

Preface

The seed for this book was planted in the early 1970s, at an undergraduate seminar on new trends in biology, where my class was told that ‘multidisciplinarity’ was the way of the future. But where, I wondered, did multidisciplinarity have its academic home? My lecturers had already supported me in enrolling in joint science and arts degrees, but it turned out that I was the first at the university to do this and there was no-one else undertaking anything similar. Where could I find other students with the same interests and a faculty dedicated to multidisciplinary research and teaching that I could eventually join? My career is defined by that search. Along the way I tried different kinds of what came to be called ‘interdisciplinary’ and ‘transdisciplinary’ research, but none was quite right. I did not know what I was looking for; I just knew I had not found it.

Twenty years after starting my quest, I had the opportunity to try out my evolving ideas as the leader of an investigation into the feasibility of prescribing diamorphine (pharmaceutical heroin) to treat heroin dependence. By the end of what turned into a seven-year project, the methodology was widely praised and I was encouraged to apply it to a new problem. It took a while to figure out what to do next, but I decided that rather than work on another specific issue, I wanted to try to systematise the approach, much of which had been intuitive. That way it could be applied by others and maybe even underpin the intellectual home I had been seeking. I brought in ideas from a range of areas—including systems thinking, the study of unknowns and public policy—of which I was previously ignorant or only dimly aware. Twelve years later this book is the result.¹ It proposes a new research style (integrative applied research), a new discipline (Integration and Implementation Sciences or I2S) and a Big-Science-type project (the I2S Development Drive).

This book aims to enlist you in the further development of these ideas, as a contributor or a critic or both. The structure of the book is unusual as it combines a single-authored proposal (Chapters 1–34) with 24 commentaries (Chapters 35–59). Let me first say something about my proposal. It paints a big picture covering a broad sweep of territory. Reading it requires a large measure of goodwill.² My challenge has been to provide enough detail to engage you, without alienating you because of the inevitable imperfections. I do not ask you to set aside criticism and scepticism. The ideas must prove themselves. But in trying to cover so much terrain and in stripping out complexities to make the arguments straightforward, there are inevitably many gaps and errors.

1 I have published various versions of the ideas along the way, especially Bammer (2005). Since that paper I have reduced the links with information science and ‘repackaged’ the other ideas.

2 Checkland (1984, p. 11) introduced me to the notion of reader goodwill.

This preface documents the origins of my ideas and acknowledges the most important contributors. It will also help explain the grounding of my approach and some of the holes.³

In writing the proposal, I soon realised that the relevant material and range of experts are vast and that if I tried to be thorough in including them all, I would never finish. Instead I hit on the idea of a range of commentaries, which would start to highlight missing areas, along with points of debate about the proposal.⁴ I was not asking the commentators—some I know well, others I have only met briefly—for endorsement, but for critical appraisal, and am delighted with how well their contributions have filled that role. Furthermore, the point of the commentaries was not to provide material for modifying my proposal. Instead, they begin a process of engaging a much larger set of proponents and critics to determine if the way forward presented is desirable and feasible. I hope that you will be inspired to join this endeavour and that you too will see gaps and areas of disagreement as opportunities to participate.

The Book's Origins and Acknowledgments

On this long journey I have benefited from much collegial support, as well as criticism, both of which have motivated improvements and sharpened ideas. In the brief acknowledgments that follow, I include people, funders and organisations pivotal in the formative experiences and provide short accounts of how I connected with each of the commentators.

Beginning

The undergraduate seminar that laid the foundations for my career occurred at the Flinders University of South Australia. I remember with appreciation a vibrant campus and smart, engaged lecturers who were trying new ways of presenting their subjects. In biology, for example, the traditional disciplines like botany and zoology were replaced with a unifying focus on the cell. I particularly valued being pushed to stop parroting and to think critically and creatively by the lecturers, tutors and demonstrators in biology, psychology and geography, as well as in first-year physics, chemistry and mathematics.

I moved to the University of Sydney to undertake my PhD and was given the opportunity to work at the intersection of pharmacology and psychology.

3 For example, I acknowledge that the lack of a strong theoretical base is a consistent criticism of my work. I agree that such a grounding is important, but it is not where my expertise lies.

4 All those invited were not able to contribute. A consequence is that some important areas are missing from the commentaries.

Although I eventually decided that that was not the kind of interdisciplinarity I wanted to pursue, I am grateful to Greg Chesher (my supervisor) and David Jackson, who provided guidance during those years.

The Australian National University and the ‘Heroin Trial’

Most of my career has been spent at The Australian National University (ANU), where I have been employed in various capacities since 1979. The most important of those jobs was my appointment in 1989 to the National Centre for Epidemiology and Population Health (NCEPH), where I still work and which I currently head. Before describing that period, let me mention two earlier appointments at ANU that were also influential. One was with the (then) Human Sciences Program, where Ian Hughes, Rosemary Brissenden and David Dumaresq were innovative in interdisciplinary teaching. The program also introduced me to others interested in interdisciplinarity, notably Brian Martin who helped me appreciate that knowledge is socially constructed. During that period I made the switch away from research using animal models of human behaviour to studying humans directly.

The second key position was with the Research School of Social Sciences where I was employed in the Director’s office to investigate a new disorder (RSI or repetition strain injury, as it was called at that time) resulting from the introduction of computers into offices. That gave me a first taste of examining a problem from various disciplinary perspectives, although this was not team based but largely relied on me finding and employing a range of different methods. Thanks go to Sue Wilson and the committee she chaired, which oversaw the research, as well as to Ilse Blignault who was also investigating the disorder and became a collaborator. It was my first experience of working with stakeholders and I am grateful to many individuals, especially a number of affected ANU employees and people associated with the RSI and Overuse Injury Association of the ACT and other groups, who provided numerous valuable lessons.

Much of my research from 1991 to 1997 involved investigating the feasibility of prescribing diamorphine to dependent heroin users (the ‘heroin trial’). I will always be grateful to Bob Douglas, NCEPH’s inaugural director, for giving me the opportunity to implement my ideas about interdisciplinary research, providing a lively environment in which to work, and teaching me about taking risks. The project was a collaborative venture with the Australian Institute of Criminology and I also want to acknowledge the Institute’s three directors over that period: Duncan Chappell, Grant Wardlaw and Adam Graycar. I ran the project by establishing numerous small teams that worked in parallel and in different ways. For example, some were grouped around a disciplinary expert investigating a discipline-based question, others brought together drug users,

police or treatment service providers to think through an aspect of a trial that might affect their lives or work, still others mixed disciplines and stakeholders to examine different angles for a particular issue. I do not have strong views about drug dependence and this allowed me to take a disinterested stance and to work with opponents as well as supporters of diamorphine prescription, as well as to take a comprehensive view of what could potentially go wrong in a trial.

At various key points during the research, I was responsible for drawing together the results from the different teams and I formulated the final recommendations, although Bob Douglas and the relevant Australian Institute of Criminology director provided oversight and support. There were scores of collaborators, some of whom provided insights into their disciplines, others into their lives as drug users, police or treatment providers. The names of those involved are acknowledged in various publications emanating from that time, especially the major reports.⁵ I also got to better understand the workings of the media, as they were intensely interested in the feasibility research throughout. And, finally, the process involved long and sometimes very intense periods of interacting with government policy makers.⁶

Collaborations continued with some people on subsequent projects and I particularly acknowledge Phyll Dance, Bev Sibthorpe, David Legge, Robyn Attewell and Sue Wilson, as well as Michael Moore who was the politician who sparked the feasibility research. As the following account will show, David McDonald, with whom I also first worked on the feasibility research, has been a consistent and valued collaborator.

Research and Other Activities after the 'Heroin Trial'

As I started working through ideas that might help me understand the intuitive processes used in the diamorphine trial feasibility investigation, I continued to do more conventional research. Even so, in most of it I was able to further develop aspects of what became integrative applied research and Integration and Implementation Sciences (I2S). Let me briefly acknowledge the key people, projects and funders here, in roughly chronological order.

Margaret Hamilton, who had been on the diamorphine trial feasibility study advisory board, invited me to work with some of her staff at Turning Point in Melbourne investigating other new pharmacotherapies for heroin dependence and then enlisted me to help her design what was to become the Drug Policy Modelling Program.

5 These can be found at <<http://nceph.anu.edu.au/research/publications>> and <<http://digitalcollections.anu.edu.au>> (both accessed 19 September 2012).

6 In the end, the Government decided not to support our final recommendation, which was to conduct a small pilot study, followed by larger trials if the results warranted such progression.

Alison Ritter (one of the commentators), who heads the Drug Policy Modelling Program funded by the Colonial Foundation Trust, was a supportive and reflective collaborator. I was able to conduct a number of influential projects through the program, especially a symposium on uncertainty, a reading group on the research–policy interface, work for a book on dialogue methods and a project on common metrics, about which there is more below. Later I also describe spin-off projects involving the other Drug Policy Modelling Program chief investigators: Paul Dietze, Pascal Perez and Lorraine Mazerolle.

The work of Michael Smithson (another commentator) on unknowns provided the stimulus and basis for one of the major components of I2S (see Domain 2, Chapters 10–16), and I have valued working with him on these significant ideas. We ran the symposium on uncertainty together and the participants (named in the book *Uncertainty and Risk: Multidisciplinary perspectives*) provided many significant insights.

Lyndall Strazdins, David McDonald, Peter Deane, Helen Berry and Lorrae van Kerkhoff, together with Alison Ritter and myself, formed the reading group on the research–policy interface. That line of work was continued through the Australian Research Alliance on Children and Youth and a partnership with Ann Sanson and Annette Michaux, where we ran a series of workshops and produced an edited book.

David McDonald, assisted by Peter Deane, led the work on the book *Research Integration Using Dialogue Methods* and the common metrics project. The former was co-funded by Land & Water Australia and the finished product was launched by Ted Lefroy (one of the commentators). Lyn Stephens joined us on a follow-up project.

Alice Roughley (a commentator), while at Land & Water Australia, co-organised (with Catherine Mobbs) a symposium on ‘integration’, at which they asked me to pull together the key findings. That was where I first presented the ideas that would become the core (five-question) framework, which were embellished and endorsed at the meeting. Alice later arranged for me to consult for the Desert Knowledge Cooperative Research Centre on their knowledge synthesis activities and subsequently joined NCEPH to lead a project about organisational and other barriers and facilitators to integrative applied research.

David Moore and Paul Dietze invited me to collaborate on a National Health and Medical Research Council funded project about psychostimulant use, where we brought on board Pascal Perez and Anne Dray to merge epidemiological and ethnographic insights using agent-based modelling.

Lorraine Mazerolle enlisted me to join her as a chief investigator on a successful bid to establish the Australian Research Council Centre of Excellence in Policing

and Security and to head up a crosscutting integration and implementation program, which is still under way. Through that centre I got to know Michael Wesley (a commentator), who was one of the other chief investigators. (He also kindly launched the book *Uncertainty and Risk: Multidisciplinary perspectives*.) When Lorraine stepped down as Director, her place was taken by Simon Bronitt (another commentator), with whom I had first worked when he wrote a paper on criminal liability for the diamorphine trial feasibility research. Participation in the Centre of Excellence allowed me to continue various projects on unknowns with Michael Smithson, as well as enabling me to progress work on 'Executive Sessions' (see Chapter 20 for more explanation). David McDonald and I undertook a project with the chief investigators and other senior researchers about their experiences in influencing policy and practice. Jen Badham is currently taking the lead in writing a book about different modelling methods.

Michael Smithson, Alice Roughley, David McDonald, Jen Badham and Lorrae van Kerkhoff at various times contributed to teaching nascent I2S ideas to Australian integrative applied research leaders in short courses.

The Australian Council of Learned Academies hired me as a consultant to undertake a project entitled 'Strengthening Interdisciplinary Research: What it is, what it does, how it does it and how it is supported'. Not only did I benefit from stimulating discussions with the steering committee, but I also had the opportunity to interview some of Australia's leading figures in research policy and interdisciplinary research practice, among them Glenn Withers (a commentator).

Lawrence Cram (another commentator), as the (now former) ANU Deputy Vice-Chancellor (Research), has been a supportive and valued sounding-board for many years and also provided input into the symposium on uncertainty, as well as the Australian Council of Learned Academies project.

Over the years, I have watched the transformation of CSIRO with great interest and had many profitable interactions with the organisation's researchers and leaders, including especially Deborah O'Connell, Daniel Walker and Ian Elsum, who all provided commentaries.

International Influences

There were also many important international collaborations and activities, of which I mention only the most significant here. Participation in the inaugural Fulbright New Century Scholars program in 2001–02 was particularly influential. Valerie Brown, with whom I had had numerous discussions about 'interdisciplinarity' over the years, encouraged me to apply and Ilona Kickbusch, who led the program, was supportive, as were the other fellows. The

novel aspect of this program was that the scholars were all working on the same problem (in our case global health) and we met as a group, as well as spending time at our placements.

The Fulbright program made it possible for me to spend six months at Harvard University's Kennedy School of Government, where I have subsequently held a research fellowship. I chose this as my primary affiliation because it was completely outside my comfort zone and I figured it was probably the toughest environment in which I could put myself. The time I spent there was exhilarating and my plan to write a version of this book then came to nothing, while I instead revelled in the intellectual delights the Kennedy School offered. Most importantly I learnt to think big. The courage to propose a new discipline and a Big-Science-type project (the I2S Development Drive) to establish it stem from that experience.

Mark Moore, then head of the Hauser Center for Nonprofit Organizations, made my placement possible. I benefited from numerous insights in our discussions, not only during the time I was located there, but also during subsequent visits. Mark provided valuable feedback on an early draft of this book. In addition, he and Frank Hartmann participated in many hours of interviews about the Executive Sessions they had organised and run (see Chapter 20). Caryn Anderson helped transcribe and analyse these, along with interviews with some participants and others involved in organising these events. Later, I was very pleased to transfer my research fellowship to the Program in Criminal Justice Policy and Management, as well as to participate as an observer in the Executive Session on Policing and Public Safety and to discuss the process with the facilitator, Christine Cole.

David Brown (a commentator) helped make my original stay at the Hauser Center productive through a collaboration on practice–research engagement (which also involved Srilatha Batliwala and Frances Kunreuther) and it remains a topic of ongoing discussion. Through the Hauser Center I met Sanjeev Khagram, who sparked my interest in the World Commission on Dams.

Bill Clark and Nancy Dickson, also at the Kennedy School, were generous in discussing my ideas while I was at Harvard and during later visits and introduced me to Marcel Bursztyn (a commentator) when he was a fellow with them.

From 2000 onwards I also tried to find out about systems thinking, interdisciplinarity, transdisciplinarity and related topics by attending as many conferences as I could, as well as visiting people whose work I had read or heard about. These experiences informed my view that the field was fragmented and marginalised. I also received various invitations for which I have been very grateful. (Again the acknowledgments below are listed in approximate chronological order.)

Allan Best, Scott Leischow and Pam Clark invited me to participate in the US National Cancer Institute funded project 'Initiative on the Study and Implementation of Systems', at which I met Bill Trochim, George Richardson and others. Bill Trochim coined the acronym 'I2S'. Through them I met Bobby Milstein who provided helpful feedback on the book.

Gerald Midgley and Wendy Gregory made me welcome when I visited them at the University of Hull and have continued to help orient me to the systems field. Gerald also provided constructive input on an early draft of the book.

Julie Thompson Klein (a commentator) is a doyen in the field of interdisciplinarity and is encouraging about everyone's contributions. We first met at an Association for Integrative Studies conference.

Gertrude Hirsch Hadorn and Christian Pohl (another commentator) hosted a six-week visiting fellowship at ETH-Zurich (Swiss Federal Institute of Technology, Zurich) funded by the Competence Centre Environment and Sustainability and administered by Nikolaus Gotsch. They facilitated a number of collaborative publications and invited me to present at a td-Net conference, where I met Catherine Lyall and Merritt Polk (both commentators), whom I subsequently visited in Edinburgh and Gothenberg, respectively.

Linda Neuhauser (a commentator) was very hospitable when I first turned up to find out more about her Health Research for Action Center at the University of California, Berkeley, as well as on later visits, and I enjoyed hosting her stay at ANU.

Michael O'Rourke (another commentator) invited me to the Enhancing Communication in Cross-Disciplinary Research conference, at which I met not only him, but also Duane Nellis, Howard Gadlin, Michelle Bennett and Holly Falk-Krzesinski (all commentators). Holly subsequently invited me to the Science of Team Science conference.

The Australian Agency for International Development (AusAID), through its Australian Leadership Awards Fellowships, has funded three programs for research leaders from the Asia-Pacific region on 'Bridging the Research-Policy Divide'. Fasihuddin and Budi Haryanto (both commentators) were two of the participants. Mahomed Patel, David McDonald, Ilse Blignault, Lorrae van Kerkhoff and Caryn Anderson were among those who helped run the programs, which were partly a spin-off from my involvement in the Global Environmental Change and Food Systems (GECAFS) project, where I worked with John Ingram, Polly Ericksen, Ajaya Dixit, Ahsan Uddin Ahmed and many others.

Writing the Book

I was extremely fortunate that between 2000 and 2011, my academic position at NCEPH allowed me to concentrate on producing this book. Since 2008 it has also been my major in-kind contribution to the work of the Australian Research Council Centre of Excellence in Policing and Security.

I am particularly grateful to the commentators for participating in this project and for the value their ideas have added.

Peter Deane has admirably filled the roles of research assistant and webmaster since 2002 and chased references as well as undertaking various other tasks for the book. Peter, Jen Badham, David McDonald, Damon Muller and Lyn Stephens participated in throwing around ideas from which the title and the final name for Domain 2 emerged. Jen assisted in crafting the name 'I2S Development Drive' and had other inputs, especially to the sections on modelling. Warren Bond drew the figures.

As well as being a long-term, valued NCEPH colleague, Dorothy Broom significantly helped clarify my ideas by editing the book, deftly exposing vagueness, crutch words and turgid prose. Of course, responsibility for all remaining woolly thinking, stilted expression and grammatical errors is mine alone.

Although I remain a slow adopter, Caryn Anderson introduced me to information science and has consistently pushed me to embrace the digital age. She and Peter Deane helped think through post-publication strategies for fostering ongoing development of I2S.

Two anonymous reviewers provided useful suggestions for improving the book, along with ideas that strayed into the territory of commentary. I made changes to implement improvements and have noted the commentary-like ideas as footnotes.

These are all-too-brief recognitions of my most salient debts. Naming everyone with whom I have been privileged to discuss the ideas underpinning this book becomes unwieldy, but I am grateful to you all.

You can follow, and contribute to, the further development of I2S at <<http://i2s.anu.edu.au>>

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