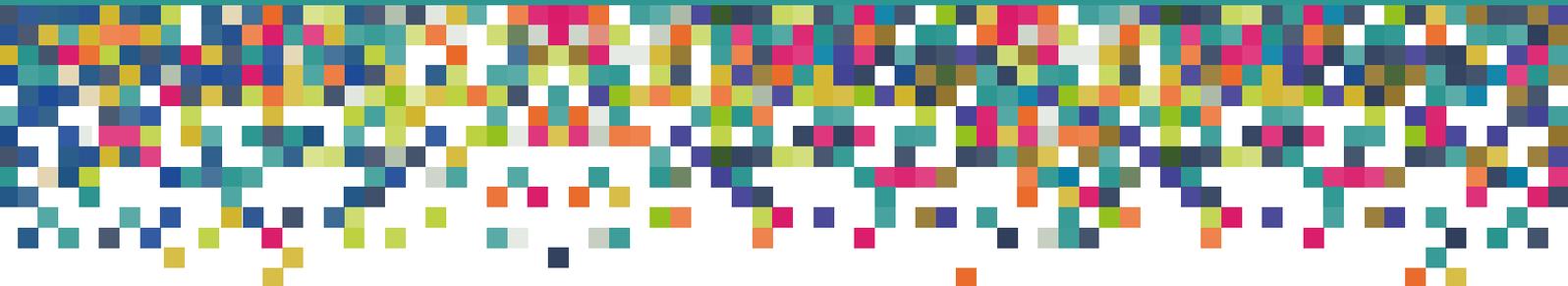




Media and  
Communications

## Media@LSE Working Paper Series

Editors: Bart Cammaerts, Nick Anstead and Richard Stupart



### **In a Mediated Society, Can Indigenous Knowledge Survive?**

A Network Ethnography Examining the Influence of Internet Use on Indigenous Herbal Knowledge Circulation in a Remote Yao Community

**Anran Wang**



Published by Media@LSE, London School of Economics and Political Science ("LSE"), Houghton Street, London WC2A 2AE. The LSE is a School of the University of London. It is a Charity and is incorporated in England as a company limited by guarantee under the Companies Act (Reg number 70527).

Copyright, Anran Wang © 2019.

The author has asserted their moral rights.

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system or transmitted in any form or by any means without the prior permission in writing of the publisher nor be issued to the public or circulated in any form of binding or cover other than that in which it is published. In the interests of providing a free flow of debate, views expressed in this paper are not necessarily those of the compilers or the LSE.

## ABSTRACT

*With the rise of Internet use in remote indigenous communities, there is an increasing concern whether indigenous knowledge can survive in a mediated society enabled by the Internet. This study discusses the influence of Internet use on indigenous herbal knowledge circulation in a remote Yao community. Motivated by the lack of systematic examination in the previous research, the present study develops a framework with its theoretical foundation in Schultz's four-process of mediatization theory and Bourdieu's theory of habitus. Informed by the work of cultural evolution, the concept of learning biases is operationalized in relation to habitus in this study. Concerning the unique organizational form of indigenous knowledge circulation, network ethnography is adopted as the most appropriate methodology. Specifically, a social network analysis was conducted with all available adult residents in a remote Yao village. Informed by the result of social network analysis, six social network survey respondents were invited to participate in the subsequent semi-structured in-depth interviews. The result of this study suggests that Internet use had negligible influence on herbal knowledge circulation. The villagers' response to the new opportunities enabled by the Internet might have been disposed by their habitus in the traditional word-of-mouth herbal knowledge circulation.*

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

## 1 INTRODUCTION

For thousands of years, local plants have been widely used in medical practice, resulting in a rich body of indigenous herbal knowledge. However, many indigenous communities are facing profound social transformation, which leads to severe indigenous herbal knowledge erosion (Edwards & Heinrich, 2006; Aswani & Sauer, 2018). In some cases, indigenous herbal knowledge persists in communities that are particularly remote (Zarger & Stepp, 2004). Spatial distance seems to not only hinder the modernisation but also help to preserve indigenous herbal knowledge.

The Internet is generally considered to be able to bridge the spatial distance between remote communities and mainstream facilities that can be found in an urban setting (Tsatsou, 2009; Brady, Dyson, & Asela, 2008). As the Internet becomes more accessible in remote communities, the influence of Internet use on indigenous herbal knowledge has become a central issue in the preservation of indigenous knowledge debate. Several attempts have been made to measure the influence (Sujarwo, Arinasa, Salomone, Caneva, & Fattorini, 2014). However, the influence of Internet use is often oversimplified to the correlation between Internet use and numbers of plants species that participants can identify. This method is problematic (Pauly, 1995) and itself implies a unidirectional process. So far, little is known about the form and mechanism of this kind of influence.

This study set out to systematically examine the influence of Internet use on indigenous herbal knowledge circulation within its own socio-cultural context. Because change brought by Internet use might take unexpected forms in the domain of indigenous herb knowledge circulation, Schulz's (2004) four-process of mediatization approach was followed to increase researcher's analytical sensitivity. Moreover, drawing on Bourdieu's (1990a) theory of habitus and borrowing the notion of cultural learning biases from cultural evolution (Henrich & Broesch, 2011), this study attempts to explore whether people's preference in traditional knowledge circulation will shape

# **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

their response to new opportunities enabled by the Internet. This work is expected to be the first systematic study of mediatization of indigenous knowledge circulation. It is also hoped that this research will contribute to a deeper understanding of the mechanism of mediatization.

Network ethnography is adopted to capture the complexities of the phenomenon. As a synergistic research method, network ethnography uses network analysis to justify the respondent selection for ethnography (Howard, 2002). Specifically, the main data were gathered through a social network survey with all available adult residents (N=98) and 6 semi-structure in-depth interviews with sampled participants. The researcher will first build a network with social network survey data. Findings from social network analysis will be used to explore cultural learning biases in traditional knowledge circulation and inform sampling strategy of interview. Thematic analysis of interview data will explore forms of change in indigenous knowledge circulation induced by Internet use. In the end, interpretation of the link between cultural learning biases and change in indigenous knowledge circulation will be addressed. The experimental application of network ethnography will explore the usefulness of this methodology in the study of indigenous knowledge community.

The remaining part of the dissertation proceeds as follows: to put the research in the context, Chapter 2 makes a critical review of relevant academic literature, along with a statement of the conceptual framework and research objectives. The research design and methodologies used in the study are then described in Chapter 3 in details. Chapter 4 presents the finding of the social network analysis, including visual inspection of the network structure and statistical examination of people's learning biases in traditional indigenous knowledge circulation. Chapter 5 presents the finding of semi-structured in-depth interviews, focusing on the two global themes: medical practice in a remote Yao community and limited mediatization of indigenous herbal knowledge circulation. In Chapter 6, the researcher interprets the results from two methods in light of the conceptual framework. Chapter 7 concludes the findings and the potential implication of this study.

## 2 LITERATURE REVIEW

### 2.1 Indigenous Knowledge of Herbal Medicine

The meaning of indigenous knowledge has evolved in the long history of research. Initially, indigenous knowledge was a term frequently used in the literature as a synonym of traditional knowledge, which suggests a body of old knowledge passed down from generation to generation (Ridington, 1990). In the 1950s and 1960s, under the dominance of modernist thinking, much of the literature describes indigenous knowledge as an obstacle to development. Later, with the rethinking of unsuccessful large-scale modernisation projects around the world, the importance of indigenous knowledge within the local setting was recognised (Agrawal, 1995). In a far-reaching report for the World Bank, Warren (1991:1) defines indigenous knowledge as 'local knowledge that is unique to a given culture or society. Indigenous knowledge constitutes the basis for local-level decision making in remote communities.' This definition emphasises the link between indigenous knowledge and its local environment.

Indigenous herbal knowledge encompasses the use of accessible plants to address local health issues. The Yao people, who lived in the mountainous areas of Southwest China for generations, were susceptible to food poisoning, common injuries, snakebites and insect stings (Li et al., 2006). With access to a rich plants resource, they have learned to use plants to address health threats that are associated with their living environment. Over time, indigenous herbal knowledge has become a cultural identity of their communities (Mazzocchi, 2006). Their knowledge base is robust: many researchers have suggested that the poorly documented knowledge system could promote the development of scientific studies (Srithi, Balslev, Wangpakapattanawong, Srisanga, & Trisonthi, 2009). Perhaps most importantly, indigenous herbal knowledge is still important for the health of a large number of the population in today's world (World Health Organization, 2000).

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

However, much of indigenous knowledge is being lost under the pressure of modernisation and cultural homogenisation. Although knowledge hybridisation is reported in some studies, a recent systematic literature review concludes that indigenous knowledge erosion is an overall global trend, and herbal knowledge is experiencing the most significant loss (Aswani & Sauer, 2018). Several factors are known to be associated with the erosion of herbal knowledge. Indigenous herbal practice has suffered from the lack of medicinal plants due to environmental degradation and climate change over a few decades (Anyinam, 1995). Moreover, indigenous herbal knowledge itself might be more vulnerable to extinction than plants. Cultural homogenisation seems to pose the most serious threat towards indigenous knowledge (Voeks & Leony, 2004). For example, under the influence of formal education, young generations started to lose interest into local ethnobotanical plant practice, because the knowledge is often denoted as primitive and backwards (Giday, Asfaw, Elmqvist, & Woldu, 2003). Furthermore, the establishment of biomedical health care facilities has resulted in abandonment of herbal medical practice in many rural areas, which aggravate the loss of indigenous knowledge (Ragupathy, Steven, Maruthakkutti, Velusamy, & Ul-Huda, 2008). When an aged herbal knowledge holder dies, their knowledge tends to disappear without being passed on.

To preserve the indigenous knowledge, different *in situ* and *ex situ* conservation strategies has been proposed. *In situ* strategies attempt to preserve indigenous knowledge in its original place through promoting people's recognition of value of the knowledge (Agrawal, 1995). Following this strategy, a range of revitalisation projects have been implemented to rehabilitate local practices (Pilgrim, Samson, & Pretty, 2009). By contrast, *ex situ* strategies refer to the preservation outside their immediate environment through documentation and storage in archives and network (Nakata, 2002). Advocates of *ex situ* strategies argue that it allows the dissemination of indigenous knowledge through the Internet. *In situ* conservation has been criticised as infeasible and inefficient, and *ex situ* strategies are criticised for merely 'creating a mausoleum for knowledge' (Agrawal, 1995: 30).

## 2.2 Circulation Pattern of Indigenous Knowledge

Most investigations on indigenous knowledge circulation build their foundation on two classic studies. The circulation of indigenous knowledge was largely considered unstructured, prior to the work of Ruddle and Chesterfield (1977). Their fieldwork from Guara Island reveals sophistication and efficacy of indigenous knowledge, and provides empirical evidence to show that indigenous knowledge circulation within communities could be structured. Building on this finding, Cavalli-Sforza and Feldman (1981) classify three modes of knowledge circulation: (1) *vertical* circulation, learning from parents; (2) *horizontal* circulation, learning from peers; and (3) *oblique* circulation, learning from non-parental members of old generation. The interruption of vertical and oblique knowledge circulation is often considered cause of indigenous knowledge erosion in a mediated society (Srithi et al., 2009).

More recently, work from the cultural evolutionary framework used learning biases as a conceptual tool to capture people's preference in indigenous knowledge circulation. Learning biases mainly concern 'what cues cultural learners use to figure out who to learn from' (Chudek, Muthukrishna, & Henrich, 2015: 7). Previous studies have suggested that indigenous knowledge often varies greatly among members of a community (Battiste, 2002). When members of communities need acquiring indigenous knowledge, they have to make a decision on who to learn it from. They can pick the most skilled individual. In some other cases, they might pick someone who is a better model for them in particular, such as individuals whom they feel more comfortable to ask (Chudek et al., 2015). Learning biases has been evidenced in many laboratory studies. To bridge the laboratory to the field, Henrich and Broesch (2011) published a paper in which they developed a method to empirically examine learning biases with their ethnographically informed data from three Fijian villages. The result of their study shows how individual-level choices could shape outcomes at the community-level. However, whether learning biases of indigenous knowledge circulation will shape people's response to new opportunities enabled by the Internet remains to be investigated.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

## 2.3 Role of Internet in Modernisation of Remote Communities

Modernisation in the field of development refers to a model of a progressive and inevitable transition from 'traditional society' to 'modern society' (Lerner, 1958). Modernists argue that the difference between the undeveloped and the developed is just a matter of time, so they take the West as the only blueprint for the creation and expansion of modernity (Manyozo, 2012; Ramos, 2014). This assumption has been questioned since 1960s when large-scale development interventions consistently failed to provide intended results (Freire, 1978; Escobar, 2011). Although critiques towards the rationale and practice of modernisation are widely accepted, modernisation thinking still persists in many development projects. As Mansell (1982: 42) commented, the revision of modernisation thinking is 'little more than superficial'.

Remoteness used to hinder the modernisation in many indigenous communities. People living in urban areas often find it difficult to resist the temptation of modernisation. However, distance makes it also difficult to live a 'modern' life in the remote area (Parker, Hudson, Dillman, & Roscoe, 1989). To fully live with modernity, individuals live in the remote area need to take much higher effort than those living in cities (Ali, 2018), since it is more expensive to ship goods to remote communities and most services are only available in towns and cities. Therefore, indigenous practice and knowledge often persist in the life of remote areas.

With the rise of Internet use in remote areas, the distance which used to hinder the modernisation is shrinking. Long before the advent of the Internet, Rogers (1962) had suggested that communication technology could speed up the transformation of societies in rural and remote areas. Compared with change brought about by older media, those that come from Internet use for rural and remote areas are often greater, because the Internet could be used to create 'an alternative dimension of social practices', in which space and distances have shrunk (Du, Haines, Sun, Partridge, & Ma, 2015: 3). In this context, there is increasing concern whether indigenous herbal knowledge can survive an accelerated modernisation.

## **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

Surprisingly, researchers have not treated the influence of Internet use on indigenous knowledge circulation in much detail. There are two research approaches that currently can be seen in the literature: (1) quantitative botanic study tradition, and (2) qualitative media study tradition. Following quantitative botanic study tradition, researchers attempt to establish correlations between Internet use and the number of plants that respondents can identify (Sujarwo et al., 2014). The correlation is often negative. However, simply translating the negative correlation into erosion of knowledge can be misleading due to operationalization issues (Pauly, 1995). In qualitative media study literature, although researchers do not specifically engage with this particular topic, but they do make secondary claims that change in indigenous knowledge circulation take different forms. For example, Kral (2014) observes that Internet-enabled mediated communication disturbed generational indigenous knowledge transmission. In contrast to Kral, Rice, Haynes, Royce, and Thompson (2016) note that social media can actually reconnect younger and older generations. These different forms of influence echo with the criticism of technological determinism that technology does not change society by itself but through offering new opportunities in pre-existing social, economic, cultural conditions (Mackenzie & Wajcman, 1999).

As far as remoteness is concerned, the digital divide is another essential factor to understand the influence of Internet use. The digital divide is generally classified into two types: differences in access, also known as first-level digital divide, and differences in use or second-level digital divide (Hargittai, & Hsieh, 2013). Since the 1990s, Internet access was considered crucial to overcome digital divide between urban and remote areas (Hargittai, & Hinnant, 2008). When Internet access increases in rural and remote areas, however, difference in Internet use between rural and urban residents remains (Dutton, Helsper, & Gerber, 2009). In an effort to explain this phenomenon, some scholars argued that individuals' socioeconomic resources limit their ability to acquire access and related skills (Livingstone & Helsper, 2007). Others have suggested that choice of lifestyle can also influence people's digital engagement (Mancenelli, 2007). The latter provides a

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

less techno-deterministic perspective on (dis)engagement with the internet, though it is difficult to disentangle digital exclusion and choice in the practice (Eynon & Helsper, 2011).

## 2.4 Mediatization

The term *mediatization* was first used by Manheim (1933/1979) to describe changes of social relations driven by mass media, and was subsequently applied in a range of social and cultural research by various scholars (Baudrillard & Levin, 1981; Habermas, 1984). However, the dispersed and inconsistent use of the term across fields does not contribute to theoretical consolidation (Hepp, 2014). The theoretical consolidation was achieved later in the media and communication research (Mazzoleni & Schulz, 1999; Schulz, 2004; Krotz, 2007), where mediatization can be referred to as 'a concept used to analyse critically the interrelation between changes in media and communications on the one hand, and changes in culture and society on the other' (Couldry & Hepp, 2013:197).

Within this broad understanding of mediatization, several scholars have tried to categorise mediatization research through more nuanced approaches. Lundby's (2014) typology of mediatization is the one most influential. Building on the work of Couldry and Hepp (2013), he divides mediatization research into three types (1) institutional tradition, (2) social-constructivist tradition, and (3) material tradition. However, this system of classification is often more confusing than clarifying. For example, when literature from leading mainstream media and communications journals was filtered with this classification, imprecision and conflation were observed in most articles (Deacon & Stanyer, 2014). Given that this classification is formulated from a high-level social metaprocess perspective, the limited utility in literature classification might relate to the gap between the ambition to become a social metaprocess and the lack of evidence to support this claim.

Through critical analysis of the debate between Deacon and Stanyer (2014) and Hepp, Hjarvard and Lundby (2015) on mediatization conceptualisation, Lunt and Livingstone (2016) argues

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

mediatization is best understood as a research programme in its present formulation. In the same vein as Lakatos's (1983) understanding, the research programme

*[...] begins with necessarily untested assumptions foundation of the research, to which can be attached a range of different theories with varying empirical commitment. Each theory could be examined, evidenced, and criticised but this does not simply lead one to accept or reject the overall research programme or its core assumption (Lunt & Livingstone, 2016: 469).*

Understanding mediatization theory as an opening and flexible research programme enables empirical work to test hypotheses generated from specific theories across different domains, which will eventually contribute to account for the growing importance of media in modernity.

The approach of Schulz (2004) seems to fit in mediatization research programme as an attached theory. Bridging mediatization with other concepts long established in the media and communication research, Schulz breaks mediatization into four processes: (1) extension, when media technologies extend human communication capacities through time and space; (2) substitution, when prior social activities are completely or partly substituted by the mediated one; (3) amalgamation, when prior social activities are merged and mingled with media activities; and (4) accommodation, when other social domains adapt to media logic. This system of classification is helpful to make mediatization measurable. However, critics contend that Schulz's approach implies a simple linear thinking (Couldry, 2008; Finnemann, 2014). It also has been noted that more studies need to be taken to examine whether this approach could capture mediatization in other domains outside Schulz's own preoccupation, politics (Lunt & Livingstone, 2016).

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

## 2.5 Habitus

Unlike proponents of mediatization, who argue 'everything is in a state of constant flux' (Hepp et al., 2014: 183), Bourdieu introduced the concept of 'habitus' to explain :

*How does human action follow regular statistical patterns without being the product of obedience to some external structure, such as income or cultural norms, or to some subjective, conscious intention, such as rational calculation (Swartz, 2002: 615)?*

Unsatisfied with Levi-Strauss's structuralism and Sartre's existentialism which dominated French academia in the mid 20th century, Bourdieu developed his own theory to account for how human action is regulated. In Bourdieu's terminology, habitus is defined as:

*A system of durable, transposable dispositions, structured structures predisposed to function as structuring structures that is, as principles which generate and organise practices and representations that can be objectively adapted to their outcomes without presupposing a conscious aiming at ends or an express mastery of the operations necessary to attain them (Bourdieu, 1990a: 53).*

To put it simply, Bourdieu understood habitus as a system of dispositions that could be acquired from past socialisation. Those dispositions predispose their holders to act out what they had internalised in the past but do not determine them to do. For example, in order to improve the possibility of success in a new situation, individuals have agency to practically adjust their expectations, which are formerly generated from their habitus (Bourdieu, 1984).

'Structured structures' and 'structuring structures' describe a reproduction process of society in habitus theory (Bourdieu, 1990a: 53). In the first place, individuals are shaped by a range of socialisation through the informal experience of social interaction. Then, subsequent actions of individuals become the key to maintaining 'the continuity and existence of society' (Swartz, 2002:

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

626). It is important to point out that habitus is a collective concept rather than individual habit (Bourdieu & Nice, 1977), since the socialisation process is collective in its essence.

After the establishment, habitus does not easily change. However, change is attainable when field and habitus are mismatched. Individuals could use their 'agent to cope with unforeseen and ever-changing situations' (Bourdieu & Nice, 1977: 72), when a certain behaviour pattern does not work anymore. Through the cycle of social reproduction, new behaviour patterns will eventually be reflected in the form of habitus change. As it takes time to change habitus, the lag time or 'hysteresis effect' can often be observed (Bourdieu 1984: 142; 1990a: 59). In an investigation of French higher education expansion of 1960s, Bourdieu (1984) found the French working-class youth was not enthusiastic about newly available high level of educational attainment in the first several years. Bourdieu's analysis suggests habitus is sometimes mismatched with emerging realities, since it is difficult to predict the outcome of a future based on the present opportunities and constraints with experience from the past.

Overall, habitus helps to explain human action without simplifying human action to either stimulus-response sequence or a matter of cultural conformity. However, recognition of habitus is accompanied by widespread criticism, very frequently on its latent determinism (Reay, 2004). Those critics claim that limited agency and rationality deprive habitus' explanatory ability about social change (Jenkins, 1992; Yang, 2014).

## 2.6 Conceptual Framework

The literature review suggests there has been little systematic analysis of the influence of Internet use on indigenous knowledge circulation in remote areas. To examine the influence in a systematic way, a conceptual framework is developed with its theoretical foundation on mediatization theory and theory of habitus. Mediatization theory is selected to capture the influence of the Internet, while theory of habitus is used to supplement the weakness of mediatization theory in explaining the mechanism of change. Moreover, the concept of learning

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

biases, from cultural evolution studies, will be operationalised as habitus. As indigenous herbal knowledge is embedded in people's life experience rather than academic literature (Battiste, 2002), this conceptual framework is consciously kept open and flexible.

Mediatization theory is used to investigate how indigenous people respond to new opportunities enabled by the Internet in the domain of indigenous knowledge circulation. Since Lundby's popular classification of mediatization based on the societal meta-process claim could be problematic in empirical studies (Deacon & Stanyer, 2014), this study will follow a more open and flexible 'research programme' perspective laid out by Livingstone and Lunt (2016). Understanding Schulz's (2004) four-process approach as a theory attached to the mediatization research programme, it will be used to guide the interpretation of findings from four aspects, which are extension, accommodation, substitution, and amalgamation. Since mediatization may take varying forms in different domains, Schulz's approach could make the change in indigenous knowledge measurable.

Bourdieu's theory of habitus provides this study with a hypothesis to explain the mechanism of mediatization. Since Bourdieu do not define habitus in a consistent way in his books, it is important to note that this study would follow the aforementioned definition provided in *The Logic of Practice* (1990a). Drawing on habitus theory, research will explore whether people's learning biases in traditional indigenous knowledge circulation will dispose their actions in a mediated society. Because habitus understands that cultural and societal change is eventually built up by individual behaviour (Yang, 2014), the constitution of a conceptual framework enables this study to transcend the dichotomies between past, present and future, between continuity and change, and between macro-structure and micro-agency, which is helpful to provide a more concrete argumentation.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

Collectively, this conceptual framework engages in the academic discussion on influence of Internet use on indigenous knowledge circulation in remote areas through connecting Schulz's (2004) four-process mediatization theory and Bourdieu's (1990a) theory of habitus.

## 2.7 Objectives of the Research

This study set out to explore the influence of Internet use on indigenous knowledge in remote areas. To researcher's best knowledge, this topic has not been systematically studied. Most relevant research has utilized the botanic quantitative study tradition, where influence is oversimplified to the correlation between Internet use and the number of plant species that respondents can identify (Sujarwo et al., 2014). In addition, some media studies have inadvertently mentioned this topic, and the influence of Internet use often comes in different forms (Rice et al., 2016). Thus, a systematic examination will contribute to understanding of the diversity of the influence.

Technology does not change society by itself but by offering new opportunities in pre-existing social, economic, cultural conditions (Mackenzie & Wajcman, 1999). A systematic examination should include an inspection of the pre-existing conditions in the field, an investigation on the change, and an exploration of the mechanism of the change. Building on the foundation of the conceptual framework, this study aims to reveal what is people's learning biases in traditional indigenous knowledge circulation, map visible and potential mediatization in the domain of indigenous knowledge circulation enabled by the Internet, and explore how learning biases might shape the mediatization.

As a guide of whole study, the research question has been formulated as below:

What is the influence of Internet uses on indigenous herbal knowledge circulation in a remote Yao community?

# **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

Three sub-questions, to assist the investigation, evaluation and explanation, will also be addressed:

What are people's learning biases in indigenous herbal knowledge circulation?

What is the visible and potential mediatization of indigenous knowledge circulation?

How might people's learning biases shape the mediatization process?

## **3 RESEARCH DESIGN AND METHODOLOGY**

### **3.1 Research Design**

To empirically answer the research question laid out above, network ethnography was adopted as the most appropriate research method. According to a definition provided by Howard (2002: 561), network ethnography is a 'process of using ethnographic field methods on cases and field sites selected using social network analysis'. This method starts from social network analysis, and the result of social network analysis is used to inform theoretical sampling strategy of the next qualitative study. It has been argued that the combination of network analysis and ethnographic field methods can create a balance between 'macro-structure' and 'micro-agency' (Howard, 2002: 570), which is particularly helpful to study knowledge community with special organisational forms. As previous studies have suggested that indigenous knowledge circulation is often structured in its own way (Ruddle & Chesterfield, 1977), network ethnography could help to overcome technological determinism and organisational determinism from which any single method might suffer.

To be more specific, a directed social network analysis was conducted firstly to unravel people's learning biases in indigenous herbal knowledge circulation and inform the sampling strategy for the subsequent in-depth interviews. Before the beginning of this project, a two-month participant observation had been conducted by the researcher. The results suggest that there is an herbal

## **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

knowledge disparity among members of the community, and people get herb advice from various routes. Insights into complicated structural features are usually not visible to traditional methods such as observations, interviews, and surveys. Recent advances in social network analysis have facilitated investigation on structural features of human activities in the small-scale society (Scott, 2017). The capability to capture collective tendency based on individual choice makes social network analysis a useful method to study learning biases (Henrich & Broesch, 2011). Moreover, result of network analysis could inform the sampling strategies of the following qualitative studies. Drawing on the connection between position and roles, Linton (1935) has shown that similar structural position in the network is often related to a particular role that shapes the position holder's attitude and behaviour. Therefore, respondents occupying different structural positions in the knowledge circulation might experience different forms of change due to their role. Through social network analysis, the researcher should be able to classify respondents into subgroups by different structural positions (Luczkovich, Borgatti, Johnson, & Everett, 2003). A sampling strategy based on that could best capture multifaceted processes of mediatization within a limited sampling size. The main limitation of social network analysis, however, is that data is collected with a close-ended question that takes data out of its rich context.

Informed by result of social network analysis, semi-structured in-depth interviews were carried out to examine ongoing and potential mediatization processes of indigenous knowledge circulation, and to uncover the motivation and experience of people in this process. Drawing on previous empirical studies where Schulz's approach was followed (Lundby, 2014), the researcher can grasp a hint of what might look like in mediatization of indigenous knowledge circulation. Semi-structured interview is sufficiently structured to address specific issues developed around the central research question, while the flexibility provides space for new or unexpected idea to emerge (Galletta, 2013). Thus, semi-structured interviews fit better than unstructured interviews and structured interviews.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

Network ethnography should not be mistaken for a simple combination of social network analysis and semi-structured in-depth interview. A synergistic effect could be yielded from the interaction of two methods (Howard, 2002). Two conceptual advances of network ethnography have been proposed: firstly, it enables a more rigorous theoretical sampling. As discussed above, social network analysis shed light on the structure of the network. With a deep understanding of structure, the researcher can select participants from interesting subgroups, which makes sample bias manageable. Secondly, the result of social network analysis could inform the subsequent semi-structured in-depth interview.

## 3.2 Study Area

Research was conducted in a Yao village in Yunnan, China, called by the pseudonym 'Luoxia'. Surrounded by high mountains, at the turn of spring and summer, villagers sometimes can spot the wild elephants that live in the nearby tropical rainforest national park. The village is connected to the nearest town by a 12 km rugged mountain road, which occasionally becomes unusable due to landslides. Because there is only a tiny convenience store in the village, villagers need to visit the town by motorcycle to access most modern facilities, such as the bank, school and hospital. For most villagers, cultivation of sugarcane and medicinal cardamom (*Amomum villosum*) constitutes their main income. In the slack season, many villagers work as wage labourers cutting wood, picking tealeaves, and doing construction work in a nearby region.

Knowing how to deal with the health threats posed by the environment with collectable plants is one of the culturally transmitted practices that villagers depend on to survive. Before biomedical facilities became accessible in the nearby town in 1950s, the way to cure illness and alleviate pain mainly lay in herbal healing. Although people are now open to biomedical treatment, herbal healing still plays an important role in their health.

Since the provision of broadband services in June 2017, Luoxia has rapidly turned into a mediated society. As a part of a poverty alleviation project, the village was connected to the Internet for the

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

first time. Within one year, many aspects of life have experienced a transformation in temporal, spatial and social dimensions due to Internet. Like people who live in the urban settings, villagers use social media to maintain contact with friends, spend time watching videos and playing game, and pay utility bills through online financial services. Moreover, a WeChat group has become the main public sphere of the village to replace the original assembly and public address system. Like Livingstone and Sefton-Green (2016: 56) noticed in urban settings, the 'digital thread' is woven into the fabric of everyday life of villagers in Luoxia. Given that online medical services are further promoted by Chinese policy makers in rural and remote areas (General Office of the State Council of the PRC, 2018), what influence the Internet has on indigenous herbal knowledge circulation has become an interesting question.

### 3.3 Ethics and Reflexivity

One challenge inherent to social network ethnography is that anonymity at the data collection stage is not possible. To inform the following interview, the researcher must know the correspondence between a node and participants (Borgatti & Molina, 2003). This special burden puts a responsibility on the researcher to be clear to the participant about who is going to see the data and what are the predictable results that might happen to participants if the data is seen.

Adhering to the principle of informed consent (Warren, 2002), an information sheet and two consent forms were prepared in Chinese. As social network survey and interview collected different types of data, and different permissions were sought through separate consent forms. With regard to data management, confidentiality is offered through using untraceable identification numbers for individuals and the disguised name for the village in the study. To further avoid harm to innocents, children and people lacking mental capacity are excluded from the study. Ethical approval of this study was given by the dissertation supervisor and the Department of Media and Communications, LSE.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

As a Han Chinese man who had lived in this village for two months, I am both an insider and outsider to this Yao community. This role could enhance the depth and breadth of my understanding about the population. Moreover, I do not have to worry too much about objectivity, which is often raised if the researcher is too close to the project (Dwyer & Buckle, 2009). However, since women from the village are not encouraged to chat with outsiders, gender was an obstacle for me to provide a balanced account of the topic.

## 3.4 Social Network Analysis Survey

Data were gathered through various methods, including unstructured interviews, a social network survey conducted by the researcher, a registered residents list provided by the village administration and a household survey shared by a community-based NGO.

### 3.4.1 Respondent Selection

In order to reconstruct the network of knowledge circulation, all available adult residents of Luoxia (N=98) were surveyed during two weeks of fieldwork in April, 2018. There are 188 registered residents in total, and 144 of whom reached legal adult age (18 years old) on the day the research started. During the researcher's stay in the field, only 98 qualified residents actually lived in the field. The gap between population of interest and number of respondents is mainly due to the fact that many villagers worked as wage labourers at that time. An incomplete network requires extra caution when it is interpreted.

### 3.4.2 Questionnaire

Following 'name generator' approach (Marsden, 1990), respondents are asked to free-list the name of individuals that they would go to for advice if they had a question about using herbal medicine to alleviate stomach ache. The question is informed by my pilot survey and unstructured interviews with villagers. Stomach ache is a common symptom that villagers encounter, and this symptom is often considered mild and not stigmatised. Therefore,

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

respondents feel more comfortable and have the confidence to give clear answers. Before respondents completed the survey, the researcher highlighted that the question did not ask them who was a healer in the village but who they would go to.

### 3.4.3 Conducting the Survey

A combination of interviews and questionnaires was employed in the survey, wherein researcher read question from the questionnaire to respondents and recorded their answers. When a questionnaire is employed, questions are more likely to be asked in a consistent wording. When an interviewer is involved, the study gains reliability and flexibility: the interviewer can provide extra assistance when interviewee is confused or unresponsive, and the interviewee also takes the questions more seriously when they are put forward by a human being (Newman, 2011; Rea & Parker, 2014). During the interview, interviewees were prompted with question 'is there anyone else?' until they confirmed all the name had been listed (Henrich & Broesch, 2011). After the question had been answered, the researcher filled out the questionnaire form (see Appendix I). If an unexpected answer was received, the researcher would record the reason and leave it as a comment on the form.

### 3.4.4 Conducting the Analysis

Following Power's (2017) approach, the researcher constructed the network with igraph package (Csardi & Nepusz, 2006) in R software environment (R Core Team, 2013). To inform the sampling strategy, a constructed network was originally intended to be analysed with package of blockmodeling (Žiberna, 2014), which is related to the concept of regularly equivalent (Sailer, 1978; White & Reitz, 1983). However, because of the characteristics of the network structure, a simple visual inspection was sufficient. To identify learning biases, the data were then analysed with packages of statnet suite (Handcock, Hunter, Butts, Goodreau, & Morris, 2008).

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

Through packages of statnet suite, the researcher used exponential random graph models (ERGMs) to model herbal knowledge circulation network with known ties among respondents, which estimate the relative importance of each variable for selecting to whom respondents would go to for advice. Different from most statistical tests that assume the value of one observation does not influence the others (McDonald, 2009), ERGMs is developed as a technique to analyse non-independent data of the social network. An investigation on adaptive learning biases in Fijian villages by Henrich and Broesch (2011) has demonstrated how to apply ERGMs to predict the likelihood of ties, given individual (node-level), interpersonal (dyad-level) and structural (network-level) terms as variables. Informed by previous studies (Henrich & Broesch, 2011), the following variables are considered potentially valuable to predict learning biases: At the node level, age, gender, years of schooling, healer (whether the respondent is a healer), and herbal medicine user (whether the respondent self-reported as an herbal medicine user) are included. At the dyad-level, age difference (year), same gender, same household are included. At the network level, as additional control terms, geometrically weighted edgewise shared partners (GWESP) were included to help improve the model fitness.

## 3.5 Semi-Structured In-Depth Interview

Informed by the result of social network analysis, data were collected from six semi-structured in-depth interviews.

### 3.5.1 Interviewee Recruitment

Following a theoretical sampling strategy, the researcher recruited six interviewees (see Appendix II) among respondents of social network survey. The number of participants was limited by the issue of time, access and other practicalities. Although its theoretical sampling strategy can help to alleviate the disadvantage, the breadth of respondents' experience might not be sufficiently exhausted.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

Different from conventional methods of sampling, theoretical sampling is 'responsive to the data rather established before the research begins' (Corbin & Strauss, 2008: 144). Two theoretical considerations contributed to the formulation of sampling strategy: (1) Flat and centralized network. Contrary to expectations, the result of social network analysis shows that the structure of knowledge circulation network is fairly flat, in which most respondents sought advice from healers directly. It seems to suggest that, except for healers, there are no special social roles in the herbal knowledge circulation. (2) 'Expected inclusion' technique. Drawing on research about digital choice and digital exclusion (Eynon & Helsper, 2011: 543), 'expected inclusion' technique was applied to disentangle the theoretical focus from digital exclusion. This means interviewees who could narrate more recent experience of Internet use were preferred.

## 3.5.2 Topic Guide

Although participants were encouraged to put forward what they thought was important, the researcher developed a topic guide (see Appendix III) to provide a structure to interview. Following Galletta's (2013) approach, the topic guide was divided into three segments: (1) opening segment, intended to create space for narrative grounded in participant experience; (2) middle segment, was designed to study the topic with participant using concrete question driven by Schulz's four process of mediatization; (3) concluding segment, set to revisit the points in the narrative that deserve exploration. To accommodate emerging themes, the topic guide and questions were refined throughout the initial stage of the interview.

## 3.5.3 Conducting the Interview

Using a semi-structure format, all participants were interviewed face-to-face at their homes. Located in the respondent's normal environment, participants could clarify their narratives by giving a demonstration on their smart phone or inviting researcher to chew the processed medicinal plants.

# **In a Mediated Society, Can Indigenous Knowledge Survive?**

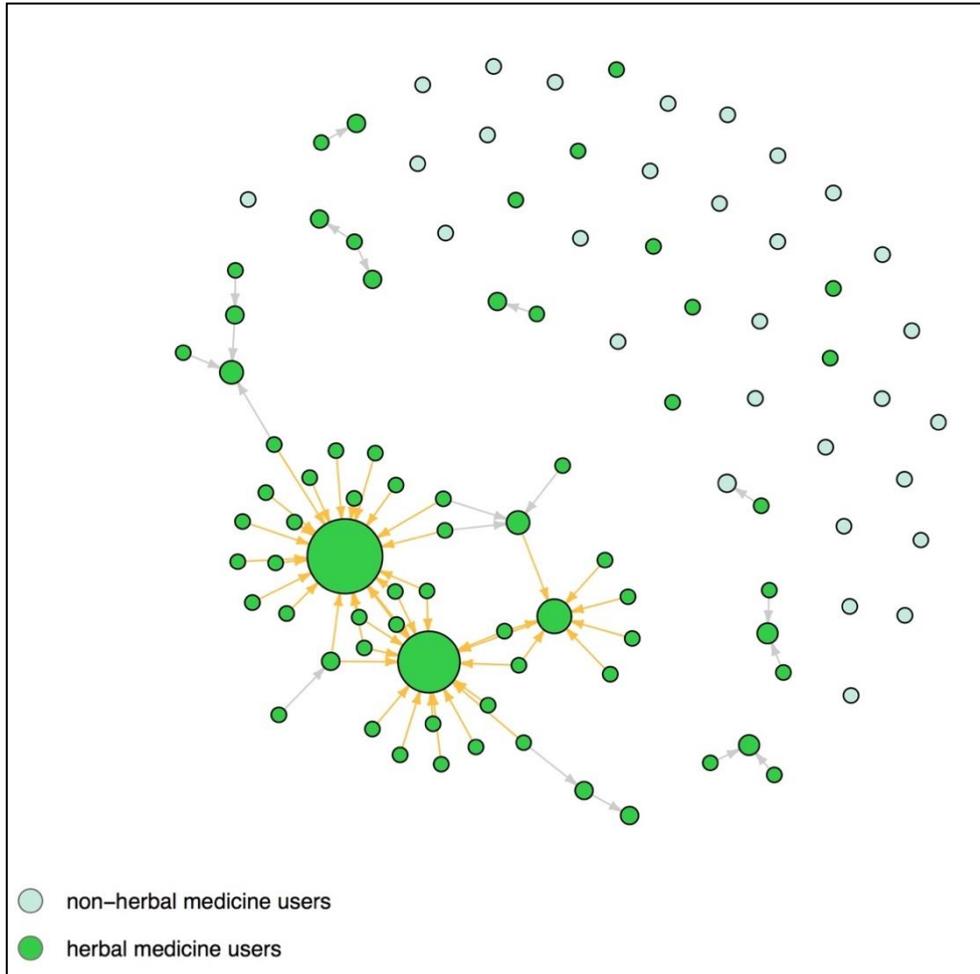
Anran Wang

## **3.5.4 Conducting the Analysis**

Considering nature of the research question, interview transcripts were analysed with thematic analysis, whereby themes are generated from data. Following Attride-Stirling's approach (2001:388), data were classified into three levels of themes: (1) Basic Themes, 'lowest-order premises evident in the text'. (2) Organizing Themes, 'categories of basic themes grouped together to summarize more abstract principles', and (3) Global Themes, 'super-ordinate themes encapsulating the principal metaphors in the text as a whole'. The key findings were presented in the result section. Additionally, relevant notes would be synthesized and analysed in the discussion section.

## **4 RESULTS OF SOCIAL NETWORK ANALYSIS**

This section provides a brief overview of the key findings from visual inspection and regression models of indigenous herbal knowledge circulation network.



**Figure 1 | Indigenous herbal knowledge circulation network of the adult residents in Luoxia Village (N = 98). Nodes are coloured by whether they still use herbal medicine and sized by indegree centrality. Edges are directed (with an arrow directed from the person requesting herbal medicine advice to the person providing it), and the edge directing to healers are highlighted in gold. The node layout is determined using the Fruchterman–Reingold algorithm.**

## 4.1 Visual Inspection

As can be seen from Figure 1, the network is centralised. In this network, a directed edge represents an interaction that a person would seek herbal medicine advice from another. Among 65 directed edges, about 71% edges were directed to three healers who are widely acknowledged

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

by other villagers. This result suggests that people substantially share the idea that healers are the proper people to provide herbal medicine advice, although which healer they actually go to is influenced by other factors.

Visual inspection also suggested that the structure of the network is flat. Contrary to expectation, difference in levels of knowledge did not lead to stratified structure in herbal knowledge circulation. The flat structure of the network suggests that ordinary folk might not play different social roles which shape people's behaviour and attitude. Therefore, the difference in experience among people is very likely smaller than expected.

What is surprising is that many people are isolated in indigenous herbal knowledge circulation network. After surveying all available adults (N=98) in the village, a total of 61 respondents were linked through 65 directed edges. In other words, 37 respondents were disconnected from the network. This is either because people reported that they did not use herbal healing anymore or they did not feel the need to ask for advice from others.

The visual inspection suggests: (1) structure of the network is flat and centralized. (2) Most herbal-advice seeking behaviour happens between healers and ordinary people. (3) Many people are excluded from indigenous herbal knowledge circulation.

## 4.2 ERGM Results

**Table 1 | ERGM results for selected variables, for the indigenous herbal knowledge circulation network.**

|                       | Estimate | S.E.  | Odds Ratio | P-value |
|-----------------------|----------|-------|------------|---------|
| Age (year)            | 0.009    | 0.015 | 1.009      | 0.5455  |
| Age difference (year) | 0.023    | 0.015 | 1.023      | 0.1135  |

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

|                           |       |       |         |              |
|---------------------------|-------|-------|---------|--------------|
| Healer ('no' = 0)         | 4.121 | 0.450 | 61.619  | < 0.0001 *** |
| Same household ('no' = 0) | 4.783 | 0.489 | 119.418 | < 0.0001 *** |
| S.E., standard error.     |       |       |         |              |

To study the learning biases in herbal advice acquiring behaviour, the researcher modelled the knowledge circulation network with ERGMs which predict the likelihood of a tie, given individual, interpersonal and structural variables (see the Methods section 3.4.4). The following variables are selected to examine pre-set learning biases hypotheses: (1) *age*, range from 18 to 83; (2) *age difference*, range from 0 to 65; (3) *healer*, 1 for healer and 0 for ordinary folks. (4) *same household*, 1 refers that two people are from the same household and 0 otherwise. The relevant results are shown in Table 1, and full ERGMs results are in Appendix IV.

*Age* was set to examine whether older people are selected more frequently as the source of herbal knowledge. The most striking result to emerge from the data is that the coefficient of age is close to 0 and insignificant. This suggests that age has no discernible effect on whether a person would be sought for advice.

*Age difference* is used to analyse whether people tend to learn from those with whom they share the similar age. Similar to age, the researcher did not find age difference as a significant explanatory variable in the model.

*Same household* is an explanatory variable in the model to test whether people are more likely to learn from a family member. Same household is by far the most powerful predictor of being sought for medicinal plant advice. The result suggests that two people are 119.42 times as likely to have an incoming tie if they are from the same household compared to if they are from different households.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

*Healer* was another powerful explanatory variable. It compares the healer's likelihood to have incoming ties with that of ordinary people. What stands out in the table is that being a healer dramatically increase the odds of an incoming tie, with those who are considered as healers being 61.62 times as likely to have an incoming tie as who are not in the village.

In summary, these results indicate that people prefer to get herbal advice from family members and healers. No evidence was found for people's preference to get herbal advice from older people or peers.

## 5 RESULTS OF SEMI-STRUCTURED IN-DEPTH INTERVIEW

This section provides an overview of the key findings from thematic analysis. Additional codes and examples can be found in Appendix V.

The cluster of themes includes two global themes: (1) medical practice in a remote Yao community and (2) limited mediatization of indigenous knowledge circulation.

The first global theme is mainly concerned with people's life experience related to medical practice. The main findings are as followed: firstly, the symptom is viewed as an objective phenomenon. Villagers can clearly dismantle the difference between biomedical treatment and herbal healing, and view them as two different approaches to alleviate or cure the symptom. Secondly, people pragmatically mixed the use of herbal healing and biomedical treatment in the practice. Herbal healing is built on the basis of indigenous knowledge, and biomedical treatment is seen as a branch of scientific knowledge. However, herbal healing and biomedical with different rationalities can live side by side in the same individual or society (Jovchelovitch, 2007; Moscovici, 2008). Thirdly, people's narratives reflected the lack of sophisticated medical equipment and doctors in the remote areas.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

In contrast, the second global theme is more relevant to the research question. Due to space limits, I will only present coded data from the second global theme.

## 5.1 Limited Mediatization of Indigenous Knowledge Circulation

### 5.1.1 Extension of Human Communication Capacity Limits

Living in the mountains, human communication capacity is limited by space. Evidence that Internet could bridge spatial distances has been found, though it is not particularly prominent in the domain of indigenous knowledge circulation.

#### *Online Encyclopaedia*

Online encyclopaedias have been used to look for symptom related information. Like Wikipedia, *Baidu Baike* (百度百科) is a Chinese-language collaborative web-based encyclopaedia. For some villagers, when encountering problems, it is a natural habit to use Baidu Baike. However, they are cautious about this information and only medical advice at low-risk levels will be adopted. As one interviewee actively mentioned:

*[I look for information] on Baidu Baike...When I feel uncomfortable, I search it on the Internet. I look for food suggestions [related to the symptom]. It is about which food helps to recover, and which food should be avoided. — Male, 24 years old (Document 4)*

Villagers are also aware the existence of herbal knowledge of the online encyclopaedia, but they do not consider it is possible to learn herbal knowledge through online encyclopaedia. In addition to doubts about the authenticity of Internet information, they also point out that herb species are limited to the local environment. Therefore, the extension on communication capacity is useless for them. The comment below illustrates the last point:

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

*I cannot ensure what on Baidu [Baikē] is right, because the herbs on their side are different from what we have here. In addition, some professionals also said that things on Baidu are not accurate. — Male, 39 years old (Document 1)*

## **Messaging Apps**

Messaging apps create the space for communication between scholars and ordinary people about medicinal plants. Residents of Luoxia are not only the people who value medicinal plants in their nearby environment. Scholars and experts in related fields have also shown interest in these plants, and their expertise might contribute to a hybridisation of indigenous herbal knowledge (Aswani & Sauer, 2018). However, the extension of human communication capacity does not lead to behaviour. As one interviewee put it:

*You know, there is a medicinal plant garden [an affiliated organisation of a prestigious Chinese research institution] in our region. They [scholars working there] told me that I could send photos of herbs to them directly, if I do not know those plants. However, I have not sent yet. [laugh] Because I have not seen something worthwhile. — Male, 39 years old (Document 1)*

## **5.1.2 Innovative but Unsuccessful Amalgamation Attempt**

A common view amongst interviewees was that the Internet had few impacts on their herbal knowledge circulation. This should not be mistaken that people have not attempted to use the Internet to address the issue. As the Internet is woven into the fabric of everyday life, these attempts are often unconscious. Identifying herbs through online applications is an example of these attempts.

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

### *Plant Identification Apps*

Use of plant identification apps is a blueprint of amalgamation between the Internet and learning of indigenous herbal knowledge. In order to enable villagers to introduce decorative plants to the visitors, *Huabanlv* (花伴侣) was introduced to two interviewees of this study by an NGO worker. As a product of the combination of image recognition and plant image library, *Huabanlv* could identify and provide a short introduction about the plant when user takes photos of that. The unexpected application in identifying herbs was quickly put into examination by the two interviewees. However, low recognition rate led to the suspicion of the credibility and usefulness of the application. This suspicion led to the abandonment of application use and sharing. For example, one interviewee said:

*When I do not know the name of the herb, I will scan the herb [with Huabanlv]. However, I find that the identification results vary almost every time even for the same plant. Once I took a photo of my friend, this application also told me a name of a plant [Laugh]. I do not dare to use this for herb collection...I showed other guys about how to use this application. They said it was useless. — Male, 27 years old (Document 2)*

This view of uselessness was echoed by another informant who highlighted a language gap:

*I went to find herbs before. I knew what I was looking for. I used Huabanlv to identify it. It was simply not right... Its name is different from what we say [in Yao]. — Male, 24 years old (Document 4)*

Indigenous herbal knowledge is often recorded in the local Yao language, while the language of the Internet is dominated by Chinese in China. Although youth from the village are bilingual, it is very difficult to translate the name of the herb between two languages.

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

### 5.1.3 Uninteresting Space for Herbal Knowledge Circulation

Apart from the aforementioned extension and potential amalgamation process, there was no convincing evidence of substitution and accommodation. Participants expressed their views on the mediatization of indigenous knowledge circulation in the future. Most interviewees do not believe the Internet is a proper platform for acquiring and sharing medical advice for the following reasons.

First, the Internet does not have the authority as medical advice provider. There was always a worry about the real identity of the person who gives medical advice on the Internet, whether the medical advice is about biomedical treatment or herbal healing. One participant commented:

*It might be true or false, I will not try it. Because no one can determine the authenticity of online information, people will not follow that. Maybe the author was bored and was just scribbling. If that [medical advice] is so good, why should he write online? Even if there would be a hospital-based online healthcare service, how do I know that I am not visiting a fake website? — Male, 39 years old (Document 1)*

The Internet does not have mechanism to reward the healer for their indigenous herbal knowledge sharing. Indigenous herbal knowledge is often considered as intelligence property of healer (Agrawal, 1995). Although the price could be as low as a cigarette, healers expect to be rewarded. Many healers keep their core herb formulation secret, and only pass it to their decedents or apprentice. Therefore, healers lack motivation to share their knowledge on the Internet.

*Even if you post it online, other people would not believe that. If someone tries it, I guess it would not work. People need to visit the healer with a sincere heart. Everything online is free. The healer would not get paid. If you visit the healer by yourself, the healer can*

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

*at least earn some money. Free herbal advice is impossible to be effective. — Male, 20 years old (Document 6)*

The only female interviewee is the only person who seems to be interested in online medical knowledge circulation. It is probably because women are not encouraged to study herbal medicine in Luoxia. Mediatization of indigenous knowledge circulation might provide females a fair chance. She reported that:

*If we [female villagers] are going to learn [herbal knowledge] from them, we have to pay. We have never tried. But even if we require to learn with them, we don't know if they will teach us... [If there is an online herbal library,] I will try to learn... If there is an online medical service, I will give it a try. — Female, 29 years old (Document 3)*

Overall, mediatization of indigenous knowledge circulation in Luoxia is negligible. These results provide support to the extension process and identify an unsuccessful amalgamation attempt. In addition, there is no convincing evidence for substitution and accommodation process.

## 6 DISCUSSION

### 6.1 Influence of Internet Use on Indigenous Herbal Knowledge Circulation

Using Schulz's (2004) four-process approach to guide the measurement, this study explores ongoing and potential mediatization in the domain of herbal knowledge circulation. The result does not provide convincing evidence for the existence of profound change and transformation in herbal knowledge circulation induced by Internet use. To be fair, extension of human communication capacity was detected. Villagers use an online encyclopaedia to look for symptom related information, and follow low-risk herb food suggestion to alleviate symptoms. With messaging apps, some villagers have access to communicate with botanic scholars directly. The

# **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

researcher also noticed an unsuccessful attempt to amalgamate image recognition technology with herb identification. These changes seem to promise a technological future, but have little if ever effects on actual indigenous herbal knowledge circulation. The finding shows that villagers were aware that Internet extends their communication capacity which used to be limited by the remoteness of their village, but did not consider the Internet could carry herbal or medical related information.

With regard to worry about cultural homogenization (Agrawal, 1995), Internet use might not pose the most serious threat to indigenous herbal knowledge circulation. The results of thematic analysis indicate that people are more pragmatic than expected when addressing health issue. Since there is a lack of sophisticated medical equipment and doctors in the remote area, they mix biomedical treatment and herbal healing to respond to health threats in different situations. Therefore, biomedical treatment is not a complete substitute for herbal healing in the field. Although health discourse on the Internet is mainly dominated by scientific knowledge (Desta, 2009), potentially more respect for scientific knowledge that people gain from the Internet might not lead to the devaluation of indigenous herbal knowledge, because the latter still help to supplement unsatisfactory medical infrastructure in the remote area.

Collectively, these findings suggest that Internet use might not have a substantive impact on indigenous herbal knowledge circulation in Luoxia. Firstly, drawing on Schulz's (2004) four-process approach, this study does not find evidence that Internet use induces profound change on indigenous herbal knowledge circulation. Secondly, as biomedical treatment is not a complete substitute for herbal healing, potentially increasing respect for modern medicine does not constitute a major threat to herbal healing which embed indigenous herbal knowledge.

## **6.2 Possible Explanation for Negligible Impact of Internet Use**

There are different practical reasons to explain the negligible impact of Internet use. Villagers have listed the language gap, regional herb species differences and the lack of reward mechanisms

## **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

as reasons to explain why they do not use the Internet to learn or share indigenous herbal knowledge. The Internet is constructed by people from urban settings, and how to accommodate indigenous knowledge does not seem to be their first priority. As the excerpt on plant identification apps has shown, villagers have to be very innovative to turn the expanded human communication capacity into something meaningful to them.

In addition, a common concern amongst interviewees was the authority of an online information provider. Hjarvard (2008) offers a perspective to view mediatization as a process that media to some extent takeover traditional institution's authority as an information provider or storytellers. In this study, interestingly, most interviewees were open to the idea sharing indigenous herbal knowledge online, but most of them stated that they would not believe in herbal knowledge or medical advice that they found online, even if the knowledge and advice were provided by seemingly verified institution or doctors. Interviewees tend to reject the authority of online herbal or health information provider.

Drawing on the concept of habitus (Bourdieu, 1990a), this tendency might come from their deeply ingrained past experience, which is operationalized in relation to learning biases in this study. Synthesizing findings from thematic analysis and social network analysis, villagers prefer to get herbal advice from who are close to them, for example family members and close friends, or those who hold the role of healer. Thus, it seems reasonable that people would not follow herbal advice or knowledge shared by acquaintances in social media, or strangers in other platforms such as online encyclopaedias. For the same reason, they are also not used to share herbal knowledge on the social media. However, villagers are also sceptical about the idea of hospital-based online medical service. Drawing on the centralised and flat structure of indigenous herbal knowledge circulation network, it could be sensed that people prefer to get herbal advice from healer directly. Villagers might not like the medium between them with healers other than word of mouth. In the context of mediated society, it is therefore likely that the authority to provide herbal or health advice and information still reside in word-of-mouth communication. As a one interviewee put

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

it: 'I will only follow the medical advice on the internet after I have seen the doctor myself in the hospital'. Word-of-mouth communication could provide a sense of accountability associated with coexistence in space, which mediated communication solely do not provide.

## 6.3 Discussion on Theory and Methodology

Based on the conversation between theory and data, habitus seems useful to explain the absence of profound mediatization in this study. It could not only account for the influence of previous learning biases on the present herbal knowledge circulation, but also predict people's innovation to adapt indigenous knowledge circulation in a mediated society. In addition, this study also supports habitus' account on the mechanism of change. As unsuccessful amalgamation has showed, individual 'deviation' and outside socialization could serve as an interrupter of routinised behaviour from the past (Bourdieu, 1996:186), although the change does not happen easily. Therefore, this study argues that habitus may help to understand the precondition of mediatization. One limitation of habitus, however, is that there is no consensus on how to operationalize habitus (Reay, 2004). Although habitus is designed to be an 'open concepts' to guide empirical work (Bourdieu, 1990b: 107), it is dangerous when everything emerged in the data could be seen in relation to habitus.

The application of network ethnography has been proved valuable for offering opportunities of reflection for each method with regard to data collection and analysis (Berthod, Grothe-Hammer, & Sydow, 2017). Whether people prefer to get herbal advice from the elder is a good illustration of how this methodology can help to avoid misinterpretation. The outcome of social network analysis is contrary to the initial unstructured interview. Through addressing this issue in the in-depth interview, it seems to indicate that people prefer to get herbal advice from certain old people such as healers, but just being old doesn't mean they would be preferred. Similarly, although many respondents reported that they did not use herbal healing in the social network survey, in-depth interview shows that it might be due to herbal healing has long been a part of

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

the taken for granted lifeworld. It became transparent to individuals. Although mixed-method approach has helped to make bias accountable, these data still need to be interpreted with caution because sample size of in-depth interview is small and many judgements of researcher have been put through the social network analysis.

## 6.4 Implication on Professional Practice

Although it is important to bear in mind the possible bias in this study, the present results might be interesting in at least two respects.

For preservation of indigenous herbal knowledge, *ex situ* conservation strategy is clearly inefficient. Although the above results suggest that the Internet does not accelerate erosion of herbal indigenous in Luoxia, but erosion of the knowledge have been pushed by other social processes. For example, many respondents reported that they did not use herbal healing anymore. In this context, *ex situ* conservation strategy advocates the creation of an online knowledge library to record indigenous knowledge. This idea is mainly challenged by two issues: First, it is difficult to persuade healers to publicize their secret medicine formulation. Second, herbal knowledge circulation is not simply a flow of information. It is almost impossible to convince people to entrust their health with an online knowledge library.

For policy aiming to supplement unsatisfying medical system in a remote area, online medical service could be based in local clinics. When experienced doctors from urban areas need to get involved, trained medical professional could help to report the symptom and interpret the medic advice. In this way, the difference in medical conditions between regions can be reduced, and the communication between doctors and patients is still to some extent a word-of-mouth communication.

## 7 CONCLUSION

Since very little was found in the literature on the influence of Internet use on the indigenous knowledge circulation, the present study was designed to systematically examine this phenomenon in a remote Yao community. Following four-process of mediatization approach proposed by Schulz (2004), the current study found that the Internet use had negligible influence on herbal knowledge circulation directly. Moreover, non-substitution relation between biomedical treatment and herbal healing in local system infers that cultural homogenization might not pose a serious risk to indigenous herbal knowledge circulation. Bringing two findings together, this study argues that Internet did not have significant influence on indigenous knowledge circulation in this remote Yao community. The results contribute to the understanding of mediatization of indigenous knowledge circulation in a small-scale remote society.

In an effort to explain the negligible influence of Internet use on indigenous herbal knowledge circulation, this study firstly examined people's learning biases in herbal advice seeking behaviour, and then compared it with people's life experience about herbal knowledge circulation on the Internet. The comparison seems to be consistent with Bourdieu's (1990a) theory of habitus which suggests people past preference for herbal advice would dispose their response to the new opportunity enabled by the Internet. When people seek herbal advice, they seek not only useful information but also information from source who has authority to provide it. The feature of online herbal knowledge circulation is inconsistent with people's preference from the past experience, thus online herbal knowledge circulation is considered untrustworthy for villagers. As mediatization theory is often criticized for take change for granted, the mechanism of change in habitus might help to explore the precondition of mediatization.

Although network ethnography was initially proposed studying the innovative organisational forms built around the Internet (Howard, 2002), this study examined the usefulness of network ethnography in the research of indigenous knowledge circulation whose unique organisational

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

forms developed in its local context. The synergistic research design is useful to bridge the gap between macro-structure and micro-agency, and offer a platform of reflection on data collection and analysis in each method.

This study might be of interest to public health policy makers, indigenous knowledge conservation advocates, and indigenous knowledge holders. The result suggests involving local medical professional into an online medical service might make the service more acceptable. Moreover, this study evidenced argument from previous research that *ex situ* conservation is a defective strategy to preserve indigenous herbal knowledge which is embedded in people's medical practice (Agrawal, 1995).

The Yao community provides a particularly suitable environment for the research design. In terms of theoretical perspective, the remote nature of community means there is less concern about alternative forms of mediatization enabled by older media, such as newspapers, books, TV, and radio. With respect to methodical perspective, remote location and small size means a relatively bounded knowledge circulation network. However, the community's short history with the Internet might induce bias in the research. Although mediatization has been observed in many domains of the community, it is likely that mediatization takes longer time to emerge in herbal knowledge circulation. Therefore, a further study could assess the long-term effects of Internet use on indigenous knowledge circulation.

# **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

## **8 ACKNOWLEDGEMENTS**

I would like to offer my sincere gratitude to Professor Robin Mansell, Professor Sonia Livingstone, Dr Eleanor Power, Dr Jennifer Sheehy-Skeffington and Dr Michael Muthukrishna from the London School of Economics and Political Science, as well as Professor Xiaoyun Li and Dr Qiang Dong from the China Agricultural University, for their wholehearted support and guidance throughout this project. I also owe my thanks to my friend Mark Markov, Hosna Jahan and Ke Ma for the generous help they have given me. I am perhaps most grateful for the kind welcome I received from the residents of Luoxia. During my stay, my problems were always too many people to visit and too many meals to have. Finally, I would like to thank my parents who gave me a curiosity about the world and the confidence to venture in.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

## REFERENCES

Agrawal, A. (1995). Dismantling the divide between indigenous and scientific knowledge. *Development and change*, 26(3), 413-439.

Ali, C. (2018). Wheat kings: Thoughts on a critical theory of rural communication. Paper for the CARGC Working Paper Series.

Anyinam, C. (1995). Ecology and ethnomedicine: exploring links between current environmental crisis and indigenous medical practices. *Social Science & Medicine*, 40(3), 321-329.

Aswani, S., Lemahieu, A., & Sauer, W. H. (2018). Global trends of local ecological knowledge and future implications. *PloS one*, 13(4), e0195440.

Attride-Stirling, J. (2001). Thematic networks: an analytic tool for qualitative research. *Qualitative research*, 1(3), 385-405.

Battiste, M. (2002). Indigenous knowledge and pedagogy in First Nations education: A literature review with recommendations (pp. 1-69). Ottawa, Canada: National Working Group on Education.

Baudrillard, J., & Levin, C. (1981). *For a Critique of the Political Economy of the Sign* (Vol. 262). St. Louis: Telos press.

Berthod, O., Grothe-Hammer, M., & Sydow, J. (2017). Network ethnography: A mixed-method approach for the study of practices in interorganizational settings. *Organizational Research Methods*, 20(2), 299-323.

Borgatti, S. P., & Molina, J. L. (2003). Ethical and strategic issues in organizational social network analysis. *The Journal of Applied Behavioral Science*, 39(3), 337-349.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

Bourdieu, P. (1984). *Distinction: A social critique of the judgement of taste*. London: Routledge & Kegan Paul.

Bourdieu, P. (1990a). *The logic of practice*. Stanford university press.

Bourdieu, P. (1990b). *In other words: Essays towards a reflexive sociology*. Stanford University Press.

Bourdiu, P. (1996). *The state nobility: Elite schools in the field of power*. Oxford: Polity Press.

Bourdieu, P., & Nice, R. (1977). *Outline of a Theory of Practice (Vol. 16)*. Cambridge: Cambridge university press.

Brady, F. R., Dyson, L. E., & Asela, T. (2008). Indigenous adoption of mobile phones and oral culture. *Cultural Attitudes towards Technology and Communications*.

Cavalli-Sforza, L. L., & Feldman, M. W. (1981). *Cultural transmission and evolution: a quantitative approach (No. 16)*. Princeton University Press.

Chudek, M., Muthukrishna, M., & Henrich, J. (2015). Cultural evolution. *The handbook of evolutionary psychology*, 749-769.

Corbin, J., & Strauss. (2008). *Basics of qualitative research: Techniques and procedures for developing grounded theory (3rd ed.)*. Los Angeles: SAGE Publications.

Couldry, N. (2008). Mediatization or mediation? Alternative understandings of the emergent space of digital storytelling. *New media & society*, 10(3), 373-391.

Couldry, N., & Hepp, A. (2013). Conceptualizing mediatization: Contexts, traditions, arguments. *Communication Theory*, 23(3), 191-202.

Csardi, G., & Nepusz, T. (2006). The igraph software package for complex network research. *InterJournal, Complex Systems*, 1695(5), 1-9.

## **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

Deacon, D., & Stanyer, J. (2014). Mediatization: key concept or conceptual bandwagon?. *Media, Culture & Society*, 36(7), 1032-1044.

Desta, A. (2009). *Comprehending indigenous knowledge: An ethnographic study of knowledge processes within natural resource management* (Doctoral dissertation, London School of Economics and Political Science (United Kingdom)).

Du, J. T., Haines, J., Sun, V. Q., Partridge, H., & Ma, D. (2015). Understanding indigenous people's information practices and internet use: a Ngarrindjeri perspective. In *Proceedings of the 19th Pacific Asia Conference on Information Systems (PACIS 2015)*. AIS Electronic Library.

Dutton, W., Helsper, E.J., & Gerber M.M. (2009) *The 2009 OxIS Survey: The Internet in Britain*. Oxford: Oxford University Press.

Dwyer, S. C., & Buckle, J. L. (2009). The space between: On being an insider-outsider in qualitative research. *International journal of qualitative methods*, 8(1), 54-63.

Edwards, S. E., & Heinrich, M. (2006). Redressing cultural erosion and ecological decline in a far North Queensland aboriginal community (Australia): the Aurukun ethnobiology database project. *Environment, Development and Sustainability*, 8(4), 569-583.

Escobar, A. (2011). *Encountering development: The making and unmaking of the Third World*. Princeton University Press.

Eynon, R., & Helsper, E. (2011). Adults learning online: digital choice and/or digital exclusion?. *New media & society*, 13(4), 534-551.

Finnemann, N. O. (2014). 13 Digitization: new trajectories of mediatization?. *Mediatization of communication*, 21, 297.

Freire, P. (1978). *Pedagogy in process: The letters to Guinea-Bissau*. London.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

Galletta, A. (2013). *Mastering the semi-structured interview and beyond: From research design to analysis and publication*. NYU press.

General Office of the State Council of the PRC. (2018). General Office of the State Council of the PRC's Opinion about Promoting 'Internet + healthcare' Development. Retrieved from [http://www.gov.cn/zhengce/content/2018-04/28/content\\_5286645.htm](http://www.gov.cn/zhengce/content/2018-04/28/content_5286645.htm).

Giday, M., Asfaw, Z., Elmqvist, T., & Woldu, Z. (2003). An ethnobotanical study of medicinal plants used by the Zay people in Ethiopia. *Journal of ethnopharmacology*, 85(1), 43-52.

Habermas, J. (1984). *The Theory of Communicative Action: Lifeworld and System: a Critique of Functionalist Reason*.-Cop. 1987.-457 S. Beacon press.

Handcock, M. S., Hunter, D. R., Butts, C. T., Goodreau, S. M., & Morris, M. (2008). statnet: Software tools for the representation, visualization, analysis and simulation of network data. *Journal of statistical software*, 24(1), 1548.

Hargittai, E., & Hinnant, A. (2008). Digital inequality: Differences in young adults' use of the Internet. *Communication research*, 35(5), 602-621.

Hargittai, E., & Hsieh, Y. P. (2013). The internet and democracy. In *The Oxford handbook of Internet studies*.

Henrich, J., & Broesch, J. (2011). On the nature of cultural transmission networks: evidence from Fijian villages for adaptive learning biases. *Philosophical Transactions of the Royal Society of London B: Biological Sciences*, 366(1567), 1139-1148.

Hepp A, Lunt P and Hartmann M (2014) Communicative figurations of the good life: ambivalences of the mediatization of homelessness and transnational migrant families. In: Wang H (ed.) *Communication and 'The Good Life'* (International Communication Association Theme Book Series, Volume 2). New York: Peter Lang, pp. 181–196.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

Hepp, A. (2014). Mediatization. A panorama of media and communication research. *Mediatization and sociolinguistic change*, 49-66.

Hjarvard, S. (2008). The mediatization of religion: A theory of the media as agents of religious change. In *Northern Lights 2008. Yearbook of Film & Media Studies* (pp. 9- 26). Bristol, U.K.: Intellect Press.

Howard, P. N. (2002). Network ethnography and the hypermedia organization: New media, new organizations, new methods. *New media & society*, 4(4), 550-574.

Jenkins, R. (1992). *Pierre Bourdieu (Key sociologists)*. London: Routledge.

Jovchelovitch, S. (2007). *Knowledge in context: Representations, community and culture*. Routledge.

Kral, I. (2014). Shifting perceptions, shifting identities: Communication technologies and the altered social, cultural and linguistic ecology in a remote indigenous context. *The Australian Journal of Anthropology*, 25(2), 171-189.

Krotz, F. (2007). The meta-process of mediatization'as a conceptual frame. *Global media and communication*, 3(3), 256-260.

Lakatos, I. (1983) *The Methodology of Scientific Research Programmes* (ed Worrall J and Currie G). Cambridge: Cambridge University Press.

Lerner, D. (1958). *The passing of traditional society: Modernizing the Middle East*. Glencoe, Ill.: Free Press.

Li, S., Long, C., Liu, F., Lee, S., Guo, Q., Li, R., & Liu, Y. (2006). Herbs for medicinal baths among the traditional Yao communities of China. *Journal of ethnopharmacology*, 108(1), 59-67.

Linton, R. (1936). *The study of man: an introduction*.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

Livingstone, S., & Helsper, E. (2007). Gradations in digital inclusion: Children, young people and the digital divide. *New media & society*, 9(4), 671-696.

Livingstone, S., & Sefton-Green, J. (2016). *The class: Living and learning in the digital age*. NYU Press.

Luczkovich, J. J., Borgatti, S. P., Johnson, J. C., & Everett, M. G. (2003). Defining and measuring trophic role similarity in food webs using regular equivalence. *Journal of Theoretical Biology*, 220(3), 303-321.

Lundby, K. (2014). *Mediatization of Communication: Handbooks of Communication Science*, vol. 21. Berlin, Germany: De Gruyter Mouton.

Lunt, P., & Livingstone, S. (2016). Is 'mediatization' the new paradigm for our field? A commentary on Deacon and Stanyer (2014, 2015) and Hepp, Hjarvard and Lundby (2015). *Media, Culture & Society*, 38(3), 462-470.

MacKenzie, D., & Wajcman, J. (1999). *The social shaping of technology* (No. 2nd). Open university press.

Mancenelli, E. (2007) *e-Inclusion in the Information Society*. Budapest: European Union. Mumtaz

Manheim, E. (1979). *Aufklärung und öffentliche Meinung: Studien zur Soziologie der Öffentlichkeit im 18. Jahrhundert*. [Enlightenment and public opinion: studies on the sociology of the public in the 18th century], Frommann-Holzboog.

Mansell, R. (1982). The "new dominant paradigm" in communication: Transformation versus adaptation. *Canadian Journal of Communication*, 8(3).

Manyozo, L. (2012). *Media, communication and development: Three approaches*. SAGE Publications India.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

Marsden, P. V. (1990). Network data and measurement. *Annual review of sociology*, 16(1), 435-463.

Mazzocchi, F. (2006). Western science and traditional knowledge: Despite their variations, different forms of knowledge can learn from each other. *EMBO reports*, 7(5), 463-466.

Mazzoleni, G., & Schulz, W. (1999). "Mediatization" of politics: A challenge for democracy?. *Political communication*, 16(3), 247-261.

McDonald, J. H. (2009). *Handbook of biological statistics* (Vol. 2, pp. 173-181). Baltimore, MD: sparky house publishing.

Moscovici, S. (2008). *Psychoanalysis: Its image and its public*. Polity.

Nakata, M. (2002). Indigenous knowledge and the cultural interface: Underlying issues at the intersection of knowledge and information systems. *IFLA journal*, 28(5-6), 281-291.

Newman, M. (2011). *Networks*. Oxford university press.

Parker, E., Hudson, H. E., Dillman, D. A., & Roscoe, A. D. (1989). Rural America in the information age. *Rural America In the Information Age: Telecommunication Policy for Rural Development*, 1-10.

Pauly, D. (1995). Anecdotes and the shifting baseline syndrome of fisheries. *Trends in ecology & evolution*, 10(10), 430.

Pilgrim, S., Samson, C., & Pretty, J. (2009). Rebuilding lost connections: how revitalisation projects contribute to cultural continuity and improve the environment. *Interdisciplinary Centre for Environment and Society Occasional Paper*, 1, 2009-1.

Power, E. A. (2017). Social support networks and religiosity in rural South India. *Nature Human Behaviour*, 1(3), 0057.

## **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

Ragupathy, S., Steven, N. G., Maruthakkutti, M., Velusamy, B., & Ul-Huda, M. M. (2008). Consensus of the 'Malasars' traditional aboriginal knowledge of medicinal plants in the Velliangiri holy hills, India. *Journal of Ethnobiology and Ethnomedicine*, 4(1), 8.

Ramos, P. H. S. (2014). Towards a developmental framework for net neutrality: The rise of sponsored data plans in developing countries.

Rea, L. M., & Parker, R. A. (2014). *Designing and conducting survey research: A comprehensive guide*. John Wiley & Sons.

Reay, D. (2004). 'It's all becoming a habitus': Beyond the habitual use of habitus in educational research. *British journal of sociology of education*, 25(4), 431-444.

Rice, E. S., Haynes, E., Royce, P., & Thompson, S. C. (2016). Social media and digital technology use among Indigenous young people in Australia: a literature review. *International journal for equity in health*, 15(1), 81.

Ridington, R. (1990). *Little Bit Know Something Stories in a Language of Anthropology*. Iowa City: University of Iowa Press.

Rogers, E. (1962) *Diffusion of Innovations*. The Free Press, New York.

Ruddle, K., & Chesterfield, R. (1977). *Education for traditional food procurement in the Orinoco Delta* (Vol. 53). Univ of California Press.

Sailer, L. D. (1978). Structural equivalence: Meaning and definition, computation and application. *Social Networks*, 1(1), 73-90.

Schulz, W. (2004). Reconstructing mediatization as an analytical concept. *European journal of communication*, 19(1), 87-101.

Scott, J. (2017). *Social network analysis*. Sage.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

Srithi, K., Balslev, H., Wangpakapattanawong, P., Srisanga, P., & Trisonthi, C. (2009). Medicinal plant knowledge and its erosion among the Mien (Yao) in northern Thailand. *Journal of Ethnopharmacology*, 123(2), 335-342.

Sujarwo, W., Arinasa, I. B. K., Salomone, F., Caneva, G., & Fattorini, S. (2014). Cultural erosion of Balinese indigenous knowledge of food and nutraceutical plants. *Economic Botany*, 68(4), 426-437.

Swartz, D. L. (2002). The sociology of habit: The perspective of Pierre Bourdieu. *OTJR: Occupation, Participation and Health*, 22(1\_suppl), 61S-69S.

Team, R. C. (2013). R: A language and environment for statistical computing.

Tsatsou, P. (2009). Reconceptualising 'time' and 'space' in the era of electronic media and communications. *Platform*, 1(1), 11-32.

Voeks, R. A., & Leony, A. (2004). Forgetting the forest: assessing medicinal plant erosion in eastern Brazil. *Economic Botany*, 58(1), S294-S306.

Warren, C. A. (2002). Qualitative interviewing. *Handbook of interview research: Context and method*, 839101.

Warren, D. M. (1991). Using indigenous knowledge in agricultural development (No. 127). World Bank.

White, D. R., & Reitz, K. P. (1983). Graph and semigroup homomorphisms on networks of relations.

World Health Organization. (2000). WHO medicines strategy: framework for action in essential drugs and medicines policy 2000-2003.

## **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

Yang, Y. (2014). Bourdieu, Practice and Change: Beyond the criticism of determinism. *Educational Philosophy and Theory*, 46(14), 1522-1540.

Zarger, R., & Stepp, J. (2004). Persistence of botanical knowledge among Tzeltal Maya children. *Current Anthropology*, 45(3), 413-418.

Žiberna, A. (2014). Blockmodeling of multilevel networks. *Social networks*, 39, 46-61.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

## 9 APPENDICES

### 9.1 Appendix I Social Network Analysis Questionnaire Form

| Social Network Analysis Survey for A Network Ethnography Examining the Influence of Internet Use on Indigenous Herbal Knowledge Circulation in a Remote Yao Community |           |          |          |          |          |          |                     |  |
|---|-----------|----------|----------|----------|----------|----------|---------------------|--|
| 社会网络分析问卷：互联网使用对草药知识流通的影响  |           |          |          |          |          |          |                     |  |
| Who would you go to for advice if you had a question about using herbal medicine to alleviate stomach pain?   |           |          |          |          |          |          |                     |  |
| 当你肚子疼痛的时候，你会向谁请教意见？   |           |          |          |          |          |          |                     |  |
| ID  | Family ID | 1st name | 2nd name | 3th name | 4th name | 5th name | name (non-resident) |  |
| 1   |           |          |          |          |          |          |                     |  |
| 2   |           |          |          |          |          |          |                     |  |
| 3   |           |          |          |          |          |          |                     |  |
| 4   |           |          |          |          |          |          |                     |  |
| 5   |           |          |          |          |          |          |                     |  |
| 6   |           |          |          |          |          |          |                     |  |
| 7   |           |          |          |          |          |          |                     |  |

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

|    |  |  |  |  |  |  |  |  |
|----|--|--|--|--|--|--|--|--|
| 8  |  |  |  |  |  |  |  |  |
| 9  |  |  |  |  |  |  |  |  |
| 10 |  |  |  |  |  |  |  |  |

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

## 9.2 Appendix II Demographic Information About Interviewees

| Demographic Information About Interviewees |     |     |       |
|--|-----|-----|-------|
| Interviewee                                | Sex | Age | H.M.U |
| 1  | M   | 39  | Y     |
| 2  | M   | 27  | N     |
| 3  | F   | 29  | N     |
| 4  | M   | 24  | Y     |
| 5  | M   | 21  | Y     |
| 6  | M   | 20  | Y     |

H.M.U., Did the interviewee self-report as an herbal medicine user in the social network survey?

## 9.3 Appendix III Semi-Structured In-Depth Interview Topic Guide

### (1) Brief Introduction and a warm up

The researcher starts from introduction of the research project and the interview. After confidentiality is discussed, researcher will ask the participant to fill out the consent form and give consent to record.

When was the last time you used herbal healing? How did you use that? How did you learn the usage of that? Did you feel better after using it?

### (2) Main topics

#### 1. Tension between indigenous herbal knowledge and scientific biomedical knowledge

Have you ever seen a doctor for similar symptom? According to your experience, what is the difference between herbal healing and biomedical treatment? What influence your decision of visiting a doctor or using herbal healing? From your own observation of other villagers, do you think most health issues can be addressed at the local level?

#### 2. Influence of the Internet use on indigenous herbal knowledge circulation

What kinds of health information have you seen while surfing the Internet? Did you use the Internet to find health information consciously (symptom-related information/ name and the usage of herb/ treatment shared by other patients or doctors)? Did anyone share with you about how to use the Internet for health information? If there is a conflict between information on the Internet and what you already know, how do you think of it and how do you do? How do you think of the Internet as a space to learn, share or preserve herbal knowledge? How do you think of the online health service?

# **In a Mediated Society, Can Indigenous Knowledge Survive?**

Anran Wang

## (3) Summing up

Researcher conclude the key points, ask participant for additional thoughts or final points, and thank participant for their contribution to the research.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

## 9.4 Appendix IV Full ERGMs Results

Table 1 | ERGM results for selected variables, for the full indigenous medicinal plant knowledge circulation network.

|                      | Estimate | S.E.  | Odds Ratio | P-value      |
|----------------------|----------|-------|------------|--------------|
| edges                | -17.353  | 2.465 | < 0.0001   | < 0.0001 *** |
| nodecov.edu          | -0.077   | 0.038 | 0.926      | 0.0431 *     |
| nodefactor.sex.1     | 0.754    | 0.360 | 2.125      | 0.0362 *     |
| nodeicov.age         | 0.009    | 0.015 | 1.009      | 0.546        |
| absdiff.age          | 0.023    | 0.015 | 1.023      | 0.114        |
| nodeifactor.healer.1 | 4.121    | 0.450 | 61.619     | < 0.0001 *** |
| nodematch.family     | 4.783    | 0.489 | 119.418    | < 0.0001 *** |
| nodefactor.husage.1  | 4.281    | 1.084 | 72.325     | < 0.0001 *** |
| odegree0             | -2.171   | 0.585 | 0.114      | 0.0002 ***   |
| gwesp.fixed.0.1      | 0.884    | 0.275 | 2.420      | 0.0013 **    |

S.E., standard error.

# In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

## 9.5 Appendix V Coding Frame

| <b>Research Question:</b> What is the influence of Internet use on indigenous herbal knowledge circulation in a remote Yao community? |              |   |  |
|---|--------------|---|--|
| <b>1 Global Theme:</b> Medical practice in a remote Yao community   |              |   |  |
| Organising Themes   | Basic Themes | Description   | Example  |
| The comparison between herb healing and biomedical system   | Rationale    | Explanation about how to understand the mechanism of herbal healing and biomedical treatment. | Herbal medicine concerns the whole body. Because it is not only useful for the wound, it is also useful to the whole body. The Western medicine, focusing on where it hurts, will not benefit the entire body. |

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

|  |  |  |  |
|--|--|--|--|
|  | Effectiveness                                | Comparison of herbal healing and biomedical treatment effectiveness. | Western medicine is much better than herbal medicine. Now, western medicine can cure cancer and leukaemia. Herbal medicine is just okay. It cannot deal with severe illness.   |
|  | Convenience                                  | Comparison of herbal healing and biomedical treatment convenience.   | It may be better to go to the hospital, because the herbs are now more and more difficult to find. The merchant will come to buy it, because it is wild, and some take years to grow up. If everyone collects a little, herbs will disappear soon. |
|  | Cost   | Comparison of herbal healing and biomedical treatment cost.          | Going to the hospital is a waste of money. There are herbs on the mountain, and they cost nothing,   |
|  | Unsatisfactory health system in remote areas | The lack of sophisticated medical                                    | Herbal medicine is safer...you know it, so you do not worry about it. But Western medicine is prescribed by others. We do not believe that [laughs]...Some doctors are just interns...You  |

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

|                             |                    |   |   |
|-----------------------------|--------------------|---|---|
|                             |                    | equipment and doctors in remote areas.  | are a little worried about prescriptions from inexperienced doctors . You can be dead if they make a mistake [laughs]...and when they become more experienced, they will be transferred to the county hospital. |
| Villagers' medical strategy | The right medicine | People choose different types of medical practices by the severity of illness.    | If it is a minor illness, it can be solved at home. If it is not, it is necessary to go to the hospital.  |
|                             | Trial              | People choose different types of medical practices according to different stages. | I use herbs first, and if herbs do not work. I go to the hospital. If the hospital [biomedical treatment] does not work as well, I can only go home to try herbs again.   |

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

|                             |                 |   |   |
|-----------------------------|-----------------|---|---|
|                             | Procrastination | People choose to use the most convenient means to maintain their condition. | I will get a headache after being blown by the wind. This is a minor illness. I have never visited the hospital for this. If I go to the hospital, and the doctor may be not good at prescribing medicine, my pain will continue. |
| Who to give medical advice? | Intimacy        | Close friend / family member  | Some [herb knowledge] are what my parents said. Some [herb knowledge] are told by friends...They are my close friend. I know them well. I know them for a long time. I meet with them quite often.                                |

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

|  |            |                 |   |
|--|------------|-----------------|---|
|  | Profession | Doctor / healer | I will only follow the medical advice on the internet after I have seen the doctor myself in the hospital |
|--|------------|-----------------|---|

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

| <b>2 Global Theme:</b> Mediatization of indigenous knowledge circulation |                      |  |   |
|--|----------------------|--|---|
| Organising Themes  | Basic Themes         | Description  | Example   |
| Extension of human communication capacity limits                         | Online encyclopaedia | Online encyclopaedia enable villagers to learn symptom related information.    | [I look for information] on Baidu Baike...When I feel uncomfortable, I search it on the Internet. I look for food suggestions [related to the symptom]. It is about which food helps to recover, and which food should be avoided.  |
|  | Messaging apps       | Messaging apps enable villagers to communicate with herb experts and scholars. | You know, there is a medicinal plant garden [an affiliated organisation of a prestigious Chinese research institution] in our region. They [scholars working there] told me that I could send photos of herbs to them directly, if I do not know those plants. However, I have not sent yet. [laugh] Because I have not seen anything worthwhile. |

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

|   |                                  |  |   |
|---|----------------------------------|--|---|
| <p>Innovative but unsuccessful amalgamation attempt</p>     | <p>Plant identification apps</p> | <p>Plant identification apps were used in herb collection.</p>   | <p>When I do not know the name of the herb, I will scan the herb [with Huabanlv]. However, I find that the identification results vary almost every time even for the same plant. Once I took a photo of my friend, this application also told me a name of a plant [Laugh]. I do not dare to use this for herb collection...I showed other guys about how to use this application. They said it was useless.</p> |
| <p>Uninteresting space for herbal knowledge circulation</p> | <p>Authority</p>                 | <p>The lack of authority to provide medical/herbal information makes people not interested in information on the Internet.</p> | <p>It might be true or false, I will not try it. Because no one can determine the authenticity of online information, people will not follow that. Maybe the author was bored and was just scribbling. If that [medical advice] is so good, why should he write online? Even if there is a hospital-based online healthcare service, how do I know that I am not visiting a fake website?</p>                     |

## In a Mediated Society, Can Indigenous Knowledge Survive?

Anran Wang

|  |                  |  |  |
|--|------------------|--|--|
|  | Reward mechanism | The lack of reward mechanism for healers makes them not interested in sharing information on the Internet. | Even if you post it online, other people would not believe that. If someone tried it, I guess it would not work. People need to visit the healer with a sincere heart. Everything online is free. The healer would not get paid. If you visit the healer by yourself, the healer can at least earn some money. Free herbal advice is impossible to be effective. |
|  | Gender issue     | Tradition herbal knowledge circulation is gendered. The Internet might provide a fair chance for female.   | If we are going to learn [herbal knowledge] from him, we have to pay, but we have never learned. But if we require to learn from them, we don't know if he will teach us... [If there is an online herbal library,] I will try to learn it.  |