Title : A Radio Study of Selected Regions in the Magellanic Clouds

Thesis and dissertation Writing by Partridge + Starfield 2007 (handwritten margin note)

Box 6.2 Extract from Introduction of a PhD thesis in physics

Chapter 1
Introduction
1.1 Overview

Claiming centrality

The Magellanic Clouds provide a unique environment in which to study many *interesting* and astrophysically *challenging* problems. They are relatively nearby, have a position which makes them observable for the entire year and they provide *ideal* case studies to investigate many classes of sources. Although distances to both the Small and Large Magellanic Clouds are still somewhat uncertain, they are relatively well-known, allowing detailed quantitative studies to be undertaken. The Clouds have been studied over a wide range of frequencies, from low-frequency radio observations through to satellite based gamma-ray studies. — 1a / 1b

Establishing a research territory

The Magellanic Clouds are one of the prime observing targets for the Molonglo Observatory Synthesis Telescope (MOST). Soon after the instrument was commissioned in 1981 an observing programme to survey both the Small and Large Magellanic Clouds was undertaken. Operating at a frequency of 843 MHz with an angular resolution of 44 arcsec, the MOST was the highest angular resolution aperture synthesis radio telescope in the southern hemisphere in regular use at that time. The resulting sub-arcminute angular resolution images provide an excellent base from which to select objects for further study. The MOST Magellanic Cloud surveys were in progress when the work reported here was started and the images from the MOST Small Magellanic Cloud survey have since been published in Turtle *et al.* (1998). — 1b / 1c

The MOST is a powerful imaging instrument particularly suited to radio surveys and to imaging, in a single 12-hour observation, sources with complex extended morphologies. In addition to 'full synthesis' observations, an observing mode called 'CUTS' can be used in which around 10 sources are each observed for a few minutes with a cadence of approximately one hour over the course of an observation. In this way a number of sources can be imaged in a single observing session, allowing a survey of a large number of sources to be undertaken in a relatively short amount of total observing time. *However*, the MOST *is restricted* to a single observing frequency, a relatively narrow continuum bandwidth of 3 MHz, fixed right-circular polarization and a fixed physical configuration. — 1d

Indicating a gap — 2a

In the early 1980s, the pressing need for a frequency agile synthesis radio telescope in the southern hemisphere was acknowledged. This need was addressed by the official opening of the Australia Telescope in 1988, with regularly scheduled observations commencing in May 1990.

The Australia Telescope Compact Array (ATCA) is a sparse radio synthesis array, with 15 baselines compared to 351 for the Very Large Array (VLA) and 40 for the Westerbork Synthesis Radio Telescope (WSRT). It was envisaged that to provide good spatial frequency coverage, four separate observations in different baseline configurations would be required to adequately image a typical radio source. In practice, such usage would have precluded the use of the ATCA to survey a large number of sources. At the time, this raised questions such as: — 1d

Extending previous knowledge

- Was a survey of a large number of sources in a small number of observing sessions achievable? — 2b
- Would a "CUTS"-type observation with the ATCA be successful for compact sources?
- Given the small number of baselines, could the resulting images be deconvolved and used for quantitative analysis?

Occupying the niche

This thesis presents the results of an observing programme which used preliminary Magellanic Cloud survey images from the MOST to select sources to be studied with the then new ATCA. To test the viability of the "CUTS" technique for the ATCA, a single 12-hour observation at 4790 MHz was made in May 1990, targeting seven sources and two calibrators in the Small Magellanic Cloud (SMC) over I-hour cycles. The reduced data produced images of satisfactory quality to enable quantitative analysis including the determination of peak and integrated flux densities and the angular extent of the source. The observing programme was therefore extended to include further sources in both Clouds over a 12 month period. At that time only 5 ATCA antennas were operational, giving just 10 baselines. The observing techniques outlined here were extremely fruitful, and are now the basis for many continuum observations with the ATCA, made with the full set of 6 antennas and 15 baselines. — 3a / 3e / 3b

The properties of 61 compact radio sources in the Clouds are presented in this thesis, including flux densities at frequencies from 408 MHz to 8.6 GHz, radio spectral indices, and the presence of coincident X-ray emission and likely classification of the emitting object. These studies have had significant scientific implications, including the selection of source candidates for other survey work and detailed studies of individual objects, two of which are the subjects of detailed chapters of this thesis*. — 3b / 3c in part

* Move 3c, titled *Thesis Outline*, is found in full in 1.4 of this thesis chapter.

CARS framework = Creating a Research Space

Table 6.1 Typical moves in thesis Introductions

Move 1	*Establishing a research territory*
	a by showing that the general research area is important, central, interesting, problematic, or relevant in some way (optional)
	b by providing background information about the topic (optional)
	c by introducing and reviewing items of previous research in the area (obligatory)
	d by defining terms (optional)
Move 2	*Establishing a niche*
	a by indicating a gap in the previous research, raising a question about it, or extending previous knowledge in some way (obligatory)
	b by identifying a problem/need (optional)
Move 3	*Occupying the niche*
	a by outlining purposes/aims, or stating the nature of the present research or research questions/hypotheses (obligatory)
	b by announcing principal findings/stating value of research (optional)
	c by indicating the structure of the thesis and providing mini-synopses (previews) of each subsequent chapter (obligatory)
	d by outlining the theoretical position (optional)
	e by describing the methods used in the study (optional)

Source: based on Swales and Feak 1994: 175 and Bunton 2002: 67

Box 6.3 Extract from Introduction of a PhD thesis in history

Chapter 1
Introduction and thesis
Overview

Introduction

In this introductory chapter the background to the present research study will be provided along with an outline of the principal theoretical propositions. The chapter will also set out the research problem and the associated research questions that the thesis seeks to address. The justification for the research and a statement of the contribution the thesis makes to the field of sports studies follows. Finally, a brief overview of research methodology will be included along with an outline and diagrammatic representation of the structure of this thesis.

Advance organizer

Occupying the niche

This thesis is an investigation of the sporting experiences of women from culturally and linguistically diverse backgrounds in Australia. Women from diverse cultural and linguistic backgrounds are a sub-population that has been identified as the 'other' in previous research
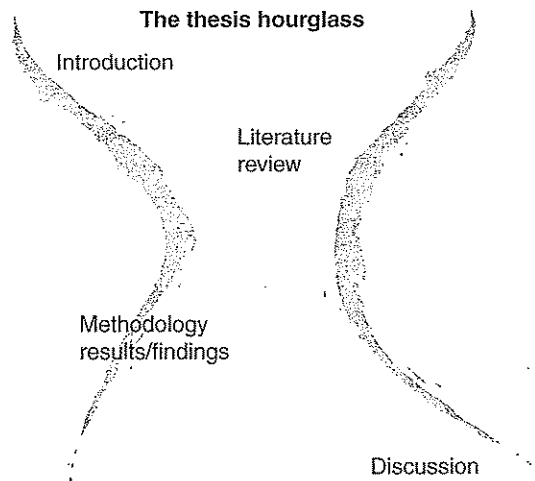
3a

The thesis hourglass

Introduction

Literature review

Methodology results/findings

Discussion

Figure 6.1 The thesis hourglass
Source: adapted from Atkinson and Curtis 1998: 52

Establishing a research territory	(hooks, 1989; Prakash, 1994). Sport theorists that have researched 'otherness' suggest that individuals and groups from outside the mainstream have been historically marginalised in dominant discourses of sports (Bhandari, 1991; Hargreaves, 1992; Long *et al.* 1997). In Australia, the under-representation of this sub-group of women has been quantitatively documented across all dimensions of sports involvement. Previous studies have indicated that women from culturally and linguistically diverse backgrounds are significantly less likely to participate in sports activities (Australian Bureau of Statistics, 1998), engage in physical activity (Armstrong, Bauman and Davies 2000) or become sports spectators (Australian Bureau of Statistics, 1998). Women from culturally and linguistically diverse backgrounds are also less likely to hold either volunteer roles or paid positions in sports organisations (Fitzpatrick and Brimage, 1998). *However,* existing research does not explore on why this under-representation occurs. Neither does it comment on how females from culturally and linguistically diverse backgrounds think about and experience sports. The research undertaken for this thesis seeks to explore how the construction of sports discourses and the organisation of sports have influenced these women's sports experiences. It will be argued that the formation of gender and ethnicity relations in sports organisations has been constituted by culturally institutionalised meanings, actions and explanations that are systemically exclusionary of women from diverse cultural backgrounds. As such, this thesis responds to the call to action by many sports studies academics who have suggested that research about migrant women and sports has been neglected for far too long (Costa and Guthrie, 1994; Hall, 1996; Hargreaves, 1994; Theberge and Birrell, 1994a). The research focuses on the intersecting domains of gender, sports and ethnicity and the implications thereof for sports theory and practice. It has been previously identified that existing research on this topic is sparse (Adair and Varnplew, 1997; Australian Sports Commission, 2000; Booth and Tarz, 2000; Hall, 1996; Mosely, 1997; Rowe and Lawrence, 1996). Given the identified gap in sports studies, this thesis has the potential to provide a better theoretical and practical understanding of sports, gender and cultural diversity.	1b & c
Establishing a niche		2a
Occupying the niche		3a 3d
Establishing a niche		2b
Occupying the niche		3a
Indicating the gap		2a
Indicating gaps	Women's studies, sports studies and migration studies have each developed their own philosophical and conceptual approaches to researching their constituent populations but each has seemingly neglected theory development about the nexus between women, sports and ethnicity. Over the last few decades feminist studies have extensively and intensively debated the role that cultural institutions	2a

	play in promulgating male hegemony; the ensuing power relations that are created, maintained and reinforced by these institutions; and the opportunities that women have to contest and resist a gendered construction of society. Initial feminist treatises proposed grand theories, which were applied to all women, however these theoretical assumptions have now shifted and recent works recognise that 'women' are not a homogenous group. In particular, feminists have delved into issues surrounding the marginalisation of women who do not fit into Eurocentric, middle-class, Western 'White' theorisation within poststructural theory (Prakash, 1994; Spivak, 1988). Poststructural feminists have further suggested that	
Establishing a niche in feminist literature	all studies of women need to acknowledge non-white, ethnic minority women and rethink how social identities and forms of knowledge can encompass the 'other' (hooks, 1989).	2b
Gap in sports studies	Research on questions of racial and cultural differences in sports appears to have been slow to respond to poststructural feminist imperatives, with research primarily located within androcentric paradigms (Thommson, 1998).	2a

Source: Taylor 2000: 1–2

Conclusion

The CARS framework has been found to be a useful way of assisting thesis writers with developing a structure for their Introduction that enables them to clearly indicate to the reader what the significance of their thesis is. It should not however be seen as rigid and inflexible: it is a tool for understanding how writers within different disciplines attempt to persuade their readers of the validity of their arguments for the research space they have created.

Writers of completed theses will often report that the Introduction was the last chapter that they wrote and many experienced writers of journal articles report a similar phenomenon. For some, the introductory section is one of the hardest to write. While it can be argued that one only knows where one is going once one has arrived and that is why the Introduction can only be written at the end of the journey, it is important to at least draft the Introduction – and the research proposal will, to a degree, be that draft – so that it can be redrafted as the thesis evolves until finally the overall meaning of the thesis emerges. As Levine (2002) puts it, Chapter 1 – the Introduction – needs to be 'rewritten' with the insights gained from having drafted the complete thesis. The Introduction may also 'tidy up' the somewhat messy, circular process of the research and make it appear more linear and logical.

A final point concerns the article-compilation thesis – a collection of published papers, prefaced by an Introduction and a concluding chapter – which