

The Australian National University

School of Archaeology and Anthropology
and

Centre for Digital Humanities Research

Research School of the Humanities and the Arts

Making and Record

Second International Workshop on String Figure-Making Practices
Wednesday, Thursday, Friday, 19–21 June 2019

Organised in collaboration with the
ETKnoS Project: Encoding and Transmitting Knowledge with a String
University of Paris, Diderot

Theatrette and Room 3.02
Sir Roland Wilson Building 120
McCoy Circuit, Acton
(map reference 1D)

PROGRAM

Wednesday 19 June — Day 1

(All sessions in Theatrette unless otherwise specified)

10:00 Introduction: Robyn McKenzie and Eric Vandendriessche

Morning Tea 10:30–11:00

Focus on Papua New Guinea

11:00 Darja Hoenigman

The importance of situational context in understanding string figure-making: a case study from a Sepik society in Papua New Guinea

12:00 Nicholas Evans & Penelope Johnson

Of swamps, cripples, mimics and lizards: the plenitude of Nen string games

Lunch 1:00–2:00

2:00 Inge Riebe

My changing interests in *issu* among Kalam

Afternoon Tea 3:00–3:30

3:30–5:00 Making Session

Room 3.02

Focus on PNG figures led by Philip Noble with presentation:

String figures in Northern District Papua New Guinea in the early 1970s.

5:00 Reception

6:00–7:30 Public Lecture: Robyn McKenzie

Making and Record: The art of string figures

Thursday 20 June — Day 2

Storytelling and narrative

9:00 Céline Petit

Why study string figures?: An historical perspective on the anthropological/ethnological value ascribed to string games since the 19th century.

10:00 Jenny Green, April Campbell Pengart and Stephan Claassen

Tie-em up: Playing with the long strings

Morning Tea 11:00–11:30

11:30–1:00 — Making Session Room 3.02

Led by April Campbell Pengart, Clarrie Kemarr Long and Emmanisha Kemarr Pepperill from Ti Tree, NT.

Lunch 1:00–2:00

2:00–3:30pm Room 3.02

Round table discussion on recording methods in the field: notation, writing, filming

Afternoon Tea 3:30–4:00

4:00–5:30 — Making Session Room 3.02

Focus on Brazilian figures led by Ivã Filho with presentation:

String Figures: Historical rescue and its use as a storytelling tool

6:30 Dinner

Library Room

The Polish White Eagle Club

38 David Street, Turner

Friday 21 June — Day 3

Mathematical 'likenesses' and other potentials

9:00 Eric Vandendriessche Room 3.02
String figures from Vanuatu: some outcomes of a comparative study

Morning Tea 10:30–11:00

11:00 Ted Goranson
Toward a future ethnomathematics

12:00 Judy McKinty
The hidden culture of the playground: string figures as play

Lunch 1:00–2:00

2:00–3:30PM Room 3.02
Discussion re outputs from this workshop and prospects for the next?

Afternoon Tea 3:30–4:00

4:00–5:00PM — Making Session Room 3.02
Focus on Aboriginal and Torres Strait Islander figures led by Gabrielle Quakawoot
with presentation: **Maths and String Finger Art**

Drinks at University House

Paper Abstracts and Presenter Biographies
(in alphabetical order)

Of swamps, cripples, mimics and lizards: the plenitude of Nen string games

Qämbälä 'gaming string; string figure games' are an elaborated part of the culture of the Morehead district of Southern New Guinea, here illustrated for people from Bimadbn village who speak Nen and the neighbouring languages Idi and Nmbo. *Qämbälä* were traditionally performed during yam-harvest time (*tars yu*) and valued to the extent that talented performers were rewarded with all the yams growing from the yam-pole on which they would hang their *qämbälä* 'string figure'. *Qämbälä* denotes both the string used and the string figures made with it.

So far we have recorded one hundred distinct string figure games from Bimadbn village, from over twenty different performers. Some are individual, some require two coordinated performers (each with their own string), and some pair a performer with a fall-guy (e.g. someone whose hand gets bitten or trapped). Many *qämbälä* are accompanied by spoken narratives (sometimes with several stages), chants, or songs, and the language(s) employed may be Nen, Idi, Nmbo, or more than one of these. While string games are performed by all age groups, it is often young children who are the most knowledgeable.

From the hundred Nen string figures we have recorded, we single out five for focussed discussion in this talk: *är bën watambnes är* 'imitator' for its amplifying mimicry, *sao* 'swamp', with its intricate use of fingers and toes as coordinated fastening points across two performers, *znezne* 'lizard skinning himself' for the persiflage of its dialogue, *gongo / ag* 'pitohui bird / coconut' to illustrate how one figure morphs into another, and the bilingual (Nen/Idi) *bara simimae* 'abandoned cripple' to illustrate the integration of string games with song.

Nicholas (Nick) Evans is Laureate Fellow and Distinguished Professor of Linguistics at the Australian National University, and Director of the Australian Research Council Centre of Excellence for the Dynamics of Language (CoEDL). He has carried out wide-ranging fieldwork on Indigenous languages of Australia and Papua New Guinea. More broadly, his driving interests are the interplay between the incredible diversity contained in the world's endangered languages and the many scientific and humanistic questions they can help us answer, such as the close interweaving of language and culture. His crossover book *Dying Words: Endangered Languages and What They Have to Tell Us*, which sets out a broad program for engaging with the world's dwindling linguistic diversity, has been translated into French, Japanese, Korean, and German.

Penelope (Penny) Johnson is a medical anthropologist, focusing on infectious disease and women's health in migrant communities, Australian Aboriginal communities and village areas in Papua New Guinea. She has been working in remote Aboriginal Communities since the 1980's and started doing fieldwork in PNG in 2004. Penny taught Culture, Health and Illness and Ethnographic Field research to students at Melbourne University and supervised Honors, Masters and PhD Students at University Melbourne, La Trobe University, the ANU and Menzies School of Medicine in Darwin. Since moving to Canberra in 2010 she has been going to the South Fly District in the Western Province of PNG on an annual basis. She has been making ethnographic film footage in collaboration with the women of Bimadbn village.

String Figures: Historical rescue and its use as a storytelling tool

The act of storytelling has always been present in the story of humankind. Today this art is highly used at child's education classrooms and it is recognized by the Brazilian curricular referential for Children's Garden School, known as RCNEI, and for the National Curriculum Base, known as BNCC, as a high importance strategy to the cognitive development of child. The use of string figures to storytelling is an ancient technique and, however, we had found, almost in their totality, educators who do not know the technique. We were able to observe, from our experience, as a teacher in formation that its use is also not contemplated in the school environment. In this sense, this presentation aim to share information about a research done in 2018 about the theme and yet present three Brazilian string figures and teach how to do them.

Ivã Filho is an Education undergraduate student, raised in Ribeirão Preto—São Paulo, Brazil. Enthusiastic in string figures, began studying the art as a hobby in 2016. In 2018, he performed a research on the string figure usage as a storytelling tool amongst different people and culture. As a result, he won an award as the best research of the year at his college. He has performed many workshop and presentations with children, teachers, students and storytellers, and, has been an active person in the sharing of his knowledge about the figures. Lately, he has focused on doing a Master's Degree about this theme. He is willing to make the Brazilian bibliographical repertoire wider through publications of books and papers.

Ted Goranson

Toward a Future Ethnomathematics

Ethnomathematics encompasses several fields, with differences among those who think which fields should be included. Often the focus is on recovering the manner that non-conventionally literate cultures encode complex abstract relationships we call 'mathematical'.

Suppose that we found ourselves limited by the conventions excluded by ethnomathematicians: modern notation and associated Western mathematical structures. In this class, we include the historical dependencies that govern representation of abstract precedence separate from independently discoverable abstractions. Suppose we wanted to be free from the limits of these in order to innovate. What would we include? What would we explore?

This talk suggests that tactile narrative may be very ancient or point to behaviour that is. String figures and sand patterns may be a window into insights, perhaps worthy of instrumenting neural patterns. We discuss other early speculations on how to proceed toward a modern 'post-literate' experience. The motivation is next generation conversational narratives with intelligent machines which can manage abstraction, inaccessible by current logics and accompanying notation.

Professor Ted Goranson is a Principal Research Fellow and Deputy Director (designate) of the Institute for Integrated and Intelligent Systems (IIIS) at Griffith University. The Institute has 40 faculty members and 80 PhD students working on AI, Autonomous Systems, Computer Vision, Logic & Symbolic Reasoning, Knowledge & Software Engineering, Cyber Security, Signal Processing, Machine Learning, Information System and Data Analytics. Ted was formally a senior research manager for the US defence and intelligence communities, where he managed both basic research and translation to fielded systems addressing most of the disciplines of IIIS. He has been with IIIS since January 2019. His research is in the areas of situation theory, modelling unknowns and intangibles, category theory, functional programming, neurobiological characterisation and programmable materials. Ted is an officer of the Society for the Interdisciplinary Study of Symmetry and sits on numerous editorial, review and science advisory boards.

Jennifer Green, University of Melbourne
April Campbell Pengart, Ti Tree School, NT
and Stephan Claassen, Best, Netherlands

Tie-em up: Playing with the long strings

Early records suggest that Indigenous Australians probably played string games prior to European contact. According to the Lutheran missionary Carl Strehlow the Arrernte “knew of the string-game *altjinka* before the arrival of whites”. In Arrernte the name of this game comes from the phrase *arrwe-iltyingke* (*arrwe* ‘rock wallaby’; *iltyingke* ‘bunch or bundle’) and it refers to one of the commonly-made figures that represents “rock wallabies carried held by their tails”. In the desert hair-string was traditionally used, but nowadays wool is more readily available, and using several colors enables contrasts in designs that are not possible if hair string alone is used. A small repertoire of string game figures seems to be widely recognized and there is some semantic consistency in their interpretation across several of the Arandic languages, as well as variation. Perhaps because of the visual iconicity of the figures some suggest that the practice falls within the scope of the broader meaning of *tyepety*, a term used in some Arandic languages to refer to narrative practices such as story-telling in the sand. This presentation draws on string game sessions filmed between 2007-2012 with Arrernte and Anmatyerr speaking peoples from Central Australia. One of the features of the way the women play is the collaborative construction of large string figures that involve several women. We will discuss our recording methods and present some preliminary analyses of several figures. We will also show some film where Anmatyerr educator April Campbell Pengart discusses string figures in relation to some spatial concepts in Anmatyerr—as April puts it, a kind of “hands-on maths”.

Jennifer Green is a Research Fellow at The University of Melbourne. Green has worked for over four decades with Indigenous people in Central Australia documenting languages, cultural history, kinship and verbal arts. Currently she is researching Indigenous sign languages in communities in Central and Northern Australia.

April Campbell Pengart is an Anmatyerr educator and author. She currently works teaching language and culture at Ti Tree School in the Northern Territory. Recent publications include *Mer Angenty-warn alhem. Travelling to Angenty Country* (2015) and *Phonological aspects of Arandic baby talk* (2014).

Stephan Claassen (Best, Netherlands) studied chemistry and theology. He works as a spiritual caregiver in elderly care and dedicates most of his spare time to the study of string figures and their context, in particular those of (Northern) Europe, the Arctic and (Papua) New Guinea.

Clarrie Kemarr Long is an Anmatyerr/Warlpiri elder who is involved in supporting language and culture at Ti Tree School. Clarrie is a local expert on songs, sign languages and sand stories. She has been a key participant in the Iltyem-iltyem sign language project and is an expert on string games.

Emmanisha Kemarr Pepperill works as an early childhood teacher at Ti Tree School. She speaks Warlpiri and Anmatyerr and provides support for language and culture programs in the school.

**The importance of situational context in understanding string figure-making:
a case study from a Sepik society in Papua New Guinea**

Early collectors and researchers of string figures have often gone to great lengths in order to mask or even get rid of the immediate contexts in which acts of string figure-making were performed. This is not only true of early 20th century photographers who would hide the string figure makers behind a canvas in order to take a 'perfect' picture of the final design, but also of contemporary researchers who try to record string figure-making as if it was isolated from real life: away from screaming children, interfering bystanders, moralising individuals or self-proclaimed 'experts'. In the recording of string figure-making performances, there is a further tendency to ignore unskilled performers who make mistakes, which makes it appear as if string figure-making did not occur in a context of repeated trial and error. However, there is much to be learned from the messy and seemingly irrelevant contexts in which string figures are made.

Following Merleau-Ponty's phenomenological approach and using subtitled video segments from my observational footage of string figure-making among the Awiakay in East Sepik Province of Papua New Guinea, I will discuss the importance of context in studying string figures, and thus comply with Geertz's use of the term 'thick description', emphasizing how apparently unimportant or extraneous factors can contribute to our understanding of the social and cultural aspects of any practice.

Darja Hoenigman (PhD 2015, The Australian National University) is a linguistic anthropologist and a filmmaker, currently a postdoctoral researcher on the ETKnoS project in Laboratoire SPHERE at Université de Paris, affiliated with the ANU ARC Centre of Excellence for the Dynamics of Language. Her research over the last 15 years has focussed on the various ways in which the use of language shapes, and is shaped by, social life in two small-scale societies, namely the Awiakay and the Meakambut in East Sepik Province, Papua New Guinea. Her writings about village fights, Catholic charismatic spirit possession, secret languages, lamenting, all-night song cycles, and recently the practice of making string figures, are intertwined with observational film. In her current project, Darja is studying the practice string figure-making among the Awiakay, with an emphasis on its socio-cultural contexts.

The hidden culture of the playground: string figures as play

Australia was the first continent for which string figures were reported. Since then, Australian Aboriginal and Torres Strait Islander peoples' string figures have been collected, studied and documented, mainly through anthropological research expeditions carried out in the late 19th and early 20th centuries. Much is known about the place of string figures in the lives of Indigenous peoples, both here in Australia and in other countries and cultures.

While the historical record is substantial, very little is known about the place of string figures in contemporary life in Australia. For most of the population, playing string games is regarded as an 'old-fashioned' childhood game, played at primary school and forgotten when we 'grow up'. Few people know that string figures are part of a much wider repertoire of traditional games, passed on from child to child by word of mouth in the folkloric tradition. Nor do they know that children have their own culture of play, with its own rules, rituals and adaptations, which exists below eye level and generally out of the consciousness of adults.

In children's culture, string games have a long tradition. Play research in Australia since the 1950s shows that some string figures have endured, while others have been altered or adapted, and new ones invented. Children show enormous capacity for creativity and invention in their string figures, but so far there has not been a systematic study among the children of Australia to see the extent of their knowledge, and most string games books for children use examples collected from the early anthropological studies.

String games, and their younger cousin, rubber-band shapes, are almost universally known, and offer ways for people of different ages and cultural backgrounds to connect through the shared experience of play. These connections have been fostered through the use of string games in exhibitions in museums, hospitals and on the streets of Melbourne.

Judy McKinty is an independent children's play researcher and cultural heritage interpreter, based in Melbourne. She has researched, collected and written about children's play for over thirty years, and has been closely involved with the Australian Children's Folklore Collection for a similar time. She has worked (and played) for the National Library of Australia, Museum Victoria, the University of Melbourne and other significant cultural places, like festivals and school playgrounds. Her work includes an oral history project on Aboriginal Children's Play with June Factor, string games workshops in Bunjilaka Aboriginal Gallery and field research for a national study of children's play. She is an Honorary Associate of Museums Victoria and was a co-editor of their journal *Play and Folklore*. See:

<https://museumsvictoria.com.au/collections-research/journals/play-and-folklore/>

Her favourite games are Marbles, Jacks and string games.

Philip Noble

String figures in Northern District Papua New Guinea in the early 1970s.

In this session I will share something of my string figure experiences in the early 1970's in PNG, and how this interest proved to me to be a way of learning how to receive as well as to give. In particular I would hope to teach a few simple and less well-known string games from Papua New Guinea, introducing some unusual hand and body movements which are difficult to describe. I find that the elegance and fluidity that I was able to experience first-hand truly enhances the whole making process. My interest developed out of a genuine desire to learn more of the way of life, language and values of the local people who generously shared with me in many ways. One abiding memory of my time in PNG, is the spontaneous laughter that often went along with string figure making. Hopefully we will experience some of this in our sharing time together.

I have posted a number of videos of the string figures that will be shared on my youtube page 'visualstories': <https://www.youtube.com/user/visualstories/videos>

Philip Noble completed a Bachelor of Science degree at Glasgow University in 1967 before going on to study Divinity at Edinburgh University. In 1971 he was ordained a priest in the Anglican Church. He then spent three years (1972–75) as a missionary in Papua New Guinea, in the Managalas area of the Northern District. During this time he collected string figure repertoire published in 1979 as *String Figures of Papua New Guinea* by the Institute of PNG Studies. In 1978 he joined with Dr. Hiroshi Noguchi of Waseda University, Tokyo in setting up the International String Figure Association. Philip spent forty years in pastoral ministry based in Scotland, until 'retiring' in 2011—leaving him more time for his practice as a visual artist. Philip has an abiding interest in developing new skills, communicating through play and in meeting people with similar interests including story-telling, Origami, more recently soap bubbles, and of course string figures.

Why study string figures?: An historical perspective on the anthropological/ethnological value ascribed to string games since the 19th century.

This presentation examines some epistemological issues involved in the development of the 'anthropology of cat's cradle', especially in the first half of the 20th century. It focuses on two main paradigms which underlay the study of string figures during that time: the anthropological or ethnological significance attached to these artefacts was then mostly based on their identification either (1) as clues to past cultural interconnections and migrations, or (2) as expressions of 'primitive' art/technique providing remarkable insight into the 'working's of primitive mind' or into 'indigenous thinking'. Whereas the first perspective led to some advances in the data collection methodology and the determination/recognition of particular technical features, the other premise gave rise to various considerations on the interrelationships between notions such as symbolism and imagination, imitation and magic, as well as on the nature of the intellectual processes involved in the creation of string figures. This paper questions further some of the legacies of these two major traditions in the anthropology of string figure-making.

Céline Petit is a Social Anthropologist (PhD in Social and Cultural Anthropology at Paris Ouest Nanterre University & in Religious Sciences at Laval University, Canada). She is a Research Fellow at the SPHERE laboratory (Sciences, Philosophy, History), University Paris Diderot. Céline is currently assistant coordinator of the ETKnoS project—'Encoding and Transmitting Knowledge with a String' (funded by the French National Research Agency—ANR, 2016-2020). Since 2000, she has been conducting ethnographical research in Canadian Inuit communities of Nunavut (Iglulik, Iqaluit, Pangniqtuuq) and Nunavik (Eastern Quebec: Kuujuaq, Tasiujaq, Inukjuak). Her doctoral thesis focused on the significance of play and the social and symbolic effects associated with ludic practices among Inuit of the Eastern Canadian Arctic, from the 19th century until now.

Gabrielle Quakawoot

Maths and String Finger Art

In this workshop we will look at some Aboriginal and Torres Strait Islander String Finger Art Shapes, their Cultural Interpretations and Shape relationships with our Platonic Solids.

Gabrielle Quakawoot is the founder of *The Art Of String Theory*. *The Art Of String Theory* brings together Culture, Mathematics and Our Dreaming with the ancient game of String Finger Art for educational, inspirational and personal growth purposes. String Finger Art and Sacred Geometry have always been a part Of Gabrielle's upbringing.

String Finger Art was encouraged from all of her family. As a toddler she was shown string shapes as part of her culture heritages, and making shapes with string on the ground was encouraged as soon as one could sit. Her Grandmother would take the looped piece of string after making string figures, find two sticks from the nearby bush and the string becomes an ancient compass with earth as your creative space. After a lifetime quest, searching for the true value of Pi and many initiative experiences Gabrielle realised one of the pictures she drew in the dirt with her Grandmother was known as The Seed Of Life and was in a field of Vedic mathematics called Sacred Geometry.

Gabrielle chose to teach herself Vedic Mathematics, The Living Mathematics Of Nature, and Sacred Geometry from many sources. She found string Finger Art was a great tactile way to encourage students to do maths.

Gabrielle Quakawoot rises from many cultural heritages including Bailai, Vanuatu and Solomon Islands with a strong Torres Strait Islander influence from her Godfather.

Gabrielle currently is an Indigenous Youth Development STEAM presenter, delivers her Goldorang Bunjurla Curriculums to mainstream and home school groups, is involved in festival art installations and involved with Indigenous Curriculum design on the Sunshine Coast.

Inge Riebe

My changing interests in *issu* among Kalam

While I collected and enjoyed string figures in a number of PNG communities I did not follow up working with them in any organised or academic way. I will discuss briefly some of my early thoughts about diffusion of figures and the boundaries of style between different regional collections which I had hoped to base a thesis on but which was not thought a suitable topic at the time. My work then concentrated on other aspects of Kalam culture and my interest in string figures moved to the way people experience their string figures and the aspects of their lives they choose to represent.

Inge Riebe did anthropological research in Papua New Guinea from 1965 to 1980. The bulk of that time was spent among the Kalam of the Bismark Schraeder Ranges, with some time in Gazelle Peninsular, Uneapa Island and the Gira River in the Northern District. String Figures were not a core area of her work but she collected some in various of these areas. She subsequently worked in Australia mainly with the Bundjalung of Northern NSW but also with other communities in NSW and Southern Queensland.

String figures from Vanuatu: some outcomes of a comparative study

In this presentation, I will describe some outcomes of a current research project in ethnomathematics aimed at studying the elaboration of string figures, as practiced on Northern Ambrym Island, Vanuatu. North Ambrymese string figures will be first examined in comparison to other string figures found throughout the archipelago of Vanuatu that I have collated—as well as with the recently published set of string figures collected by anthropologist Bernard A. Deacon (1903-1927) while completing fieldwork in central Vanuatu, ex. New Hebrides (Sherman & Deacon, 2019). Secondly, North Ambrymese string figure-making practices will be compared with another procedural activity known as ‘sand drawing’. This activity consists of drawing a continuous line in the sand with one finger. Both activities are referred to locally using the same vernacular verb *tu* (lit. ‘to write’). We will examine their shared and exclusive geometric and algorithmic properties, by focusing on concepts such as operation, procedure, iteration and transformation. Concomitantly, the making of string figures and sand drawings are both means of recording and expressing knowledge relating to particular mythological entities or environmental elements. We will investigate the links between the procedures involved in the making of these figures as well as the particular forms of memory and tradition embedded in these practices.

Eric Vandendriessche obtained a French ‘Agrégation’ of mathematics (1992) and taught mathematics for about twenty years. In 2010, he received his Ph.D. in the History and Philosophy of Science from Paris Diderot University, with a dissertation in ethnomathematics devoted to the study of string figure-making practices in oral tradition societies (Trobriand Islands, Paraguayan Chaco). Since 2015, Eric Vandendriessche has been a researcher (Chargé de recherche) at the French National Centre for Scientific Research (CNRS), and a member of the Sciences, Philosophy, History laboratory (SPHere). He is currently coordinating the research program ‘Encoding and Transmitting Knowledge with a String: a comparative study of the cultural uses of mathematical practices in string figure-making (Oceania, North & South America)’ (ETKnoS, 2016–2020), funded by the French National Research Agency. For the past year he has been undertaking fieldwork in Vanuatu (South Pacific), aimed at studying/ comparing different algorithmic and geometric practices (in particular, mat making, sand drawing, and string figure making).