

The ANU Undergraduate Research Journal

Volume Two 2010

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Contents

Foreword	7
Editors' Note	9
Acknowledgements	11
Referees	13
Biographies.	15
 About the cover page	 21
<i>Kate Groves</i>	
 People smugglers:	
The other 'boat-people'	23
<i>Hannah Purdy</i>	
 Is Citizenship an Effective Solution to the Palestinian Refugee Plight?	 39
<i>Radhika Chaudhri</i>	
 Culturing our sense of smell	 47
<i>Jennifer Robertson</i>	
 Uncovering the sexual tricks of orchid flowers	 65
<i>Julianne D. Livingston</i>	
 Climate change impacts on Australia's alpine ecosystems	 81
<i>Rachel Slatyer</i>	
 The Effectiveness of Interest Rate Parity	 99
<i>Jincheng Zhang and Ying Dou</i>	
 Towards a Re-interpretation of Early Islamisation Processes in Southeast Asia	 115
<i>Kate Woodley</i>	
 Balancing Human Rights and Customs in the Pacific Region: A Pacific Charter of Human Rights?	 125
<i>Kelly Haines-Sutherland</i>	
 International Disaster Response Law and the Coordination of International Organisations	 143
<i>Isabelle Reinecke</i>	
 "A Space of Time that is Always Filled with Moving": Cinematic Modes and the Writing of Gertrude Stein.	 163
<i>Patricia May</i>	

Foreword



The ANU Undergraduate Research Journal is a high quality student publication that demonstrates the breadth and depth of undergraduate research training at Australia's national university.

I am particularly pleased that the second edition of the journal focuses on the multidisciplinary engagement of undergraduate students in ANU research. I firmly believe that the traditional disciplinary strengths of a university community must be complemented by interdisciplinary approaches that bring knowledge from a wide range of academic specialisations together into common frameworks that can respond to the many new challenges we face in society.

And undergraduate students in the research-intensive environment for study offered by ANU have much to gain from this perspective. At ANU we actively promote interdisciplinary approaches to research and education – we believe this approach encourages students to think in new and more innovative ways.

As I prepare to step down from the role of Vice-Chancellor at ANU next year, I hope that the publication of the ANU Undergraduate Research Journal will continue to be an important annual milestone for the ANU community well into the future, bringing to the attention of the wider community some of the best research talent being nurtured at ANU across such a diverse range of fields.

A handwritten signature in black ink, which appears to read 'Ian Chubb'.

Ian Chubb AC
Vice-Chancellor and President
The Australian National University

Editors' Note

We would like to present the Australian National University's community with the second volume of the ANU Undergraduate Research Journal (AURJ), the annual showcase for exceptional undergraduate work from a variety of disciplines. Established in 2008, AURJ was designed to give students a unique opportunity to publish their undergraduate work; it is a peer-reviewed journal managed by a team of postgraduate student editors, with guidance from the staff of the Office of the Dean of Students and published both in print and electronically by ANU eView.

While ANU is widely appreciated for its scholarly production at the professional and post-graduate levels, less is known about the extent and the quality of research conducted by the almost ten thousand undergraduate students who represent more than half of the university's enrollments. As we believe that this substantial share of the ANU community deserves equal attention to their more senior colleagues, and that originality, commitment and entrepreneurship are qualities to be found across the whole academic body, we seek here to exhibit a snippet of this year's undergraduate production.

AURJ extends to these students' research experience and alerts them to the range of opportunities that are available at ANU for research and publication. In particular, by publishing work from a range of disciplines, we would like to encourage the academic community to become aware of different fields of study and to engage in discussions about these interdisciplinary issues. In order to do so, we have chosen a crosscutting topic, that of *movement* that forces us to consider real-world problématiques in their constantly evolving features beyond scholarly sectoralism.

We live in a constantly moving and interconnected world. Such dynamism creates relationships where actions lead to reactions, whether biological adaptations, literary movements or political and economic international dynamics. This year's volume explores the movement inherent in today's world. Although the articles range from a variety of disciplines, they all revolve around the idea of purposeful movement and the effects of such movement.

In accordance with the AURJ tradition, we chose not to use a uniform referencing system in order not to enforce a discipline-specific tone on all essays and took away from the integrity of a student's article. As with last year's volume, each

article is referenced according to the general norms of the relevant field, and should enable readers to approach these essays as examples of “best practice” scholarship in their discipline.

We hope readers enjoy perusing the journal as much as we have enjoyed putting it together.

The Editorial Team:

Michele Acuto

Aditya Chopra

Michelle Jester

Acknowledgements

The Editors of the ANU Undergraduate Research Journal wish to express their sincere thanks to the following people.

- Professor Ian Chubb, Professor Penny Oakes, Dr Paula Newitt for their continued support of the activities of this journal.
- All ANU students for their submissions to the journal.
- Students whose articles have been published in this edition for their hard work in improving the academic quality of their submissions even further.
- Special thanks to all academic referees and mentors for their commitment during the editorial process.
- Dr Dierdre Pearce, Project Manager, Dean of Students Office, for her guidance and support.
- ANU eView Team for their patience and willingness to help us produce a fantastic publication.

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Biographies

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Kate recently completed a bachelor of Visual Arts with honours. She majored in Printmedia and drawing and spent her honours year researching concepts of place and space and the human body within the landscape. Over the last 6 months she has undertaken volunteer work at the National Gallery of Australia with the Australian Prints and Drawings department. She was involved in the 7th Australian Print Symposium in 2010. She hopes to pursue a career in Printmedia and drawing, implementing the skills and theories, which she has studied at university.

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Hannah Purdy

Hannah is a fourth year Bachelors of Arts & Commerce student majoring in International Business, International Relations and Development Studies. She travelled extensively to places such as India, Iran, Russia, Turkey and South-East Asia. With a personal interest in refugee rights and advocacy, she has undertaken the research for her paper on people smugglers while interning at the Fleilich Foundation. She hopes to commence her Honours year in 2011 and delve deeper into the issues covered in her paper.

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Radhika is in her fourth year of a Bachelor of Arts/Bachelor of Laws in the College of Arts and Social Sciences, and has a keen eye for politics. In particular, she is interested in political theory, development and refugee issues within the broader framework of international relations.

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Jennifer is a third year Bachelor of Science (Advanced) student with majors in Chemistry and Molecular Biology. Her passion for Science developed in secondary school with her selection for the 2006 CSIRO Student Research Scheme (winning the prize for Best Scientific Poster) and the 2007 National Youth Science Forum. She has travelled widely and lived in Australia, New Zealand and England. In 2009, she studied Biochemistry at Uppsala University in Sweden. She tutors and demonstrates at the Research of Chemistry at ANU and is a regular volunteer at Calvary Hospital and with the Special Olympics. In 2011, she hopes to continue her research into the olfactory cortex as part of her Honours year at ANU.

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Julianne is currently completing her Honours research and hopes to graduate with a Bachelor of Science with Honours in 2011. After travelling around Australia, Europe and Vietnam, she chose to focus her studies on the fields of zoology and genetics at the Research School of Biology. Her life-long passion for the natural world has led her to enthusiastically undertake ecological and conservation focused research and volunteer projects, including this paper on sexually deceptive orchids and the relocation and tracking of re-introduced native birds in Mulligan's Flat Nature Reserve. Her academic awards include the Rabobank Scholarship (2007), Field Naturalist Association of Canberra Prize (2008), IARU Global Summer Research Scholarship (2009), L.D. Pryor Prize (2009) and the ANU Honours Scholarship (2010).

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Rachel Slatyer

Rachel graduated from the Australian National University in 2010. Her primary interests are in animal ecology and behaviour, and she majored in evolution and ecology, and genetics. She received first class Honours in ecology and evolution and won a University Medal. R. Slatyer recently volunteered on a wild animal research program in Ecuador and hopes to commence her PhD soon.

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Jincheng Zhang

Jincheng is in the final year of her study for a Bachelor of Commerce. She has majored in Accounting and Finance and has paid specific attention to the Australian taxation system, multinational finance, financial instruments and corporate finance. While at ANU, she has received the Chancellor's Letters of Commendation for every academic year. She hopes to commence her Honours year at ANU shortly.

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Ying is completing his final year in a Bachelor of Commerce degree majoring in finance. He hopes to undertake Honours research into multi-national finance and financial derivatives. In 2009, he participated in the JP. Morgan Share Market Competition and ranked 10th amongst more than 5,000 participants.

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Kate Woodley

Kate is undertaking a Bachelor of Arts degree, majoring in Arabic and History. As a young child, Kate dreamt about living in the Arabian Desert, isolated from the world but for the company of Arabian horses and the occasional camel. Perhaps unsurprisingly, Kate's future plans earned her a trip to the child psychologist. Although she no longer aspires to live in the desert wilderness, Kate has retained a lifelong interest in the Middle East. She has completed a previous undergraduate degree in Near Eastern Archaeology at the University of Sydney, and intends to pursue postgraduate studies in Islamic History upon the completion of her current ANU degree.

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Kelly Haines-Sutherland

Kelly graduated with a Bachelor of Arts (Honours)/Bachelor of Laws in 2010. Her studies focused on international relations and political science and she has a keen interest in the Pacific region. Kelly has also worked part-time as a paralegal during her degree, at a small company, a law firm and at two community legal centres. This paper was completed as part of the law internship program in 2009.

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Isabelle Reinecke

Isabelle Reinecke has recently completed Bachelor of Laws (Hons) and Bachelor of Science (Psychology) at ANU. Her interest in International Disaster Response Law was stimulated by a visit to the International Federation of the Red Cross and Red Crescent Societies in Geneva, Switzerland with the College of Law's International Organisations Law program in 2008/2009. The growing frequency of increasingly horrific natural disasters around the time of writing, including Hurricane Katrina, the Pacific Ocean Tsunami and Black Saturday fires in Australia (and the Haiti and Pakistani disasters more recently), have encouraged her to pursue a career in international law, focusing on international disaster relief. She represented the university in the 2010/11 summer Philip C. Jessup International Law Moot Court Competition. She will commence a Graduate position at Clayton Utz in Sydney in 2011.

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Patricia May

Patricia is in her third year of the Bachelor of Philosophy (Arts) (PhB) degree, majoring in English and Film Studies. In 2008 she received the Ronin Films Prize for Introduction to Film Studies and the Rachel Dorph Memorial Prize for English. Her research interests include contemporary American fiction, women's writing, literary modernism and early film history.

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Michele Acuto

Michele is a PhD candidate in the Asia-Pacific College of Diplomacy (School of Regulation, Justice and Diplomacy), researching the relevance of global cities for global governance. He has tutored international relations in the School of Politics and International Relations since 2008. He is also affiliated with the University of Canberra, where he teaches sociology in the Faculty of Business & Government, and is visiting scholar at the National University of Singapore's Cities Research Cluster and collaborator for the 'urban hybridization' project at the Milan Polytechnic. Along with the AURJ he also works as Senior Editor for the DC-based magazine *Diplomatic Courier*. He was previously independent consultant on diamond trade and the Kimberley Process, served as JPO for the Secretariat of the International Campaign to Ban Landmines, and visiting researcher at the Institute of European Affairs in Dublin. He has a BA in Diplomacy from the University of Genoa, a specialization in Peace and Conflict Studies from the International Peace Research Institute in Oslo, as well as Master of International Affairs and a Master of Diplomacy from the ANU.

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Aditya is in his second year of PhD research at the Planetary Science Institute at ANU. He obtained an undergraduate degree in chemistry from the University of Western Australia in 2007 and in 2008 graduated with first class Honours in astronomy at ANU. His research interests span across astrobiology and planetary science with the focus of his PhD research being the study of the origin and evolution of life using abundances of chemical elements. He was an author in the inaugural edition of the ANU Undergraduate Research Journal in 2009, where he published results of his Honours year research on the topic that subsequently became the foundation for his PhD research. He enjoys sharing his passion for science with the public and can often be found at volunteering at outreach events or communicating through local and national media.

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Michelle recently graduated with a Master of Culture, Health and Medicine from ANU. She completed her undergraduate degree at Davidson College in the United States, receiving a Bachelor of Arts in East Asian Studies. She is interested in international health issues, particularly the development of health programs that meet the needs and knowledge of the local area and people. She worked as a vestibular researcher at Johns Hopkins Hospital and wrote her undergraduate thesis on feminine beauty ideals in China and how they have led to various medical beauty trends. In addition to AURJ, she has also served as the Managing Editor of her undergraduate school's student news publication.

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About the cover page

KATE GROVES

Motion

In everyday life, without conscious realisation, we use our bodies to convey emotions. This work aims to capture the physical movement one performs to convey an emotion.

The body is used as a drawing tool and covered in paint and other materials. It continuously travels across the surface, rolling, dancing, shifting and slipping to convey a narrative of human movement. As the body moves, the paint begins to tell a story of one's physical movements and the marks of a free moving body are left behind. The work is continuously danced upon; creating layers of motion where an imprint of the human body is left behind. This work is a recording of human movement in a particular place and time; it celebrates and weeps motion and emotion within the human body.

People smugglers: The other 'boat-people'

HANNAH PURDY

Abstract

With over 16 million refugees and asylum seekers worldwide, the necessity of an effective global response has never been more paramount. However, with little consideration of the realities of the refugee situations, Australia's border protection policies have been strengthened, limiting the legitimate solutions available to asylum seekers. This article will focus on the alternative solutions demanded by asylum seekers, and in particular on the 'assistance' provided by people smugglers. People smugglers apprehended in Australian waters are found to be Indonesian fishermen, with the nation's high poverty rate considered the primary driver for their involvement in smuggling activities. Without adequate support from their government, Indonesian fishermen may consider the income generated from people smuggling ventures more beneficial than the potential risks such as imprisonment. It will be argued that Australia's response to the 'boat people' challenge must change: resources need to be targeted correctly with a focus on development in Indonesia, rather than barrier building. Disadvantaged Indonesian fishermen must be provided with increased income opportunities and security, while asylum seekers need to be provided with legitimate relocation options. This will see the Australian government more effectively working towards its goal of "stemming the flow of refugees".

Our small boats drift.
We are the foam
floating on the vast ocean
we are the dust
wandering in endless space
our cries are lost
in the howling wind.¹

1 Isamu, A. and J. Daigaku. (1978) *Boat people: today's "untouchables": the holocaust of the 20th century - documentary = Tham nan cua the ky thu 20* Asian Relations Center, Socio-Economic Institute, Sophia

The mass departure of Vietnamese refugees following the fall of Saigon during the 1970s propelled the term 'boat people' into common use. These lyrics, penned in response to the plight of these refugees, poetically express the hopelessness and despair felt by many forced to flee their homeland. In 2001, the Australian Government "thundered that Australia's historic generosity towards refugees had made it a soft target for a new breed of organised criminals: the people smugglers".² More recently, then Prime Minister Kevin Rudd stated, "people smugglers are engaged in the world's most evil trade and they should all rot in jail because they represent the absolute scum of the earth".³ These statements are highly politicised and are indicative of the Australian Government and public's perceptions of, and attitudes towards, people smugglers and refugees. Policies are targeted to increase border protection methods and decrease the arrival of refugees, with little consideration of the refugees themselves.

With little scholarly attention paid to the relationship between asylum seekers and people smugglers in Indonesia, this study will highlight some missing elements of the people smuggling picture and will seek to fill a gap in the relevant literature. As the relationship needs to be understood in the broader context of globalisation and migration, the issues will be discussed in relation to the global refugee situation. Australia's responses will then be discussed; and through an analysis of a refugee experience, the incongruity of Australian and global responses to refugees will be explored. It will be shown that refugees will seek alternate pathways if they are unable to be assisted through legitimate avenues.

This analysis will develop into the existence of people smugglers in response to this demand, and Australia's political responses. Once again, the incongruity of these responses will be explored in comparison with the reality. The motivations and necessity of people smuggling for the 'small players', Indonesian fishermen, will be analysed; considering poverty to be the primary driver of involvement in people smuggling activities. Inadequacies within the Indonesian system and responses to this poverty will be explored, with an emphasis on Indonesia's position within the process of refugees attempting to reach Australia via sea.

In conclusion, alternative solutions and recommendations to the global problem of refugee resettlement and the existence of people smugglers as an alternative solution for refugees will be outlined. Issues of development will be found to be of key importance. It will be argued that Australia's response to 'boat people' must change. Rather than strengthening border protection and entrance barriers, resources need to focus on issues of development, providing asylum

University, Tokyo., p. 13.

2 O'Neill, M. (2008). *Blind Conscience*. Sydney, University of New South Wales Press Ltd. , p. 6.

3 Berg, C. (2010). "Seeking A Political Crisis." *Governance & Service Provision: The Drum Unleashed*, from <http://www.ipa.org.au/news/2135/seeking-a-political-crisis>.

seekers with legitimate relocation options and poor Indonesian fishermen with increased income opportunities. Development, dealing with the issues of poverty and corruption as well as relocation, needs to be addressed in order for any positive steps to be made.⁴ For development to be targeted correctly an adequate assessment of all components of the problem is required; the reason for the existence of people-smugglers, and the benefits and costs of becoming a people smuggler must be considered.

Refugees Worldwide

Since the cessation of World War I the plight of refugees has become an international concern.⁵ By 1950, approximately 1.5 million refugees had been recognised internationally and the need for a global response became essential. The United Nations High Commissioner for Refugees (UNHCR) was established in response. 1951 saw The United Nations Convention Relating to the Status of Refugees created,⁶ remaining today as the key relevant global treaty,⁷ with 43.3 million forcibly displaced people now in existence worldwide at the end of 2009; including 15.2 million refugees and 983,000 asylum seekers.⁸

Australia and its territories, as of January 2010, is home to 22,548 refugees and 2,350 asylum seekers.⁹ The vast majority reaching Australia by air with a valid visa for entry, applying for asylum while living in the community.¹⁰ According to Julian Burnside, human rights and refugee advocate, the rate of people arriving in Australia by boat "has always been tiny. The largest number to arrive in any 12-month period over the past three decades is 4100. Compare that with about 200,000 new permanent migrants every year".¹¹

4 Nicholson, B. (2002). "The Wrong End of the Telescope: Economic Migrants, Immigration Policy, and How it Looks from Albania." *The Political Quarterly* 74(4): 9 p. 440.

5 Barnett, L. (2002). "Global Governance and the Evolution of the International Refugee Regime." *International Journal of Refugee Law* 14: 24. p. 241.

6 Ibid., p. 245.

7 McMaster, D. (2001) *Asylum seekers: Australia's response to refugees*, Melbourne University Press, Melbourne, p. 9. IN Phillips, J. (2010). *Asylum seekers and refugees: what are the facts?* D. o. P. Services. Canberra, Parliamentary Library: 18. p. 3.

8 UNHCR. (2010). "Refugees, Asylum-seekers, Returnees, Internally Displaced and Stateless Persons." *2009 Global Trends*, Retrieved 19 June, 2010, from <http://www.unhcr.org/4c11f0be9.html>.

9 UNHCR (2010). 2010 Regional Operations Profile - East Asia and the Pacific. *Australia*.

10 DIAC, (2010) *The facts about immigration detention*, media release, 3 July 2009, viewed 7 June 2010, http://www.newsroom.immi.gov.au/media_releases/739?page=4&

11 Burnside, J. (2010). Abbott ignorant on boat arrivals. *The Age*, Fairfax Media. & Phillips, op. cit., p. 6.

Australia's Response to Refugees

Although small, the number of unauthorised arrivals has been increasing since 1988. Yet it was not until John Howard's 1996 - 2007 political leadership that the issue became more prominent due, in part, to the significant increase in unauthorised boat arrivals between 1999 and 2001. The Howard Government response included the Border Protection Legislation Amendment Act 1999, adding to the Customs Act 1901 and the Migration Act 1958, targeted to stop asylum seekers reaching Australia. Three key incidents in the second half of 2001; the Tampa Affair, the children overboard affair, and SIEV X sinking, all of which are now well documented,¹² particularly highlighted the various 'inadequacies' within the existing legislation, leading to the "major shift in Australian immigration policy".¹³

The proximity of the three incidents to the events of September 11 terrorist attacks reinforced public alarm, and as the arrivals were from the Middle East, a hardening of attitudes occurred.¹⁴ Anti-refugee rhetoric increasingly labelled asylum seekers as 'illegals',¹⁵ while the government was led to "thunder that Australia's historic generosity towards refugees had made it a soft target for a new breed of organised criminals: the people smugglers. Floodgates were opening to the world".¹⁶ Howard was determined to strengthen legislation further, utilising the public's unease against those who would 'throw their children overboard' to legitimise the proposed measures.¹⁷ This incident became a central component of the 2001 Federal election campaign, and after winning his third term in office, Howard created and enshrined additional powers in the Border Protection (Validation and Enforcement) Act 2001 (BPVE) and the

12 See for instance;

Hatton, T and Audrey Lim (2005), 'Australian Asylum Policy: The Tampa Effect', *Agenda*, 12 (2), 15.

Mares, P. (2002). *Borderline: Australia's response to refugees and asylum seekers in the wake of the Tampa*. Sydney: UNSW Press.

Mathew, P. (2002). 'Australian Refugee Protection in the Wake of the Tampa,' *American Journal of International Law*. 16. 372.

13 Hugo, G. (2002). "Australian Immigration Policy: The Significance of the Events of September 11." *International Migration Review* 36(1): 4. p. 38.

14 Ibid p. 39.

15 Hatton and Lim, op. cit., p. 115.

16 O'Neill, op. cit., p. 6.

17 McMaster, D. (2001). *Asylum seekers: Australia's response to refugees*. Melbourne, Melbourne University Press. p. x.

Migration (Excision from Migration Zone) Act 2001.¹⁸ Current policy became a re-emergence of earlier White Australia policy.¹⁹ Refugees became queue jumpers.²⁰

Yet "the concept of an orderly queue does not accord with the reality of the asylum process".²¹ According to the UNHCR, less than 1 per cent of the world's refugees may be resettled in any given year.²² With the "absence of a solution for millions of refugees in protracted situations continuing to pose a major challenge to UNHCR and its partners, to host countries, the refugees themselves and the international community at large".²³ While annually 2.5 to 3 million places are available for international migrants,²⁴ the UNHCR estimates that only 79,000 refugees are accepted by resettlement states each year. This figure is particularly small in comparison to the 747,000 refugees that the UNHCR also estimate will be in need of resettlement in 2010 due to the absence of durable solutions.²⁵

Yet "none of this seems to matter to a country that has increasingly been willing to use aggressive military manoeuvres in order to keep these refugees at bay".²⁶ Popular opinion asserts that those seeking to reach Australia via illegitimate means are queue jumpers, merely seeking a better life for self-serving reasons. This approach is ignorant of the realities of refugee situations.²⁷

The Refugee Experience

The arrival of asylum seekers to Australia involves more than these statistics and emotive public responses. With the development of more restrictive immigration policies, the 'human face' of the refugee issue has been often overlooked.

The story of Sondos Ismail, her schoolteacher husband Ahmed and their family, highlights these problems.²⁸ After her father was killed by Saddam Hussein's secret police, the family fled to Iran, hoping to find security. Unable to secure

18 Hatton, Timothy and Lim, Audrey (2005), 'Australian Asylum Policy: The Tampa Effect', *Agenda*, 12

(2), 15. p.119.

19 Wazana, R. (2004). "Fear and Loathing Down Under: Australian Refugee Policy and the National Imagination." *Refugee22*(1): 13., p. 83

20 Ibid p. 83.

21 Phillips, op. cit., p. 5.

22 UNHCR, (2009) *Statistical yearbook 2008*, Geneva, 2009, viewed 4 May 2010, <http://www.unhcr.org/pages/4a02afce6.html>; pp. 10 -11.

23 UNHCR (2009), *Global trends*, op. cit., p. 4.

24 Van Kessel, G. (2001). "Global migration and asylum." *Forced Migration Review 10*: 4. p. 10.

25 Durable solutions are the three options available to refugees and which the UNHCR can assist with; voluntary repatriation; local integration; or resettlement to a third country in situations where it is impossible for a person to go back home or remain in the host country. (Fundraising Reports,6. UNHCR: 2010c)

26 Wazana, op. cit., p. 84.

27 Ibid p. 86.

28 Kevin, T. (2004). *A Certain Maritime Incident: The sinking of SIEV X*. Melbourne, Scribe Publications. p. 33

adequate income in Tehran the family lost a child due to their inability to pay for medical care. After six years in this environment Ahmed's brother, living in the United States, sent US\$3000 for the family to seek out a better life.²⁹ Assured that Australia was a kind and generous country, the family moved to Indonesia and in 1999, Ahmed paid for passage for himself on a boat from Indonesia, hoping his family would be accepted later. Ahmed won the right to refugee status and after a period in detention, he was granted a temporary protection visa (TPV).³⁰ Progressively introduced since 1999, these new visas did not allow families to join those granted asylum in Australia for at least three years.³¹ The granting of asylum to all family members was precisely the outcome the family sought. With the removal of this option, Ismail and her remaining three children spent time in an Indonesian detention centre, finally resorting to using "people smugglers to try to be reunited, a move that was a much riskier proposition in 2001 than it had been for Ahmed".³²

Approached by Middle Eastern associates of Egyptian smuggler Abu Quassey, Sondas was promised the boat was safe. Charged US\$500 and kids free she was suspicious because her husband's trip had cost US\$1200.³³ Her husband begged her not to make the dangerous voyage but after two years apart in limbo, she was determined.³⁴ The vessel that Abu Quassey organised was small and unnamed. It was later to become known as SIEV X. Sondas survived the sinking but she and Ahmed lost their three daughters, Aiman, 9, Fatima, 7, and Zahra, 6. Sondas survived in the sea off the coast of Java for 19 hours before Indonesian fishermen found the boat's wreckage.³⁵

As starkly visible throughout Sondas' story, the concept of an orderly queue does not exist for asylum seekers. Asylum seekers attempting to reach Australia via sea are fleeing countries in which there may be no Australian immigration or UN office or attempting to gain a legitimate visa may be too dangerous.³⁶ Not all refugees who make it to Indonesia register with UNHCR,³⁷ nor do they all live in designated refugee camps. Either way, living conditions can be quite terrible. The situation in Indonesia results in refugees trying to preserve whatever cash they have while existing in a perpetual state of poverty. It is difficult to imagine the desperation Sondas experienced in caring for her children in these

29 Ibid p34

30 Head, Mike (2010), *Drowned refugees were victims of Australian policy*, Accessed 3 May, 2010 from <http://www.wsws.org/articles/2001/oct2001/refu-o29.shtml>.

31 Hatton and Lim. *Agenda*, p. 118.

32 Kevin, op. cit., p. 34.

33 Ibid

34 Ibid. p. 35.

35 Head, op. cit.

36 Phillips, op. cit., p. 5.

37 Ibid

circumstances. It is not difficult to see why she was determined to risk the sea voyage and join her husband after the family's attempts at finding a legal solution had failed.

The People Smuggling Experience

"The IOM and UNHCR have jointly stated that in the absence of legal migration options to pursue, migrants invariably exploit the asylum channel, 'it being often the only entrance possibility effectively open to them'".³⁸ Heckmann et. al. agree, "arguing that the increasing proportion of asylum seekers who use illegal migration channels - most notably smuggling - do so to 'circumvent restrictive admission policies in advanced industrial countries'".³⁹ Risking the sea voyage can be seen as less harmful than repatriation or a continued existence in Indonesia.⁴⁰ Accordingly, in response to this demand⁴¹ to overcome protective legal entrance barriers, people-smugglers⁴² have emerged. People smugglers facilitate illegal entry attempts across international borders.⁴³

Although scholarly research into current people smuggling activity is limited, judgements available from the Western Australian and Northern Territory Supreme courts of Australia provide much information regarding the role of fishermen in people smuggling activities, reflected in the following articles.⁴⁴ The anecdotal evidence in the following stories is representative of the circumstances surrounding many SIEV's ventures into Australian waters, in support of the notion that people smugglers are not criminal masterminds.

On April 8 2009 Hasanusi, an Indonesian fisherman, sailed into Christmas Island's Flying Fish Cove in his 12 metre wooden fishing boat with 38 Iraqi asylum seekers onboard. At his trial in March 2010, prosecutor Anthony Evers stated the crown case was straightforward. "Hasanusi is a people smuggler . . . [having] equipped his boat with enough fuel, food and water for the journey".⁴⁵ Prosecutors told the court that Hasanusi was paid double his normal wage to bring the group to Australia. Hasanusi testified "that he had been hired to take

38 Brolan, C. (2003). "An Analysis of the Human Smuggling Trade and the Protocol Against the Smuggling of Migrants by Land, Air and Sea (2000) from a Refugee Protection Perspective." *International Journal of Refugee Law* 14(4): 36. p. 570.

39 Van Kessel., op. cit., p. 10.

40 Hoffman, op. cit., p. 5.

41 Ibid. p. 1.

42 Brolan, op. cit., p. 573.

43 United Nations, *Protocol to Prevent, Suppress and Punish Trafficking in person, especially women and children, Supplementing the United Nations Convention against Transnational Organized Crime*.

44 The case judgements can be accessed at: <http://decisions.justice.wa.gov.au/supreme/supdcns.nsf>, and at: <http://dcssearch1.nt.gov.au/CES5/doj-ntsc.aspx> by using the search term 'people smuggling'. The articles referenced in this paper contain a summary of the judgements that I believe to be appropriate.

45 Guest, D. (2010). 'Accused people-smuggler's mutiny fear'. *The Australian*. 16 March 2010.

the group on a fishing trip and was forced to come to the Australian territory fearing that he would be thrown overboard otherwise - a jury rejected the claim... Judge Allan Fenbury said it was clear that the fisherman knew what was planned from the beginning, though he noted that Hasanusi was lured into crime by an organised trafficking operation. "You are a simple uneducated fisherman from Indonesia", Fenbury said. "It must have been the money that made you do this. The people smugglers will always prey upon people like you who need the money". Hasanusi was sentenced to 6 1/2 years in prison with a minimum of 3 1/2 years before good behaviour can apply".⁴⁶

In May 2010, four Indonesian fishermen were paid a nominal amount to bring a boatload of Afghan nationals to Australia.⁴⁷ The Supreme Court heard that the men were under the impression they were to drop the asylum seekers at Ashmore Island and then could return to Indonesia. "The court heard they did not understand the serious consequences of their actions. Three of the men were paid \$63 and the fourth \$150 before setting off for Ashmore Island. All four had given their money to their families. The court heard they were very poor people lured by 'real criminals' for a very small amount of money. The men have all been sentenced to serve a minimum of three years in jail. Justice Judith Kelly said the court was bound to give the men the minimum sentence of five years' jail, with a non-parole period of three years. She said it was an "extremely harsh" mandatory sentence that did not allow the court any discretion. Last year, Justice Dean Mildren also criticised the minimum sentence, after dealing with two Indonesian crewmen from the SIEV 36, which exploded after being intercepted by the Australian Navy".⁴⁸

The people smuggling process

The stories of these fishermen consistently demonstrate that convicted people smugglers are uneducated fishermen, earning more money for their involvement in the smuggling activities than from fishing. A fisherman is able to make a month in salary, sometimes many months salary in one venture. Although not all traditional fishermen will consider people smuggling to be a viable option for improving their economic status, it is hypothesised that if the opportunity for an individual to become involved with people-smuggling presents itself, poor fishermen will utilise the opportunity, considering the risks to be worth the opportunity to assist in the reduction of poverty for themselves and their families.

46 Associated Press, (2010b), 'Indonesia people smuggler jailed in Australia', *Arab News*. 22 April 2010. Available at; <http://arabnews.com/world/article45837.ece>

47 Stewart, P. (2010). People smugglers' \$63 boat trip ends in jail, ABC News.

48 Ibid

Like any social activity, people smuggling requires planning, organisation, and implementation. There are those like Abu Quassey, organiser of the SIEV X venture, and there are others who implement the operations. These others are the Indonesian crews of the various fishing vessels and are the small players drawn into this activity. The anecdotal evidence outlined previously supports the notion that the Indonesian crews apprehended in Australian waters are not criminal masterminds like Abu Quassey. Smuggling operations can be best considered as a grass-roots affair, "originating from within the stranded refugee communities and/or local Indonesian communities".⁴⁹ There is no evidence for any form of organised crime with "individuals involved in transporting people as an occasional and secondary occupation to their main income earning activity or loose, fluid networks of locally based smugglers, probably with transnational contacts through shared ethnicity or kinship".⁵⁰ Contrary to popular belief, people smugglers are not 'the scum of the earth'.

As will be shown, these people smugglers are disadvantaged Indonesian citizens, becoming involved in people smuggling activities as a result of many factors. These will be discussed in depth below, and include the loss of traditional land rights and poverty in Indonesia, the fact that a demand for their services as people smugglers exists, and that this activity will result in a payment greater than that which can be earned in their fishing occupation. It is a choice of economics.

Smuggling for Survival

The 3.06 million square kilometres of the Indonesian archipelago⁵¹ is home to "38 per cent of all marine fish species and some 78 per cent of the world's corals".⁵² The archipelago is divided, roughly down the centre, by a remarkable biological demarcation known as Wallace's line, separating the ecozones of Asia and Wallacea, a transitional zone between Asia and Australia. Significantly, to the east of the Wallace line the Eastern Indonesian regions of East Nusa Tenggara, Maluku and Papua,⁵³ have "access to the marine resources of the Arafura Sea

49 Marfleet, Phillip (2006), *Refugees in a Global Era* (Hampshire, UK: Palgrave Macmillan). p. 255.

50 Hoffman, op. cit., p. 2.

51 Suharto, (2007). Forthcoming the 2010 Indonesian Population and Housing Census: The 23rd Population Census Conference. *The 23rd Population Census Conference*. D. o. p. s. B. S. Indonesia). p. 2.

52 Dutton, Djohani, et al. (2009). Balancing biodiversity, conservation and development in eastern Indonesia. *Working with nature against poverty: development, resources and the environment in eastern Indonesia*. B. P. Resosudarmo. Singapore, Institute of Southeast Asian Studies. p. 129.

53 Resosudarmo, B. P. and F. Jotzo (2009). Introduction. *Working with nature against poverty: development, resources and the environment in eastern Indonesia*. B. P. Resosudarmo. Singapore, Institute of Southeast Asian Studies. p. 7.

which lies between Australia and Indonesia".⁵⁴ The Arafura is Indonesia's 'golden fishing ground' its' most commercially productive.⁵⁵ Roughly 12 million living east of the Wallace line "depend directly on biodiversity and ecosystem services for their livelihoods and well-being".⁵⁶

The growing demand for resources

However, the resources of this biologically diverse and economically important region "are under increasing pressure as global demand increases, as comparable resources in western and central Indonesia are depleted and as population expands due to in-migration and local economic and population growth".⁵⁷ The United Nations estimates that Indonesia's urban population has increased almost fourfold since 1950.⁵⁸

Overfishing occurs in response to increasing population and is related to a large-scale fishing boom in the Arafura Sea.⁵⁹ Primarily the result of large-scale illegal fishing, where commercial operators have not conformed to Indonesian Government requirements,⁶⁰ the below acceptable level of natural resources has "disrupted and diminished the opportunities for the small-boat [and traditional] fisherman of eastern Indonesia to derive a living from the sea".⁶¹ As these fishermen have seen their capacity to operate curtailed, and as competition for the remaining resources grows, they have been forced to extend their voyaging, shifting to strategic locations along coasts of eastern Indonesian southern islands.⁶² These fishermen are also more likely to resort to illegal and destructive fishing methods themselves, placing even greater pressure onto inshore environments essential for fish spawning; reducing further catch, returns, and social well-being⁶³ and leading to a dangerous cycle which "further diminishes the prospects of local communities for sustainable

54 Ibid. p. 8.

55 Resosudarmo, B. P., Napitupulu, et al. (2009). *Illegal Fishing in the Arafura Sea. Working with nature against poverty: development, resources and the environment in eastern Indonesia*. B. P. Resosudarmo. Singapore, Institute of Southeast Asian Studies: 178 - 200. P. 178

56 Dutton et al., op. cit., p. 125.

57 Ibid.

58 Kreager, P. (2006). "Migration, social structure and old-age support networks: a comparison of three Indonesian communities." *Ageing & Society* 26: 24. p. 39.

59 Fox, J. J., D. S. Adhuri, et al. (2009). *Searching for a Livelihood: The Dilemma of Small-boat Fishermen in Eastern Indonesia. Working with Nature Against Poverty: Development, Resources and the Environment in Eastern Indonesia*. B. P. Resosudarmo and F. Jotzo. Singapore, Institute of Southeast Asian Studies Publishing: 201 - 225. p. 206

60 (*Kompas*, 9 June 2003; *Tempo Interaktif*, 30 February 2003). IN Resosudarmo (Napitupulu and Campbell), op. cit., p. 184.

61 Resosudarmo (Napitupulu and Campbell), op. cit., p. 180.

62 Fox et.al., op. cit., p. 201.

63 Resosudarmo (Napitupulu and Campbell), op. cit., p. 193.

livelihoods and this contributes to increased poverty".⁶⁴ These threats to biodiversity and livelihoods have been further aggravated by the culture of corruption intertwined into the Indonesian system. "As a consequence, there is both little substantive protection from encroachment, hunting and illegal harvesting of resources and little incentive for park neighbours to manage adjacent lands and seas in ways that are compatible with nature conservation".⁶⁵ Without protection from encroachment, these waters are vulnerable to the kind of overexploitation known as the 'tragedy of the commons'.⁶⁶ Fishermen have become disenfranchised by the unfair enforcement of their individual rights and their inability to compete with larger illegal operators.⁶⁷

Indonesian fishermen have limited opportunities to break out of this poverty cycle. Attempting to increase their catch by fishing in Australian waters, or turning their hand to people smuggling are two ways of fending off poverty.

Indonesian-Australian Collaboration

Since 2007, Australian patrols of its waters are now supplemented by joint patrols with Indonesia "for a more coordinated approach to reducing illegal, unreported and unregulated fishing in the region".⁶⁸

The restricted access to Australian waters resulting from these increased patrols severely limits the ability of Indonesian fishermen to escape the cycle through fishing Australian waters. January 2010 figures show that number of boats caught fishing in Australian waters has declined to about 30 since June 2009, compared to "hundreds" over previous years. Increased patrols "have made it too risky for businessmen bankrolling the illegal fishing, but an industry expert says that the fishermen may turn to people smuggling to survive".⁶⁹ As Jim Fox asserts, "These fishermen are actually very skilled. They know the seas between Australia and Indonesia, and those skills they are going to try to put to work".⁷⁰ Professor Fox says Indonesia has also cut the fuel subsidy that helped make the

64 Dutton et al., op. cit., p. 130.

65 Ibid. p. 131.

66 The commons: "resource that is shared by many people. The atmosphere, oceans, lakes and rivers are commons that provide natural resources and absorb pollution. ... they can be used by anyone to any extent. Open-access commons are vulnerable to overexploitation because no one is responsible for controlling the intensity of their use. Overexploitation under these circumstances is known as the tragedy of the commons . . . Overfishing illustrates how tragedy of the commons is a consequence of 'rational' decisions by individual resource users to get as much of the resource as possible". (Marten 2001: *Chpt 10*)

67 Resosudarmo (Napitupulu and Campbell) , op. cit., p. 190.

68 Australian Customs and Border Protection Service, (2007). 'Australia and Indonesia conduct joint fisheries patrol'. *Customs media release*. 1 November 2007. Available at; <http://www.customs.gov.au/site/content9614.asp>

69 News, A. (2010). Patrols could force fishermen into people smuggling.

70 Ibid.

trips viable. "The bosses who control that trade can shift their capital and do other things," he said. In Papua "and elsewhere a lot of that capital has moved into illegal logging, but for the poor fishermen there are very few alternatives. Temptation now is for some of these people to get back into people smuggling".⁷¹ Home Affairs Minister Brendan O'Connor disagrees, drawing attention to the more than 20 successful prosecutions in which jail terms of five or six years have been imposed. O'Conner believes that the jail terms should deter fishermen from taking jobs as people smugglers.⁷² Yet in reality, and despite this statement, the boats keep coming. The Australian, on June 19 2010, reported that during the previous week the Australian Navy had intercepted two suspected asylum-seeker boats off Christmas Island. They were on the 70th and 71st boats to arrive this year and the fourth and fifth suspected asylum-seeker boats to enter Australian waters from Indonesia in the week.⁷³

Australia's policies have clearly not been successful. Nor has Indonesia, in collaboration with Australia or through its own initiatives, successfully responded to the regional flow. "Indonesia's domestic laws against people smuggling are largely based on immigration offences and not related to people smuggling as such. What this means is that if a person ultimately seeking asylum in Australia enters or exits Indonesia legally, which is relatively easy to do, there is little the Indonesian authorities can do".⁷⁴ At a local level, Indonesia's judiciary remains susceptible to bribery, so charges can easily be dropped or convictions avoided or reduced. Corruption within Indonesia's law-enforcement agencies is rampant, making it almost impossible for international maritime organisations to control the region. Despite Australia's desires, Indonesia has more important priorities than passing new, stronger laws to crack down on people smuggling. "This is compounded by the slowness of the passage of much legislation and the disinterest or antipathy felt by some Indonesian legislators towards Australia . . . One factor in this antipathy is that some Indonesian legislators believe the problem is Australia's, not theirs."⁷⁵ They also note that Australia devotes considerable border protection resources to stopping Indonesian fishing in Australian territorial waters - waters they say were traditionally Indonesian".⁷⁶

71 Ibid.

72 Ibid.

73 Perpitch, N and D. Guest, (2010), *Asylum seekers boats keep coming as riot case hits court*. The Nation. 19 June 2010. Page 6.

74 Lintner, Bertil (2002), *Blood Brothers: Crime, Business and Politics in Asia* (Chiang Mai: Silkworm Books). p. 303.

75 Lintner, op.cit., p 304.

76 Kingsbury, op. cit.

Indonesia as a Transit Country

Asylum seekers attempting to enter Australia by boat invariably arrive having transited through Indonesia.⁷⁷ The Indonesian President Yudhoyono, in identifying his country as a 'transit' country, has also expressed a fundamental truth, "Australia as a destination country and Indonesia as a transit country cannot resolve this issue by ourselves".⁷⁸ Indonesia's inability to resolve the issue by itself is further complicated by "the absence of national refugee legislation and procedures".⁷⁹ The UNHCR is the primary provider of protection and assistance to refugees and asylum-seekers, undertaking responsibility for registration, status determination and the search for durable solutions in Indonesia.⁸⁰

Finding durable solutions will not be easy. Corruption is a significant issue. In regards to human trafficking, a United States Department of State report, *Trafficking in Persons Report 2010* states, "Corruption remains endemic in Indonesia, and members of the security forces continued to be involved both directly and indirectly in trafficking ... Fraudulent recruitment brokers involved in trafficking often operate outside the law with impunity. Some Ministry of Manpower (MOM) officials reportedly licensed and protected international labor recruiting agencies involved in human trafficking, despite the officials' knowledge of the agencies' involvement in trafficking. Some fraudulent recruitment agencies tied to families or friends of government officials or police make deals when caught, and then continue to operate. Government passport services remained the object of widespread corruption, and recruitment agencies routinely falsified birth dates, including for children, in order to apply for passports and migrant worker documents".⁸¹

The degree of corruption exposed above, together with the corrosive effects noted in the World Bank report underline President Yudhoyono's acknowledgement that Indonesia cannot resolve the issue by itself. Over more than the past decade, the policies of Australian Government's, both Liberal and Labour, have failed to stop asylum seekers attempting to enter Australia by boat. This seemingly intractable problem is identified by Bimal Ghosh, who states, "when there are high emigration pressure in sending countries, and powerful demand pull in

77 Tailby, R., (2001) 'Organised Crime and People Smuggling/Trafficking to Australia. *Australian Institute of Criminology, trends and issues* No. 208., p. 4.

78 Associated Press, (2010a), 'Indonesia, Australia agree on asylum seeker plan', *The Jakarta Post*, 10 March 2010. Available at: <http://www.thejakartapost.com/news/2010/03/10/indonesia-australia-agree-asylum-seeker-plan.html>

79 UNHCR., *Australia*.

80 Ibid

81 United States Department of State, (2010) *Trafficking in Persons Report 2010 - Indonesia*, 14 June 2010, available at: <http://www.unhcr.org/refworld/docid/4c1883ecc.html>.

the destination countries and especially when the two converge, restrictions on admission do not, by themselves, stop migration; they only drive the movements into irregular channels".⁸²

Restrictive immigration policies and the consequent tight control of Australia's maritime border have clearly failed.

Alternative Solutions and Recommendation

In the very long-term Bimal Ghosh's notion of regulated openness, involving an international approach to the orderly movement of people may be the way forward.⁸³ Ghosh believes in the ability of international organizations to solve international problems, and in this sense, regulated openness; the notion of open borders sustained by a code of cooperation between members, based on a set of mutually agreed norms and principles to "secure a good part of the efficiency-related benefits of openness while avoiding much of the distributional tension and negative externalities that free movement would generate",⁸⁴ is similar to the idea of an international global warming regime. The movement of asylum-seekers and refugees cannot be solved within national borders and so an international approach, and calls for a new international regime are attractive. However, as the global warming debate has shown it is often easier to reach agreement among nations that something must be done than to agree on what to do.

A global response to this global problem is necessary but enacting a response through an International agreement will take a long time. More immediately, practical solutions are required.

Australia's responses to asylum seekers and people smugglers have focused on increasing border protection methods and creating disincentives for arrivals. Yet despite the large amounts of money spent on such things as funding the IOM and UNHCR in Indonesia, arresting and prosecuting smugglers, operating detention centres and border surveillance; people smuggling continues.⁸⁵ Australia's contributions to the UNHCR refugee fund for such things as detention centres and their own spending on strengthening border protection methods could more appropriately be used to alleviate some of the root causes of the displacement of asylum seekers. Until those causes are addressed, people

82 Ghosh, B., (2005) *Managing Migration: Whither the Missing Regime?* UNESCO (15 February 2005), Available at, <http://unesdoc.unesco.org/images/0013/001391/139149e.pdf>

83 Ibid.

84 Ibid., p. 11.

85 Hoffman, op. cit., p. 7.

will continue to flee life-threatening situations. These people are desperate: they seek asylum for their very existence and will continue to do so until conditions are safe.⁸⁶

"If Australia is serious about putting an end to people smuggling, it needs to address the reasons why asylum seekers risk getting on a boat".⁸⁷ As a global problem, the existence of refugees, and thus the demand for people smugglers will not disappear unless all root causes, such things as war, famine, and natural disasters are combated. This is highly unlikely. Thus, it is imperative that these causes are considered in any attempt to stop unauthorised arrivals attempting to reach Australia as simply increasing migration barriers can backfire, encouraging people smuggling ventures.⁸⁸ "It is recognised within migration research that irregular people movements cannot be turned on and off like a tap, although an assumption that they can, appear to underpin some policy decisions".⁸⁹ More realistically, providing asylum seekers and refugees with satisfactory alternatives is the only way to ensure effective prevention as "they only turn to smugglers in the absence of both viable and legal options. When these are available, the customer base then falls away and the trade stops".⁹⁰ However, these options are not currently available. Less than 1 per cent of the world's refugees may be resettled in any given year,⁹¹ and with the absence of durable solutions, the three primary solutions available to refugees, this number is not likely to increase.

More appropriate re-settlement and processing options must be provided for refugees. "Drastic improvements must also be made to the registration and resettlement processes to give asylum seekers more hope that their claims are being considered in a transparent and timely manner".⁹² This could occur if the Australian government were to place funds in an Indonesian refugee processing centre rather than an offshore detention facility. Furthermore, funds currently spent on detention centres in Indonesia could be more appropriately allocated to deterrence and development options for the region. Deterrence through information, education, adequate health care, employment, legal and social services would comfort refugees, making them less likely to seek out an alternative solution.

Deterring fishermen from becoming people smugglers will involve addressing the tragedy of the commons, which leads to much of the poverty experienced by fishermen in Indonesia. While environmental degradation may not be reversed,

86 McMaster, op. cit., p.

87 Hoffman, op. cit. pp 7-8

88 Ibid. p. 4.

89 Castles, p. 208 IN Ibid.

90 Hoffman, op. cit., pp. 1-2.

91 UNHCR, *Statistical yearbook 2008*, pp. 10 -11.

92 *Submission 16 to the Senate Inquiry*, pp. 7, 4 -5 and Hoffman, op. cit. pp 7-8

measures can be put in place to promote protection of the commons. Primarily, individual rights to the resources must be recognised and incentives put in place to encourage the abidance of license regulations and less destructive harvesting methods.

While it will take time to put such measures into force, the long-term benefits will be an increase in catch quality and quantity, improving incomes for fishermen. In the short term, combating the inequalities caused by poverty is paramount. Although it is a regional problem, if Australia desires to diminish the flow of asylum seekers attempting to enter Australia it must focus its efforts on assisting Indonesia to provide such things as education, employment opportunities, and social welfare to affected individuals.

The problem of fishermen in poverty, turning to people smuggling, needs to be addressed with regional development, focused on combating the root causes of poverty. This is particularly important when considering that the current preventative measures, namely, punishment, have been demonstrated to be ineffective. If fishermen are removed from the equation, for asylum seekers without legitimate options their means of travel to Australia by sea is removed. Australia's response to the 'boat people' must change. Rather than strengthening border protection and entrance barriers, resources need to focus on issues of development, providing asylum seekers with legitimate relocation options and poor Indonesian fishermen with ways to increase their income opportunities.

Is Citizenship an Effective Solution to the Palestinian Refugee Plight?

RADHIKA CHAUDHRI

Abstract

While a lasting solution to the Israeli-Palestinian conflict remains elusive, Palestinian refugees displaced during the formation of Israel face an uncertain future. More than four million Palestinians live as refugees in neighboring Middle Eastern states, often in marginalized circumstances. It is in this context that citizenship has been suggested by some commentators as a means of providing them with formal status and therefore a basis upon which rights may be protected. Focusing on Lebanon, this paper examines the potential of citizenship as a solution to the systemic deprivation suffered by this population. Ultimately, any proposed solution has no salience beyond the rights it can secure. In examining the geo-political realities of this volatile region, the author suggests that citizenship, in any of its current potential manifestations, is an undesirable and ultimately ineffective solution to the Palestinian refugee problem.

Displaced Palestinians represent the longest enduring unresolved refugee problem in the world,¹ and a failure of the international community to achieve a durable solution to the Israeli-Palestinian conflict. Sixty years after the formation of Israel and ensuing Palestinian exodus, more than four million Palestinians remain living as refugees in neighbouring Arab countries with “almost a total absence of guarantees for basic rights.”² Lack of formal status has often resulted in compromised provision of services and protection for these refugees, and their continual marginalisation has prompted many international leaders

1 Donna Arzt, *Refugees Into Citizens: Palestinians and the End of the Arab-Israeli Conflict*, (New York: Council on Foreign Relations, 1997), 120.

2 Asem Khalil, “Palestinian Nationality and Citizenship: Current Challenges and Future Perspectives”, Euro-Mediterranean Consortium for Applied Research on International Migration, Research Report 2007-07, *European University Institute*, 2007, 29.

and commentators to call for the repatriation or resettlement of Palestinians currently living in camps. The question of whether Palestinians need to belong to a secure nation-state has presented significant challenges for policy-makers, as it can be considered from many different perspectives and opens complex discourse regarding the concepts of 'nation' and 'belonging' that cannot be fully addressed here. This essay will focus instead on Lebanon, since this "may be the most inhospitable country of refuge for Palestinians,"³ and consider whether citizenship is 'needed' to ensure basic rights for them. Ultimately, none of the current citizenship options available to this Palestinian diaspora amounts to a substantive solution for these refugees. While providing each refugee with a holistic membership to a secure nation-state is a relatively uncontroversial ideal position, the Lebanese context demonstrates the dangers of transposing this normative framework onto the volatile political reality of the Middle East.

Palestinians who fled to neighbouring Lebanon are "the most destitute grouping of Palestinian refugees in any Arab host country,"⁴ and therefore provide an instructive context for examining the debate over citizenship. Lebanon is home to four hundred thousand refugees, who comprise about one tenth of its population.⁵ Although many of these refugees entered the country more than half a century ago, most still reside in camps and "sixty percent of the Palestinians in Lebanon live below the poverty line."⁶ Not only have they been persistently denied naturalisation as Lebanese citizens, but "the Lebanese government has made every effort to make life uncomfortable, and Lebanon unwelcoming, for the Palestinian community."⁷ This hostility should be understood in conjunction with the religious composition of Lebanon, which has substantial Christian Maronite and Shi'a populations. The predominantly Sunni Palestinian refugees are therefore considered a destabilising threat to this delicate sectarian balance.⁸ This is demonstrated most clearly in the legal classification of Palestinians as foreigners,⁹ which operates with the reciprocity doctrine, enshrined in Lebanese law, to deprive Palestinians. The reciprocity doctrine provides employment and other entitlements to foreigners in Lebanon in reciprocal measure to the entitlements that Lebanese nationals would receive in the foreigner's country of origin. As Palestinian refugees are stateless and therefore cannot claim 'most

3 Susan Akram and Guy Goodwin-Gill, "Brief Amicus Curiae: The Status of Palestinian Refugees Under International Refugee Law", to the United States Department of Justice, Executive Office of Immigration, United States Board of Immigration Appeals, 2000, 26.

4 Jaber Suleiman, "Refugees or Foreigners? The Case of Palestinians in Lebanon" in Grabska, K and Mehta, L (eds), *Forced Displacement: Why Rights Matter*, (London: Palgrave Macmillan, 2008), 93-164, 94.

5 Rex Brynen, "Imagining a Solution: Final Status Arrangements and Palestinian Refugees in Lebanon," *Journal of Palestine Studies*, 26:2, (Winter 1997), 42-58, 53.

6 Arzt, *Refugees Into Citizens*, 46.

7 Brynen, "Imagining a Solution" 48.

8 International Crisis Group, "Palestinian Refugees and the Politics of Peacemaking", *ICG Middle East Report No 22*, 5 February 2004, 14.

9 Suleiman, "Refugees or Foreigners?", 95.

favoured nation' status, the reciprocity doctrine deliberately operates in labour, association, social security and property ownership laws to effectively "single out the stateless Palestinian refugees for exclusion."¹⁰

Not only are Palestinian refugees in Lebanon systematically discriminated against at general law, but have also been periodically "killed, imprisoned, tortured, and expelled,"¹¹ usually in the context of regional geopolitical conflict. Armed exchanges between the Palestinian Liberation Organisation and the Israelis were widely regarded by the Lebanese as exposing Lebanon to the hostilities of the Israeli-Palestinian conflict, and therefore the Lebanese government has increasingly sought to deprive Palestinians of as much agency as possible. Intensifying Israeli strikes on Lebanese camps from 1982 fuelled a Civil War in which refugee camps were attacked,¹² most notably in the refugee camps of Sabra and Shatila, where the Christian Phalange launched "a massacre of the civilian population."¹³ After more than a decade of attacks and raids, the Taif Accord released by the Lebanese government in 1989 marked the end of the Civil War and explicitly excluded the possibility naturalising Palestinian refugees,¹⁴ leaving them to remain as "stateless persons living in perpetual limbo."¹⁵ In 2009, Lebanese officials continue to express intentions to expel all Palestinians at the earliest possible opportunity.¹⁶

Palestinian deprivation and persecution stems "in part from their lack of standing as subjects of international law."¹⁷ This has led commentators such as Arzt to propose citizenship as the only robust means of "cementing... civil, political and especially social rights."¹⁸ As the "world's largest concentration of stateless persons,"¹⁹ Palestinians occupy a "legal vacuum,"²⁰ and are unable to claim legal personality and the entitlements that would flow from this. While statelessness precludes a person from invoking diplomatic protection, Arzt and others claim that, "through citizenship, individuals demarcate their legal status, and become citizens as opposed to foreigners."²¹ While Arzt understands citizenship as a substantive concept beyond a formal legal classification, allowing Palestinians

10 Khalil, "Palestinian Nationality and Citizenship", 31.

11 Akram and Goodwin-Gill, "Brief Amicus Curiae: The Status of Palestinian Refugees Under International Refugee Law", 28.

12 Helena Lindholm Schulz, *The Palestinian Diaspora: Formation of Identities and Politics of Homeland*, (London: Routledge, 2003), 56.

13 Jean Allain, *International Law in the Middle East: Closer to Power than Justice*, (Aldershot: Ashgate, 2004), 111-112.

14 Suleiman, "Refugees or Foreigners?", 97.

15 Allain, *International Law in the Middle East*, 101.

16 Arzt, *Refugees Into Citizens*, 47.

17 Allain, *International Law in the Middle East*, 114.

18 Arzt, *Refugees Into Citizens*, 3.

19 Ibid, 74.

20 Jean Allain, *International Law in the Middle East: Closer to Power than Justice*, (Aldershot: Ashgate, 2004), 125.

21 Khalil, "Palestinian Nationality and Citizenship", 40.

to “truly exercise choice and to affect the course of their own lives,”²² other commentators such as Allain regard *any* formal legal status as a viable foundation for the provision of rights. Under either conception, citizenship is seen as the key to guaranteeing human rights for Palestinian refugees, “giving [them] the voice they have been denied for over three generations.”²³

However, few share Arzt’s optimism about the potential for a final status solution, citing the volatile geopolitical situation of the Middle East as effectively precluding any realistic prospect of citizenship for Palestinian refugees. For refugees in Lebanon, the citizenship possibilities open to them are: resettlement as Lebanese citizens, a return to their original homeland now in Israel, or repatriation to a new Palestinian state. It is relatively clear that the Palestinian refugees in Lebanon cannot expect to resettle there as citizens. Since their arrival they have been consistently “regarded as a security problem,”²⁴ and three quarters of Lebanese oppose Palestinian resettlement.²⁵ The Lebanese fear that “implantation will tip the political balance of religious and ethnic groups in the country”²⁶ has now concretised itself in national law. After the Taif Accord, which states, “there shall be no settlement of Palestinians in Lebanon”²⁷ and subsequent Constitutional amendment, the possibility of resettling Palestinians as citizens has been categorically rejected by the Lebanese people. For their part, “there are few Palestinians who would like to stay there permanently, even if given citizenship.”²⁸ Anti-Palestinian sentiment in Lebanon highlights the Palestinian fear that integrating into the Lebanese population would not provide any meaningful guarantee of rights, while at the same time extinguishing their right of return and claims to compensation.²⁹ Thus, acquiring Lebanese citizenship appears an unlikely and ultimately ineffective answer for securing refugee rights.

Similarly, a hostile Israeli government makes return to Israel both unrealistic and undesirable for Palestinians. For most refugee populations, an alternative to permanent settlement in a country of refuge is a return to country of origin. Once returned, refugee status ceases as the persons concerned become subjects of the state as citizens. In this regard, Palestinians occupy the unusual position of being indefinitely prevented from returning to their homes by virtue of the sovereign exercise of migration control by the Israeli government. Although

22 Arzt, *Refugees Into Citizens*, 120.

23 Ibid, 116.

24 Khalil, “Palestinian Nationality and Citizenship”, 31.

25 Rex Brynen, “Imagining a Solution: Final Status Arrangements and Palestinian Refugees in Lebanon,” *Journal of Palestine Studies*, 26:2, (Winter 1997), 42-58, 53

26 Khalil, “Palestinian Nationality and Citizenship”, 31.

27 Suleiman, “Refugees or Foreigners?”, 97.

28 Arzt, *Refugees Into Citizens*, 47.

29 Ilan Peleg, “The Palestinian Refugees: A Political Perspective” in Ferris, Elizabeth (ed), *Refugees and World Politics*, (New York: Praeger, 1985), 152-167, 158.

“most Palestinian official discourse on the right of return lacks nuance...”³⁰, its classical formulation is by reference to the 1948 United Nations General Assembly Resolution 194(III), which provides: “refugees wishing to return to their homes and live at peace with their neighbours should be permitted to do so at the earliest practicable date.” However, as early as 16 June 1948, the Israeli Prime Minister Ben-Gurion decided that Palestinians were not allowed to be allowed to return.³¹ Successive Israeli governments have cited “Israel’s ‘demographic security’ as the consequent need to prevent a situation where the Palestinian Authority floods Judea and Samaria with returning refugees.”³² In any case, for the Palestinians, returning to their ‘homeland’ as Israeli citizens is unlikely to be acceptable or considered to be genuine return. In addition, the ongoing Israeli-Palestinian conflict and mutual accusations of terror and violence strongly suggest that acquiring Israeli citizenship may create legal personality for the refugees, but would not provide them with ‘membership’ to the nation of Israel such that they could be guaranteed the enjoyment of rights and freedoms. In any case, the official Israeli position makes it clear that refugee return “will not, under any conceivable circumstances be realised.”³³

With both resettlement in Lebanon and return to Israel effectively ruled out by the respective governments, the final citizenship option for Palestinians in Lebanon is repatriation to a new Palestinian state. While a solution of this kind “is more attractive for host neighbour states that refuse to naturalise Palestinian refugees,”³⁴ its most obvious deficiency is the current absence of any such Palestinian nation. The conferral of Palestinian citizenship requires the establishment of a Palestinian state, which in turn is dependant on a durable peace settlement with Israel, and thus “the refugee problem is ultimately inseparable from the underlying cause of the decades-long conflict.”³⁵ The essential condition of a negotiated two-state solution has proven extremely elusive in the sixty years since the creation of Israel. After several major wars, three *intifadas* and continual cross border attacks, most recent polling from June 2009 reveals that sixty-seven percent of the Palestinians and sixty-two percent of the Israelis believe that it is completely impossible to reach a final status agreement.³⁶ Thus it seems unlikely that the Palestinians in Lebanon will

30 Brynen, “Imagining a Solution”, 45.

31 Jean Allain, *International Law in the Middle East*, 106.

32 Brynen, “Imagining a Solution”, 46.

33 Ibid, 45.

34 Khalil, “Palestinian Nationality and Citizenship”, 38.

35 Arzt, *Refugees Into Citizens*, 83.

36 Palestinian Centre for Policy and Survey Research, “PRESS RELEASE: Joint Israeli-Palestinian Poll, June 2009: Pessimism among Israelis and Palestinians regarding the prospects for a settlement and a Palestinian state in the next few years, but majorities on both sides support a two-state solution.” <<http://www.pcpsr.org/survey/polls/2009/p32ejoint.html>> (June 14, 2009) accessed 19 September, 2009.

be able to claim citizenship to a new Palestinian state, the formation of which depends on a peace agreement that has so far eluded every government that has pursued it.

Further complications arise as to what level of control the Israeli government might retain over Palestine if borders for the two states could be settled. In assessing the efficacy of citizenship in ensuring rights for Palestinian refugees, this issue is particularly significant. At present, Israeli forces have imposed tight border controls and blockades restricting the supply of food and access to land in both Gaza and the West Bank. These blockades have been described by international commentators as a “policy of collective punishment... to punish Gazans for political developments within the Gaza strip, constituting a continuing flagrant and massive violation of international humanitarian law.”³⁷ The resulting strain on the Palestinian territories has resulted in eighty percent of Gazans living below the poverty line, and blocks on exports have effectively frozen business activity.³⁸ Thus, if citizenship is pursued as a tool for securing basic rights for refugees, the current situation provides little surety of any such guarantee. Membership to a Palestinian state is only a substantive solution for refugees in Lebanon if the Palestinian state they are absorbed into differs substantially in its relations with Israel and commands sovereign authority over its territory, both of which are far from assured.

Even if these obstacles could be overcome, further problems prevent Palestinian refugees from full enjoyment of membership to a new Palestine. Firstly, “international experience suggests in general that the number of refugees who choose homeland repatriation is often much smaller than planners and activists initially anticipate.”³⁹ This phenomenon seems likely in Lebanon, where “less than one percent have family connections in the West Bank or Gaza.”⁴⁰ Of the four hundred thousand refugees, only “approximately three percent of the Palestinians in Lebanon were born in Palestine before 1948. As the conflict continues without resolution, this number is likely to shrink.”⁴¹ This means that for many, the new Palestine would be another foreign state with which they have no personal connection, and makes resettlement there an unattractive prospect unlikely to confer a sense of membership. In addition, “many Palestinians in Lebanon could not afford to relocate to the West Bank or Gaza,”⁴² rendering useless any *de jure* entitlement to citizenship they might have. This point is particularly significant in the event that the creation of a Palestinian state triggers

37 United Nations, ‘Gaza: Silence is not an option - The Special Rapporteur on the situation of human rights on Palestinian territories occupied since 1967, Richard Falk, issued the following statement’ (Press Release, 9 December 2008).

38 UK Home Office, *Operational Guidance Note on Israel, Gaza and the West Bank*, February 2009, para 3.6.5.

39 Brynen, “Imagining a Solution”, 48.

40 Ibid.

41 Ibid.

42 Ibid.

the Lebanese government to “place additional pressures on refugees to leave.”⁴³ If the Lebanese government introduced further restrictions on Palestinians in an effort to expedite their transfer to Palestine, this would be counterproductive for the refugees in question. The practical effect would be to trap those too poor to move from Lebanon with even fewer rights than they can currently claim.⁴⁴ Thus, even if all barriers to the creation of a functional Palestinian state could be overcome, offering refugees repatriation remains a path fraught with difficulties and the insidious potential to promote intensified oppression by the Lebanese government.

It is therefore critically important not to view membership to a particular state as a solution unto itself, particularly in the context of Palestinian refugees. Rather, the merit of citizenship lies in its effectiveness as a means toward the ultimate goal of providing a durable guarantee of basic rights and security. While citizenship is one means of accessing such protection, international law regimes and diplomatic negotiation also provide mechanisms for obtaining these basic conditions.⁴⁵ Significantly, the pursuit of international protection schemes and international diplomatic intervention require Palestinians to maintain their refugee status. Since “new Palestinian refugees [were] barred from returning to their homes, and also were retroactively deprived of their citizenship,”⁴⁶ their refugee status embodies their marginality, and hence keeps the unresolved Palestinian problem highly visible in the international community. Indeed, “most of the refugees themselves wished to become neither Israeli citizens nor citizens of their host countries since either would acquiesce in the legitimacy of the state of Israel.”⁴⁷

It is estimated that of 6, 375, 800 Palestinian refugees, only 2, 643, 764 have been granted citizenship anywhere in the world.⁴⁸ For those who have been unable or unwilling to accept some form of citizenship, the status of ‘refugee’ is perceived as an asset in the battle to survive, and a latent form of power.⁴⁹ Thus, contrary to the claims of Arzt and other proponents of a state-based solution, “refugee activism is the ideal instrument”⁵⁰ for promoting what Fatah have described as “the dream of two-thirds of the Palestinian people;”⁵¹ namely, genuine recompense for Palestinian refugees. In this sense, “Palestinians’ rights

43 Rex Brynen, “Refugees, Repatriation and Development: Some Lessons from Recent Work,” (Paper presented at the Stocktaking Conference on Palestinian Refugee Research, Ottawa, June 17-20 2003), 3.

44 Ibid.

45 Lex Takkenburg, *The Status of Palestinian Refugees in International Law*, (Oxford: Clarendon Press, 1998).

46 Akram and Goodwin-Gill, “Brief Amicus Curiae”, 20-21

47 Ibid, 25.

48 Ibid, 24.

49 Suleiman, “Refugees or Foreigners?”, 95.

50 International Crisis Group, “Palestinian Refugees and the Politics of Peacemaking”, *ICG Middle East Report No 22*, 5 February 2004, 7.

51 International Crisis Group, “Palestinian Refugees and the Politics of Peacemaking”, *ICG Middle East Report No 22*, 5 February 2004, 9.

as individuals are sacrificed for the sake of 'Palestinian national interest.'⁵² Ultimately therefore, maintaining refugee status should be recognised as an equally important means of pursuing rights. It should not be dismissed on the assumption that membership to a state has any saliency independent of its capacity to protect refugees. In this context, the merits of both citizenship-based solutions and keeping a refugee identity can be recognised. The experience of the last sixty years have demonstrated that on its own, neither solution is particularly well-adapted to the Palestinian context, and therefore this is not a helpful dichotomy with which to resolve this situation. Instead, in addressing the plight of refugee populations in Lebanon, the tendency to dichotomise these positions must be resisted and a composite approach may be more appropriate.

Palestinian refugees in Lebanon are "amongst the most disadvantaged in any field, suffered from poor living and housing conditions, restrictions on mobility and high rates of unemployment."⁵³ More than sixty years after the initial Palestinian exodus from Mandate Palestine, these refugees continue to face systematic discrimination and violent persecution. Ongoing marginalisation and the comprehensive failure of a final resolution to the Israeli-Palestinian conflict represents a "manifest in the inability to provide a solution for nearly four million Palestinian refugees, who... remain in exile."⁵⁴ While Arzt, Allain and others promote citizenship as a basis for guaranteeing the provision of basic rights for these refugees, it is clear that resettlement in Lebanon and return to Israel are both unrealistic and ineffective solutions. Repatriation to a new Palestinian state also presents significant challenges and may further compromise the situation of Palestinians who are unable to take up the offer of citizenship. This analysis demonstrates that while citizenship may provide basic rights, entitlement and a sense of belonging for some refugee populations, it is not an option that holds much promise for Palestinians in Lebanon. Citizenship solutions are not necessarily well-adapted to all refugee situations; rather, their saliency lies in their capacity to secure basic conditions. In the case of Palestinian refugees in particular, maintaining refugee status and forgoing membership to any state is a form of political capital that allows access to international protection schemes and ensures the continuing relevance and visibility of the Palestinian plight. Although this tactic has also encountered difficulty, it is clear that a solution may require a composite approach that recognises the merits and limitations of both positions. For the four hundred thousand Palestinian refugees still living in Lebanon, "the refugee question remains the Holy Grail of Palestinian politics."⁵⁵

52 Khalil, "Palestinian Nationality and Citizenship", 29.

53 Jean Allain, *International Law in the Middle East*, 111.

54 Ibid, 101.

55 International Crisis Group, "Palestinian Refugees and the Politics of Peacemaking", 10.

Culturing our sense of smell

JENNIFER ROBERTSON

Abstract

The functioning and connectivity of the olfactory system, which produces our sense of smell, has recently been attracting increased attention from neuroscientists, particularly since the award of the 2004 Nobel Prize to Buck and Axel for their research in this field. To study the olfactory system further, it would be advantageous to develop methods for keeping isolated brain tissue viable for long periods of time. This study examines the morphology, electrophysiology and survival of cells in brain slices that have been kept in culture, in comparison to acute slices. We prepared parasagittal slices that contained the olfactory bulb (OB), the piriform cortex (PC) and the lateral olfactory tract (LOT). Such slices would be particularly useful in studies that depend upon intact connectivity between the OB and the PC. In this study, we identified differences in the synaptic and intrinsic properties between pyramidal neurons in the acute and cultured slices. Also, the GABAergic interneurons appear not to have been affected. Therefore, we concluded that these slices would be suitable for use in studying some aspects of the olfactory system but only once the differences identified have been investigated further.

Introduction

Despite decades of research, much is still unknown about how the olfactory system functions, particularly how information is processed in the PC (also known as the primary olfactory cortex) (Kandel 2000). Recently, scientists such as Buck and Axel (1991) have demonstrated that any given odour receptor can recognise many different ligands and any odour ligand can bind to many different receptors, resulting in almost unlimited specificity (Firestein 2005, Dennis 2004). The question then remains, how does the brain process all of these signals to recognise a single smell? Researchers are now focusing on this question. It has been demonstrated that the PC is the first site of cortical

processing and thus a major area of interest (Poo 2009, Sheperd 2006). It is believed that understanding how information is processed in this relatively simple part of the cortex, will enable understanding of more complex, cortical regions (Shepherd et al. 2006).

A common technique for studying the olfactory system is to prepare acute slices and measure the properties and connectivity of the neurons, within the slice, using patch clamping. However, this technique is limited by the approximately 5 hour lifespan of the neurons once they have been removed from the brain. Therefore, there have been few studies on the connectivity changes or the molecular biology in this region, as such studies require more time. Thus, there is the requirement of a technique that can maintain the slices for longer. This study assesses the use of cultured slices to fulfil this requirement.

The slices of particular interest to this study are parasagittal slices that encompass the OB, the PC and the interconnecting LOT (Figure 1). These slices are of particular interest because if suitable, they will allow researchers to study the connections between the OB and the PC. Understanding how the signal is changed in between these locations will provide insight into how olfactory information is processed.

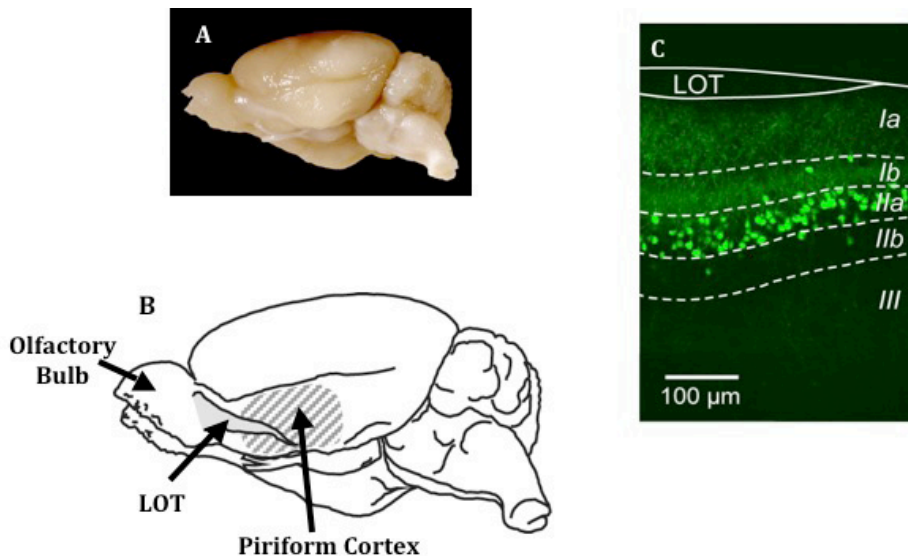


Figure 1: A: A mouse brain B: A schematic of a rodent brain demonstrating the OB, LOT and PC, the line represents the slices used for this study C: The layers of the PC.

Figures adapted from images by Bekkers

The method of culturing slices of mice brains has proven successful for hippocampal slices with minimal differences to the acute slices (Stoppini et al. 1991). Here we apply this method for the first time to parasagittal PC slices. We tested these slices by examining the morphology of individual stained neurons, testing them electrophysiologically and observing any changes in the fluorescence and soma size of GABAergic interneurons in the culture. It was hypothesised that the cultured slices would give similar results to the acute slices, but in our study some differences were identified.

Materials and Methods

Slice Preparation

The brains of P7 GAD67-GFP transgenic mice (cultured slices) and a P25 GAD67-GFP transgenic mouse (acute slice) were aseptically removed in accordance with the Animal Experimentation and Ethics Committee of the Australian National University. GAD67-GFP transgenic mice are mice that express a green fluorescent protein in GABAergic interneurons. Acute slices (300µm thick) were prepared using standard methods (Suzuki and Bekkers, 2010). For cultured slices, parasagittal slices (200µm) were taken using a razor blade in a sterilised, oxygenated ice-cold solution of (in mM) 1 CaCl₂, 5 MgCl₂, 10 glucose, 4 KCl, 26 NaHCO₃, 248 Sucrose and phenol red (acidity indicator). The slices from the P7 mice were then transferred to the culture dish and those from the P25 mouse were used immediately or fixed. This allowed for the slices to be of a similar age when analysed.

Slice Culture

The slices were placed on semiporous membranes in a 6 well culture dish. Each well contained, 0.75L of culture medium (containing 0.0084g/mL MEM in Hepes base, 20% horse serum, 1mM L-glutamine, 1mM CaCl₂, 2mM MgSO₄, 12.9mM D-Glucose, 5.2mM NaHCO₃, 30mM Hepes, 0.075% Ascorbic acid, and 1µg/mL Insulin). The culture was kept at 35°C in 5%CO₂, for 5-7 days and fed every 2-3 days.

Electrophysiology

The slices were studied using patch clamp techniques. They were maintained in a bath solution of artificial Cerebral Spinal Fluid (CSF), which was kept at around 35°C and bubbled with carbogen (95% oxygen, 5% carbon dioxide). The

activity of individual neurons in the slices were recorded using electrodes filled with internal solution containing (in mM) 135 K-methylsulfate, 7 KCl, 0.1 EGTA, 2 Na_2ATP , 2 MgCl_2 , 0.3 Na_2GTP , 10 Hepes and 0.2% biocytin. Cells were chosen from Layer II (Figure 1C) that appeared to be pyramidal neurons (from somatic morphology). Whole-cell recordings were taken of neurons using a MultiClamp 700 amplifier and Axograph. The passive and firing properties of individual neurons were determined by applying a series of positive and negative current steps using current clamp. Next we inserted a stimulating electrode into the LOT and recordings of EPSPs (excitatory post-synaptic potentials) were taken. This was repeated with the stimulating electrode in Layer II. The pipette offset was monitored and adjusted, as were the resting membrane potential and the bridge balance. A holding current was applied to some cells to maintain the resting membrane potential at approximately -65mV.

Histology

The recording electrode contained 0.2% biocytin, which diffused throughout the neuron during the recordings. The slices were then fixed using 4% paraformaldehyde for 1 hour and washed with Phosphate Buffered Saline (PBS). The slices were then processed using a standard biotin-avidin method (Horikawa 1988). The slices were washed with PBS then distilled H₂O and mounted onto microscope slides. The stained cells were observed under an electronic microscope using a 63x oil immersion objective and traced using the Neurolucida cell reconstruction system (MBF Bioscience).

Fluorescence Studies

The remaining cultured slices were removed from culture and fixed using 4% paraformaldehyde for 1 hour and washed with PBS. They were then mounted and 5 μm image stacks of the GFP fluorescence through each slice were taken using a confocal microscope. Each soma was traced in the optical section where the fluorescence of the soma was the brightest. The fluorescence and soma size was recorded for each neuron.

General Analysis

The electrophysiological data was analysed using Axograph and Excel. Due to the small number of cells, a large number of recordings were taken from each cell and the means of each analysis were compared graphically. Recordings were excluded from the mean if they contained major irregularities due to the spontaneous or epileptic activity of the neuron. Due to the small number of cells, further statistical analysis was not performed.

Analysis of Intrinsic Properties

To determine if the cells maintained the same basic electrophysiological properties after culture, the standard intrinsic properties were measured. These were: the membrane time constant (the product of the input resistance and capacitance of the membrane), the resting membrane potential (difference in electrical charge across the membrane when at rest), the input resistance (relationship between current injected into the cell and the resulting voltage), the voltage threshold (the minimum voltage required for the action potential to fire) and the action potential half-width (the width of the action potentials at half their height) (Kandel, 2000).

The membrane time constant was calculated from the exponential of best fit to the voltage decrease, which occurred after a small current step. The resting membrane potential was measured as the voltage of the neuron before the current step was applied. The input resistance was calculated from the graph of voltage and current using Ohm's Law ($V=IR$). The voltage threshold was measured as the voltage at which the action potential fired. The spike half-width was determined by measuring the width of the action potential at half its height.

Analysis of Synaptic Properties of Pyramidal cells

To determine if the cells responded to stimulation in the same way, we tested the synaptic properties of pyramidal cells. A stimulating electrode was inserted first into the LOT and then into Layer II of each of the slices. In each case the stimulus was a series of five pulses of 20Hz. The response of the cells to each series of stimulations was recorded 51 times for each location (to reduce overall error) and a final measurement was recorded again at the LOT (1st position). The similarity between the initial and final recordings showed that the results were not merely due to the reinsertion of the stimulating electrode.

The amplitude of the EPSPs was normalised to the size of the initial peak in each recording and a baseline correction was made at the base of each peak.

From the EPSP recordings it was possible to determine the EPSP decay time by fitting an exponential to the final EPSP (the others were affected by summation) and the synaptic latency by measuring the time between the stimulus artefact and where the first EPSP began. We compared the differences in synaptic latency and decay between the LOT and Layer II in the acute slice and the two cultured slices.

Analysis of Fluorescence Data

Normalised frequency histograms were constructed for both soma size and fluorescence intensity using the data from our cultured slice recordings and previously published data from acute slice recordings (Suzuki and Bekkers, 2010). The mean and standard error of each were also calculated.

Results

In this study we recorded the morphology and the intrinsic membrane and synaptic properties of one pyramidal neuron from an acute slice and two from cultured slices. The fluorescence studies were conducted on two cultured slices and compared to data from acute slices from Suzuki and Bekkers, 2010.

The neurons in both the cultured and acute slices have a broadly pyramidal morphology.

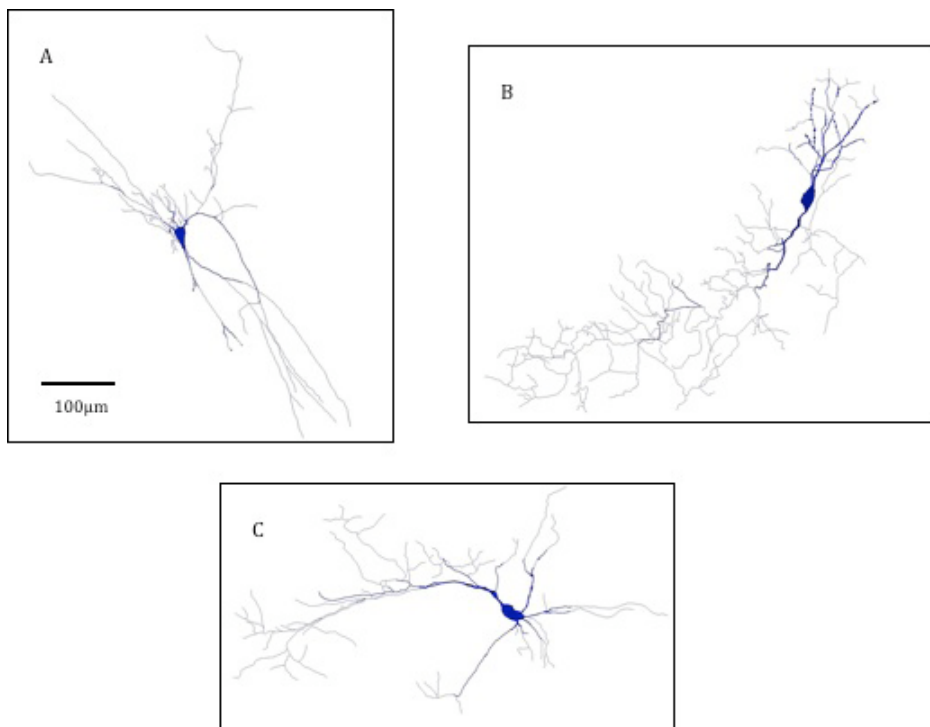


Figure 2: Tracings of the analysed neurons. A: The neuron from the acute slice. B: The neuron from cultured slice 1. C: The neuron from cultured slice 2.

The tracings of the neurons were completed using the NeuroLucida cell reconstruction system and allowed for a comparison of the morphology (Figure 2). All the neurons can be tentatively described as pyramidal neurons. There are, however, several irregularities. The variability in soma shape and size may have occurred from the insertion of the recording electrode. There are differences in the amount of branching, the length and the distribution of the dendrites. Due to the small number of cells traced and time constraints, these differences could not be quantified.

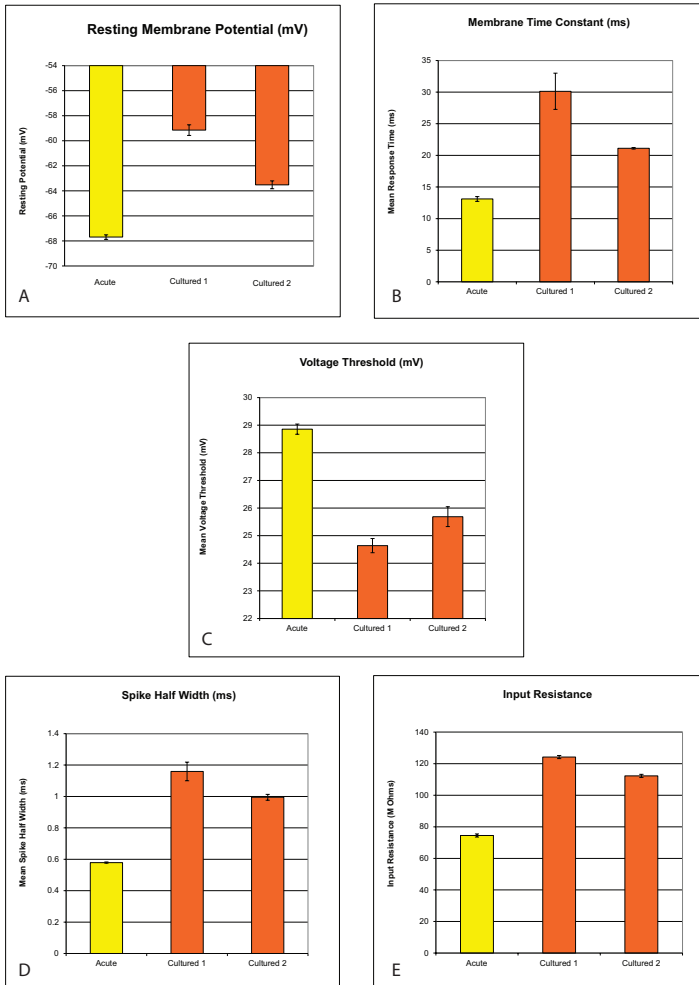


Figure 3: Comparisons of the mean intrinsic properties (error bars show standard deviation) of the neurons in the acute slice (yellow bars) and cultured slices (orange bars). A: resting membrane potential, B: membrane time constant, C: voltage threshold for action potential generation, D: spike half-width, and E: input resistance

The neurons in the cultured slices exhibit different intrinsic properties to that of the acute slice.

After confirming that there was little change in the morphology, we focused on comparing the intrinsic membrane properties of resting membrane potential, membrane time constant, voltage threshold, spike half-width and input resistance (Figure 3).

Despite being unable to complete a further statistical analysis on the intrinsic properties, (sample sizes being too small), it can be observed from the graphs that there is a large difference in the membrane time constant, input resistance, resting membrane potential, voltage threshold and spike half-width in the cultured slices compared to the acute slice. There is also a difference between the cultured slices, which suggests more cells need to be analysed.

The neurons in the cultured slices and acute slices exhibit some differences in synaptic properties.

To determine if the connectivity of the neurons was maintained in culture, despite the intrinsic properties changing, a study of the synaptic properties was undertaken.

When the stimulating electrode is located in the LOT (Figure 4), there are significant differences in the EPSP responses from the acute and cultured slices. In the acute slice, the EPSPs facilitate (i.e. the size of the EPSPs increases over the first two or three stimuli). However, in the cultured slices, the EPSPs do not. This suggests a difference in the synaptic connectivity.

When the stimulating electrode is located in Layer II, the EPSP responses of the neurons are very similar in the acute and cultured slices (Figure 5); there is no facilitation. Thus, unlike the LOT input (Figure 4), there has not been a change in the synaptic properties, so it is likely that the connections are still the same.

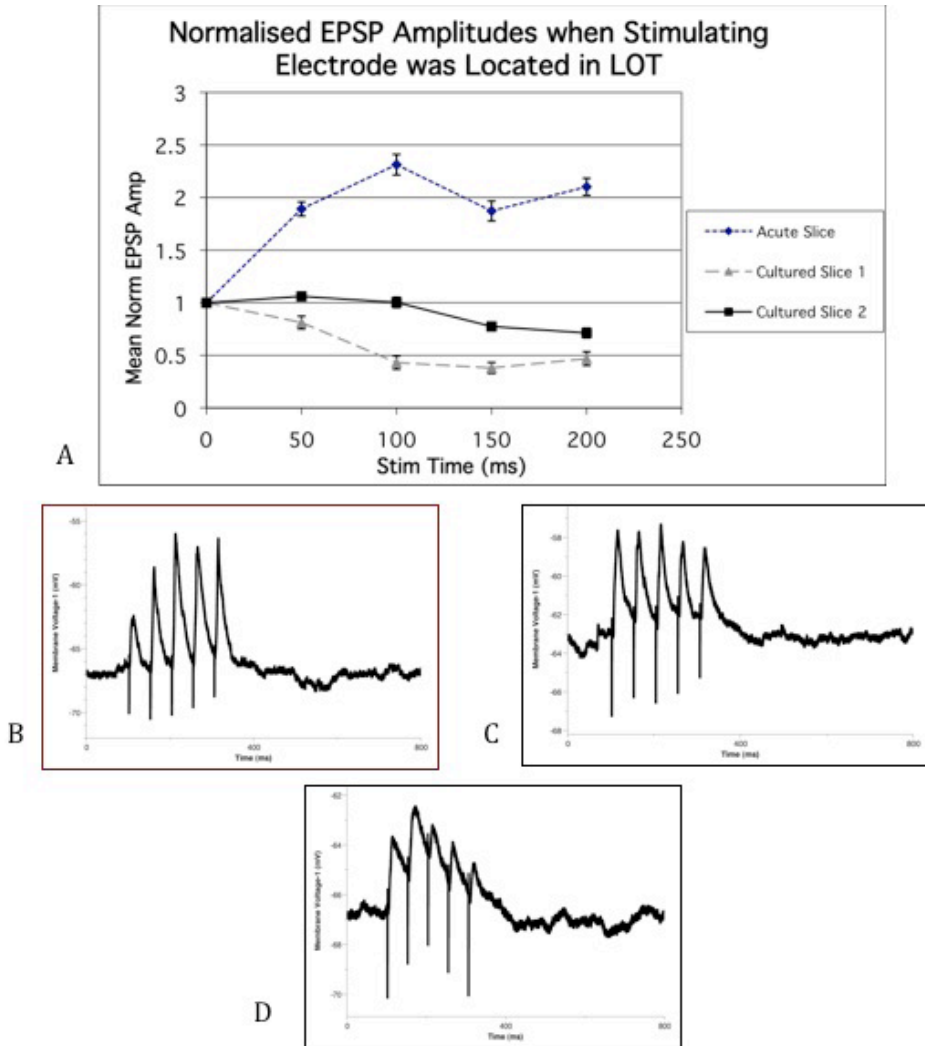


Figure 4: The EPSPs in the acute slice exhibit facilitation during LOT stimulation but those from the cultured slices do not. A: Average normalised EPSP amplitude comparison. B: Typical recording from the acute slice neuron. C: Typical recording from the cultured slice 1 neuron. D: Typical recording from the cultured slice 2 neuron. In panels B, C and D, X-axis shows time from 0-800 milliseconds and the Y-axis shows the membrane voltage in millivolts.

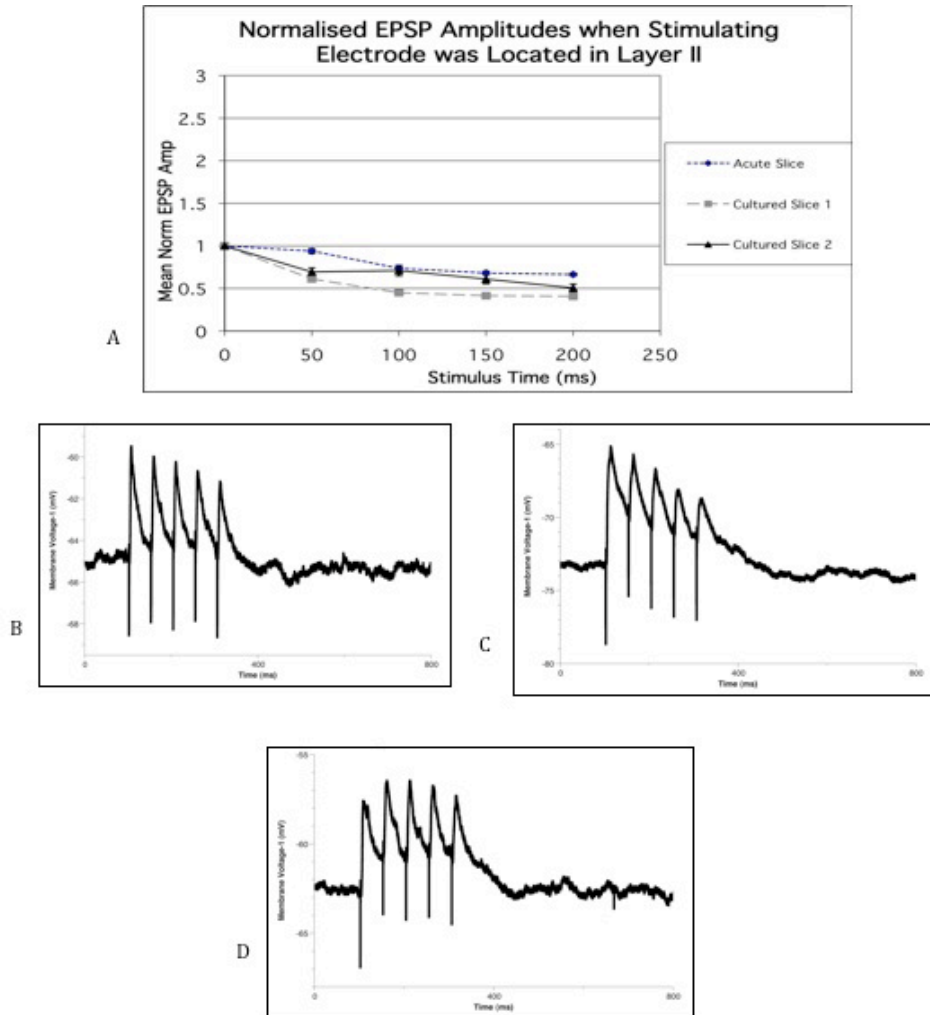


Figure 5: The EPSPs in the acute slice exhibit facilitation during Layer II stimulation but those from the cultured slices do not. A: Average normalised EPSP amplitude comparison. B: Typical recording from the acute slice neuron. C: Typical recording from the cultured slice 1 neuron. D: Typical recording from the cultured slice 2 neuron. In panels B, C and D, X-axis shows time from 0-800 milliseconds and the Y-axis shows the mebrane voltage in millivolts.

Having identified a possible change in the synaptic properties we attempted to determine if the lack of facilitation in the cultured slices during LOT stimulation was due to a change in connectivity of the synapses in culture. We measured the synaptic latency and EPSP decay to do this. The latency comparison (Figure 6A), shows a large difference between the acute slice and cultured slice 1, as well

as the acute slice and cultured slice 2. The decay time comparison, (Figure 6B) shows differences between the acute slice and cultured slice 1 but not cultured slice 2. This suggests that these differences may just be the result of intercellular variability.

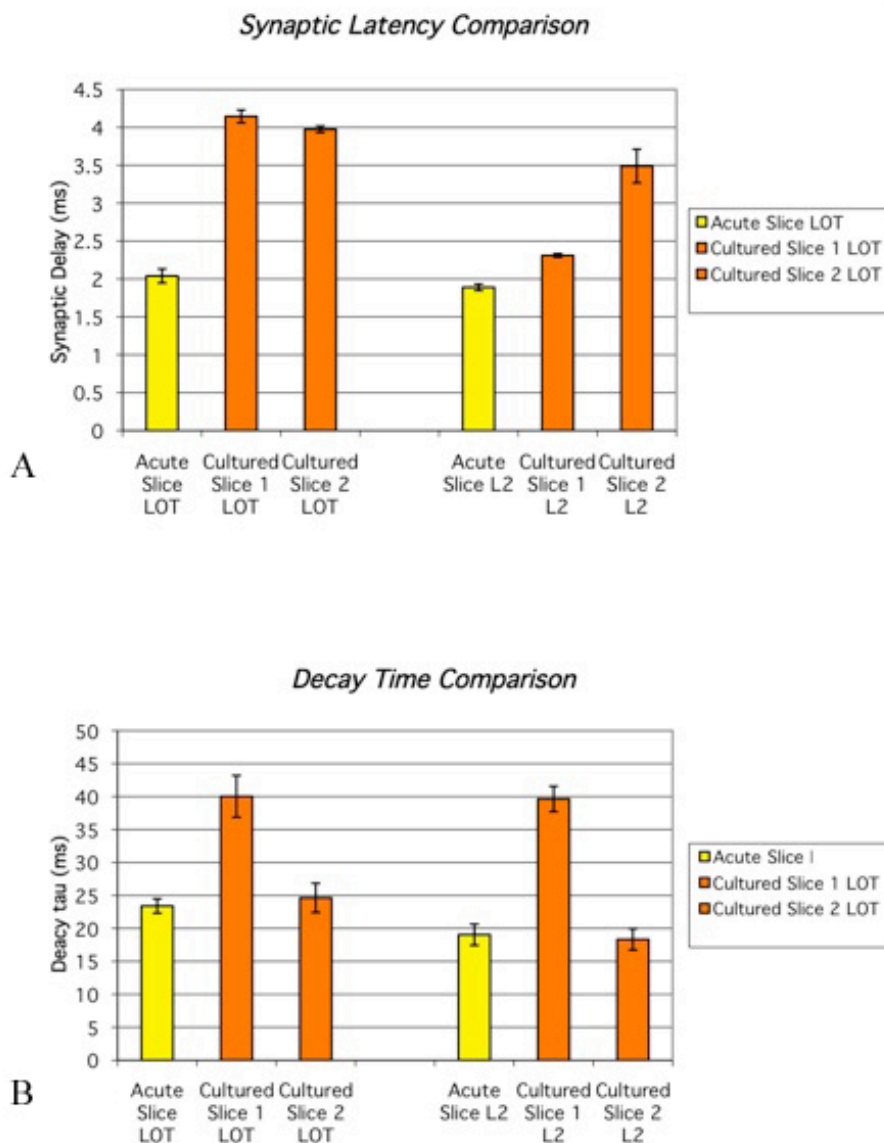


Figure 6: A. Comparison of the EPSP latency in the acute and cultured slices in the LOT and Layer II. B: Comparison of the decay in the acute and cultured slices in the LOT and Layer II.

The subtypes of GABAergic interneurons remained unchanged in culture.

Since there are similarities and differences in the morphology, intrinsic properties and synaptic properties of the pyramidal neurons, have there been any changes in GABAergic interneurons? We attempted to answer this question through a comparative study of both the fluorescence intensity and soma size of GABAergic interneurons, between the cultured and acute slices. Figure 7 demonstrates the fluorescence of the slice and the slice under white light.

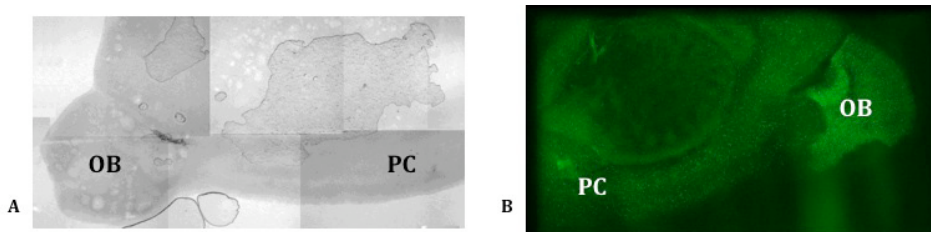


Figure 7: A: A reconstructed image of a cultured slice under white light and B: An image of a cultured slice demonstrating the green fluorescence of the GABAergic somata.

The fluorescence intensity histograms for the cultured and acute slices (Figure 8) overlap and have a similar broad skewed shape. The mean GFP fluorescence intensity for the cultured slices is 0.352 ± 0.007 ($n=566$) and for the acute slices (data from Suzuki and Bekkers 2010), the mean is 0.352 ± 0.002 ($n=14180$). These values are equal considering uncertainty and that different people took the recordings, which suggests that the GABAergic interneurons are not changed in the culture.

This similarity is further demonstrated in the soma size histograms, which also overlap (Figure 9). The overlap is not perfect, which suggests some change, though this is possibly due to the acute and cultured slice data being collected by different people. The means, however, are almost identical, for the cultured slices the mean is $134.0 \pm 3.7 \mu\text{m}^2$ ($n=566$) and for the acute slice is $133.2 \pm 0.4 \mu\text{m}^2$ ($n=14180$). Therefore, it is likely that the size of the GABAergic interneurons is not affected by the culture and that no particular subtype has been lost.

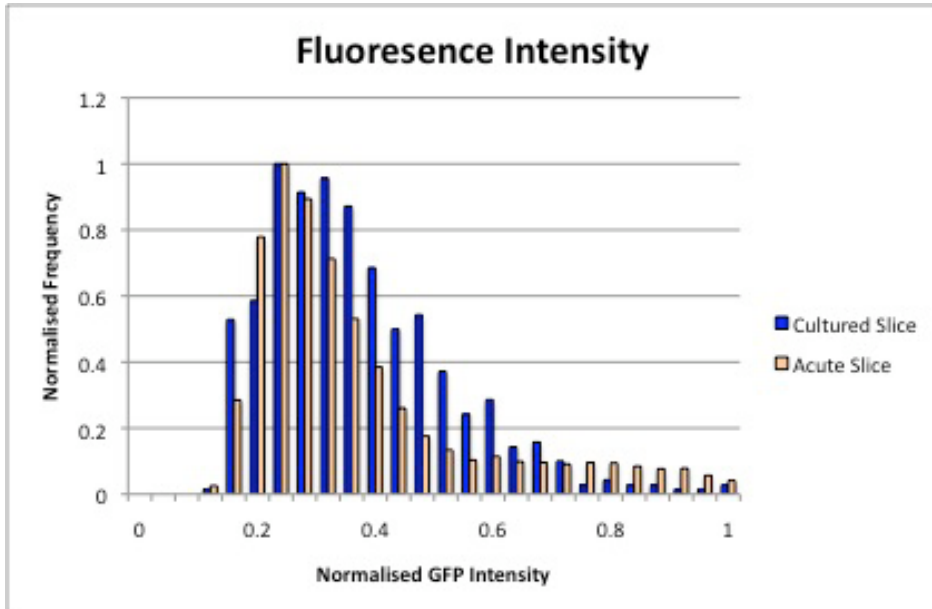


Figure 8: Normalised frequency histograms of the normalised GFP intensity in the cultured and acute slices.

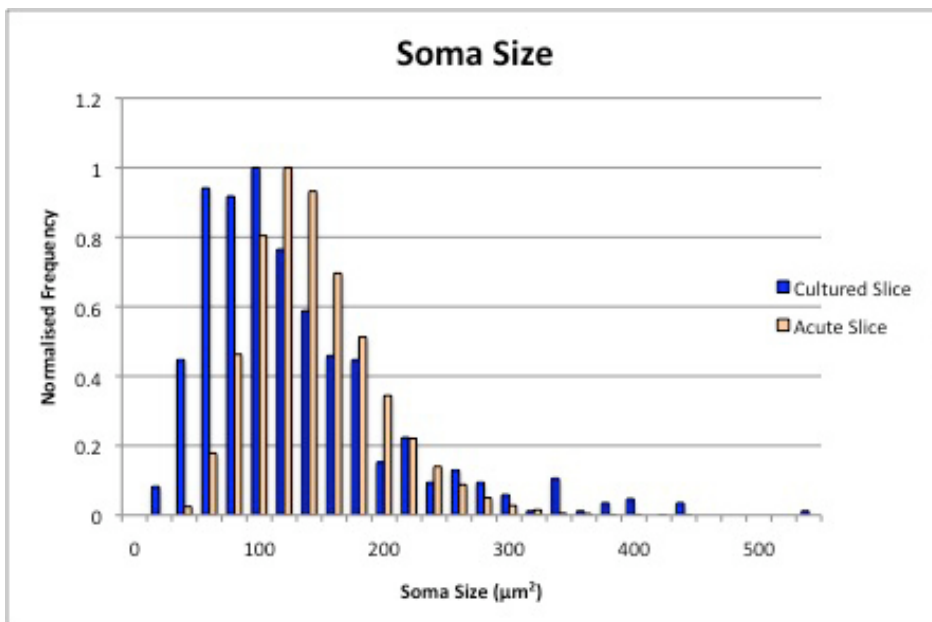


Figure 9: Normalised frequency histograms of soma size in the acute and cultured slices

Discussion

From this study it appears feasible to culture parasagittal slices containing the OB, LOT and the PC but that there may be some differences. We have been the first to apply this method to parasagittal slices for use in studying the olfactory system. To ensure as many potential differences between the slices were identified, a range of different methods of analysis were applied. Since these slices will be used in connectivity studies, the main focus was on the morphological, intrinsic and synaptic properties of individual neurons in the PC, as well as survival of GABAergic interneurons (believed to play an important role in the processing of information in the olfactory system (Suzuki and Bekkers, 2010).)

The culture method used in this study was based on that reviewed by Gähwiler et al. (1997) and first applied to the hippocampus by Stoppini et al. (1991). Studies, in different areas of the brain, demonstrated that cultured slices are similar enough to acute slices. Our study found differences in the slices, suggesting this method might not be of a suitable standard for studying the olfactory system. We recommend groups studying other cortical areas to also investigate these differences to ensure that their future findings are not merely an artefact of the culture method.

If the results of further studies reflect those found here, then we could conclude that these slices are suitable for use in some research as long as the differences are considered.

The morphology of the putative pyramidal neurons requires further analysis.

The differences in the morphology of the stained neurons in the acute and cultured slices suggests that changes may be occurring in culture, however, with the small sample size this may just be a result of the diversity of structure between pyramidal neurons (Kandel 2000). More cells need to be traced and their differences quantified (for example by calculating the average number of spines on the dendrites) before any changes can be considered due to the culture. One hypothesis is that one of these neurons was an interneuron, which explains the differences in the electrophysiological properties.

After the slices have been in culture the intrinsic properties of the pyramidal neurons change.

In this study we found differences between the intrinsic properties of the neuron in the acute slice and those in the cultured slices. This may be due to the culture method, differences in the quality of the patch recording or just interneuronal variability.

The increase in resting membrane potential in the cultured slice neurons means that they would be more depolarised and thus more excitable. This is consistent with reduced synaptic latency. The increase in input resistance after culture suggests that there has been a decrease in the number of ion channels. This is consistent with the finding that in culture, neurons tend to simplify and strengthen their connections (Gähwiler 1997), which would result in a reduction in ion channels. This could also be the result of the difference in age of the slices during analysis (25 days for acute, 14 days for cultured). As neurons age, they produce more connections and more channels (Kandel, 2000) which lowers the resistance.

The difference in spike width between the neurons in the acute and cultured slices is interesting, as we expect the spike width to be the same for neurons exposed to similar conditions (Stuart, 1997). This supports our earlier hypothesis that we were recording from different types of neurons. However, it is also possible that this was due to a change in conductance of the K⁺ ion channels. A smaller influx of K⁺ would slow hyperpolarisation, thus increasing the width of the spike, as seen in the cultured slices (Kandel 2000). This could be explained by an increase in voltage threshold, which would result in it being more difficult for the action potential to fire. A change in the conformation of the resting channels would affect the membrane time constant. Since the membrane time constant and the spike width increased, it suggests that a change in the conformation of the channels has occurred during culture.

If these changes in the intrinsic properties are confirmed by analysing more neurons then the cultured slices are not suitable for electrophysiology studies unless the differences can be quantified and applied during analysis.

The long-distance synaptic connections appear changed in the culture, whereas the short-distance synaptic connections appear similar.

By studying the changes in EPSP patterns after the neurons had been in culture, we found that their long distance (LOT to Layer II) connections had dramatically altered but that the short distance (within Layer II) connections had not.

The synaptic delay is proportional to the number of synapses that the signal has to pass through before reaching the electrode (Kandel, 2000). Since this appeared greater in the neurons from the cultured slices, it is possible that the neurons have decreased the number of long and increased the number of short distance connections. This explains why facilitation of the EPSPs is not observed in the LOT stimulated cultured slice but is observed in the LOT stimulated acute slice. This is also consistent with Gähwiler et al. 2005 review, which hypothesised that intercellular connections rearrange in culture.

GABAergic interneurons survived the culture process

The fluorescence analysis suggested that none of the GABAergic interneuron subtypes present in the acute slices were absent from the cultured slices. This distinction was used by Bekkers and Suzuki (2010) to classify the subtypes. The slight difference in the shapes of the histograms could be attributed to different experimenters recording the results. Since the means are equal within uncertainties, it is reasonable to assume that there is little change in the relative numbers of each type of GABAergic interneuron. This suggests that there is no specific loss of subtypes of these cells, in culture. This result, combined with our finding that there are minimal changes in short distance connectivity, implies that the processing of information within the PC could be studied using these slices. To ensure all types of neurons survive, further histological studies would need to be completed. Also, it would be useful to study the total number of neurons to ensure there is not an overall loss.

Conclusion

The use of cultured slices in understanding the connectivity and molecular biology of the olfactory system is feasible but there are some limitations in this technique. Future studies with larger sample sizes are needed to quantify the differences outlined in this paper. The culturing of slices is a useful technique that could be applied to other areas of the brain but it is important to complete a thorough comparative study on the slices before use.

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Uncovering the sexual tricks of orchid flowers

JULIANNE D. LIVINGSTON

Abstract

Rather than the conventional offer of a food reward such as nectar or pollen, many orchid species from the Australian *Chiloglottis* genera use sexual deception to attract male pollinators. These orchids emit an odorous pheromone very similar to the sexual pheromone produced by females of the pollinator species, thereby luring the male to the flower with the false offer of sex. The high degree of specificity between sexually deceptive orchids and their pollinators indicates that there must be subtle but important differences in the pheromones produced among even closely related orchids. This paper investigates whether the *PACPT* (Palmitoyl-Acyl Carrier Protein Thioesterase) gene, found to be highly expressed in the pheromone-producing part of *Chiloglottis* orchids, may be involved in the production of sexual mimicry pheromones. An analysis of the distribution of genetic variation in the gene sequence, as well as its possible effects on the amino acid it encodes was conducted across five species within the *Chiloglottis* genera. The results are not only highly encouraging for future research into the role of this gene in pheromone production, but may also provide helpful diagnostic tools for cryptic species that pervade the sexually-deceptive orchids.



Figure 1. *Chiloglottis valida* with sexually attracted pollinators.

Credit: Rod Peakall.

Sexual deception of pollinators is surprisingly common and diverse in terrestrial orchids, being the method of pollination in nine of thirty-nine Australian orchid genera within the Diuridea tribe (Dafni & Bernhardt 1990; Mant *et al.*, 2002; Schiestl & Peakall 2005). By mimicking the morphology and sex pheromones of female pollinators, these sexually deceptive orchids are able to lure male pollinators with the false offer of sex and accomplish cross-pollination without the cost of a food reward (Schiestl *et al.*, 2003; Bower & Brown 2009). This type of sexually deceptive pollination has been well studied in many Orchidaceae families (Dafni & Bernhardt 1990; Soliva & Widmer 2003; Vela *et al.*, 2007; Mant, Peakall & Schiestl 2005), with extreme specificity between orchid and pollinator species the norm. Recent investigations into the sexual deception of *Neozeleboria* (Tiphiiidae) thynnine wasp by orchids in the Australian *Chiloglottis* genera have also revealed very species-specific pollination patterns, such that

closely related *Chiloglottis* species are usually pollinated by closely related thynnine wasp species (figure 1) (Mant *et al.*, 2002; Schiestl & Peakall 2005; Bower & Brown 2009).

Attraction of specific pollinator species maintains the species borders of sexually deceptive orchids and is accomplished through variation in pheromone traits between species (Mant, Peakall & Schiestl 2005). The array of odour compounds involved in the mimicry of thynnine wasp sex pheromones have only recently begun to be discovered within the *Chiloglottis* genera (Schiestl & Peakall 2005). For instance, a single chemical compound termed ‘Chiloglottone’ has recently been found to be the sole sex pheromone responsible for the attraction of male pollinators in two sister thynnine wasp species (Schiestl *et al.*, 2003). Interestingly, this pheromone is produced by two distantly related orchid species; *Chiloglottis trapeziformis* and *Chiloglottis valida* (Schiestl *et al.*, 2003). The joint production and attraction to the Chiloglottone pheromone in the wasps can easily be explained by a shared ancestry, however, the mimicry in distantly related orchids has raised interestingly evolutionary questions regarding the extent to which compounds involved in pheromone production vary among *Chiloglottis* orchid species (Mant, Peakall & Schiestl 2005). This variation and flexibility in pollinator pheromone mimicry may explain the lack of genetic differentiation among *Chiloglottis* species within subgeneric clades (compared to among clades) i.e. the joint attraction of the same thynnine wasp pollinator by *C. trapeziformis* and *C. valida* has led to gene flow and low genetic variation between the orchid species (Mant, Peakall & Weston, 2005).

To fully understand the evolutionary processes involved in the mimicry of pollinator sex pheromones by *Chiloglottis* orchids and the subsequent effects on gene flow and pollinator specificity, the active compounds involved in pheromone production across species and populations must be identified (Mant, Peakall & Schiestl, 2005). A cDNA library has been constructed containing nucleotide gene sequences which are highly expressed in the pheromone-producing labellum of *Chiloglottis* orchids (Schiestl & Peakall, 2005). Analysis of the taxonomic variation in these gene sequences will assist in identifying the multiple genes involved in pheromone production and the subsequent variation that results in subtle but important differences in the pheromones produced by different *Chiloglottis* orchids. This paper aims to measure the genetic variation in the exon and intron nucleotide sequences of the highly expressed Palmitoyl-Acyl Carrier Protein Thioesterase (*PACPT*) gene across five distantly related *Chiloglottis* species. The protein encoded in this gene is known to play a crucial role in the biosynthesis of plant fatty acids (Jones *et al.*, 1995), hence any genetic variation within the expressed exon sequence that results in nonsynonymous changes between species in the encoded amino acid sequence may alter the biosynthesis pathway of the sex pheromones.

A secondary aim of this investigation into genetic variation is the development of primers for highly variable intron sequences within the *Chiloglottis* genera. Species-specific variation is expected to occur most highly within the intron sequences of the *PACPT* gene as these are relatively isolated from selection. As a result, introns accumulate single nucleotide polymorphisms (SNPs) and nucleotide insertions and deletions (indels) more frequently than exons (Campbell *et al.*, 2006). Therefore, identification of species-specific variation in intron sequences may not only complement existing markers for phylogenetic analysis of *Chiloglottis* orchids, but also aid in the identification of morphologically similar or cryptic orchid species (such as *Chiloglottis valida* subsp.) that have so far confounded and limited many studies on sexually deceptive orchid-pollinator interactions (Mant, Peakall, & Schiestl, 2005; Mant, Peakall, & Weston, 2005; Bower & Brown 2009).

Methods

Primer Design

Primers were designed using web-based PRIMER 3 software (Rozen & Skaletsky 2000) to amplify the gene sequence encoding for the production of palmitoyl-acyl carrier protein thioesterase (*PACPT*) in five *Chiloglottis* species based on a consensus cDNA sequence of *PACPT* from *C. trapeziformis* (Purdue Genomics Facility, 2010). I predicted the location of four introns in the cDNA sequence (exons only) by comparison with the complete genomic sequence of *PACPT* in the genomic model plant *Arabidopsis* (GenBank). The four sets of primers were designed to amplify and sequence four overlapping sections of the *PACPT* gene sequence, avoiding intron/exon junctions. The total exon length was estimated to be around 1362 nucleotide bases with four introns estimated to be between 30 and 150 bases in length each.

Orchid DNA sequencing

Each of the five *Chiloglottis* species included in this study, has a distinct pollinator that is distinguishable by morphological characteristics (Mant *et al.*, 2002). A simplified phylogenetic tree of the *Chiloglottis* genera (Mant, Peakall, & Weston, 2005), illustrating the placement of the five sampled *Chiloglottis* species across the three main clades is presented in figure 2. Multiple species samples were included to allow comparison of genetic variation among and within species and clades (table 1).

Orchid DNA was extracted using DNeasy Plant Mini Kit (Qiagen, Melbourne, Australia), with confirmation of DNA extract obtained by gel electrophoresis (1% agarose, 40 min at 110 volts). Polymerase chain reactions (PCRs) (40µl) contained: 24.9 µl milliQ H₂O; 4.0 µl 10X PCR buffer (Qiagen, containing 15 mM MgCl₂); 2.5 mM dNTPs, 2.0 µl; 25 mM MgCl₂, 2.4 µl (Qiagen); 1% (w/v) BSA(Biolabs), 0.5 µl 2mM of each primer in a pair, 2.0 µl; 5 units/µl *Taq* polymerase, 0.2 µl; and 100 nm/µl of template DNA; 2.0 µl.

Taxon	Location
<i>C. diphylla</i>	NSW: Buladelah fire trail
<i>C. formicifera</i> 1	NSW: Nattai National Park
<i>C. trapeziformis</i> 1	ACT: Black Mountain
<i>C. trapeziformis</i> 2	ACT: Black Mountain
<i>C. valida</i> 1	ACT: Lowden Road
<i>C. valida</i> 2	ACT: Black Mountain
<i>C. aff. plaricallata</i>	NSW: Kanangra-Boyd National park

Table 1. Taxon and location of the *Chiloglottis* samples

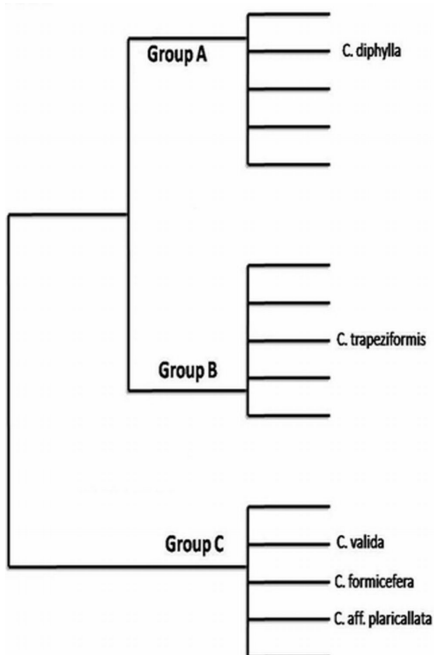


Figure 2. Simplified *Chiloglottis* phylogeny of the five sample species.

Source: Mant, Peakall & Weston, 2005

The PCR amplification was performed in CP-002 Palm Cycler (Corbett Research) with a touch-down thermal cycling program: 30 sec denaturation at 94°C followed by 40 secs at 66°C for primer annealing and then 90 secs at 72°C for extension. The annealing temperature decreased by 4 °C at every cycle until it reached 54°C, where it then reduced to 49°C for the last 10 cycles. Successful amplification of primer products in each sample was confirmed with gel electrophoresis (2%, 20min 130 volts then 10 min at 145 volts).

Purification of PCR products for sequencing followed ExoSAP-IT protocol (USB Corporation). The primers used for amplification were also used for sequencing, and all DNA fragments were sequenced in both directions. Sequencing reactions (20µl) contained 12.93 µl milliQ H₂O, 3.0 µl 5X PCR buffer (Qiagen), 2 mM of one primer, 0.32 µl; 0.75 µl of ABI Big Dye (Perkin Elmer Boston, MA); and 50 ng/µl of PCR Product, 3 µl. PCR sequence products were precipitated and purified with sodium acetate: ethanol followed by centrifuging and a 70% ethanol wash (x3).

Sequence Analysis

Alignment and editing of sequences was done in Geneious basic 4.6.4. PCR products for each sample were aligned to form a continuous sequence, except in *C. formicifera* which was constructed with only the reverse primer sequence for the second DNA segment as the forward primer sequence was corrupted. The *PACPT* sequences for each sample were aligned with the cDNA sequence from *C. trapeziformis* to identify intron location, size and polymorphisms. Ambiguities in the identity of nucleotide bases were resolved with visual analysis of sequence chromatographs. All sequences were trimmed to 1645 base in length, commencing and ending at the same exon sequence. SNPs and insertions/deletions (indels) within the exons and introns of each sample were identified as species or clade specific. Extra nucleotide bases were classified as an insertion if present only in that species or clade. Likewise, if more than one clade shared the extra nucleotide bases, the species or clade without the extra nucleotide bases was classified as having a deletion. Phylogenetic trees were constructed using complete, trimmed sequences, as well as exon and intron only sequences (bootstrapping was not conducted). Finally, exon-only sequences of each sample were translated into amino acid sequences to identify the SNPs that may produce non-synonymous changes in the encoded amino acid sequence.

Results

Not only did the four primer pairs successfully amplify their intended products, producing a continuous *PACPT* gene sequence length (ranging from 1150 to

1623 base pairs in length between species) in all of the *Chiloglottis* samples, but there was substantial interclade and interspecific genetic variation within the exon and intron sequence: rejecting the null hypothesis of no variation. Surprisingly, comparison of the *C. trapeziformis* cDNA sequence with nuclear sequence from the seven *Chiloglottis* samples (including 2 *C. trapeziformis* samples) revealed the location of 6 introns, 2 more than predicted (figure 3).

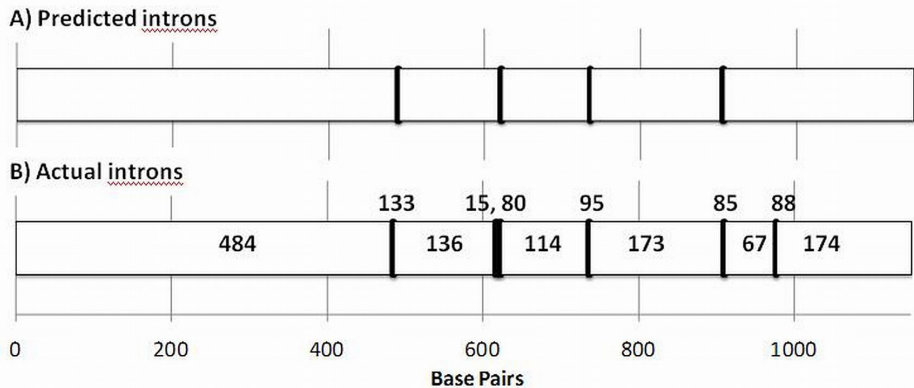


Figure 3. A) Four predicted introns in the PACPT sequence when compared to the complete *Arabidopsis* sequence. B) Actual position of 6 introns identified in the *Chiloglottis* consensus sequence.

The intron and exon-only phylogenetic trees showed identical genetic relatedness among samples, as did the phylogenetic tree constructed from the entire sequence (figure 4). The location and relatedness of species samples within the *PACPT* phylogenetic tree almost mimics that of Mant, Peakall, & Weston's (2005) phylogeny constructed from comprehensive DNA fingerprinting methods (figure 2), except for *C. formicera*'s position within the *C. trapeziformis* clade. This is due to the extremely high similarity (99.8%) in the *PACPT* sequence between the two species. Such low genetic variation was not observed even between the two *C. valida* samples, who shared just 98.4% of their nucleotide bases. Similarity between the *C. valida* sampled from Black Mountain and *C. aff. plaricallata* was also very high, sharing 97.9% of their nucleotide bases. Overall, the *PACPT* gene sequence was fairly conserved between clades, with 91.3% of the sequenced nucleotide bases being shared amongst all seven *Chiloglottis* samples.

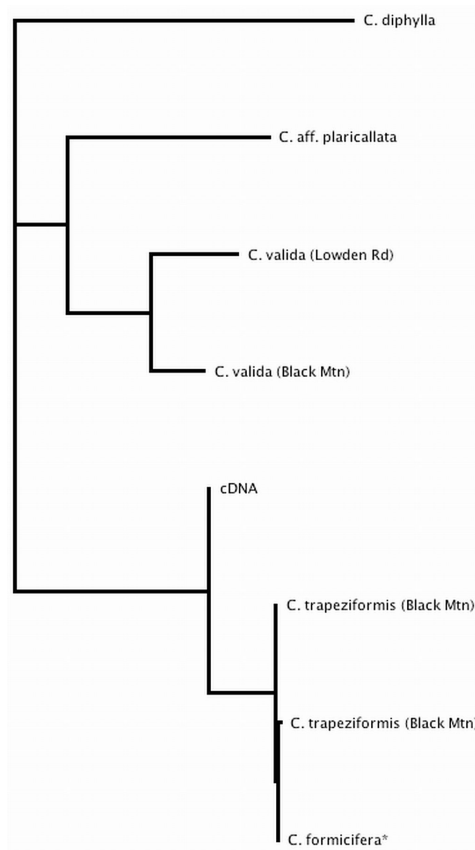


Figure 4. Phylogenetic tree constructed from ACPT gene sequences from seven *Chiloglottis* samples (cDNA is exon-only sequence from a *C. trapeziformis*)

Analysis of intron-only sequences revealed taxonomic differences in the distribution of variation, with 64% of variation accounting for differences between clades. Overall, 86% of nucleotide bases were shared across all seven samples with 49 SNPS and 5 indels distinguishing *Chiloglottis* species among the three clades (table 3 & figure 5). There was no variation in the intron sequence between *C. formicifera* and *C. trapeziformis* samples (as previously mentioned), but there was surprising intra-species variation within the *C. valida* clade. The *C. valida* sampled from Black Mountain shared 7 SNPs and a 7bp deletion with the *C. aff. plaricallata* sample, which were not present in the *C. valida* sampled from Lowden Road.

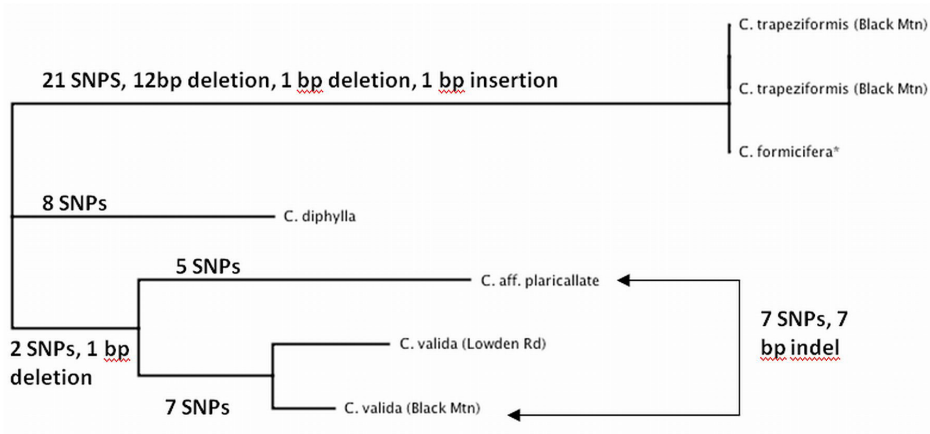


Figure 5. Intron-only phylogenetic tree illustrating the distribution of genetic variation within the intron sequences of the PACPT gene in seven *Chiloglottis* samples.

The distribution of genetic variation in the exon sequences was similar to that within introns, with 78% of the variation accounting for differences between clades, and each clade is being distinguishable by unique SNP combinations (although there were no indels within the exon regions) (figure 6). Again there was no species-defining genetic variation within the *C. trapeziformis* clade in the exon sequence, making it impossible to uniquely identify these two species based on these *PACPT* gene sequences alone. As expected, the exon sequences were less variable than the intron sequences, with 93.5% of nucleotides shared by all samples (this is due to the absence of indels within exon regions). Approximately 50% of all the SNPS within exons translate into nonsynonymous changes in the encoded amino acid (AA) sequence across the seven *Chiloglottis* samples, with each sample from the *C. diphylla* and *C. valida* clades encoding for at least 1 unique AA change (figure 6).

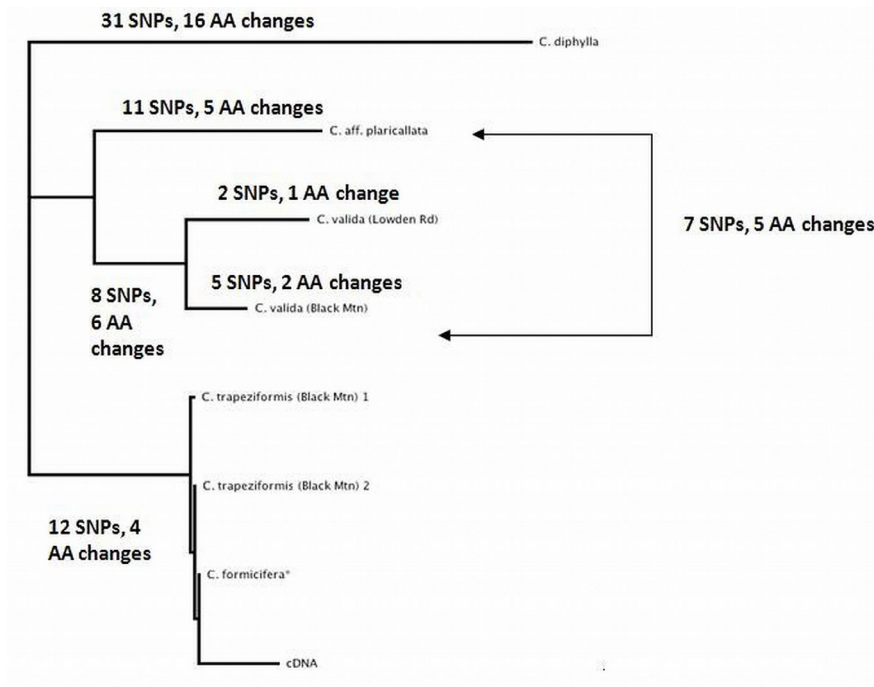


Figure 6. Exon-only phylogenetic tree illustrating the distribution genetic variation within the exon sequences of the PACPT gene in seven *Chiloglottis* samples.

Discussion

An analysis was conducted of the genetic variation in the exon and intron nucleotide sequences within the *PACPT* gene, which is found to be highly expressed in the pheromone-producing labellum of *Chiloglottis* orchids (Schiestl & Peakall 2005). Genetic variation that codes for changes to the *PACPT* amino acid sequence were identified both among and within clades (figure 6). In addition, species-specific genetic variation within the (unexpressed) intron segments were mapped, thereby providing an additional genetic marker to complement existing phylogenetic markers and possibly aid in the identification of cryptic *Chiloglottis* taxa and other Orchideae (figure 5).

The high expression of the *PACPT* gene within the pheromone-producing labellum has lead researches to suspect that it may be involved in the production of pheromone compounds. As a metabolically essential protein that determines the length of plant fatty acids (Jones *et al.*, 1995), it is certainly possible that *PACPT* plays a role in the production of the active compounds used to mimic pollinator sex pheromones across the *Chiloglottis* genera. As such, the high

percentage (50%) of SNPs identified within the expressed exon sequences that result in nonsynonymous changes in the encoded amino acid sequence of *PACPT* (at least 5 per species excluding *C. formicifera*) may create differences in the form and function of the protein between species and certainly between genetically divergent clades (figure 6). Unfortunately, the poorly understood effects of post-transcription and post-translation regulatory mechanisms (Campbell *et al.*, 2006) on *PACPT* function prevent any conclusions as to how, and what degree, these identified SNPs might change the role of *PACPT* in the plants. However, given the variety of SNPs, and subsequent variation in the amino acid sequence within species (see *C. valida* figure 6), between species and particularly between clades, there is evidence to suggest that *PACPT*'s metabolic function may vary between *Chiloglottis* clades even if the protein is not involved in pheromone production.

Although exon variation was identified (figure 6), the level of conservatism within the coding regions of *PACPT* is high enough to allow four pairs of primers designed from *C. trapeziformis* cDNA sequence to successfully amplify the intended gene sequence (1,645 nucleotide bases) across the five *Chiloglottis* species. The conservation of the *PACPT* gene sequence is also illustrated in the way that its phylogeny mirrors the *Chiloglottis* phylogeny constructed from a more comprehensive AFLP fingerprinting method (Mant, Peakall & Weston's (2005)) (figure 2, 4 & 5). Congruency between phylogeny and variation in sex pheromone compounds is reported in Lepidopteran moths (Lofsdedt & Kozlov, 1996 as cited by Mant *et al.*, 2002) and within some species of thynnine wasps (Mant *et al.*, 2002). However there was one exception to this pattern; the sequence of *PACPT* in *C. formicifera* is identical to that of *C. trapeziformis* even though they are relatively distantly related species. While there is less certainty in the sequence of *C. formicifera* due to one forward primer segment being discarded, it is unlikely that the reverse sequence was misinterpreted. In addition, there was no cross-species contamination evident in other PCR products or the negative control. Lastly, increased species sampling could only reposition *C. formicifera* into its taxonomically correct *C. valida* clade if there is extremely high intra-species variation within the *PACPT* gene, which has not been observed within this study. Instead, it is likely that the *PACPT* gene is highly conserved between this two distantly related species, either due to pollinator-driven selection (Mant, Peakall, & Schiestl, 2005) or other selection pressures on its metabolic functions (Jones *et al.*, 1995).

The distribution of genetic variation was taxonomically unbalanced, with a high proportion of variation due to the differences between clades in both exons (78%) and introns (64%). Mant, Peakall & Weston (2005) found similarly large genetic differences between the three *Chiloglottis* clades (73% of the total variation) relative to species within the clades. The lack of genetic differentiation

between species is suggested to be the result of consistent (or episodic) gene flow among closely related orchids (Mant, Peakall & Weston, Schiestl 2005; Mant, Peakall & Weston, 2005). Schiestl and Peakall (2005) demonstrated that different species of *Chiloglottis* (*C. trapeziformis* and *C. valida*) can indeed attract each others pollinators through joint production of the sex pheromone Chilogottone, thereby facilitating hybridization and gene flow between species. The joint attraction of even distantly related pollinators and subsequent gene flow between sympatric orchid species has also been supported in microsatellite studies in *Ophrys* orchids by Soliva & Widmer (2003). Whether gene flow between species can account for the high genetic similarity in the *PACPT* gene among the sampled *Chiloglottis* species cannot be inferred from the present results. However, the genetic similarity of species within the spring and summer-flowering *C. trapeziformis* and *C. valida* clades, and their relatively higher genetic differentiation from the autumn-flowering *C. diphylla* clade, does match the predicted relatedness of cross-pollinating plants in accordance with their ecological circumstances (Mant, Peakall & Weston, 2005)

Comparing variation in exons versus introns in the *PACPT* sequence at all taxonomic levels supports my prediction of higher genetic variation in intron segments; the *Chiloglottis* species samples shared less nucleotide bases and had five indels in their intron sequences compared to the exon segments (which had no indels difference between species) (figure 5 & 6). However, further sampling and statistical tests would need to be done to confirm whether introns do have significantly higher variation than exons. Variation in the number of introns within the *PACPT* gene between *Chiloglottis* and *Arabidopsis* (figure 2) species is an important result, but not unusual as the two plants are not closely related (Campbell *et al.*, 2006). Nevertheless, it does provide an additional measure of the genetic variation that exists within the *PACPT* gene in plants and may be useful for phylogenetic studies.

The identification of cryptic *C. valida* and other *Chiloglottis* subspecies to date has been based on the responses of pollinators to their unique chemical signatures (Bower & Brown 2009), as have cryptic *Ophrys* species (Vela *et al.*, 2007). However, the use of short intron sequences for identification of cryptic species would be valuable in many instances, particularly sympatric species that may attract multiple pollinators (Schiestl & Peakall 2005). Aside from *C. formicifera*, I hypothesise that the four sampled species could be assigned to their correct taxonomic clade solely on species-specific variation within the intron sequence (varying from 2 to 21 SNPs and accompanying indels), based on multiple samples within the *C. formicifera* and *C. valida* clades and the overall genetic divergence of the *C. diphylla* clade (figure 5). Although clade-specific variation was observed in exon regions, the shorter length and higher proportion of variation within introns suggests that intron-based diagnostics

would be ideal for identifying morphologically similar or cryptic *Chiloglottis* species (such as *C. valida* subsp., Bower & Brown 2009). Future research would benefit from designing primers that target the diagnostic intron sequences in the sampled species followed by wide-spread testing in the *Chiloglottis* genera.

Conclusion

This study provides the first measure of the distribution of genetic variation in the *PACPT* gene sequence across the three main *Chiloglottis* clades. The high number of nonsynonymous changes to the encoded amino acid sequence of *PACPT* identified in four of the five *Chiloglottis* species sampled indicates that *PACPT*'s metabolic function may indeed vary within and between *Chiloglottis* clades. This genetic differentiation among species provides evidence in support of the hypothesis that *PACPT* is involved in the production of species-specific pheromone production. Future research will benefit by increasing the orchid sample size (including more taxa), as well conducting multiple extractions from each plant (to add consistency and statistical strength to the data). Continued differential analyses of *PACPT* expression between the labellum and other parts of the plant will also indicate whether *PACPT* is indeed expressed significantly higher in the pheromone-producing labellum than anywhere else in the plant; providing further evidence for the protein's potential role in the evolution and variation of pollinator sex pheromones in *Chiloglottis* orchids. An important secondary outcome from the design of novel primers for the partial sequencing of the *PACP* gene is the identification of species and clade-specific genetic variation. These genetic markers could be used for the identification of morphologically similar or cryptic species that so often characterise sexually deceptive genera (Mant, Peakall & Weston, 2005; Bower & Brown 2009). Aside from diagnostic purposes, the variability in these primer segments may complement existing markers in phylogenetic investigations in taxonomic groups with little genetic differentiation (Mant *et al.*, 2002).

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Climate change impacts on Australia's alpine ecosystems

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Abstract

Global ambient temperatures have increased significantly (average 0.7°C) over the last century. In high-altitude areas, concurrent changes in precipitation regimes are already having a noticeable impact on snow area, depth and persistence in alpine and subalpine zones. Australia's alpine habitat is limited, covering only approximately 0.15% of the continent. Changes in snow regimes predicted under future climate change are likely to have a significant impact on the animals and plants whose ecology is intrinsically linked to snow conditions. For small mammals, reduced snow depth and area will reduce the availability of suitable over-wintering habitat and could increase predation. However, these effects are species-specific. Changes in snow regimes are predicted to significantly alter the composition and distribution of alpine vegetation communities. In particular, movement of species ranges to higher altitudes is predicted to *increase* species diversity in the alpine zone (though with a likely loss of some species). Wildfires poses an additional threat to alpine plants and animals, with many species apparently vulnerable to an increase in fire frequency. However, they appear to be resilient to high wildfire intensity. Thus, while climate change presents a significant threat to Australia's alpine ecosystems, the specific impacts will depend on the resilience and adaptability of individual species.

Introduction

Current global climate change is likely to affect natural ecosystems worldwide. In Australia, average maximum and minimum temperatures have increased by 0.6°C and 1.2°C respectively over the last century (Hennessy *et al.* 2007). Furthermore, the rate of warming appears to be increasing globally (Hennessy

et al. 2007; Trenberth 2007). Concurrent changes in precipitation and other environmental factors such as fire regimes are likely to have a significant impact on the diversity and distribution of species and ecosystems.

Mountain regions may be particularly affected by climate change: warming is thought to be occurring more rapidly in alpine areas than at lower elevations (Beniston *et al.* 1997, Diaz & Bradley 1997) and species already occupying high-altitude areas have little scope for up-slope migration (Beniston 2003; Hennessy *et al.* 2003; Walther *et al.* 2005). Habitat loss and fragmentation under climate change are significant threats to these ecosystems, with the creation of progressively smaller 'islands' of alpine and subalpine habitat (see Figure 1), within a 'sea' of montane woodland.

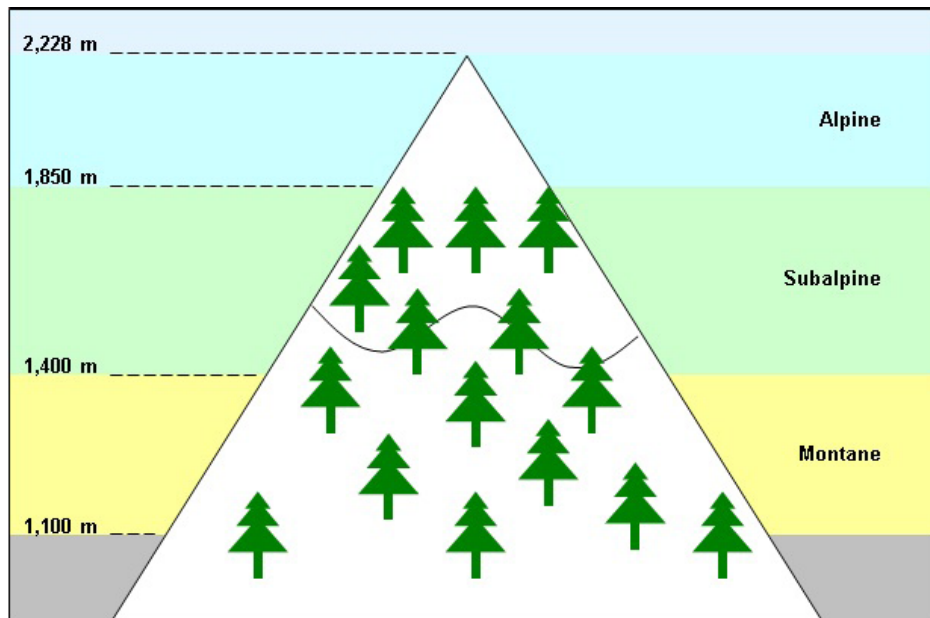


Figure 1. Diagram depicting mountain habitats. The alpine region comprises the alpine and subalpine zones, with the former extending above the tree line and the latter extending from the snow line to the tree line. The montane zone is woodland, below the snow line. Approximate elevations of the zone margins in the Mt. Kosciuszko alpine area in New South Wales are given.

Australia's alpine regions (Figure 2) cover only 0.15% of the continent, with an altitudinal range of just 400m (Costin 1957; Pickering and Armstrong 2003; Williams *et al.* 2008). On mainland Australia, the most extensive alpine areas occur in the Snowy Mountains of New South Wales, and the Bogong High Plains in Victoria (Williams *et al.* 2008). These areas have warmed by approximately

0.2°C over the last 35 years (Hennessy *et al.* 2003) and Australia's alpine zones have been identified as one of six key regions that are highly vulnerable to climate change (Hennessy *et al.* 2007).

This review summarises current trends and projected effects of climate change on Australia's alpine environments, with a focus on snow cover, and examines the predicted impacts of these environmental changes on alpine biodiversity.



Figure 2. Map of Australia's mainland alpine areas in dark shading.

Source: Wikimedia commons, 2010.

Trends and predictions for snow cover in Australian alpine areas

Perhaps the most immediate and important effect of climate change on alpine environments worldwide is its impact on snow cover. Climate change models predict a 0.5 to 1.5°C warming and up to 10% less precipitation (relative to

1990) in southeastern Australia by 2030 (Suppiah *et al.* 2007). Corresponding models for alpine areas estimate a temperature rise of up to 1°C temperature and 8.3% less precipitation by 2020 (Table 1), both of which are likely to affect snow conditions (Hennessy *et al.* 2003). The distributions of many species are determined by snow – its presence or absence, depth and persistence (Green and Osborne 1998; Matthews 2010). Consequently, changes in snow conditions are likely to have a substantial impact on biodiversity in alpine regions.

Globally, average snow cover has decreased by 10% since the late 1960s (Matthews 2010; Walther *et al.* 2002). Climate models, incorporating high- and low-impact changes in temperature and precipitation, predict a decline in the area of snow cover in Australia of between 22 up to 85% by 2050 (Hennessy *et al.* 2003). This projected decline is accompanied by a trend for an upward shift in the snow line (Hennessy *et al.* 2003). On Mt. Kosciuszko, the snow line is predicted to rise from its current elevation of 1460 m to between 1490 m and 1625 m by 2020 (Hennessy *et al.* 2003), while more recent models project an overall rise of 60 to 570 m by 2050 (Hennessy *et al.* 2007). This represents a reduction in the altitudinal range of the alpine/subalpine zones of between 7% and 74%.

In the Kosciuszko alpine area, maximum snow depth has decreased by approximately 10% and spring snow depth has declined by 40% over the last 40 years (Nicholls 2005). Climate models predict a further decrease in maximum snow depth of up to 99% (relative to 1990) by 2050 (Hennessy *et al.* 2007).

The Australian alpine zone typically has continuous snow cover for at least four months per year, with some snow patches persisting throughout the summer (Edmonds *et al.* 2006; Green and Pickering 2002). Green and Pickering (2009) estimate that snow thaw has occurred, on average, 2 days earlier per decade since 1954, with reduced variation in the date of first snow melt. A further decrease in snow persistence is predicted under both low- and high-impact climate change scenarios (Table 1; Hennessy *et al.* 2007).

Table 1. Predicted changes in temperature, precipitation, snow cover area, snow line and snow persistence under low- and high-impact climate change scenarios for 2020 and 2050, relative to 1990.

	Temperature (°C)	Precipitation (%)	Snow cover (%)	Snow line (at Mt. Kosciuszko; m)	Snow persistence (days)
Low impact 2020	+ 0.2	+ 0.9	-10	+ 30	-5
High impact 2020	+ 1.0	-8.3	-39	+ 165	-40
Low impact 2050	+ 0.6	+ 2.3	-22	+ 60	-15
High impact 2050	+ 2.9	-24.0	-85	+ 570	-100

Derived from Hennessy *et al.* 2007 and Hennessy *et al.* 2003.

Diversity in Australian alpine regions and impacts of climate change

Snow is ecologically important for both animals and plants inhabiting alpine and subalpine zones worldwide (e.g. Matthews 2010; Stenseth *et al.* 2004; Wipf and Rixen 2010). Reduced snow cover, depth and persistence predicted under climate change are therefore likely to have significant impacts on the distribution and diversity of species in alpine environments.

Alpine fauna

Australia's alpine fauna are thought to be highly vulnerable to the effects of climate change (Hughes 2003). Four small mammal species are common in the mainland alpine region: the mountain pygmy-possum (*Burramys parvus*), bush rat (*Rattus fuscipes*), broad-toothed rat (*Mustacomys fuscus*), and dusky antechinus (*Antechinus swainsonii*) (Broome 2001). In winter, these animals rely on cavities in rocks and insulated space formed by heathland shrubs, underneath the snow pack (subnivean space) (Sanecki *et al.* 2006a; Sanecki *et al.* 2006b). Reduced snow cover (both in area and depth) will therefore impact directly on these species by reducing the availability of subnivean habitat. It may also increase their susceptibility to predation (Green and Sanecki 2006) and/or reduce their competitive advantage over low-altitude species (Table 2) (Green and Pickering 2002).

The mountain pygmy-possum, Australia's only obligate alpine mammal, is considered to be particularly sensitive to climate change – models suggest a complete disappearance of its bioclimatic range with a 1°C rise in temperature accompanied by a 5% reduction in winter precipitation (Brereton *et al.* 1995). Adults hibernate under the snow for up to seven months of the year (Broome 2001). Winter snow cover is critically important for hibernation, as it dampens subnivean temperature fluctuations, so that individuals are usually exposed to temperatures between 1.5°C and 2.5°C (Körtner and Geiser 1998). In natural conditions, Körtner and Geiser (1998) found that bouts of hibernation were longest as the possum's body temperature approached 2°C, while earlier laboratory experiments demonstrated that energy conservation was greatest when ambient temperature was also 2°C (Geiser and Broome 1993). Energy use increases eightfold when ambient temperature falls to 0°C and individuals lose almost four times more body mass per day than at 2°C (Geiser and Broome 1993). Shallower snow cover and an increased proportion of precipitation falling as rain rather than snow will cause greater temperature fluctuations. This, in turn, is likely to cause more frequent arousals, greater loss of stored body fat and higher winter mortality (Geiser and Broome 1993; Hennessy *et al.* 2003; Körtner and Geiser 1998). Over-winter survival in this species is already low (70% for adult females, 40% for adult males) and declining population numbers in low-snow years have previously been noted (Green and Pickering 2002).

Changes in snow conditions might also have an important impact on predation patterns, in addition to the direct affects on subnivean space. In contrast to mountain pygmy-possums, broad-toothed rats, bush rats and dusky antechinus are active under the snow during winter and vulnerable to predation (Green and Pickering 2002). Over three years, Green (2003) found that these species made up an average 86% of the diet of red foxes (*Vulpes vulpes*). In the alpine zone, spring diets in two of three years consisted entirely of these three mammals (Green 2003). The broad-toothed rat, listed as 'vulnerable' in New South Wales, is selectively targeted by foxes and constituted 45% to 82% of their diet (Green 2003). Broad-toothed rats cluster in subnivean nests during winter and substantial population declines in shallow-snow years have been attributed to increased fox predation (Green and Pickering 2002). Studies in North America have found increased predation of small mammals by foxes and coyotes when snow is shallow (Gese *et al.* 1996; Halpin and Bissonette 1988) as shallow snow is likely to minimise the effort required to dig up prey (Green and Pickering 2002; Halpine and Bissonette 1988). Selective predation on broad-toothed rats means that this species is the most vulnerable to climate change-induced increases in fox predation.

Predator-prey interactions will also be affected by changes in species' distributions and movement patterns. In Australia, the arrival times of at least

seven bird species that migrate to alpine regions during spring have advanced by a month or more since the 1970s (reviewed: Chambers *et al.* 2005). Green (2010) examined the influence of temperature and thaw date on the arrival times of migratory birds and insects in the Kosciuszko alpine area over 30 years. He found that earlier snowmelt was associated with earlier arrival of Richards pipits (*Anthus novaeseelandiae*). In contrast, the alpine migration of bogong moths (*Agrotis infusa*), which form a key component of the spring and summer diets of many alpine birds (and mountain pygmy-possums), was not related to snow melt (Green 2010). These results suggest that advancement of the spring thaw could lead to an increasing mismatch between the timing of bird arrival and the availability of their major food source (Green 2010).

Climate change is expected to alter competitive interactions between species, so that some increase while others decline (Tylianakis *et al.* 2008). Altitudinal shifts in the distribution of Australian alpine animals, observed over the 30 years prior to 1999, suggest that some species are already responding to general warming (Green and Pickering 2002). The broad-toothed rat, dusky antechinus and mountain pygmy-possum are the only Australian mammals whose abundance increases with altitude. This suggests that they may hold a competitive advantage over similar, lower-altitude species (swamp rat (*Rattus lutreolus*), agile antechinus (*Antechinus agilis*) and Eastern pygmy-possum (*Cercartetus nanus*) respectively) in alpine and subalpine zones (Green and Pickering 2002). Decreased snow cover could reduce these competitive advantages and allow expansion of species (both native and feral) whose distributions are currently restricted by snow cover (Green and Pickering 2002). For example, bioclimatic modelling suggests that there is potential for increased overlap in the distributions of swamp rats and broad-toothed rats with local warming (Green *et al.* 2008). However, a recent study by Matthews *et al.* (2010) showed that topography, soil, vegetation and local habitat features might constrain the distributions of animals, independent of snow cover. This means that non-climatic factors could moderate (or exacerbate) the effects of climate change and increases the difficulty of accurately predicting future species' distributions.

Table 2. Summary of the predicted effects of snow regime changes on Australian alpine fauna.

Species/group	Predicted effect of changes in snow regimes	Cause	Reference
Mountain pygmy-possum	Range contraction	Reduced snow cover	Brereton et al. (1995)
	Increased winter mortality	Reduced snow depth	Geiser & Broome (1993); Körtner & Geiser (1998); Hennessy et al. (2003)
	Reduced competitive advantage over low-altitude species	Reduced snow cover	Green & Pickering (2002)
Broad-toothed rat	Increased predation	Reduced snow depth	Green & Pickering (2002); Green (2003)
	Reduced competitive advantage over low-altitude species	Reduced snow cover	Green & Pickering (2002)
Dusky antechinus	Reduced competitive advantage over low-altitude species	Reduced snow cover	Green & Pickering (2002)
Migratory birds	Earlier spring arrival	Increased spring temperatures; earlier thaw date	Chambers et al. (2005); Green (2010)

Alpine flora

Alpine plant life is largely governed by temperature and the duration and depth of snow cover (Gonzalo-Turpin and Hazard 2009). The impacts of global warming on Australia's alpine plants are expected to vary considerably with vegetation type (summarised in Table 3). Climate change effects on alpine vegetation may also vary at different spatial scales. For example, Edmonds *et al* (2006) predicted an increase in species richness at a small scale as species immigrate from adjacent habitats. However, Good (1998) suggested that plant diversity would decrease across the alpine habitat as a whole, due to loss of species that are restricted to areas with persistent summer snow. The communities most at risk are snowpatch feldmark and short alpine herbfields, which are associated with late snowdrifts and dependent upon snowmelt water during summer (Good 1998; Pickering and Armstrong 2003; Scherrer and Pickering 2001).

Late summer snowdrifts represent an important aspect of the alpine environment that is likely to change under global warming, with models predicting a decrease in both their size and number (Edmonds *et al.* 2006). Persistent snowdrifts constrain the time available for plants to grow and reproduce, but also hydrate the soil and influence soil chemistry (Edmonds *et al.* 2006; Slatyer *et al.* 1984).

In one large-scale study, areas with greater summer snowdrift persistence had a lower number and diversity of vascular plants (Edmonds *et al.* 2006). However, loss of this habitat under global warming is likely to result in diminution of plant species associated with persistent summer snow (Edmonds *et al.* 2006). Decline of a key snowpatch fieldmark species, *Coprosma niphophila*, since surveys in the 1970s may be an early reflection of such changes (Edmonds *et al.* 2006; Pickering and Armstrong 2003).

In Victoria, forest trees, principally *Eucalyptus pauciflora*, are beginning to extend their range into subalpine grassland (Wearne and Morgan 2001). However, this particular study could not conclude whether range shifts were due directly to climate change influences (Wearne and Morgan 2001). A recent meta-analysis of treeline data from 166 sites worldwide found that treeline advancement had occurred at approximately half of the sites and was associated with greater winter warming (Harsh *et al.* 2009). Although treeline shifts are likely to be slow (new *E. pauciflora* have established only a maximum of five metres from the forest-grassland boundary), species with greater dispersal capacity, such as many introduced weeds, may rapidly expand their ranges upslope as snow cover decreases (Wearne and Morgan 2001). A rising treeline will lead to extensive fragmentation of previously contiguous, treeless alpine habitat, increasing the extinction risk for species (both plant and animal) remaining in these alpine 'islands' (Halloy and Mark 2003; Moen *et al.* 2004). However, some plant species might have the potential to adapt to changing environmental conditions. Recent studies have found considerable local adaptation and genetic structuring of alpine plant species occurring along altitudinal gradients (e.g. Byars *et al.* 2009; Gonzalo-Turpin and Hazard 2009; but see: Byars and Hoffmann 2009). Local altitudinal adaptation, combined with gene flow, will enhance the potential of plants to adapt to environmental change (Gonzalo-Turpin and Hazard 2009). Species might also respond to climate change via phenotypic plasticity (Byars and Hoffmann 2009). For example, Byars and Hoffmann (2009) found marked differences between the leaves of *Craspedia lamicola* from high and low elevations, but most of this variation was attributable to environmental, rather than genetic differences (Byars and Hoffmann 2009).

Table 3. Alpine vegetation types and their predicted response to climate change.

Vegetation type/species	Predicted response to climate change	Reference
Ranunculus niphophilus (herb)	Decline	Edmonds et al. (2006)
Cushion plants	Decline	Edmonds et al. (2006)
Rushes	Decline	Edmonds et al. (2006)
Fen and bog	Decline	Pickering and Armstrong (2003)
Short alpine herbfield	Decline	Pickering and Armstrong (2003); Scherrer and Pickering (2003)
Tall alpine herbfield	Expansion, followed by decline	Pickering and Armstrong (2003)
Snowpatch feldmark	Decline	Pickering and Armstrong (2003)
Windswept feldmark	Expansion	Pickering and Armstrong (2003)
Trees	Expansion	Pickering and Armstrong (2003), Wearne et al (2001)
Shrubs	Expansion	Edmonds et al. (2006)
Heath	Expansion	Costin (1957)
Grasses	Expansion	Edmonds et al. (2006)

Fire in alpine regions

Wildfires have played an integral role in shaping Australia's environment and biological diversity. Historically, large fires have occurred infrequently in alpine regions (reviewed: Williams *et al.* 2008), but climate models suggest that changes in temperature, precipitation, humidity and wind-speed in the future are likely to increase both the frequency and severity of wildfires in the future (Hennessy *et al.* 2005). In early 2003, wildfires burnt 70% of the alpine and subalpine zones of southeastern Australia, providing a unique opportunity to examine the responses of plants and animals to large-scale fires (Green 2006). Encouragingly, over 90% of plant species regenerated quickly and several species even appeared to be more abundant (or present where they had previously been absent) after the fire (Walsh and McDougall 2004; Williams *et al.* 2008). Thus, alpine vegetation was generally resilient to fire.

Extensive loss of heathland shrubs, which form the structural base of subnivean habitat, is thought to have led to significant declines of bush rat, broad-toothed rat and dusky antechinus populations in the winter following the fires (Green and Sanecki 2006; Williams *et al.* 2008). Slow regeneration of heath (5 – 20 years) means that small mammals are likely to be susceptible to an increased fire

frequency that does not allow adequate recovery of subnivean habitat (Bradstock 2008; Williams *et al.* 2008). Mountain pygmy-possums, whose boulderfield habitat provides additional subnivean space that is relatively resistant to fire, and corroboree frogs (*Pseudophryne* spp.), which occupy wet areas, were more resistant to fire effects (Williams *et al.* 2008). No population declines (and even a slight increase) were detected for the nationally vulnerable northern corroboree frogs at 34 sites in the Mt. Kosciuszko area (Williams *et al.* 2008).

Future directions

Species can respond to climate change by migration, adaptation or plastic changes and different species experiencing the same environmental changes are likely to show a range of responses (Byars and Hoffmann 2009). Migration potential is limited in the alps, but studies in plants indicate both plastic and adaptive responses to environmental gradients (e.g. Byars and Hoffmann 2009; Byars *et al.* 2009). The adaptive potential of alpine animals has not been thoroughly studied, but low dispersal and gene flow between populations (Koumoundouros *et al.* 2009; Mitrovski *et al.* 2007) is likely to limit rapid adaptation. Thus, phenotypic plasticity is likely to be an important determinant of a species' resistance to climate change and this is a key area for future research. For example, one question might be: 'can small mammals change their behaviour to ameliorate the effects of reduced snow cover duration?'

Our understanding of the impact of climate change on ecosystems is far from complete, but obtaining accurate predictions of future environment scenarios is important for conservation management. Predictions arising from climate change models are typically at a broad scale, with much higher uncertainty for changes at a small scale. Localised cooling and drying over the last 20 years has been reported in southeastern Tasmania, contrasting with global warming trends (Kirkpatrick *et al.* 2002). Thus, local models for climate change are necessary if these are to be useful for species management. In addition, the high uncertainty inherent in many climate change models means that predictions arising from these models should be used with careful consideration of the assumptions included in the model. For example, Hennessy *et al.* (2007) predicted only a 7% reduction in the alpine zone under the lowest-impact model. This change on its own would probably have minimal impact on the abundance or distribution of species. However, the high-impact model predicted a 74% loss of alpine zone habitat – clearly a concern for those species restricted to the alpine zone. Given this uncertainty, local models that provide shorter-term (and therefore more accurate) estimates will be more useful for predicting the impacts of climate change on biodiversity and for conducting research into species responses to climate change.

A third area that should be a focus of future research is non-climatic factors that could moderate or exacerbate direct climate-change effects. For example, alpine species are predicted to lose their competitive advantage over lower-altitude species as snow cover decreases. This indirect threat of climate change is additional to the direct effects of reduced snow cover. However, if non-climatic factors can negate the indirect effects (e.g. if the distribution of low-altitude species are limited by factors other than snow cover), the alpine biota may be better able to withstand the direct impacts of climate change. Alternatively, climate change could exacerbate current threats to biodiversity, such as predation by introduced predators. Understanding the interactions between these direct and indirect effects of climate change is the next step towards being able to effectively predict and conserve biodiversity.

Finally, while this review has focussed on the impacts of changes in snow cover as a result of global climate change, other factors including ultraviolet radiation (which might particularly affect high altitude amphibians), wind patterns, and human activities might also change in the future, causing additional impacts on natural systems. Estimates of the changes likely to occur, and research into their potential effects are now necessary.

Conclusions

The Australian alpine region is a unique habitat that is threatened by current and future climate change. Some of Australia's alpine species appear to be under significant threat from direct and indirect effects of climate change impacts on snow cover. For example, the mountain pygmy-possum is likely to suffer from significant habitat loss, and increased fox predation threatens broad-toothed rat populations. Several plant species are also predicted to decline or disappear. Alpine species are generally resilient to fire, but an increased frequency of natural wildfires is likely to cause significant population declines. However, Australia's alpine environment and its biodiversity may be resistant to the effects of at least low-impact climate change.

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The Effectiveness of Interest Rate Parity

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Abstract

This paper provides an investigation as to whether there has been any improvement on the effectiveness of IRP in forecasting exchange rates in three-month periods. With AUD being the base currency, the research is conducted using nine foreign currency proxies, namely USD, JPY, GBP, CHF, NZD, CAD, HKD, SGD and CNY. Historical exchange rates of AUD over the nine foreign currencies and three-month interest rates in the ten countries from 1 January 1995 to 30 December 2008 are collected and computed. According to our results, although there is evidence suggesting that IRP generally holds, its quality does not appear to have improved in recent years. Indeed, we found strong evidence indicating that the quality of IRP is not related to the time horizon. One possible explanation to this finding might be that the recent financial crisis has triggered significant government intervention and brought incredible currency risk, deteriorating the quality of IRP.

Introduction

The Interest Rate Parity (IRP) condition is a commonly employed technique in making exchange rates forecasts. Forecasts under this condition are made by inputting the spot exchange rates and the interest rates in the domestic and foreign countries respectively. Therefore the reliability of this technique is highly related to how the two interest rates are affected. In recent years, as the world becomes more internationally related, interest rates are no longer determined solely by countries' domestic economic factors. Since the quality of IRP is positively connected to the level of the global financial market integration, it is reasonable to expect an improvement in the quality of IRP compared with a decade ago.

This paper aims to test whether the performance of IRP in forecasting exchange rates in three-month periods has improved recently. This requires quantitative measures. With AUD being the domestic currency, nine currencies (including USD in the US, JPY in Japan, GBP in the UK, CHF in Switzerland, NZD in New Zealand, CAD in Canada, HKD in Hong Kong, SGD in Singapore, and CNY in China) are used as foreign currency proxies over which exchange rates of AUD are to be forecasted. Data of spot exchange rates, domestic interests and foreign interests for the period 1995-2008 were collected from reserve banks of the ten countries in discussion.

Theoretical Arguments

Generally there are two versions of IRP – covered and uncovered. Before examining IRP, we made an assumption that forward parity always holds (ie. $E[S_t^{d/f}] = F_t^{d/f}$). For this to be true, investors have to be risk neutral so that risk premium is equal to zero. Although this “unbiasedness hypothesis” was rejected by many finance literature (Chinn and Meredith, 2005), it was first argued by Mussa (1979) and tested by Froot and Thaler (1990) that the proposition may be better applied at longer horizons.¹ In the real world, many macroeconomical models assume a strong version of perfect capital market. Therefore, for ease of calculation and comparison, we combine forward parity and covered IRP (CIRP), making the model we are testing to be:

$$\frac{E[S_t^{d/f}]}{S_0^{d/f}} = \left(\frac{1+i_d}{1+i_f} \right)^t \quad (1)$$

This is effectively the expression of Uncovered IRP (UIRP). Because historical forward rates of exchange over various foreign currencies are not easily accessible to the general public, expression (1) is a commonly used model for market-based forecasts of exchange rates. It presents a simple way of forecasting exchange rates, and it is easy to work out its forecast accuracy by comparing $E[S_t^{d/f}]$ and $S_t^{d/f}$.

In order to test whether this equation works better than in previous times, we first examine whether it generally holds. If it does, $E[S_t^{d/f}]$ calculated from equation (1) will be close to the actual. From this, we have the following hypothesis:

¹ Exceptions include Flood and Rose's (1996) results for intra-EMS exchange rates, and Frankel and Poonawala's (2004) findings for emerging markets. Interestingly, Chaboud and Wright (2003) found that UIRP holds for major currencies at extremely high frequencies, such as intraday.

$$H_0: S_t^{d/f} = E[S_t^{d/f}] = \frac{E[S_t^{d/f}]}{S_0^{d/f}} = \left(\frac{1+i_d}{1+i_f} \right)^t, \text{ where } T_t - T_{t-1} = 3 \text{ months}$$

We expect this to hold because if rates of return from investments of two countries are not the same, funds will move to a country with the more attractive rate. As we assume that forward price is an accurate predictor of future spot price, equation (1) will also hold. Recent research suggests that UIRP tends to hold for over medium to long periods (Flood and Taylor, 1997; Cochrane, 1999; Alexius, 2001; Chinn and Meredith, 2004 and 2005; Chinn, 2006; Zhang, 2006). However, it must be noted that the majority of current support in favour of the standard, linear, specification of UIRP is restricted to major floating currencies and three-year or longer horizons (Mehl and Cappiello, 2007). As our research is vis-à-vis three-month periods and includes emerging markets, it is possible that the alternative hypothesis works. That is:

$$H_A: S_t^{d/f} \neq E[S_t^{d/f}] = \frac{E[S_t^{d/f}]}{S_0^{d/f}} = \left(\frac{1+i_d}{1+i_f} \right)^t, \text{ where } T_t - T_0 = 3 \text{ months}$$

This could be the case even if the CIRP itself holds, because forward parity may not hold in the real world. After testing whether IRP generally holds, we can then further test whether it has become more accurate recently. If it does, the absolute forecast errors of IRP should be generally decreasing from 1995 to 2008. So we have the second null hypothesis:

$$H_0: \frac{E[S_t^{d/f}]}{S_0^{d/f}} = \left(\frac{1+i_d}{1+i_f} \right)^t \text{ decreases over the period of 1995-2008}$$

Recently, there has been a trend of rapid integration in the world, evidenced by more widespread free trade agreements in goods market and the increases in cross-border financing in financial markets. With the reduction of barriers and the increase in integration, it is reasonable to expect that a financial market has become more efficient recently. This means numerous investors can respond faster to market mispricing, making CIRP hold better. Due to our assumption of $E[S_t^{d/f}] = F_t^{d/f}$, it also means that model (1) (ie. UIRP) should work better than previously. If it does not, the alternative hypothesis applies:

$$\text{HA: } \frac{E[S_t^{d/f}]}{S_0^{d/f}} = \left(\frac{1+i_d}{1+i_f} \right)^t \text{ does not decrease over the period 1995-2008}$$

This includes situations where the absolute forecast errors increase, remain the same, or move randomly without obvious trends over time. Because IRP forecasts exchange rates by inputting spot exchange rate and the interest rates in the two countries, fluctuations in interest rates can significantly affect the accuracy. When interest rates are highly manipulated by the governments, the quality of IRP may deteriorate. Because of the economic recession since 2008 and its signs in previous years, governments or central banks of many countries started to set interest rates artificially. This raises the potential of a less accurate IRP.

Empirical Evidence

Data Collection

In order to test the forecast accuracy of IRP in three-month intervals, we use AUD as the domestic currency and choose nine main currencies as foreign currency proxies (namely, USD, JPY, GBP, CHF, NZD, CAD, HKD, SGD and CNY). We then retrieved historical daily spot exchange rates of AUD over the nine foreign currencies and three-month interest rates in the ten countries on the first days of January, April, July and October from 1 January 1995 to 30 December 2008. For non-trading days (eg. 1 January), we apply the rates on the closest day before that date. It is often difficult to locate data on interest rates and spot foreign exchange rates at many time horizons that are time synchronous. Therefore, we ignore time differences over the world and assume that all countries use Australian Eastern Standard Time. So interest rates on a foreign reserve bank are treated to be quoted in accordance with Sydney time, making allowances for possible time discrepancies. All exchange rates are in the form of direct quote with AUD as the numerator. All interests are converted to periodic rates over three months.

According to expression (1), if $i_d > i_f$, then $E[S_t^{d/f}] > S_t^{d/f}$. In other words, if IRP holds, higher interest rate currency should depreciate and vice versa. This worked for all currency pairs we examined. The relationship between AUD and USD serves as a good example in this matter. From 1 January 1995 to 1 April 1997, AUD boasted higher interest rates and depreciated. From 1 July 1997 to

1 October 1998, USD boasted higher interest rates and depreciated. This also applies to other time periods, with slight deviations allowed. However, the relationship between AUD and NZD is an exception. Over the 1995-2008 period, i_{AUD} is generally lower than i_{NZD} , while AUD has generally depreciated against AUD.

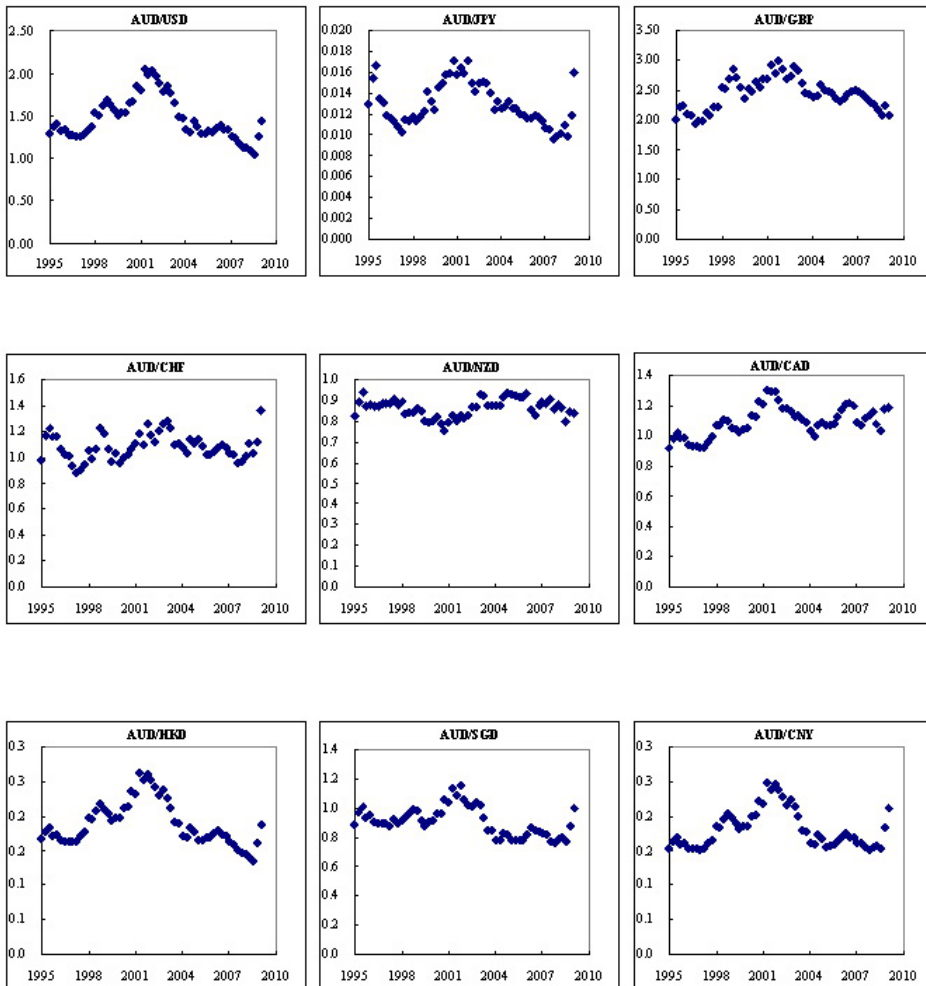


Figure 1: Exchange Rates of Australian Dollar over the period 1 January 1995 to 31 December 2008 (56 observations). This figure plots the series of exchange close-rates on the first day of each quarter of the Australian Dollar (AUD) vs the US Dollar (USD), Japanese Yen (JPY), British Pound (GBP), Swiss Franc (CHF), New Zealand Dollar (NZD), Canadian Dollar (CAD), Hongkong Dollar (HKD), Singaporean Dollar (SGD) and Chinese Yuan (CNY).

We then use expression (1) and the above data to forecast future spot rates. If the forecasts are accurate, the scatter plot graph with expected spot rates $E[S_t^{d/f}]$ being y-axis and actual spot rates $S_t^{d/f}$ being the x-axis should have an intercept of 0 and a slope of unity. Also, if IRP works better in these years, the absolute forecast errors should be decreasing over time. Thus, the scatter plot graph with absolute forecast errors as the y-axis and dates as the x-axis should be negatively sloped.

Empirical Results

Table 1 summarises all the expected exchange rates from calculation. Table 2 and Table 3 show the forecast error and absolute error respectively. According to Figure 2, with actual exchange rates being the x-axis and expected rates being the y-axis, almost all of the currency pairs provide trendlines with slopes equal to 1 and intercepts close to 0. Therefore the IRP condition accurately forecasted exchange rates, with the only exception of AUD/JPY, whose deviations are fairly statistically significant.

Table 1: Forecasted Spot Rates of Australian Dollar over the period 1 April 1995 to 31 December 2008. This table presents forecasted exchange close-rates on the first day of each quarter of the Australian Dollar vs the US Dollar (USD), Japanese Yen (JPY), British Pound (GBP), Swiss Franc (CHF), Newzealand Dollar (NZD), Canadian Dollar (CAD), Hongkong Dollar (HKD), Singaporean Dollar (SHD) and Chinese Yuan (CNY) over the period 1 April 1995 to 31 December 2008. The exchange rates are forecasted according to IRP:

$$\frac{E[S_t^{d/f}]}{S_0^{d/f}} = \left(\frac{1+i_d}{1+i_f} \right)^t$$

T	F0.25AUD/USD	F0.25AUD/JPY	F0.25AUD/GBP	F0.25AUD/CHF	F0.25AUD/NZD	F0.25AUD/CAD	F0.25AUD/HKD	F0.25AUD/SGD	F0.25AUD/CNY
1/04/1995	1.320757184	0.013719425	2.045386922	1.018520838	0.818320029	0.919389036	0.1703147	0.897696472	0.156199125
1/07/1995	1.397977317	0.016460472	2.229937945	1.226556982	0.880191897	0.981927012	0.180450814	0.983075355	0.166774818
1/10/1995	1.434831747	0.017735429	2.264487608	1.279211981	0.930977201	1.035048301	0.184723454	1.026326564	0.173437062
1/01/1996	1.34616926	0.014410566	2.107875412	1.218761892	0.860942221	0.997274404	0.173278739	0.945954618	0.162241723
1/04/1996	1.366187619	0.013945405	2.095609246	1.228855984	0.86758367	1.007461819	0.175528129	0.966396494	0.164356630
1/07/1996	1.304118872	0.012714666	1.974140557	1.129681946	0.859872925	0.965425595	0.167390553	0.924085603	0.156084960
1/10/1996	1.296390638	0.012386293	2.00630946	1.065860526	0.849439283	0.959094679	0.166510819	0.915542292	0.156579586
1/01/1997	1.282397901	0.012076467	1.999089196	1.062775596	0.862412525	0.959738632	0.164646796	0.908135858	0.157329625
1/04/1997	1.264200712	0.011399063	2.122741658	0.96971649	0.87552389	0.944576413	0.162262252	0.900671732	0.155177546
1/07/1997	1.276983883	0.010848031	2.083799826	0.917021603	0.871655509	0.943498349	0.163628547	0.882982784	0.157184057
1/10/1997	1.32482479	0.01207147	2.186078286	0.941285548	0.882785594	0.980156012	0.16984703	0.924473996	0.163183942
1/01/1998	1.365027986	0.011866635	2.179020554	0.978957692	0.857555699	1.005394719	0.173920438	0.885420267	0.168219666
1/04/1998	1.524695303	0.012327794	2.487902412	1.091940507	0.859911805	1.078104278	0.194118891	0.907233293	0.188944254
1/07/1998	1.503806488	0.011814865	2.473125122	1.027668604	0.801309771	1.066887578	0.191265058	0.927075874	0.186172263
1/10/1998	1.606624167	0.012243416	2.629450698	1.091769688	0.821466374	1.103459424	0.204534052	0.955245313	0.199235049
1/01/1999	1.679448943	0.012847606	2.785650725	1.261556043	0.842336827	1.100627865	0.213864178	0.990040366	0.207381785

1/04/1999	1.631265065	0.014786372	2.675433277	1.220385419	0.86206388	1.053173332	0.207356064	0.979577977	0.200570580
1/07/1999	1.574165084	0.013823748	2.520110011	1.102192987	0.84378668	1.04629292	0.20024462	0.910580128	0.193724674
1/10/1999	1.493953087	0.012917586	2.359465875	1.004407265	0.802344822	1.025371406	0.189820691	0.876662784	0.185785061
1/01/2000	1.532251764	0.015158233	2.526200955	1.059800186	0.789466524	1.047941557	0.194391133	0.894564134	0.190947694
1/04/2000	1.531260294	0.015692378	2.47199483	0.99171607	0.796074666	1.056317016	0.194120236	0.913777205	0.191240321
1/07/2000	1.650748788	0.016534857	2.631526668	1.020694244	0.815789549	1.139765506	0.209083811	0.955742459	0.207294390
1/10/2000	1.66476299	0.016718119	2.541496507	1.049051627	0.777662489	1.13188309	0.210675829	0.96111132	0.210099792
1/01/2001	1.841986201	0.018102014	2.708960231	1.096845543	0.748354954	1.237048133	0.23296222	1.055845646	0.232345213
1/04/2001	1.807608956	0.016611922	2.695091292	1.131800848	0.791410408	1.213678029	0.228483838	1.049347937	0.226923585
1/07/2001	2.050648621	0.017196183	2.901485738	1.202267113	0.818336956	1.308008819	0.259961479	1.142973263	0.254575502
1/10/2001	1.994179056	0.016644122	2.769399741	1.115080833	0.791292215	1.305127971	0.252088001	1.096238509	0.245157779
1/01/2002	2.06834386	0.0177638	2.978406127	1.284537927	0.819068428	1.309338957	0.261338526	1.176287328	0.251144356
1/04/2002	2.006994622	0.015534883	2.849357152	1.201203787	0.809371842	1.259373636	0.253594181	1.08235949	0.241897602
1/07/2002	1.934357916	0.014820002	2.69937669	1.154980386	0.819126663	1.205661518	0.244402387	1.048177863	0.233786890
1/10/2002	1.842412989	0.015665373	2.76140185	1.256670459	0.858860435	1.201615224	0.232731592	1.042745192	0.222635265
1/01/2003	1.903893317	0.015842057	2.929578409	1.304837095	0.85796171	1.187948261	0.240554192	1.067542715	0.230102111
1/04/2003	1.828091119	0.015592093	2.852763742	1.325885464	0.919824153	1.143179483	0.230960893	1.050643988	0.219845121
1/07/2003	1.712735049	0.014636461	2.640772294	1.27593398	0.908097125	1.145782813	0.216414672	0.968670477	0.206000627
1/10/2003	1.538972127	0.012958038	2.480754301	1.145957143	0.871083343	1.121032039	0.194471545	0.873770738	0.184646504
1/01/2004	1.52006885	0.013790657	2.466001387	1.161754972	0.871251574	1.108853236	0.193549935	0.87787143	0.182387296
1/04/2004	1.3930033	0.013147242	2.415246357	1.131710077	0.876391574	1.063245258	0.176813873	0.817590874	0.167129995
1/07/2004	1.371296226	0.013283503	2.449937771	1.087925327	0.871335093	1.033780064	0.173413611	0.817062122	0.164519479
1/10/2004	1.48952481	0.013945298	2.62337236	1.199518182	0.904008276	1.107140746	0.188213439	0.864388725	0.179170537
1/01/2005	1.425969692	0.013165981	2.507839974	1.155564437	0.922694091	1.121070916	0.180235653	0.842720072	0.172375435
1/04/2005	1.324267903	0.01316723	2.489467343	1.186453076	0.911548599	1.097215157	0.167791023	0.806098456	0.160774045
1/07/2005	1.332046762	0.012723738	2.466810859	1.135585764	0.909925068	1.102913179	0.168397518	0.799970378	0.162653085

1/10/2005	1.349974216	0.012537949	2.373157378	1.073378234	0.89978187	1.106259786	0.171220569	0.796984828	0.165593927
1/01/2006	1.336733458	0.012264319	2.337902615	1.063448002	0.89561316	1.149604695	0.169915096	0.787515714	0.168544604
1/04/2006	1.380597892	0.012274304	2.380850426	1.087900908	0.916691976	1.196267379	0.175604235	0.826850312	0.175407304
1/07/2006	1.407640376	0.012551399	2.463496626	1.121072306	0.839838262	1.222088316	0.178907053	0.867111386	0.180888547
1/10/2006	1.354683877	0.01240134	2.504487492	1.140464871	0.810863442	1.234381354	0.171951501	0.8511330863	0.175362932
1/01/2007	1.348901902	0.011996361	2.540202329	1.117306198	0.861763881	1.225287714	0.170708011	0.848975497	0.176396376
1/04/2007	1.277971575	0.011262186	2.515301902	1.077975852	0.881122733	1.112874535	0.162098096	0.832607857	0.169204326
1/07/2007	1.254050808	0.011135674	2.461734377	1.060525525	0.872186314	1.0952334875	0.158219998	0.825949685	0.167420496
1/10/2007	1.191369546	0.010089562	2.381527776	0.991336173	0.890187594	1.133880437	0.150293553	0.776817795	0.161306238
1/01/2008	1.155759605	0.010436777	2.314262189	1.005814019	0.843272324	1.163618692	0.146872013	0.774155072	0.156653444
1/04/2008	1.169823212	0.0107722	2.302960904	1.054577654	0.868153205	1.201833788	0.149153673	0.818145812	0.161115164
1/07/2008	1.157792616	0.011758917	2.232095708	1.158333073	0.85422495	1.128023587	0.146620126	0.835187021	0.163400215
1/10/2008	1.105796109	0.01058569	2.140324743	1.077800227	0.791049297	1.08100098	0.13978484	0.805940578	0.159187989
31/12/2008	1.330724228	0.0126108	2.279832497	1.167457566	0.838860438	1.237661104	0.170399675	0.907189456	0.189964169

Source: All the data used (including exchange rates as well as interest rates) are retrieved from the reserve banks of the 10 countries. Weblinks:

http://sc.info.gov.hk/gb/www.info.gov.hk/hkma/chi/statistics/index_efdhk.htm
<https://secure.sgs.gov.sg/apps/msbs/domesticInterestRatesDisplay.jsp?tableName=domesticInterestRatesForm.jsp&startYear=1988&startMonth=00&endYear=2009&endMonth=11&frequency=M&displayType=Table&columns=03&columns=04&columns=12>
http://www.bankofcanada.ca/en/rates/sel_hist.html
<http://www.bankofengland.co.uk/mfsd/iadb/Index.asp?first=yes&SectionRequired=1&HideNums=1&ExtraInfo=true&Travel=NIX>
<http://www.boc.cn/finaidata/iliv/fd31/>
<http://www.federalreserve.gov/releases/h15/data.htm>
<http://www.rba.gov.au/Statistics/Bulletin/F01hist.xls>
<http://www.rba.gov.au/Statistics/HistoricalExchangeRates/index.html>
<http://www.snb.ch/en/about/stat/statpub/akziwe/stats/akziwe>
http://www.stat-search.boj.or.jp/ssi/mtshhtml/m_en.html

Table 2: Forecast Error (%) = (Forecast-Spot)/Spot over the period 1 April 1995 to 31 December 2008.

	1995-2001		2002-2008	
	Mean	Median	Mean	Median
AUD/USD	-0.0098	-0.0046	0.0428	0.0516
AUD/JPY	0.0475	0.0448	0.0602	0.0682
AUD/GBP	-0.0148	-0.0072	0.0246	0.0262
AUD/CHF	0.0310	0.0117	0.0420	0.0573
AUD/NZD	-0.0112	-0.0185	-0.0100	-0.0042
AUD/CAD	-0.0007	0.0115	0.0304	0.0277
AUD/HKD	-0.0198	-0.0105	0.0283	0.0328
AUD/SGD	-0.0053	-0.0107	0.0326	0.0301
AUD/CNY	0.0096	0.0136	0.0436	0.0556

Table 3: Absolute Error = $\frac{E[S_t^{d/f}]}{S_0^{d/f}} = \left(\frac{1+i_d}{1+i_f} \right)^t$ over the period 1 April 1995 to 31 December 2008.

	1995-2001		2002-2008	
	Mean	Median	Mean	Median
AUD/USD	0.0419	0.0367	0.0602	0.0612
AUD/JPY	0.0824	0.0894	0.0802	0.0692
AUD/GBP	0.0485	0.0544	0.0367	0.0347
AUD/CHF	0.0702	0.0710	0.0622	0.0573
AUD/NZD	0.0308	0.0294	0.0286	0.0217
AUD/CAD	0.0336	0.0298	0.0409	0.0321
AUD/HKD	0.0427	0.0321	0.0517	0.0496
AUD/SGD	0.0415	0.0338	0.0493	0.0375
AUD/CNY	0.0421	0.0399	0.0621	0.0644

Table 4: Regression Output for Plots of $E(S_t^{AUD/f})$ over $S_t^{AUD/f}$ over the period 1 April 1995 to 31 December 2008

	Obs	Intercept	Slope	R-squared
AUD/USD	56	0.1254	0.9297	0.8610
T-stats		1.6555	18.2921	
AUD/JPY	56	0.0026	0.8505	0.6931
T-stats		2.5543	11.0432	
AUD/GBP	56	0.3877	0.8452	0.7554
T-stats		2.4116	12.9127	
AUD/CHF	56	0.4432	0.6245	0.4146

T-stats		4.0351	6.1848	
AUD/NZD	56	0.2641	0.6825	0.5230
T-stats		3.4454	7.6943	
AUD/CAD	56	0.1295	0.8961	0.7520
T-stats		1.6854	12.7975	
AUD/HKD	56	0.0178	0.9085	0.8593
T-stats		1.8553	18.1628	
AUD/SGD	56	0.1521	0.8449	0.7546
T-stats		2.4730	12.5465	
AUD/CNY	56	0.0146	0.9448	0.8530
T-stats		1.4940	17.7014	

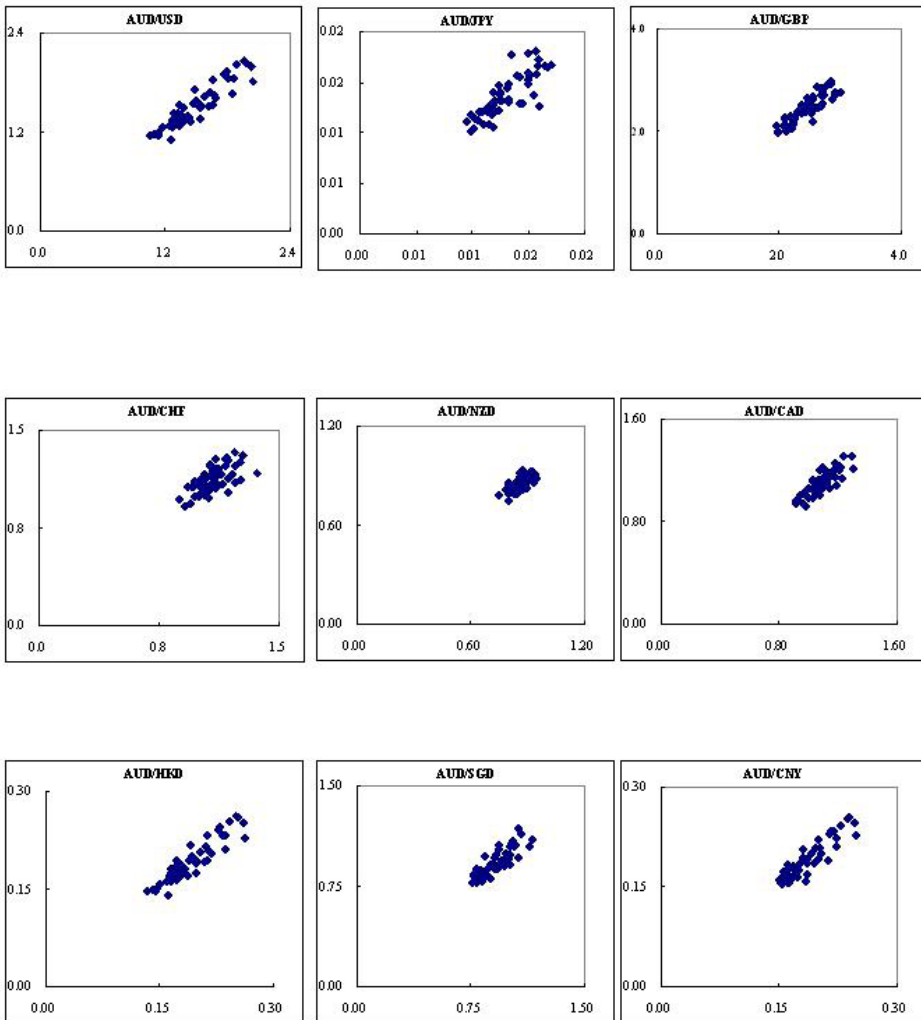


Figure 2: Expected Spot Rates (y-axis) vs. Actual Spot Rates (x-axis) over the period 1 April 1995 to 31 December 2008 (55 observations).

The regression output in Table 4 further supported this idea. Apart from AUD/NZD and AUD/CHF, the currency pairs give an average slope of 0.9 and an average intercept of 0.02. For AUD/NZD and AUD/CHF, the slopes are both below 0.7 and the intercepts are both above 0.2, providing unfavourable evidence. Further, the fact that AUD/JPY has a slope of 0.85 and an intercept less than 0.01 does not necessarily mean the output from AUD/JPY is providing favourable evidence. Its R-square of 0.6931 reveals that only less than 70% of the total observations can be explained. Nevertheless, overall, the null was found to hold. Thus, one can safely conclude that the IRP works on average and the first H_0 holds.

Figure 3 is comprised of nine graphs representing the absolute forecast errors in the nine currency pairs. If the quality of UIRP has improved, most graphs should look negatively sloped. But in Figure 2, none of the nine pairs shows an obvious downward trend. Indeed, the trendlines in graphs of AUD/USD, AUD/HKD and AUD/CNY seem to be even upward sloping, providing a completely opposite result from that expected.

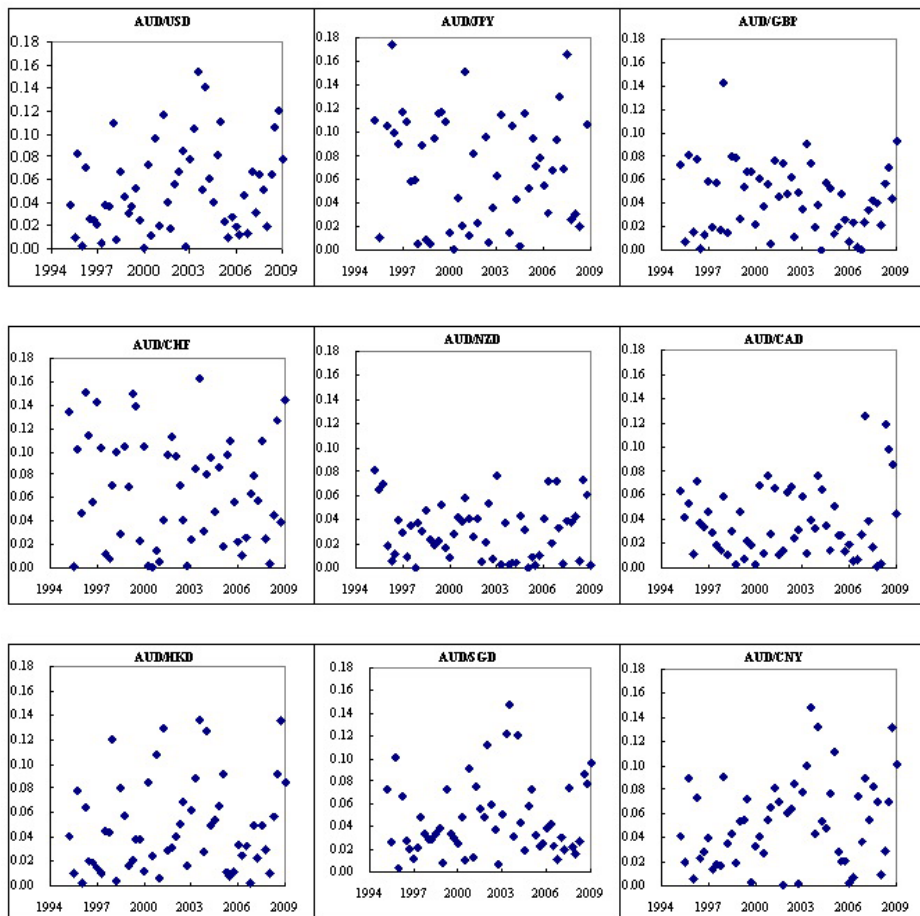


Figure 3: Scatter Plot of Absolute Error over the period 1 April 1995 to 31 December 2008.

This result is also supported by regression outputs in Table 5. Unsurprisingly, five out of nine pairs have positive slopes. For the other four pairs whose slopes are negative, the slopes are merely below -0.0001. In fact, for all of the nine currency pairs, only one pair had the slope greater than 0.001 or less than -0.001. However, just because the average slope is close to zero does not suggest the relationship between IRP's quality and years is stable. The R-square for the nine currency pairs only averaged to 0.01, meaning the observations are poorly explained by the equation. In other words, the forecast errors tend to move randomly without obvious trends despite of which year the forecast is performed. Therefore it is concluded that the quality of IRP in forecasting exchange rates is not affected by years and the second H_A holds.

Table 5: Regression Output for Plots of Absolute Error over the period 1 April 1995 to 31 December 2008.

	Obs	Intercept	Slope	R-squared
AUD/USD	57	0.0380	0.0005	0.0402
T-stats		-96.64	-3342.97	
AUD/JPY	57	0.0863	-0.0002	0.0017
T-stats		-53.84	-1964.95	
AUD/GBP	57	0.0517	-0.0003	0.0287
T-stats		-120.04	-4220.68	
AUD/CHF	57	2.9454	-0.0014	0.0165
T-stats		0.65	-669.86	
AUD/NZD	57	0.0338	-0.0001	0.0066
T-stats		-156.02	-5376.94	
AUD/CAD	57	0.0327	0.0002	0.0107
T-stats		-124.50	-4291.08	
AUD/HKD	57	0.0400	0.0003	0.0126
T-stats		-95.99	-3332.50	
AUD/SGD	57	0.0415	0.0002	0.0061
T-stats		-108.11	-3758.82	
AUD/CNY	57	0.0372	0.0005	0.0586
T-stats		-103.05	-3569.58	

Analysis of Empirical Results

According to empirical evidence, the first null hypothesis is accepted (ie. IRP generally holds well). It was found that IRP also holds for emerging markets such as China. This is contrary to the previous literature findings that in developing markets with high transaction costs and low liquidity, IRP is expected to work

poorly (Frankel and Poonawala, 2004). However, it is notable that among the ten main currencies we examined, CNY is the only one in a emerging market. So we cannot conclude that IRP holds in emerging markets.

The second null hypothesis is rejected (ie. there is no trend of IRP getting better recently). The average R-square of less than 0.01 means this is significant evidence. Also, all of the nine currency pairs have R-squares close to zero. This means no trends exist in any countries, no matter whether they are market-based or bank-based, developed or developing countries. This is probably because interest rates in many countries have been frequently altered recently to recover the economy from recession. A famous example of government or bank manipulation would be Sweden's Riksbank which became the first to set its interest rate below zero in July 2009 (Picerno, 2009). The recession has also raised political risk by increasing the potential of currency crisis. Rising political risk also lies in the fact the investors in different countries may value their domestic and foreign investment risks differently. Thus, a lack of improvement in forecast accuracy in recent years is probably due to the recession. Finally, it must be noted that we assumed forward parity always holds and ignored differential tax laws in our research. As a result, it could be the case that after relaxing the assumption that $E[S_t^{d/f}] = F_t^{d/f}$, or after taking differential tax laws into consideration, empirical results will show that CIRP has improved recently.

Conclusion

To conclude, regarding three-month horizons and major currency pairs in the world, IRP generally works well in forecasting exchange rates, but it does not work better now than in previous years. This reflects that the markets for the major currencies are relatively efficient for IRP to work, while recent recessions and government intervention have deteriorated the quality of IRP. However, these findings are based on the forward parity. The fact that settlement in the foreign exchange market may occur with time lags is not taken into consideration. Also, by equalizing bid and ask rates of exchange, transaction costs are ignored. Further investigations that relax the above assumptions would be fruitful.

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Towards a Re-interpretation of Early Islamisation Processes in Southeast Asia

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Abstract

This essay problematises gradualist conceptualisations of early Southeast Asian Islamisation processes, arguing that although such models offer plausible interpretations of Islamisation processes on a regional scale, they become problematic when applied to local cases of Islamisation. These problems arise primarily because local historical evidence ‘resists’ gradualism as the tempo of Southeast Asian Islamisation processes, as shown by the cases of Pasai and Gresik. This article proposes an alternative conceptualisation of local Southeast Asian Islamisation as a process occurring over long stretches of time punctuated by short periods of rapid change. Not only is this alternative conceptualisation of Islamisation’s tempo more consistent with the evidence from Pasai and Gresik, it also provides an alternative framework for re-evaluating existing theories of the origins and nature of early Islamisation in Southeast Asia.

Introduction

In a 2006 paper on the historical origins of Islam in Southeast Asia, Southeast Asian Studies scholar Azyumardi Azra criticises Western scholars for their adherence to implicit Orientalist frameworks, arguing that these frameworks influence the nature of theorising on the origins of Islam in the region.¹ Ironically, Azra goes on to characterise early Southeast Asian Islamisation as “an evolutionary process”, thereby himself adhering to a hidden framework which views the ‘natural’ tempo of Islamisation as a gradual process, characterised

¹ Azra Azyumardi, *Islam in the Indonesian World: An Account of Institutional Formation* (Bandung: Mizan, 2006), 2.

by slow change over historical time. This essay seeks to problematise such conceptualisations of early Southeast Asian Islamisation, arguing that although gradualism provides a plausible framework for interpreting regional Islamisation processes, it fails to adequately explain local Islamisation processes. Through a re-examination of the historical evidence at the sites of Pasai and Gresik, this essay will contend that the tempo of early local Islamisation processes at these sites is better understood in terms of stasis, punctuated by abrupt change.

Early Islamisation in Southeast Asia: Problems & Possibilities

In 2009, the US-based Pew Research Center's Forum on Religion & Public Life released a report on the size and distribution of the world's global Muslim population.² Contrary to longstanding popular beliefs that the Middle East – the 'spiritual' centre of Islam – held the majority of the world's Muslim population, the Pew Report revealed that only 20.1% of the global Muslim population reside in Middle East and North Africa.³ In contrast, the Pew report noted that 26% of the world's Muslims reside in Southeast Asia.⁴ Moreover, the report revealed that the world's most populous Muslim nation is located not in the Middle East, but in Southeast Asia. With more than 200 million of its inhabitants professed adherents of the Islamic faith, Indonesia's Muslim population easily eclipses that of any Middle Eastern country.⁵

In thus considering the importance of Islam to the Southeast Asia region, it is surprising to observe that the process of early Islamisation – the way by which individuals and groups become Muslim, and societies and cultures become 'Islamic', up until the mid- 15th CE – has been widely neglected by scholars of Southeast Asian Studies.⁶ To state that scholars have neglected Islamisation is not to argue that scholars have ignored questions of how Islam spread throughout Southeast Asia. Such questions have animated scholarly debate for more than a century.⁷ Rather, it is to emphasise that the *process* of Islamisation itself continues to be overlooked by scholars of Southeast Asia.⁸

2 Pew Research Center's Forum on Religion & Public Life, Mapping the Global Muslim Population: A Report on the Size and Distribution of the World's Muslim Population (Washington D.C., 2009).

3 Ibid.,6.

4 Ibid.,12.

5 Ibid.,5.

6 Donald P. Little, 'Review', Middle East Journal 34, no.3 (Summer, 1980): 369.

7 For an overview of these debates, see Azra, Islam in the Indonesian World,10-25.

8 This undertheorisation of Islamisation also extends to the broader field of Islamic Studies. See, for example, Ira Lapidus, 'Review', The American Historical Review 86, no.1 (February 1981): 187.

The effect of this scholarly neglect is perhaps nowhere more evident than in relation to the tempo of Islamisation processes in Southeast Asia. That scholars of Southeast Asia have consistently interpreted Islamisation processes in gradualist terms is borne out by a survey of literature on the topic. For example, Azra nominates early Southeast Asian Islamisation as a slow “evolutionary process”, while Houben visualises the process of Southeast Asian Islamisation as “like a slow, giant wave”.⁹ Even the American anthropologist Clifford Geertz describes Southeast Asian Islamisation as “painfully gradual”, despite admitting to the existence of little evidence to support this claim.¹⁰

The reasons *why* many scholars have chosen to adopt gradualism as the tempo of early Southeast Asian Islamisation are harder to discern, partly because – as Geertz indicates – they are not necessarily related to historical evidence. Suffice to say that the dominance of gradualism relates to scholarly understandings of Islamisation as a form of cultural change, a process seen by many scholars as temporally analogous to biological change.¹¹ Cultural change is thus considered to be a process akin to neo-Darwinian evolutionism, a theory characterised by its claim that species evolve by gradual, constant transitions over long periods of time.¹² One need only look to the predominance of claims of gradualism as the tempo of Southeast Asian Islamisation, to appreciate the underlying influence of neo-Darwinian evolutionism.

While gradualism may seem a *natural* choice for the tempo of early Southeast Asian Islamisation processes, it is by no means an inevitable one. During the 1970s, Gould and Eldredge challenged neo-Darwinian evolutionism’s tenets of gradualism, by offering an alternative way of interpreting the fossil record.¹³ Gould and Eldredge noted that scientists had explained the absence of fossil evidence supporting the notion that evolution occurred through slow, constant transitions over long periods of time with reference to ‘imperfections’ in the preservation of fossils.¹⁴ However, because Gould and Eldredge proposed that

9 Azyumardi Azra, *Islam in the Indonesian World*, 6; Thomas Houben, “Southeast Asia and Islam”, *The Annals of the American Academy of Political and Social Science* 588, no.1 (July 2003), 153.

10 Clifford Geertz, *The Religion of Java* (Chicago: University of Chicago Press, 1976), 97. For further examples, see Michael Laffan, *Islamic Nationhood and Colonial Islam: the Umma Below the Winds* (New York: Routledge, 2003), 12; Merle Ricklefs, *Mystic Synthesis in Java: A History of Islamization from the Fourteenth to the Early Nineteenth Century* (Norwalk: Eastbridge, 2006), 11; B.J.O. Schrieke, *Indonesian Sociological Studies Volume 2* (The Hague: W. Van Hoeve Ltd, 1957), 231.

11 Mesoudi, Whiten and Laland point to the widespread scholarly use of Darwinism evolutionary insights to explain cultural change, noting that Darwin himself used analogies with cultural change to explain biological evolutionism. Alex Mesoudi, Andrew Whiten and Kevin N. Laland, “Is Human Cultural Evolution Darwinian? Evidence Reviewed From the Perspective of The Origin of Species”, *Evolution* 58, no.1 (2004), 1.

12 Niles Eldredge and Stephen Jay Gould, “Punctuated Equilibria: An Alternative to Phyletic Gradualism”, in *Models in Paleobiology*, edited by T.J.M. Schopf (San Francisco: Freeman, Cooper & Co., 1972): 89.

13 Stephen Jay Gould and Niles Eldredge, “Punctuated Equilibria: the Tempo and Mode of Evolution Reconsidered”, *Paleobiology* 3, no.2 (Spring 1977): 115-151.

14 *Ibid.*, 116.

speciation occurs in rapid, punctuated time scales, occurring between periods of stasis, they argued that stasis in the fossil record reflected evidence that no change was occurring, rather than evidence of any lack of preservation.¹⁵

The importance of Gould and Eldredge's challenge to gradualism lies in its ability to provide us with alternative ways of understanding Southeast Asian Islamisation. This is not to argue that gradualism as the tempo of Southeast Asian Islamisation is entirely unsupported by the historical record. When viewed from a broad, regional perspective, the historical record *does* appear to support interpretations of early Southeast Asian Islamisation as a gradual process. Where problems arise, however, is when gradualist frameworks are applied to Islamisation on a local scale. Simply put, these problems emerge because the local historical record can 'resist' gradualist interpretations.

Case Study: Pasai and Gresik

Two examples of the way evidence for local Southeast Asian Islamisation resists or conflicts with gradualist interpretations derive from the sites of Pasai and Gresik.

Pasai is an area located in the north of the Indonesian island of Sumatra. Pasai has long been regarded as a key area for the reconstruction of early Islamisation in Southeast Asia, primarily due to the region's comparatively rich written and archaeological records.

One of the earliest pieces of historical evidence for the presence of Islam in Pasai derives from the traveller's account of the Venetian merchant, Marco Polo. In 1292 CE, Polo visited the Southeast Asia region *en route* to China. Among his many reports is a description of an island he called 'Java the Less' or 'Little Java', widely identified by modern scholars as Sumatra.¹⁶ Polo reported the presence of eight kingdoms on the island, including the Muslim-populated 'Ferlech' (identified by scholars as Perlak). According to Polo's description, "Saracen merchants" had converted the locals to Islam, although only the city dwellers had converted.¹⁷ Significantly, Polo identified the kingdom of Samara - identified by modern scholars as Pasai-Samudra - as non-Muslim.¹⁸

The next piece of historical evidence from Pasai is a remarkably well-preserved gravestone purportedly belonging to a Muslim King of Pasai. According to Moquette, the inscriptions on the gravestone identified it as belonging to Malik

15 Ibid., 116-117.

16 G.B. Badelli Boni, *The Travels of Marco Polo* (New York: Harper & Brothers Publishers, 1852), 248.

17 Ibid., 248.

18 Ibid., 249.

al-Salih, who died in 1297 CE.¹⁹ Winstedt reports that the fifteenth century CE Malay chronicle *Hikayat of Raja-Raja Pasai* refers to al-Malik al-Salih, and his conversion to Islam.²⁰

The historical record then falls silent until the Islamic tombstone of al-Malik al-Salih's son, al-Malik al-Zahir, who died in 1326 CE.²¹

In 1345 CE, Ibn Battuta, a Moroccan Muslim traveller whose sojourns took in the frontiers of India, Southeast Asia, Central Asia and West Africa, visited what he identified as the Muslim Kingdom of Pasai.²² At Pasai, Ibn Battuta reports being received by the Muslim king al-Malik al-Zahir (grandson of al-Malik al-Salih), where he remained as a guest of the royal court.²³

It is also noteworthy that Winstedt reports the presence of Islamic gravestones at Pasai, dating to 1407 CE, while Fatimi reports the recovery of another Islamic tombstone from 1428 CE.²⁴

When contextualised within a regional perspective, evidence of Islamisation, such as the 11th century CE Champa inscriptions from Vietnam, the 11th/12th century Leran Stele from Gresik, the 13th century gravestone of Sultan Sulaiman bin Abdullah, bin al-Basir at Lamreh, and the 14th century CE Terengganu Stone, the Pasai evidence supports a gradualist interpretation of Islamisation.²⁵ However, when considered on a local scale, the historical evidence of Pasai's Islamisation produces an altogether different, at times confused picture of a process alternately characterised by periods of stasis and abrupt change. Given these anomalies in understanding Pasai's Islamisation, it is instructive to examine how past scholars have attempted to reconcile these anomalies and 'gaps' in Pasai's local historical record within a gradualist framework.

19 As stated by S.Q., Fatimi, *Islam Comes to Malaysia* (Singapore: Malaysian Sociological Research Institute Ltd, 1963), 31.

20 R.O. Winstedt, "The Advent of Muhammadanism in the Malay Peninsula and Archipelago", *Journal of the Royal Straits Branch of the Royal Asiatic Society* 77 (December 1917): 171.

21 Elizabeth Lambourn, "Tombstones, Texts, and Typologies: Seeing Sources for the Early History of Islam in Southeast Asia", *Journal of the Economic and Social History of the Orient* 51, no.2 (2008): 258.

22 Ross, Dunn, *The Adventures of Ibn Battuta: A Muslim Traveller of the Fourteenth Century* (Berkeley: University of California, 2005), xiii.

23 *Ibid.*, 257.

24 R.O. Winstedt, "The Advent of Muhammadanism in the Malay Peninsula and Archipelago", 171; Fatimi, *Islam Comes to Malaysia*, 31-32.

25 For Champa, see Jacob Ramsay, "Cambodia and Vietnam" in *Voices in Southeast Asia: A Contemporary Sourcebook*. Compiled and Edited by Greg Fealy and Virginia Hooker (Singapore: Institute of Southeast Asian Studies, 2006), 33. For Lamreh, see Merle Ricklefs, *A History of Modern Indonesia c.1200* (Basingstoke: Palgrave, 2002), 4. For the Leran and Trengganu material, see Fatimi, *Islam Comes to Malaysia*, 38-42 and 60-69.

In a 1968 treatise on the origins of Islam in Southeast Asia, the Dutch scholar Drewes deliberates at length upon the case of Pasai and its evidence.²⁶ Drewes accepts Ibn Battuta's reports that Pasai had become an Islamic kingdom by 1345 CE, but rejects Polo's account, citing the author's unreliability in correctly identifying locations.²⁷ Instead, Drewes turns to Chinese accounts, arguing that they attest to Pasai's Islamisation prior to Polo's visit in 1292 CE.²⁸

Of these Chinese sources, Fatimi conveys that shortly after a Chinese envoy met with a minister from the Kingdom of Pasai-Samudra in 1282 CE, two envoys bearing Arab-Muslim names were sent from Pasai-Samudra to China.²⁹ Drewes takes these reports to affirm that Islamisation was already well underway before 1282 CE, thus pushing the date of the Islamisation process back into the distant past.³⁰ It is important to note, however, that these Chinese sources do not identify these envoys as Muslim, nor do they identify Pasai as a Muslim kingdom. This circumstance alone does not disprove Drewes thesis, however, the important point to observe is that Drewes represents these Chinese sources as relatively unproblematic compared to Polo's report, whereas they arguably present equally challenging historiographical issues as evidence of Pasai's Islamisation.

Drewes faces further problems in explaining the 'gaps' in the historical record after 1297 CE. Interestingly, he neglects to offer any specific explanation of these 'gaps', although he makes extensive reference to evidential preservation issues in Southeast Asia.³¹ It is, however, significant to mention a scholarly debate surrounding the origins of Malik al-Salih's tombstone. In 1912, the Dutch scholar J.P. Moquette proposed that the stylistic features of the gravestone indicated that it was imported from Cambay, India in a period after the monarch's death – a theory subsequently accepted by many scholars, including Drewes.³² By arguing that the gravestone was not contemporaneous with the king's death, but imported at a later date, Moquette effectively removed the piece from Pasai's sequence of evidence.

Strikingly similar themes emerge in relation to the second case study of Gresik, a coastal locale situated in East Java, Indonesia.

26 G.W.J. Drewes, "New Light on the Coming of Islam to Indonesia", *Bijdragen tot de Taal-, Land- en Volkenkunde* 124, no.4 (1968): 433-59.

27 *Ibid.*, 448-449. It is interesting to note that Drewes still apparently accepts Polo's identification of Perlak as Muslim.

28 *Ibid.*, 447-448.

29 Fatimi, *Islam Comes to Malaysia*, 10.

30 30 Drewes, 'New Light on the Coming of Islam to Indonesia', 448.

31 *Ibid.*, 433-434.

32 Fatimi, *Islam Comes to Malaysia*, 32. Fatimi observes that Moquette left the date of the stones creation as 'unspecified'. For a brief discussion on the continued resonance of Moquette's claims, see Lambourn, "Tombstones, Texts, and Typologies: Seeing Sources for the Early History of Islam in Southeast Asia", 264.

Gresik initially came to prominence in the 19th century CE, following the discovery of a gravestone dating from around the 15th century CE.³³ According to inscriptions, the gravestone belonged to Maulana Malik Ibrahim, an individual believed to be an Arab missionary or merchant who came to Southeast Asia and died in 1419 CE.³⁴ A second significant discovery occurred at a cemetery in the village of Leran, located near Gresik during the early twentieth century. In 1910, Moquette discovered a tombstone inscribed with the epitaph of a Muslim woman.³⁵ Known as the 'Leran Stele', Moquette surmised a date of 1102 CE for the stele, based upon his interpretation of the Arabic inscription. However, Ravaisse suggested 1082 CE as a more accurate reading of the inscription.³⁶

Like Pasai, the Gresik material supports a gradualist interpretation of Islamisation processes when set against regional evidence of Islamisation. However, when the Gresik material is considered on a local scale – separated as it is by several hundred years – gradualist interpretations of its local Islamisation begin to unravel.

Similar to the case of Pasai, the problematic temporal 'gap' between the Leran Stele and the gravestone of Maulana Malik Ibrahim prompted Moquette to re-evaluate the Leran Stele's position in the sequence of the Gresik evidence. Moquette's dating of the stele to the 11th and early 12th centuries CE reportedly raised problems in the scholar's understanding of Gresik's material sequence, such that he questioned its provenance as from Southeast Asia. According to Drewes: "Moquette...found it *unacceptable* (my emphasis) that this inscription, shallowly incised in a soft type of stone, should have defied the damp tropical climate for so many centuries, so that he *doubted very much whether this stone actually belonged in Java* (my emphasis). He was inclined to assume that it had been brought to Java from an arid region".³⁷ Moquette thus sought to erase the stele from Gresik's material record by claiming that the item had been transported from another region, at a later period in time.

Moquette's decision to expunge the Leran Stele from Gresik's material record is particularly provocative in light of its implications for interpretations of local Islamisation. If the Leran Stele was indeed indigenous to the region – if it had survived the climatic conditions of Southeast Asia – then scholarly claims that evidence of gradual Islamisation processes had not been found because it had not survived are called into question.

33 Drewes, 'New Light on the Coming of Islam to Indonesia', 448.

34 Winstedt, "The Advent of Muhammadanism in the Malay Peninsula and Archipelago", 175. Winstedt notes that traditional Javanese literature records that Maulana Malik Ibrahim was one of eight or nine wali sanga, or saints, who brought Islam to Java.

35 Drewes, "New Light on the Coming of Islam to Indonesia", 454.

36 P. Ravaisse, "Le Inscription Coufique de Leran a Java", *Tidschrift voor Indische Taal-Land-en Volkenkunde* 65 (1925): 690, 701.

37 Drewes, "New Light on the Coming of Islam to Indonesia", 454.

Evidence of Early Islamisation: A Question of Preservation?

Claims of evidential preservation - or rather, lack thereof - abound throughout the literature on early Southeast Asian Islamisation. Ricklefs, for example, determines that "no definite conclusions (on the origins of Islam) have been possible because the records of Islamisation that survive are so few".³⁸ Similarly, Drewes expresses dismay over the paucity of evidence due to: "the devastating effect of the climate, the tropical rainfall, insects, mould and the remarkably quick rate of alluvial deposit, which together annihilate all trace of human activity as soon as man is no longer present".³⁹

It is important to recognise that such assertions are not without foundation. In the particular case of Ricklefs complaint, paper-based documents plausibly survived the passage of time in fewer numbers, primarily due to the region's humid climatic conditions.⁴⁰ However, whether such preservation issues affected the *entire* body of historical evidence is questionable.⁴¹ Lape, for instance, suggests that any lack of archaeological remains relates not to a lack of preservation, but to the lack of archaeological attention paid to the region.⁴² Indeed, Lape's own discovery of dietary remains from around 1200 CE on Indonesia's Banda islands challenges claims that the environment "annihilated all trace of human activity".⁴³

If preservation issues are not as acute as scholars have previously indicated, how then can we understand the persistence of claims that historical evidence once existed, but can no longer be seen? I would suggest that these claims are the direct result of Southeast Asian Islamisation conceptualised as an evolutionary process. Because many scholars of Southeast East Asia take the term 'evolution' to mean a slow, constant process of change, there exists an implicit expectation that historical evidence of Islamisation will reflect this process. However, because the local historical record frequently fails to meet these expectations, scholars explain these problematic 'gaps' in terms of evidential preservation problems, or in the case of Moquette, by excluding evidence from the local record altogether.

38 Ricklefs, *A History of Modern Indonesia* c.1200, 3.

39 Drewes, "New Light on the Coming of Islam to Indonesia", 433.

40 Whether written documents provide insight into Islamisation processes remains another question.

41 Peter Lape, "Archaeological Approaches to the Study of Islam in Island Southeast Asia", *Antiquity* 79, no.306 (2005): 831.

42 *Ibid.*, 831.

43 *Ibid.*, 832-833.

If we reconsider these so-called ‘gaps’ in the historical record, not as evidence of preservation problems, but as data representing Islamisation at work (or rather, not at work), our understanding of Islamisation as a process becomes open to new possibilities.

Towards a Re-interpretation of Local Islamisation Processes at Pasai and Gresik

Armed with a clearer understanding of how gradualist frameworks shape interpretations of evidence of local Islamisation processes, we may thus revisit our case study of Pasai and Gresik.

In terms of Pasai, I would suggest that the characterisation of its early Islamisation process as one of stasis, punctuated by short periods of abrupt change, accords better with the historical evidence currently available to us. Such an interpretation arguably better explains Pasai’s evidential ‘gap’, than do claims that evidence once existed, but can no longer be seen due to preservation issues.

Here, it is relevant to recall Moquette’s claim that the Pasai gravestone of al-Malik al-Salih was imported from Cambay at an unspecified date after the king’s death. Lambourn puzzles over the apparent ‘blindness’ of Moquette to the stylistic differences between gravestones of Cambay and that of al-Malik al-Salih, arguing that Moquette’s failure to see these differences “is very difficult to understand since these are so glaringly obvious”.⁴⁴ However, if we emphasise Moquette’s gradualist pre-commitments, we begin to understand why – like the Leran Stele – the remarkable preservation of the gravestone, where no other local material had apparently survived, raised problems in Moquette’s mind. By removing the gravestone from Pasai’s indigenous sequence, Moquette was better able to reconcile why the gravestone had survived.

Reading Pasai’s Islamisation in terms of this alternative tempo also lends itself to resolving Drewes *problematique* regarding the incongruity between Chinese sources and Marco Polo’s report. The important point to observe is that, contrary to Drewes belief, neither historical account is intrinsically incompatible with the other. They only become incompatible when scholars view Islamisation as a slow, constant process across historical time. Because Drewes conceives of Islamisation in these terms, he takes the presence of Muslim envoys at Pasai as conclusive evidence that Islamisation processes were already under way by 1282 CE, thus refuting Polo’s later reports that there were no Muslims at Pasai a

44 Lambourn, “Tombstones, Texts, and Typologies: Seeing Sources for the Early History of Islam in Southeast Asia”, 264.

decade later. That little or no Islamisation had occurred - despite the presence of Muslim envoys - until after 1292 CE, when Islamisation occurred abruptly, is a possibility that Drewes never seriously considers. His *a priori* assumptions about the tempo of Islamisation obstruct this possibility.

Moquette's insistence on expunging the Leran Stele from Gresik's historical record may be understood in similar terms. For Moquette, the problem posed by the 11th/12th century stele was not strictly that the stone *had* survived the tropical climates of Southeast Asia, but that other expected evidence had seemingly *not* survived between the 12th and 15th centuries CE. Because Moquette envisaged Islamisation in gradualist terms, he sought to reconcile Gresik's evidential 'gap' by arguing that the Leran Stele - like the gravestone of al-Malik al-Salih - was imported from a foreign country at a later period. However, if we remove Moquette's broader assumptions about the gradualist tempo of local Islamisation in Southeast Asia, Gresik's Islamisation assumes a different appearance - one also characterised by long periods of stasis, punctuated by brief periods of abrupt, small scale Islamisation.

Although the cases of Pasai and Gresik are by no means conclusive, they are at least suggestive that there exist grounds for re-evaluating gradualist interpretations of early local Islamisation processes on a broader basis.

Conclusion

Clearly, there are no easy answers when it comes to understanding early Islamisation processes in Southeast Asia. Throughout this paper, I have argued that although gradualism offers a plausible framework for interpreting regional historical evidence of early Southeast Asian Islamisation, its utility as a tool for explaining local evidence of Islamisation is less certain. Because the local historical record can 'resist' gradualist interpretations of Islamisation, I have argued for a re-interpretation of the tempo of local Islamisation as a process characterised by stasis, punctuated by periods of rapid change. The value of understanding local Islamisation in these terms resides, not only in providing an alternative and arguably more nuanced reading of the local historical record, but also in providing an alternative framework for evaluating existing theories on the origins and spread of Islam throughout the Southeast Asian region.

Balancing Human Rights and Customs in the Pacific Region: A Pacific Charter of Human Rights?

KELLY HAINES-SUTHERLAND

Abstract

This paper examines whether a regional human rights instrument could be designed for the Pacific that would reconcile human rights with Pacific customs, duties and collective practices. The paper will explore an area of Pacific custom that conflicts with women's rights encapsulated in international human rights treaties: the traditional practices of bride payment and tribal determination of marriage partners. These examples serve to highlight the difficulties inherent in constructing a charter that balances the protection of human rights and customs. The current system of human rights protection in the Pacific will be outlined, and the prospects for success of a regional charter will be examined. Furthermore, the paper discusses the theoretical debate concerning cultural relativism and universalism in international law, and what this debate says about the viability of a Pacific Charter of Human Rights. Finally, other challenges to a charter, minority rights and codifying custom, will be highlighted. The paper concludes that an inventory of customs and human rights common to the Pacific region could form the foundations of a Pacific Charter of Human Rights, but that some difficult areas such as reconciling women's rights with Pacific practices remain unresolved.

Introduction

The Pacific is one of the last regions of the world without a regional mechanism for the protection of human rights. This paper will examine the viability of a Pacific Charter of Human Rights, and whether such a document would need its own Pacific flavor to cater for local customs and culture. The key challenge

is creating a document that is not just symbolic, but is representative of the region and its peoples. A representative and effective charter must balance the aims of protecting the human rights of Pacific Islanders while safeguarding their customs, values and practices.

Human Rights

Human rights are the norms set out in international human rights instruments, which have been devised predominantly by the United Nations. The principal document that stipulates human rights is *The Universal Declaration of Human Rights* (UDHR), which was adopted by the United Nations General Assembly in 1948. Seven human rights treaties now constitute the international legal framework that governs the protection of human rights.

Human rights are considered by the drafters of international human rights instruments to be universal and inalienable norms and 'inherent in persons by virtue of their humanity'.¹ Therefore international human rights treaties are perceived as the codification of rights that already exist.² Article 1 of the UDHR encapsulates this idea: 'All human beings are born free and equal in dignity and rights'.³ However, there is debate as to whether human rights are universal and inalienable, or defined by cultural and social context. This debate is discussed below.

International human rights instruments are largely based upon the concept of the rights of the individual. The human rights movement stems from a liberal tradition of Western political and legal thought, which privileges individual rights over cultural and group rights.⁴ Furthermore, even where cultural and group rights exist in international treaties, they are formulated from an individual perspective.⁵ A Pacific Charter of Human Rights would need to incorporate cultural and group rights, which are fundamental to Pacific societies.

1 New Zealand Law Commission, *Converging Currents: Custom and Human Rights in the Pacific* (2006) 60.

2 Ibid 61.

3 United Nations, *The Universal Declaration of Human Rights*, (1948) <<http://www.un.org/en/documents/udhr/index.shtml>> at 26 October 2010.

4 Paul Hunt, 'Reflections on International Human Rights Law and Cultural Rights' in Margaret Wilson and Paul Hunt (eds), *Culture, Rights and Cultural Rights: Perspectives from the South Pacific* (2000) 25, 25.

5 Ibid 35.

Pacific Customs, Duties and Collective Practices

Custom is an integral part of Pacific culture. The New Zealand Law Commission defines *custom* broadly as ‘the values, principles and norms that members of a cultural community accept as establishing standards for appropriate conduct, and the practices and processes that give effect to community values’.⁶ Jean Zorn contends that practices become custom when they are fairly regularly practised by a large segment of the community.⁷ *Customary law* is what the people of a particular community consider they are bound to do or not to do.⁸ Examples of Pacific customs that will be discussed in this paper include tribal determination of marriage partners and bride payments.

Customary law was used in pre-colonial Pacific societies as the principal means of governance. Zorn describes how Pacific societies functioned without central authority:

Without state mechanisms...the Pacific nevertheless had functioning legal systems. They had complex sets of unwritten rules governing aspects of social, political and economic behaviour. They had effective methods for ensuring that the rules would be followed and they also had workable procedures for settling disputes.⁹

Customary law is still widely used as a means of governance in the Pacific. Daily life in the small island states of Tokelau and Wallis and Futuna is almost completely governed by customary law.¹⁰ In order to be relevant to the Pacific context, a Pacific Charter of Human Rights would need to allow for the continuation of Pacific custom, values and practices.

Custom has altered considerably over time to reflect social, economic, political and religious changes in the Pacific.¹¹ Colonisation and the introduction of Christianity to the Pacific have had a considerable effect on custom, so that it has diverged from pre-colonial custom.¹² Many pre-colonial beliefs and values were modified by missionary teachings.¹³ A question for drafters of a Pacific Charter of Human Rights is whether custom that is included in the charter should reflect traditional or modern custom, values and practices.

6 New Zealand Law Commission, above n 1, 47.

7 Jean G. Zorn, ‘Custom then and now: the changing Melanesian family’ in Anita Jowitt and Tess Newton Cain (eds), *Passage of Change: Law Society and Governance in the Pacific* (2003) 95, 101.

8 New Zealand Law Commission, above n 1, 47.

9 Zorn, above n 7, 96.

10 New Zealand Law Commission, above n 1, 41.

11 Ibid 55.

12 Ibid.

13 Ibid 58.

Collective practices are also an integral part of Pacific society, where the extended family, clan or tribe are central to the peoples' way of life. Konai Helu Thaman describes life in the Pacific as a 'shared way of living of a group of people, which includes their accumulated knowledge and understandings, skills and values'.¹⁴ The focus on the clan above the individual in the Pacific may mean that collective rights may subjugate certain individual rights. The example provided in this research paper is the collective determination of marital partners in Pacific tribes, which conflicts with a woman's right to choose their partner in international human rights law. A Pacific Charter of Human Rights would need to find a way of balancing collective rights and individual rights, so that it reflects the reality of life in the Pacific while protecting fundamental individual rights.

In contrast to the Western liberal conception of individual rights as paramount, the traditional value systems of the Pacific emphasise the duties of the individual to the group.¹⁵ Andreas Follesdal describes Pacific societies as duty-oriented:

Our cultures, societies and traditions [place] great emphasis on the individual human duties and obligations to respect customary norms, laws and familial and chiefly authority rather than rights.¹⁶

However, international human rights instruments largely exclude duties.¹⁷ This conflict between duties and rights must be addressed in preparing a Pacific Charter of Human Rights.

Cultural Relativism vs Universalism

The conflict between cultural relativism and universalism is central to the debate over whether human rights and customs can be reconciled to create a Pacific Charter of Human Rights. Universalists contend that human rights are absolute and applicable to all societies.¹⁸ Cultural relativists contend that human rights

14 Konai Helu Thaman, 'Cultural Rights: A personal perspective' in Margaret Wilson and Paul Hunt (eds), *Culture, Rights and Cultural Rights: Perspectives from the South Pacific* (2000) 1, 1.

15 Guy Powles, 'Duties of individuals: some implications for the Pacific of including "duties" in "human rights" documents' in Victoria University of Wellington (ed), *Essays and Documents on Human Rights in the Pacific* (1992) 49, 49.

16 Ibid.

17 Andreas Follesdal, *Human Rights and Relativism* (2003) <http://www.etikk.no/globaljustice/papers/GJ2003_Follesdal_Human_Rights_and_Relativism.doc> at 26 October 2010.

18 New Zealand Law Commission, above n 1, 70.

are based on Western liberal values, and do not necessarily apply to all cultures and societies.¹⁹ The middle ground between these two contrasting positions is that some norms are universal, while others are relative to culture and context.²⁰

Universalists dismiss the arguments of cultural relativists as conveniently espoused by those in power. Rosalyn Higgins comments that relativism 'is a point mostly advanced by states...It is rarely advanced by the oppressed, who are only too anxious to benefit from perceived universal standards'.²¹ Universal norms can be supplemented with cultural and group rights and duties, which are important in the Pacific context. The New Zealand Law Commission contends that international law is also being expanded to give greater recognition to custom and group rights.²² For example, articles 5 and 34 of the *Declaration on the Rights of Indigenous Peoples* (2007) recognise the right of indigenous people to maintain their legal systems and customs in accordance with international law.²³

Cultural relativists assert that human rights should be determined by local cultural values and custom.²⁴ Sally Engle Merry contends that human rights are embedded in Western liberal assumptions 'about the nature of the person, the community and the state [and] do not translate easily from one setting to another'.²⁵ A more extreme view advocated by cultural relativists is that universal norms are destroying the diversity of Pacific cultures,²⁶ are disruptive of customary social structures and subversive of traditional authority.²⁷ In their extreme forms, cultural relativism and universalism are seemingly irreconcilable.

However, there are several means by which cultural relativism and universalism can be made more compatible. First, some norms may exist universally, such as the principle of human dignity.²⁸ Jennifer Corrin Care suggests that it is possible to develop a core of basic rights that are common to all cultures.²⁹ Second, culture and human rights are both changing and dynamic, as Engle Merry highlights:

19 Ibid.

20 Henry J. Steiner, Phillip Alston and Ryan Goodman, *International Human Rights in Context: Law, Politics, Morals* (3rd ed, 2008) 515.

21 Rosalyn Higgins, *Problems and Process: International Law and How We Use It* (1994) 96.

22 New Zealand Law Commission, above n 1, 43.

23 Ibid.

24 Dejo Olowu, 'The United Nations Human Rights Treaty System and the Challenges of Commitment and Compliance in the South Pacific' (2006) 7 *Melbourne Journal of International Law* 155, 161.

25 Sally Engle Merry, *Human Rights and Gender Violence* (2006) 2.

26 New Zealand Law Commission, above n 1, 21.

27 Steiner, Alston, Goodman, above n 20, 475.

28 Ibid 519.

29 Jennifer Corrin Care, *Conflict between customary law and human rights in the South Pacific* (1999) 4 <www.vanuatu.usp.ac.fj/sol-adobe_documents/usp%20only/pacific%20law/corrin> at 20 August 2009, 16.

Considering cultures as changing and interconnected, and rights as historically created and transnationally redefined by national and local actors, better describes the contemporary situation. It also reveals the impossibility of drawing sharp distinctions between culture and rights or seeing relativism and universalism as diametrically opposed and incompatible positions.³⁰

Indeed, human rights norms are broadly phrased and thus can potentially be adapted according to cultural context.³¹ This is manifest in regional charters adopted by other regions, that incorporate universal norms but also reflect cultural diversity. For example, the *African Charter on Human and Peoples' Rights*³² links the concepts of human rights, group rights and the duties of individuals to family and society.³³ However there are some Pacific customs that appear to fundamentally conflict with human rights, which suggests that there may be a limit to the compatibility of human rights and Pacific custom.

Women's Rights and Pacific Custom

The conflict between human rights and Pacific customs is illustrated by patriarchal practices that infringe on the rights of women contained in international human rights instruments. In many Pacific communities, women can neither choose their marital partners nor terminate a marriage once contracted.³⁴ Instead, the men of a tribe determine who a woman's marital partner will be. Women are chosen as wives based on customary rules governing incest, and on criteria including age, beauty, industriousness and social class.³⁵ Bride payments are also a 'uniform and widespread custom' in the Pacific.³⁶ Anthropologist Douglas Oliver states that the price paid for a bride is usually for her sexual, domestic and reproductive services.³⁷

As a result, Pacific women experience high levels of domestic violence.³⁸ Martha Macintyre suggests that in many societies in the South Pacific there is a

30 Sally Engle Merry, 'Changing Rights, Changing Culture' in Jane K. Cowan, Marie-Benedicte Dembour and Richard A. Wilson (eds), *Culture and Rights: Anthropological Perspectives* (2001) 31, 39.

31 New Zealand Law Commission, above n 1, 70.

32 *African Charter on Human and Peoples' Rights*, opened for signature 27 June 1981, 1520 UNTS 217 (entered into force 21 October 1986).

33 Petra Butler, *A Human Rights Charter for the Pacific* (2005) Human Rights Research: Victoria Human Rights Programme 2 <<http://www.victoria.ac.nz/nzcpl/HRRJ/vol3/Butler.pdf>> at 26 October 2010, 11.

34 New Zealand Law Commission, above n 1, 4.

35 Douglas L. Oliver, *Native Cultures of the Pacific Islands* (1989) 63.

36 Kenneth Brown, 'Customary Law in the Pacific: An Endangered Species' (1999) 3 *Journal of South Pacific Law* 1, 3.

37 Oliver, above n 35, 62.

38 Amnesty International, *Pacific Leaders must address high rates of violence against women* (2009) <<http://www.amnesty.org.au/news/comments/21494>> at 26 October 2010.

belief that husbands gain the right to physically punish their wives by virtue of bride payments.³⁹ Margaret Jolly describes the effect of the custom of bride price on women: 'Women are paid in the guise of bride price for their labour, both in the bed and in the garden, they allow their bodies to be battered, to be abused and discarded'.⁴⁰ It must be acknowledged however, that levels of domestic violence vary greatly throughout the Pacific.⁴¹ In Papua New Guinea many women accept the right of their husbands to beat them, whereas in other countries physical abuse requires the payment of a fine to a wife.⁴²

International human rights law requires equality and non-discrimination between men and women. For example, articles 2(f) and 5(a) of the *Convention on the Elimination of All Forms of Discrimination Against Women* (CEDAW) require states to take all appropriate actions to modify or abolish customs and practices that constitute discrimination or that are based on the idea of inferiority, superiority or on stereotyped roles for women.⁴³ Furthermore, international human rights instruments include provisions guaranteeing the rights of women to enter into marriage only by the full and free consent of both parties⁴⁴ and to have the same rights and responsibilities as a man during marriage and in the event of dissolution of the marriage.⁴⁵ These provisions contained in international human rights instruments directly conflict with the customs of bride payments and patriarchal determination of marriage partners in the Pacific.

There is some debate as to whether practices that infringe on women's rights are a product of traditional custom, or custom that has evolved and modified over time. Steven Fischer contends that the subordinate position of women in the Pacific only worsened as a result of colonisation and the widespread introduction of Christianity in the Pacific.⁴⁶ Christianity had a detrimental effect on Pacific women through missionary teachings on the subordinate position

39 Martha Macintyre, 'Hear us, women of Papua New Guinea!: Melanesian women and human rights' in Anne-Marie Hilsdon et al (eds), *Human Rights and Gender Politics: Asia-Pacific perspectives* (2000) 147, 150.

40 Margaret Jolly, 'Women ikat raet long human raet o no?: women's rights, human rights, and domestic violence in Vanuatu' in Anne-Marie Hilsdon et al (eds), *Human Rights and Gender Politics: Asia-Pacific perspectives* (2000) 124, 134.

41 Steven Roger Fischer, *A History of the Pacific Islands* (2002) 277.

42 Macintyre, above n 39, 150.

43 *Convention on the Elimination of All Forms of Discrimination Against Women*, opened for signature 18 December 1979, 1249 UNTS 13, arts 2(f) and 5(a) (entered into force 3 September 1981).

44 *International Covenant on Economic, Social and Cultural Rights*, opened for signature 16 December 1966, 993 UNTS 3, art 10(1) (entered into force 3 January 1976); *International Covenant on Civil and Political Rights*, opened for signature 16 December 1966, 999 UNTS 171, art 23(3) (entered into force 23 March 1976); *Convention on the Elimination of All Forms of Discrimination Against Women*, opened for signature 18 December 1979, 1249 UNTS 13, art 16(c) (entered into force 3 September 1981).

45 *Convention on the Elimination of All Forms of Discrimination Against Women*, opened for signature 18 December 1979, 1249 UNTS 13, art 16(c) (entered into force 3 September 1981); *International Covenant on Civil and Political Rights*, opened for signature 16 December 1966, 999 UNTS 171, art 23(4) (entered into force 23 March 1976);

46 Fischer, above n 41, 276.

of women, forcing women to adopt men's surnames,⁴⁷ and abolishing separate men's houses, resulting in an increase in domestic violence.⁴⁸ Conversely, some traditional brutal practices against women were abandoned with the introduction of Christianity,⁴⁹ and some churches have assisted women in advocating for equality.⁵⁰ Kenneth Brown asserts that while pre-colonial societies were undeniably patriarchal, colonial administrations played a role in institutionalising and entrenching patriarchy by codifying customs, laws and structures that operated to crystallise discrimination against women.⁵¹

Conversely, Macintyre contends that discrimination against women in the pre-colonial era is analogous to the discrimination experienced by Pacific women today.⁵² Macintyre suggests that most customary groups had no tradition of rights for women prior to colonisation; women's lack of capacity was ubiquitous and extended to all forms of law.⁵³ In addition, the customary system was based on male domination and traditional dispute resolution was presided over by men.⁵⁴ It is important to note that women's status varied greatly between Pacific nations and societies. There is no doubt that customary practices changed due to colonisation and the introduction of Christianity, however it is debatable whether these changes to the Pacific way of life operated to increase the discrimination, inequality and violence suffered by Pacific women. This debate is central to the question of whether a Pacific Charter of Human Rights should incorporate traditional or modern custom.

Determining whether pre-colonial custom was discriminatory in the treatment of Pacific women has been made difficult by loss of knowledge and by biased recordings.⁵⁵ Loss of traditional knowledge upon colonisation resulted in reliance upon the literary recordings of missionaries, colonists and ethnographers.⁵⁶ The New Zealand Law Commission contends that these people interpreted custom from a Western male perspective, leading to a bias in recordings of Pacific customs.⁵⁷ The Fiji Women's Rights Project states that '[t]radition, culture and custom in the main is defined by men, not women - therefore there is a conflict about whose custom is being applied, especially given that custom is largely

47 New Zealand Law Commission, above n 1, 88.

48 Jean G. Zorn, *Women, Custom and International Law in the Pacific* (Occasional Paper 5, University of the South Pacific, Port Vila 2000) 13.

49 New Zealand Law Commission, above n 1, 88.

50 Keiti Ann Kanongata'a, 'Pacific Women and Theology' (1995) 13 *Pacific Journal of Theology* 17, 17.

51 Brown, above n 36, 4.

52 Macintyre, above n 39, 151.

53 Brown, above n 36, 4.

54 Corrin Care, above n 29, 2.

55 New Zealand Law Commission, above n 1, 87.

56 Ibid.

57 Ibid.

unwritten'.⁵⁸ Indeed men have assumed a central role in recording and codifying custom.⁵⁹ Through Western education, Pacific women have begun to question their traditional obligation of subordination due to this bias in recordings.⁶⁰

The key question is whether custom can be adapted to accommodate equality in status, a right guaranteed by international human rights instruments. Drafters of a Pacific Charter of Human Rights would presumably wish to incorporate provisions guaranteeing equality of rights for women and non-discrimination. The paper has highlighted the changing and dynamic capacity of custom, and its previous adaptation to Christianity and colonisation. The New Zealand Law Commission points out that acknowledgement of women's rights and equality in status in other societies (including Western societies) has only been a recent development.⁶¹ Thus it seems possible that Pacific custom could change to accommodate modern notions of the equal status and rights of women.

The resistance to equal rights for women, and to other human rights protections, is coming predominantly from those who benefit from the status quo.⁶² Former Vice-President of Fiji, Ratu Joni Madraiwiwi, has observed:

In the Asia-Pacific region there is some resentment about the concept of human rights...Interestingly it is not the downtrodden, the oppressed or the marginalised who make the criticism. It is those of us who are part of established power structures that query the applicability of these rights.⁶³

Pacific women, particularly poor rural women, complain about their inability to participate in political decisions and about increasing levels of male violence.⁶⁴ The drafters of a Pacific Charter of Human Rights would need to ensure broad and extensive consultation in determining which customs and human rights should be included in such a document, including comprehensive consultation of women. The key challenge is creating a Pacific Charter of Human Rights that incorporates women's rights while remaining sensitive to Pacific customs and culture.

58 Fiji Women's Rights Movement and the Crisis Centre, *Report of the Commission of Inquiry on the Courts* (1984) 172 in Jennifer Corrin Care, *Conflict between customary law and human rights in the South Pacific* (1999) 4 <www.vanuatu.usp.ac.fj/sol-adobe_documents/usp%20only/pacific%20law/corrin> at 20 August 2009.

59 Jolly, above n 40, 135.

60 Fischer, above n 41, 276.

61 New Zealand Law Commission, above n 1, 84.

62 Ibid.

63 Ratu Joni Madraiwiwi, 'Rights and Rites: A Discourse', New Zealand Law Commission Custom and Human Rights Workshop', (Nadi, Fiji, 2008).

64 Jolly, above n 40, 136.

The Current Status of Human Rights in the Pacific

Pacific nations have a low level of engagement in the international human rights treaty system.⁶⁵ Even where treaties have been ratified, most Pacific nations have failed to meet the reporting requirements of the treaties.⁶⁶ While the Law Association for Asia and the Pacific (LAWASIA) contends that Pacific countries have relatively good human rights records, it concedes that problems still exist in some areas.⁶⁷ These include the status of women, the rights of indigenous peoples and the rights of minorities.⁶⁸ Conversely, Dejo Olowu contends that there is not a 'vibrant culture of human rights protection in the Pacific'.⁶⁹ Olowu argues that the Pacific should not be insulated from international human rights protections, and should proceed to ratify all international human rights treaties.⁷⁰

There are many explanations for the perceived indifference of Pacific nations towards international human rights treaties. The primary reason given for low levels of ratification is that many human rights norms are already constitutionally entrenched.⁷¹ The lack of economic, technical, human and institutional capacity to fulfil the commitments of international treaties is also seen as a significant reason for low levels of ratification and reporting.⁷² Finally, international human rights treaties are perceived as a form of neo-colonialism, whereby former colonial powers and other Western nations force Pacific nations to comply with instruments that have been principally designed by the West.⁷³ This last point highlights the importance of designing a charter that reflects the customs and culture of the Pacific, so that the people of the Pacific have a sense of ownership of towards the charter and are not reluctant to implement its provisions.

All Pacific constitutions contain clauses that protect human rights, with the exception of Niue.⁷⁴ Accordingly, many human rights norms are already encapsulated in Pacific law. Most Pacific constitutions also recognise customary

65 New Zealand Law Commission, above n 1, 68.

66 Ibid.

67 Law Association for Asia and the Pacific, 'Report on a proposed Pacific Charter of Human Rights prepared under the auspices of LAWASIA, May 1989' in Victoria University of Wellington (ed), *Essays and Documents on Human Rights in the Pacific* (1992) 99, 101.

68 Ibid.

69 Olowu, above n 24, 164.

70 Ibid 163.

71 Thaman, above n 14, 2.

72 A. H. Angelo, 'Lo Bilong Yumi Yet' in Victoria University of Wellington (ed), *Essays and Documents on Human Rights in the Pacific* (1992) 33, 40.

73 Ibid 39-40.

74 A. H. Angelo, 'The Niue Constitution' (2009) 15 *Revue Juridique Polynésienne* 157, 177.

law.⁷⁵ However, the recognition of custom is often limited by Pacific constitutions to the extent that it conforms with human rights or the protection of justice.⁷⁶ For example section 100(3) of the *Constitution of Fiji 1997* provides that custom will apply unless 'inconsistent with a provision of this constitution or a statute, or repugnant to the general principles of humanity'. Furthermore, there is evidence that Pacific courts and legislatures are adjusting the law so that discriminatory customary practices are made illegal.⁷⁷ For example, the decision in 1994 of *Noel v Toto* in Vanuatu outlawed any discriminatory customs.⁷⁸ These examples suggest that national courts and legislatures are favouring human rights over customary law when engaging in law reform and dispute resolution.

The current system has not reconciled custom and human rights to ensure that both are consistently protected. Epeli Hau'ofa characterises life in the Pacific as occurring at two different levels, the national level of government occurring in capital cities, and that of the ordinary people who 'tend to plan and make decisions about their lives independently'.⁷⁹ Courts at the national level (which are often comprised of expatriate judges) are reluctant to use custom in their decisions because judges are unfamiliar with Pacific customs, and find it difficult to apply unwritten law.⁸⁰ Therefore human rights are given more attention by the judiciary and customary law is often excluded from consideration. However, the majority of disputes in Pacific nations do not reach the national level of Pacific legal systems and are instead presided over by chiefly authorities and governed by customary law.⁸¹ Constitutional protections and human rights are not applied in traditional dispute resolution.⁸² A fundamental question in creating a Pacific Charter of Human Rights is how a regional charter could be effective in addressing this inconsistency in the application of human rights and custom, and whether it would impact on traditional dispute resolution where human rights are most likely to be infringed.

It has been suggested by the New Zealand Law Commission that rather than formulating a Pacific Charter of Human Rights, resources and time would be better spent on attempting to harmonise existing human rights and custom provisions in Pacific constitutions.⁸³ Pacific constitutions do not currently recognise collective rights or duties which are integral to the Pacific culture,

75 Caren Wickliffe, 'Culture Rights, Culture and Human Rights Education' in Margaret Wilson and Paul Hunt (eds), *Culture, Rights and Cultural Rights: Perspectives from the South Pacific* (2000) 129, 129.

76 Corrin Care, above n 29, 7.

77 Brown, above n 36, 4.

78 *Noel v Toto*[1995] VUSC 3.

79 Epeli Hau'ofa, 'Our Sea of Islands' (1994) 6(1) *The Contemporary Pacific* 148, 148.

80 Zorn, above n 7, 97.

81 *ibid.*, 130.

82 *Ibid.*

83 New Zealand Law Commission, above n 1, 69.

and this is one area that could be addressed.⁸⁴ It is contended that Pacific constitutions are more effective and enforceable and are perceived as locally owned.⁸⁵ Indeed the question of the best means of addressing human rights in the Pacific is pertinent, and the creation of a Pacific Charter of Human Rights is only one of many possible solutions.

The Law Association for Asia and the Pacific (LAWASIA) prepared a Draft Pacific Charter in 1989, which is adapted to the Pacific context and encompasses cultural rights, group rights and duties.⁸⁶ It was hoped that governments of the Pacific would subsequently implement a mechanism based on the document prepared by LAWASIA.⁸⁷ However, Pacific governments are yet to actively or comprehensively engage in the creation of a Pacific Charter of Human Rights.⁸⁸ This may be attributable to the criticism of the draft charter by academics such as Thaman as 'still very much a European document'.⁸⁹ LAWASIA are currently revising the 1989 Draft Pacific Charter, and are advocating for Pacific governments to agree to a basic set of human rights principles that can be applied in the Pacific context.⁹⁰ However, the reluctance that has been demonstrated towards the LAWASIA draft charter begs the question of whether there is sufficient enthusiasm in the Pacific for a regional charter.

Other Challenges in Constructing a Charter

Minority Rights

Any attempt to formulate a Pacific Charter of Human Rights that includes custom must consider the rights of minority and migrant communities living in the Pacific. While some Pacific countries only have small minority and migrant populations, non-indigenous people comprise more than a quarter of the populations of Fiji, Nauru and Palau.⁹¹ A document that incorporates the customs and collective practices of indigenous Pacific peoples could potentially result in marginalisation of minorities and migrant communities and restrict these groups from practicing their own culture and customs.⁹²

84 Zealand Law Commission, above n 1, 69

85 Ibid.

86 Law Association for Asia and the Pacific, above n 67, 107.

87 Ibid 99.

88 New Zealand Law Commission, above n 1, 236.

89 Thaman, above n 14, 3.

90 Law Association for Asia and the Pacific, *Profile of LAWASIA* (2010) <<http://lawasia.asn.au/profile-of-lawasia.htm>> at 26 October 2010.

91 New Zealand Law Commission, above n 1, 84.

92 Ibid.

The Fijian experience illustrates the complexities inherent in attempting to balance the rights of migrant communities while safeguarding Pacific custom and practices. Fiji has a large Indian population who were originally recruited for plantation work in Fiji during the colonial era.⁹³ In the 2007 Fiji Census, out of a population of 837,271 only 475,739 people identified as Indigenous Fijian, and 313,798 identified as Indian Fijian.⁹⁴ The 1990 *Constitution of Fiji* effectively precluded Indian Fijians from possessing political power and cultural autonomy.⁹⁵ This was justified as uplifting the position of the indigenous community.⁹⁶ However, the constitution was altered in 1997 to reaffirm 'recognition of the human rights and fundamental freedoms of all individuals and groups' and recognise Fiji's multicultural society.⁹⁷ Former Minister for Education, Taufa Vakatale is sceptical of the policy of multiculturalism, which he contends is contributing to the diminishing of Fijian culture.⁹⁸ He contends 'equality in principle becomes discrimination in practice'.⁹⁹ Indeed the situation in Fiji illustrates the difficulties of simultaneously protecting the rights of minority groups and Pacific culture, and the reluctance of ministers such as Vakatale to adopt Western liberal values over practices that protect culture and custom.

Codifying Custom

Pacific customs are incapable of being strictly identified because of their changing and dynamic nature.¹⁰⁰ Accordingly, codifying Pacific customs would present a challenge for the drafters of a Pacific Charter of Human Rights. Zorn contends that custom is changing at an accelerated rate due to technological, economic and political changes in the Pacific.¹⁰¹ Once customary norms are fixed in law they become frozen, and incapable of reflecting the changing nature of custom.¹⁰²

Another challenge to codifying custom in a Pacific Charter of Human Rights is variance in customs between states and within states.¹⁰³ As Zorn states, Pacific

93 Brij V. Lal, 'The passage out' in K. R. Howe, Robert C. Kiste and Brij V. Lal (eds), *Tides of History: the Pacific Islands in the twentieth century* (1994) 435, 448.

94 Fiji Islands Bureau of Statistics, *Population Censuses and Surveys* (2010) <http://www.statsfiji.gov.fj/cens&surveys/cens&survestats_index.htm> at 26 October 2010.

95 Amnesty International, *Fiji: new era for human rights with new constitution* (1998) <<http://asiapacific.amnesty.org/library/Index/ENGASA180011998?open&of=ENG-FJI>> at 26 October 2010.

96 Jon Fraenkel, 'The Fiji coup of December 2006: who, what, where and why?' in Jon Fraenkel and Stewart Firth (eds), *From Election to Coup in Fiji: The 2006 Campaign & its Aftermath* 420, 422.

97 *Constitution (Amendment) Act 1997*(Fiji) preamble.

98 Taufa Vakatale, 'Multiculturalism vs. Indigenous Cultural Rights' in Margaret Wilson and Paul Hunt (eds), *Culture, Rights and Cultural Rights: Perspectives from the South Pacific* (2000) 70, 74.

99 Ibid.

100 New Zealand Law Commission, above n 1, 46.

101 Zorn, above n 7, 96.

102 New Zealand Law Commission, above n 1, 43.

103 Zorn, above n 7, 96.

societies were historically heterogeneous: '[e]ach of the indigenous societies of the Pacific had its own customs. Each of the small village societies of the pre-colonial Pacific was an independent mono-cultural entity'.¹⁰⁴ In order to design an accurate charter, the drafters would have to undertake an inventory of customs applicable to all Pacific nations. Moreover, Pacific governments would need to agree on values, customs and practices common to the region.¹⁰⁵ Even then, customs could change and consequently render the charter inaccurate.

Conclusion

Custom is changing and dynamic, and accordingly may be capable of adapting to conform with human rights norms. Human rights thinking must also take into account the perspectives, customs and practices of Pacific peoples. Integral to this process is to create an inventory of Pacific customs, values and practices that are common to and reflective of the entire region and a core of basic human rights common to all cultures in the Pacific.¹⁰⁶ This would provide the foundations of a viable charter that would harmonise custom and human rights, and would thus be representative of Pacific peoples. However there are still some areas such as women's rights, where custom and human rights are currently in direct conflict. The question is whether a Pacific Charter of Human Rights could resolve this inconsistency and whether a charter would be effective in influencing traditional conflict resolution occurring at a grassroots level, where human rights are most likely to be infringed.

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¹⁰⁴ Zorn, above n 7, 96.

¹⁰⁵ New Zealand Law Commission, above n 1, 283.

¹⁰⁶ Corrin Care, above n 29, 16.

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International Disaster Response Law and the Coordination of International Organisations

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Abstract

Natural disasters, deeply ingrained in our historical and contemporary conceptualisation of the environment, are rapidly increasing in frequency and severity. There has, however, never been a comprehensive legal framework on the provision and/or facilitation of assistance in peacetime situations of natural, industrial or technological disaster. Rather, a body of International Disaster Response Law (IDRL) has developed from a melange of binding and non-binding instruments with varying purpose, scope and content. This essay examines the patchwork body of IDRL and outlines the need for improved coordination within the sector. Two shortcomings of and potential solutions to coordination of international organisations at the inter-international level are investigated through a legal framework. The interaction of the international and domestic levels of coordination are then examined, and coordination of national and international legal structures to improve the response capacities of both spheres is proposed.

Introduction

The recent horrors of the Haiti earthquake and Australian bush fires are etched in our memories, easily recalled along with the images of destruction caused by the Myanmar cyclone, Hurricane Katrina on the United States Gulf Coast and the Indian Ocean Tsunami. Such memories reflect the exponential upward trend¹ in the prevalence and impact of disasters, particularly in the

¹ Tadanori Inomata, UN Joint Inspection Unit, *Towards a United Nations Humanitarian Assistance Programme for Disaster Response and Reduction: Lessons Learned from the Indian Ocean Tsunami*

recent decade. During the six years of 2000 – 2006 the number of disasters had reached 5287, compared to 1231 in the 1970 – 1980 decade. This year alone Relief Web has recorded 101 disasters requiring international support.²

Despite the obvious prevalence and severity of disasters, there has never been a comprehensive legal framework on the provision and/or facilitation of assistance in peacetime situations of natural, industrial or technological disaster. Rather, a body of International Disaster Response Law (IDRL) has developed from a melange of binding and non-binding instruments with varying purpose, scope and content. IDRL has thus become a minefield of legal barriers and omitted regulation, as deadly as bush fires and earthquakes themselves.

Of the many gaps left in IDRL, coordination difficulties are a ‘systemic’³ problem for the humanitarian aid regime. Indeed, inadequate coordination ‘is probably the most discussed issue’⁴ and its failures ‘remain a constant complaint’⁵ among both international actors and between international actors and their domestic counterparts in affected states. The costs of coordination failures are serious. Uncoordinated responses lead to duplication, confusion, increased expenses, inefficient use of resources, inappropriate aid and sometimes fatally result in disaster affected persons not receiving ‘the right aid at the right time, delivered in the right way.’⁶

Parts I and II of this essay examine the patchwork body of IDRL and outline the need for improved coordination within the sector. Part III appraises two shortcomings of coordination of international organisations at the inter-international level and investigates remedies through a legal framework. Part IV analyses the interaction of the international and domestic levels of coordination and proposes coordination of national and international legal structures to improve the response capacities of both spheres.

Disaster (2006), 3.

2 ‘Latest disasters’, Relief Web, <<http://www.reliefweb.int>> (10 November 2010).

3 Moore, Daniel and Eng, ‘International NGOs and the Role of Network Centrality in Humanitarian Aid Operations: Mozambique Floods Study’ (2003) 27(4) *Disasters* 305, 305.

4 David Fisher, *Law and Legal Issues in International Disaster Response: A Desk Study* (2007), 150.

5 *Ibid*, 150.

6 *Ibid*, 13.

I. IDRL

IDRL, while ‘not a new component of international law’,⁷ could be accused of sneaking up on scholars and practitioners. In response to the increasing human and economic toll taken by peacetime disasters, the area has quietly grown to become a huge patchwork of over 130 diverse binding and non-binding instruments.⁸ These include inter-state and international organisation-to-state multilateral⁹ and bilateral treaties;¹⁰ UN General Assembly (GA), International Conference of the Red Cross and Red Crescent, and Economic and Social Council (ECOSOC) Resolutions;¹¹ guidelines;¹² and frameworks.¹³

Further, while IDRL can be found in treaties, municipal law and regulations, research to date by the IFRC suggests the non-existence of a system of customary IDRL.¹⁴ As a result, there are no clear and coherent regulatory agreements dealing with various aspects of transboundary disaster management and humanitarian assistance and a clear identifiable pattern of general principles on key aspects of disaster response is lacking.¹⁵

Nevertheless, IDRL describes the body of rules and principles for international humanitarian assistance in the wake of peacetime disasters of natural, technological or industrial origin.¹⁶ As a body of law, IDRL is necessary to fill the gap left by International Humanitarian Law (IHL) which, under the

7 Michael H. Hoffman, *International disaster response laws, principles and practice: reflections, prospects and challenges* (2003), 1.

8 Inomata, above n 1.

9 For example, *Framework Convention on Civil Defence Assistance*, opened for signature 22 May 2000, (entered into force 23 September 2001), *Tampere Convention on the Provision of Telecommunications Resources for Disaster Mitigation and Relief Operations*, opened for signature 18 June 1998, (entered into force 8 January 2005) (‘Tampere Convention’). Provisions can also be found in treaties on a range of international law topics, such as *Convention on the Privileges and Immunities of the United Nations*, opened for signature 13 February 1946, (entered into force 17 September 1946), *Kyoto International Convention on the Simplification and Harmonization of Customs Procedures*, opened for signature 18 May 1973, (entered into force 25 September 1974), amended by protocol 26 June 1999.

10 *United States of America and Japan Exchange of Notes Constituting an Agreement Relating to Emergency Flood*, 1959; *United Kingdom of Great Britain and Northern Ireland and India Agreement for the Duty Free Entry of Relief Supplies*, 1964.

11 Examples: *Resolution on strengthening of the coordination of emergency humanitarian assistance of the United Nations*, GA Res 46/182, UN GAOR, 47th sess, 78th plen mtg, UN Doc A/RES/46/182 (1991); *Resolution on strengthening the effectiveness and coordination of international urban search and rescue assistance*, GA Res 57/150, UN GAOR, 57th sess, 75th plen mtg, UN Doc A/RES/57/150 (2002).

12 For example, *Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance*, 30th International Conference of the Red Cross and Red Crescent, adopted 20 November 2007.

13 For example, *Hyogo Framework for Action 2005-2015*, (2005)

14 Hoffman, above n 7, 17.

15 Inomata, above n 1, 9.

16 Hoffman, above n 7, 1.

four Geneva Conventions,¹⁷ offers a universally recognised set of rules and humanitarian protections designed to alleviate human suffering in response to catastrophic international¹⁸ and internal¹⁹ armed conflict. Unlike IHL, IDRL applies to (usually) unintended disasters in a cooperative peacetime context when states or intergovernmental humanitarian or other organisations offer, request, provide or accept cross-border disaster assistance.

Taking cues from IHL, the spatial scope of IDRL can be productively applied far from a disaster's point of impact (such as in agreements facilitating information sharing and establishing early warning systems) and its temporal scope may extend beyond the emergency phase of a disaster to the pre-disaster (for example, pre-positioning relief supplies) and post-disaster (for example, procedures for review of lessons learned and information sharing) stages.²⁰ It encompasses information sharing, coordination, deployment of personnel, equipment and supplies, access and assistance to disaster victims, status of humanitarian responders and standards of conduct.

17 *Geneva Convention for the Amelioration of the Condition of the Wounded and Sick in Armed Forces in the Field*, opened for signature 12 August 1949, art 2 (entered into force 21 October 1950) ('First Geneva Convention'); *Geneva Convention for the Amelioration of the Condition of Wounded, Sick and Shipwrecked Members of Armed Forces at Sea*, opened for signature 12 August 1949, art 2 (entered into force 21 October 1950) ('Second Geneva Convention'); *Geneva Convention Relative to the Protection of Civilian Persons in Time of War*, opened for signature 12 August 1949, art 2 (entered into force 21 October 1950) ('Third Geneva Convention'); *Geneva Convention Relative to the Treatment of Prisoners of War*, opened for signature 12 August 1949, art 2 (entered into force 21 October 1950). ('Fourth Geneva Convention').

18 *First Geneva Convention*, art 2; *Second Geneva Convention*, art 2; *Third Geneva Convention*, art 2; *Fourth Geneva Convention*, art 2; *Protocol Additional to the Geneva Conventions and Relating to the Protection of Victims of International Armed Conflict (Protocol I)*, opened for signature 12 August 1949, art 1(3) (entered into force 7 December 1978).

19 Common art 3 to the *First, Second, Third and Fourth Geneva Conventions. Protocol Additional to the Geneva Conventions of 12 August 1949, and Protocol Additional to the Geneva Conventions and Relating to the Protection of Victims of Non-international Armed Conflicts (Protocol II)*, opened for signature 12 August 1949, (entered into force 7 December 1978), art 1.

20 Hoffman, above n7, 15.

II. COORDINATION: LOST IN THE 'YAWNING GAP'²¹

Coordination is commonly understood to include,

the general elements of interaction between State Parties or their competent bodies, mutual assistance in the provision of technical facilities and equipment and the planning and carrying out of activities related to emergency response.²²

Coordination of the different elements of the complex international humanitarian network is vital to enable humanitarian aid organisations to work together effectively in response to disasters, yet remains a major missing link within the 'yawning gap'²³ at the core of IDRL.

Improving coordination has been described as 'critical to optimise the flow of resources among agencies and increase the accountability, effectiveness and impact of aid operations'.²⁴ Further, there is agreement among humanitarian actors that it is one of the most significant challenges to effective disaster response. An International Federation of Red Cross and Red Crescent Societies (IFRC) survey found that coordination problems were reported by 40 – 90% of international and national organisations (International Humanitarian Organisations experiencing the problem most severely, followed by Governments and National Societies).²⁵

Inadequate coordination can be identified at two levels of the international disaster response strata: the inter-international sphere and in the international-domestic relationship. At the inter-international level, almost 60% of respondents to the IFRC survey reported lack of coordination between international actors (such as, the UN system and Non-Governmental Organisations (NGOs)) and more than 35% encountered it 'frequently or always'.²⁶ The Humanitarian Response Review, conducted by Office for the

21 David Fisher, *Summary Version – Law and Legal Issues in International Disaster Response: A Desk Study* International Federation of Red Cross and Red Crescent Societies, Geneva, (2007) 21.

22 Hosrt Fischer, *International Disaster Response Law: A Preliminary Overview and Analysis of Existing Treaty Law* (2003), 6.

23 Fisher, *Summary Version*, above n 21, 21.

24 Moore, Daniel and Eng, above n 3, 305.

25 Fisher, above n 4, 150.

26 Ibid 151.

Coordination of Humanitarian Affairs (OCHA), found that almost 70% of donors identified strong coordination as the number one element required to improve the performance of the global humanitarian system.²⁷

The consequences of such ineffective coordination are frustrating. For example, the IFRC notes that during major disaster operations in 2004-2005 massive amounts of unneeded and inappropriate aid were brought in. International actors failed to sufficiently communicate, gather and share information about what each other would supply and what was needed, resulting in mountains of used and unsuitable clothing, expired medications, duplicative and unnecessary field hospitals, culturally unacceptable food and other inappropriate items.²⁸ Such aid is not merely 'worthless to the recipients; it has a negative value'²⁹ as it slows customs, occupies storage and transport space when it is most needed.

Uncoordinated responses between international and domestic actors (such as, governments and civil society) have similarly devastating consequences for the distribution of international assistance. For example, uncoordinated domestic regulatory systems for customs can create severe bottlenecks.

This occurred in Sri Lanka and Indonesia after the Indian Ocean Tsunami (Tsunami) where 'hundreds of containers of relief goods remained stranded long after many of the items they contained, such as tents, blankets and body bags, were no longer needed and food had perished.'³⁰

Therefore, absent effective coordination structures at the inter-international and international-domestic levels require critical attention to ensure effective disaster response and to mitigate the suffering caused to disaster-affected populations.

III. INTER-INTERNATIONAL LEVEL

Previously, the international community through the League of Nations attempted to legally impose a centralised approach to disaster relief coordination by adopting the Convention and Statutes Establishing an International Relief Union³¹ in 1927. However, the body was crippled by

27 Costanza Adinolfi, *Office for the Coordination of Humanitarian Affairs, Humanitarian Response Review* (2005), annex XII.

28 Ibid 14.

29 John Telford and John Cosgrave, *Joint Evaluation of the international response to the Indian Ocean Tsunami: Synthesis Report*, (2006), 47.

30 Adinolfi, above n 27, 13.

31 *Convention and Statute Establishing an International Relief Union*, opened for signature 12 July 1927, (entered into force 27 December 1932).

under-funding and effectively died with the demise of the League of Nations and withdrawal of Red Cross support in the late 1930s. Global coordination policies and structures have subsequently been developed mainly through non-binding instruments.

A. Ineffective UN-Centrism

1. The Problem

The existing international humanitarian coordination system operates in three networks with limited linkages between them: the UN system; the Red Cross/Red Crescent Movement (whose internal coordination mechanisms are established under the Seville Agreement);³² and NGOs.³³ Overall, however, the system is understood to be UN driven. UN GA Resolution 46/182³⁴ conferred on the UN a 'central and unique'³⁵ role in providing leadership and coordinating the efforts of the international community to support disaster-affected communities. It was expected to play an 'increasingly important role in coping with the exponential rise in diverse human and material losses caused by disasters.'³⁶ Indeed, the UN system has a comparative advantage over other channels as its leadership is based on universal membership and global political acceptance of guiding principles contained in Resolution 46/182's annex.

Essential coordination functions are discharged by the OCHA whose functions are carried out through the Interagency Standing Committee (IASC) as chaired by the Emergency Relief Coordinator (ERC), and the Humanitarian Coordinators (HCs) at the country level through the UN Country Team (UNCT). Additionally, roles are regularly played by the UN Disaster Assessment Team (UNDAC), the International Search and Rescue Advisory Group (INSARAG), the UN High Commissioner for Refugees (UNHCR), the World Health Organisation (WHO), and the UN Children's Fund (UNICEF) among others.

Despite this apparently vast UN coordination system, the effectiveness of it is a subject of 'continuing concern and debate and dissatisfaction'³⁷ within international humanitarian organisations and donor communities. Problems can be seen along many lines. An especially major issue is the overlap of various coordination agencies, particularly in the relief to recovery transition.

³² *Seville Agreement* (1997).

³³ Adinolfi, above n 27.

³⁴ *Resolution on strengthening of the coordination of emergency humanitarian assistance of the United Nations*, GA Res 46/182, UN GAOR, 47th sess, 78th plen mtg, UN Doc A/RES/46/182 (1991).

³⁵ Inomata, above n 1, 3.

³⁶ *Ibid* 3.

³⁷ Adinolfi, above n 27, 46.

The IASC and Global Platform for Disaster Risk Reduction (Global Platform) (previously Interagency Task Force on Disaster Reduction (IAFT/ISDR)) are two distinct UN system interagency coordination bodies under the same authority (OCHA and the ERC). They are both key global forums for UN and non-UN partners – where IASC deals with coordination of disaster relief, Global Platform addresses disaster risk reduction. Despite UN GA Resolution 46/182³⁸ calling for an integrated smooth transition from relief to reconstruction and risk reduction, the bodies have developed guidelines and policies on humanitarian assistance and disaster reduction ‘more or less in isolation.’³⁹ Tandanori Inomata, UN Inspector to the Tsunami found that the two instruments had not been streamlined and complied systematically under a single humanitarian umbrella in a readily available and understandable format for the benefit of a wider professional humanitarian audience, particularly humanitarian actors in the disaster-affected countries.’⁴⁰

Further, Inomata wrote,

[T]he dichotomy between the IASC and the ISDR [now the Global Platform] systems represents the risk of fragmentation and waste of initiative by the numerous actors and funding sources involved along with the non-binding Inter-agency coordination provided to them.⁴¹

Under the present structure, the problems of the interagency machinery are compounded as their decisions are non-binding; most members revert to headquarters for final decisions; they do not report to ECOSOC; they have an administrative nature that prevents them from adopting a common strategy or programmes committing their respective governing bodies; and member states are not allowed to exercise governance over humanitarian assistance of diverse entities and actors.⁴²

2. Solution: An Intergovernmental Committee?

An intergovernmental committee on disaster reduction and response, as recommended by Inomata to the UN in his report,⁴³ may be the solution. No intergovernmental forum has consistently discussed disaster-related humanitarian assistance in depth, despite a call over a decade ago by the Secretary General for consolidating and grouping humanitarian and

38 *Resolution on strengthening of the coordination of emergency humanitarian assistance of the United Nations*, GA Res 46/182, UN GAOR, 47th sess, 78th plen mtg, UN Doc A/RES/46/182 (1991)

39 Inomata, above n 1, 10.

40 Ibid 10.

41 Ibid 17.

42 Ibid 18.

43 Ibid.

humanitarian-related matters under a single ‘humanitarian umbrella’⁴⁴ agenda. This stands in stark contrast to other major economic and social sectors under GA and ECOSOC governance, which have 14 functional commissions and expert bodies, including 9 intergovernmental bodies, reporting to them. Creation of such a body in the humanitarian sector is available under Article 68 of the UN Charter,⁴⁵ to assist ECOSOC in the ‘performance of its functions’ and to varying degrees advise it on system-wide coordination and mobilisation of expertise of the interagency machinery. Similarly to the bodies established in other sectors, such a body could be mandated by the GA to pursue the implementation of the outcome of the major UN conferences and summits through the consideration of experience gained and lessons learned in their fields.⁴⁶

A specialised intergovernmental body for disaster response and reduction could assist ECOSOC in a number of ways. It could review and streamline humanitarian laws and principles for emergency response and disaster reduction; ensure legislative coordination and consistency between the specialised agencies, funds and programmes in policy-making and resource management by taking advantage of the experience and expertise of these partners; and provide a framework for strategic planning and coordination of policies of the organisations of the UN system at the intergovernmental level throughout the entire disaster management process.⁴⁷ The creation of such a forum, open to main actors and benefiting from recommendations of the current interagency bodies, would enable governmental stakeholders to garner the collective will necessary to strategically manage the resources they mobilise.⁴⁸

Therefore, uncoordinated overlap in UN system functions in the humanitarian sector inhibiting the effective delivery of relief in disasters, may be remedied by the creation of an intergovernmental body, as found in other economic and social sectors. Genuine moves by the UN system to overcome the IASC and Global Platform dichotomy are still awaited. However, with mounting pressure to create a coordinated system directed at improving the accountability, effectiveness and impact of relief and recovery assistance change will no doubt occur soon.

44 *Mandating and delivering: analysis and recommendations to facilitate the review of mandates: report of the SG*, UN Doc A/60/733 (2006), para 97.

45 *United Nations Charter* (1945).

46 *Resolution on integrated and coordinated implementation of and follow-up to the outcomes of the major United - Nations conferences and summits in the economic and social fields*, GA Res 57/270B, UN GAOR, 57th sess, 91st plen mtg, UN Doc A/RES/57/270B (2003), para 46-48.

47 Inomata, above n 1, 18.

48 *Ibid.*

B. NGO Coordination

1. The Problem

The NGO network is a crucial element in the international disaster response structure. International NGOs (INGOs) are regularly cited as being 'better prepared, funded and informed than the UN',⁴⁹ even sometimes supporting traditional UN functions such as facilitating logistical capacity. The network is rapidly expanding, as reflected in the response to the Tsunami disaster where the number of INGOs 'grew unabated',⁵⁰ and includes a huge, diverse group: small, large, experienced, inexperienced, specialised, general, resource-rich, resource-poor and so on. However, despite the potentially wide-ranging benefits of such an expansive network, proliferation of INGOs has tended to cause uncoordinated disaster responses with disastrous consequences for affected communities.

Examples abound in disaster response assessments of INGOs failing to coordinate properly between themselves, share information, avoid duplication and bring consistent consensus on important issues. The Tsunami Evaluation Committee found that the INGO sector requires 'collective responsibility, representation and coordination beyond what is currently available.'⁵¹ After the Tsunami, for example, in one part of the west coast of Aceh there were 22 medical, 95 shelter, and over 60 education INGOs.⁵² Rather than spreading capacities across affected areas in response to local demand, local authorities and coordination structures were overburdened in some location and under-resourced in others. Sectoral group fragmentation of INGO coordination also inhibits integrated planning within any specified geographical area. In another post-Tsunami instance, a large INGO constructed a number of houses in an area where the community, working with another INGO, had developed a site plan for the construction of a road. The number and diversity of actors, combined with reduced incentives to coordinate due to large funding and reduced interest in coordination due to a competitive atmosphere compound to create an especially difficult coordination environment. Improved INGO disaster response coordination is vitally necessary to ensure more effective, efficient, and coherent delivery of humanitarian services.

49 John Telford and John Cosgrave, *Joint Evaluation of the international response to the Indian Ocean Tsunami: Synthesis Report* (2006), 58.

50 Ibid 55.

51 Jon Bennett, *Coordination of international humanitarian assistance in tsunami-affected countries* (2006), 29.

52 Telford and Cosgrave, above n 49, 56.

2. Potential Solutions

Attempts at INGO coordination have been made and three main platforms exist: IASC, thematic and operational. At IASC level they are represented through observer standing of three consortia: the International Council of Voluntary Agencies (ICVA) – with more than 70 members; the Steering Committee for Humanitarian Response (SCHR) – an alliance of nine of the largest INGO networks; and InterAction – a coalition of over 150 US-based INGOs. Operational networks include the Disasters Emergency Committee (DEC), Alliance 2015, and Save the Children Alliance. Thematic coordination mechanisms are also being developed, for example the Interagency Working Group (IAWG-ECB). However, these platforms have failed to ensure coordinated responses.

An InterAction report found that there needs to be a radical shift in organisational mentality. INGOs must ‘see and prioritise’⁵³ coordination as a duty and functional requirement in humanitarian response, not an option. This can be done internally by INGOs by ensuring staff are properly educated on coordination and its importance. Additionally, structural changes need to be made within IDRL. An agreed INGO representative mechanism is regularly suggested by senior coordinators.⁵⁴ At the IASC level, INGO joint bodies have no authority to make binding commitments for their members. This lack of INGO representative body with delegated authority means that each INGO usually speaks for itself, making coordination especially difficult.

The IASC could pre-establish Terms of Reference for the appointment of INGO liaison officers and establish an INGO liaison office to deal with other agencies and share information. This could overcome the problems experienced during the Tsunami response effort where no special liaison was appointed by INGOs because ICVA membership was unable to agree on technical aspects.⁵⁵ The IASC INGO consortia have also been recommended by InterAction to draft coordination guidelines and adopt performance standards and indicators on NGO-managed coordination mechanisms in humanitarian emergencies.

In response to the recommendation of the Humanitarian Response Review,⁵⁶ IASC in 2005 approved the creation of nine sectoral clusters⁵⁷ with lead organisations responsible for global coordination among its partners in the area. The clusters have been successfully employed in a number of emergencies,

53 Eric Schwartz and Samuel Worthington, *NGO Impact Initiative: An Assessment by the International Humanitarian Community* (2006), 36.

54 Bennett, above n 57, 9.

55 Ibid 61.

56 Adinolfi, above n 27.

57 In nutrition, water and sanitation, health, camp coordination and management, emergency shelter, protection, logistics, telecommunications, early recovery.

but are 'beset by growing pains',⁵⁸ including insufficient INGO involvement which can worsen INGO coordination. It has been recommended that the IASC should promote the use of these clusters as a vehicle for developing common INGO indicators, reporting and joint assessments.⁵⁹ Clusters could also be improved by the OCHA actively working to ensure the inclusion of INGOs in cluster coordination meetings.

Therefore, system-wide changes must be made to the INGO network. As a major component of the international sphere of the IDRL system, its proper coordination – through a representative body, pre-established liaison officers and/or a cluster approach – is essential to ensure that efficient delivery of relief is provided to disaster affected communities. Major inter-international level shortcomings are present in the IDRL structure at several points, especially within the UN system and the INGO network. However, despite these current problems, there is much room for improvement at overlapping organisational, structural and legal stratum and active movement towards the attainment of effective inter-international level coordination is being made.

IV. INTERNATIONAL DOMESTIC LEVEL

Current principles and guidelines for humanitarian assistance and its application have proved inadequate. While national regulatory attempts have been made for international-domestic coordination, most struggle to implement effective systems that accommodate the multiple concerned ministries, departmental and local levels of government, civil society, and INGOs. Further, there are no legally-binding guidelines for States to follow on the issue.

A. Unclear Regulatory Frameworks

The absence of clear international and national consensus and authority among and within governments has created legal barriers to coordinated relief delivery. Two of the numerous legal hurdles to effective international-domestic level coordination will be addressed here: entry of relief personnel; and customs.

⁵⁸ Fisher, above n 4, 152.

⁵⁹ Schwartz and Worthington, above n 53, 43.

1. Entry

In order for relief to be delivered to an affected population, foreign personnel must obtain permission to enter and remain in an affected country, and transit through surrounding countries. However, there is no single global regime controlling how persons temporarily cross borders. Relief workers are left to the mercy of national visa regulations that vary between states and differ based on their nationality, the international status of their employer and their country of origin. Visa processing can be laborious and take up to several weeks, preventing access of personnel until after their presence is most vitally required.

Nations rarely have specific laws relating to visa procedures for international relief personnel and ad hoc procedures are usually established immediately following a disaster. Otherwise, relief personnel must resort to utilising tourist provisions allowing for visa-free short-term stays. However, problems then arise once time-limits for visa free travel lapse.

An assortment of international standards can be drawn from a range of binding and non-binding instruments. In some bilateral borderland rescue and relief treaties states agree to waive visa requirements and passport controls for government emergency personnel from the counterpart state under appropriate circumstances.⁶⁰ Also, numerous instruments have called for the facilitation of entry,⁶¹ including UN GA Resolution 57/150 which calls on states to ‘simplify or reduce, as appropriate, the customs and administrative procedure related to the entry, transit, stay and exist of international urban search and rescue teams and their equipment and materials’.⁶² Some exemptions can also be extracted from privileges and immunities law. For example, an exemption from immigration-related restrictions and fees is contained in Article 25 of the Convention on Privileges and Immunities of the UN,⁶³ which states that visa applications for officials should be ‘dealt with as speedily as possible’. However, this merely implies that any visa application procedures be expedited, rather than proscribe that personnel necessarily be automatically exempted. Further, the UN is entitled to issue laissez-passer travel documents to its officials

60 For example, *Agreement between Denmark and the Federal Republic of Germany on Mutual Assistance in the Even of Disasters or Serious Accidents* (1985), art 5.

61 For example, *ASEAN Agreement on Disaster Management and Emergency Response*, (2005), arts 14-16; *Tampere Convention*, arts 9(2)(c); *Inter-American Convention to Facilitate Disaster Assistance*, (1984), art VII; and *Resolution on strengthening of the coordination of emergency humanitarian assistance of the United Nations*, GA Res 46/182, UN GAOR, 47th sess, 78th plen mtg, UN Doc A/RES/46/182 (1991), paras 6-7: calls on affected and transit states to facilitate the access of humanitarian organisations.

62 *Resolution on strengthening the effectiveness and coordination of international urban search and rescue assistance*, GA Res 57/150, UN GAOR, 57th sess, 75th plen mtg, UN Doc A/RES/57/150 (2002), para 3.

63 *Convention on the Privileges and Immunities of the United Nations*, opened for signature 13 February 1946, (entered into force 17 September 1946).

that do not reveal the nationality of the holder – averting restrictions on this basis. Such exemptions, however, are useless for the numerous non-UN humanitarian relief bodies.

2. Customs

The shipment of relief goods and equipment to an affected country from international sources can be similarly adversely affected by domestic customs regimes that are designed to address a variety of issues (including legitimate concerns around the regulation and taxation of international commerce and control of contraband). Nevertheless, ‘The urgent need for entry of relief goods and equipment, particularly after a sudden-onset disaster like an earthquake or tsunami, requires some deviation from normal procedures.’⁶⁴

Customs-targeted soft law instruments of ‘universal application’⁶⁵ have recommended states to expedite the forwarding of relief consignments by waiving restrictions on their import and export; simplify associated paperwork; waive duties, taxes and fees; and authorise customs clearance outside normally prescribed hours and locations.⁶⁶ Additionally, the 23rd International Conference of Red Cross and Red Crescent Societies (1977) recommended several measures to expedite international relief, including: waiving requirements for consular certificates of origin, invoices⁶⁷ and import/export licences;⁶⁸ reducing, to the minimum, requirements and restrictions relating to hygiene and animal protection;⁶⁹ instructing customs authorities in transit and recipient countries to expedite processing;⁷⁰ encouraging donors to give prompt notification to consignees, ensure detailed manifests, and seek prompt acknowledgement of relief shipment arrivals.⁷¹

64 International Federation of Red Cross and Red Crescent Society, *International standards on customs and disaster relief* (2006), 1.

65 Ibid 1.

66 *Recommendation to Expedite the Forwarding of Relief Consignments* (1970) Customs Cooperation Council.

67 *Recommendation B*, 23rd International Conference of Red Cross and Red Crescent Societies (1977).

68 *Recommendation C*, 23rd International Conference of Red Cross and Red Crescent Societies (1977).

69 *Recommendation D*, 23rd International Conference of Red Cross and Red Crescent Societies (1977).

70 *Recommendation I*, 23rd International Conference of Red Cross and Red Crescent Societies (1977)

71 *Recommendation H*, 23rd International Conference of Red Cross and Red Crescent Societies (1977).

Hard law, 'of less universal reach',⁷² can also be found in a range of binding multilateral,⁷³ bilateral⁷⁴ and regional⁷⁵ treaties, status agreements, and memoranda of understanding between states and international organisations.

Provisions can also be found amongst law on privileges and immunities,⁷⁶ and trade-related standards.⁷⁷

This disparate body of law has created serious barriers to the efficient coordination of relief efforts between international and domestic actors. A complete and coherent body of international law and guidelines are therefore require to improve international-domestic IDRL coordination.

B. A Regulatory Framework

Lessons can be learned from the telecommunications relief sector of IDRL. In clear contrast to the disparate collection of law on entry and customs, the Tampere Convention on the Provision of Telecommunication Resources for Disaster Mitigation and Relief Operations (the Convention) adopted in 1998⁷⁸ is regularly held up as 'a milestone'⁷⁹ in IDRL law. It is the first global

72 International Federation of Red Cross and Red Crescent Society, above n 64, 1.

73 For example, *Tampere Convention*, art 9 on removal/reduction of regulations restricting the import, export or transit of telecommunications equipment; *Kyoto International Convention on the Simplification and Harmonization of Customs Procedures*, opened for signature 18 May 1973, (entered into force 25 September 1974), amended by protocol 26 June 1999: reduced formalities/waived duties and fees; *Convention on Temporary Admission*, opened for signature 26 June 1990, (entered into force 27 November 1993), Annex: allows temporary admission of goods imported for humanitarian purposes to be without duties/taxes/restrictions; *Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency*, opened for signature 26 September 1986, (entered into force 26 February 1987), art 8: calls for waiver of customs duties on the property and equipment of international relief providers.

74 For example, *Convention between the French Republic and the Federal Republic of Germany on Mutual Assistance in the Event of Disasters or Serious Accidents* (1997), art 5.

75 For example, *Inter-American Convention to Facilitate Disaster Assistance* (1984), art 5; *ASEAN Agreement on Disaster Management and Emergency Response* (2005), art 14; *Agreement among the Governments of the Participating States of the Black Sea Economic Cooperation on Collaboration in Emergency Assistance and Emergency Response to Natural and Man-Made Disasters* (1998), art 10.

76 For example, *Convention on the Privileges and Immunities of the United Nations*, opened for signature 13 February

1946, (entered into force 17 September 1946), art 18(g): grants many exemptions, including from customs duties and restrictions with regard to property and assets imported or exported for official use and for the personal use of officials.

77 For example, the vast majority of state parties to the WTO and *General Agreement on Tariffs and Trade* (GATT) have agreed to lower trade barriers (tariffs/duties/restrictive customs practices). However, preferences are often given to products depending on origin, especially to least developed countries, customs unions (European Economic Area, Southern Africa Customs Union), regional free trade areas (NAFTA, ASEAN), and bilateral free trade agreement signatories.

78 *Tampere Convention on the Provision of Telecommunications Resources for Disaster Mitigation and Relief Operations*, opened for signature 18 June 1998, (entered into force 8 January 2005).

79 Marco Ferrari, 'Easing the way to Disaster Mitigation: The Tampere Convention' (Paper presented at the, Telecoms for Disaster Relief: Tampere Convention World Summit on the Information Society, 22

treaty providing a comprehensive regulatory framework for international cooperation on disaster telecommunications and provides for state-to-state, inter-government, non-governmental and non- state actor assistance.

The Convention was developed from a collection of law similarly disparate to that faced by entry and customs sectors currently. Nevertheless, it has achieved a targeted effort to facilitate the provision of timely and effective telecommunication recourses and rapid, efficient information flows for disaster prevention and response. While the full benefits of the Convention are yet to be seen, it has been applied successfully in a number of disasters, including the Mozambique floods in 2000. However, problems were present during those floods. For example, telecommunication delegates from humanitarian organisations starting the installation of radio equipment on vehicles on the basis of generic local authorisations were nearly arrested by the army. The problems were resolved, but at local and personal level negotiations rather than through the law. Nevertheless, commentators have emphatically stated that such problems did not arise from the Convention itself, but from its non-entry into force, and especially, from the non-adoption of administrative procedures for its implementation on the part of the individual States at the time of the floods. In 2005, the Convention entered into force and the expectations for the results of the full application of the Convention 'are very high as they are having immediate effects on saving lives [sic]'.⁸⁰

In response to the need for a clear regulatory framework for other areas of IDRL coordination the International Conference of the Red Cross and Red Crescent adopted Guidelines for the Domestic Facilitation and Regulation of International Disaster Relief and Initial Recovery Assistance in 2007 (Part V for example, deals with 'Legal Facilities for Entry'). However, these are merely recommendatory and non-binding. The transformation of the relevant aspects of these guidelines into an UN convention, similar to the Tampere Convention, may significantly mitigate legal barriers and improve coordination at the international-domestic level of international disaster response.

V. CONCLUSION

Disasters are becoming increasingly frequent and ferocious, requiring coordinated global responses more than ever. The international community faces significant challenges at both the inter-international and international-to-domestic levels of disaster response. Two main networks of the international system, the UN and INGOs, face particular internal coordination problems.

February 2005).

⁸⁰ Ibid 3.

Potential solutions are, however, available. These include, the establishment of an intergovernmental forum reporting directly to ECOSOC, an INGO representative body, pre-established INGO liaison officers and continued application of the cluster approach. The coordinated interaction of international and domestic legal systems also requires careful consideration. Pointless legal barriers need to be broken down, perhaps through a global regulatory system, to ensure that relief services are effectively delivered to suffering populations. The full achievement of a comprehensive alleviation of these problems will probably take many years. Nevertheless, with careful reflection on past mistakes and efforts by the international community to compile a more coherent body of IDRL, there is potential for substantial progress.

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“A Space of Time that is Always Filled with Moving”: Cinematic Modes and the Writing of Gertrude Stein

PATRICIA MAY

Abstract

The relationship between film and literature has always tended to be examined in terms of the effect that literary works have had upon cinema. The reverse – that is, the way cinematic techniques might filter into and find expression in works of fiction – has largely been overlooked by scholars. In this essay I examine the work of the American modernist Gertrude Stein, relating her experimental prose to cinematic modes of looking and of experiencing time. Focusing on *Three Lives* and *Tender Buttons*, I argue that Stein not only draws upon philosophical ideas linked to film, but appears to be attempting to replicate cinematic experience as text. Cinema was at this time becoming enormously important to the American experience, as part of a new visual culture linked to photography, advertising, and mass entertainment. I argue that, in drawing on film in this way, Stein is able to capture and replicate a distinct form of “Americanness” – the fast-paced, visually busy, but also fragmented nature of urban life in the early twentieth century.

Much has been written on the impact of literature upon film, on filmic adaptations of literary works and the ways in which literary structures have found their expression in the cinema. The same cannot be said of the reverse: very few scholars have explored in any depth the impact that cinema has had upon the nature of literary forms, or the ways in which film has “infiltrated, contaminated and altered” literature (Murphet and Rainford 2003). This essay is intended as an examination of the manner in which film can be said to filter, consciously and unconsciously, into the structures and preoccupations of American literary modernism. Focusing on *Three Lives* and *Tender Buttons*, I

argue that Gertrude Stein's writing is informed by the cinema in a number of complex ways: stylistically, in her experimental prose, but also in her treatment of time and of the act of looking. In arguing this, I want to draw on ways in which the visual culture that emerged in the early twentieth century has found its way into the very way we perceive and categorise the world around us. I am interested in the way in which this cinematic culture might be thought of as a particularly American phenomenon, or as particularly American in its importance – and how, in turn, the cinematic quality of Stein's writing might be linked to questions of cultural identity.

At this point we might note the tendency within criticism to look to Stein's critical writings when approaching her less accessible works. *Tender Buttons*, in particular, tends to be read through the prism of much later writings, in an attempt to supply it with the coherent meaning that it so obviously refuses to court. This is a useful and convenient way to approach Stein, and one that I intended to draw on. It is, however, an approach that requires caution. Literary celebrity was something that Stein craved from the beginning of her career. Her critical writings almost without exception exist in the form of public lectures, delivered to the Oxford and Cambridge literary societies, and while on tour in America, in the 1930s. In these lectures, Stein explains her theories of literature and the processes of composition that informed several of her works. But while highly useful, these lectures are also problematic, in that their extremely public nature marks them partly as exercises in self-mythologising. Given her repeated references to herself as "if you like being a genius" ("Portraits and Repetition" 1934, 107), I feel that what she tells us in the 1930s, about how she was structuring and thinking about her writing twenty years earlier, is to be taken with a grain of salt.

I am not interested so much in how Stein's work might be said to dovetail with avant-garde cinema, or even with various developments in the visual arts (Stein associated herself with Cezanne and Picasso in Paris – her "Portraits" are sometimes said to be cubist [Hoffman and Murphy 1992, 2; Walker 1984, 20]). Rather I would like to focus more on the *idea* of cinema itself, on the sort of philosophical and perceptual problems associated with it, and how these might be said to filter into Stein's work.

Motion, temporality, time: *Three Lives* and Stein's "continuous present"

Early critical writing on cinema focuses on the fact that it *moves*, on film as a part of "the cultural and conceptual fascination with questions of motion" (Marcus 2007, 18). Cinema as an art form was interesting because it was alive, and was

therefore ephemeral, in a way that no art form had ever quite been before. It could be made to capture life in a way that seemed as realistic as if these captured images had been lived. Yet what the cinema shows us is only ever an illusion: not living but mechanical, a series of frames being fed through a machine. A paradox exists in the liveliness, but intangibility of the medium. As Virginia Woolf wrote in 1926: "We behold [the images on screen] as they are when we are not there. We see life as it is when we have no part in it" (Woolf 1926, 167). Bound up with these questions of the cinema as motion are, of course, ideas of time. The very movement of the cinematic image means that film is one of the only forms of art that is experienced in "real time", and one that can manipulate the sense of time as we experience it. Film alone has the potential to create an illusion of the present moment as *present*, that is, paradoxically vanishing even as it is experienced: any given image in a film disappears almost before we have a chance to process it. From this we might conclude that early theorising about cinema places the new form within a discourse of fading and decay, linking it with the seeming impossibility of capturing life in art – ideas that modernism in general was fascinated with, and with which Stein's *Three Lives* very much engages.

This critical fascination with cinema as a moving art becomes highly important when considered alongside early twentieth century conceptions of what it meant to be American. "Americanness" by this point had come to be linked to movement, speed, velocity: with Taylorism and the production line, with the development of the automobile, with vibrant metropolises like New York, and with the supposedly countless opportunities they offered for social progression and for the gaining of wealth (Murphet 2003, 72). Cinema was made up of images that moved; and America (which, less than two decades after the invention of the medium, would come to be so ubiquitously linked to the film industry), was a country that moved. Stein apparently recognised this, and she takes the idea up in several of her critical lectures. "[T]he American thing," she declares, "is the vitality of movement" ("Portraits and Repetition" 1934, 103). In "The Gradual Making of *The Making of Americans*", she explains further:

Think of anything, of cowboys, of movies, of detective stories, of anybody who goes anywhere or stays at home and is an American and you will realize that it is something strictly American to conceive a space that is filled with moving, a space of time that is filled always filled with moving. ("The Gradual Making of the Making of Americans" 1934, 97).

Stein, connects movement (and here, "the movies") to an American cultural identity. This is highly significant in that it marks the cinema as an essentially American form. It might thus be argued that Stein's appropriation of cinematic

forms in her writing is linked to her cultural identity, to her “Americanness”. It seems possible that she is picking up ideas that exist as a kind of cultural static during the time in which she is writing.

In 1934, Stein described the sort of style she was attempting to achieve in *Three Lives* as “including everything and a beginning again and again within a very small thing” (“Composition as Explanation”, 26). She explains that she set out to create the sense of a “continuous present”, apparently meaning that she wanted to cause the reader to be completely immersed in the experience of the text, to the point that they forget that what they are reading is a linear narrative, becoming caught in the “present” of the story rather than its “past” or “future” (“Composition as Explanation”, 25). Importantly, she repeatedly refers to the “naturalness” of this development. Stein sees herself as a writer articulating modes of being very specific to the time in which she is writing, as tapping into a sort of cultural “zeitgeist”. The experience of time that Stein intended to create with her “continuous present” seems to strike a chord with the way we experience time in the cinema. In her later writings she suggests that this similarity was not deliberate, but the result of the fact that “each of us in our own way are bound to express what the world in which we are living is doing” (“Portraits and Repetition” 1934, 105). We might therefore argue that the cinema filters into *Three Lives* unconsciously, at the level of language. Stein’s technique of “beginning again and again within a very small thing” can be likened to a loop of film being fed through a projector. Her play with syntax and repetition seems to mirror film broken down to its bare components: individual cells which vary only slightly in what they depict, but nonetheless create the illusion of a living, beating, *moving* present.

“Melanctha”, one of the novellas in *Three Lives*, sees Stein develop a distinctive prose style which uses repetition to stall our sense of the passage of time. In doing so, Stein seems to create a style that mimics in its structure and ‘feel’ the technical qualities of a strip of celluloid. Film as a material is essentially made up of an image that is repeated again and again, with tiny incremental differences. When the film is “read” by a projector, the fragments run together and the repetition causes the image to appear on the screen as a moving, living whole. In Stein’s “Melanctha”, the repetition of specific words and entire phrases works in a similar way. It is possible almost to pull any passage out to demonstrate this, but we might focus on an interior monologue from Melanctha’s lover, Jeff Campbell:

Always Jeff knew, sure, Melanctha was wrong in what she had said that night to him, but always Melanctha had had deep feeling with him, always he was poor and slow in the only way he knew how to have any feeling. Jeff knew Melanctha was wrong, and yet he always had a deep

doubt in him. What could he know, who had such slow feeling in him?
What could he ever know, who always had to find his way with just
thinking. (109)

This passage provides a good example of the sort of anaphora that characterises the novella as a whole. Anaphora is the repetition of a word or phrase at the beginning of successive clauses, and it is the near-constant use of this that makes Stein's style in "Melanctha" seem so distinctive. Ideas take much longer to develop in this novella than we might expect, because they are forced to loop back on themselves, in the same way that each image in a film is forced, however fleetingly, to refer to the image that has preceded it. In Stein's case, this repetition is intended to stall the flow of time, and thus cause us to be caught in, almost swept up by, the present moment.

Stein is also able to achieve a stalling of the flow of time in the novella through a play with tense. "Melanctha" is not written in the present tense, but the text has a tendency to use present-tense verbs, with a repetition of the "ing" sound featuring prominently. Thus, for instance, we have "he was really feeling" instead of "he really felt", "he was beginning to really have understanding" instead of "he began to really understand" (90). A sing-song texture emerges as a result of this which is significant in that it seems childish. It almost suggests that Jeff and Melanctha are not adults, that they are incapable of the sort of retrospective analysis that would be implied by "he began to really understand" and are experiencing the world with the simple directness of childhood. Time ceases to be something rational, linear and measurable and becomes, for them, something amorphous, loose, extremely present. (Though, it must be said, this play with tense can also be linked to primitivism in the work, to Stein's depiction of African-Americans as incapable of using language with sophistication).

"Melanctha" also reveals its indebtedness to film in some of the ideas that it plays out at the level of its plot: specifically, the idea that it is impossible to truly "know" or understand what seems present or tangible to us. This idea can be linked to the early philosophical conceptions of the cinematic image outlined earlier – as something ephemeral and slightly disturbing, showing us the world as it is when we are not present, creating a "reality" that is more beautifully real than life itself but that we can never touch or access. Regardless of how close they get to one another, Jeff and Melanctha seem not to be able to connect, and they are never able to experience their closeness without an anxious sort of intellectualising, a questioning of what each actually means to the other and what the feelings they are experiencing actually indicate. In its depiction of their relationship, the text is playing with a paradox: the moment as it is lived is passing too. As Charney puts it, for modernists, "The simple single moment was conceived as inconceivable both because the moment is always already gone

before we can perceive it and because the single moment is therefore extended beyond any one moment" (Charney 1998, 30). This is a profoundly cinematic way of viewing time and human experience.

Stein's play with technique in "Melanctha" does not fully achieve what she claims to have intended. She appears to have meant the aesthetic of the "continuous present" to create a sense of cinematic velocity – a sense of time experienced as it is in reality, and therefore, as it can be in the cinema. But Murphet notes that the use of technique in *The Making of Americans* actually "tended to stretch events out over intolerable periods" (Murphet 2003, 78), a critique which can definitely be extended to *Three Lives* and to "Melanctha" in particular. Stein's play with syntax and repetition does not produce the feeling that we are caught in the present moment as it is lived, but rather that we are in a kind of limbo, ceasing to move at all. "Melanctha" is in many ways difficult and tedious reading, with its seemingly unending stretches of "I am certainly now feeling" and "I am certainly now beginning to be feeling". If we forget "future" and "past" in the text it is because we are bogged-down in the language, caught in circular passages where repetition has the effect of stripping words of meaning. The shape of Stein's prose might well recall a strip of film, but she fails utterly to capture film's vivacity and liveliness in the "time-sense" of her work.

Looking and excess: *Tender Buttons*

Murphet contends that the "aesthetic break into 'movement-images'" is not achieved until *Tender Buttons*, Stein's highly experimental book-length prose poem (Murphet 2003, 78). This work is inherently cinematic, and appears to be about the act of looking. *Tender Buttons* essentially consists of a series of portraits, not of individuals, but of household objects and familiar rooms, made abstract, distorted, disconnected. It is almost as though Stein is attempting to unravel meaning: she begins with a recognisable noun, and then spins outwards in what seems to be a nonsensical stream of associations. The poems resist coherent reading, and *Tender Buttons* represents Stein at her most difficult and inaccessible. I want to argue that the work's disorienting stylistic qualities can be linked to the privileging and decentring of vision that comes about with the introduction of cinema and the rise of modern visual culture. They can also, as Murphet (2003) argues, be seen as an extension and refinement of the aesthetic of the "continuous present".

It is the belief of many critics that the introduction of cinema changed the very way that humans perceive and categorise the world around them. North observes that "a fundamentally different kind of visual experience is available

to the modern eye" (North 2005, 178). Cinema is recognised as belonging to a broader cultural phenomenon: as Charney points out, it "comprehensively brought together the attributes of modernity's distractions and entertainments" (Charney 1998, 82). North (2005) links the rise of modern visual culture to development of advertising, to the modern metropolis as a visually busier space, even to the new sort of "looking" that comes with the advent of high-speed travel in trains and automobiles. With the rise of visual culture modernity itself becomes a "flashing, fleeting experience" like "the moment of shock" (Charney 1998, 47). The increased pace and variety of visual experience was held by theorist Walter Benjamin, and others to have actually altered the sensory organisation of human beings (Charney 1998, 47 – 48). North (2005), indeed, notes that this idea came to be so crucial to the thinking of twentieth century theorists that these "supposed changes to the human sensorium have come to represent modernity itself" (185). In light of this, the privileging and questioning of vision that Sitney (1990) finds in modernist writing takes on a new importance. According to Sitney, modernist literary works "stress vision as a privileged mode of perception, even of revelation, while at the same time cultivating opacity and questioning the primacy of the visible world" (Sitney 1990, 2). This can be directly connected to the shift in the nature of visual experience brought about by the rise of modern visual culture, and the advent of cinema.

Stein herself notes the importance of looking to her project in *Tender Buttons*:

I did express what something was, a little by talking and listening to that thing, but a great deal by looking at that thing. This as I say has been the great problem of our generation, so much happens and anybody at any moment knows everything that is happening that things happening although interesting are not really exciting. ("Portraits and Repetition" 1934, 112 - 113, my emphasis).

Stein is no longer interested in "everything that is happening" – in narrative, in events, perhaps even in human relations, because "things happening although interesting are not really exciting". In *Tender Buttons* she turns her attention instead to the mute, still world of objects and spaces, bringing this to life in a vibrant, nonsensical, and definitely "exciting" way. I want to argue that Stein, whether intentionally or not, creates a sort of "looking" in this work that is actually mechanical, analogous to what the movie camera does, and not to what happens when the human eye "sees".

At this point I would like to mention theories of "cinematic excess", a concept that can help to illuminate what Stein is attempting to achieve. It refers to the idea that the cinematic image always captures more information than it means to: that it is impossible to control beyond a certain point what the camera sees,

because it captures everything that is in front of it (Thompson 1986, 131). This is in contrast to the human eye – which does not “see” exactly what it sees, because the brain invariably processes and rearranges the information it receives into a coherent image. Excessive elements exist outside the limits of the film’s intention, and are therefore both “counternarrative” and “counterunity” (Thompson 1986, 134). Thompson shows how seemingly trivial detail can distract the viewer, draw attention away from the narrative and thus work against the “meaning” of a film – producing a sort of odd parallel-reading that calls into question the ability of the image to make meaning at all (Thompson 1986, 138).

Examining *Tender Buttons* through this idea of excess might go some way towards explaining its difficulty, and even account for the fact that so many hesitate to approach this work critically without the prism of Stein’s lectures for support. Of course this reading is drawing on theories that do not come into being until a good sixty years after *Tender Buttons* is written. But in attempting to create a sort of “looking” that mimics the mechanical, all-seeing eye of the camera, Stein’s work necessitates the inclusion of excessive elements. It seems fairly simplistic to point out that *Tender Buttons* resists coherent meaning. If nothing else, bringing the concept of cinematic excess to the work allows for an analysis that goes at least a little way beyond this observation.

Syntactical play is taken to a new extreme in *Tender Buttons*: syntax is not only altered, but blown utterly apart. The work seems on a first reading to be made simply of random words, squashed together without punctuation. The syntactical play might be said to build on what we see in “Melanctha”. In that novella, sentences are broken in a way that both captures the dialectical qualities of African-American speech, and disrupts our perception of the passage of time. Here, though, syntax is not simply fractured to produce a particular effect, but ripped apart, with phrases consisting of a jumble of words that do not follow a recognisable pattern and thus barely make sense (“There is no way to see in onion and surely very surely rhubarb and a tomato” [176]). The difficulty of the work seems to stem largely from this disunity, from the seeming randomness with which “sentences” are constructed. This fracturing of the work might be compared to other key modernist texts: *The Waste Land* by T.S. Eliot (1922), for instance, is also made up of fragments, and it too appears at times to be nonsensical. Yet certain definite themes, of decline, barrenness, and ennui, emerge when Eliot’s poem is considered as a whole. The same cannot be said of *Tender Buttons*. The work has almost no thematic unity, because it resists meaning at the level of language. Unity perhaps only exists in its general structure: in the titles of each of the prose poems, which signal to us the fact that the work, if it is “about” anything, deals with the act of looking at ordinary spaces and objects, in a way that disconnects them from recognisable experience.

Detail in *Tender Buttons* can be termed "excessive" because of its volume and apparent uselessness: it does not serve any discernable purpose beyond "offering itself for perceptual play" (Thompson 1986, 133). Stein jams fragmented glimpses of familiar environments into awkward or nonsensical clauses: "A single speed, the reception of table linen, all the wonder of six little spoons, there is no exercise" (190). The work is composed almost entirely of these frenetic, half-glimpsed images, which, though often quite beautiful, are also equally distracting and equally disorienting. Returning to the idea that *Tender Buttons* is about looking, we might remark that there is no one part of it as an "image" that our eye is directed to. This excess of detail makes it difficult to make critical judgements about the work. As Thompson (1986) writes, cinematic excess is extremely difficult to write about because "[a]nalysis implies finding relationships between devices", but excessive elements, perhaps because they are a by-product of the nature of the cinematic apparatus, "do not form relationships, beyond those of coexistence" (134).

Stein requires her readers, if they persist with the work, almost to drown in the barrage of imagery presented in *Tender Buttons*. The titles of the prose-poems are all that we are offered in the way of a concrete referent: "GLAZED GLITTER", "A BOX", "A RED HAT". The third chapter of the work, "Rooms", differs in that it is not composed of these short poems, but paragraphs which run together. This makes it the most interesting and frustrating section to approach. Without the titles, there is nothing to anchor or ground us in the text. Responses to this section seem likely to take one of two forms. Either we might suspend logic, the unconscious search for meaning in the piece, and "lose" ourselves in the language, in the barrage of imagery; or we might resist its dense meaninglessness, and thus immediately lose the ability to concentrate on it. If our response falls along the lines of the former, we can surely see what Murphet means when he suggests that this work represents the realisation of the cinematic "time-sense" Stein was attempting to create in her earlier writings (Murphet 2003, 78). *Tender Buttons* can be seen to achieve the sense of the "continuous present", the feeling that, as we read, we are experiencing the present moment unfolding and vanishing, unfolding and vanishing, that Stein claimed she had created through her games of repetition in earlier novels. *Tender Buttons*, however, requires a very particular, open, detached style of reading in order to be successful in this respect.

Thompson (1986) points out that "most viewers are determined to find a necessary function for any element the critic singles out. For some reason, the claim that a device has *no* function beyond offering itself for perceptual play is disturbing to many people" (133). In the end, *Tender Buttons* may be unsettling because the images or signs it contains are not actually meant to convey anything in particular, but are instead a sort of excess, the result of an attempt on Stein's

part to see the world anew, through mechanical eyes. A kind of meaning arises out of the juxtaposition of the images with one another, but this “meaning” is uncertain, disturbing, a function of the way we are trained to read (and view) images rather than the result of a specific idea Stein means to advance. It may be, in fact, that in *Tender Buttons*, “The stamp which is not only torn but also fitting is not any symbol. It suggests nothing” (191).

Conclusion

Despite the fact that Stein only claimed a passing interest in cinema, and claimed this only in retrospect, ideas about looking, and the new ways of “seeing” brought about as a consequence of modern visual culture, nevertheless filter into and find expression in her work. *Three Lives* reveals its indebtedness to cinema in the way that it plays out modernist philosophical ideas about the fleetingness and ephemerality of the cinematic image at the level of its plot: dealing with the inability to know or to directly experience the present moment. “Melanctha” can also be linked to cinema in that Stein’s technical experiments in this novella, and in works that followed it, was intended to create a sense of time as it is experienced in a film: a “continuous present”, “a beginning again and again within a very small thing” (Composition as Explanation 1926, 26). *Tender Buttons* is an abstract work that seems to reproduce the sort of detached, mechanical “seeing” that is a function of the camera – though in this case it is a “camera” without human intention at the other end of it, left to pick up everything in front of it. What results is a jumble of visual detail that leaves the reader adrift in “waste and excess and mess” (Charney 1998, 33).

We might well ask to what degree can this sort of analysis be applied to other modernist works of fiction. Do we require a specific statement from the author about a work’s relationship to cinema, as we are lucky enough to have with Stein, to entitle us to examine writings with the influence of cinema in mind? Stein, of course, was writing at the very dawn of cinema. Visual culture since then has exploded in ways that have surely been beyond the imagining of anyone at the turn of the last century: not only with the introduction of television, but the rise of personal computers and the internet, gaming, the development of smart phones, and so on. Current popular debate as to whether digital culture changes the way that our thought processes function, leading to a decline in our ability to concentrate on sustained tasks, and to a difference in the way we comprehend and consume information, seems to very much echo scholarly debate about the way in which the advent of cinema affected the sensory perception of human beings. It therefore seems surprising, and perhaps disappointing, that more

comprehensive studies of the way cinema, and visual culture, have "infiltrated, contaminated and altered" (Murphet and Rainford 2003, 1) literary forms, have not been attempted.

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