Society, Biology and Human Affairs applies the Attribution Non-Commercial Share Alike 3.0 Unported (CC-BY-NC-SA 3.0) License http://creativecommons.org/licenses/by-nc-sa/3.0/ to all works it publishes. Under the CC BY-NC-SA 3.0, authors retain ownership of the copyright for their work, but authors allow anyone to copy, distribute, transmit and adapt their work for non-commercial purposes, so long as the original authors and source are cited and the resulting work is distributed only under the same or similar license to this one.

Society, Biology and Human Affairs Notice and Takedown Policy:

If you are a rights owner and are concerned that you have found material, for which you are the rights owner, on our website and you have not given permission, please contact us in writing stating the following:

1. Your contact details
2. The full bibliographic details of the material
3. The URL of the item
4. A statement that, under penalty of perjury, you are the rights owner or are authorised to act for the rights owner.

Please send to:

Society, Biology and Human Affairs, Editor
Department of Anthropology
Durham University
Dawson Building, South Road
Durham, DH1 3LE
United Kingdom

SBHA_editor@biosocsoc.org

The ‘Notice and Takedown’ procedure is then invoked as follows:

1. Society, Biology and Human Affairs will acknowledge receipt of your complaint by email or letter and will make an initial assessment of the validity and plausibility of the complaint.
2. The material will be temporarily removed from the Society, Biology and Human Affairs’ website pending an agreed solution.
3. Society, Biology and Human Affairs will contact the contributor who submitted the material. The contributor will be notified that the material is subject to a complaint, under what allegations, and will be encouraged to assuage the complaints concerned.
4. The complainant and the contributor will be encouraged to resolve the issue swiftly and amicably and to satisfaction of both parties, with the following possible outcomes:
   a) The material is replaced on the Society, Biology and Human Affairs’ website unchanged.
   b) The material is replaced on the Society, Biology and Human Affairs’ website with changes.
   c) The material is permanently removed from the website.
5. If the contributor and the complainant are unable to agree a solution, the material will remain unavailable through the Society, Biology and Human Affairs’ website until a time when a resolution has been reached.

Society, Biology and Human Affairs
ISSN 2046-0058
Contents

Editorial.................................................................................................................................iii

Original Articles

Beware the animals that dance: conservation as an unintended outcome of cultural practices
Ashley Massey, Shonil Bhagwat, and Paul Porodong...........................................................1

Is there a psychological proximate mechanism for inducing a Trivers-Willard effect in humans? Results of an internet experiment looking at the desired sex composition of children after mortality priming
Paul Mathews.........................................................................................................................11

Ocular conditions among women involved in palm kernel oil processing in the Cape Coast Metropolis, Ghana
Augustine Tanle, AA Ilechie, Kofi Awusabo-Asare, GO Ovenseri and M Anderson.........................25

The Abortion Debate in Mexico: Newspaper Coverage and Discourse, 2001-2003
Emily Vala-Haynes, Rob Stephenson, Roger Rochat, Eileen A. Yam, Lisa G. Rosas, Sandra G. Garcia.................................................................41

Instructions for Authors...........................................................................................................63

Editor: Dr Alejandra Núñez-de la Mora, Department of Anthropology, Durham University
Dawson Building, South Road, Durham DH1 3LE
Email: SBHA_Editor@biosocsoc.org

Editorial Board
Robert Attenborough (Australian National University), Renee Cadzow (State University of New York at Buffalo), Leslie Carlin (Brighton and Sussex Medical School), George Ellison (London Metropolitan University), Mhairi Gibson (University of Bristol), Rie Goto (University of Cambridge), Paula Griffiths (Loughborough University), Kate Hampshire (Durham University), Nick Mascie-Taylor (University of Cambridge), Doreen Montag (Australian National University), Catherine Panter-Brick (Durham University), Tessa Pollard (Durham University), Dan Sellen (University of Toronto), Lyliane Rosetta (CNRS, Paris), Claudia Valeggia (University of Pennsylvania), Maria Inês Varela-Silva (Loughborough University)

Editorial Assistant: Erika McClure, Department of Anthropology, Durham University
Editorial

In this issue of Society, Biology and Human Affairs we see once more the richness of topics to which a biosocial approach can be applied. Ashley Massey and collaborators employ the case study of Gumantong in Sabah, Malaysian Borneo, to highlight the distinction between communities expressing an intention to conserve and conservation as an unintended outcome of cultural practices. They explore the implications of this distinction for the process of recognising and supporting Community Conserved Areas. Paul Mathews presents the results of an internet experiment designed to explore the effect that the respondents’ perception of their own mortality has on the desired number of sons and daughters to test for a proximate psychological mechanism that could facilitate a Trivers-Wallard effect in humans. Augustine Tanle and collaborators report on the implications of oil palm kernel processing for the ocular health of the women involved in the industry in Ghana. They address the issue of the negative impact that some poverty-relieving activities may have on the health of the population, and make a case for the need to introduce health care services along with the economic development activities. Finally, Emily Vala-Haynes and collaborators document the role that the free press in Mexico has had in informing the public about the abortion debate in recent years. They show how most articles present only one viewpoint, often that of players in extreme sides of the debate. She highlights the importance of continuous monitoring of the press as the legal context evolves in Mexico.

I hope you enjoy reading this volume and find its content thought provoking.

Alejandra Núñez-de la Mora
Editor

http://www.biosocsoc.org/sbha/resources/76_2/SBHA_76_2_Nunez.pdf
Copyright; © 2011 Nunez de la Mora, A. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.
Beware the animals that dance: Conservation as an unintended outcome of cultural practices

Ashley Massey1, Shonil Bhagwat1, and Paul Porodong2
1 School of Geography and the Environment, University of Oxford, Oxford OX1 3PG, United Kingdom
2 School of Social Sciences, Universiti Malaysia Sabah, Kota Kinabalu 88400, Sabah, Malaysia
Email: ashley.massey@gmail.com

Abstract

The International Union for the Conservation of Nature (IUCN) World Parks Congress of 2003 and the Conference of Parties to the Convention on Biological Diversity (CBD) of 2004 call for the recognition and support of Community Conserved Areas, with the CBD Programme of Work on Protected Areas committing countries to take action by 2008. Both within protected areas and in the matrix of land beyond reserves, customs and beliefs of indigenous and local communities can yield conservation benefits. Identifying an intention to conserve by the custodians of customary conserved areas can be challenging as customary practices are embedded within a myriad of cosmologies and worldviews. However, the definition of Community Conserved Areas does not require an expressed intention to conserve nor does it specify the mechanisms by which nature or natural resources can be conserved. Thus, conservation as an unintended outcome of cultural practices is included within the scope of community conservation. Fieldwork was conducted in Sabah, Malaysian Borneo, from October 2010 to April 2011. Data for the case study of Gumantong comes from an interview with Porodong Mogilin, Native Chief Representative of Matunggong Native Court in Bavanggazo, Kudat and meetings of community leaders from the 13 villages surrounding Gumantong. This paper 1) employs the case study of Gumantong in Sabah, Malaysian Borneo, to highlight the distinction between communities expressing an intention to conserve and conservation as an unintended outcome of cultural practices and 2) considers the implications of this distinction for the process of recognizing and supporting Community Conserved Areas.

Keywords: Customary conservation, Community Conserved Area, ICCA, intention to conserve, cultural practices, indigenous

http://www.biosocsoc.org/sbha/resources/76_2/SBHA_76_2_Massey_et_al.pdf
Copyright: © 2011 A Massey et al. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial Share-Alike 3.0 Unported License.
**Introduction**

Over twelve percent of the Earth’s land surface is formally conserved as inter alia, protected areas, forest reserves, and national parks. Both within these protected areas and in the matrix of land use beyond, customary practices of indigenous and local communities\(^1\) can yield conservation benefits. Customary conservation can provide ecosystem services such as hosting pollinators, watershed protection, and serving as refugia for wildlife in the landscape (Bhagwat, Kushalappa, Williams and Brown, 2005). In addition to their conservation value, customary conservation can add low-cost community-based conservation to landscapes saturated with protected areas (Borrini-Feyerabend and Kothari, 2008). However, customary conserved areas often lack formal recognition and face threats due to human-induced global change (Verschuuren, McNeely, Wild and Oviedo, 2010). In Malaysian Borneo, customary conserved areas that lack government-recognised land tenure are threatened by infrastructure projects and agro-development schemes (K.T.S. Group, 2011).

The growing understanding of the conservation value of customary conserved areas and their potential contribution to the contemporary conservation framework has led to the integration of Areas Conserved by Indigenous Peoples and Local Communities (ICCAs\(^2\)) with governmental conservation plans and policies (Borrini-Feyerabend and Kothari, 2008). The International Union for the Conservation of Nature (IUCN) World Parks Congress of 2003 and the Conference of Parties to the Convention on Biological Diversity (CBD) of 2004 call for the recognition and support of Community Conserved Areas, with the CBD Programme of Work on Protected Areas committing countries to take action by 2008 (Kothari, 2006). Responding to the CBD’s call for action, a collaboration in Sabah, Malaysian Borneo, of a global non-profit organization (Global Diversity Foundation) and regional government conservation agencies (Sabah Biodiversity Centre and Sabah Parks) explore opportunities to support

---

\(^1\) “Community” is a simplistic term used in this paper to denote self-regulating groups of natural resource users for wont of a better term. The value of this term has been debated (Agrawal and Gibson, 1999).

\(^2\) “ICCA” is used in the literature to refer to both “Areas Conserved by Indigenous Peoples and Local Communities” and “Indigenous and Community Conserved Areas and Territories”, often shortened to “Indigenous and Community Conserved Areas”. “CCAs” refer to “Community Conserved Areas”, however the definition also includes indigenous peoples (see page 5 for a full definition). Although these terms can be used interchangeably, in this paper the term is chosen to reflect the literature being discussed.
ICCA within Sabah’s legal environment and policy framework (Majid Cooke and Vaz, 2011).

Protected areas are created with the expressed purpose of conserving nature and/or natural resources. Although customary conserved areas exhibit conservation value, in some cases their conservation may be an unintended outcome of beliefs and practices potentially unrelated to nature conservation or the management of natural resources. Borrini-Feyerabend, Kothari and Oviedo (2004, p.51) note that “the voluntary management decisions and efforts of such communities lead towards the conservation of habitats, species, ecological services and associated cultural values, although the protection status may have been set up to meet a variety of objectives, not necessarily related to the conservation of biodiversity”. A review of resource and habitat taboos by Colding and Folke (2001, p.584) finds that taboos “do not necessarily proceed from environmental concerns or origins”, however their form mirrors those of contemporary conservation analogs.

Conservation as an unintended outcome of cultural practices

The effects of cultural practices on the environment are variable; some practices degrade the environment or unsustainably utilise natural resources, some have a negligible effect, and others act to conserve the environment. This paper acknowledges that cultural practices conserving the environment comprise customary conservation and seeks to avoid the description of those practising customary conservation as “ecologically noble savages” (Redford, 1991). Both customary conservation and Western conservation comprise value-laden belief systems and neither are rooted in an absolute understanding of the natural world and the role of humans within it (Angermeier, 2000).

Smith and Wishnie (2000, p.493) propose: “to qualify as conservation, any action or practice must not only prevent or mitigate resource overharvesting or environmental damage, it must also be designed to do so”. However, identifying the intentionality or design behind purported conservation actions can be especially challenging within the myriad of cosmologies and worldviews that comprise customary conservation (Mulder and Coppolillo, 2005). Hunn (1982) as cited in Smith and Wishnie (2000) describes examples that lack intentionality or design as epiphenomenal conservation, or conservation as an unintended by-product of factors such as low population densities, limited technologies and limited demand of resources.

The IUCN (2003, p.202) defines Community Conserved Areas as “natural and modified ecosystems including significant biodiversity, ecological services and
cultural values voluntarily conserved by indigenous and local communities through customary laws or other effective means”. This definition describes Community Conserved Areas by the observable outcome of a resource being “voluntarily conserved” and describes the conservation mechanism as “customary laws or other effective means” (emphasis added). Thus, in addition to an expressed intention to conserve nature and/or natural resources, this definition includes conservation as an unintended outcome of cultural practices. Outcome-based definitions of conservation do not require an expressed intention to conserve nor do they specify the mechanisms by which nature/natural resources can be conserved.

This paper 1) employs the case study of Gumantong in Sabah, Malaysian Borneo, to highlight the distinction between communities expressing an intention to conserve and conservation as an unintended outcome of cultural practices and 2) considers the implications of this distinction for the process of recognizing and supporting Areas Conserved by Indigenous Peoples and Local Communities (ICCAs).

Methods

Fieldwork was conducted in Sabah, Malaysian Borneo, from October 2010 to April 2011, following a 6-week pilot trip in Sabah and Sarawak from June to August 2010. The research employed key informant interviews, oral and written questionnaires, scientific and grey literature reviews, as well as ethnographic tools including participant observation on-site and at conservation planning and capacity building workshops. The primary data for the case study of Gumantong comes from an interview with Porodong Mogilin, Native Chief Representative of Matunggong Native Court in Bavangazo, Kudat and meetings of community leaders from the 13 villages surrounding Gumantong. Dr. Paul Porodong facilitated access and served as a Rungus translator in Kudat. A well-respected native of Bavangazo, one of the villages surrounding Gumantong, his close ties with the village and interviewee enabled frank discussion and minimised reporting error due to inter alia, access and control issues and power inequalities between researcher and interviewee.

Gumantong: Beware the animals that dance

The landscape of the Rungus people in Kudat, northern Malaysian Borneo, includes puru, patches of forest approximately one hectare in size and inhabited by rogon (spirits).
Appell (1995) observes that in addition to protecting small patches of forest from conversion to agriculture, puru may include springs or water sources. Rungus community members from five local villages jointly observe the most celebrated puru of the region, which caps the highest hill, Gumantong. Porodong Mogilin, Native Chief Representative of Matunggong Native Court, relates that in the first half of the 20th century, locals believed that if someone entered the Gumantong puru, the animals there would dance. If the person laughed, they would die instantly on the spot, and if they kept quiet, they would die once they returned home (Mogilin, 2011). Within the Rungus Spirit World, the dancing animals are considered kopizo, or omens, who explain to the trespasser he is dying because he has caused religious offence in breaking the strict prohibitions against entering the area (Porodong, 2010) (Figure 1). The Rungus avoided the dancing animals on the hilltop at all costs, which in turn conserved the water catchment area of the local villages. It is unclear whether the belief in the dancing animals was originally adopted with conservation of the watershed in mind, as the intentionality behind the belief was not expressed as part of the oral history.

In the mid-20th century, the Rungus people converted to Christianity and began to clear puru for agriculture, claiming that Christianity is stronger than the forest spirits (Mogilin, 2011). As the puru disappeared, the groundwater level dropped and local villages became dependent on government-supplied water. A British team surveying Gumantong included Iban people, an ethnic group from the interior with a reputation of headhunting. The Iban were not afraid of the dancing animals on Gumantong and hunted and ate them (Mogilin, 2011). Thus, the belief in the dancing animals that protected Gumantong was corroded as locals observed the actions of visiting outsiders.

Despite the loss of the belief in the dancing animals in the mid-20th century, at the end of the century local communities prevented the Forest Department from clearing Gumantong’s forest to plant a fast-growing exotic, Acacia mangium (Kothari, 2006). Although Kudat was formerly a mosaic of mature and fallow secondary rainforest, today the landscape of Kudat is primarily a monoculture of Acacia mangium due to its widespread planting in the 1980s by the Sabah Forestry Development Authority (SAFODA) for pulp production (Turnbull, Midgley and Cossalter, 1998, cited in Porodong, 2010, p.24-25). The spread of Acacia was enabled by the pervasive use of fire in swidden agriculture, as fire catalyzes the germination of buried Acacia mangium seeds. Acacia mangium has also been shown to out-compete native species such as Melastoma (Osunkoya, Farah and Rafhiah, 2005, cited in Porodong, 2010, p.24-25).
protesting the proposed clearing of Gumantong for the planting of Acacia mangium, the communities surrounding Gumantong expressed concern that the exotic species would dry up their water source. To conserve the hilltop, these communities partnered with the United Nations Development Programme (UNDP) on Climate Change. The villages recently learned that the Forest Department gazetted a 590-hectare area including Gumantong as a Forest
Reserve Class 1 (Watershed) in 2007 without informing the village chiefs or native court chiefs representing the 13 communities and 3,000 villagers. The villages have subsequently registered a complaint with the Chief Minister of Sabah and have proposed Gumantong be recognized as an Indigenous Peoples’ and Community Conserved Area (ICCA) (Sabah Publishing House, 2011).

Recognizing Conservation as an Unintended Outcome of Cultural Practices

Since the late 20th century, village leaders around Gumantong have expressed an intention to conserve the hilltop by the aforementioned partnership with the UNDP Climate Change Programme, protesting the Forest Department’s proposal to plant Acacia mangium, and proposing the recognition of Gumantong as an ICCA. Conversely, at the start of the 20th century, the hilltop and corresponding watershed were conserved as an unintended outcome of the belief in the dancing animals. This distinction between areas intentionally conserved and areas conserved as an unintended outcome of cultural practices holds implications for the process of recognizing and supporting Community Conserved Areas within the framework of the Convention on Biological Diversity.

As demonstrated in the case of Gumantong, beliefs and practices comprising customary conservation are not static, but rather evolve as a natural part of cultural change and adaptation. The introduction of Iban outsiders eroded the local belief in the dancing animals of Gumantong and the conversion to Christianity enabled the clearing of puru in the landscape for agriculture. Mulder and Coppolillo (2005, p.111) note that “where the positive conservation outcome is unintentional, it becomes critical to determine what institutions or practices are responsible for this outcome, and how these might be affected (or bolstered) by social and ecological changes”. In cases of conservation as an unintended outcome of cultural practices, communities may not strive to retain conservation value in the face of social and ecological changes, as conservation may not have been an intention in the first place.

Recognizing and supporting ICCAs can help retain conservation value in the face of social and ecological changes, however there is a risk of imposing conservation agendas on local custodians who conserve as an unintended outcome of cultural practices. Negative social impacts of imposing conservation on local communities have included the restriction of land use and the loss of management rights (West and Brockington, 2006). Even in cases where land use and management rights are unchanged, formally describing an area as “conserved” may alter local perceptions of rights and ownership (Pathak, 2006).
The process of recognizing and supporting ICCAs must acknowledge that communities may have had negative experiences or hold preconceptions of formal conservation and must include safeguards to ensure the autonomy of local custodians (Kothari, 2006). In the case of ICCAs where conservation is an unintended outcome of cultural practices, the conservation value of their practices must be sensitively discussed with communities before raising the option of their opportunity to identify the area as an ICCA.

Borrini-Feyerabend, Kothari and Oviedo (2004, p.71) acknowledge the potential temptation of conservation agencies to identify ICCAs on their own, proposing instead: the “legal recognition of a Community Conserved Area should be pursued only at the request of the concerned community, and with its prior informed consent”. However, communities that conserve as an unintended outcome of cultural practices may not recognize the opportunity to include their areas within this framework, as conservation is not their expressed purpose. Thus communicating to local custodians the breadth of the definition of Indigenous and Community Conserved Areas and the diversity of mechanisms contributing to conservation, including conservation as an unintended outcome of cultural practices, should form a key component of the process of recognizing and supporting ICCAs (Figure 2).

This paper highlights that both conservation as an expressed intention and conservation as an unintended outcome of communities’ cultural practices fall within the scope of ICCAs. This distinction is raised to note the benefits and
challenges inherent in recognizing and supporting ICCAs where conservation is an unintended outcome of cultural practices. As governments begin to formally recognize and support Community Conserved Areas within the framework of the Convention on Biological Diversity, ICCAs where conservation is an unintended outcome of communities’ cultural practices require tailored approaches in the recognition process. Research and monitoring designed with this distinction in mind will contribute to a new paradigm of community conservation: one that 1) acknowledges indigenous people and local communities who conserve as an unintended outcome of cultural practices, 2) supports their conservation in the face of social and ecological changes, and 3) recognizes the autonomy of local custodians in the process.

Acknowledgements

Fieldwork in Malaysian Borneo was supported by a Biosocial Society Postgraduate Bursary and Keble Association Gordon Smith Award. Additional support was provided by the Sir Richard Stapley Educational Trust and the Sidney Perry Foundation. Logistical support was provided by Universiti Malaysia Sabah, Global Diversity Foundation, and PACOS Trust. We would also like to acknowledge the support of Professor Kathy Willis, Director of the Oxford Biodiversity Institute.

Literature Cited


Is there a psychological proximate mechanism for inducing a Trivers-Willard effect in humans? Results of an internet experiment looking at the desired sex composition of children after mortality priming

Paul Mathews
Department of Social Policy, London School of Economics and Political Science
Email: p.s.mathews@lse.ac.uk

Abstract
Background: The Trivers-Willard hypothesis predicts that in species where competition for mates limits males’ reproductive success, it is adaptive for parents in relatively poor condition, and thus with limited parental investment capacity, to produce more female offspring. Conversely those in good condition, with greater capacity for parental investment, are predicted to have more male offspring. Most previous research has looked at physiological indicators of condition. This study tests whether psychologically priming human participants to make them think they are in relatively poor condition leads to the reporting of fertility preferences consistent with the Trivers-Willard hypothesis.

Methods: An internet experiment was used to randomly allocate childless participants to one of three groups. The first two groups were primed to think about a) their own mortality (to prime low parental investment - poor condition) or b) their dental health (to control for negative mood – though this would not effect parental investment). A second control group was not provided with any priming. Participants were then asked the number of sons / daughters they desired.

Results: No statistically significant associations were found between priming group and the desired sex composition of future children.

Conclusions: This study does not find any evidence for a psychological proximate mechanism, whereby the desired sex composition of offspring is consistent with predictions drawn from the Trivers-Willard hypothesis.

Key words: Trivers-Willard hypothesis, psychological proximate mechanism
Introduction

Robert Trivers and Dan Willard article in Science in 1973 is one of the most influential and highly cited papers of 20th century evolutionary biology. The article sets out what came to be known as the Trivers-Willard hypothesis. Their hypothesis is that many species adaptively undertake conditional sex-biased investment in offspring where parents invest in the most beneficial sex of offspring for the conditions in which the parents find themselves. The logic of this hypothesis stems from differences in the limits of male and female reproductive capacity. Consider mammals, where males have a greater potential reproductive capacity than females. Males’ ‘fixed costs’ of impregnation (sperm) are negligible. Females have much higher ‘fixed costs’ through gestation and lactation. Males can potentially (and do) produce a very large number of offspring, though, if some males have many offspring, this must mean that some males have relatively few or no offspring. Males in short have more variance than females in their reproductive success (Bateman, 1948). Males will compete for mating as the main limitation on male reproductive success is access to mates. Relative status and condition will also influence an individual’s reproductive strategy, and investment from parents will influence their offspring’s condition. Therefore Trivers and Willard hypothesised that because relatively high-status, good-condition parents are able to invest more in their offspring, in such circumstances it would normally be adaptive to invest in male offspring, who can successful compete for mates and thus ‘maximise’ their parents’ reproductive success in subsequent generations. On the other hand relatively low-status, poor-condition parents are less able to provide investment. This means that any male offspring will be at a disadvantage when competing for mates. Therefore such parents should invest relatively more in female offspring to ‘minimise’ the risk of having no grand-offspring.

Sex specific allocation of resources can occur during two stages of offspring development (Keller et al., 2001). First, the allocation can be biased before the birth of the offspring. This will lead to variance in the sex ratio at birth, and the Trivers-Willard hypothesis would predict that those in good condition will have more sons, whilst those in poor condition will have more daughters. Secondly, resources can be allocated through parental investment after birth. In their 1973 article Trivers and Willard explicitly stated that the hypothesis could also apply to humans. Most of the work testing the Trivers-Willard hypothesis in contemporary low-fertility resource-rich human populations has been focused on the latter stage (investment after birth e.g. (Smith et al., 1987; Gaulin and Robbins, 1991; Koziel and Ulijaszek, 2001; Hopcroft, 2005). Whether humans in
low-fertility resource-rich societies genuinely display behaviour in keeping with the hypothesis is still very much debated (Freese and Powell, 1999; Keller et al., 2001).

The literature that has looked at associations between parental condition and sex ratio at birth, have generally found a relationship in the direction predicted by Trivers-Willard. For example more male offspring than average are born in good-condition, high-status families e.g. billionaires (Cameron and Dalerum, 2009), US senior political executives (Betzig and Weber, 1995) and heavier Ethiopian women (Gibson & Mace 2003). On the other hand, poor-condition low-status groups such as Hungarian Gypsies give birth to more daughters (Bereczkei and Dunbar, 1997).

The Trivers-Willard hypothesis explains the logic at the ultimate level of varying the allocation of resources by sex of offspring. But as set out by Tinbergen (1963), it is also important to develop an explanation of the phenomenon at the proximate/mechanistic level. Where research has occurred on mechanisms for explaining Trivers-Willard sex ratios at birth the focus has predominately been on the physiological mechanism. For example Mathews et al. (2008) looked at maternal diet and James (2008) examined hormonal correlates linking condition and offspring sex-ratio.

Another less well studied, but potential important, mechanism is psychological. Human reproduction is partly the product of our decision-making. In virtually every human population where demographic data has been collected, average fertility is below our species’ theoretical physiological average maximum of 15 children, which is taken by many demographers as evidence of human populations constraining their fertility (Livi-Bacci, 2001). In contemporary low-fertility resource-rich societies the prevalence of contraceptives and safe abortion means that fertility is largely under the control of the individual, and so childbearing is even more the product of a series of decisions (even if the decisions are not always consciously expressed). The Trivers-Willard hypothesis could be of great utility in explaining sex composition of families in low-fertility resource-rich populations, if a psychological decision-making proximate mechanism can be found that induces adaptive responses to perceived condition. This is because couples can alter the sex composition of their family by stopping reproduction after births of children of a particular sex (Yamaguchi 1989).

There is limited empirical evidence to support this claim. However, the sex of preceding offspring is a significant factor in explaining differential parity progressions in many low fertility societies at the population level (Hank and Kohler, 2000; Pollard and Morgan, 2002; Kippen et al., 2005). At the individual
level Johns (2004) has highlighted the possibility of psychological factors influencing childbearing by showing that individuals who thought they had low life expectancy had a female biased sex ratio amongst their children. It is often adaptive for individuals to change their reproductive strategy to fit the conditions in which they find themselves (Stearns, 1992). In humans one of the major mechanisms for phenotypic plasticity is through our higher than average cognitive capacity; it is our capacity for decision-making that let’s us adapt to diverse conditions. Therefore taking the underlying ultimate logic of Trivers-Willard, there could be a psychological adaptation whereby individuals who think they are in relatively poor condition will want more daughters, and vice versa, those who think they are in relatively good condition will want more sons.

The theoretical relationship is set out in Figure 1. Arrow A represents the majority of research that has been conducted on the physiological link between condition / status and sex-ratio of offspring. This article is setting out the possible relationship between shown in Arrow C. It is important to note that the relationships envisaged in Arrows B and D will not always be entirely straightforward. There will be inaccuracies as individuals are unable to fully measure their actual relative condition and the risks prevalence (Montgomery 1998; Montgomery 2000; Carvalho 2005). With Arrow D demographers have shown that fertility attitudes regularly predicted actualised fertility, so individuals who want to have a lot of children per se tend to have more children than those whose preference is for a smaller families (though it should be noted that the associations are no always particularly strong (Miller and Pasta 1995; Gipson and Hindin 2009; Ni Bhrolchain, Beaujouan et al. 2010).

Most of the work cited above looking at sex ratios at birth has been observational, which can weaken arguments of causality: the theoretical relationship between condition and sex ratio at birth is tested by looking at associations observed in particular populations. In such observational studies heterogeneity might be a problem as it is difficult to rule out the possibility that an unmeasured characteristic is influencing both the measurement of condition and the sex-ratio. For example a failure to control for ethnicity and migration might mask the relationship between poor condition and female preference in an observation study. In the UK relatively disadvantaged groups include recent migrants from regions such as South Asian where there is a cultural legacy for son preference. Trivers-Willard (page 90, 1973) make clear the effect will be seen only relative to the average condition, though for South Asian in the UK the appropriate ‘average’ may be that of fellow South Asian migrants, not the UK average.
Randomisation of participants produces two or more systematically identical groups, an experimental ‘treatment’ can then be provided to one of the groups. As the groups were identical to prior to the treatment, after the treatment has been administered differences between the groups can be attributed to the effect of the treatment. In this study I investigate two psychological components; i) perceived condition and ii) desired sex composition of offspring. As these components can be manipulated experimentally within ethical parameters (see methods section for details) this makes this study well suited to a randomised experiment.

Methods

I obtained data from students at several UK higher education institutions, who voluntarily took part in a series of online experiments. Students are a good group to study for experiments of this nature because they are generally in a relatively similar positions in terms of their individual socio-economic status and life course. As university students are normally young and childless the measurement of the desired sex composition of offspring will not be confounded by actualised childbearing. This article reports the results of one
component of these experiments. The experiment was described to participants as a ‘survey’ to conceal its experimental nature, though respondents were provided with introductory information sufficient to ensure informed consent, along with subsequent debriefing information. Participation was entirely voluntary and as is standard in experimental psychology the respondents are not considered to have been sampled from any wider population.

**Dependent variable - Desired sex composition of offspring**

The desired sex composition of participants’ offspring was measured using two questions. ‘Do you have any preferences on the minimum number of daughters that you have?’ and ‘Do you have any preferences on the minimum number of sons that you have?’ They had to choose a response from the following answer categories;

- I would not like any sons / daughters
- I would like at least one son / daughter
- I would like at least two sons / daughters
- I would like three or more sons / daughters
- I have no gender preferences
- Prefer not to say / Cannot say

From these responses a measure was calculated with three outcomes; the respondent wanted as a minimum a) more sons than daughters, b) more daughters than sons, c) the same number of sons and daughters (including those who did not want any children).

**Explanatory variable**

Participants were randomly allocated to one of three ‘treatment’ groups i) mortality primed ii) dental health primed and iii) unprimed. The first ‘mortality’ group were primed with a series of preceding questions regarding their own mortality and potentially fatal health problems. This prime should induce the respondents’ salient thoughts towards a condition where they are questioning their survival, and thus unavailable to invest heavily in their future offspring. If parental investment is limited then the Trivers-Willard hypothesis suggests female offspring represent a better ‘risk minimising’ evolutionary strategy. So priming questions on own mortality should induce a female biased composition of desired offspring, compared to the control groups. Mortality primes have been shown to influence the reporting of indicators of reproductive strategy (Matthews and Sear, 2008; Wisman and Goldenberg 2005; Fritsche, 2007; Zhou et al., 2008; Zhou et al., 2009). This is the first time, as far as I am aware, that the
effect of such primes on the sex composition of desired offspring has been measured.

The second ‘dental health’ group were asked a series of questions about visiting a dentist and poor dental health before answering the questions on desired sons and daughters. This group was included as a control for negative mood, as questions about dentistry would act as an unpleasant, but non-fatal, prime. This prime should therefore not induce individuals to consider their capacity for parental investment substantially compromised, and thus it should not influence the desired sex composition of their children. This prime also acted as secondary control for the effect of participants answering preceding questions per se. The final ‘unprimed’ group were not asked any questions prior to questions about the desired sex composition of their offspring. This group is somewhat larger because it acted as a control group for several other experiments not reported here.

First, I tested for significant bivariate associations between priming and the desired sex of offspring with a chi square test. I then fitted multivariate regression models and tested the significance of the priming using Wald tests on the regression coefficients. Whilst the participants were randomly allocated between each of the groups (i.e. the only systematic difference between the groups is in the primes they received before the questions on desired sex composition of offspring), I nevertheless asked participants about their family and socio-economic background to test whether any observed effects were caused by random concentrations of particular subgroups within any of the treatment groups. Specifically I collected information on the respondents’ age, expected future income, parental education, country of birth, ethnicity, religiosity, partnership status, sibship size, experiences of mortality and the deprivation and life expectancy of the participant’s local neighbourhood. This information is used as control variables in a multivariate analysis, and I also controlled for the total number of desired children. Due to the non-representative nature of the information the coefficients for these control variables are not reported.

Males and females were analysed separately, due to the underlying theoretical differences in their reproductive strategies: in previous work I have reported differential responses between the sexes to mortality priming (Mathews and Sear 2008). I fitted multinomial logistic regression models, separately for each sex. I used those respondents who did not indicate any sex preference for their children as a base group, the model coefficients therefore show the unexponentiated relative probability that the respondent reported wanting a) relatively more male children or b) relatively more female children. Coefficients
greater than zero indicate that the variable increases the likelihood of the particular desired sex composition of offspring, compared to the base condition of having no bias in their preference for male or female offspring and having no priming.

Ethical clearance was obtained from the London School of Economics ethics committee, and from the ethics committees of those participating institutions who deemed it necessary. For experimentation to be ethically justifiable any risk to the human subjects should be minimised. The participants were primed towards thoughts salience with poor condition and mortality, which could be emotionally upsetting, so it was necessary to ensure that along with introductory and debriefing information, such priming was relatively mild and will only have a short term effect. Nevertheless if a short term artificial prime induce significant short term effects in the predicted direction it is then possible to argue that real stimuli that are stronger and more continuous will have greater long-term effects. The experiments took place between October 2008 and April 2009. Analysis is limited to respondents who were childless and under forty years of age.

Results

In total 1,222 female and 503 male students participated in the relevant sections of the experiment. The median age of participants was 21 years. The results for the bivariate analyses are given in Table 1, and the results for the multivariate analyses are given in Tables 2 and 3. Both the bivariate and multivariate results show that there is no relationship between priming and desired sex composition for either sex. It was expected that own mortality priming would i) increase the percentage of respondents desiring more daughters than sons, and ii) decrease the percentage reporting a desire for more sons than daughters. In Table 1 the bivariate analyses shows that it is actually the unprimed control group that has the highest percentage desiring daughters for male and female participants. This is in the opposite direction to the hypothesised relationship, though the overall association is not statistically significant.

The lack of the hypothesised relationship is also seen in the multivariate models. Mortality priming did not induce any statistically different effects compared to the control group who were unprimed. The only marginally statistically significant effect is from the female dental health primed group, who reported wanting more daughters than sons, though this effect is only barely within a 10% significance level.
Table 1. Bivariate analysis

<table>
<thead>
<tr>
<th>Priming</th>
<th>FEMALES</th>
<th>MALES</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>a) Desires more</td>
<td>b) Desires more</td>
</tr>
<tr>
<td></td>
<td>sons than daughters</td>
<td>daughters than sons</td>
</tr>
<tr>
<td>Own mortality</td>
<td>7.4%</td>
<td>13.1%</td>
</tr>
<tr>
<td>Dental health</td>
<td>11.5%</td>
<td>9.3%</td>
</tr>
<tr>
<td>Control - No priming</td>
<td>10.3%</td>
<td>13.9%</td>
</tr>
<tr>
<td>N</td>
<td>123</td>
<td>160</td>
</tr>
<tr>
<td>Chi square test p value</td>
<td>0.347</td>
<td></td>
</tr>
</tbody>
</table>

Table 2. Multivariate analysis for females

a) Effect on likelihood of reporting desires **more sons** than daughters

<table>
<thead>
<tr>
<th>Priming</th>
<th>Coef</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own mortality</td>
<td>-0.22</td>
<td>0.50</td>
</tr>
<tr>
<td>Dental health</td>
<td>0.11</td>
<td>0.69</td>
</tr>
</tbody>
</table>

b) Effect on likelihood of reporting desires **more daughters** than sons

<table>
<thead>
<tr>
<th>Priming</th>
<th>Coef</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own mortality</td>
<td>-0.06</td>
<td>0.83</td>
</tr>
<tr>
<td>Dental health</td>
<td>-0.48</td>
<td>0.09</td>
</tr>
</tbody>
</table>

Table 3. Multivariate analysis for males

a) Effect on likelihood of reporting desires **more sons** than daughters

<table>
<thead>
<tr>
<th>Priming</th>
<th>Coef</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own mortality</td>
<td>0.33</td>
<td>0.31</td>
</tr>
<tr>
<td>Dental health</td>
<td>0.23</td>
<td>0.54</td>
</tr>
</tbody>
</table>

b) Effect on likelihood of reporting desires **more daughters** than sons

<table>
<thead>
<tr>
<th>Priming</th>
<th>Coef</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Own mortality</td>
<td>0.11</td>
<td>0.81</td>
</tr>
<tr>
<td>Dental health</td>
<td>-1.04</td>
<td>0.19</td>
</tr>
</tbody>
</table>

Conclusion

The Trivers-Willard hypothesis has undoubtedly been highly influential in contemporary evolutionary biologists when measured in the number of citations the original 1973 article has received. But as Festa-Bianchet (1996) suggested, there may be a publication bias towards results that show support for the Trivers-Willard framework. As such the literature may represent a 'biased sample' of unusual sex-ratio studies. It is therefore important to present research that does not simply reinforce the potential for biased sex allocation. In this study I have outlined a new potential proximate mechanism for humans to bias the sex-
ratio of their offspring via psychological decision making. However, I have not found any evidence for such a mechanism’s existence in an experiment with a large number of participants.

The Trivers-Willard hypothesis has been regularly applied to help explain human behaviour. There are, however, many factors and trade-offs that will occur as individuals attempt to maximise their reproductive success. If psychological as well as physiological proximate mechanisms are found, it may increase the utility of the Trivers-Willard hypothesis for explaining the sex composition of families in low-fertility resource-rich populations. In such populations, almost all members are well nourished, and parents can choose (due to effective contraceptives) when to stop reproduction based on the sex composition of their existing children. This means that psychological decision-making is an important route for understanding variance in the sex composition of families in such populations, and the lack of a Trivers-Willard psychological proximate mechanism means that other factors (such as social norms) may be of greater utility in understanding differences in families’ sex composition.

This study has limitations; it uses a relatively small and non-representative group of childless individuals. The priming was, for obvious ethical reasons, relatively weak. Similarly whilst there was negative priming there was not compensatory positive condition priming, so that this side of the effect is still unknown. So it would be inappropriate to conclude that there are not any psychological routes through which Trivers-Willard effects could operate in fertility decision-making, but this study does not find any evidence for their existence.

Acknowledgements

I would firstly like to thank the anonymous participants who voluntarily provided information for this study. I would also like to thank the Biosocial Society whose support from the Conference Presentation Fund allowed me to present work from my PhD at the International Society for Behavioural Ecology Congress in Perth, Australia between 26 September 1 - October 2010. The collection of the data used in the papers was funded by the Economic and Social Research Council. I would like the two anonymous reviews for their comments on an earlier draft of this paper. Finally, I would like to thank my PhD supervisor, Dr Rebecca Sear, for her comments on this manuscript, and her general support throughout my PhD.
References


Festa-Bianchett, M. 1996. Offspring sex ratio studies of mammals: Does publication depend upon the quality of the research or the direction of the results? Ecoscience, 3, 42-44.


James, WH 2008. Evidence that mammalian sex ratios at birth are partially controlled by parental hormone levels around the time of conception. Journal of Endocrinology, 198, 3-15.


Ocular conditions among women involved in palm kernel oil processing in the Cape Coast Metropolis, Ghana

Augustine Tanle1 AA Ilechie2, Kofi Awusabo-Asare1, GO Ovenseri2 and M Anderson2
1 Department of Population and Health, University of Cape Coast, Cape Coast, Ghana
2 Department of Optometry, University of Cape Coast, Ghana
Email: augtanle@yahoo.com

Abstract

Background: While pro-poor economic activities have provided employment to poor and vulnerable groups in a number of African countries, some of the activities expose those involved to occupational hazards but these hazards are rarely discussed. One of such activities is oil palm kernel processing with its associated exposure to heat with consequences for ocular health. The paper explores the implications of oil palm kernel processing for the ocular health of the women involved in the industry in the Cape Coast Metropolis in the Central Region of Ghana.

Methods: The study involved a survey, in-depth interviews and a Standard ophthalmic examination was carried out on 100 women aged 13 years and above some of whom had been in palm kernel oil processing for ten years or more. The participants were those who were available and willing to participate in the research.

Results: The most commonly reported ocular complaints were itching (20.0%), red and painful eyes (13.0%) and blurred vision at distance (13.0%). Among the ocular diseases identified were chronic conjunctivitis (21.0%), pterygium (11.0%) and cataract (8.0%). The prevalence of suspected glaucoma (C/D > 0.5) was about 3% while the prevalence of visual impairment (VA≤6/18 in the better eye) was 24%. Only 22% of the impairment observed could be attributed to hazards associated with the job.

Conclusions: The processes involved in the palm kernel oil business predispose women to risk of eye diseases. Provision of eye and vision care services at regular intervals could reduce the magnitude and severity of ocular problems associated with this industry.

Keywords: Women, occupational hazards, palm kernel oil processing, ocular condition, Cape Coast

http://www.biosocsoc.org/sbha/resources/76_2/SBHA_76_2_Tanle_et_al.pdf
Copyright: © 2011 Tanle et al. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial Share-Alike 3.0 Unported License
Introduction

In sub-Saharan Africa, over 50 per cent of women are engaged in various economic activities in the informal economy as a means of earning a living (Amu, 2005). One of such activities is palm kernel oil processing, particularly among vulnerable women in urban areas. While these activities have provided employment to such women, the opportunity costs to their health are rarely discussed. The processing of palm kernel oil involves long hours in the sun winnowing, removing particles, roasting the kernels or heating paste from the kernel to produce oil. Firewood and shells of the palm kernel are used as fuel in the processing. These activities are also undertaken in areas where sanitation tends to be poor (Awusabo-Asare and Tanle, 2008). Furthermore, excessive heat, sun and dust have been implicated in degenerative ocular conditions such as pterygium, pingueculae (Newell, 1992). Thus, the conditions under which the processing of the oil take place can generate or aggravate exiting ocular health. For instance, pre-existing ocular conditions such as trachoma and conjunctivitis could be aggravated with prolonged exposure to smoke. In cases of trachoma, eye irritation from biomass smoke may cause persons to rub their eyes which, under unsanitary conditions, can spread the infection.

Furthermore, the effects of biomass smoke on human eyes have been widely documented in previous studies (Mishra, Retherford & Smith, 1997; Schwela, 1997; Warwick & Doig, 2008). Smoke from biomass fuel, which contains some of the same pollutants found in tobacco and in ambient air, have been linked with ocular diseases such as acute and chronic conjunctivitis, trachoma, dry eye syndrome, and cataract (Mishra, Retherford & Smith, 2002). The paper is a study of ocular conditions among women involved in palm kernel oil processing in the Central Region of Ghana. It explores some livelihood issues ignored in the development of projects and programs among people who are already vulnerable. The study has implications for occupational health and safety in some of the economic activities in the informal sector in Ghana.

Conceptual Issues

Occupational health and safety has been defined as the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations (International Commission on Occupational Health, 2002). Couched out of the general definition of health, the definition covers aspects which are specific to the health of workers such as the maintenance of equipment and tools, the general working environment and protection from factors which can adversely affect their health. The intention is to ensure that structures are put in place to protect the health and lives of workers. While
these objectives have been largely achieved at some national and international levels, the health and safety associated with some activities such as those in the informal sector are yet to be seriously considered.

In Ghana, there is no national policy specifically on occupational health services. A draft policy jointly developed by the Ministries of Labour, Health, and Mines and Energy is yet to be promulgated. There are, however, two main statutes which govern aspects of occupational health and safety, namely, the Factories, Offices and Shops Act (Act 328 of 1970) and the Mining Regulations 1970 (LI 665) which are in use in the labour and mining sectors respectively (Clarke, 2005). Other statutes which have bearing on occupational health services are the Workmen's Compensation Law 1987, Workmen's Compensation (Calculation of Compensation) Instrument (LI 1594 of 1994), Small-scale Gold Mining Law (218 of 1989), The Mining and Minerals Act (Act 703 of 2006), Environmental Protection Agency Act (Act 490 of 1994) and the Ghana Health Service and Teaching Hospitals Act (Act 526 of 1999).

One main shortcoming of the legal provisions on occupational health services is its limited coverage: The Factories’ Act and Mining Regulations Act which govern issues of occupational safety, are limited to factories, offices, shops, ports and construction and the mining sectors respectively and do not cover the informal sector (Adei and Kuufaa, 2007; Clarke, 2005; Ghartey and Dorkenoo, 2002). To fill the void and for local development, District/ Municipal/ Metropolitan Assemblies are expected to oversee safety issues in their areas of jurisdiction, and where possible, enact by-laws to regulate activities as per the Local Government Act (Act 462 of 1993). In a number of cases this has not been done. Therefore, activities in the informal sector, including the palm kernel processing industry, are not covered by any specific legislation nationwide and in a number of districts. The outcome of the existing situation is the lack of any framework to regulate and ensure occupational health and safety. This paper examines the working environment of women in the palm kernel oil processing industry and its implications for their ocular health.

Data and Methods

The main data for the study were obtained from a survey, involving a questionnaire, in-depth interview, and examination of the eyes of selected women engaged in palm kernel oil processing in the Cape Coast Metropolis and the adjacent Komenda-Edina-Eguafo-Abirem (KEEA) District of the Central Region (Awusabo-Asare and Tanle, 2007). Through an earlier study, eight main palm kernel oil processing sites were identified within the Metropolis and District. These were at Adisadel Village, Siwdo, Kakumdo, Abura, Ankafro,
Ataabadze, Benyadze and Dabir. The study was conducted at these main processing sites (Figure 1).

Figure 1. Map of KEEA and Cape Coast Districts showing study sites

At these sites, 300 women consisting of leaders, ordinary members and people who provided ancillary services such as the cracking and milling of the kernels were identified and listed. At each site, the women select their leaders, and among the criteria used are age, number of years in the business, and negotiation skills. The leaders usually represent the members at any meeting, manage the affairs of the site and promote the welfare of its members. The rest constitute
the ordinary members at each site. Of the 300 women listed, 185 were interviewed based on availability, number of years in the industry and willingness to be interviewed. About 20 of them were excluded because they had been in the business for less than 6 months or were assisting a relation. The 185 respondents consisted of 173 ordinary members and 12 leaders and constituted 68% of the potential respondents (Table 1). Both the ordinary members and leaders were interviewed using questionnaire and in-depth guide. The instruments were reviewed by the University of Cape Coast Ethical Review Board before they were administered. Among other things, the results from this first study (see Awusabo-Asare and Tanle, 2008) indicated that the women faced health problems, including ocular health. As a follow-up, the Department of Population and Health, in collaboration with the Department of Optometry, organised an eye screening test for the participants.

Table 1: Distribution of respondents by site and sample size

<table>
<thead>
<tr>
<th>Site</th>
<th>Total number of member F</th>
<th>Number interviewed F</th>
<th>Total number of leaders F</th>
<th>Number interviewed F</th>
<th>Total number interviewed F</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adisadel</td>
<td>52</td>
<td>15.6</td>
<td>35</td>
<td>21.0</td>
<td>4</td>
</tr>
<tr>
<td>Siwdo</td>
<td>26</td>
<td>7.8</td>
<td>13</td>
<td>7.8</td>
<td>2</td>
</tr>
<tr>
<td>Kakumdo</td>
<td>33</td>
<td>9.9</td>
<td>15</td>
<td>9.0</td>
<td>2</td>
</tr>
<tr>
<td>Abura</td>
<td>81</td>
<td>24.3</td>
<td>50</td>
<td>30.0</td>
<td>6</td>
</tr>
<tr>
<td>Ankaful</td>
<td>16</td>
<td>4.8</td>
<td>9</td>
<td>5.4</td>
<td>2</td>
</tr>
<tr>
<td>Ataabadze</td>
<td>35</td>
<td>10.5</td>
<td>20</td>
<td>12.0</td>
<td>2</td>
</tr>
<tr>
<td>Benyadze</td>
<td>38</td>
<td>11.4</td>
<td>21</td>
<td>12.6</td>
<td>3</td>
</tr>
<tr>
<td>Dabir</td>
<td>19</td>
<td>5.7</td>
<td>10</td>
<td>6.0</td>
<td>2</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td><strong>300</strong></td>
<td><strong>100.0</strong></td>
<td><strong>173</strong></td>
<td><strong>100.0</strong></td>
<td><strong>23</strong></td>
</tr>
</tbody>
</table>

For the eye test, women were bussed to the Abura processing site where the leaders had assured the team of their support. The leaders of the rest of the sites assisted in mobilising the women for the test. Within a period of two days 100 women were examined. Visual acuity (VA) was assessed using the Snellen illiterate E chart at 6 metres. Blindness was defined as VA < 3/60 in the better eye while visual impairment was defined as VA < 6/18 to 6/60 in the better eye. VA of 6/18 or better in the worse eye was regarded as normal. Subjects unable to see 6/18 had their VA re-assessed with pinhole. For those unable to see 6/18 with pinhole, clinical judgement was used to determine the main cause of visual impairment or blindness. If two or more pathologies were adjudged to contribute equally, visual impairment was attributed to the most treatable cause.
Ocular health examination was performed using a pen torch and direct ophthalmoscope. Static retinoscopy without cycloplegia but with a fogging technique shown to have comparable result to cycloplegia was performed on all patients as a starting point for full subjective refraction. Best corrected acuity after subjective refraction was measured in each eye. Refractive error was defined as measured spherical error greater than 0.8D in the better eye. Cataract was defined as a lens opacity consistent with 6/12 or worse vision. Glaucoma was defined as the presence of a pale, cupped disc with a cup to disc ratio of 0.6 or more. One hundred persons were assessed using the World Health Organisation disability scale (WHO, 1973). The WHO disability scale is the international standard and most reliable diagnostic classification for visual impairment in researches involving some population sub-groups. The disability scale actually grades “impairments” rather than “disabilities” although the word disability is the standard operational terminology for “impairment” in all general epidemiological and clinical use (Refer to World Heal Organisation's International classification of functioning, disability and health (ICF), WHO Geneva 2001). According to the scale (WHO, 1973) eyes rather than people are assessed which implies that 200 eyes were examined in the study.

The survey and the eye examinations were carried out in June 2010 by two lecturers and three students at the Departments of Population and Health; and two doctors of optometry, who are lecturers, and three postgraduate students at the Department of Optometry, University of Cape Coast, conducted the ocular test about two months after the fieldwork. The Statistical Product for Service Solution (SPSS) version 12 was used to analyse the quantitative data.

Results

Socio-demographic characteristics of respondents

Of the 100 women who presented themselves for assessment, more than half (53.0%) were aged 45 years and above; 73% had never had formal education, and one per cent claimed to have had secondary school education. Four out of ten respondents reported that they had worked for less than ten years while a third had been in the business for 20 years and above (Table 2). These were also women with no formal education or training, and two out of three women had worked in the palm kernel business for ten years or more.
Table 2: Socio-demographic characteristics of respondents.

<table>
<thead>
<tr>
<th>Age</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;25</td>
<td>14</td>
<td>14.0</td>
</tr>
<tr>
<td>25-34</td>
<td>14</td>
<td>14.0</td>
</tr>
<tr>
<td>35-44</td>
<td>19</td>
<td>19.0</td>
</tr>
<tr>
<td>45-54</td>
<td>25</td>
<td>25.0</td>
</tr>
<tr>
<td>55+</td>
<td>28</td>
<td>28.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Highest level of education</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>73</td>
<td>73.0</td>
</tr>
<tr>
<td>Primary or higher</td>
<td>27</td>
<td>27.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Duration in business</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 10</td>
<td>40</td>
<td>40.0</td>
</tr>
<tr>
<td>10-19</td>
<td>22</td>
<td>22.0</td>
</tr>
<tr>
<td>20-29</td>
<td>22</td>
<td>22.0</td>
</tr>
<tr>
<td>30-39</td>
<td>10</td>
<td>10.0</td>
</tr>
<tr>
<td>40+</td>
<td>6</td>
<td>6.0</td>
</tr>
</tbody>
</table>

| N                   | 100       | 100.0      |

Palm kernel processing activities

From the study the following activities were identified in the processing of the palm kernel oil:

- Winnowing which is carried out to remove particles and dust after the nuts have been cracked;

- Removing all unwanted materials or the few un-cracked nuts. This activity involves sitting at one spot for several hours for two or three days;

- Washing the nuts with clay to separate the nuts from the shells;

- Washing the clay off the nuts and drying before frying;

- Frying the nuts for four to five hours (at times in the hot sun). Palm kernel shells and firewood are used as fuel;

- Fetching water to mix with the ground nuts to produce a fairly thick nut paste; this is done over distances because some of the sites do not to have water
readily available. This can involve a number of trips depending on the quantity to be processed;

- Boiling the paste for about two to three hours: This involves boiling and stirring of the paste over hot fire to induce the oil (See figure 2); and

- Extracting the oil which forms on top of the paste while boiling until only the thick paste is left in the pot. This process may last for 12 hours (could be left overnight to cool).

Activities 1, 5, 7 and 8 have in-built ocular health hazards: Dust and particles from the winnowing, frying of the nuts, boiling of the paste and the scooping of the oil nuts. The last three activities involve spending several hours over smoky environment and exposure to heat as the sources of fuel are palm kernel shells and firewood. There are also the related hazards of burns, heat and cuts. In spite of these hazards, none of the women used any protection in any of the stages – such as wearing of goggles during winnowing and the frying of the nuts and the boiling of the paste (Figure 2).

Figure 2: Photograph showing some women stirring the paste on fire in the sun
In the survey, the 100 women were asked to mention the most common health problems which, in their opinion, could be attributed to their work. According to them, the most common health problems that they experienced from their work were general body pains (67.0%) and malaria (20.0%) (Table 3). General bodily pains and symptoms of malaria accounted for nearly 90% of the reported cases and did not mention ocular health as an immediate problem.

Table 3 Most common health problems

<table>
<thead>
<tr>
<th>Problem</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Malaria</td>
<td>35</td>
<td>20.2</td>
</tr>
<tr>
<td>Cholera</td>
<td>17</td>
<td>9.8</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>5</td>
<td>2.9</td>
</tr>
<tr>
<td>Body pains</td>
<td>116</td>
<td>67.1</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td><strong>173</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Similarly, in the in-depth interviews, health problems, other than ocular, came up as the major ones. For instance, in an answer to the major health problem, one of the respondents, Grace (pseudonym), identified bodily pains as the major problems associated with the business.

R: “Occasionally, I experience some pains at my chest, ribs or waist mostly in the nights because of the various activities I go through in the business (Grace, about 41 years).”

Like a number of her colleagues, she did not consider the implications of the activity for her ocular health. However, another respondent, Afetey (about 45 years) identified ocular health as one of the challenges associated with the business. According to her:

I: “Does this business (processing of palm kernel oil) have any effect on your health?”

R: “Yes! Once when I was winnowing, particles from the cracked kernels fell into my causing it to itch. Also, when stirring the oil paste some oil splashed on my arm and this has left a scar on my arm (she shows it). [Afetey, about, 45 years].”
Some of the women had experienced ocular health problems and, therefore, were aware of some of the possible implications of some of the processes for their ocular health. As in the case of Grace, a number of them have not considered the implications of their activities for ocular health as this was not spontaneously mentioned. The study further explored their health seeking-behaviour and involvement in the health insurance scheme. For instance, Afetey did not seek professional medical care when particles got into her eyes. The response from the in-depth was typical of the responses from the women on ocular health-seeking behaviour. Furthermore, none of them had ever sought ocular care, including those who had ever had a problem. It was based on these narrations and observations that follow-up eye tests were conducted for some of the women.

Results from eye test

Ocular pathology

Of the 200 eyes examined, 56% had, at least one ocular pathology. The commonest pathology was chronic (allergic) conjunctivitis, which was seen in at least one in five eyes, followed by pterygium (11.1%), and cataract (8.0%). The prevalence of glaucoma (C/D ratio > 0.6) was 2.5%. The spectrum and frequency of ocular pathology among the subjects are shown in Table 4 and Figure 3. From the results, only 22% can be directly related to hazards on the job and impairment.

Visual status

Of the 200 eyes examined, 83% had grade zero disability (no evidence of visual loss) and about 16% had grade 1 disability (evidence of visual loss, but VA 6/60 or better). The prevalence of blindness (VA <3/60 with available correction) was about two per cent. An additional six per cent of the women were visually impaired (6/60=VA<6/18). At least one eye in six had a refractive error that reduced VA to <6/18. Astigmatism 33 (16.5%) was the most common refractive error (Table 4) and (Figure 3). The VA and refractive error of one subject could not be determined as a result of non compliance. The other category consisted of diabetic retinopathy, retinal detachment, juxtapupillary choroiditis and toxoplasmosis. Refractive errors (32.5%) and cataracts (8.0%) were the commonest cause of visual impairments. Toxoplasmosis (0.5%), severe corneal lesions (0.5%) and retinal detachment (0.5%) were the sole causes of blindness. Although refractive error was the leading cause of visual impairment, only one person reported having worn spectacle correction.
Table 4: Spectrum and frequency of ocular conditions among subjects

<table>
<thead>
<tr>
<th>Diagnosis</th>
<th>Frequency</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Astigmatism</td>
<td>33</td>
<td>16.5</td>
</tr>
<tr>
<td>Hyperopia</td>
<td>18</td>
<td>9.0</td>
</tr>
<tr>
<td>Myopia</td>
<td>14</td>
<td>7.0</td>
</tr>
<tr>
<td>Presbyopia</td>
<td>24</td>
<td>12.0</td>
</tr>
<tr>
<td>Allergic conjunctivitis</td>
<td>43</td>
<td>21.5</td>
</tr>
<tr>
<td>Bacterial conjunctivitis</td>
<td>4</td>
<td>2.0</td>
</tr>
<tr>
<td>Corneal ulcers</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>Pinguecula</td>
<td>6</td>
<td>3.0</td>
</tr>
<tr>
<td>Pterygium</td>
<td>22</td>
<td>11.0</td>
</tr>
<tr>
<td>Cataract</td>
<td>16</td>
<td>8.0</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>5</td>
<td>2.5</td>
</tr>
<tr>
<td>Others</td>
<td>14</td>
<td>7.0</td>
</tr>
<tr>
<td><strong>N</strong></td>
<td><strong>200</strong></td>
<td><strong>100.0</strong></td>
</tr>
</tbody>
</table>

Figure 3: Distribution of Ocular Conditions
In 2003, the Government of Ghana introduced a health insurance scheme which covers basic medical cases (e.g. routine treatment such as diarrhoea, upper respiratory disease, malaria, cholera, etc.) and prevention of blindness which covers free cataract surgery and subsidised services for management of ocular conditions for the insured. In the absence of a policy to regulate safety, people are expected to be treated in the case of accidents. One of the challenges, though, is the number of people who are aware of and registered with the scheme.

The 100 women who were examined were asked about their awareness of the National Health Insurance Scheme (NHIS) and whether they had registered. About two thirds (58%) of the respondents were aware of the NHIS. Of the 58% who had heard about it, 25% (15) said they had registered, implying that 85% had not registered (43 among those who had heard and 42 of those who had not heard). With the NHIS in operation for about seven years, some of the women claimed that they had not heard of it, and these were women who were involved in an economic activity with health hazards.

Discussion and conclusions

The processing of palm kernel oil provides income and viable economic activities to poor women in the Central Region, but these benefits are not without its costs, one of them being the health hazards involved in the activity. The conditions under which palm kernel oil is extracted entails high levels of exposure to smoke, heat and dust, with implications for ocular health (See figure 2).

Over half of all eyes of the women examined in this study had one or more identifiable ocular lesions out of which nearly a quarter (chronic conjunctivitis, pterygium, pinguecula and cataract) could be attributed to hazards associated with the processing processes. Symptoms of itching and chronic (allergic) conjunctivitis can be linked to long term exposure to biomass smoke. This is not unusual, as in general, there is interplay between immunity to allergies and length of exposure. But a number of the women did not make direct links when asked about the implications of the activities for their health.

Cataract is the commonest cause of treatable blindness in most population based studies in Africa, and has been found to correlate with long term exposure to biomass smoke (Pokhrel, Smith, Asheena, Amar, & Bates, 2005). From the study, the prevalence of pterygium, which is often a reactive or proliferative response to environmental influences, was high. The environmental irritants are
commonly present at the processing sites and these include dust, wind, particulate and chemical air pollution as well as solar radiation (Apple & Rabb, 1991). The high prevalence of Pterygium among the women could thus be associated with the working environment.

Glaucoma was identified to be responsible for only about three per cent of the pathologies diagnosed in this study. This is inconsistent with other reports from the developing world where glaucoma is the second leading cause of visual impairment (Gregory and Pitts, 2001, Odjimogho and Odjimogho, 2004). This may perhaps be due to diagnosing glaucoma in this study: fundoscopic findings of CD ratio of six. The activities involved in the processing of palm kernel oil predispose the processors to potential risk factors for developing eye diseases. Provision of eye and vision care services at regular intervals would significantly reduce the magnitude and severity of ocular problems associated with this industry. Further studies should ideally include more information on the prevalence of dry eye syndrome.

Conclusions

The hidden cost of promoting small-scale activities within the context of poverty reduction is hardly factored into the development planning process. Pro-poor strategies hardly include mitigating factors for unintended negative side effects of activities. Some of the women in the oil palm kernel processing business were found to be suffering from occupational related ocular health which constituted a hidden cost in the business. There are other hidden health costs which can be investigated to provide basis for incorporating health and other concerns into pro-poor activities. Those working in the informal sector where no regulations exist, especially the women involved in small-scale processing such as soap-making, shea butter processing, and stone cracking (Lund, Dei, Boakye and Opoku-Agyeman, 2008), face serious health hazards. At the institutional level, occupational health and safety laws and procedures exist but are enforced mostly in the formal sector. A National Health Insurance Scheme was introduced in the country in 2003 to provide basic healthcare for people. However, over 80% of the women engaged in the palm kernel oil processing had not registered as at the time of the survey. The low patronage of the national health insurance scheme reflects the general conditions in the country among the urban poor (GNA, 2011). The provision of health care generally, and eye and vision care services in particular, at regular intervals could significantly reduce the magnitude and severity of health problems associated with such industries.
The Cape Coast Metropolitan and Komenda-Edina-Eguafo and Abirem Assemblies which are responsible for the areas where the study was undertaken need to enact by-laws to protect the health and lives of the women who are involved in the palm kernel oil processing industry as per the Local Government Act (Act 462 of 1993). Promoting the health and safety of citizens should be part of pro-poor programmes in the development agenda of national and local governments.

References


The Abortion Debate in Mexico: Newspaper Coverage and Discourse, 2001-2003

Emily Vala-Haynes, MA, MPH\(^1\), Rob Stephenson, PhD\(^2\), Roger Rochat, MD\(^2\), Eileen A. Yam, MPH\(^3\), Lisa G. Rosas, MPH\(^4\), Sandra G. Garcia, ScD\(^5\)

\(^1\)Population Studies Center, University of Pennsylvania \(^2\)Hubert Department of Global Health, Rollins School of Public Health, Emory University \(^3\)Department of Population, Family and Reproductive Health, Bloomberg School of Public Health, Johns Hopkins University \(^4\)Department of Epidemiology, School of Public Health, University of California Berkeley \(^5\)Population Council, Mexico City, Mexico

Email: evala@sas.upenn.edu

Abstract

Background: Abortion in Mexico is highly restricted, and the issue has been openly debated as policy-makers consider reforming abortion legislation. The newly free press in Mexico plays a key role in informing the public about the abortion debate.

Methods: Using a sample of 100 articles from five Mexico City newspapers containing the word “abortion,” this study examines the context in which abortion is discussed in the media and the social actors that are associated with pro-choice, anti-abortion and mixed arguments from 2001 to 2003.

Results: Non-governmental organizations and Catholic Church representatives were the principal social actors, with coverage also given to policy-makers who support liberalization of abortion laws. Most articles present only one viewpoint when covering abortion, dominated by organizations and leaders who represent the extreme sides of the debate.

Conclusion: Abortion has earned a prominent place on the public agenda and in the news media. Future research should continue to monitor and document newspaper coverage of abortion as the legal context evolves in Mexico.

Key Words: Abortion, Mexico, Media, Newspapers


http://www.biosocsc.org/sbha/resources/76_2/SBHA_76_2_Vala-Haynes_et_al.pdf

Copyright: © 2011 E. Vala-Haynes et al. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial Share-Alike 3.0 Unported License
In Mexico, abortion laws are highly restrictive, and only when a woman becomes pregnant as the result of rape is abortion legal in all 32 states, including the Federal District (Mexico City) (GIRE 2007). Nevertheless, approximately 875,000 abortions are practiced there each year (Juarez et al. 2008). Abortion is the leading cause of hospitalization due to pregnancy complications in Mexico, as well as the third leading cause of maternal mortality (Lara et al. 2003). Political debate surrounding abortion in Mexico often plays out between the conservative National Action Party (PAN), which has a strict anti-abortion platform, and the leftist Democratic Revolution Party (PRD), which advocates for more liberal abortion laws (Lamas and Bissell 2000). From the 1930s until 2000 the Institutional Revolutionary Party (PRI) controlled the government and did not take a firm stance on abortion. However, the PAN has held the presidency since President Vicente Fox’s victory in 2000, followed by the election of fellow PAN candidate President Felipe Calderón in 2006, and its party members consistently oppose abortion (Lamas and Bissell 2000).

Despite PAN control of the executive branch, Mexico City has a recent history of incremental and progressive legal reform regarding abortion. In 2000 the PRD and PRI parties enacted the “Ley Robles” in Mexico City, which legalized abortion in cases of fetal malformation and when a woman’s health was at risk (Lamas and Bissell 2000). The Ley Robles was upheld by the Mexican Supreme Court in January of 2002, and the law was further liberalized to include women who became pregnant as the result of rape or nonconsensual artificial insemination (Kendrick 2003). More recently, in April 2007, the Mexico City Legislative Assembly voted to legalize abortion under all circumstances up to 12 weeks gestation (McKinley 2007).

In the past two decades a free press has risen in Mexico, increasing the legitimacy of print media as a source of objective information on abortion (Lawson 2002; Hughes 2006). Recently, various cases involving abortion received significant media attention. Among those, the case of Paulina del Carmen Ramirez Jacinto in 1999 received the most coverage (Taracena 2002). At age 13, Paulina became pregnant as the result of rape and received official approval to undergo a legal abortion (Lara et al. 2003). Influenced by visits from anti-abortion representatives, as well as by hospital officials who exaggerated the risks of abortion, Paulina carried her child to term. Media coverage of the case was unprecedented, and public support overwhelmingly favored Paulina and her right to an abortion as a rape victim (Taracena 2002). This further contributed to
public outrage in 2000 when the PAN-led government in the state of Guanajuato passed an amendment to outlaw abortion in the case of rape. Faced with pressure manifested in the national press and public opinion polls, the governor of Guanajuato vetoed the bill (Lamas and Bissell 2000). Both the Paulina and Guanajuato cases demonstrate the role that public opinion, fanned by press attention, can play in the shaping of abortion policy.

The various impacts of media on health attitudes and behaviors and, more specifically, reproductive health policy, are well documented (Olasky and Olasky 1986; Patterson and Hall 1998; Terkildsen et al. 1998; Dutilh Novaes 2000; Taracena 2002; Stephenson and Lee 2003; Pruitt and Mullen 2005; Barakso and Schaffner 2006). While media coverage of an issue can affect public perception of that issue, the media also plays a more passive role because it must focus on topics that most interest news consumers. Thus, the news both shapes and reflects the public agenda (Perse et al. 1997).\(^1\) A study on perceptions of induced abortion in Brazil found that mass media has a significant influence on public opinion regarding abortion in that country (Dutilh Novaes 2000). In the United States, a study of the mass media found that the press set the overall tone for abortion messages received by the public, thereby shaping public discourse (Terkildsen et al. 1998). Given the media’s role in determining how social movements are presented to the public, studies have concluded that the media is a critical component in the success of those movements (Terkildsen et al. 1998; Barakso and Schaffner 2006). Media coverage of issues moves them higher on the political agenda and serves as an important resource for interest groups seeking policy change (Otten 1992).

Compared to broadcast media, the print media in Mexico has moved faster toward independence. Newspapers are still considered more independent than other media forms in Mexico, which are often criticized for having an overly sensationalist focus (Lawson 2002; Johnson 2006). Only 10% to 15% of Mexicans report that their news comes primarily from newspapers; however, the print media is read primarily by the Mexican elite, including opinion leaders and political decision makers, theoretically making its influence disproportionate to its readership (Lawson 2002).

---

\(^1\) The effect of media on its audiences is a topic not fully resolved in the broader theoretical communications literature. This paper is primarily concerned with how the press portrays abortion, and less with issues of bi-directional causality. The authors acknowledge that media has an effect on society and, conversely, society has an effect on media. Regardless of causal direction, an examination of the different ways in which media portrays abortion remains important.
This study examines the context in which abortion is discussed in five Mexico City newspapers during the first years of President Fox’s presidency, a time when the rise of the conservative PAN coincided with an increasingly active feminist movement, a newly free press, and growing debate about Mexico’s restrictive abortion laws. The study identifies the social actors that are associated in the press with various arguments supporting and opposing abortion and documents the context in which abortion is presented to the public in the print media. It seeks to better understand how this controversial issue is discussed in influential Mexican newspapers, which can play an important role in shaping how key stakeholders and the general public perceive the abortion debate.

**Methods**

Five newspapers based in Mexico City (*El Universal, La Jornada, Reforma, La Prensa* and *El Sol de México*) were selected to represent publications that, according to Lawson’s (2002) study of the Mexican press, were associated with the political left (*La Jornada*), right (*La Prensa*), center-left (*El Sol de México*), center-right (*Reforma*) and center (*El Universal*). Between January 2001 and December 2003, researchers at the Mexican reproductive health advocacy organization GIRE (Grupo de Información en Reproducción Elegida) searched daily hard copy editions of each newspaper and identified all articles containing the word “abortion” either in the title or in the body of the article. Of the 600 articles collected from the GIRE database, 100 were randomly sampled for analysis.

One coder analyzed article content using MaxQDA qualitative data analysis software. The main themes arising were identified and compared to determine the context in which abortion is portrayed in the print media, including how abortion is framed by other issues, abortion and maternal mortality statistics, the representation of abortion-related events, government actors, abortion legislation, and discussion of the abortion debate. Finally, key pro-choice, anti-abortion and mixed/neutral messages and actors were identified.

For the purpose of this analysis, the term pro-choice will refer to those who support abortion in all cases, and the term anti-abortion will refer to those who oppose abortion in all cases. Mixed opinion refers to those who support abortion in some cases, such as when a woman’s life is in danger or a pregnancy is the result of rape. Articles classified as pro-choice disproportionately covered events and actors that favored either complete decriminalization of abortion or
further liberalization of abortion laws. Articles classified as anti-abortion disproportionately covered events and actors that opposed abortion in all cases or favored further legal restrictions on the practice of abortion. Mixed articles contained balanced coverage of both pro-choice and anti-abortion viewpoints. Neutral articles contained no opinions and primarily covered abortion statistics.

Results

Of the 100 analyzed news articles and op-eds, 27 were from *Reforma*, 24 from *La Jornada*, 21 from *El Sol de México*, 17 from *El Universal* and 11 from *La Prensa*. Thirty-eight covered primarily the pro-choice side of the abortion debate, and 25 covered primarily the anti-abortion side of the debate. The rest of the articles were divided between mixed (n=15 articles) and neutral (n=22 articles) categories. Table 1 shows how articles were classified according to the newspaper in which they appeared. Although there were no clear patterns of pro-choice or anti-abortion coverage across newspapers, both *El Universal* and *Reforma* showed the greatest number of articles in the mixed and neutral categories. In contrast, the number of articles in the mixed and neutral categories for *La Jornada*, *La Prensa*, and *El Sol de México* was lower.

<table>
<thead>
<tr>
<th>Newspaper</th>
<th>Pro-choice</th>
<th>Anti-abortion</th>
<th>Mixed opinion</th>
<th>Neutral</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><em>El Universal</em></td>
<td>7</td>
<td>2</td>
<td>2</td>
<td>6</td>
<td>17</td>
</tr>
<tr>
<td><em>La Jornada</em></td>
<td>11</td>
<td>8</td>
<td>3</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td><em>Reforma</em></td>
<td>6</td>
<td>6</td>
<td>8</td>
<td>7</td>
<td>27</td>
</tr>
<tr>
<td><em>La Prensa</em></td>
<td>4</td>
<td>4</td>
<td>0</td>
<td>3</td>
<td>11</td>
</tr>
<tr>
<td><em>El Sol de México</em></td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>4</td>
<td>21</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>38</strong></td>
<td><strong>25</strong></td>
<td><strong>15</strong></td>
<td><strong>22</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The majority of articles were classified as news (n=86), and 14 were op-eds. Of the op-eds, seven reflected mixed or neutral opinions toward abortion. Five op-eds were classified as pro-choice, and two were anti-abortion. *La Reforma* published the most op-eds (n=6), three of which were mixed or neutral and two of which were pro-choice.
Framing of the abortion debate

Abortion was often reported in the context of other controversial issues. Anti-abortion groups framed abortion in the context of other topics they opposed on a moral basis. The issue most commonly mentioned alongside abortion was same-sex marriage, stressed by the Catholic Church as a comparable example of immorality. Condemnation of abortion in the context of other issues opposed by the Church was common.

“The bishop of Querétaro, Mario de Gasperín, insists that Catholics do not vote this July 6 for parties or candidates that are in favor of abortion, euthanasia, manipulation of embryos, prostitution, homosexual marriage, physical and chemical contraception, pornography, human cloning and social crimes like drug trafficking, alcoholism and ethnic or racial discrimination.” La Jornada

“In his homily, [Bishop Martínez Zepeda] warned that the Catholic Church...will not be able to keep silent about the acts and political tendencies that seek legal reforms, referring to the themes of abortion and homosexual unions.” Reforma

In contrast, articles covering pro-choice groups placed abortion in the context of the women’s rights movement. Articles emphasized a concern among pro-choice leaders that Mexico’s restrictive abortion laws are reflective of a sexist culture that does not allow women to be equal to men.

“Espinosa emphasized that the [National Women’s Institute] has as its most ambitious objective to achieve a ‘cultural change’ and break the ‘paradigms’ of a society that has maintained the inequality of opportunities and economic and social conditions for women.” La Jornada

Newspapers also covered discussion of the abortion debate in general. Leaders on all sides of the debate discussed whether to define abortion as a social justice or public health issue. In addition, some argued over who should have a say in drafting abortion laws—women, doctors, lawyers or legislators. While some leading figures spoke of the need to bring the topic into the open, others argued that debate was unnecessary. A sign at a protest against the forum Ethical and Legal Aspects of Abortion: Debating Decriminalization, read, “...the right to life is not debated. It is respected!” (La Jornada). An alternative sentiment was provided in
coverage of the pro-choice non-governmental organization (NGO), Catholics for the Right to Choose.

“Joined together in the capital Zócalo as an act of solidarity with ‘the thousands of women who have died due to unsafe abortions,’ they affirmed that Catholics ‘do not live to suffer nor to carry the blame or repent for the conscientious decisions that we make’ and reiterated that their intention is not to obligate anyone to have an abortion, but rather to create conditions to open a debate, ‘far from prejudice and criticism.’” La Jornada

In recognition of the “clash of absolutes” surrounding the topic of abortion, an op-ed in Reforma further discussed the principal arguments on both sides of the abortion debate, as well as the merits of opening a dialogue around the polarizing issue.

“In the superficial discussion of the issue, the extremes appear irreconcilable and polemics inevitable. But going into more depth in the arguments of pro-abortionists and anti-abortionists is necessary to eliminate the absolutisms and open a space for the acceptability of some elements of each of the two positions that could perhaps permit the formulation of an intermediate proposal and, in a certain way, reconciliation.” Alfonso Ruiz Miguel, Reforma op-ed

Reporting of abortion statistics

The reporting of abortion statistics was found primarily in neutral articles that covered various studies commissioned by both the pro-choice and anti-abortion coalitions. Most statistics cited in newspaper articles referred to the number of abortions performed each year in Mexico, the percentage of those abortions that occur in clandestine settings, and the number of deaths that result from complications due to unsafe abortions.

“The academic...stated that according to various studies each year an average of 500 thousand abortions are practiced. According to the most conservative statistics, from 200 thousand to 250 thousand [are practiced] in the same period, and according to the progressives up to one
The primary concern expressed in newspaper articles was maternal morbidity and mortality resulting from complications due to unsafe abortions. Articles covered reactions to abortion statistics, as well as the use of maternal mortality data by the pro-choice movement as a way to argue for the complete decriminalization of abortion. An article in *El Sol de México* covered an initiative to decriminalize abortion by Norma Gutierrez de la Torre of the PRI party.

“’We know that the theme generates a diversity of opinions and goes against customs, ideas and dogma, but...we cannot deny the existence of the problem. We cannot close our eyes and permit women to continue dying from undergoing abortions in conditions that put their health and life at risk.’” *El Sol de México*

Other articles focused on abortion’s specific contribution to maternal mortality, reporting that complications from unsafe abortions resulted in approximately “6000 deaths each year in Latin America” (*La Jornada*). One article reported that abortion was the third leading cause of maternal mortality in the northern state of Chihuahua (*El Sol de México*). Along with concerns over maternal mortality came a recognition of economic inequality, because wealthy women are less likely to resort to unsafe abortions. A researcher at the National Autonomous University of Mexico highlighted this problem:

“’The criminalization of abortion generates major problems of social justice and public health, in that women with economic resources who decide to abort do it in better conditions; this does not happen with poor women...’” *El Sol de México*
who increase mortality and morbidity statistics, generating high costs for attention in public hospitals.” El Sol de México

**Coverage of abortion-related events**

One way the abortion debate arose in the articles was in the reporting of abortion-related events. Newspapers covered events that concentrated on either pro-choice or anti-abortion viewpoints, although some events focused on opening a dialogue around the topic of abortion. Two newspapers covered the forum on *Ethical and Legal Aspects of Abortion: Debating Decriminalization*, as well as the anti-abortion advocacy organization Grupo Provida’s protest staged outside the event. The event that received the most newspaper coverage was a march in the central square of Mexico City in honor of the *Day for the Decriminalization of Abortion in Latin America and the Caribbean*.

“In commemoration...the organization Catholics for the Right to Choose vowed to defend the lay State and the separation of Church and State, and affirmed that despite major advances in the fight for the right to a legal and safe abortion—which is the case of the Federal District with the application of the Ley Robles—‘the challenges are immense.’” La Jornada

Coverage of anti-abortion events included the *Day of the Unborn*, in addition to a forum on *The Herods of the New Century: Violence and Infant Mistreatment*. *La Jornada* covered the 25th anniversary of Grupo Provida in which the Church congratulated the organization for “fostering a culture of life.” *Reforma* published two separate reports on the opening of *Punto y Aparte*, a film aimed at dissuading women from having abortions. Conferences organized by anti-abortion groups also received coverage.

“From May 5-9 will convene the Continental Meeting of National Commissions of the Pastoral Family ‘for a culture of life’...where topics will be discussed that according to the bishop of Querétaro go against the Catholic religion.” La Jornada
Coverage of government agencies and abortion legislation

Government agencies were generally cited in articles that focused on abortion statistics. The National Council on Population provided abortion incidence data, and the Commission for Gender and Equality was cited in reference to maternal mortality due to abortion. *El Sol de México* reported figures obtained from the Mexican Institute of Social Security in an article about adolescent pregnancy:

“...of every hundred women of 15 to 19 years, ten have an abortion, which is generally practiced in inadequate conditions, causing bleeding and infections that can lead to death.” *El Sol de México*

Although most government officials remained neutral concerning their attitudes toward the abortion debate, some directors of government organizations were quoted when they took sides in the debate. *Reforma* covered the pro-choice comments of Gerardo Laveaga, the director of Mexico’s National Institute of Criminal Sciences (INACIPE), with the headline, “*INACIPE Gives Support to Induced Abortion*,” and an article that included a quote from Laveaga:

“It is necessary to debate more about the cases where circumstances lead the woman to have an abortion. To start, we should permit women with scarce resources to do it if they desire and the State backs them. It is sad to see how they end up piercing the uterus or cause themselves pain in order to abort. This should be seen from the perspective in which it is a personal decision.” *Reforma*

Legislative coverage focused primarily on the “Ley Robles”—enacted in 2000—and the Supreme Court’s upholding of the law as constitutional amid legal challenges by the PAN and other conservative advocates.

“[As] Chief of Government of the Federal District [from] 1999-2000, Robles...obtained the approval of a law that decriminalized abortion in cases of malformation of the fetus, cases of rape and when the life of the mother is at risk.” *Reforma*

Other coverage consisted of various initiatives introduced by members of the PRI and PRD to further liberalize abortion laws, as well as reports on current
laws. The now defunct leftist party, Mexico Possible (PMP), and the PRD used legislative sessions as forums through which to denounce Church involvement in politics. In addition, legislators in the Federal District passed a law that increased penalties for providers who force women to have abortions.

“During the regular session of the Legislative Assembly of the Federal District, on the issue of abortion...the PRD and PAN established that there will be at least five to eight years of prison for a person who practices abortion without the consent of the woman and from eight to ten years if there is physical or moral violence in order to impose the practice [of abortion].” El Universal

**Pro-choice messages and actors**

Pro-choice messages in newspapers focused both on a woman’s right to make decisions about her own body and the large number of maternal deaths due to complications from abortion. One article covered the topic of abortion legalization as an indicator of a modern society, such as in Europe, where even predominantly Catholic countries have liberal abortion laws. According to one representative of the Evangelical Church in Mexico,

“'[The decision to abort] is not about the rights or responsibility of third parties, but of [the women] themselves.’” El Universal

“With the exception of Ireland and Poland, which have some restrictions, actually all the women of the countries of Europe have the right to a safe and legal abortion. This situation contrasts with our conservative and evangelized region of America...” Gabriela Rodriguez, La Jornada op-ed

In addition, one pro-choice advocate argued that the decision to have an abortion is difficult for the woman, and she should be well informed about the risks involved.

“'Abortion is not considered by women as a method of family planning, least of all in a country like Mexico,’ affirmed Julia Chavez Carapia, coordinator of the Center for Women’s Studies of the National School for Social Work...she pronounced herself in favor of the decriminalization of
abortion, since in any case thousands are performed daily, but in a clandestine manner and in unhealthy conditions that only bring about death and health complications in the majority of women.” La Prensa

In addition to pro-choice arguments, coverage of abortion advocates also included their protests against involvement of the Catholic Church in electoral politics. PMP leader Patricia Mercado’s attempts to obtain an official injunction against the Church, as well as other condemnation of Church involvement in politics, received coverage in several newspapers.

“Patricia Mercado...asserted yesterday that the Catholic Church hierarchy should not decide which parties exist nor what they offer politically. That, she said, is decided by votes.” Reforma

“For immersing itself in electoral affairs to demand that Catholics of Querétaro not vote for ‘a party that is against the absolute respect of human life,’ the [PMP] presented to the Special Group for Attention to Electoral Crimes...a denouncement against Querétaro bishop Mario de Gasperín.” El Sol de México

NGOs and their leaders stood out as the most prominent pro-choice actors in newspaper coverage. NGOs such as Catholics for the Right to Choose, GIRE and Feminist Millennium organized events and publicized studies on abortion incidence and opinion. La Jornada covered a protest in Mexico City led by María Consuelo Mejía, director of Catholics for the Right to Choose, who criticized the Church’s anti-abortion arguments.

“She added that the request to the Catholic hierarchy is that it open a space for dialogue and ‘listen with humanity and compassion to what happens in the lives of women,’ because we see with worry, she said, a growing distance between the moral teachings of the Church and the daily lives of people.” La Jornada

Pro-choice politicians and their respective political parties were also featured in newspaper coverage of abortion. Most politicians focused on arguing for the liberalization of abortion laws as opposed to decriminalization of abortion in all cases. While the PRD argued that abortion laws must be liberalized to prevent
maternal mortality, both the PRI and PMP proposed initiatives that would completely decriminalize abortion in the Federal District.

“The PMP will drive legislative methods to ‘contribute to the eradication of sexism and machismo in our country.’ In its legislative platform it will argue that the fourth constitutional article contain the decriminalization of abortion...” El Universal

_Anti-abortion messages and actors_

Anti-abortion messages in newspapers were presented primarily by leaders of the Catholic Church. Arguments included the Catholic principle that life begins at conception, as well as calling for the defense of innocents. According to the Church, decisions regarding abortion should not be based on public opinion surveys, but rather on moral grounds. Anti-abortion leaders referred to abortion as murder, genocide, and a massacre of innocent human beings. Others pointed to the constitutional right to life and warned of the negative physical and psychological consequences to a woman who chooses to abort. An article in _La Jornada_ described an Apostolic Announcement made by Giussepe Bertello:

“‘In our days a culture of death is being breathed, where...the value of this right [to life] is intended to be conditional.’ He asked that despite opposition and persecution, the ‘joy and happiness to have collaborated in favor of life so threatened of the most weak, in those innocents who cannot defend themselves and whose silent screams many do not want to hear’ predominate.” _La Jornada_

Coverage by _La Prensa_ of a Church sermon included a cardinal’s demonization of pro-choice advocates, whom he viewed as equivalents to the leader of a biblical massacre.

“Cardinal Rivera Carrera specified that the local legislators who promote laws to murder innocents are the actual Herods. He indicated that the life of a human being begins at conception [and ends at] death and those who want to decriminalize abortion are without doubt the true Herods of our era.” _La Prensa_
The Church used both religious and political platforms to assert its resistance to all initiatives that would liberalize abortion laws. Through apostolic announcements, voting handbooks, sermons and press releases, its leaders called on their constituents to vote against any political party or figure that supported abortion.

“In a discussion with the Danish ambassador, the Pope affirmed that ‘a vision of a Europe separate from God can only lead to social fragmentation, moral confusion and political division.’” La Prensa

“In the letter, distributed in Querétaro Catholic churches and also in Guanajuato, the Querétaro bishop exhorts that [congregations] ‘not vote for candidates or parties that promote abortion, euthanasia, homosexual or lesbian relationships’ and that they vote ‘for candidates less evil, according to their judgement and conscience.’” El Universal

The only anti-abortion political party routinely covered in articles was the PAN, which includes in its political doctrine an opposition to abortion in all cases. PAN leaders opposed the Ley Robles, calling it unconstitutional and leading the fight to the Supreme Court, where the law was ultimately upheld. Throughout the sampled articles, PAN leaders maintain there is a constitutional right to life that begins at conception. Thus, the opposition to abortion in all cases is an integral part of what defines the party.

“We are not going to renounce who we are, our defense of the dignity of a person from gestation. If we did that we would cease to be who we are and we want to continue being the PAN, but with a modern response to this and other issues, such as sexual preference.”’ La Jornada

“If someone is in favor of abortion, they do not have a reason to be a PAN member. The position of the party concerning abortion is an untouchable matter.” Mayor of Mérida, Ana Rosa Payán at National PAN Convention, El Universal

“Women are the owners of their bodies, but not of what they carry in their womb.” Alejandro Landero (PAN) Reforma
Newspaper coverage of anti-abortion NGOs concentrated on those, such as Grupo Provida, that allied with the Church. Other NGOs, such as the System for Integral Family Development and the Christian Family Front participated in anti-abortion events, but the Grupo Provida received the most coverage. Provida worked with the Church and the PAN party to oppose abortion in all cases throughout Mexico. In an article in Reforma, Provida director Jorge Serrano Limón praised the film *Punto y Aparte* for its anti-abortion stance.

“‘It takes life as the only value that should be respected from the moment of conception and that should not be eliminated by abortion. It talks of the physical and psychological consequences that a woman who aborts suffers, and there has not been any other documentary or film with such refinement.’” Reforma

Mixed messages and actors

While most newspaper coverage of abortion focused on the pro-choice and anti-abortion sides of the debate, some articles covered messages with mixed opinions, which consisted of those in favor of abortion under some circumstances. *El Sol de México* covered a survey on abortion opinion which showed that most of the Mexican public fell into the mixed opinion category.

“More than 69 percent of Mexicans think that abortion should be legal under some circumstances...78 percent approve of the interruption of pregnancy when the health of the mother is at risk and 63 percent approve of this method when the product is the result of rape. In terms of the decision that is made when the product has defects, 52 percent of those surveyed said that they would have to permit abortion in these circumstances.” El Sol de México

Members of political parties with either pro-choice or anti-abortion platforms at times asserted themselves to be of mixed opinion. For politicians from leftist parties, this meant expanding the cases under which abortion should be legal, while politicians from conservative parties focused their messages on maintaining the status quo. This was primarily the case with legalizing abortion when the pregnancy resulted from rape, a condition under which abortion was declared constitutional by the Supreme Court during the time period in which
articles were sampled. Others sought to legalize abortion for economic reasons, which is legal only in the state of Yucatan.

“[A] delegate of Puerto Vallarta, Jalisco, at the 45th National PAN Convention was proposing in a tribunal yesterday to open the opportunity, so that in the doctrinal principles, the party accepts abortion only in cases of rape, illness of the mother or extreme poverty.” El Universal

The individual who received the most news coverage in the category of mixed opinion was Rosario Robles, a member of the PRD party and the mayor of the Federal District, whose Ley Robles legalized abortion in the cases of rape, fetal abnormalities and when a woman's health was at risk. Robles appeared in articles in every newspaper as she advocated for the liberalization of abortion laws in Mexico City and throughout the country.

“The women of the PRD fight for our right to choose. We are respectful of all religions, of all beliefs, of the right of each woman to act in accordance with her [beliefs]. Because of this, because we defend this secular and free vision, we will continue fighting so that women will continue fighting freely for their maternal [rights].” Reforma

“Upon enacting the law, she affirmed, ‘I did not tell women to abort, nor did I tell them not to abort. I told them: you are going to decide. If you are at risk of losing your life and you have five children, then you can decide to interrupt that pregnancy so that those children are not left as orphans and I am not going to penalize you for that. If you decide to continue with your pregnancy, knowing the risks, you are within your rights. It is a decision that you are going to make in accordance with your conscience and your religion.’” La Jornada

Discussion

The abortion debate is portrayed differently in each of the five Mexican newspapers examined. Most articles present only one viewpoint—pro-choice or anti-abortion—when covering the topic. These viewpoints were dominated by organizations and leaders who represented the extreme sides of the debate rather than by figures who voiced the moderate stance of the majority of the population, as shown in several abortion opinion surveys.
Other studies on abortion and media have focused entirely on the topic of abortion and how that isolated topic was presented in article text and quotes. However, abortion is often embedded in broader issues, and this analysis found that the context in which abortion was framed depended on the viewpoint being covered in an article. Anti-abortion leaders, viewing abortion as an issue of morality, frequently paired the topic with same-sex marriage, which is also fervently opposed by the Catholic Church. By constantly identifying abortion alongside an issue such as same-sex marriage, as well as issues that they view as unquestionably immoral—human cloning, drug trafficking, alcoholism, ethnic or racial discrimination—abortion opponents lump the subject within a context of issues that are not broadly accepted within Mexican public opinion.

Like previous studies on coverage of abortion in the United States media, this research found that many articles placed the issue in the overall context of the women’s rights movement (Patterson and Hall 1998; Barakso and Schaffner, 2006). As feminist organizations become more prominent in Mexican society, they frame abortion in the context of a broader call for equality and as a necessity to improve the public health of women by preventing maternal mortality due to abortion. In abortion opinion studies, respondents often expressed concern over maternal mortality and violence against women as their reasons for supporting abortion in some circumstances (Garcia et al. 2004). Thus, just as anti-abortion groups have framed abortion in a context of issues that are universally opposed, pro-choice groups frame abortion in a similar way, using as their context the universally supported right to health and equality of women.

Due to the clandestine nature of abortion in Mexico, incidence data are difficult to collect and can only be estimated. While some articles recognized the wide range of numbers presented by various abortion studies, most cited only one source. Although at least one article in each newspaper referred to the range of reported data on abortion incidence, the vast majority did not. However, newspaper readership includes political elites who may cite statistics reported in the press to influence legislative decisions. The reporting of varying estimates may be a concern for those involved in the abortion debate because the true incidence of unsafe abortion cannot be known. Consequently, the lay reader may interpret the media’s presentation of inconsistent abortion estimates as junk science, dishonest reporting, or both. This problem with accuracy of data may also be of concern in countries with less restrictive abortion laws, but it has not been addressed by existing studies of abortion in the media. The wide range of
incidence estimates in a country like Mexico, where abortion is legally restricted, make recognition of that range imperative in facilitating constructive debate.

Coverage of government and legislation in the abortion debate focused on studies conducted by government agencies regarding unwanted pregnancies, adolescent pregnancies, abortion incidence and maternal mortality data. Agencies and politicians alike viewed this data as indicative of the fact that abortion was an issue that had to be addressed in one way or another. Most agreed that better sex education and increased access to family planning was needed in order to prevent unwanted pregnancies. This was echoed by the PAN, Mexico’s conservative ruling party. In the articles, only the Grupo Provida took a stance against all forms of family planning. The Church, although opposed to contraception in its official doctrine, did not comment on that position in the analyzed articles. Thus, the coverage suggests a growing acceptance of the importance of family planning, which is further reflected in the decrease of the country’s total fertility rate from 5.7 in 1976 to 2.2 in 2003 (INEGI 2005).

While surveys show that public opinion does not fall into strictly pro-choice and anti-abortion categories, this is not reflected in newspaper coverage of the topic. In 2000, a majority (69%) of Mexican adults felt that abortion should be legal in some circumstances (Garcia et al. 2004), yet few of the leaders covered in the sampled articles expressed that opinion. Much like media coverage of abortion in the United States (Perse et al. 1997; Patterson and Hall 1998), the Mexican press appears to over-represent the extreme sides of the debate.

Previous analyses of polemical issues in newspapers have found that effective coverage is based on the unbiased presentation of objective information such as incidence or mortality data, or on the presentation of various viewpoints in the same article (Hughes 2006). In the sample of articles from five Mexico City newspapers, articles from Reforma and El Universal contained the most balanced coverage. This is consistent with the content analysis conducted by Hughes (2006), who found that Reforma and El Universal more consistently offered multiple interpretations of political events. Hughes (2006) also found that in two-thirds of news items, only one perspective was presented.

Newspaper coverage of leaders of the abortion debate showed a clear gender divide. While most pro-choice advocates were women who represented NGOs, most anti-abortion advocates were men who represented the Catholic Church. The gender differences carried into politics, as women from the PMP and PRD
parties called for the liberalization of abortion laws, and men from the PAN party condemned any further liberalization. This gender divide evident in newspaper coverage differs with the Garcia et al. (2004) abortion opinion study, which found that men were significantly more likely than women to hold pro-choice opinions.

While both newspapers with left-of-center ideologies (La Jornada and El Sol de México) appeared to favor a pro-choice stance in abortion coverage, both newspapers with right-of-center ideologies (La Prensa and Reforma) published articles that were split equally between pro-choice and anti-abortion. On the issue of abortion, El Universal articles favored pro-choice coverage. Thus, from the sample in this analysis, the political ideologies of the left-of-center papers appear to have come through in the coverage of abortion, whereas more balanced reporting came from the right-of-center newspapers.

Conclusion

This analysis provides a snapshot of the primary political arguments and social actors contributing to the abortion debate in major Mexican newspapers in the first years of President Fox’s term. Less than a year after newly elected president Felipe Calderón took office in December 2006, abortion earned an even higher place on the public agenda and in the news media, particularly in light of the heavily disputed April 2007 reform that legalized abortion during the first trimester in Mexico City. Public health advocates and media researchers interested in the topic of abortion should continue to monitor press coverage of the issue as the legal context evolves; to make efforts to sensitize journalists to the importance of providing balanced and informed information on this polemical topic; and to train key stakeholders on how to speak to journalists about the often complex public health, legal and political aspects of the abortion debate.

Acknowledgements

This study was conducted while the first author was an MPH student at Emory University’s Rollins School of Public Health. The project was made possible thanks to the generous support of the William and Flora Hewlett Foundation. In addition, we thank Javier Arrellano, Erika Troncoso and staff at Grupo de Información en Reproducción Elegida.
References


Hughes, S., 2006. *Newsrooms in Conflict: Journalism and the Democratization of Mexico*. University of Pittsburgh Press; Pittsburgh, PA.


Society, Biology and Human Affairs
Guidelines for authors

1. About SBHA

Society, Biology and Human Affairs is the in-house journal of the BioSocial Society. It is a peer-reviewed, Open Access journal that aims to publish refereed articles describing empirical and theoretical, primary and secondary research exploring the intersection between social and biological processes as these relate to humans. The Journal will consider articles on ‘human affairs’ from the social and natural sciences, and particularly encourages submissions from those ‘boundary’ disciplines that encompass both – such as biocultural anthropology, medical sociology, social epidemiology, demography, bioethics, and the history of science.

SBHA is published twice a year, in June/July and November/December but manuscript submissions are received all year round. Authors will be provided with a working timetable once their manuscripts have been accepted by the Editor for review.

Authors should submit their article electronically as an email attachment to the Editor of SBHA: Alejandra Núñez-de la Mora (SBHA_editor@biosocsoc.org).

2. Open Access

Society, Biology and Human Affairs applies the Creative Commons Attribution License (CCAL) http://creativecommons.org/licenses/by/3.0/ to all works it publishes. Under the CCAL, authors retain ownership of the copyright for their article, but authors allow anyone to download, reuse, reprint, modify, distribute, and/or copy articles in SBHA, so long as the original authors and source are cited. No permission is required from the authors or the publishers. Please read about the Creative Commons Attribution License before submitting your paper. Your submission will be taken as acceptance of these terms.

Learn more about open access at http://www.sherpa.ac.uk/guidance/authors.html.

3. Manuscript Types

The Journal will consider three types of submissions:
• Brief communications – comprising short reports of interesting or novel findings of a focused nature. They should not exceed 2,500, inclusive of abstract, and include no more than 2 figures or tables and no more than 15 references.

• Original Articles – comprising reviews or presentation of results from more complex research designs with more important theoretical or methodological content or implications. While there are no standard limitations on the length of original articles, authors are cautioned to be concise in their presentations and to employ figures and tables only as necessary.

• Letters to the Editor – comprising commentaries, news or responses to published articles of up to 500 words.

4. General Instructions

Manuscripts must be submitted in grammatically correct English. All manuscripts should be formatted in Garamond 14-point and double-spaced throughout (including headings, text, footnotes, tables and figure legends) to facilitate manuscript review and typesetting. Text files should be submitted in the following formats: DOC or RTF. Graphics files can be submitted in the following formats: EPS or TIFF files.

All manuscripts should have a uniform style and be submitted exactly as they are to appear in print. A manuscript should consist of the following subdivisions, each beginning on a separate page:

• Title page
• Abstract and keywords
• Text
• Literature cited
• Footnotes, if any
• Figure legends
• Tables (sent as separate files)
• Figures (sent as separate files)

The spelling of nontechnical terms should be as recommended in the current Webster's International Dictionary. Always spell out numbers when they stand as the first word in a sentence; do not follow such numbers with abbreviations. Numbers indicating time, weight, and measurements are to be in Arabic numerals when followed by abbreviations (e.g., 2 mm; 1 sec; 3 ml).
**Title page.** The title page must contain the following:

- **Title:** The title should be a clear description of the paper’s content.
- **Author’s name (or names) followed by their department and Institution, city, state, country and e-mail.**
- **All grant information including corresponding grant numbers.**

**Abstract.** The abstract should consist of 250 words or fewer. Abstracts will precede the introductory section of the text in the manuscript and will also be published in full on the Journal’s webpage to comply with requirements of electronic search engines. The abstract should be written in complete sentences and should include the following sections with section heads in bold followed by a colon.

- **Background:** A succinct statement of the rationale for the study and a statement of the specific study hypothesis and/or study objectives.
- **Methods:** A brief description of the study design, materials, subjects, data collection and statistical or other analysis methods used.
- **Results:** A brief description of the principal findings.
- **Conclusions:** A brief statement of the conclusions drawn relative to the objectives of the study.

This structure can be waived for certain articles at the discretion of the Editor.

**Key Words.** Authors should supply 4 to 6 key words, terms, or brief phrases that will aid in identifying the article to electronic search engines.

**Literature Cited** The Journal uses the Harvard system of referencing with authors’ names cited in the text wherever their work is referred to. References should be cited in the text by author name(s) and year of publication.

... an earlier report (Turner, 2000) ...
... studies by Redman (1994) reveal ...

For two authors use ‘and’, for three or more use the first author followed by ‘et al.’.

... Redman and Turner (2001) suggest ...
... studies by Turner et al. (2001) reveal ...

When references are made to more than one paper by the same author published in the same year, they should be designated in the text as

... studies by (Lasker, 1998a,b) reveal ...

and in the literature list as:


When citing more than one reference these are listed in ascending order of year of publication and then in alphabetical order of first (and subsequent) authors’ surnames. Separate citations with a semi-colon.

. . earlier reports (Roy 1994; Johnson and Tay 2001; Smith 2008; Small 2010; Xiu 2010 )

When citing publications by the same author(s) the authors’ names only need be given once and subsequent dates of publication can be listed separated by a semi-colon.

. . earlier reports (Roy 1994; 2001)

References should be listed alphabetically at the end of each article.

For listing publications by the same author, single author references should be listed first (in ascending order by year of publication), then two-author references (in alphabetical order by second authors’ name, then in ascending order by year of publication) and finally three or more author references (in alphabetical order by second, third, fourth etc authors’ name, then in ascending order by year of publication).

Include all authors’ and editors’ names in the reference list except where there are more than three authors/editors in which case the first three authors’ names followed by ‘et al.’ will suffice, for example:

single author – Smith LB

two authors – Smith LB, Jones JW

three authors – Smith LB, Jones JW, Lee JP

four or more authors – Smith LB, Jones JW, Lee JP, et al.

Journal Article:

Book:

Chapter in edited Book:
Chapters in edited books –Redman GM, Phillips R., Peters, GGR. Sickle cell

**Edited Books:**


Personal communications and submitted manuscripts should be listed as unpublished communications in the text and not listed in the "Literature Cited" section.

**Tables and Figures** – Authors are encouraged to include Tables and Figures to illustrate Original Articles and Brief Communications but not to replicate issues, data or analyses described in detail elsewhere in the text.

All figures/tables and photographic images will be published under a Creative Commons Attribution License (CCAL), which allows them to be freely used, distributed, and built upon as long as proper attribution is given. Please do not submit any figures or photos that have been previously copyrighted unless you have express written permission from the copyright holder to publish under the CCAL license.

SBHA does not redraw figures accepted for publication in articles. Therefore, figure preparation is the author's responsibility. Authors should be sure that appropriate font sizes, line thicknesses, etc. are used to ensure that the Tables and Figures will be legible when published in the Journal’s A4 (297 x 210 mm) format. Text within Tables and Figures should use font (Garamond 14), same as in the main text.

Titles and legends (captions) for figures and tables should be included in the main article file (after Literature cited), not as part of the figure/table files themselves. Figures/tables should not be embedded in the main manuscript file. Provide a separate file for every figure/table in your manuscript.

**Tables.**

All tables must be cited in the text. Tabular material should be simple and uncomplicated, with as few vertical and horizontal rules as possible. Table titles should be complete but brief. Information other than that defining the data should be presented in footnotes. Footnotes to a table should be typed directly beneath the table and numbered with superscripts (1, 2, 3, etc.). They should not be numbered in sequence with the footnotes in the text. Also, if superscript numbers could be mistaken for exponents, substitute superscript a, b, c, etc.
Figures.

All figures must be cited in the text. Figure legends are to be numbered consecutively as follows: Figure 1. . . . , Figure 2. . . . , and should follow the sequence of reference in the text. Abbreviations for all figures should be listed alphabetically and placed before the first figure mentioning them.

Cover art.

Authors are invited to submit color photos for consideration as cover illustrations and as links to their piece on the Journal’s website. These should be submitted electronically in ping or .jpg format preferably at 300dpi.

5. Miscellaneous

Metric system. The metric system should be used for all measurements, weights, etc. Temperatures should be expressed in degrees Celsius (centigrade). Metric abbreviations should be expressed in lowercase without periods.

Symbols. When preceded by a digit, the following symbols are to be used: % for percent; ° for degree.

6. Informed consent

The Society, Biology and Human Affairs Journal requires that all appropriate steps be taken in obtaining informed consent of any and all human subjects participating in the research comprising the manuscript submitted for review and possible publication. A statement indicating that the protocol and procedures employed was reviewed and approved by the appropriate institutional review committee must be included in the Methods section of the manuscript. For those investigators who do not have formal ethics review committees, the principles outlined in the Helsinki Declaration should be followed (www.wma.net/en/20activities/10ethics/10helsinki/index.html).