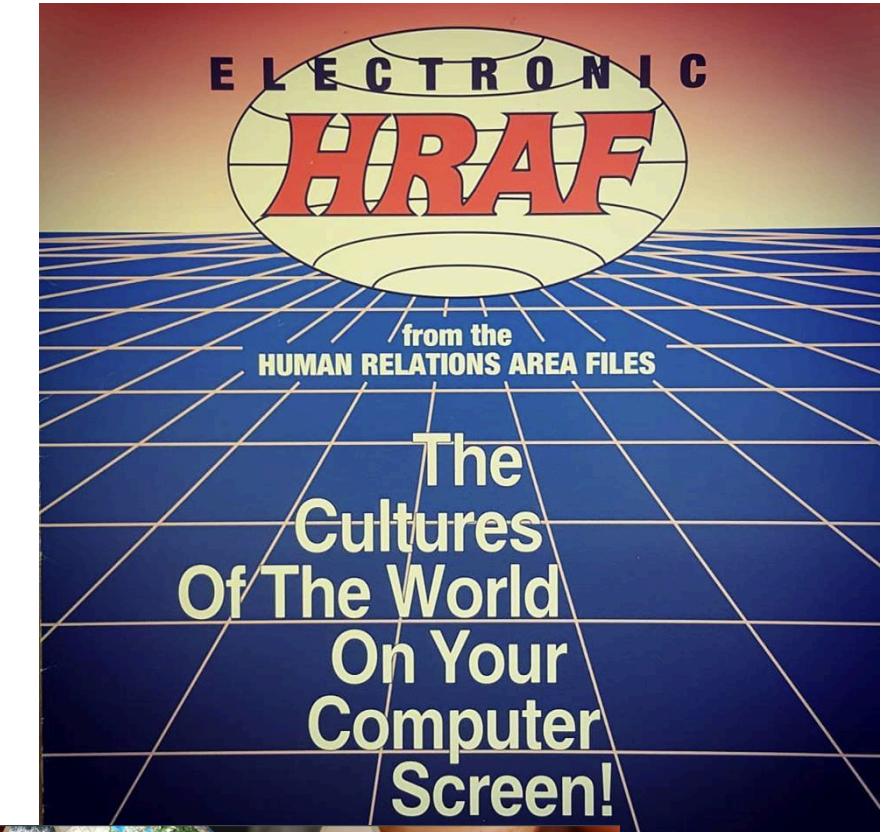
- electronic Human Relations Area Files (eHRAF): Digital ethnographic documents; over 360 cultures, more than 6,300 documents, over 3 million ‘paragraphs’, indexed at the paragraph level using 700+ subject codes
- eHRAF search using three **subject codes**: 867 Transmission of Cultural Norms, 868 Transmission of Skills, and 869 Transmission of Beliefs

▼ 550 NAMING, PRESTIGE AND STATUS MOBILITY ▼ 860 SOCIALIZATION

- 551 PERSONAL NAMES 861 TECHNIQUES OF SOCIALIZATION
- 552 NAMES OF ANIMALS AND THINGS 862 WEANING AND FOOD TRAINING
- 553 NAMING 863 CLEANLINESS TRAINING
- 554 STATUS, ROLE, AND PRESTIGE 864 SEX TRAINING
- 555 TALENT MOBILITY 865 AGGRESSION TRAINING
- 556 ACCUMULATION OF WEALTH 866 INDEPENDENCE TRAINING
- 557 MANIPULATIVE MOBILITY 867 TRANSMISSION OF CULTURAL NORMS
- 558 DOWNWARD MOBILITY 868 TRANSMISSION OF SKILLS
- 869 TRANSMISSION OF BELIEFS



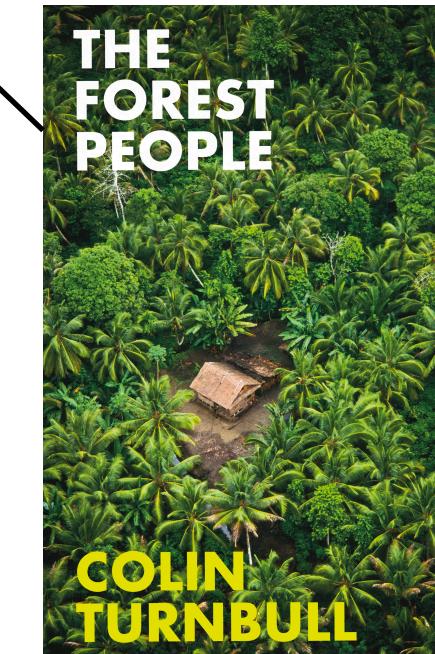
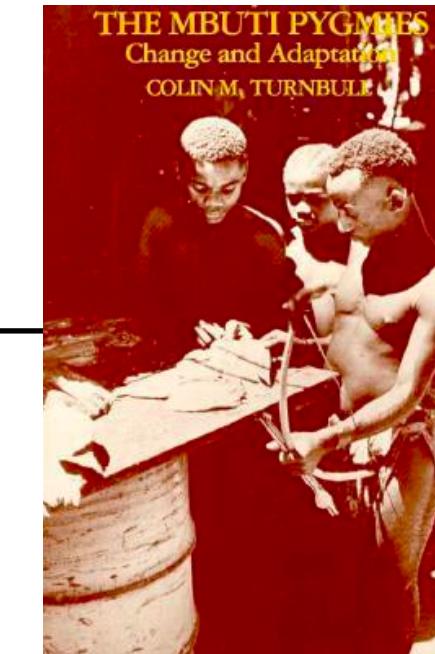
Social learning evidence
■ Teaching
■ Other



The hunter-gatherer social learning data

A systematic cross-cultural sample

**Mbuti,
Central Africa**



**Inuit,
N.A. Arctic**

Cultures
n = 23

Documents
n = 77

Paragraphs
n = 142

Instances
n = 273



Instance of social learning

Instance of social learning

Instance of social learning

The hunter-gatherer social learning data

A systematic cross-cultural sample

Mbuti,
Central Africa



Cite

Turnbull, Colin M.
The Mbuti Pygmies: change and adaptation

Show Snippet | Show Page
Section: ELDERS AND ARBITRATION
Page: 55
Search Result:

It was at moments like this that the elders came into prominence. In the Mbuti scheme of things age was clearly the dominant principle of social organization, with territory hard on its heels, then gender, and kinship lagging behind. The responsibility allocated to childhood was that of ritual purification, most specifically in the daily act of lighting the hunting fire. The youths had full control of the political arena, and the adults were fully occupied with all the major economic responsibilities. The role of the elders was the one, as vital as all the others, of socialization. During the daytime, when youths and adults were off on the hunt, the elders mostly stayed behind in the camp, looking after the young children. By playing with them, acting out great sagas of the hunting and gathering days of yore, or just by lying back under the trees and telling stories, old women and men, the tata of the camp, filled the youngsters with their own love of the forest, their trust in it, and their respect for the forest values that made life so good.

Age stratification (561)
Status of children (858)
Transmission of cultural norms (867)
Status of adolescents (882)
Activities of the aged (887)
Status and treatment of the aged (888)

Domain: Cultural values,
Mode: Oblique,
Process: Teaching (storytelling)
Age: Early childhood
Gender: Neutral

Domain: Subsistence
Mode: Oblique
Process: Collaborative learning
Age: Early childhood
Gender: Neutral

The hunter-gatherer social learning data

A systematic cross-cultural sample

Mbuti,
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Age stratification (561)
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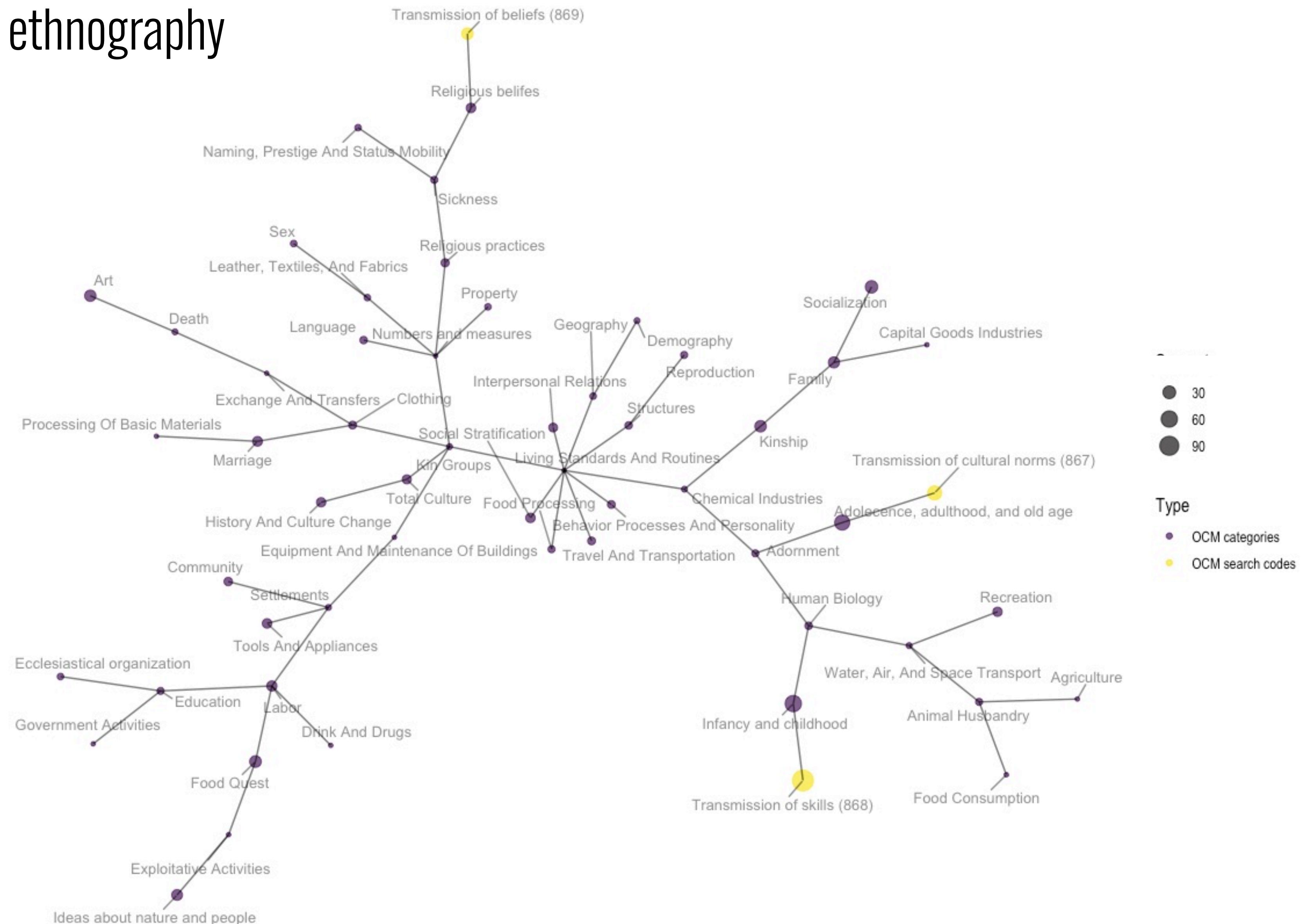
Domain: Cultural values,
Mode: Oblique,
Process: Teaching (storytelling)
Age: Early childhood
Gender: Neutral

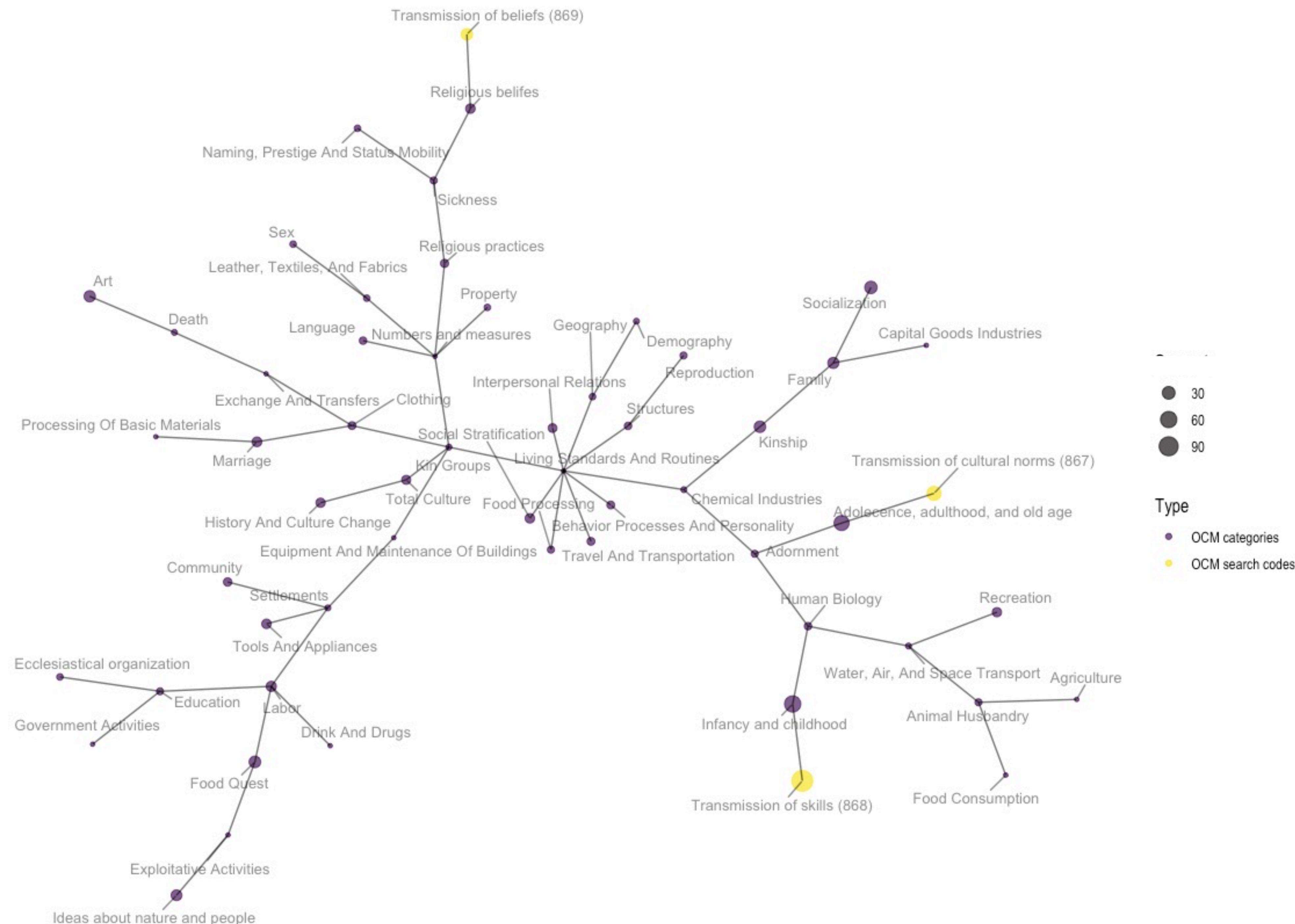
Domain: Subsistence
Mode: Oblique
Process: Collaborative learning
Age: Early childhood
Gender: Neutral

Mapping the ethnographic record

The content of social learning ethnography

Minimal spanning tree:
vertices are subject code groups, vertex size is number of subject codes within that group per paragraph, edge length is distance between subject code groups where $dist = 1 - (cor)$





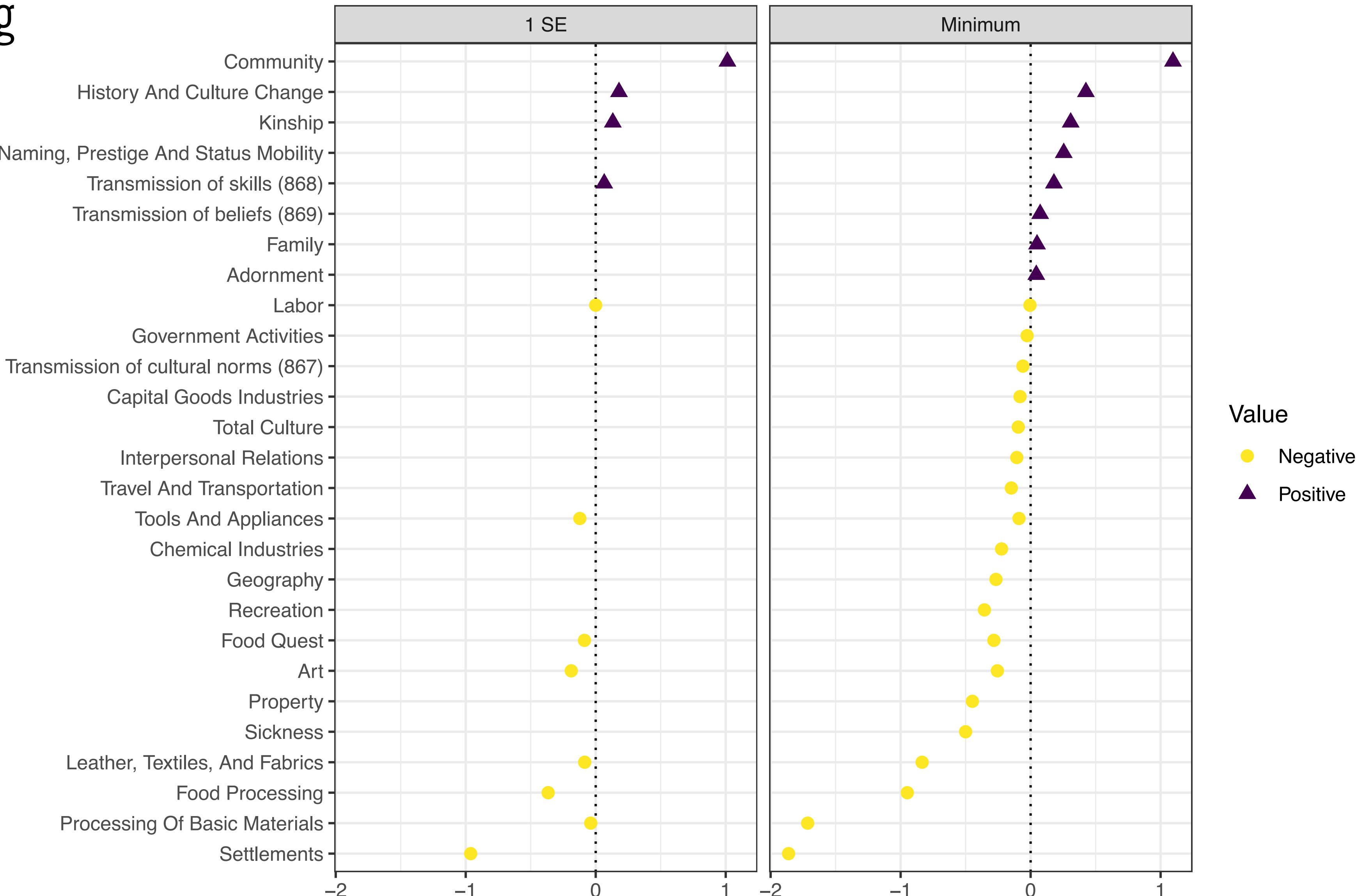
Predictors of evidence for teaching

Counts of evidence for teaching

Using subject codes to predict counts of evidence for teaching at the paragraph level [0..7]

43 unique subject code predictors

Poisson distributed elastic net lasso regression, λ minimum & λ 1SE via 20-fold CV



Predictors of evidence for teaching

Teaching vs. other processes

Using other coded variables to predict teaching vs. non-teaching social learning at the instance level

Multi-level logistic regression, index variable approach

Random effects for paragraph, document

	j	k
Cultural values		
Religious		
Ecology	Domain	
Misc. skills		
Manufacturing		
Subsistence		
Female		
Male	Gender	
Neutral		
Middle childhood		
Adolescence		
General	Age	
Childhood		
Infancy		
Early childhood		
Oblique		
Vertical	Mode	
Unknown		
Horizontal		

Model

$$E(\text{logit}[P(y_i = 1)]) = \alpha_{j[i]} + \epsilon_i, \text{ for } i = 1, \dots, n,$$

Where $y_i = 1$ is evidence for teaching in a given instance i and $\alpha_j = \alpha + \sum_1^k r_{k,j} \sim N(\alpha, \sigma_{\alpha_j}^2)$ is an “adjusted” mean for group j of categorical predictor k . Here, $r_{k,j}$ is a group-level effect of the k predictor.

The random effect for each index variable k is, $\alpha_j = \alpha + r_j \sim N(\alpha, \sigma_{\alpha_j}^2)$ is interpreted as an “adjusted” mean for group j . Here, r_j is a group-level effect.

Priors

$$\alpha \sim \text{Student-}T(3, 0, 2.5)$$

$$sd_k \sim \text{Student-}T(3, 0, 2.5)$$

$$z_k \sim \text{Normal}(0, 1)$$

This model involves the use of non-centered parameterization for group-level coefficients, i.e., it defines the independent standard normal coefficient z_k as parameters and then scales them according to the standard deviations sd_k .

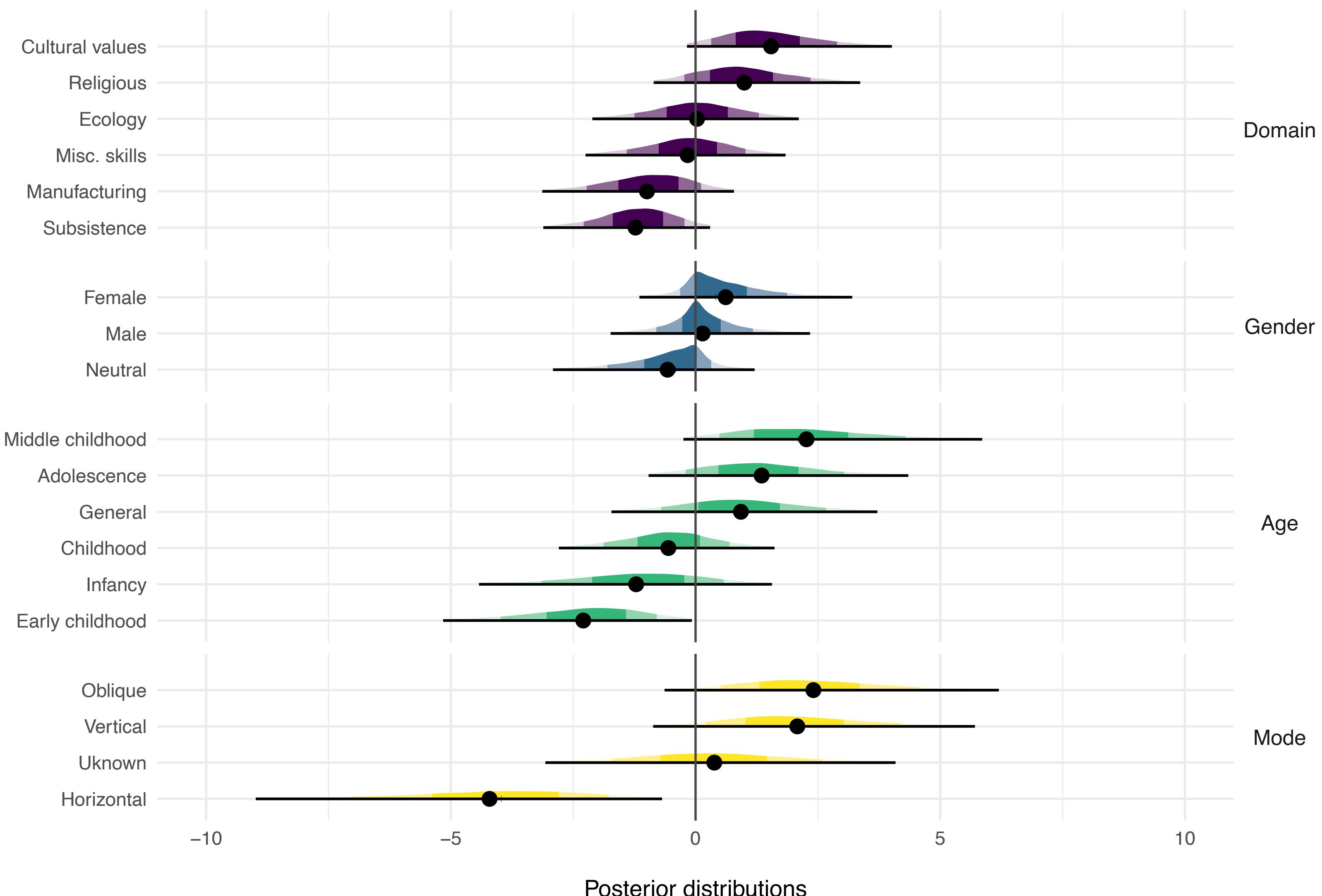
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Random effects for paragraph, document



Teaching is a distinct form of social learning among hunter-gatherers

Relative to other social learning processes

- A systematic sample of ethnographic texts suggests...
 - Teaching is **more common for opaque and socially complex phenomena**, e.g., cultural values, social history, cultural change, features of community
 - Teaching becomes **more common across development**, up to adolescence
 - Teaching is **more often occurring between older individuals and younger individuals**; not necessarily within nuclear families
 - Subsistence skills are equally likely to be learned via teaching **or** other forms of social learning; unlike cultural values, which are more exclusively learned via teaching

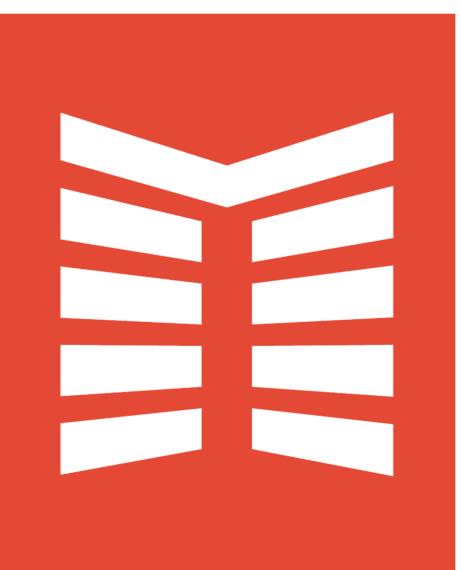


Aranda initiation ceremony, 1904

Source: <http://www.webpages.uidaho.edu>

Thank you

Zachary GARFIELD, Research Fellow
27 June 2022



Institute for
Advanced
Study in
Toulouse