



Scientific Knowledge-Production and Progress:
Neuropsychological Knowledge and the
Contemporary Specialty of Clinical Neuropsychology

Submitted by

Robert A. Burns B.So. (Hons.).

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**Department of Psychology
Faculty of Medicine
The University of Adelaide
Adelaide, SA 5005
Australia**

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The production and progress of scientific knowledge, and the exploration of the history of neuropsychological knowledge and the specialty of clinical neuropsychology, are the central areas of interest that were dealt with in this thesis. These interests were approached in several ways. First, philosophical and sociological perspectives were explored, to develop an initial interpretive framework and an approach to the study of science and its history. Second, the history of neuropsychological knowledge was explored, to provide a background context for the contemporary specialty of clinical neuropsychology, and a basis for the consideration of the interpretation of historical change in science. Third, the scientist-practitioner model in psychology was discussed, to illuminate the accepted philosophy of science that informs the research and practice, and education and practicum training, of scientist-practitioners in psychology and, by implication, clinical neuropsychology. Finally, the conceptualisation of the contemporary specialty of clinical neuropsychology was explored, to enhance the contextualisation of the specialty and inform the discourse-analytic study of pre-existing textual data and extracts of interviews with 19 neuropsychological researchers and practitioners, many of whom were neuropsychologists. The study explored areas of concern associated with neuropsychological research and practice and the development and progress of a scientific specialty within a

multidisciplinary and competitive sector. Although the study can be seen as illuminating the area of science investigated, namely contemporary clinical neuropsychology, the analysis primarily focused on the ways in which the textual data could inform the philosophical and sociological understanding of science.

In the course of the project a particular variety of social constructionism was developed and applied. An extreme variety of social constructionism can be seen as emphasising the political struggles associated with the production, resulting formations, and dissemination of scientific knowledge. This emphasis can be interpreted as implying an extreme form of relativism in which all regimes of knowledge are viewed as being equal, except for the inequality that results from their being associated with political power. However, it is argued in this thesis that a more moderate, albeit contestable, form of relativism is appropriate, in which competing regimes of knowledge are considered to be unequal in ways that have substantive material effects, independent of politics. Notwithstanding this, it is also suggested that demarcating the political and scientific components of scientific knowledge-production and dissemination is rhetorical action that serves the interests of particular groups engaged in hegemonic struggles. Therefore, even if competing regimes of scientific knowledge are viewed as being substantively unequal, the process

of making such differential attributions of validity and effectiveness, in particular cases, is loaded with political interests, and thus is, in principle, interminably contestable and, in this sense, relative. In this context, the thesis can be seen as having explored and elaborated a theoretical framework for understanding the significance, composition and interaction of regimes of scientific knowledge and their production, political action, and interpretation in struggles for scientific hegemony.

Statement of Authorship

This work contains no material which has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, it contains no material previously published or written by another person, except where due reference has been made in the text.

I give consent to this copy of my thesis, when deposited in the University Library, being available for loan and photocopying.

Robert Andrew Burns

April, 2006

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Chapter 1

Introduction

1.1 Introduction

The concern with scientific knowledge-production and progress is a historical interest that can readily be seen as not only being ancillary to the actual practice of science itself, but also irrelevant to practising scientists. Nevertheless, although such an inquiry may be viewed as legitimate in its attempt to illuminate science for the sake of understanding, the best the inquiry into science can hope for is that it informs practitioners of science, and consequently facilitates the production and progress of scientific knowledge itself. This thesis continues this inquiry, and thus its primary orientation is philosophical and interpretive.

To foster the development of a robust interpretive framework of scientific knowledge and progress, a field of scientific inquiry was explored, which in this case was the history of neuropsychological knowledge and the contemporary specialty of clinical neuropsychology. This

chapter outlines the ways in which these interests in science and neuropsychological knowledge were explored.

1.2 The aims of the thesis

The thesis has two primary aims: 1) to develop an interpretive framework that elaborates the possibility and potential for scientific knowledge and progress; and 2) to explore an area of scientific knowledge. The exploration of an area of science is seen as facilitating the understanding of science because it provides scientific discourse with which to interpretively interact.

The choice of subject matter can be seen as somewhat arbitrary: in this thesis the area of investigation is neuropsychological knowledge and the contemporary specialty of neuropsychology. This area of science was chosen because clinical neuropsychology claims to be scientific, and is also a specialty within the discipline of psychology, the discipline in which the thesis was produced. Further, contemporary clinical neuropsychology finds itself within a multidisciplinary and deeply historical field of enquiry, a complex condition which it was hoped would generate a dynamic philosophical inquiry.

Further, the two primary interests of the thesis are seen as having relevance to the discipline of psychology as a whole. This is not only because neuropsychology is embedded within the discipline of psychology, but also because much of psychology either aspires to be scientific or claims scientific status and, importantly, aspires to progress scientifically and socially. Therefore, this thesis can readily be viewed as being, at least in principle, of interest to psychology and its constituency.

1.3 The structure of the thesis

To address the aims of the thesis the remaining chapters are structured in the following ways:

1) Chapter Two explores philosophical and sociological perspectives that conceptualise the achievement and maintenance of social hegemony in science, and the production of scientific knowledge and its progress. Additionally, some of these perspectives suggest approaches by which to investigate and interpret scientific knowledge and its history. The ideas that were established in this chapter form the conceptual point of departure for the remainder of the thesis.

2) Chapter Three presents an abridged history of neuropsychological knowledge. The chapter represents the first way in which this interest in the exploration of neuropsychological knowledge was approached in the thesis. The chapter serves two functions: 1) to provide a background context for the remainder of the thesis that deals primarily with the specialty of clinical neuropsychology; and 2) to generate historical scientific discourse that can act as a point of contact from which to conceptualise further the history of change in science.

3) The framework in Chapter Two was supplemented by, and oriented towards, a textually-based discourse analytic approach in Chapter Four, to establish a framework that informed the use of interview data and pre-existing texts in the investigation of the discourse of a subject matter (Fairclough, 1992; Potter & Wetherell, 1987; and Wood & Kroger 2000). The discursive approach emphasises the performative and constructive qualities of language use, thus positioning language as rhetorical action that produces representational versions of reality. A textually-based, discourse-analytic study of this kind is viewed as offering a means to illuminate texts, and thus inform the understanding of the area of concern analysed.

In this context, the study aimed to deliver two outcomes: 1) a supplementary examination of the discourse relating to research, practice and progress in the specialty of neuropsychology; and 2) a continuation of the development of the interpretive framework of science. The interview study is presented in Chapters Six to Nine. And, preceding this, chapter five discusses the discipline of psychology's scientist-practitioner model, which orients the discussion that takes place in Chapters Six and Seven. Moreover, although Chapter Five does not present interview extracts, it does present relevant pre-existing textual material to supplement the discussion of the model.

5) The thesis is discussed in Chapter Ten. This chapter performs two functions: 1) to summarise and comment on the main points made in Chapters Two to Nine regarding scientific knowledge and progress; and 2) to discuss the primary aspects of the interpretive framework that were established over the course of the thesis.

Chapter 2

Interpreting Scientific Knowledge-Production and Progress

2.1 Introduction

This chapter explores interpretive frameworks that are germane to the understanding of social and scientific histories. Initially there is a discussion of the Foucaultian framework, which conceptualises the formation of, and changes in, social history in general. The Foucaultian concepts of discourse, knowledge/power, archaeology, and genealogy are discussed, and their relevance to the interpretation and investigation of histories is examined. Following this, the philosophy and sociology of science is explored. The prioritised aspects of this examination provide a supplement to the Foucaultian approach to interpreting history: an approach that elaborates scientific knowledge-production, and the achievement and furtherance of scientific hegemony in society. The resulting framework forms the point of departure for the investigation and interpretation of the history of neuropsychological knowledge that occurs in the remainder of the thesis.

2.2 Foucaultian history

2.2.1 Approaching the analysis of history

One of the more intelligible accounts of what Foucault means by his particular form of historical analysis can be found in the preface to Foucault's book entitled *The Birth of the Clinic: An Archaeology of Medical Perception* (Foucault, 1973). He explains three ways of doing history to which he is opposed. First, there is what he calls the "aesthetic method," which involves the use of logical relations like analogy, a search for the origins, or harbingers of world views, and an exposition of the taxonomies of these world views.

He calls the second approach "the psychological method," in which rational attributes are allotted to some periods and ideas in history while others are presented as irrational. The problem with this approach to which Foucault (1973) draws attention is the historical contingency associated with attributions; that is, any such attribution may be reversed on review at some point in the future. Therefore, historical analysis that proceeds in

this way runs the risk of being undermined by its own method.

He calls the third approach "commentary." When using this approach adherents ask what particular constructions in language mean, and also what the speaker under analysis intended to say. The deep levels of meaning are sought in order to comprehend properly the relationship between the signifier and the signified associated with statements. This form of analysis, which Foucault calls "exegesis," seeks to uncover the true meaning of language. However, Foucault indicates that, in attempting to bring the deeper levels of language to the surface, an infinite regress is generated, because each analysis provides more meaning for exegesis. Because of this infinite regress, commentary, so defined, contains a remainder in interpretations; that is, whenever we finish doing our analysis, there is always more analysis that can be done.

Foucault asks whether it is possible to circumvent this and leave no remainder in our approach to analysing history. In the hope of doing this, Foucault suggests that we would need to view historical events not simply as autonomous instances where the aim of analysis is to expose the hidden aspects of meaning; instead, we would need to

view events as possibilities that form systems that transform throughout history. This analysis attempts to identify the differences that are either contemporaneous with, or in series with, other events over time. Foucault claims that his historical approach is important because it focuses on the elucidation of what he calls the "conditions of possibility" that enable the creation of what he also calls "discursive formations." "Discursive formations" can be defined as heterogeneous, but relatively organised and systematic, regimes of knowledge (including technologies and practices) that provide the framework for interpretation and action.

This analytical approach is not to be taken as an indication that he is critical of historical outcomes in such a way that one possibility is viewed as better or worse than another possibility, or that the contemporary situation is to be either vilified or commended for its practices. Rather, Foucault attempts to conduct a "structural study that sets out to disentangle the conditions of its history from the density of discourse..." (Foucault, 1973, p. xix), which is thus analytical rather than judgemental. Instead of focusing on intentions, meaning, and referents, the focus of analysis is to expose the regimes of knowledge, the ways in which they interact,

and consequently, the way they are more or less transformed through this interaction. These worlds are, of course, in a constant state of relative flux and degree of intractability, and are constantly being influenced by a range of other practices, and events more generally.

The approach preferred by Foucault has not, so far, adequately avoided aspects of the aesthetic method outlined initially (in particular, the approach partly concerned with origins and taxonomies); however, another attempt is made through his distinction between "general" and "total" histories. The difference between general and total histories is defined by Foucault (1972) in the introduction to *The Archaeology of knowledge*. Foucault suggests that historical analysis has, in some hands, focused on searching for continuities throughout history: elaborating those similarities and distant origins that provided the groundwork for the progression or regression of rationality, and unearthing totalities that bind history and periods into coherent units. He suggests that the whole process results in the establishment of a place in the past that reflects who we are now. This approach to history attempts to identify the deep-level *Weltanschauungen* that provide the overarching frameworks that smooth out differences, and provide the causal

connexions between surface level disparities. In short, the search is for a totalised historical analysis that minimises the importance of disparate phenomena. The approach attempts to create a minimal set of general regularities and laws that may, at times, resemble our contemporary concepts or, at least, through causal means, provide a justification for our current practices through the identification of origins or foundations that have since progressed, developed, and saturated the social world. The aim is to identify the historical origins of, and demonstrate the progress of, rationality or irrationality.

In contrast, another school of historical analysis, to which Foucault identifies himself as belonging, is that of general histories. This approach to history focuses on discontinuity, and involves identifying such discontinuities as threshold, rupture, mutation, transformation, and disruption in the course of events; that is, the approach takes differences in history seriously, and actively avoids resorting to the homogenising effects of total histories. Nevertheless, in contrast to his polemical approach, general and total histories can be seen as interdependent, and together they may provide a complementary and moderated approach to

interpreting the history of change. As an approach, a general history aims to create a "series of series" [Foucault's (1972) words], an expression that alludes to the discontinuities between components within a series. However, there remains the possibility that similar components are used at different points in the series. Thus, an ignoring of continuity, or at least the way in which components are clustered and draw on prior elements in the series, is as analytically unrealistic as an ignoring of discontinuity. To put it more strongly, Foucault's approach needs to make use of the very approach he explicitly attempts to contrast it with.

The notion of taxonomy is also not so easily kept distinct from Foucault's approach. For instance, the elucidation of discursive formations would seem to require exposition associated with taxonomic descriptions not only individually, but also with reference to the interrelationships of contemporaneous and sequential discursive formations. If the sequencing and constituents of events are important, then some classificatory scheme would seem necessarily to result from such an analysis.

The final aspect of Foucault's exposition of his approach indicates the difficulties that he encounters in

attempting to disentangle these approaches and create an alternative. A focus on discontinuity in analysing history is what Foucault (1972) calls "paradoxical," but otherwise could better be called a self-fulfilling prophecy (This consequence could also be relevant in the same way to the approach of total histories.): an interest in identifying discontinuities provides a bias towards creating differences, and thus only after divisions are made can discontinuity be "observed." This admission not only shows the potential for inconsistencies and conflict between historical analyses, but also shows the artificiality of his polemic. Foucault's approach does not preclude the possibility of leaving its own kind of remainder in analysis.

2.2.2 Contingency and causality in history

In their Book *Using Foucault's methods*, Kendall and Wickham (1999) discuss some of the concepts and difficulties associated with understanding Foucault's approach. Although they mention that it is difficult to say that Foucault's apparent "methodological" texts are exactly methodological *per se*, or rigorous or clear, they nonetheless attempt to provide a clarification.

Firstly, Kendall and Wickham describe what they call a "trap" in thinking about Foucault's ideas. While his work explores the histories of various subjects, Kendall and Wickham suggest that it is wrong to make what they call "ahistorical political points" about these histories (Kendall, & Wickham, 1999, p. 4). They recommend that we avoid thinking about the histories of particular subjects that result from using Foucaultian scholarship as a means to make teleological judgments. Without appealing to its religious associations, the term "teleology" refers to the postulation that phenomena occur as a result of design or purpose, which history necessarily and inevitably moves towards manifesting. This claim contrasts with the view that manifest phenomena are the result of the accumulation of directionless prior causes. Kendall and Wickham assert their anti-teleologism dogmatically, and suggest that this is why histories never stop: "They never stop because they aren't going anywhere" (p. 4). This claim is based on Kendall and Wickham's, and Foucault's belief in the intrinsic incompleteness of systems, a belief that there can only ever be, at most, the pretence of closure regarding the ending of history: a belief that implies that there always remains the possibility of rupture and disruption in incomplete systems. This situation could

readily be viewed as being applicable in social affairs because of our fallibility.

In order to accommodate this insight into our thinking about the history of change, we are, according to Kendall and Wickham, to develop a perspective that sees the present as being as strange as the past, rather than as an inevitable trail of causal change towards a preset goal. Additionally, they explain that Foucaultian histories could be called "histories of the present," which is not to say that the aim is to identify the "totality" of the present, nor to identify the historical "causes" for the present, but that historical analysis is to be used as a way to "diagnose the present"; that is, to illuminate the "condition" of the present in some area of investigation. However, this conceptualisation seems to be rather strange: on the one hand, an attempt is made to steer clear of teleologism and, on the other hand, there is also an avoidance of directional causal thinking. As a substitute the description of particular areas is apparently the goal of investigation.

Clarifying and expanding on their interpretation, Kendall and Wickham attempt to decentre causal thinking more thoroughly by suggesting that we look, firstly, for

what they call "contingencies" rather than "causes." By focusing on contingencies rather than causes, we come to view the emergence of conditions as "accidents of history" (p. 5), and see that the conditions were not necessary, and that they could have been another way. That is to say that the prevailing conditions in a circumstance represent one of a set of possible combinations of conditions, given the array of factors that could be said to be relevant to the event. Thus, the permutations of interacting factors provide a potentially large number of possible circumstances that could occur in any particular case.

Kendall and Wickham go to some lengths to explain that by "contingent" they, and Foucault, do not mean that absolutely anything can happen. There is still an acknowledgment that some circumstances exert a certain limited power on the emergence of conditions. Nonetheless, much of our history is a result of unforeseen events of which we may or may not be able opportunistically to take advantage. Even so, on many occasions, factors coalesce into potent bundles with effects that individuals and organisations are unable to avoid or thwart. This is a peculiarity of history that reduces the applicability of human-centred determinism; that is, our control over ourselves, our environment, and the outcome of our actions.

However, the conceptualisation seems to rely too greatly on human perception in arguing for contingency: just because events that manifest are unforeseen does not mean that these events are not caused. Moreover, the conceptualisation appears to be entirely compatible with a causal interpretation. The interaction of factors results in a series of prioritisations that isolate and manifest possibilities, such a process can readily be viewed as a causal chain. Under this reinterpretation of Kendall and Wickham's framework, their argument for contingency is shown not to achieve the disproof of causality that it is supposed to.

Despite the problems demonstrated here as being associated with their account of the emergence of events, Kendall and Wickham continue by recommending that we refrain from suggesting causal links between the events involved in the emergence of conditions, saying "To the Foucaultian way of thinking, such exercises in causal logic are futile"(Kendall & Wickham, 1999, p. 7). Rather than using a causal diagram with unidirectional arrows linking up the factors, they suggest that we use a multidirectional, or even a directionless, diagram. In the former, all factors are linked together in a network of relations, while in the latter, and more extremely,

contingencies just occupy a territory together with no definite interrelationships defined. Kendall and Wickham suggest that these two diagrams demonstrate the "logic" of contingency, which appears to simply consist of refusing to refer to "cause."

This view culminates in the strong denial of ontological causality:

... we must see every contingency in a contingent relationship with every other contingency. There is no necessary pattern to their relating. Indeed there is nothing necessary about their relating at all—they may or may not relate in any way, and if they do, the form of their relationships to one another is not dictated by any pattern or any outside force; to attribute the status of cause and/or effect to any one of them or to any outside force would be to falsely impose some necessity of relating onto them (Kendall, & Wickham, 1999, p. 8-9).

Kendall and Wickham appear to be saying in this quote that because the organisation of contingencies is not necessary, which is to say that they are temporary coincidences, the notion of causality is invalid. In support of this belief they also propose that events are unique and unrepeatable. The way in which this supports

contingency over causality is mysterious. Even if this proposed unrepeatability were accepted, the manifestation of events, as outlined above, would still appear to be compatible with the notion of causality because of the limiting conditions that a set of contingencies places on the emergence of events. Kendall and Wickham seem to be suggesting that events are unique and unrepeatable because they are the result of a convergence of a novel set of factors brought together by way of an accident of history. However, this argument is flawed: their notion of contingency cannot be supported by the novelty and unrepeatability of events if the very novelty and unrepeatability of events assumes the notion of contingency. Moreover, the belief in the unrepeatability of events, irrespective of Kendall and Wickham's premises, seems presumptuous. Whether a resemblant set of contingencies can or cannot occur again in some other time and place needs to be seen as an interpretive issue that cannot be determined *a priori*. Moreover, it seems to be a matter of experience that many phenomena are indeed repeatable. Thus, it could be more sensible to remain agnostic prior to an investigation as to whether the conditions are unique or repeatable, and only develop a judgment after considerable investigation of a phenomenon has occurred. Assuming this, the diagnosis of cause can be

seen as being dependent on the degree of detail considered and permitted, given the limitations of a science and its resources, in the investigation and description of a situation.

Considering this, it appears that the discussion of causality and contingency provided by Kendall and Wickham is unable to undermine causal logic in its epistemological and ontological forms; their negation of causality is not only an attempt to place limits on what we can know about causality in the world, it is also a stronger claim about the way the world is, in particular, non-causal. Notwithstanding, instead of arguing for the reality of non-causality, they merely claim *a priori* that the world is ontologically non-causal and that, on this basis, it is inappropriate to make causal inferences. Additionally, their conceptualisation is compatible with causality: the emergence of events, whether believed to be repeatable or not, involves a sequencing of events that provides the conditions for manifestation, which can readily be seen as causal. Incidentally, the fact that they claim to be representing the Foucaultian approach by arguing for the notion of contingency can only be damning of Foucault to the extent that they do in fact represent his ideas faithfully. That they are indeed representing Foucault is

supported by the previous section in which Foucault was shown to attempt to distance himself from causal thinking in his approach to conducting histories, and is also corroborated in the section below that deals with Foucaultian genealogy.

2.2.3 The interests of Archaeology

"Archaeology" is the term used by Foucault (1972) to describe his particular kind of research concerned with the constitution and arrangement of the visibilities of social practices. "Knowledge" is the term Foucault uses to refer to these social practices, which can be seen as systems that consist of heterogeneous networks of language, other social practices, and technologies (Kendall and Wickham, 1999). In an ideal situation knowledge and that which it acts upon are symbiotic: one supports and provides the space for the other, thus enabling their perpetuation and transformation within the framework. A good example of this mutually supportive relationship is found in Foucault's (1977) work where he attempts to demonstrate how the visibilities of prison and criminality provide the space for the production and reproduction of knowledge about the very notions of criminality and imprisonment: a point also discussed in Kendall and Wickham (1999).

Knowledge makes certain phenomena visible by acting upon them and attempting to make them manageable within a system of statements. Importantly, Foucault uses the term "statement" much more broadly than the usual language-based use; instead, Foucault's notion of a statement can be understood as being the means by which certain components of knowledge are expressed. Thus, statements represent the heterogeneous components of knowledge, which include the language, technologies, strategies that interact with, shape, and manage the targets of knowledge. Within this context, the following comment made by Foucault about the general aim of archaeology can be rendered intelligible, and understood as expressing a broad interest in elucidating the geography of knowledge and its transformation:

What one must characterize and individualize is the coexistence of these dispersed and heterogeneous statements; the system that governs their division, the degree to which they interlock or exclude one another, the transformation that they undergo, and the play of their location, arrangement, and replacement (Foucault, 1972, p. 34).

Foucault (1972) enumerates four areas of interest to consider when elucidating knowledge archaeologically: 1)

the formation of objects; 2) the formation of enunciative modalities; 3) the formation of concepts; and 4) and the formation of strategies (Foucault, 1972). First, the interest in the "formation of objects" refers to the way in which objects are positioned, shaped and transformed by knowledge. Second, the interest in the "formation of enunciative modalities" refers to the possible statements and actions that are available for the shaping and positioning of objects and subjects. Third, the interest in the "formation of concepts" refers to the ways in which all the categories and constitutive statements are developed, and what shape they take. Fourth, the interest in the "formation of strategies" refers to the ways in which statements, strategies, and practices come together to form what Foucault (1972) suggests are usually known as "theories" or "models," which are mobilised to shape and position targeted objects (Foucault, 1972, Fairclough, 1992).

Despite their abstruse quality, the overlap between these interests may provide the means for simplifying the aims of archaeology. An archaeological investigation can be considered as being an attempt to illuminate the ways in which surfaces, involving the constitution of, and interrelationships between, the components of knowledge,

provide the possibility for certain actions, interpretations, shapes, and positions, while precluding others. In relation to this, Kendall and Wickham (1999), and Foucault (1972), emphasise that an archaeologist elucidates the "rules" associated with the mobilisation and repetition of knowledge; that is, the body of accepted beliefs, of which some may be unjustified and untrue. Taken literally, the recommendation to elucidate the rules can be seen as being a difficult demand to accommodate, and could be interpreted as involving pedantic and extensive delineation. Although this is an option, a more liberal interpretation is also possible: the extent to which an investigation reveals the constitution and interrelationships of regimes of knowledge can be seen as indicating the ambit of the possible. This approach to elucidation provides an allusion to the ways in which repeatability is made possible or precluded without resorting to the creation of a formal and elaborately long list of rules.

In contrast to Danaher, Schirato and Webb's (2000) suggestion that "discourse" is a term that refers to language exclusively, Kendall and Wickham suggest that Foucault's notion of discourse is not exclusively related to language, but also includes the organisation of the

material conditions that express knowledge. Given this interpretation, the articulations of hegemony can be construed as being discursive, and thus the notions of knowledge and discourse can be considered as having a considerable overlap. Regardless of the exact intentions of Foucault, his exposition of archaeology demonstrates an interest in the general material conditions of social hegemony. Therefore, even if the dispute about the "correct" interpretation of "discourse" is resolved, and it is concluded that it is in fact exclusively language-based, the interests of archaeology offset this exclusivity by extending attention to extra-linguistic features of social hegemony, which nonetheless, in critiques, are represented in language. In this thesis, where it is perceived as being important to distinguish between the two interpretations, the notion of discourse that includes language and extra-linguistic aspects will, throughout be presented as discourse_F, while the exclusively linguistic form will be represented without this distinguishing feature.

2.2.4 The interests of Genealogy

"Genealogy" is another approach to the study of history developed by Foucault. He developed genealogy

after archaeology, and it was apparently perceived by him as being the successor to archaeology (Kendall and Wickham, 1999). Foucault (1984) suggests that genealogy is not about the search for origins, causality and continuities; instead, the aim is to identify the accidents of history that shape the present, and again, as in archaeology, to identify discontinuities:

Genealogy does not pretend to go back in time to restore an unbroken continuity that operates beyond the dispersion of forgotten things; its duty is not to demonstrate that the past exists in the present, that it continues secretly to animate the present, having imposed a predetermined form on all its vicissitudes. Genealogy does not resemble the evolution of a species and does not map the destiny of a people. On the contrary, to follow the complex course of descent is to maintain passing events in their proper dispersion; it is to identify the accidents, the minute deviations—or conversely, the complete reversals—the errors, the false appraisals, and the faulty calculations that gave birth to those things that continue to exist and have value for us; it is to discover that truth or being does not lie at the root of what we know and what we are, but the exteriority of accidents (Foucault, 1984, p. 81).

Despite the opaqueness of much of this passage, Foucault presents a clear aversion to teleologism. He dismisses the interest in searching for origins that are seen as predetermining the form of the present or mapping the future. Instead, he emphasises that he is interested in the proper dispersion of events that "give birth" to the present. This interest is claimed to demonstrate the externality of accidents and truth—that the effects of clumsy and erroneous beginnings still exert their influence on our reality and notions of truth. However, he also dismisses the search for continuity, and in the same way as was demonstrated in the earlier discussion on this topic, he also requires the notion of continuity to achieve his aims here. Moreover, incorporated into Foucault's (1972) conceptualisation of knowledge is the very notion of the achievement of reproducibility and perpetuation (i.e., continuity).

Another interest of genealogy is the notion of "power" (Kendall and Wickham, 1999), which also supports the causal interpretation of Foucault's interests. In contrast to the more traditional view of power as being associated with political hegemony, Kendall and Wickham (1999) suggest that the Foucaultian notion of power is best understood as a form of energy. Conceptualised as energy, power can be

seen as that which allows the movement of the material world, and which is divided up by, and directed through discourse. In this context, power enables the expression of knowledge through the platform provided by discourse. This is known as the "power/knowledge nexus" because of the interdependence of power and knowledge (Kendall and Wickham, 1999).

This notion of power allows the employing of the notion of resistance. The term resistance refers to the extent to which the flow of power is impeded. Although Foucault paid considerable attention to the impeding aspects of the notion of resistance (Kendall and Wickham, 1999; Danaher, Schirato and Webb's, 2000), it needs to be recognised that resistance has a reciprocal relationship with conductance: in instances in which resistance is low conductance is high, and vice-versa. This function of power is implicated in Foucault's conceptualisation of history: a specific aim of the creation of knowledge is to foster as much conductance, or as little resistance, as possible within a system of knowledge during the course of its perpetuation. The attempt to create systematic knowledge, as described by archaeology, can be viewed as a conductance creation impetus that attempts to reduce the conflicting aspects of natural and social phenomena that

impinge on the production and reproduction of particular regimes of knowledge.

Considering this discussion, genealogy appears to be interrelated with the aims of archaeology in the form of the power/knowledge nexus: the elucidation of one cannot occur without the elucidation of the other because power runs through knowledge and knowledge provides the conduit for power. Moreover, the interest in elucidating power/knowledge seems to have an overlap with the traditional sense of political power: to the extent that genealogy is interested in the elucidation of the constitution of knowledge, its responsiveness to resistance, and its reproduction, such an analysis draws attention to the social hegemony of knowledge. Moreover, as contingent social, and at times, hegemonic systems, knowledge can readily be viewed as a means to achieve political ends. Finally, the very notion of power can be also interpreted as a causal one. Although the formation of contingencies may very well be unstable and unique, the path that power takes through knowledge, and through the interactive interface with other non-discursive aspects of materiality, provides the means by which series of events effect change.

Although there has been considerable criticism of the Foucaultian framework here, this should not be taken to mean that there is nothing of merit that can be drawn from these ideas. The criticism of the framework is merely intended to illuminate the areas that are perceived as in need of alteration to make them more coherent, manageable and conceptually effective. In this regard, the transformations can be seen as an attempt to augment the framework where this is required. The results of this modification might be called a "neo-Foucaultian" framework.

2.3 The philosophy and sociology of science

The Foucaultian view of history outlined and criticised in the previous sections provides a means by which to illuminate the structure of, and transformations in, history in general, and through its interest in the systematicity of regimes of knowledge and their associated "truths," it also applies specifically to the production and dissemination of scientific knowledge. Nonetheless, to supplement this understanding, the philosophy and sociology of science should be consulted.

Some philosophers interested in the philosophy and the sociology of science have been concerned with the exposition of what it is to be scientific, what constitutes scientific progress, and how such progress is, or may be, achieved. Importantly, these perspectives have been expressed in both descriptive and prescriptive terms.

2.3.1 The philosophy of science of Aristotle

Aristotle is generally credited with "inventing" logic, both deductive and inductive (Richards, 1987). He also described the way in which logic should be used to investigate phenomena. Initially, Aristotle promoted the use of deductive logic to gain certain knowledge of the world. This was to be achieved *a priori*, and was essentially an exercise in semantics: the aim was to create syllogisms, link them together in a series and then, hopefully, arrive at the ultimate conclusion that would reveal the nature of reality. In order for this to occur the premises had to be worded in such a way that they described the true nature of phenomena; however, because experimental values were not initially included in Aristotle's approach, it became evident that *a priori* premises of a universal character, that were also

undisputable, were difficult to establish. To combat this, he developed an empirical approach of induction.

Aristotle's induction is the approach by which universal propositions are generated from limited data that have no exceptions. He advocated observation as a means by which universal generalisations could be established from clusters of particular attributes common to types of phenomena. Despite this empirical value, and the fact that it was made use of in observational research at the time, he nonetheless retained a proclivity for dogmatic speculation and circumstantial conjecture, which he interpolated into his inferences as it suited him.

Historically, Aristotle was revered as an authority in many of the areas of inquiry that he commented on, and his opinions remained largely unquestioned for nearly 2000 years. His conceptual contribution can be considered as being of significance to scientific and empirical values but, at the same time, his dogmatism, and the extent to which his ideas were excessively revered in history, hindered the progress of science (Richards, 1987).

2.3.2 The philosophy of science of Francis Bacon

Francis Bacon (1561-1626), in his work the *Novum Organon* (1620, reprinted in 1952), explicated another inductive philosophy of science. Also, Bacon suggested that knowledge is power, which was an early adumbration of the view of knowledge in which utility is associated with truth. In this regard, his search for the scientific method presumed that the end result would provide science with the means by which it could benefit the progress of society. Although the reverence of the ancient thinkers, such as Aristotle, was declining at this time, Bacon's emphasise on speculation and empirical investigation was still rather radical, as it suggested that, on many issues, the Greeks may not have been correct.

Bacon was more determined than was Aristotle about the significance of experimentation, and rigorous and extensive data collection (Riggs, 1992, Richards, 1987). He advocated caution in arriving at inferences, and emphasised the need for the search for counterexamples in the search for truth (Riggs, 1992). However, his method was cumbersome because it did not explicitly include the notion of hypotheses which, while being at risk of error, allow data to be organised and short cuts in data collection to

be taken (Richards, 1987). Furthermore, he considered this method to provide the basis for the progress of knowledge towards ultimate truth. The general principles generated by induction, since they were true, could then be used deductively to generate specific inferences (Riggs, 1992). Like Aristotle, Bacon failed to see a major problem with induction that was later elaborated by David Hume (1748, reprinted in 1999); the problem that, no matter how much data is collected, inductive inferences provide no guarantee that evidence will not emerge that confutes these inferences. This problem demonstrates that inductive inferences are provisional and only probable, thus eliminating the possibility of attaining the certain knowledge of ultimate truth by way of this method, which is not to say that this method does not provide a probable route to truth.

2.3.3 The philosophy of science of Logical positivism

The philosophy of Logical Positivism, which emerged in the early part of the 20th century, attempted to create a solid or certain basis on which we can base our knowledge claims about the world. Essential to this philosophy is the notion of protocol statements, which are those ideal constructions that as suggested by Schlick (1959),

represent facts about the world unambiguously and without bias and distortion. The belief in this possibility was expounded by many philosophers such as Neurath (1959) and Wittgenstein (1921, reprinted in 1961).

Understanding the uncertainty associated with inductive inferences, the logical positivists attempted to create a certain and logical foundation for the representation of facts in the world. The philosophy of logical atomism propounded by Bertrand Russell (1959) and Ludwig Wittgenstein is an instance of the attempt to create this foundation. Wittgenstein (1889-1951) proposed the picture theory of representation in his book entitled *Tractatus Logico-Philosophicus* (1921, reprinted in 1961). This theory proposed that language consists of atomic constituents, and that propositions, which comprise these atomic constituents, refer to corresponding atomic facts in the world. This mirror view of representation is a realist account of representation, in which language is seen as being an unbiased medium of truth generation and representation.

The positivists developed the principle of verification (Ayer, 1936, reprinted in 1970). According to positivists, protocol statements can be verified because

they are particular statements. These statements are not based on induction; instead, they refer to particular qualities or aspects of phenomena. Thus, logical positivists considered that these statements can be verified as being true. For example, propositions that make a positive claim regarding the possible existence of an entity or quality are in principle verifiable because the observation of this entity or quality verifies its truth. However, these propositions are not falsifiable because, logically, a lack of forthcoming evidence does not settle the matter conclusively. In contrast to verifiable statements, inductive generalisations cannot be verified because of the continuing possibility of counterexamples.

Positivists such as Ayer (1936, reprinted in 1970) suggested that the principle of verifiability was a criterion of meaningfulness, and that all statements that do not conform to this criterion are thus meaningless. This assertion was meant as an attack on transcendental metaphysics, in which certain knowledge of the world is assumed as being necessary and/or possible prior to experience and the gathering of empirical knowledge about the world. Thus, through setting the limits of meaningfulness so narrowly, Ayer and the logical positivists constrained the limits of scientific knowledge,

and what was appropriate for scientific investigation. Due to this the logical positivists minimised the importance of inductive inferences in science (Richards, 1987).

The positivists suggested that protocol statements provide the possibility of a unified and cumulative science. This belief was maintained through postulating the possibility of creating a foundational logical framework, a framework that provides the method by which facts about the world, expressed as protocol statements, could be translated and organised with certain accuracy (Neurath, 1959).

However, this framework has not been forthcoming in an explicit or cogent form. Moreover, both Russell and Wittgenstein eventually decided that the atomic view of representation was wanting and abandoned logical positivism. In his book entitled *Philosophical Investigations* (1953), Wittgenstein attempted to reconceptualise representation by developing the notion of language-games. Within this formulation Wittgenstein suggested that games and tools were appropriate analogies for language. In this view, language is inherently social and comprises a multiplicity of tools that serve the many purposes that we apply them to. Thus, to understand

language we need to understand the particular game being played, its tools, and its rules. This complexity of structure precludes the possibility of universal criteria for classifying representation and usage, and suggests that the success and failure of the objectives of a game are determined internally by the rules of that specific game, a form of relativism. Therefore, according to this view, a language-game provides the tools and determines the rules for successful and unsuccessful representations; a view of representation that is more liberal than that of logical positivism, and gives a framework in which various scientific logics and values are possible.

2.3.4 The philosophy of science of Karl Popper and Imre Lakatos

The philosopher Karl Popper developed his philosophy of science in works such as *The Logic of Scientific Discovery* (1935, and translated in 1959), and *Conjectures and Refutations* (1963) in which he proposed a theory known as falsificationism. Popper was concerned with two interests: 1) scientific methodology; and 2) the demarcation of scientific from non-scientific activity. Scientific methodology refers to the area of interest within the philosophy of science, in which philosophers

attempt to provide the criteria for selecting one theory over alternatives (Riggs, 1992), to promote the possibility and method by which to achieve progressive shifts in scientific knowledge. Those interested in the demarcation of science attempt to clarify and specify scientific method so that science can be identified and distinguished from non-science, particularly, pseudo-science (i.e., those activities that pretend to be scientific but are not genuinely scientific).

Popper denied that science needed induction. He thought that although hypotheses were unable to be verified, because of the problem of induction, they could be falsified, and thus, if falsification was adopted, science could be seen as progressing deductively. For instance, the inductive inference that all swans are white, inferred from a sample of white swans, can readily be falsified by the observation of a black swan; a deductive falsification.

Considering this, Popper suggested that the mark of scientificity is found in the attempt to falsify observations; indeed, according to this view, scientificity is identified through the very possibility of falsification. A difficulty arises, however, with the

distinction between in-principle, and in-practice falsifiability. A proposition is in-principle falsifiable if there is an ideal situation or critical experiment that can be imagined that would be able to falsify the proposition. In this context, if science is unable to provide the appropriate experimental conditions, propositions that are in-principle falsifiable may not be falsifiable in practice, and they may never become so in the future either. Further, a proposition needs to be seen as being falsifiable in principle before it is deemed falsifiable in practice because it is an inductive inference that the experimental conditions of a science will be able to falsify a proposition; an inference not available to Popper. Despite this difficulty, those theories that are unable to be falsified in principle are seen as being unscientific. Given this criterion for scientificity, Popper proposes that science progresses through the proliferation of a series of bold conjectures; that is, conjectures that are relatively more falsifiable than their rivals.

Unlike the logical positivists, Popper and Imre Lakatos (1978) contend that observations are theory-laden; that is, facts in the world and the propositions that represent them are readily confounded. Moreover, whereas

the positivists believed in the possibility of a foundational logical apparatus for representation, Popper and Lakatos suggest that science progresses by a series of theories and that these theories provide the context for the constitution of facts. To this effect Popper and Lakatos distinguish between naïve and sophisticated falsificationism. Naïve falsificationism suggests that propositions are not theory-laden, and thus counterexamples are considered able to refute a theory directly. In contrast, sophisticated falsificationism suggests that no fact about the world can refute a theory; instead, falsification can only occur when there is a theory to replace an existing one (Riggs, 1992). However, this can be seen as overstating the case, because a language could be available within a theoretical framework that allows data to be interpreted as refuting. For example, if the claim that all swans are white is made, the observation of a black swan can be seen as being a refutation, as long as the observation and the description of a black swan are possible.

The notion that falsification requires a replacement theory also has an additional requirement. In Popper's view, the progress of science is identified by the development of alternative conjectures that account for the

shortcomings of previous ones and include greater empirical content: that is, the new conjectures need to pass all the tests of previous conjectures and provide novel implications, thus providing science with an increase in the scope of its applicability, or empirical content. Over time, a series of refuted theories provides science with a set of increasingly robust conjectures, and consequently increases in the verisimilitude (i.e., truth-likeness) of scientific knowledge are made. His theory precludes the notion of truth per se and merely allows us to refer to theories as withstanding the tests imposed upon them over the course of their history. Further, if conjectures do not survive future tests, then they could still be called "verisimilar," but they could also be called false. In Popper's view, one theory can have more empirical content than another, and withstand more tests, while having significant amounts of falsified hypotheses. More extremely, an entire theory could be falsified while still being verisimilar. This could be the case, for instance, if its empirical content is significant, and it is the most sophisticated and useful theory we have available. Strictly speaking, because a verisimilar theory is just an approximation to the truth it is false because of this very approximation.

Notwithstanding this, Popper overgeneralised the importance of falsification and limited his interest to this, primarily because he was mainly concerned with an ideal of knowledge associated with theoretical physics. Therefore, he did not recognise the importance of other concepts such as particular statements and correlations, which merely demonstrate the strength of a relationship between variables, and do not take the form of universal propositions.

Imre Lakatos (1978) developed a sophisticated falsificationist theory in his book *Methodology of Scientific Research Programmes*, which builds upon Popper's theory. According to Lakatos, scientific research programmes consist of a hard-core set of conjectures or assumptions that remain uncontested throughout the life of the research programme. The hard core is surrounded by a protective belt of auxiliary hypotheses that provides the hard core with shielding; that is, the auxiliary hypotheses divert attention away from the hard core. Further, it is the auxiliary conjectures that can be falsified and transformed experimentally, leaving the hard-core conjectures untouched.

In order to illuminate this process Lakatos makes use of the concepts of positive and negative heuristics. A negative heuristic, while abstract, is a strategy by which attention is diverted away from any speculation regarding the soundness of the hard core, while a positive heuristic is a strategy that draws attention to the auxiliary hypotheses and attempts to resolve any conflict that empirical anomalies may have with the research programme. Positive heuristics allow the transformation and augmentation of the protective belt through substitution. In this way, Lakatos construes change in science as being through a series of theories (i.e., hypotheses).

The notion of the series of theories also applies to research programmes, and Lakatos supposes that a range of scientific research programmes is possible at any one time, and that, importantly, it may take many centuries for one to be fully refuted, and discarded in favour of a rival. Moreover, this process of change is due to the rewriting of history that occurs in the light of new knowledge, resulting in the generation of an alternative perspective. The question of whether a programme is progressive or degenerative can only be determined through this rewriting and reflective process because, although the speed at which a programme appears to find support rather than

counterevidence for its hypotheses seems desirable on the surface, such periods may eventuate in an irresolvable degenerative phase. In contrast, the converse may apply to a programme that is slow to accumulate any kind of evidence. This situation demonstrates the chaotic and relatively unpredictable nature of scientific progress.

Lakatos is not clear about the means by which a research programme is developed, particularly its hard core, but the refutation and abandonment of a hard core is suggested to occur in a holistic fashion after a critical mass of transformations to the protective belt accumulate. Moreover, because of Lakatos's interest in providing a rational means for theory selection, he suggests that the abandonment of a research programme should only occur when a rival theory provides an alternative hard core that, in conjunction with its auxiliary hypotheses, accounts for all the "facts" that were not falsified by the previous programme and also provides new propositions that require testing. This process of theory comparison is relatively unproblematic for Lakatos, because he does not believe that alternative theories are incommensurable.

Within Lakatos's account of rationality, scientists embedded within rival research programmes may have no

rational criteria for theory selection until a paradigmatic resolution has occurred; that is, the prevailing paradigm constitutes history by sorting out what hypotheses can be seen as true and false in the history of a science. In the short term, the progress of science proceeds through ambiguous means and relies on continued research and competition in the hope of a future resolution. Therefore, Lakatos's views on scientific research programmes not only illustrate the difficulties associated with falsifying theories, but also indicate the limits of a rational methodology for science.

2.3.5 The philosophy of science of Thomas Kuhn

The approach of Popper and Lakatos is an attempt to create a rational account of scientific progress, and to delineate criteria for selecting theories rationally. Moreover, their approach is normative (i.e., prescriptive) as they attempt to demonstrate the best way in which science can be aided in its progress, and their work does not consider the social aspects of transformations in science.

In contrast, in his book entitled *The Structure of Scientific Revolutions*, Thomas Kuhn (1970) while attempting

to demonstrate the rational progress of science, also showed some of the social and non-rational aspects involved in transformations in science, through the concept of what he called "paradigm shifts." By the term "paradigm" Kuhn means the overarching set of theories, methods and assumptions that inform the research that is conducted by scientists in a particular area. One of his main assertions is that science is not cumulative, an assertion which is compatible with his belief that paradigms are incommensurable; that is, they operate in different terms that do not meaningfully correspond. Therefore, in the context of the incommensurability of paradigms, true or not, a cumulative science is impossible.

Kuhn outlines the structure of change as a cyclical sequence of events. The first stage is called pre-paradigm science, which is a condition in which there is no single paradigm that predominates in a particular field. "Normal science" is the condition in which there is one paradigm that predominates in a particular field.

However, in the light of Lakatos's theory, this appears to be an oversimplification, and, as Riggs (1992) demonstrates, the persistence of controversy and the competition between schools of thought or paradigms may continue indefinitely even within what we normally call

advanced sciences. Further, it would be crude to call sciences that are embedded in continuing conflict pre-paradigmatic when some of these scientists act in the way that is compatible with what Kuhn identifies as normal science; that is, the period in which scientists, acting within the confines of a paradigm, engage in puzzle solving. In other words, the research of the scientists is directed towards clarifying the implications of the paradigm.

During normal science, as research continues within the confines of the paradigm, Kuhn believes that anomalies inevitably begin to emerge. Anomalies are considered to be counterexamples to the theory being tested, and thus to reduce the conflict, modifications to the theory are required. As anomalies increase in number the impetus to solve them gathers pace, and eventually, alternative hypotheses are presented as contenders for substitution. The emergence of this situation is the "paradigm debate and revolution" stage of change. The emergence of an alternative paradigm is explained by Kuhn in terms of a gestalt-shift in perception, and thus, for Kuhn, it is a psychological phenomenon.

Kuhn believes that the paradigms are conceptually independent (i.e., incommensurable), and thus require the scientist to switch from one way of thinking to another and view the anomalies in new terms. However, the extent to which incommensurability is true *in toto* is debatable, Lakatos, for instance, did not conceive of changes in research programmes as being instances of incommensurability. Riggs (1992) suggests that partial incommensurability is more likely, which may be more appropriately interpreted as the non-translatability of theoretical terms, but which does not prevent each side from understanding the other's terms.

Paul Feyerabend had discussed incommensurability prior to Kuhn (Riggs, 1992) and suggested that it occurs at the theoretical level, where the observation language of one theory differs from that of its rivals. More extremely, he also asserts that an instance of incommensurability is itself subject to interpretation: it is a matter of social achievement whether or not a particular observation language is rendered compatible or incompatible with its rivals. Despite this, it is an empirical matter whether all of the terms of one paradigm are transformed or successfully translated in a paradigm shift, and thus the interpretation of certain facts may remain stable. Thus,

it seems slightly inappropriate for Kuhn to make such a broad inductive generalisation regarding the incommensurability of paradigms, particularly when he claimed to be being descriptive.

In Kuhn's view paradigm change illustrates the socio-political aspect of his theory: in order for a paradigm shift to occur the scientists involved in the field need to be persuaded to convert. Kuhn considers paradigm change as being similar to religious conversion, and thus the fact that a paradigm does not change, when there is an alternative available, may merely be the result of political resistance rather than a rational evaluation of the progressive promise associated with the rival paradigm and the fulfilment of any scientific paradigm shift criteria that may be available at the time. This ever present possibility indicates the potential significance of the influence of social persuasion in paradigm change. Looked at in this way, the only progress in science is the phase in normal science in which scientists solve puzzles. But progress of this kind ultimately goes nowhere. This is because the apparent incommensurability of paradigms suggests that, if paradigm change is to be viewed as progress, progress can only be defined as change, as there

is no possibility of cumulating knowledge between paradigms.

2.3.6 The philosophy of science of Paul Feyerabend

Paul Feyerabend, in his book *Against Method* (1975), argues against the possibility of a universal scientific method, but in so doing, prescribes his own universal methodology. He suggests that there is no possibility of accounting for scientificity or progress by any particular rational criteria. Furthermore, he suggests that scientific knowledge should not be seen as having a status superior to that of any other belief system, for example, myth or voodoo.

Feyerabend believes that the history of science is sufficiently complex to warrant the abandonment of the possibility of reducing the nature of scientific activity to a single rational framework and, importantly, that history demonstrates that rational assumptions are violated in the process of developing a science. Consequently, Feyerabend proposes that the term "anarchy" best describes the situation. Feyerabend emphasises the extra-scientific and irrational aspects of social practice, such as

obstinacy, propaganda, and *ad hoc* adjustments (i.e., rationalisations) to theory.

Riggs (1992) criticises Feyerabend on this point, suggesting that the generalisation that every inductive rule can be dispensed with in any given instance is inductive, and thus it is unjustified to assume that this will always be the case. Additionally, Riggs emphasises that it is possible that one rule is used where another is suspended. Moreover, the point made effectively by Kuhn and Feyerabend that there is a distinction between scientific and extra-scientific concerns clearly implies the possibility of propaganda and institutional obstinacy winning over supposedly rational scientific content. More strongly than this though, their theories relativise the notion of rationality by placing it within the confines of Wittgensteinian language games.

While there may not be an absolute scientific method, Feyerabend seems to be suggesting that there are scientific "methods" associated with particular theories. This is evidenced in his assertion that "methodological pluralism" is the case, a term that can be seen as being related to methodological anarchy. However, because of his anarchistic intentions, Feyerabend makes the more extreme

claim, whether he is serious or not, that because methodological pluralism is the case, anything goes. This seems to overstate the case insofar as the indoctrination of scientists and their embedment within institutions and paradigms necessarily constrains the potential for variability in approaches sufficiently to render inappropriate the notion that "anything goes." Nonetheless, Feyerabend stresses that it is the proliferation of theories and the implied contestation between them, and thus the institutionalisation of the notion that anything goes, that facilitates the progress of science itself; in weaker terms, Feyerabend believes that progress is facilitated by the extent to which scientists think outside the terms of dominant theory. However, it would seem that the very notion of scientific progress is unavailable to Feyerabend, because he maintains a relativistic view of knowledge: he argues that scientific knowledge has no more status than other belief systems, and that alternative belief systems are also based on observations which are used to "develop" theory. He can make this claim because of the theoretical dependence of observation languages (i.e., languages that describe the world).

However, Riggs suggests that Feyerabend wrongly infers from this that all belief systems are equal. The commonly held belief described by Riggs (1992) is that the status of science is identified through its greater capacity for objectivity regarding the nature of reality than that offered by other belief systems. Riggs attempts to offset Feyerabend's relativistic notion by suggesting that the most commonly held view of the value of scientific knowledge, compared to other systems, is its predictive and practical potential. However, although the non-equivalence of systems of knowledge is appealing, the assessment of asymmetrical power is, nonetheless, paradigmatic. Considering this, it is possible that, within the rules of their logic, devotees of voodoo, for instance, could maintain the belief in the asymmetrical strength of their belief system. Therefore, by making appropriate use of their language game, believers in voodoo could be viewed as being rational in spite of the supposed counterevidence presented by a science that presumes superiority.

2.3.7 Science, paradigms and progress

The brief history of the philosophy and sociology of scientific knowledge outlined here demonstrates the complexities of, and difficulties in, describing exactly

what it is that makes science unique, and provides it with the means to make substantive progress. Furthermore, the notion of relativistic paradigms seems to have some validity, as it is difficult to dissociate assertions regarding the nature of scientific progress, rationality, and scientific methodology from their particular interpretive frameworks. Importantly, it needs to be recognised that claims of scientificity and progress come from interested parties in science, and thus these claims are not unbiased.

2.3.8 Science Studies: studying and conceptualising the production and dissemination of scientific knowledge

An additional complement to the understanding of science and its progress are some of the researches associated with the field called Science Studies. Researchers involved in Science Studies are interested in the production and dissemination of scientific knowledge: the organisation of, and interrelationships between, science, technology and society.

Several researchers involved in Science Studies have developed a social constructionist framework for

understanding the development of the organisation of science, and for studying scientific practices. The resultant framework encourages researchers into scientific knowledge, and readers of their work, to appreciate the micro-processes of change involved in the production of scientific knowledge, a focus that can be seen as complementing and augmenting some of the broader and more abstract aspects of the Foucaultian framework and the philosophy of science.

2.3.8.1 The social construction of knowledge in the laboratory

Latour and Woolgar (1979) outline a social constructionist framework for conceptualising the production and dissemination of scientific knowledge claims in their book *Laboratory Life*. The motivation for their research was that they were unhappy with the research on scientific knowledge-production in the field of Science Studies up to that point: according to Latour and Woolgar a substantial amount of research had been conducted, at that stage, on the macroscopic aspects of scientific knowledge-production. It is Latour and Woolgar's contention that this focus had maintained much of the mystery of science because the internal processes of scientific knowledge-

production had remained relatively underdeveloped. Due to these observations, they took the study of scientific knowledge-production into the laboratory, where they investigated the scientific activity that was conducted there over a period of two years. Consequently, they call their work "the anthropology of science" and their study a "monograph or ethnographic investigation of one specific group of scientists" (p.28).

One of their main interests is in the way in which scientific knowledge-production is made sense of by scientists. However, Latour and Woolgar contend that the way in which science is presented in the literature prevents the reader from grasping the ways in which scientific knowledge claims are really produced, as many literary techniques serve to hide and obfuscate the means of production. In this regard, they attach considerable importance to this ethnographic form of investigation, in the hope of reducing the reliance on scientists' published claims about the manner of scientific activity, and the interpretation and status of scientific knowledge claims.

Due to their interest in illuminating the processes involved in scientific knowledge-production, Latour and Woolgar recommend that research such as this should be

generally agnostic about the truth values of scientific knowledge claims. By diverting attention from making decisions about the truth value of particular knowledge claims, they suggest, attention can be redirected to the central interest of illuminating the processes involved in scientific knowledge-production.

As might be expected from the aim of their investigation, Latour and Woolgar deny that the study of the socialisation of scientists into the ways of science is the only means of gaining a valid understanding of scientific knowledge-production. While scientists are uniquely positioned to be our informants, this does not mean that interpretation by outsiders is inappropriate, invalid or necessarily lacking insight. Latour and Woolgar use this view to support the anthropological imperative not to "go native" when interpreting and illuminating tribal knowledge and practices. Maintaining a conceptual distance from the natives' worldview is believed to facilitate the identification of particularities, which may be in danger of being overlooked by insiders, who are more accustomed to, and thus possibly take for granted, the cultural knowledge and practices. Consequently, although Latour and Woolgar maintain that their approach "is not intended as an attack on scientific activity" (p. 31), it is still

possible that their perspective could cause some consternation among scientists because of the possibility of undermining the authority of science simply by attempting to illuminate scientific knowledge-production, while remaining agnostic about the knowledge claims of scientists.

2.3.8.1.1 The equipment in the laboratory

Latour and Woolgar (1979) note that, within the laboratory, much of the activity had the creation of diagrams and graphs as the end result. There were two types of equipment involved in this process: transforming equipment and inscription devices. The transforming equipment made transformations on, or manipulated, a phenomenon. Examples include a rotary evaporator and a centrifuge (p. 51). By contrast, inscription devices translated a phenomenon into written "inscriptions" such as those of diagrams and graphs. The difference between, and the interdependence of, the two types of equipment is significant: the inscription devices enabled traces of a phenomenon to be translated onto a transportable graph or diagram, while the transforming equipment facilitated the transition towards this end by manipulating the phenomenon

and making it amenable to the translation of the inscription devices.

Those in the laboratory considered their primary product to be journal articles, and to this extent, Latour and Woolgar suggest that the inscriptions and the supporting text in the articles should be viewed as an attempt to provide the "transportability" of the laboratory as a "trace" itself. Thus, activity in the laboratory can be seen as being a multifaceted set of activities that attempt to manipulate, translate, and transport phenomena. In this regard, an inscription constitutes or, in a sense, reconstitutes the phenomenon to which it is intended to refer. However, Latour and Woolgar note that, regardless of the transformations made on a phenomenon and the translation of it into inscriptions, the end result needs to be believed to have a direct relationship with the phenomenon represented. To this effect, much of the activity they observed in the laboratory revolved around attempts to enhance the prospect of this occurring.

The equipment in the laboratory consisted of a multifarious array of apparatus, techniques and procedures that originated from other fields, and from different times. Those in the laboratory organised all this into a

mode of production with a range of possible inputs and outputs. Latour and Woolgar suggest that the interpolation of new techniques and technologies enables change or "progress" by transforming the set of possible inputs and outputs, and also facilitates an increase in the standardisation of production so that a stable and reliable transition from an initial state to a final inscription is achieved.

Latour and Woolgar note that the construction of a smooth transition can be impeded at any point by flawed techniques or technology, or by malpractice, all of which need to be quickly identified and ameliorated to continue the progression towards the ideal of standardisation and automation. Once standardisation and automation have been "achieved," the inscriptions become the focus of discussion and, in an ideal situation, the process of production moves to the background, allowing the comparison of diagrams and the discussion of the phenomena they represent to take precedence.

2.3.8.1.2 The rhetoric of standardisation and representation

Latour and Woolgar (1979) suggest that the material production of representation is closely related to literary persuasion. To achieve representation, the problematic status of the early stages of production needs to be reduced, and while this is partly achieved by making adjustments to the experimental activity in the laboratory, the transition to the standardisation of the transformations to, and representations of, phenomena is argued for rhetorically in articles. Latour and Woolgar suggest this argumentation uses positive and negative modalities. This means that scientific rhetoricians attempt to move their own knowledge claims towards fact, while moving opponents' knowledge claims away from fact, and downplaying any interfering problems that do not support the progress of their cause. In the early stages of knowledge-production a phenomenon may merely, and modestly, be called a possibility, but as research and argumentation continue its status may be more boldly intimated to have moved up the scale of probability, potentially and eventually reaching the status of fact. If a phenomenon is seen to have achieved the status of "fact," only then has it the opportunity to sever its relationship

with the way it was produced, because facts have the privileged position of being representations of reality rather than contrived effects of the means of production. While an accepted fact has a place in the explicit knowledge-base of a particular community, the ultimate achievement of a fact is to become tacit knowledge, in which case the fact is, at times, assumed without being discussed.

There are two important features of this conceptualisation: 1) the construction of facts is a two-way process in which ostensible phenomena have the potential to move up and down the scale from fact to artefact; and 2) the production of facts reconstitutes and re-represents phenomena, and thus representations made later in the process may be markedly different from earlier ones. This potential for the continued transformation of knowledge claims demonstrates their provisionality, and thus supports the view that the production of facts and artefacts is best conceptualised in the same terms; that is, symmetrically.

The understanding that emerges from Latour and Woolgar's exposition of the rhetorical process of production is that "reality" needs to be viewed as the

effect of the social agreement associated with the establishment of facts rather than as the cause of the agreement (Latour, 1987; Latour and Woolgar, 1979). Latour and Woolgar (1979) want to establish that reality cannot be appealed to in order to establish the proposed fact as a fact, or the proposed artefact as an artefact, but rather, it is only through "completing" this process of fact construction that reality can be identified: a decision that is made by stakeholders, which invariably is accompanied by the assumption that no further social and scientific negotiation and contestation is required. Moreover, it is the decision that the process is complete that is precisely the point of social contestation, a decision that may change at any point in the dissemination of a fact, even after certain interested parties have made a definitive decision (Latour, 1987; Latour & Woolgar, 1979). Therefore, as knowledge disseminates, the control that the authorial stakeholders have over its endurance, and the ways in which it is used, represented, and interpreted, diminish rapidly.

2.3.8.2 Representation in science: circulating reference

In his book entitled *Pandora's Hope: Essays on the Reality of Science Studies*, Latour (1999) discusses the

process of representation in science, detailing a field trip into the Amazon by a team of scientists intent on identifying whether one part of the forest was advancing or retreating. Latour considers the strength of Science Studies, in which field he sees himself as being involved, to be its "empirical" practices. Latour values going into the field to study the processes of science, since, for Latour, a field trip offers the opportunity to conduct an empirical study of the philosophical questions that the armchair philosophers of the past discussed without what Latour claims to be "an empirical grounding" (p. 24).

One of the central issues that Latour was concerned with was the question of representation, or the relationship between referents and language, or "how do we pack the world into words?" (p. 24). Latour considers the "old" realist discussion of representation to be spurious. This account proposed two distinct ontological domains: language and the world, which requires that language and its referents span a gap to relate. In contrast, Latour wishes to illustrate how this is not, in his view, the "correct" picture; instead, he claims that a different phenomenon of "circulating reference" represents the situation more appropriately: "I want to show that there is neither correspondence, nor gaps, nor even two distinct

ontological domains, but an entirely different phenomenon: circulating reference" (p. 24).

The four scientists in the field were a geographer, a botanist, and two pedologists (pedology is a soil science). The botanist believed that the forest was advancing, but the initial botanical evidence was equivocal. According to the botanist it could have been advancing or retreating, whereas, for the pedologist, at first sight, it must have been retreating because, according to pedology, soil turns to clay, and the savanna was clay. Therefore, the orientation of the different disciplines provides a conflict of opinions that a field trip could, possibly, clear up.

While standing on location in the forest with the scientists, Latour noticed that the group's initial scan of the surrounding area contrasted dramatically with an earlier occasion in a restaurant, where they all gathered around a table looking at a map of the area to be studied. With the map before them they could point with certainty at the coordinates pre-constructed for them by a host of sciences including trigonometry, cartography, and geography (p. 29). Latour reflects that the laboratory has a similar pre-constructed quality to it, in that one science hides

and enables another: the collection of technologies and techniques come together to provide the framework from which science can function. Thus, the field trip and the laboratory both illustrate what Latour calls the "tautological" nature of scientific activity.

Extending this observation, Latour noticed that the site in the forest itself started to take the shape of a laboratory: when they arrived, pre-positioned tags were all over the area marking out a grid. This grid facilitated data collection. For example, through the rigorous sampling of the vegetation, back at the botanical institute, the botanist was able to make inferences regarding the pattern of growth of the species that lay within the grid. If the integrity of the categorisation and labelling of the vegetation is maintained throughout this process, then this serves as a means to establish a relationship between the taxonomic classifications of botany, and the distribution and characteristics of the vegetation in that section of the Amazonian forest.

Although a lot of information was lost in this process, such as the forest itself and its "absolute" variation, which was only sampled, there was nonetheless some preservation in the process. It is these variant and

invariant qualities that Latour is interested in. Some of what the botanist gained in this process of data collection was as follows: 1) the entire sample was at her disposal in her office, which meant that she could examine them at her own discretion; 2) plants from different regions and times could be juxtaposed, compared and contrasted; and 3) the data generated could be organised and reorganised as required, to identify patterns and differences. Due to the power associated with folding space and time into one small locality, the botanist could construct patterns and analyse the sample in a way that could not be achieved by merely standing among the trees in the forest.

According to Latour, it is through this process of data collection and organisation that he "identified" that the process of representation is best described as the establishment of an indeterminately large chain of mediators in which reference can circulate faithfully. Instead of the relationship between language and referent being understood as involving two distinct worlds corresponding somehow across a single gap, representation involves a vast number of gaps and transformations that maintain a set relationship. It is this chain of mediating components that provides the link between the subject and the predicate. The relationship between subject and

predicate then requires that the chain of mediators remains reversible; representation occurs when the possibility of reversibility is achieved through the achievement of reliability and standardisation. Where the path of mediators can be followed up and down the chain of representative media, the transportation of "truth" is enabled and maintained because the subject/predicate relationship is made dependable and clear:

If the chain is interrupted at any point, it ceases to transport truth—ceases, that is, to produce, to construct, to trace, and to conduct it. *The word "reference" designates the quality of the chain in its entirety*..."Truth value circulates here like electricity through a wire, so long as this circuit is not interrupted (p. 69).

This conceptualisation demonstrates the significance of the requirement of conductance associated with sophisticated representations. In addition, Latour emphasises that any attempt to avoid taking account of the number of components involved in the chain of media that facilitate representation avoids the full extent and quality of representation, which is precisely what Latour claims the realist model does. The difference between the models may be no more than this, because Latour still

includes the notion of gaps into the phenomenon of representation, albeit a large series of gaps. Further, the symbolic transformations and standardisation that are discussed by Latour would presumably be included in a sensible realist account of representation, because language is evidently symbolic, and must be considered to have a stable and reliable relationship with its referents if a representational situation is ever to be achieved.

Latour identifies two other processes that are at work in representation: reduction and amplification. He suggests that the process of reduction is identified in the field trip, as the chain of mediations extends away from the forest, through the categorical organisation of the sample, back in the office. The forest itself is lost, and "reduced" to the sample of data and the ways it can be organised:

From forest to expedition report, we have consistently re-represented the forest-savanna transition as if drawing two isosceles triangles covering each other in reverse. Stage by stage, we lost locality, particularity, materiality, multiplicity, and continuity, such that, in the end, there was scarcely anything left but a few leaves of paper. Let us give the name *reduction* to the first

triangle, whose tip is all that finally counts (p. 70).

In contrast, amplification is the process by which time and space converge at the end of the data collection phase, and allows an enhanced perspective that would not be possible without the chain of mediators and the organisation functions of data collection.

The initial conflict between botany and pedology could only be "resolved" after the data collection was complete, through the rhetorical negotiation and contestation of the proper interpretation of the evidence collected. A tentative conclusion and hypothesis reached by the scientists was that, contrary to the pedologists' first assumptions, the forest was probably advancing. The reason for this was hypothesised to be earthworms enriching the soil, which supplied the pedologists with an adequate reason, if true, to abandon their first assumption that the forest was receding because soil turns to clay. However, the verification of such a hypothesis, despite the fact that the earthworm was found in the sample, was something that a future field trip would have to explore, because the sample of earthworms was so small. Therefore, the results of the study required the continuation of the research in

order to attempt to reach a final assessment on the matter. If, after the next expedition, it was decided that the earthworms were present in sufficient quantity to enrich the soil to the adequate depth, and no other problems arose, then the scientists might have what they and everyone else would consider to be the final determiner of the issue: not only could they conclude that the forest was in fact advancing, but that the cause was the earthworms.

Following the way in which scientific practices create the possibility of arriving at a final decision about a state of affairs demonstrates the construction of the relationship between language and referents. As intimated by Latour and Woolgar (1979) the process of constructing scientific knowledge is progressively placed into the background as knowledge claims become increasingly "secure" and "definite." Thus, this process attempts to move towards the achievement of representation associated with the simpler realist model of representation he discussed; that is, a significant and reliable relationship between language and referent. While Latour (1999) discusses the relationship between language and referents associated with a realist account of representation, the additional important aspect of a realist perspective is that reality can be represented accurately by language.

Notwithstanding, Latour's account of representation is that it is socially constructed, but this claim does not prevent him from suggesting that science can create effective and significant representations of the world. Therefore, Latour's conceptualisation of circulating reference can be seen as an amplified, critical account of representation that does not negate the possibility of accessing the realities that are of such interest to science, but instead clarifies the way in which this can be achieved. This is an important aspect of Latour's work because it provides the possibility of moderating relativism, while strengthening the significance of the potential of scientific knowledge claims.

2.3.8.3 Scientific hegemony and alliances

An effective supplement to the above discussions of the Foucaultian framework, the philosophy of science and the micro-processes of science is the work of Callon (1986). In his paper entitled *Some elements of the sociology of translation: domestication of the scallops and the fishermen of St Brieuc Bay* he explicates a framework that deals with the broader social components of alliance formation and the construction of scientific knowledge. Initially, he distances himself from asymmetrical analyses;

that is, analyses that leave one or more aspects of the production of knowledge intact or untouched by the analytical framework, or the analyst's partisanship, for instance, the natural phenomenon ostensibly represented, some or all of the social groups involved, or the social analyst's perspective.

For Callon, both the natural and the social aspects of knowledge-production are in dispute in the process of producing knowledge. According to this view, the production of knowledge is a process of establishing a territory for controversy to play out, and temporal and situational settlements eventually to be reached. During a controversy, an analyst's beliefs about the ontological status of the natural and the social phenomena involved in an investigation need to be suspended; the way in which the controversy is negotiated and arbitrated needs to be followed until a settlement has been reached, at which time the beliefs and definitions of the natural and the social become evident in the terms provided by the groups being investigated. Nonetheless, any settlement is to be viewed as potentially subject to destabilisation in the future, a situation that maintains the symmetrical understanding of knowledge-production.

The players involved in controversy and alliance formation are what Callon calls "actors" and "actants": the term "actor" refers to humans, while the term "actant" refers to non-humans. He provides three analytical suggestions for proceeding in an investigation, which he calls "principles": agnosticism, generalised symmetry, and free association. "Agnosticism" refers to the suspension of judgement regarding the way the actors involved in a controversy talk about and establish how nature and society are to be interpreted: the imperative is to refrain from deciding on the identity of the actors and the actants involved in a controversy when the nature of their identity is precisely what is still being negotiated and contested (p. 200). "Generalised symmetry" is the term used to identify the practice of explaining all phenomena in the same terms with impartiality towards the particular elements involved; that is, all aspects are to be problematised within the same framework. Callon's third principle, "free association," refers to the abandonment of *a priori* distinctions between, and definitions of, the natural and the social; rather, we are to investigate social controversy to arrive at the way in which the natural and the social are divided up and defined by the process of knowledge-production. Thus, the distinction between, and the identities of, natural and social

phenomena "are the result of analysis rather than its point of departure" (p. 201). Moreover, an investigation provides an illumination of controversy, and the ways in which phenomena are constructed throughout the process.

Callon proposes a conceptualisation of the process of scientific knowledge-production that emerged from the application of these principles. He claims to have discerned four "moments of translation" in the course of the scientific controversy he studied: problematisation; interessement; enrolment; and mobilisation. First, "problematisation" refers to the process by which "instigators" identify a "problem" and proceed to try to convince those "with" this problem that it is in fact real and impacts on their interests. Importantly, the instigators then insist that they can assist those with the problem to overcome it. Such instigators attempt to interpose their services and products into the path of those with the apparent problem. Where they succeed in this endeavour they become relatively indispensable; that is, they attempt to become an "obligatory point of passage": a passage that those with the problem need to travel through in order to attain their goals. Second, "interessement" refers to the related mechanism by which instigators, who can be called "translators," attempt to

interest and convince those with the problem, and lock them into the roles and identities that they, the translators, outline for them. Third, "enrolment" is the actual success of interessement: enrolment has occurred when those who are targeted accept the identities and roles allocated to them. Finally, "mobilisation" refers to the knowledge that enrolment has occurred. In order for enrolment to be identified some means of representing it needs to be used: in large groups a representative sample may need to be collected, while in other cases spokespersons may also be of utility as group representatives.

These four moments of translation can be seen as an interrelated set of mutually supportive processes that outline the persuasion that is required in order to achieve substantive change and the production of scientific knowledge. In a symmetrical manner, this process involves the persuasion of both the natural and social entities/phenomena that are involved in a particular controversy.

An issue may be made of Callon's term "obligatory point of passage," because it would be seen as overstating the case in many instances; instead, "relative indispensability" may be more appropriate where competition

in the market place is high and, importantly, where competitors and target groups have access to each other. In a situation where there are competing translators, the problem of developing and maintaining enrolment is relatively more complex because of the increased degrees of freedom associated with possible actions: the potential for resistance to, and recalcitrance towards, any particular translator can be seen as being related to this competition between choices.

Finally, this perspective echoes the political strategies famously recommended by Niccolo Machiavelli in his book entitled the Prince (1531, reprinted in 1999) in which he discusses the means by which practitioners, princes, may attempt to negotiate the fraught path to social hegemony. Importantly, Machiavelli emphasises that the modus operandi of practitioners interested in achieving and maintaining social hegemony needs to be one in which anything that needs to be done will be done if it is at all possible to do it. While this approach appears cynical and potentially immoral—indeed he does recommend killing as a necessary means in the required circumstance—if the achievement and maintenance of social hegemony is the object of enquiry, then it is important to be descriptive rather than moralistically prescriptive or proscriptive.

In any case, the extent to which descriptive pragmatics diverges from prescriptive and proscriptive morality depends entirely on the practical utility of specific moralistic considerations in particular circumstances. Indeed, Machiavelli's elaboration contained considerable overlap between these considerations, and a primary aim of his text can be considered to be to foster the transition towards a healthy, stable and equitable social condition—a laudable objective. Further, although Machiavelli's elucidation of social hegemony is descriptive in one sense, it is also very prescriptive because of his emphasis on explicating and enumerating conditionals that facilitate achievement, and recommending their use whenever they are required. In this regard, the interests of Callon and Machiavelli can be seen as being intertwined and complementary inasmuch as they focus attention on the conditions for social achievement and the description of social process, thus providing a dynamic framework with which to analyse and interpret the pursuit of hegemony.

This framework can be seen as compatible with, and supplementary to, the neo-Foucaultian framework and the work of Latour and Woolgar (1979), and Latour (1999) discussed in previous sections. The moments of translation that Callon discusses illustrate the criteria that need to

be fulfilled before social and scientific hegemony can be achieved; this interest is shared by the Foucaultian approach to archaeology and genealogy, and Latour and Woolgar's (1979) and Latour's (1999) research on the micro-processes of science, but they do not elaborate this interest in the same manner. Therefore, if Callon's and Machiavelli's input into alliance formation is not considered and included in an interpretive framework, and the other frameworks are solely relied upon, this significant aspect of social action may remain obscured.

2.4 Conclusion

This chapter explored frameworks concerned with the conceptualisation of history, change, scientificity and the progress of scientific knowledge. Although the Foucaultian approach was found wanting in some ways, the transformations made to it are seen as providing a more flexible, robust and intelligible interpretive framework that can be used to inform the research and illumination of history and change in general, and science specifically. Nonetheless, the exploration of the philosophy and sociology of science that followed provided an additional opportunity to augment this understanding in terms of the manner of scientific activity, its representation, and progress in both scientific and social terms. As a result of this exploration, a relativistic, paradigmatic and social constructionist interpretation of scientific representation and knowledge-production was established; a framework that demonstrates that scientific knowledge and hegemony are achieved through an interminable series of trials of strength between networks of association.

The conceptualisations explored in this chapter cover the various levels of organisation associated with

knowledge production. Moreover, the work of Latour and Woolgar (1979) and Callon (1986) also provide an additional supplement to the Foucaultian approach to history by providing informative directions/suggestions on how to investigate and interpret scientific knowledge-production and the contents of scientific knowledge itself. Therefore, this chapter can be viewed as a conceptual point of departure for understanding the processes involved in scientific knowledge-production, and also as a source of reference for the manner in which to investigate and interpret scientific knowledge-production and the contents of scientific knowledge.

Chapter 3

Neuropsychological Knowledge and the Progress of Science

3.1 Introduction

This chapter explores the historical constitution and transformation of neuropsychological knowledge, and discusses how this can inform the understanding of historical changes in, and progress of, science. In the history of neuropsychological knowledge there appear to have been two significant areas of controversy: 1) the most significant organ associated with psycho-physiological phenomena; and 2) the degree and specificity of the localisation of functions within the proposed organ. It is argued that the diversity of views represented in the history of the area demonstrates that there has been a series of schismatic changes in the discourse_F in these main areas of concern: importantly, these changes occur within the framework of particular discourses_F as well as between discourses_F. This phenomenon is also demonstrated to have a degree of non-linearity: dissociations from the past may not be everlasting; rather, supposedly superseded views

have the potential to be revivified and, subsequently, to regain popularity.

Reflecting on this history, a moderate form of relativism is proposed which reduces the absolute potential of non-linearity, through arguing that it is appropriate to admit the notion of discursive_F asymmetries into the interpretation of competitions between regimes of scientific knowledge. These discursive_F asymmetries create difficulties for achieving schismatic change, the most evident example of which is the emergence and continuing hegemony of the priority of the brain. In this context, the possibility of discursive_F asymmetries in science indicates the need for the notion of "the relative irreversibility of knowledge" to be included into the framework of scientific knowledge-production, an inclusion that specifies the potential for representation and progress in science.

3.2 Approaching the study of history

The investigation in this chapter is informed by the neo-Foucaultian and translation sociological approaches to history discussed in the previous chapter. In this regard,

the primary interest is in the exposition of the conflicts in, and representations and transformations of, neuropsychological knowledge through much of its history. The notion of generalised agnosticism, as it refers to historical investigation, suggests that we suspend judgment regarding the truth of knowledge claims: the aim is merely to explore the history of change and the many ways in which conceptualisations associated with the field of knowledge are formed and transformed. Nonetheless, this interest is concerned with ontological and epistemological issues at the meta-theoretical level of knowledge-production; that is, the interest is in developing knowledge of the means of scientific knowledge-production rather than knowledge of the status of neuropsychological phenomena.

Therefore, the aim is to interface this examination with a framework that can be interpreted as providing a candidate for the model of best fit to account for the dynamics of the historical changes and knowledge represented. Such a framework not only creates an account of, but also sets the limits of possibility for, scientific representation and progress, because of its status as a universe of discourse (i.e., the territory of a specific field of knowledge). Thus, reflexively, the resultant framework can be treated, by critics, in the same way as

that of the object of investigation (i.e., neuropsychological knowledge and its history).

3.3 A history of neuropsychological knowledge

3.3.1 Neuropsychological knowledge in ancient Egypt

The earliest medical record detailing the diagnosis and treatment of head injuries is written on a papyrus that originated in ancient Egypt. The document came to be called the *Edwin Smith Surgical Papyrus*, and it is reported to have been bought by Edwin Smith in Luxor, Egypt, in 1862. The document has been dated at between 2200 and 3000 B.C. The first eight of the 48 case studies contained in the document relate to head injuries. The text reveals that the Egyptians were aware that damage to the central nervous system could have distinct effects at distal locations in the body, and could also be associated with various functions, for example, eye-hand coordination (Finger, 1994, 2000; Leon-Carrion, 1997; Walsh, 1994; Winston, 2003).

The case studies reveal an early adumbration of a localisation theory of neuropsychological functioning,

because of the different effects that were associated with the location of injury. The papyrus reveals that the author, presumably an Egyptian physician, after having observed motor deficits on the same side of the body as the head-injury itself, inferred that motor functions were ipsilaterally controlled by the brain. By contrast, today it is believed that lesions to the motor cortex create effects contralateral to the site of injury. According to this framework, an injury to one side of the head could lead to a substantial *contre coupe* injury (i.e., an injury on the opposite side of the brain which received the blow) causing motor deficits on the contralateral side; an effect which would seemingly account for the inference made by the author of the papyrus (Walsh, 1994).

Although the papyrus provided no information on the long-term cognitive effects of head injuries, another papyrus from the same period, known as the *Ebers Papyrus*, recognised remembering as having an organic basis that can be disrupted if the brain is adversely affected (Finger, 1994; Walsh, 1994).

Regardless of the significance of these documents and their allusions to the importance of the brain, it is to be noted that an important assumption held by Egyptians was

that the heart, not the brain, was the seat of consciousness, intelligence, and the soul; a supposition that was well developed when these documents were written, and which was maintained for many centuries thereafter. Furthermore, in their embalming practices, the Egyptians are reputed to have unceremoniously discarded the brain, while the heart, and other organs such as the lungs, liver, stomach, and kidneys were treated with substantially greater care, by being replaced after embalming or placed into jars and preserved (Finger, 1994).

3.3.2 Neuropsychological knowledge in ancient Greece

Despite the apparent conflicting framework contained in the papyruses, the cardiocentric view of the Egyptians is presented by Finger as having been relatively stable, enduring and uncontested. In contrast, Greek thought appears to have been more varied (Finger, 1994). At least two early Greeks, Alcmaeon (c. 500 B.C.) and Anaxagoras (400-428 B.C.), proposed that the brain, rather than the heart, was responsible for cognition and sensation. After describing his dissections of the optic nerve which, incidentally, were some of the earliest, Alcmaeon proposed that the brain was in fact of central importance for cognition and sensation. In addition, the *Hippocratic*

corpus, the body of work that was written under the name of Hippocrates (460-370 B.C.), but which is believed to have had many contributors, also proposed that the brain was the important organ in relation to cognition. Hippocrates rejected demons and spirits as explanatory devices (i.e., one aspect of demonology, which was dominant in Greek thought until this time, c. 400 B.C.), and, instead, viewed psychic phenomena as having their genesis in the physical body: an orientation called "somatogenesis" (Finger, 1994, 2000; Selnes, 2000; Winston, 2003).

One of the Greek contributors to the science and art of dissection was Herophilus (335-280 B.C.). He provided a rudimentary description of the brain, identifying the cerebellum, cerebrum, and ventricles—he assumed the psyche resided in the latter. In addition, Erasistratus (c. 310-250 B.C.) conducted comparative cross-species studies of brain-surfaces, and concluded that the complexity of the cerebral convolutions correlated positively with intelligence (a view that would be lost and then revived much later in history). Before this time, Democritus (c. 460-370 B.C.) and Plato (c. 429-348 B.C.) both believed that the soul resided in three locations. The intellectual part of the soul was located in the head, while the emotional aspects, such as anger and fear, resided in the heart,

while the passions, such as greed and desire, resided in the liver or the gut.

By contrast, Aristotle (384-322 B.C.) was less impressed by these ideas and the Hippocratic corpus. He maintained the cardiocentric perspective more extremely than some of his contemporaries, suggesting that the heart was the primary centre of all psychic functions (Bennet & Hacker, 2003; Finger, 1994; Winston, 2003). He reduced the status of the brain to that of a radiator (i.e., a cooling device). Heat played an important role in his scheme: it was seen as being a quality that distinguished live from inanimate objects, all of which were believed to be unable to produce heat. Additionally, heat rises and, since the brain is cool and lies above the heart, the notion of it being a radiator of heat seemed quite plausible.

Supportive of this belief was the fact that blood vessels surround the surface of the brain; thus they could be interpreted as providing blood with an opportunity to circulate around the radiator, being reduced in temperature before circulating back to the heart. In addition, the unusually large brain of humans was reasoned to indicate that it provided an extra power to cool the "passions" of the heart, thus allowing humans to be the most rational and intellectual creatures on Earth.

This peculiar cardiocentric perspective, which was maintained so strongly by Aristotle regardless of the contrasting beliefs of many of his contemporaries, not only had a long intellectual history in Greek thought, but was also rooted in Ancient Egypt, Mesopotamia, China, Judaism and Hinduism (Finger 1994). This afforded Aristotle the appeal to tradition and, consequently, he could confidently maintain the contrast between his views and those of some of his contemporaries who did not have such an appeal at their disposal.

3.3.3 The orientation of Galen and his influence on cell doctrine theory

Galen (130-200) spent much of his career in Rome, serving four successive emperors. In the course of developing his ideas he performed many dissection studies on animals. It is believed that he did not perform any dissections on humans, because Roman law outlawed the practice. Certainly, there is no evidence that he did. His dissections included various animals such as cattle, sheep, pigs, cats, dogs, monkeys and apes. Galen rejected Aristotle's cardiocentric view: he provided two different theories in his extensive writing that located intelligence within either the ventricles or the brain substance. He

also postulated a finer-grained localisation theory by suggesting that the cerebellum was responsible for motor functions and that the cerebrum was responsible for sensory functions (Clark and Dewhurst, 1973; Finger, 1994, 2000; Winston, 2003).

His main theory was that vital spirits are emitted from the heart and travel to the brain, where they are transformed into the more refined "animal spirits." He changed his opinion on where these animal spirits reside, but he believed they are either at the base of the brain in the *rete mirabile* (a network of blood vessels that was, incidentally, later found not to be present in humans) or in the ventricles. It is due to Galen's dissections of certain animals in which the *rete mirabile* is found that he assumed that it was also present in humans. Although this issue is now viewed as being resolved, Galen's apparent error persisted even after some early human dissections took place. This view was maintained until the 16th century, and in some instances into the 17th century (Clark and Dewhurst, 1973).

According to Galen, the animal spirits lie in wait at one of these two locations (i.e., the *rete mirabile* or the ventricles) until they are needed, at which time they pass

through hollow nerves to perform their sensory or motor functions. In other work he suggested that the animal spirits flow, not only into hollow nerves, but also into the brain substance itself. Additionally, at one stage he declared that no wound to the brain could impair function unless the wound penetrated to the ventricles, where the animal spirits reside (Finger, 1994, 2000; Leon-Carrion, 1997).

Galen distinguished between imagination, cognition, and memory. However, he did not localise these functions himself, this was achieved by later users of his knowledge who revered certain aspects of his work over that of others (Finger, 1994; Selnes, 2000). Although Galen was inconsistent, a certain reading of his work came to dominate dogmatically the thinking of the next millennium. The Church fathers, initially Nemisius (c. A.D 390) and St Augustine (A.D 354-430), selectively extracted aspects of Galen's thinking and modelled what became known as cell doctrine theory. Proponents of this view positioned consciousness in the ventricles and localised Galen's three faculties (imagination, cognition, and memory) in different areas of the ventricular system (Bennet, Hacker, 2003; Clark and Dewhurst, 1972; Finger, 1994, 2000; Selnes, 2000; & Walsh, 1994).

Even though the dominant theory of ventricular localisation remained stable for many years, the division of the ventricles remained disputed, as was the way in which the faculties were distributed or located within them. One scheme promoted a three-cell system, while another proposed a five-cell system. The three-cell system located the faculty of sensation in the first ventricle, imagination at the rear of the first or in the second, reasoning in the second, and memory in the third. An alternative proposal was that the third cell, located at the rear, controls motor functions as well as memory. In addition, in the 10th century a dynamic model supplanted the original static view. A digestive-tract metaphor was proposed, in which perceptions are initially processed in the first ventricle, and progressively pass through the ventricles, until they are stored in memory in the third (Clark & Dewhurst, 1973).

One plausible motivation for the rise of the cell doctrine theory was the religious orientation of its adherents. The belief that the soul was immaterial was viewed as precluding the possibility that the brain substance itself could be seen as being responsible for intelligence. The hegemony of the Church throughout this period produced a relatively dogmatic and static view

regarding the localisation of the faculties (Finger, 1994). Furthermore, despite the emergence of the Renaissance and the revival of interest in dissection and experimentation, cell doctrine theory continued to dominate in Europe in the early part of the renaissance, and the last remaining vestige of the theory was maintained until the early part of the 19th century (Clark and Dewhurst, 1973; Finger, 1994, 2000).

During the European Middle Ages, which lasted from around the 4th century to the 14th century, there was widespread cultural stagnation, and the lack of neuroscientific research and the endurance and hegemony of cell doctrine theory reflect this (Finger, 1994). In contrast, in the Middle East, many scholars translated the ancient texts of the Greeks in addition to those of Galen and Aristotle. It was not until the Europeans became aware of these texts, and consequently disseminated them through Europe, just prior to the Renaissance, that a renewed interest in anatomy, physiology, and medicine developed. Finger (1994) suggests that the Black Death of 1347 expedited this change by making the impotence of the doctrines, perpetuated by the Church of the day, entirely evident.

Spearheading the change were those who transgressed norms and revived the interest in, and need for, human dissection. Leonardo Da Vinci (1472-1529) carried out dissections of over 300 corpses, despite a law forbidding the practice. He found that the anatomical descriptions of the ventricles perpetuated up to this time were flawed: due to the lack of anatomic dissection research during the reign of cell doctrine theory the depictions of the human brain and the ventricular system were crude. However, although Da Vinci amended the anatomical depiction of the ventricles, he did not reject ventricular localisation.

Another researcher, Andreas Vesalius (1514-1564), also carried out many human dissections, and on the basis of these maintained that the *rete mirabile* did not occur in humans. He also contended that Galen made at least 200 errors in his anatomical descriptions. However, while he facilitated the criticism of historical writings, and reinvigorated interest in anatomy, he too failed to reject cell doctrine theory (Bennet, Hacker, 2003; Clark & Dewhurst, 1994; Finger, 1994, 2000).

Up until the 17th century attention remained on the ventricular system, and the cerebral substance was perceived as unimportant and was therefore ignored. This

is assumed to be partly due to the view received from Galen that the cerebral convolutions have no relationship to intelligence (Finger, 1994; Clark & Dewhurst, 1973). Moreover, while attention to the anatomy of the brain substance itself was reinvigorated during the renaissance, the belief that there was no pattern to the convolutions survived until the early 19th century.

However, in the 17th century the shift away from cell doctrine theory began, through the work of several figures. Franciscus de le Boe (1614-1672), and the Oxford physician Thomas Willis (1621-1675), both asserted independently that the brain, and not the ventricles, was responsible for mental function. Willis proposed that the corpus striatum, the corpus callosum, and the cerebral cortex were responsible. According to his view, the corpus striatum is responsible for sensation and movement, the corpus callosum is responsible for imagination, and the cerebral cortex is responsible for memory. He also associated involuntary systems and operations that are vital to life with the cerebellum—an area in which he believed there to be more separate regions than we do today (Bennet, Hacker, 2003; Clark & Dewhurst, 1973; Finger, 1994, 2000; & Selnes, 2000). Additionally, while Franciscus de le Boe began the focus on the surface of the brain, it was not until the

1830s that it was considered to have a fairly standard pattern within species (Finger, 1994; Clark & Dewhurst, 1973).

3.3.4 Gall's craniology

At the end of the 18th century Franz Joseph Gall (1758-1828) started to disseminate what he called "craniology," which later became known as "phrenology" (Finger, 1994). Although his work was quickly altered and then largely dismissed, his central belief that the brain substance and the cerebral cortex are the basis for cognitive functions gained consensus and quickly became a tacit assumption (Selnes, 2000; & Young, 1970). Instead, what was disputed was the location and distribution of cognitive functions in the brain. Gall's theory was an extreme version of a localisation theory. The presuppositions that Gall made included the following: 1) the faculties are innate; 2) the faculties are dependent upon brain organisation; 3) the brain is the organ that houses the faculties; and 4) each faculty or function has its own distinct organ within the brain, which implies that localisation is as extensive as the faculties are numerous. In addition to these assumptions Gall proposed what is known as "the doctrine of the skull": he believed that organ size correlated with

faculty strength, and that these faculties are located on the surface of the cerebral cortex (i.e., in the grey matter). The final element of the "doctrine" was that the protrusions associated with developed faculties create lumps on the surface of the skull. These beliefs suggested to Gall the possibility of locating and partitioning brain organs and functions through the measurement and identification of outer-skull lumps. However, although he localised 27 faculties, some of his inferences were based on scant empirical evidence (as few as one or two human cases) (Leahey and Leahey, 1984).

Gall primarily studied the extreme elements in society. This was because of the belief that sizable protrusions were abnormal or unusual, owing to the correlation with faculty strength, and so he sought out the extremes of society such as the gifted and the criminally delinquent. Additionally, Gall believed that the faculties that control behaviour can only be used for good or bad; that is, the faculties are not unbiased and produce either virtuous or delinquent behaviour. He also maintained that the faculties are inherited and immutable. By asserting these views, he precluded the possibility of self-improvement and rehabilitation (Wilson, 1994).

Johann Caspar Spurzheim (1776-1832) aided in the development, transformation and dissemination of craniology, renaming it phrenology (Clark and Dewhurst, 1973; Finger, 2000; Wilson, 1994). He worked with Gall initially, but eventually started to add his own ideas and disseminated his own transformed version, which initially enjoyed popularity. He indicates (Spurzheim, 1837) that the term stems from two Greek words *phreno* and *logos*: the former meaning mind and the later meaning discourse or doctrine, "hence it means the doctrine of the mind" (p. 1). Echoing Gall's conceptualisation, Spurzheim intimates a potential functional psychology by suggesting that we cannot observe the mind itself, but that we can observe its manifestations (Leahey & Leahey, 1984):

As men are not endowed with the knowledge of the essential nature of mind itself, I cannot speak to you of the mind; we can, however, observe its manifestations, and the conditions under which these manifestations take place. Phrenology, then, is the doctrine of the manifestations of the mind, and of the relations which these manifestations bear to certain bodily conditions (Spurzheim, 1837, p. 1).

Like Gall, Spurzheim believed that phrenology was in the unique position of being able to provide the tools to analyse behaviour and relate these manifestations to skull

shape. Spurzheim added 8 new faculties and re-ordered Gall's nomenclature, and it was Spurzheim's version of phrenology, around 1820, that elicited popular interest. Furthermore, in contrast to Gall's static, hereditary view, Spurzheim believed that the faculties are in fact adaptable to circumstances and are not intrinsically good or bad: they can be modulated, and thus are subject to rehabilitation and self-help (Leahey and Leahey, 1984; Wilson, 1994).

Nonetheless, he did maintain that faculties are inherited, and that there are limitations on their potential for transformation. Within his system certain groups and races are ordered hierarchically. For instance, Australian Aborigines are viewed as largely incorrigible while, more generally, women occupy a relatively lower position than men in the hierarchy of being. Thus, although Spurzheim retreated from Gall's over-deterministic perspective, he still maintained that human behaviour is subject to biological constraints and laws of nature. The potentials and limitations for a psychology of change contained within his conceptualisation supported and reproduced the colonial values of the British, and thus, because of its compatibility with commonly held views,

Spurzheim's phrenology was greeted initially with considerable popular support (Wilson, 1994).

3.3.5 Reactions against phrenology

As phrenology was promulgated, conflicting maps of functions were produced. Even worse, Gall's initial interest in the relation of functions to brain structures was ignored, and phrenology became predominantly a means of forecasting and assessing character (Clark & Dewhurst, 1973). In their rebuttal, opponents were able to capitalise on this degenerative shift, while also focusing on the perceived problems with the doctrine of the skull. Continued research into the brain eventually found biological ground for opposing phrenology. Distinct organs were found to be impossible to delineate in the areas defined by phrenology, and importantly, while the brain does cause some indentations on the interior of the skull, the effects do not extend to its exterior (Finger, 1994).

One of the leading detractors of phrenology was the French scientist Marie-Jean-Pierre Flourens (1794-1867), who advocated the study of ablation effects and brain stimulation in animals. After researching animals he concluded that functions are indivisible, and that the

whole cortex works as a unified whole; a theory which came to be known as "equipotentiality" and is still held dogmatically by some neuroscientists. His experiments with birds provided him with the evidence that all disrupted functions improve concomitantly. Flourens's approach to investigation (i.e., ablation and stimulation) was taken up enthusiastically by many researchers and, initially, his holistic theory of brain function was well received. This was partly owing to the strength of the reaction against phrenology which, because of its association with localisation, appears to have resulted in a similar reaction against that notion.

3.3.6 The cerebral convolutions

Gall's craniology reinvigorated the impetus to research the cerebral convolutions, even though phrenological practitioners deviated from such an interest. While the 18th century produced examples of detailed pictures of the cerebral gyri and sulci, it was a relatively purposeless activity until the advent of phrenology because of the generally accepted insignificance of this aspect of the brain. Thus, the emergence of phrenology provided a new and important purpose for the interest in investigating the convolutions. As a result of

this increased attention, by the middle of the 19th century the cerebral convolutions became seen as, at least to some degree, systematically organised (Clark and Dewhurst, 1973).

Gall's interest in the cerebral convolutions cannot be overstated, and his anatomical drawings are fairly good representations of them; they were regarded throughout much of the 19th century as exemplary (Clark and Dewhurst, 1973). This is rather peculiar, considering the generally held belief in the lack of correlation between the cerebral convolutions and the outer bumps of the skull, and particularly, the difficulty in identifying Gall's supposed organs because of the complexity of the convolutions.

3.3.7 The re-emergence of cortical localisation

By the 1870s there was a return to the notion of cortical localisation (Finger, 1994, 2000; Walsh, 1994; Young, 1970). In 1861, Paul Broca (1824-1880) provided the evidence that is generally cited as providing the basis for the re-emergence of localisation theory after equipotentiality's brief reign during the period of phrenology's popularity. Although it was not the first time that such evidence was presented in the years

following phrenology's relative stigmatisation, it was the first time that such evidence gained acceptance by the scientific community. Interestingly, Broca's evidence for some degree of localisation was based on one case in which an anterior lobe lesion was associated with a speech fluency and articulation deficit. The notion of cerebral dominance was not accepted at the time, but in 1865 he suggested that a specific area of the left frontal lobe is responsible for speech articulation. Additionally, while he initially believed that the localisation was quite specific in its cortical region (i.e., the third left cortical convolution), incoming evidence began to confute this belief, and it is now accepted that there is considerable individual variation in the location of the function (Bennet, & Hacker, 2003; Clark and Dewhurst, 1973; Finger, 1994, 2000; Rosenfield, 1988; Walsh, 1994; Young, 1970).

Prior to Broca's claims, Gall had located speech in the same area as did Broca (Winston, 2003), and additionally, several other researchers, such as Jean-Baptiste Bouillaud in 1825 and his contemporaries Claude-Francois Lallemand in 1820, and Leon Louis Rostan in 1823, suggested that speech could be localised. However, there was also some evidence that appeared to conflict with this

position. Between 1820 and 1831 Gabriel Andral studied a sample of 37 patients with anterior lesions, of whom only 21 had speech impairments. Although he did not report the laterality of the lesions, he noted that 14 patients with speech impairments had lesions that were posterior to the frontal lobes (Clark and Dewhurst, 1973; Finger, 1994, 2000; Walsh, 1994).

Additional research in Broca's time furthered the trend towards localisation theory. Fritsch and Hitzig (1870, in Bennet & Hacker, 2003) are credited with discovering the motor cortex in dogs through stimulation experiments. Previously, researchers had either failed to affect motor functions with stimulation, or their stimulation was apparently so strong that they could not localise the effects. However, Fritz and Hitzig provided appropriately mild amounts of stimulation to cortical areas, which consequently allowed them to delineate the motor strip and suggest that it is somatotopically organised, a view which is still held today (Bennet, & Hacker, 2003; Finger, 1994, 2000; Young, 1970). Sir David Ferrier improved on this delineation by using finer currents and consequently produced more specific motor movements such as the movement of a single digit. Thus, Flourens's extreme holistic theory was largely viewed as

being refuted by this time, including some of his conclusions about the brains of the animals he studied. However, his work helped to refocus attention on the brain at a time when the attention of those supporting phrenology had departed from it. And, ironically, his experimental approach eventually led to the re-emergence and, by and large, the acceptance of a certain degree of cortical localisation (Clark and Dewhurst, 1973; Finger, 1994, 2000; Rosenfield, 1988; Young, 1970).

Walsh (1994) notes that one way in which a vestige of the holistic view is maintained in the contemporary conceptualisation is through the notion of cerebral redundancy: the observation that certain cognitive-behavioural deficits that result from cortical damage can be ameliorated by other cortical areas taking over the responsibility for the function. Thus, the concept of cerebral redundancy makes use of the notions of the localisation of functions and the flexibility (or general potential) of the cortex.

Interest in localisation theory became quite extreme again during the late 19th and early 20th centuries because of the cortical cartographic research approach known as "cytoarchitectonics." Cytoarchitectonics is the study of

cells, their composition, and their arrangement in the cortex. The development of staining techniques enabled the illumination of various divisions in the cortex to be made by researchers in the early 20th century. The results indicated that the cortex consists of various cell types and structures. These divisions revived the belief that specific functions could be localised. The perceived success of the delineation of the motor and sensory areas of the cortex provided hope that this could also be done with higher cognitive functions. However, the same level of delineation has not yet been forthcoming (Walsh 1994).

Many different cytoarchitectonic maps emerged. In 1905 Campbell provided a map with 20 cortical divisions. This was followed in 1909 by Brodmann's schema: his divisions numbered 50. This work continued, with researchers producing maps with over 200 divisions. The problem of the "reality" associated with these physiological representations became an important question (Walsh, 1994), a condition which is also reminiscent of the multiple schemata of phrenology.

In contrast to the excesses and ambiguities of cytoarchitectonic research, the earliest scheme of divisions is still apparently the most widely used today.

These divisions are the frontal, temporal, parietal and occipital lobes, which are named after their overlying bones, and are assigned a variety of functions with varying degrees of localisation within each lobe. Although these divisions are themselves somewhat arbitrary physiologically, they are viewed by many as being more important and representative than the more enthusiastically detailed subdivisions, in the schemata of cytoarchitectonics (Walsh, 1994).

3.4 Scientific representation and progress

The history of neuropsychological knowledge reveals that there were primarily two main controversies: 1) the location of the seat of consciousness; and 2) the localisation of the various cognitive abilities within the overarching framework. Examples of proposals for the seat of consciousness include the cardiocentric, the ventricular and the brain-based views. In addition to the extreme differences between views such as these, various differences can be found to have occurred within the framework of particular views. For example, cell doctrine theory, phrenology, and cytoarchitectonics all contained,

over time, a variety of conflicting taxonomic models for the localisation of functions.

The controversies that appear in the history of neuropsychological knowledge can also be seen as occurring at two different levels: metaphysical and empirical. The overarching domain of a particular orientation such as cell doctrine theory informs the possibilities and limitations of the ways in which phenomena can be interpreted and represented. For instance, within the confines of cell doctrine theory phenomena can only be associated with the ventricular system. Such frameworks can here be called "totalised universes of discourse"; that is, they provide an all-encompassing domain that orients and limits possible interpretations, and actions, and specifies the kinds of objects that exist and the way in which they exist. On the other hand, at the empirical level there can be substantial conflicts within these universes of discourse. This is instanced in the variety of conflicting taxonomic models that accumulated within the confines of many of the frameworks, even within cell doctrine theory.

The model of conflict that emerges from the history of neuropsychological knowledge appears to be one of non-linearity: the hegemony of one view cannot be taken to mean

that an alternative view, even a previously displaced view, cannot be revivified, and consequently regain popularity. Such a non-linear view of change decentres the notion of cumulative progress, because history may cut short the expected trajectory of a framework and replace it with that of an alternative. Further, this non-linearity creates problems for representation: whether a conflict is over subtle or substantial differences in orientation, the mere existence, and especially the preponderance, of conflicting forms increases the need for rhetorical arguments that consequently confound representations with politics.

Notwithstanding, throughout the history of neuropsychological knowledge there are examples of emerging conclusions that seem to be irreversible: contralateral motor control; the non-existence of *rete mirabile* in humans; the relatively systematic organisation of the cerebral convolutions; the lack of correlation between the cerebral convolutions and the bumps on the exterior of the skull, and importantly, the association between the brain and psycho-physiological phenomena. The apparent non-existence of the *rete mirabile* in humans seems to have been established in a sensible manner: through research on human subjects rather than by merely inferring its existence in humans from its presence in horses. If these are

convincing examples of the relative irreversibility of conclusions in the history of neuropsychological knowledge, this goes some way to requiring a limitation to be placed on the suggested non-linearity of history; that is, making it a less than total non-linearity.

The notion of empirical systems aids the legitimacy of believing in the relative irreversibility of conclusions in science, and can be seen as a potential framework for identifying a demarcation between scientific knowledge and politics. The primary objective of an empirical system is to create a standardised means of data collection. Once this condition is met, the empirical system allows representations to be made, reproduced, and retraced systematically, and with a degree of transparency. Progress can be assigned to those moments in which increased standardisation, reliability of reproduction, and clarity of representation can be interpreted as being achieved.

Nevertheless, it still remains true that any claim to scientificity and progress may be countered by antagonists as being wholly rhetorical or counterfactual. Notwithstanding this, scientific knowledge is one aspect of the rhetorical armoury of social persuasion. Therefore,

scientific knowledge may be mobilised in the service of struggles for social hegemony where it is hoped to tip the scales in favour of a particular group: the results of which can evidently have substantial quantitative and qualitative material effects. In this context, the empirical system serves two functions: 1) to increase the possibility of partitioning the political and the scientific components of knowledge-production, thus serving to aid the persuasiveness of the attribution of scientificity, knowledge and progress; and 2) to advance knowledge, within the terms of its own universe of discourse_F, in the hope that the resulting knowledge will serve to increase the chance of winning scientific trials of strength, and consequently establishing hegemony and relative irreversibility.

3.5 Conclusion

The history of neuropsychological knowledge provides a basis for conceiving of historical change as involving a series of schisms, which can be viewed as differences that emerge within and between discourses_F in the process of developing and disseminating knowledge. This series of schisms may also be viewed as being non-linear; that is, rather than progress being perpetually cumulative, a change in framework sometimes results in a previous view being revived. However, the extent to which this non-linearity is possible needs to be seen as limited. The entrenchment and hegemony of universes of discourse_F limit the ease with which schisms can occur. Further, although science depends on politics for the achievement of hegemony, consideration of the empirical system provides an indication of the way in which regimes of scientific knowledge may be seen as empirically, and not just politically, asymmetrical. As a universe of discourse_F, the empirical system enables the production of knowledge and creates associations that are unequal in the ease with which they can be broken down and rearranged. In this context of discursive_F asymmetries, hegemonic scientific

knowledge attains a degree of irreversibility, thus limiting the potential for non-linearity.

This relative irreversibility of knowledge provides the basis for interpreting progress in science and implies that only a moderate relativism could be appropriate. Although science and politics are viewed as mutually dependent, and relatively confounded, here, the hegemony of scientific knowledge is not reduced to political asymmetries in which regimes of scientific knowledge are interpreted as being equal. Instead, in a synergic manner, differences between regimes of scientific knowledge include substantive material effects of their own, which support, and are supported by, political action.

Chapter 4

The Approach of the Discourse-Analytic Study

4.1 Introduction

Interviewing scientists provides the opportunity to explore discourse relating to scientific practices and knowledge-production. The interview research described in this chapter, and presented in Chapters Six to Nine, is informed in part by the perspectives presented in chapter two, and is also supplemented by a consideration of textually-based, discourse-analytic research practices.

As noted in chapter two, Latour and Woolgar (1979) believe that the way science is written obfuscates the "actual" way in which science is done. They attempted to circumvent this by conducting an ethnographic study, in the belief that close observation of scientific practices can more effectively provide the opportunity to create an adequate descriptive interpretation of scientific practices. While this study was informative, and can be seen as augmenting the background interpretive framework of scientific practices, other ways of studying these

practices are also possible: in particular, a discursive orientation. The scepticism associated with the Foucaultian framework implies the suspension of judgment about the relationship between language and referents, and focuses attention on discourse and interrelationships within the discursive field of a topic. In this framework, discursive data can be seen as an essential component to the exploration and understanding of the discursive field of an area of investigation.

Considering discursive research, Fairclough (1992) suggests that, in comparison to Foucault's more detached and abstract discourse analysis, a textually-oriented discourse analysis focuses more intently on analysing the discourse associated with texts. Depending on the research topic, discourse-analytic research can take advantage of a variety of data sources: two of the main sources of data include transcripts from interviews and pre-existing texts (Fairclough, 1992; Wood & Kroger, 2000).

In their seminal book entitled *Discourse and Social Psychology: Beyond Attitudes and Behaviour*, Potter and Wetherell (1987) consider there to be three major components to the study of discourse analysis: construction, function, and variation. The term

construction is selected by Potter and Wetherell for three main reasons: 1) the production of language necessarily draws on a stock of "pre-existing linguistic resources"; 2) the process of producing language actively selects and omits linguistic resources; and 3) the significance of language suggests that accounts literally "construct" substantial aspects of our social reality. In this context, constructions can be seen as representing accounts and versions of reality. Moreover, the constructive qualities of language provide the basis for the interest in analysing the "function" of constructions in language: the performance of producing language prioritises certain versions of reality, and thus constructions can be considered as functioning to create these versions.

The final implication of the constructive qualities of language is that the corpus of linguistic resources available, in conjunction with selectivity, provides the conditions for the variation between constructions. Potter and Wetherell consider that the performative and constructional qualities of language imply that there will necessarily be considerable variation. However, sensibly, there can be no measure for the expected variation on any topic *a priori*, and thus conservatively the degrees of freedom associated with a topic would be expected to vary

according to the linguistic resources available to any given topic. As a result of these concepts, in interviews, the data produced need to be seen as an effect of the interview and as being a "co-construction" resulting from the interaction between the interviewer and the interviewee (Holstein & Gubrium, 1995, cited in Wood & Kroger, 2000).

A realist model of language is inapplicable in discourse analysis because of the general implications associated with versions. Consequently, any attempt to identify the "real" version of reality, or the truth value of accounts, within the variability of the data, is decentred and construed as a version itself. An implication of this is that devices that emphasis interpretation need to be used and borne in mind, to contain discourse and remain agnostic about references to reality. This view of language is seen as being reflexive, and thus the resulting analysis, and the inevitable priority of a version, must be viewed accordingly within the terms provided. Consequently, this discourse-analytic perspective decentres Latour and Woolgar's (1979) empirical assertion regarding their qualitative research, but also echoes, in a similar way, their view that knowledge is socially constructed.

4.2 The aims of the current study

One of the aims of the study is to illuminate the ways in which a sample of scientists provides accounts relating to organisation and practice in their areas of specialty. By focusing on the organisation of specialties and their practices, it is expected that scientists' constructions will provide perspectives on the positioning of specialties, their interaction, and also their social and scientific progress. Another aim of the study is, following on from Chapter 3, to continue to provide an interface between the interpretive framework, developed in Chapter Two and this chapter, and scientific discourse. This approach should continue to illuminate the field of knowledge itself and also, importantly, to provide an additional opportunity to augment the interpretive framework. Specifically, the aim is to develop the theoretical understanding of the significance of scientific specialties in relation to multidisciplinary interaction and the notion of scientific progress. For these purposes, and due to previously stated interests (see Chapter One), the specialty of neuropsychology will be the primary specialty of examination, which not only continues the attention given to it in Chapter Three, but also provides a

specified location for the examination of its internal organisation, practices, and multidisciplinary interface.

4.3 Participants

The primary group of specialists approached for participation were affiliated with the field of neuropsychology. An "ideal" neuropsychologist could be considered to need the following identity markers to qualify: 1) membership of a professional psychological society, such as the Australian Psychological Society (APS); 2) a Masters degree or a PhD in neuropsychology, which includes clinical training; and 3) not only registration as a psychologist, but also membership of a specialist guild, such as the APS College of Clinical Neuropsychologists (CCN). In addition to the ideal neuropsychologist, there are also various other types of people who have interests in neuropsychological phenomena, but who are not neuropsychologists according to this definition, principally: 1) researchers in psychology who investigate neuropsychological phenomena and are not trained and registered neuropsychologist clinicians; 2) clinical psychologists who have overlapping skills, knowledge and work experience in a neuropsychological area;

3) neuropsychology postgraduate students who are still in training and are not as yet qualified clinicians; and 4) researchers and practitioners from other specialties who have an overlapping interest and work experience in areas of neuropsychological concern. For the purposes of this study, people from the above categories were approached, where possible, for participation. In total, 21 interviews were conducted, but 2 interviewees withdrew from the study before their participation was finalised. The remaining sample of 19 participants consisted of 16 people with a psychology background, and 2 researchers and 1 researcher/practitioner from related disciplines. Of the participants with a psychology background, 12 were clinical neuropsychologists, three were neuropsychology postgraduate students, and one was a clinical psychologist with overlapping work experience and a professional interest in neuropsychology.

4.4 Method

The initial generation of the interview topics was informed by the aims of the study, and the researcher's pre-existing knowledge of neuropsychology and its practices. In addition, McDowell's (1999) qualitative

study of research and practice in conflict resolution was consulted because of the similar approach and interests.

The interview topics, formulated into exploratory and open questions, were then "tested" on the first interviewee, to identify and initially address any obvious problems with the questions before continuing with further interviews. The success of this first interview provided some confidence in the main questions identified. The approach to developing interview questions was informed by Wood and Kroger's (2000) suggestion that interview questions cannot be entirely specified in advance. As a result, a continuing process of development was adopted in which topics and questions were shaped and, at times, re-shaped during the interview process: new questions emerged through reflective consideration in between interviews and also, opportunistically, during interviews. This follows Rubin and Rubin's (1995) description of the continuous design, except that the changes made during the interview process decreased in number as familiarisation with the areas of interest increased, and the emergence of unexpected themes decreased.

The interview strategy was to probe the interviewees with the pre-established questions and allow them space to

explore the topic with as little interference by the researcher as possible; that is, the researcher's role was "facilitative," with the central aim of being minimally biasing interviewees' responses. Therefore, in addition to asking the pre-established questions, the researcher sought clarification where it was perceived as being appropriate, and attempted to explore some themes further. However, beyond this, an effort was made to remain silent. Questions associated with established and emergent topics were repeated, where applicable, in the following interviews, until a set of responses was gained; specifically, this occurred when the topic was deemed to be of central concern, and when the topic was in an area that was applicable to many of the remaining participants.

The main areas of interest finally broached were as follows:

- 1) Neuropsychological practice;
- 2) The relationship between research, practice, and education and training;
- 3) The function of change on practices;
- 4) The interaction with other specialties;
- 5) The development of a trade guild.

The categorically organised interview segments can be found in appendix A.

The interviews were transcribed using ordinary punctuation, in order to facilitate reading and reduce the obtrusive quality of linguistic signifiers that are sometimes adopted in discourse-analytic transcriptions. Moreover, the analytic approach of the study is not focused on contestation and negotiation in conversation, or the linguistic particularities of articulation in speech but, instead, it focuses on the broader organisational references that are made use of in constructions (i.e., a molar discursive analysis). Therefore, for these purposes, the transcription of the interviews was conducted with the express aim of "preserving" the interviewees' words, word order, and "perceived" meanings, where they were deemed not to interfere with identity protection, and gained the approval of participants.

Due to the attempts to avoid the possibility of readers determining identity, various personal details of the participants, such as age, sex, state of residence, years of experience, and place of work were withheld. However, to orient the reader in the presentation of extracts in chapters six to nine, and immediately preceding

the presentation of the extracts, participants are identified as being, for example, a researcher, practitioner, educator, student, neuropsychologist, and/or clinical psychologist according to the relevance of the question, thus providing a modicum of context. It was the set of personal details that was seen as posing one of the largest threats to anonymity, whereas the generality of role identifiers was felt to be considerably more dissociated from the identity of participants because of the diffusion associated with the "base rates" (i.e., total size of the population) of those associated with such categories.

In the analysis and presentation of the interview data only a small number of extracts are included, partly because of the overall size of the interview data, and also the repetition associated with responses. Further, being a discursive analysis, a significant aspect of the presentation of the data is that the selected extracts perform a narrative function in combination with the analysis to facilitate the readability and intelligibility of the discourse. In this context, the presentation is a selective narrative that is inevitably shaped by the researcher who was guided by an interest in illuminating

the apposite areas of the research topic, and limited by the scope of the textual-data available in the corpus.

4.5 Procedure

Ethics approval was gained from the Psychology Department's Disciplinary Subcommittee of the University of Adelaide Human Research Ethics Committee. The interviewees were approached across Australia through email, by post or by phone. The addresses were found on the internet via university and target-specialty-related websites. On some occasions, key people were approached by telephone and asked to participate, and also to inquire whether they knew of any potential participants to whom they could direct the researcher. On the first contact, via email or post, potential participants were provided with an information sheet (see Appendix B), and allowed the opportunity to respond, at their discretion, to the request to participate. They were encouraged to reply by email or phone to organise a time for the interview.

The researcher conducted one interview in person and the remainder over a speakerphone. All of the interviews were recorded, with the permission of the interviewees.

The speakerphone was used because it enabled the recording of the interactions using a microphone, and also because many of the participants were located interstate. The interviews ranged in length from 10 minutes to around 30 minutes, depending on the number of questions, and the speed and length with which participants answered them.

It needs to be emphasised that the interview data are supplemented with pre-established texts considered to be of no less value than interview data, and which are presented and analysed in the same tone. Moreover, although the final number of participants in the study is small, unlike quantitative research, no general standard exists for determining sample size, and indeed, the approaches are incommensurable, thus offsetting the belief in the intrinsic value of large numbers in samples. Wood and Kroger (2000) emphasise this point by suggesting that the critical concern is the quality of discourse rather than the size of the sample, and that one significant interview or text may suffice for the purposes of certain topics of interest. Therefore, other criteria need to be considered. Two primary considerations are the size and accessibility, and the receptivity and response rate of the target group. Primarily consisting of neuropsychologists and other practitioners in psychology across Australia, the

target population sampled is a relatively small group of people. Additionally, it was not expected that approaching potential participants by email and by post was going to result in a large response rate, given the widely recognised nuisance value of unsolicited emails. Nonetheless, this approach was adopted due to its low cost, efficiency, and because it was perceived as being less manipulative than contacting in person. While 250 people were approached for participation, the small number of responses was expected not only because of the way in which they were approached, but also because of the interests and orientation of the study, which could readily be interpreted by the target group as being objectionable and worthless, considering the group's expected concerns for practical research and practice.

As previously discussed, the framework to discourse analysis has a central place for the notion of variability (Potter & Wetherell, 1987; Wood, & Kroger, 2000), which is believed to be present within and between accounts, and dependent on the context in which constructions are produced. It is this variability that occurs in accounts of a topic that demonstrates the constitutive and performative role of language. However, in research, the interest in variability does not necessarily equate to a

search for "normative data" on the full extent and scope of variability. Such an approach can be seen as being theoretically naïve given the adopted perspective, because of the coconstruction involved in the interview process: the variability created/identified also omits possible variability. Instead, the limited notion of satiation can be used to inform the interview process. The extent to which new interviews are perceived to provide little or no new information can, ideally, be seen as the point at which to cease adding new participants, even though the inevitable interpretive bias associated with satiation needs to be accepted while making use of the concept. Due to the, at times, repetitive approach of the interview process adopted in the study, this was perceived to be generally achieved for the major themes broached.

However, inevitably, this did not extend to all topic areas, because of the relatively small target group, the lack of control associated with finding appropriate people who were receptive to participate, and the fact that some topic areas were considered to be ancillary to the primary research interests, and idiosyncratic to participants. Therefore, although informative, the notion of satiation is a limited but informative criterion, and thus it is not totally applicable. Instead, the interview process, in

general, can be construed as needing to be more flexible and reflective than the limits of this criterion allow.

Interviewees were informed that the interview transcripts would be transcribed, and edited to ensure their anonymity. During the editing process, pains were taken to ensure that any aspects of the interview that could be seen as "revealing," in terms of the possibility of personal identification, were deleted from the final transcript. The transcripts were then sent to the interviewees, for them to approve or disapprove the researcher's adjustments and transcription.

Interviewees were given the opportunity to expand on and clarify any statements they may have made in the interview and, on reflection, found to be unsatisfactorily articulated. This option was provided in order to increase the likelihood of participation through providing the interviewees with a degree of control. However, this option was not taken up by many, and when it was, did not result in extensive change. Participants were also informed that the final transcripts would not appear in full in the appendixes to the thesis; instead, the different topics covered in the interviews would be grouped with similar responses from other interviews. This

approach would not only enable the quick referencing of relevant constructions on a topic, and thus serve a practical reader-friendly purpose, but would also further ensure anonymity, through the discontinuity of the presentation of the interviews. The measures taken to ensure anonymity were included in the procedure to increase the likelihood of participation, since it was felt that participants might, possibly correctly, perceive some professional risk in their being identified. Once the transcripts were approved by the interviewees, a consent form was sent to each (see appendix C for an example), and only once they signed this and returned it to the researcher were they considered full participants and their transcripts included in the analysis section, where applicable, and appendixes. Finally, the participants were also provided with a short report, which was a draft of a few sections of the thesis. The report was provided to the participants to help them to more fully understand the research approach, the way in which the interviews were used, the analysis, and the discourse of their colleagues.

4.6 Summary

This chapter outlined the approach taken in conducting the discourse-analytic study of research and practice in neuropsychology. The approach taken was discourse-analytic, and drew on the interpretive framework developed in Chapter Two, and augmented in this chapter with literature indicating the significance of textually-based discourse analysis. Textually-based discourse analysis of the kind delineated in this chapter can be viewed as having significance to the aims and interests of the thesis insofar as it provides a means by which to access the discursive richness of a field of inquiry, and position this within a broad interpretive framework.

Chapter 5

The Scientist-Practitioner Model in Psychology

5.1 Introduction

This chapter explores the philosophy of the scientist-practitioner model [SPM], and its adoption in psychology, in order to contextualise Chapters Six and Seven, which discuss related issues in the specialty of neuropsychology. The SPM provides the philosophical orientation for education, training, research, and practice in what is intended to be a scientific psychology.

It is argued that the model provides an oversimplistic conception of scientificity, and is ambivalent towards its primary target-group, scientist-practitioners. As a consequence, the model fails to provide an adequate description of the role of the practitioner, and the relationship between research and practice. Ways of addressing these shortcomings are discussed, and a cyclical and interpretive model that emphasises the positive significance of the practitioner will be suggested as being more representative and practicable. Despite the

limitations of the scientist-practitioner model, its primary interests in developing applied knowledge in service to society, and attempting to create and maintain the bridge between research and practice should remain two of its most enduring contributions to psychological research and practice.

5.2 The scientist-practitioner model in psychology

The discipline of psychology has pursued scientific status in relation to the knowledge produced in its researches and practices. In the pursuit of scientificity, psychology has developed and institutionalised a philosophy of practice known as the "scientist-practitioner model" [SPM] or the "scientist-professional model," which was first formally adopted by the American Psychological Association in 1947, and was implemented as "the" model of education and training in psychology, in 1949, at the Boulder conference in Colorado (Bernstein & Kerr, 1993; John, 1994; Kanfer, 1990; McDowell, 1999; & O'Sullivan & Quevillon, 1992).

Five important aims of the SPM can be identified: 1) to produce practitioners who base their clinical practice

on scientific evidence (i.e., evidence-based practice); 2) to increase the preponderance of clinicians who also research; 3) to focus research on clinical utility, and cumulate this knowledge for the benefit of psychology and society; 4) to produce a systemic culture of scientific values in psychology that are in alignment with the SPM and are maintained by individuals in psychology; and 5) to promote the discipline of psychology to the wider community as providing services based on a body of scientific knowledge and its scientific application.

After the Second World War it was noticed that many returning veterans required psychological services. However, at this time psychologists were primarily research academics, and thus there was a dearth of suitable practitioners to accommodate this new demand. Moreover, the knowledge of psychology and its available practices was inadequate to deal with the requirements of these patients. The institutionalisation of the SPM was seen as a move to legitimise the knowledge of psychology as scientific and, at the same time, provide a point of departure from which to cumulate credible, applied knowledge associated with the provision of psychological services. Thus, the development of the SPM can be interpreted as a role creation strategy (John, 1998; Kanfer, 1990; McDowell, 1999).

The emergence of this situation has relegated basic research in psychology—research that has no foreseeable or short-term application in practice—to a relatively minor role. Thus, the model orients attention towards utility and attempts to focus research on the development of strategies and technologies that are of use to practice (i.e., applied research). The prioritisation of this orientation can be seen as echoing the impetus of the scientific approach expounded by Francis Bacon, which was discussed in chapter two. This approach can be viewed as being laudable and necessary if the goals of social service are to be achieved. However, if short-term outcomes are overvalued and, as a result, more speculative basic research is relatively discouraged, then this approach may have the result of limiting the very progress of applied knowledge that is hoped for.

The philosophy of science that the SPM is based on is an early form of Logical Positivism (which was discussed in chapter two), the acceptance of which, among philosophers, was short lived (John, 1998) due to a range of shortcomings that were discussed in Chapter Two. John suggests that this philosophy of science was often promulgated by, and taken up in, the various sciences in confused, fragmented, and distorted ways (John, 1998). The positivist philosophy

of science held the view that there is a "method" to scientific enquiry and that the progress of scientific knowledge is cumulative. Moreover, John suggests that despite there being no clear statement about what constitutes the scientific method, psychology maintained the belief that there must be such a method, and actively sought after it. It remains a point of logic that the lack of clarity or consensus as to what constitutes scientific method need not be taken as a reason to abandon the pursuit.

The observation of what other, and "credible" sciences were doing provided psychology with a set of qualities that could be used to define loosely what it means to be scientific, for instance, quantification, operationalism, standardisation, and experimentation (John, 1998), and thus psychology became concerned with those phenomena that were amenable to empirical investigation in these terms. Moreover, the dominance of behaviourism in psychology at this time, which emphasised material inputs and outputs in person-environment interactions, was particularly compatible with this orientation (Kanfer, 1990).

The positivist view maintained that empirical data provided the possibility of building a reflection of

reality (John, 1998; & Sampson, 1981), which draws on ideas resembling the Wittgensteinian picture theory of representation also discussed in Chapter Two. Thus, the philosophical view adopted by psychology was a philosophy in which the application of a strict "canon," or set of methodological guidelines was hoped and believed to provide the means by which accurate representations could be achieved, and practical knowledge developed; knowledge that would thus be definable as scientific (John, 1998).

Implicit in the adoption of the model by psychology is, first, the understandable belief in the value of the ideal of scientific knowledge and, second, the pragmatic belief that social sanction would accompany this affiliation because of the high status of science in society. Therefore, psychology's epistemic authority and power would increase according to the extent to which the model was adopted in research and practice (John, 1998; Kanfer, 1990).

The rhetoric of persuasion is necessarily implicated here in order to achieve this broad aim of becoming scientific: for a discipline to attain and maintain scientificity, a marketing strategy is required in which it needs to attempt to persuade significant others that it

knows what it means to be scientific, and that scientificity is associated with its researches and practices. Although this persuasive component has the potential to devolve into cynical rhetoric in which there is nothing substantive to back up the claim of scientificity, the SPM in psychology is presented as an attempt to avoid this rhetorical vice by asserting an earnest attempt to enact its conceptualisation of what it is to be scientific. Thus, psychology has attempted to achieve and maintain a consistency between the social presentation of the discipline and its actual activities.

The SPM is seen as providing the basis from which students can be inculcated in a version of scientific method, and subsequently the emerging practitioners are expected to apply scientific knowledge in their practice settings in a scientific way. It was intended that practitioners would participate in research by reporting their findings about the effectiveness of psychological knowledge in practice back to the scientific community, thus generating an interactive pursuit of applied knowledge, and change in research and practice (Bernstein & Kerr, 1993; John, 1994, 1998; & McDowell, 1999).

However, subsequent to the establishment of this intention, and despite the emerging multitude of practitioners, and the apparent hegemony of the SPM, there has, on occasions, been a divergence from this prescription. Many practitioners do not participate in research and, more importantly, many do not actively keep abreast of academic research, nor apply it in practice (John, 1994; Kanfer, 1990; McDowell, 1999). Instead, rather than always deferring to the knowledge generated from research, and academic recommendations, many practitioners make personal choices about the strategies that they will use, and are influenced by the persuasiveness of colleagues, and personal experience (Barlow, Hayes, and Nelson, 1984, in Kanfer, 1990). These maverick practices evidently undermine psychology's scientific values as they are conceptualised in the SPM.

The supporters of the model as the authorised model in psychology promise that it will provide, through its adoption, the means by which social status and scientific progress will be achieved. The following prescription for the adoption of the SPM was issued by the Australian Psychological Society, College of Clinical Psychologists (CCP):

The APS College of Clinical Psychologists endorses the long-standing policy of the Australian Psychological Society that the preparation of clinical psychologists should be based on the "scientist-practitioner" model.

The basic assumptions of this model are as follows: psychological research, teaching of the basic discipline of psychology, professional training of psychologists, and the professional practice of psychology are inter-related parts of a single system, with responsibility of the total system devolving upon all who work within its various components (CCP Course Approval Guidelines, 2003, p. 2).

This statement attempts to unify the individual professionals who comprise psychology under the umbrella of the SPM, and by limiting the legitimate action of professionals to that of striving to uphold the values of the model.

In response to the complexities and difficulties of enacting the prescriptions of the SPM in practice, the course approval guidelines of the CCP include a caveat that attempts to ameliorate the excesses of the ideals of the model:

The education and training of professional psychologists according to the scientist-practitioner model proceeds at several levels:

1. Mastery of the knowledge, principles and methods of the basic discipline of psychology.
2. Training in the conceptual skills required to apply the basic knowledge principles and methods to problems of professional practice.
3. Acquisition of specific skills in the use of relevant procedures, technologies and techniques.
4. Development of an orientation or mind-set which includes:
 - a) a respect for evidence;
 - b) a constant endeavour to achieve rigorous appraisal of and improvement in one's own practice;
 - c) a constant effort to **increase** the component of psychological practice that is based firmly on scientific principles and evidence, and to **decrease** the component that is based on unsubstantiated speculation, unanalysed experience, intuition or art. It is recognised however that science progresses by a fusion of these types of cognitive processes, i.e., hypothesis generation often involves intuition and creative speculation followed by experimental justification of these hypotheses (CCP Course Approval Guidelines, 2003, p.3).

This statement illustrates the significance of the SPM to the education and training of psychologists.

Incorporated in the indoctrination of aspirant psychologists is the evidence-based mindset that is considered as desirable for psychologists. The "successful" inculcation of this mind-set ensures that psychologists self-monitor their practices, and consequently augment their activities as required to achieve greater alignment with the ideals of the model. Psychologists are encouraged to have a respect for evidence, and to aim to increase the science and decrease the art in practice; however, this aim is tempered by the recognition that a coexistence or "fusion" of these two aspects is found in the fusion of science and clinical practice.

In regard to the practice of psychology, although the scientific values of the SPM are readily construed as ideals to aspire to, there remains the proviso in the above extract that any unscientific aspects involved in the practice of psychology are tolerable only insofar as they subserve the generation of hypotheses and their subsequent testing, and are thus ultimately expunged through hypothesis testing. However, this suggestion oversimplifies the role of hypothesis testing by intimating that clarity and accuracy are a consequence. Instead, as discussed in Chapter Two, the refutation of a hypothesis is

a complex process; this process may require considerable post-analysis by practitioners in order to interpret aptly the meaning of results, and importantly clarity and accuracy may not be a consequence.

In this context, the SPM is ambivalent in its apparent attitude to practitioners in that it prescribes the proper way to produce scientist-practitioners while, at the same time, it attempts to overcome the influence of unscientific aspects attributed to them. This situation results in the devaluation of the human qualities of practitioners, and gives priority to a simplistic and narrow view of scientific practice and the means by which to achieve validity. In addition, this view has the potential to truncate the range of authorised practices further than is needed, and thus perhaps to reduce the relevance of psychology to society.

To countervail these difficulties, the notion of "professionals," which Manicas and Secord (1983 in Kanfer, 1990) define as being those who are informed by scientific knowledge, but who also bring extra-scientific knowledge into their practice, could be given a more legitimate position in the SPM, thus reducing the ambivalence about the scientist-practitioner. Practices involving

professionals can be called para-scientific, a term which could be seen as readily applying to psychological practice because of the significance of the practitioner's general-knowledge base and interpretive framework. Moreover, Richards (1987) applies the label of "para-science" to some aspects of medical clinical practice, an ascription which, if widely accepted, would provide a precedent in a hegemonic and respected discipline that psychology might defer to in re-evaluating and defining its own scientist-practitioner values.

Despite the limitations of the SPM Kanfer (1990) suggests that it should not be entirely dispensed with lest the valuable qualities be lost in the process. He suggests that one of the most valuable characteristics of the model is the value it has for the relationship between research and practice with its emphasis on practical utility. In this context, he considers one of the main challenges of psychology to be the development of effective strategies to promote and maintain the connexion between research and practice. This suggestion can be considered to be one of the primary interests of the SPM, and pertinently so since an endemic and substantial disconnection between research and practice could easily have the effect of diminishing

the credibility of the discipline, and the validity of its practices.

Kanfer proposes a cyclical, system for relating practice to research, an interpretive process which can be called hermeneutic (Bernstein, 1983; Parker, Addison, 1989), as follows: 1) investigate the complaint in the initial consultation; 2) translate this information into the language of science; 3) scan the literature for relevant information; 4) define outcome criteria; 5) identify appropriate interventions and technologies; 6) apply interventions and technologies and monitor against defined outcome criteria; and 7) if outcomes are not reached, then return to one of the previous steps as required. He emphasises that this process is iterative not only because it is essentially cyclical, but also because it can apply to various levels of the intervention. Although this is an interesting elaboration regarding the way in which research can be related to practice, it essentially begs the question: the relevance of the literature for informing interventions is precisely the problem of the relationship between research and practice. Further, even if this approach is taken seriously, if a practitioner interprets the literature as providing little insight into, or practical application for, the complaint

that they are facing in practice, this is exactly the point at which they may decide not to continue with literature consultation.

Although Kanfer emphasises that the process can be repeated if outcome criteria are not met, he does not indicate specifically that alternative hypotheses should be considered and the data re-interpreted in an attempt to account for the failure to meet the outcome criteria.

There are a number of possible ways to account for outcome criteria not being met in a particular case, for example: 1) inappropriate success criteria were set; 2) ineffective interventions and technologies were applied; 3) interventions and technologies were misapplied; and 4) the complaint was misdiagnosed. Analysing and evaluating these possibilities is essentially the problem that the practitioner is faced with. Thus, if it is decided that a technology may be at fault, then the practitioner may search for alternatives and, if any are available, apply them. However, if there are no potential alternatives the exploration may come to an unsatisfactory conclusion.

To rule out the possibility that the technology was misapplied, the practitioner could re-investigate in detail

the appropriateness of the technology and the manner of its proper application. However, if the practitioner believed this was not the case, in whatever fashion this is arrived at, then it would remain possible that the complaint was misdiagnosed. In this case the process of investigation would require that the problem be re-framed; that is, that alternative hypotheses needed to be proposed and the process of assessment, diagnosis, and treatment needed to be conducted again.

However, the process of re-framing a problem is by no means simple or linear. For example, although the practitioner may have a few alternative hypotheses, there may be no clear way of differentiating them in the short term. Therefore, a hypothesis might need to be entertained for a period, and abandoned once the practitioner decided that it was inadequate to explain the complaint, thus providing space for the entertainment of one of the alternative hypotheses: an event that may occur at any stage during the process of treating a patient.

On the other hand, the practitioner might have difficulty re-framing the problem: in this case, various means of generating a hypothesis might be adopted, one of which would be literature consultation. If an alternative

hypothesis was not available, however, the search would need to be called off at some point, especially if other practical considerations become more demanding in the practitioner's schedule. Conversely, the relative availability of an alternative hypothesis, one that was amenable to available technologies, might enable the practitioner to repeat the intervention, and again monitor the results against success criteria.

Importantly, it could be argued that this cyclical process undermines the very idea of misdiagnosis, because the judgement regarding a success of a diagnosis is embedded in a process with no definite end. Notwithstanding this, a diagnosis would likely to gain interpretive appeal in the certain situations, for example: 1) the success criteria are met; and 2) the success criteria were not met, but no further treatment and alternative hypotheses were available.

The dynamic non-linearity of this hermeneutic investigative model can readily be seen as signifying the significance of, not only the practitioner's role in practice and the difficulty of side-stepping their input, but the interpretive component that pervades the process. In this context, this interpretive component, and the means

by which to make use of it in practice, can be seen as an essential and significant skill for a scientist-practitioner to develop.

5.3 Conclusion

This chapter discussed the adoption and the philosophical orientation of the SPM in psychology. The model can be construed as an authorised vehicle that provides the framework for the research and practice of psychology and its progress, and the inculcation of the model can be considered to be a role creation framework for scientist-practitioners.

Despite the intention that the model supports the psychological practitioner, the values of scientificity associated with the model create an ambivalence for their role in practice: the scientific values of automation, standardisation, and objectivity, in conjunction with the notion of the cumulative progress of science, not only obscure but also aim to reduce, and even interdict the influence of the knowledge and experience of the practitioner. In contrast, a more liberal and positive conception of the role of the scientist-practitioner could make use of the notion of para-scientific professionals, an adoption that would reduce the ambivalence of the position that psychological practitioners are given in the current formulation of the SPM. Further, for the practitioner,

relating research to practice, and carrying out a diagnosis and intervention can readily be seen to involve a cyclical and hermeneutic approach: a process that is imbued with the significance of practitioner's interpretation and choice.

Despite the problems associated with the SPM, its adoption has provided psychology with a certain means to develop applied knowledge in service to society, and to create and maintain the relationship between research and practice. Without a strong emphasis on these attributes it is likely that psychology would be rhetorically disadvantaged in a society that values science and professionalism. Nonetheless, without countervailing the excesses of the SPM, psychology unnecessarily maintains difficulties for itself and its scientist-practitioners.

Chapter 6

Clinical Neuropsychology

6.1 Introduction

The specialty of clinical neuropsychology is discussed in this chapter. The framework of neuropsychological systems and syndromes is initially explored. This is followed by a discussion of approaches to neuropsychological diagnosis and rehabilitation.

Following this exploration, interview extracts from interviews with neuropsychologist practitioners discussing the battery and hypothesis testing approaches are discussed. It is argued that the primary controversy within clinical neuropsychology is in regard to the merits of the qualitative and quantitative approaches. Both of these approaches can be interpreted as having problematic scientific qualities that can only be softened, but not obviated, by a more moderate approach. Notwithstanding these problems, it is argued that a set of diverse approaches affords clinical neuropsychology the means to adapt to a variety of practice settings and situations in which not all potential approaches are practicable.

Therefore, any decrease in the diversity of approaches, because of a resolution to an internal struggle regarding the scientificity and applicability of a particular approach, rather than furthering its ambitions, may limit or reduce the penetration, and the social standing, of the science in society.

6.2 The specialty of clinical neuropsychology

6.2.1 A framework for interpreting neuropsychological phenomena

In his book *Neuropsychology: A clinical Approach*, Walsh (1994) describes what he considers to be four important concepts that have informed the development of contemporary neuropsychology's research and practice: 1) neuropsychological syndromes; 2) functional systems; 3) double dissociation of function; and 4) disconnection syndrome.

The concept of "syndrome" is derived from medicine, where it has been found to have substantial utility. Diagnosis depends on the expression of pathology through signs and symptoms. Symptoms can be defined as the

indicators of pathology that a patient may present with and, importantly, be aware of, while signs can be defined as indicators of pathology that require an observer (e.g., a clinician), and perhaps mensuration technologies. The distinction between symptoms and signs is not absolute, as there is, on occasion, potential for an overlap of the terms. Regardless of this occasional failure of the distinction between them, the main and important function of both terms is that they refer to "indicators of pathology."

Walsh defines a syndrome as being a pattern or cluster of particular signs and symptoms that differs significantly from other clusters, and is assumed to have systematic underlying pathological determinants. He claims that psychological tests in the past were ineffective in providing an analysis of brain damage, and that the adoption of the concept of neuropsychological syndromes provided a framework within which to develop appropriate assessments. Given this concept, adapted psychological tests have gained currency as providing the means by which patterns of results can correspond more or less with pre-established syndromes.

Kinsbourne (1971, cited in Walsh 1994) suggests that the association between syndromes and specific diseases is probabilistic rather than necessary. This is true because of the limitations of diagnostics, and also because neuropsychological syndromes share many indicators of disease, which complicates the process of determining the specific underlying pathology.

Walsh emphasises that "differential diagnosis," a technique adopted from medicine, is of particular importance in the context of syndromes. This technique is the attempt to differentiate syndromes by identifying and clarifying indicators of a particular syndrome to the exclusion of others, unless comorbidity is present, in which case the identification of the comorbid syndromes is the objective. Within the framework of syndromes, adequate diagnosis depends on the clinician having a thorough knowledge of the set of relevant pathological indicators, the ways in which they cluster, the means of differentiation, and the effectiveness of these means.

Disentangling syndromes may be difficult either because of diagnostic inadequacies or intrinsic ambiguity. If the delineation and identification of an indicator is rendered visible within the practices of a science, then

the potential for excluding certain possibilities emerges. However, Walsh notes that, compared with many aspects of medicine, neuropsychological syndromes are generally regarded as having fewer signs and symptoms, and as having many more overlaps with other syndromes. In neuropsychological assessment this multiple signification complicates, and may even prohibit in some cases, the process of safely excluding, or disqualifying, alternative hypotheses.

Closely related to the issue of multiple significations is the question of the applicable taxonomic model for neuropsychological syndromes. Walsh describes two contrasting models: the monothetic and the polythetic models. The monothetic taxonomic model has clear divisions, in which the indicators in the cluster constituting the syndrome are necessary and sufficient for the demonstration of underlying pathology. In contrast, polythetic taxonomies have no single indicator, or sets of indicators, that provide evidence for a particular underlying pathology. This means that indicators are non-essential to clusters; that is, patients may be assigned to a diagnostic category despite the absence of any one of the indicators associated with the category. Due to this, Walsh suggests that diagnostic classifications of this type

assign patients with a "sufficient" number of shared indicators to the same diagnostic category. In addition, he suggests that, because neuropsychological phenomena take forms approximating the polythetic more often than the monothetic taxonomy, the polythetic taxonomy has specific value in neuropsychology by providing the interpretive framework with which to diagnose patients.

However, while the notion of the polythetic taxonomy may represent neuropsychological syndromes appropriately, the implied nature of such syndromes inevitably complicates diagnosis. Indeed, through viewing monothetic and polythetic taxonomies as being related along a continuum on which the various syndromes can be placed, an extreme exemplification of the polythetic taxonomy is diagnostically prohibitive, because of the difficulties in interpreting multiple significations. Thus, for neuropsychology to be effective it must have, within its field of interest, a substantial set of syndromes that can be viewed as being amenable to differential diagnosis, and thus the syndromes that it encompasses within its practices must lie at a manageable distance from the end of the polythetic side of the continuum.

The concept of a "functional system" as applied in neuropsychology was developed by Luria (1974). Walsh (1994) suggests that the term "function" can be used in two ways. Firstly, an element of a system can be defined as having a particular function, in that it performs a specific activity or set of activities. Secondly, the term "function" can refer to the processes of a system which involve several elements that have their own "functions," which interact to produce a "single" systemic function. Walsh and Luria suggest that functional systems have a constant and invariable task which produces an invariable result. In addition, this invariable result is produced in a variety of ways, as the system's set of mechanisms attempt to cope with fluctuations in the factors affecting it.

The notion of a functional system implies that the damage incurred to any part of the system is expected to result in a disruption to the task, and a qualitative change to the result. Thus, it is of interest to neuropsychology to be able to identify clearly the qualitative change in function, and also to identify the affected mechanism within the neuropsychological system.

It needs to be noted that, because of the supposed polythetic nature of neuropsychological syndromes, the mechanisms associated with a system may also be part of another system, which implies that at least two functions could be affected as a result of a damaged mechanism. In this context the notion of "double dissociation of function" is important to diagnostic neuropsychology, because it provides the possibility of localising lesions by taking into account the multi-system affiliations of mechanisms. According to this view, all systems that depend on a particular mechanism for the continued performance of their function will be affected by an interruption to the functioning of that particular mechanism, while all those systems that do not use that mechanism will remain unaffected. The complexity of the factors involved in localising such mechanisms in neuropsychology is evident: failing to provide a double dissociation of function in a diagnostic assessment cannot be taken necessarily to mean that double dissociation does not exist, because of the fact that the neuropsychological assessment may not isolate functions and elicit functional deficits at the required level of specificity.

Walsh believes that lesions may affect physically adjacent systems, and where this is so, in a particular

case, the establishment of as few as two can provide adequate information to infer the site of a lesion. However, greater certainty will be gained with subsequent dissociations. Nonetheless, an important component of the dissociation of functions is the neural basis of the inferences: if neuropsychology had no recourse to pre-established brain-behaviour knowledge in order to orient diagnostic targeting, then the double dissociation of functions would have no neural basis to which to refer and, consequently, the results would merely be "psychological" dissociations.

Finally, the concept of the disconnection syndrome is important to the understanding of the neural basis of functional systems, the knowledge of which first emerged late in the 19th century (Walsh, 1994). The establishment of knowledge regarding the functions of neurons and axons, and their interrelations within and between the cerebral hemispheres provided the basis for the distinction between cortical and conduction syndromes, the latter of which can be seen as synonymous with the term "disconnection syndrome." The notion of the "cortical syndrome" refers to any damage incurred to particular physical locations of the cerebral cortex potentially resulting in the damage to a mechanism required for the normal functioning of certain

systems. In contrast, the notion of the "conduction syndrome" refers to the disconnection between the cortical pathways connecting the mechanisms of a particular system or systems.

Walsh enumerates three possible types of disconnection: 1) intrahemispheric disconnection; interhemispheric disconnection; and 3) the conjunction of these types of disconnection. Intrahemispheric disconnections occur when cortical pathways within a hemisphere are damaged in such a way that communication between a system's mechanisms is prevented. In contrast, interhemispheric disconnections occur when either the cortical pathways within a hemisphere that pass through the corpus callosum are damaged, or the corpus callosum itself is damaged to a level that prevents the proper functioning of systems.

Walsh remarks that holistic theorists denied the results of the research on disconnection syndromes that were conducted in the early part of the 20th century, and instead reported instances where disconnection effects were absent. Ostensible evidence for these claims was garnered from epileptic patients with surgically severed corpora callosa. However, these results are now generally seen as

being caused by the use of inappropriate techniques that fail to elicit signs of disconnection, signs that are now seen as easily detectable given the available assessment technologies.

Effective techniques for identifying split-brain effects emerged in the 1950s, the knowledge gleaned from this has formed the basis for the current understanding of interhemispheric disconnection syndromes. Walsh suggests that the knowledge of disconnection syndromes has aided the development of a distributed neural model of functional systems, described here, and thus has furthered the representativeness of the interpretive framework for lesion localisation in neuropsychological research and practice.

6.2.2 Contemporary neuropsychological assessment

Sbordone and Saul (2000) trace the history of neuropsychological assessment. Psychological tests were first used to investigate the psychological effects of brain injury in the United States and the Soviet Union during the 1930s. The first neuropsychological laboratory in the USA was established by Ward C. Halstead in 1935. Through observing brain-damaged patients, and administering psychological tests of higher-cognitive functions, he

developed the first standardised neuropsychological test battery, consisting of 10 subtests.

In another laboratory, established by Ralph M. Reitan at the Indiana University Medical Center, a modification of this battery was developed in 1955, and consequently renamed the Halstead-Reitan battery. This battery was standardised on specific brain-damaged groups and controls. The resulting indices have been applied to the localisation of lesions and to inferring the causes of defects, on the basis of performance patterns. Sbordone and Saul report that Reitan's battery is still the most popular in the United States today.

In addition to these developments, there has been some development of neuropsychological tests for specific dysfunctions. World War II provided the opportunity for the development of neuropsychological tests through the study of veterans who had suffered penetrating head-injuries. At the Massachusetts Institute of Technology, Hans-Lukas Teuber and colleagues developed specific tests that were sensitive to parietal lobe damage, and outlined the specific effects on spatial relations and problem-solving that result from such damage (Sbordone and Saul, 2000).

One of the earlier approaches to neuropsychological assessment was that of a general test for organic dysfunction. This approach attempted to distinguish those with organic dysfunctions from those with mere "functional" dysfunctions (Walsh, 1985); that is, deficits that do not have an organic basis. This conceptualisation may actually be a false dichotomy, because it is difficult to imagine a psycho-behavioural dysfunction that indeed does not have any organic concomitant. Considering this, a "functional" dysfunction could be viewed as a diagnostic perplexity: instances in which an organic basis cannot be hypothesised may merely be labelled "functional dysfunctions" because no organic determinations are possible within the knowledge base of the science at a particular historical moment.

Walsh (1985) suggests that the attempt to identify organic dysfunctions was, unfortunately, accompanied by the belief that every organic defect had a shared functional deficit. Thus, this belief provided the grounds for developing a neuropsychological "test," ostensibly for brain damage.

At the time Walsh wrote *Understanding Brain Damage*, in 1985, and regardless of the development of localisation theory in neuropsychology, there were still such tests

emerging and being used within neuropsychology. The feature that single tests for brain damage have in common with the standardised use of neuropsychological test batteries is that they both make use of cut-off scores; in the former the tests naturally produce one score, while in the latter many scores from the tests within the battery may be aggregated, and thus reduced to a single score.

One problem with this approach is that, while these tests may have been "validated" on specific brain-damaged groups with significant group differences, the frequency of misclassifications associated with their use in individual cases may be unacceptable for clinical purposes; that is, these tests are based on probability, and thus the probability of misclassification may be at an unacceptable level in clinical situations. For this reason Walsh warns against the uncritical use of such cut-off points in testing. He also maintains that it may be useful to administer one or more such screening measures if there is evidence that a large proportion of brain-damaged cases perform poorly on a particular test. Despite this, he draws attention to the work of Yates (1966, cited in Walsh, 1985) who insightfully acknowledged that, if screening batteries have been validated on clearly defined criterion groups, then they serve little use in those clinical

situations where the diagnosis is unclear: if a test identifies specific damage where this specific damage is obvious, testing would appear to be superfluous.

In contemporary neuropsychology Walsh (1985) suggests that the term "battery of tests" has several meanings: 1) the overall number of tests that are available in the specialty of neuropsychology; 2) the set of tests that an individual neuropsychologist uses on certain occasions or in general; and 3) a set of specific tests associated with a predetermined and standardised battery. The practices of neuropsychologists vary, from fixed to flexible testing procedures. Using the fixed procedure to testing, a practitioner makes use of a standardised battery of tests that are used in all situations in the same way, whereas making use of the flexible procedure, a practitioner may either select a set of tests that they think will provide them with the information required to identify the deficit(s), if they have enough information to make the judgment, or alternatively, they may proceed in a step-wise manner, progressively selecting tests that home in on the dysfunction, about which they make increasingly specific speculations. Considering these procedures, Walsh reiterates Russell's (1982, Cited in Walsh, 1985) comments that any value judgments about the merits of fixed versus

flexible testing hinges on the principle that a dysfunction needs to be tested in order for it to be elicited, a principle that can be applied to both procedures. The problem with fixed tests is that they may not be diverse or specific enough to test particular dysfunctions, while, on the other hand, the flexible testing approach may miss detecting a deficit by selecting an inappropriate or inadequate set of tests to elicit evidence of the deficit.

Standardised test batteries apparently provide the means to cluster analyse and compare scores statistically. In contrast, flexible testing that eschews the use of predetermined and compatible tests within a battery compares what could be called incommensurable quantitative data.

Additionally, qualitative features of test performance may be included in the analysis, and such inclusion has a controversial history. Christensen (1974) details the approach to qualitative neuropsychological investigation initially developed by Alexander Luria. In contrast to the sample-based factor-analytic models, the qualitative approach claims to provide the means for "accessing" the specifics of the psychological process and neurodynamics of a single subject.

A difference between laboratory experimentation and clinical neuropsychological practice on single subjects is also emphasised by Christensen: unlike the laboratory scientist, the diagnostic neuropsychologist is evidently not in a position to know in advance what the diagnosis of the patient should be; instead, he or she must carry out an investigation to decide on the appropriate diagnosis. In many cases, the neuropsychological investigation needs to be relatively short and manageable, because of time constraints imposed on the practitioner and the restricted capability of the patient, while maintaining its validity.

The neuropsychological investigation is part of the general clinical investigation, which consists of various medical, and supposedly objective, sources of data and neurological assessment. Initially, it starts with a clinical interview regarding the history and current state of the patient, and the known manifestations of the condition. Following this, Christensen suggests that testing should begin with the implementation of a relatively large number of tests covering a broad spectrum of psychological activity. This preliminary testing provides the basis on which to move to the second, and selective, stage of testing, in which indications of dysfunction from the first stage are followed up with tests

that home in on the specifics of the dysfunction. This second stage of testing is supposed to be informed by the first stage and the generation of data at the second stage itself, thus creating an interactive investigation at this level. In this context, the aim of the second stage is to tailor testing to the indicators of the individual's pathology that manifest in the assessment process, and because this process is highly interactive, an assiduous and learned practitioner is required for a successful diagnosis.

This qualitative approach, while advocating standardised and integrated tests that disambiguate complex processes, maintains the practitioner as the central figure in the diagnosis. The approach involves an interest, not only in the analysis of the quantitative features of test performance, but also in the qualitative features of the way in which tests are performed by patients, and thus all of these data need to be incorporated into the analysis to arrive at a diagnosis. Christensen maintains that a diagnosis becomes possible when the tests are selected which appropriately elicit the "signifying" qualitative features of pathology, thus enabling the appropriate assignment to syndromes.

The qualitative approach dismisses the standardisation of assessment beyond the test norms themselves; instead, in the assessment situation, the examiner is required to use all the manipulative strategies available to elicit the indicators of pathology: "...static standardised techniques must be entirely discouraged" (Christensen, 1974, p. 26). Some examples of this manipulation include altering the speed of test administration and the presentation of stimuli, and extending the scope of tasks.

The third stage of the neuropsychological investigation involves the assignment of the elicited indicators of pathology to the appropriate syndrome classification followed by the generation of hypotheses regarding the localisation of lesions. In this context it is the qualitative dictum that it is only with the advocated level of flexibility, in conjunction with the interactive participation of a knowledgeable and experienced examiner, that the neuropsychological investigation will be fruitful and empirically valid. However, given the conceptualisation of the qualitative investigation, questions about its reliability and validity inevitably arise. Christensen concedes that the determination of reliability in neuropsychological investigations is a problem: whereas, in a laboratory,

reliability can supposedly be readily determined statistically, in a qualitative neuropsychological investigation, this approach is more difficult, even precluded. This is because, in a neuropsychological investigation, the examiner does not get the opportunity to administer the same test sufficiently often to produce a statistically adequate sample. Furthermore, and importantly, the result of an individual test in an investigation usually has multiple significations, and is thought to gain its "exact" meaning only when clustered with the results of other tests and qualitative features (Christensen, 1974). This clustering supposedly provides the opportunity to make a syndrome analysis of best fit for the data-complex observed. Thus, the implication is that the data-complex narrows the variety of possible syndromes with which it could be seen as being compatible. This can be expressed as a belief that the organisation of sufficient data will eventually lead to such a conclusion.

Interestingly, Christensen claims that the reliability of the investigation is demonstrated by the identifying of a defect through associating the set of psycho-behavioural data with a particular syndrome. Thus, Christensen seems to be intimating that reliability is self-referential: an investigation is "reliable" when the indicators of

pathology are classifiable within the confines of a syndrome. This notion of reliability appears to be akin to one of clarity of diagnosis. Moreover, it is problematic because of the ways in which the investigation and the elicitation of data are manipulated and interpreted by the examiner throughout the investigation: an implication that leaves open the possibility of inter-examiner variability. Therefore, inter-examiner consistency is a higher standard of reliability as it guarantees a degree of confidence that the conclusions that are reached in diagnosis will be the same. Finally, since the neuropsychological investigation promotes the idea that experimenter manipulation and interaction is intrinsic to the validity and reliability of the investigation, it seems that the intimation is that the qualitative investigation is objective because it is subjective, which seems both paradoxical and incoherent.

The qualitative approach of Alexander Luria was introduced into the United States in 1975. However, Luria's approach was not received well there because of differences in theoretical orientation—the Americans preferred empirical standardisation. As a result, the Americans believed that his approach lacked validity and was subjective, and thus the education of qualitative clinicians was also considered to be fraught with

difficulties and dubious. On account of this, Luria's approach was compromised by Charles Golden, Thomas Hammeke, and Arnold Purisch, who reduced his investigation to a standardised 269-item test battery which came to be known as the Luria-Nebraska Neuropsychological Battery, and was released in 1978 (Sbordone and Saul, 2000).

One advantage of the quantitative method is that the tests can be carried out by a trained psychometrist rather than by a neuropsychologist: someone who does not have the same conceptual framework and education as a neuropsychologist, and thus cannot interpret test scores, but is able to administer the tests (Ogden, 1996). However, the advisability of this approach is debatable because a patient's qualitative test performances are not seen by a neuropsychologist. An example of the qualitative information that is lost in a quantitative analysis is the tiredness of the patient that may occur near the end of long administration sessions, and which, when it occurs, is evidently more likely to result in poor test performance on the later tests; a strict quantitative approach would blindly score and assess the test results without taking the qualitative feature of tiredness into account.

Notwithstanding these considerations, there are computer programmes available that can score tests, analyse results, and provide a diagnosis of best fit. However, Ogden asserts that, unlike a clinician, a strict quantitative approach does not take individual differences into account and, because of this, it is diagnostically quite restricted. Problems with Luria's qualitative investigation, such as the centrality of the practitioner, are also recognised by Ogden, and he recounts the provocative comments of some critics, who suggested that Luria himself was the only one who could successfully diagnose with his approach.

In response to the apparent problems with the excesses of both the quantitative and qualitative approaches, the "qualitative-flexible" approach has been proposed. It uses hypothesis testing, and a flexible battery of tests, and takes qualitative variables into account, but attempts have been made to provide ways to use qualitative information in a more consistent and reliable manner than that of Luria's qualitative investigation (Ogden, 1996).

The qualitative-flexible approach can be seen as an attempt to reduce the potential excesses of both the traditional approach and extreme aspects of the qualitative

and the quantitative approaches. One of the main problems with both of these approaches is the reliability/validity trade-off. The statistical rigor of the quantitative approach provides reliability of assessment, but the approach runs the risk of reducing validity because of possible decreases in sensitivity to individual differences. On the other hand, the qualitative approach dispenses with a systematic control for reliability in favour of an aspiration towards validity, but in the process, runs the risk of producing inconsistent results by relying too greatly on the subjective judgement of the practitioner to gain ostensibly objective and accurate diagnoses. Thus, the qualitative-flexible approach attempts to ameliorate the problems with the reliability/validity trade-off, and because of this, it might be seen as an acceptable alternative within the limitations of the means of assessment available.

6.2.3 Neuropsychological rehabilitation

Once a neuropsychological diagnosis has been made, the prognosis for the patient, and any potential for rehabilitation, become of central importance. Diagnoses obviously impact on the type of rehabilitative strategy

that is selected, a fact that demonstrates the need for diagnostic accuracy (Leon-Carrion, 1997).

Rehabilitation appears to depend on the type of framework adopted by a practitioner, and the type and extent of the deficits present in a patient. Uzzell (1997) describes two diametrically opposed assumptions regarding the potential for rehabilitation of specific deficits: the Stimulation model and the No-Transfer-of-Training model. The Stimulation model is based on the evidence that targeting specific abilities improves performance on these abilities in different contexts. The No-Transfer-of-Training model provides a more restricted account of the potential for rehabilitation because of the suggestion that re-learned abilities cannot be transferred to new scenarios, but instead, the abilities have to be re-learned in each new situation in which a specific ability is used (Uzzell, 1997). These two models provide two very different assumptions about the basis of neuropsychological rehabilitation, and thus lead to very different rehabilitative strategies and beliefs about the potentials for rehabilitation. Despite the differences, each approach appears only to be applicable to specific types of dysfunction with varying degrees of severity, and thus neither approach should be seen as being of general

applicability to the exclusion of the other (Uzzell, 1997). In this context, these rehabilitative models seem to be associated more closely with specific neuropsychological syndromes and the severity of damage rather than to an alternative framework of neuropsychological phenomena. Thus, because of their differential applicability to specific syndromes, they remain compatible with the overarching framework of neuropsychological syndromes.

Leon-Carrion (1997) suggests that the quantitative and qualitative approaches to neuropsychological assessment provide frameworks for different rehabilitative strategies. The quantitative approach is evidently based upon psychometric assessments, and focuses on the speed and function of cognitive abilities. As stated by Leon-Carrion (1997), this approach bases its rehabilitation on three assumptions: 1) deficits are a direct result of focal lesions; 2) rehabilitation can lead patients back to a state of normalcy (i.e., prior functionality); and 3) progress towards normalcy can be monitored with quantitative assessments.

In contrast to the quantitative approach, the qualitative approach appears to draw on the notion of functional systems more explicitly. The qualitative

approach attempts to analyse the ways in which deficits affect systems and affect the life of the person. This approach describes the cognitive-behavioural systems affected and not affected by focal lesions, and what the functional changes are. Thus, the qualitative approach attempts to delineate and interpret the cognitive-behavioural changes that have occurred to the "whole" person after injury. The aim of this type of rehabilitation, according to Leon-Carrion, is to bring the patient back to a state of "coherence" rather than prior normalcy. In order for this to be achieved the intact systems need to be considered in their relationships to the occurrent dysfunctional systems and their components. In this regard, rehabilitation must proceed by working with what is intact, while the clinician must bear in mind what is damaged, and consider the ways in which, and the extent to which, the functional systems can compensate for lost functions.

The difference between coherence and normalcy is an important one if the approaches are to be considered as in opposition; however, it is a difference which appears to fall into a semantic confusion that ultimately dissolves the conflict. A return to normalcy assumes that the

previous functions can be specifically reinstated, thus returning the person to a prior level of functioning.

In contrast, establishing coherence is suggestive of a dysfunctional system which has been compensated for by another, and that consequently performs the affected function in a different way while providing the same result. Thus, the two goals can be seen as equivalent insofar as they achieve the goal of functional compensation and re-establishment, except for the fact that the qualitative approach, so construed, explicitly embeds the rehabilitative result in a transformed system. Furthermore, the potential for achieving the aims of both approaches described here by Leon-Carrion would appear to be limited by the particular neuropsychological dysfunction instanced. For example, in either case, the return to normalcy or coherence may only be possible if the brain has appropriate undamaged areas available, which are equipped to take over functions performed by the damaged areas in question. Thus, it appears that, while the quantitative approach may at first appear to be un-theorised, and opposed to the qualitative approach and the notion of functional systems, both approaches can be construed as being informed by the interpretive framework associated with functional systems.

Notwithstanding this, the substantive difference between the two approaches can be considered as relating to the way in which patients are dealt with when deficits are too extensive for compensation to be achieved. When this is the case, the quantitative approach is inadequate because of its limited focus on functional re-establishment. In contrast, the qualitative approach appears to be more useful in dealing with this eventuality because it focuses on the whole person systemically. It provides the framework in which to attempt to attenuate extensive deficits by focusing on teaching patients how to cope with them, rather than narrowly focusing on rehabilitating the severity of the deficit itself.

6.3 Interview data and neuropsychological assessment

This section provides a further discussion of neuropsychological assessment in practice by presenting and analysing relevant pre-existing texts and interview extracts of interactions with neuropsychologist practitioners.

6.3.1 A definition of the hypothesis testing and the battery approaches to assessment

In the following dialogue, a neuropsychologist practitioner elucidates his/her interpretation of the distinction between the battery approach and hypothesis testing:

Interviewer (I): Can you tell me about hypothesis testing in practice and the battery approach, like in Australia—how they're used and any differences?

Participant (P): okay, well my understanding of it is that a battery approach is, kind of, about selecting a number of tests that will essentially give you some idea as to functioning in all of the different cognitive domains that there are. And from that, you kind of apply that, you really try and apply that to each and every patient irrespective of their history, irrespective of the referral question that you're given, and irrespective of the findings that are observed on particular tests or actual behavioural observations made during the actual assessment itself. Whereas hypothesis testing is more about formulating ideas about a particular patient: what kind of cognitive difficulties they might have, ah, what kind of neuropsychological, or neurological, or neurosurgical syndrome they might have, um, on the basis of information provided from their referral

question, information in the chart, information provided by the patient and the patient's family, and while you're in the middle of testing, and also just your own observations of them while they're in the room with you, and then being flexible to add or subtract tests depending on all of that information. So in other words, you might find that, for a particular patient, their executive functioning seems to be particularly important so you don't spend two hours assessing, you know, another function, you spend much more time trying to answer hypotheses about their executive functioning. So, "is it primarily this aspect of executive functioning or that aspect?" all that sort of thing. And the idea I think that's also incorporated in that, is that you use one test to maybe generate a hypothesis, so from one test, or test result, you get an idea about what might be going on, and then you try to select something else that will either confirm or argue against that so you use a test that assesses similar functions or that assesses some of the same functions but is different in some ways, and really try and get to the bottom of the, you know, the processes that are affected that way.

The battery approach is understood by the practitioner as being a standardised application of set tests regardless of case-specific information that might be available to the practitioner. In contrast, the hypothesis-testing approach is seen as providing the opportunity to interact with the clinical information available to select and omit

particular tests, which results in the progressive isolation and clarification of a particular dysfunction. This approach requires a practitioner to speculate about what the clinical syndrome might be by analysing the information that is available from a wide variety of sources, and consequently decide on the direction that testing should take. In the practitioner's formulation, hypothesis testing not only avoids the redundant testing associated with the battery approach, but it is also regarded as providing the very possibility of delineating dysfunctions to the appropriate level of specificity.

6.3.2 Practice settings and neuropsychological assessment

In the following interaction, a neuropsychologist practitioner gives an account of the types of practice settings in which particular approaches to neuropsychological assessment are more appropriate than others:

I: So, in Australia, with regard to hypothesis testing and the battery approach, I guess, is there, um, do you know anything about that in terms of the way they're used in Australia?

P: In my experience the battery approach tends to be more with a medico-legal-type assessment where it's become, it seems pretty standardised in terms of what neuropsychologists use to assess, um, neurological deficits post-injury, and that tends to be the battery approach, um, whereas in my clinical practice, as I'm not doing a medico-legal report, I don't tend to do batteries, I'm more hypothesis testing, and I rely very heavily on the clinical interview with the parents and the school, in particular, to select which tools I'm going to use.

I: So why is it that the batteries are used in the medicolegal sort of area?

P: I think that it's become, I guess, a routine type of assessment. So I think, primarily, it's for comparative purposes because often one side will request the assessment and the other side will request a counter assessment, and if you're both using the same tools, then it's easier to do comparative analysis.

In another interview extract, a neuropsychologist practitioner gives further reasons why batteries are used predominantly in medico-legal neuropsychological assessments:

I: ...so why is the testing so extensive in the medico-legal area?

P: Because, I think it's really basically because the lawyers are very stringent in talking about test reliability, solely standardised procedure and, of course, the minute you deviate from that...

I: you open yourself...

P: Yeh, so there's a little bit of backside covering from that perspective. I think that can be argued, but certainly, um, it's not as, I don't see it as important in the clinical arena simply because we're doing the assessments for a completely different purpose.

For these practitioners the medico-legal arena has adopted the battery approach because of the potential for comparative analysis. For both practitioners the rationale appears to be that the battery approach allows the replication of test results due to the mechanistic and standardised qualities that can be ascribed to it, and thus such qualities minimise the possibility of counterattacks from opposing parties (an interpretation also guessed and advanced by the interviewer). This rationale intimates that hypothesis testing is subjective and unreliable, which causes problems for comparative analysis. Consequently, hypothesis testing in the medico-legal arena would be prone to exacerbating conflict between legal parties. In this regard, the medico-legal arena is perceived as being

relatively extreme in its interpretation of what it is to be scientific.

In the following interaction, another neuropsychologist practitioner adds to this discussion on the relationship between testing approaches and the purpose of assessments:

I: A-huh. So, do they teach hypothesis testing more these days? Is there, um, a tendency towards that in practice?

P: In my experience, I mean, I was educated, I went through the masters course work and that sort of thing several years ago, and what we tended to get taught in the university setting was probably a little bit more consistent with the battery approach, but they weren't necessarily saying, you know, "this is how you should assess people," they were more saying that, "these are all the different sorts of tests that you can use." I think more in clinical practice, like when you go and do placements and that sort of thing, then your supervisors—the people that are working in the field—are probably using the hypothesis testing approach to a greater extent, but a lot of times it depends, like in the public system you're constrained by time, you've got a huge waiting list, and you've got to have some idea of what you're going to do before you go in, and there's not a huge

amount of flexibility because you might have another patient turning up at a particular time, do you know what I mean?

I: Yep.

P: Whereas, in private practice, in particular, you've got more medico-legal work, you've usually got more time so that the assessment will be much more comprehensive, your conclusions, um, have to be much more specific: you're not just doing it for the purposes of helping the patient, but you're actually doing it to answer very specific medico-legal questions. So it depends, to some extent, on the context that you're doing your assessment in as well.

I: Okay, so in the public system the hypothesis approach is just an effective time saving technique, I guess, as well?

P: Yes, it can be... yeh. Certainly, if you think that a patient has problems in some areas more than others and you kind of focus on those areas and de-emphasise others, but at the same time hypothesis testing is perhaps to some extent sometimes limited by the amount of time that you can spend with each patient, so you need to get a little bit of an idea of all areas of cognitive function and the extent to which you can really tap into, on a very finely-tuned level the, you know, the specific problem, which may be limited by time constraints and, I mean, we also believe too in, well, both public and

private, that you can assess, or you can access a lot of information, just via what the patient's telling you or what their family's telling you, and you can target interventions based on that without necessarily needing to do this really fine-grained analysis of cognitive functioning. So again, it depends, like if it's for medico-legal purposes, "do we need to know exactly what processes have been affected?" or if it's for clinical purposes, "do we need to find some way of helping this patient?" And the extent to which you do hypothesis testing and fine-grained assessments depends on the purpose to it.

In contrast to the previous two practitioners, this practitioner does not suggest that the battery approach is preferred in the medico-legal setting. Importantly, the practitioner emphasises that the type and extent of testing conducted in any particular situation is variable and dependent on the purpose of the assessment and situational limitations. Consequently, there are purported to be instances in which minimal testing is required without any intimation that this reduces the validity of neuropsychological assessments. Additionally, the practitioner suggests that time limitations in the public system sometimes prevent fine-grained examinations from being conducted. This situation is contrasted with the medico-legal setting, in which more time is allocated to

practitioners, thus providing them with the possibility of conducting more fine-grained examinations when it is required. This account provides a partial and alternative explanation for the differential in practices between these two settings.

6.3.3 Artfulness, objectivity and scientificity

As discussed in chapter five, the SPM maintains a distinction between scientific practices and artful practices. In accordance with this distinction, the College of Clinical Psychologists [CCP] provides a statement of what it sees as an inappropriate way to train scientist-practitioners, which thus serves as an exemplar of SPM values:

Unstructured training, in which the psychologist's role is presented as essentially the practice of an art which must be acquired on the basis of long experience, has no place in courses of training for scientist-professionals (CCP Course Approval Guidelines, 2003, p. 7).

In this statement, the CCP attempts to dissociate the proper training of scientific skills from the training of artful skills. In this context, unstructured training is

associated with the development of artful skills, which are viewed as taking considerably longer to acquire than scientific skills. This view draws on the SPM's idealised values of standardised procedure, automation, and objective standards of data collection; a view that interprets scientificity with the process of simplification, thus rendering plausible the depreciation of artful skills. In this context, in order for the values of the model to be implemented in the training of scientist-practitioners, the personal experience, knowledge, and strategies of trainers that have been developed over time, and that relate to the practice of psychology, should be kept hidden in favour of a more scientific and thus valid approach to education.

At the other extreme, the CCP proscribes the use of what it calls the cookbook approach:

The "**cookbook**" approach, in which a package program (or set of assessment instruments) is selected on the basis of pre-determined criteria, is also insufficient in the teaching of clinical interventions. Standardised treatment programs provide a useful starting point and are appropriate for group interventions, but the teaching of such programs alone encourages an over-simplistic view of client problems. (CCP Course Approval Guidelines, 2003, p. 7).

In this passage, the "cookbook approach" refers to assessment and treatment approaches that draw on pre-determined and standardised criteria. In this regard, the kind of assessment referred to here can readily be interpreted as being that of the battery approach. Moreover, the rationale for this proscription is that such approaches are over-simplistic. Through distancing proper education and training from the unstructured and cookbook approaches, the CCP lays the groundwork for a more tempered approach. The CCP prescribes the alternative approach that it views as being more appropriately attuned to SPM values: "The preferred model for clinical training is the **problem formulation and hypothesis testing approach**" (CCP Course Approval Guidelines, 2003, p. 6). The CCP appears to be suggesting that training based on the "problem formulation and hypothesis testing approach" avoids the pitfalls of the unstructured approach and the associated artfulness of practice, and consequently saves time in the training of scientist-practitioners.

Moreover, by suggesting that the cookbook approach is over-simplistic and, through contrasting the preferred approach with this, and associating the preferred approach with the values of the SPM, hypothesis-testing is positioned as more valid and favourable. Despite this, the

values of the hypothesis-testing approach can be interpreted as being at odds with some of the scientific values of the SPM such as objectivity and standardisation, and as was suggested in an earlier section, this is an interpretation that becomes particularly apparent when hypothesis testing is contrasted with the battery approach.

The distinction between the unstructured approach and hypothesis testing, as proposed by the CCP, is also itself problematic. In the following dialogue, a neuropsychologist practitioner discusses this issue in neuropsychological assessment:

I: So are there any changes in testing in recent years, and also, um, in the future to look out for?

P: Um, from personal experience, I guess, when I was a student the advice was to get as much experience in practice at testing as you could, so I think initially, on graduation, we, as neuropsychologists, tended to over-assess and I think, and well, I can see for myself, as I get more experience and have more practice, I'm more likely to streamline the testing, the testing is more limited but it's more targeted, so I can get to the core of issues a lot quicker, rather than running through a whole battery of assessments.

Despite the apparent misunderstanding of the question, this practitioner provides an account of the way in which neuropsychological testing skills are developed over time and are dependent on experience. The practitioner's approach to testing is asserted as having become more streamlined and targeted; a situation which is associated with the ability to access the empirical realities more quickly. This account runs counter to the training values of the CCP in two ways: 1) by valuing extensive experience in psychological testing; and 2) by arguing that extensive experience facilitates access to the empirical realities of neuropsychological conditions.

A stronger claim against the SPM is that some of its empirical values actually prevent access to the realities that their implementation in practice is supposed to provide. In the following interview extract, a neuropsychologist practitioner alludes to this by discussing the apparent emergence of the use of technicians in neuropsychological testing:

P: I think the other aspect too in diagnosis, which isn't necessarily addressed very well in the medicolegal arena, is that, for me, part of the important part of diagnosis is observational data, um, where people are completing tests. Now what's

been happening in recent times is that some neuropsychologists are employing technicians to do the assessments and then the neuropsych' writes the report. Personally I have a little trouble with that, I know that its perhaps in America as well, but I have a little difficulty with that in that I prefer to actually observe the person carrying out tests because there's more than one way to do the same task, it's very difficult to get information on executive functioning, for example, purely on test scores.

The role substitution described here is construed by this practitioner as potentially reducing the empirical validity of certain neuropsychological assessments conducted in this way. The practitioner assigns a positive value to qualitative data related to the ways in which tests are carried out by patients, and consequently intimates that a neuropsychologist is therefore not well positioned to make judgments about various conditions in cases in which this role substitution occurs.

Despite this, the rationale for the role substitution described here can be seen as being more congruent with the SPM than that of this practitioner and even the CCP's statements above: the development of standardised procedures for testing (i.e., the avoidance of artfulness), and the valuing of empirically standardised tests and data

collection methods (i.e., the use of assessment technicians and the avoidance of subjectively-judged observational data), sets up a situation highly conducive to this type of role substitution. Therefore, within the framework of these values the emergence of assessment technicians can be seen as being a progressive shift for the science by increasing the exemplification of the scientific values aspired to.

6.4 Conclusion

Although the framework of neuropsychological systems and syndromes provides a universe of discourse_F that orients and limits interpretation of neuropsychological phenomena, a variety of means to diagnose and rehabilitate is still possible: it is primarily the means of approaching the clinical access to neuropsychological phenomena that is the central area of scientific controversy in the specialty. It was argued that both the qualitative and quantitative approaches can be interpreted as having problematic scientific qualities. Notwithstanding this, diagnosis and rehabilitation modalities are limited by the options available within the qualitative and quantitative continuum. In this context, modalities that attempt to avoid the pitfalls of the approaches are the best that the science can hope for within its field of available resources.

Although there are substantial differences between the various approaches to neuropsychological assessment, the approaches can appeal to the scientific values associated with the scientist-practitioner model, and importantly, they all can also be seen as diverging from the scientific

values and aspirations of the model in some way. Despite this interpretive ambivalence, and any temptation to alleviate this by softening the extremes of these approaches, the very diversity of approaches to neuropsychological assessment can be seen as providing clinical neuropsychology with the flexibility and the facility to adapt to a greater variety of practice settings and situations than would be possible if a single approach was exclusively endorsed by the specialty. Therefore, scientific controversy within a science may lack practical utility if a single model is fought for by proponents. In this context, an approach that attempts to minimise the excesses and problems of other approaches should not be seen as being the natural successor, and the appropriate resolution, to any particular controversy; instead, a variety of approaches may provide the science with the flexibility and adaptation to a variety of practice settings and situations, thus increasing its relevance to, and social standing in, society beyond that which it would achieve if only one approach predominated.

Chapter 7

Research and Practice in Neuropsychology

Participant:... the goal of my research is 100 per cent to feedback into clinical practice... (a researcher/practitioner from the interview data)

7.1 Introduction

This chapter explores ways in which the scientist-practitioner model [SPM] informs education, research, and practice in neuropsychology. Postgraduate practicum experience, and the education of aspirant psychologists, are discussed, and it is suggested that, in addition to the inculcation of scientist-practitioner values, practicum experience provides a means by which students are exposed to the socio-political components of practice; extra-scientific knowledge that is essential to effective practice. Moreover, educators who are active clinicians also may provide a bridge that lessens the disparity between the formal education and practicum experience of aspirant psychologists, by communicating the holistic aspects of their own practice experience and knowledge. This approach may be seen as providing a supplement to the dispassionate imparting of scientific knowledge and methods

contained within formal education and promoted by the values associated with the SPM.

The inculcation of scientist-practitioner beliefs can be construed, at least in part, as an attempt to nurture an ethos that supports the SPM. Two of the primary beliefs associated with the model are that, firstly, scientist-practitioners should keep abreast of the literature and, secondly, a systemic and applied research and development focus provides the means by which psychological practice, as a whole, can progress cumulatively. However, it is argued here that interest in the research literature is dependent on the continued progress and relevance of research and, importantly, that continued progress is contingent on the favour of history and difficult to sustain.

Moreover, although applied research and development can be construed as being an important and conservative way that a specialty can facilitate its progress, the extent to which this value is shared by other specialties sets the conditions for competitive progress. This competition raises the potential for the substitution of knowledge, roles, and research and practice agendas as a result of developments that occur within other specialties and

disciplines. This emphasises the chaotic emergence and schismatic displacement of knowledge, which contrasts with the cumulative view of progress.

7.2 Practicum experience and practitioner education

The education and training of psychologists generally only begins to conform to the practical values of the SPM at the postgraduate level. Prior to this, the education of aspirant psychologists generally only covers the knowledge and methods of psychological science. Thus, this approach adopts the values of the SPM in stages rather than concomitantly (Kanfer, 1990).

The postgraduate training of practitioners in psychology includes a minimum number of practicum placements in a variety of clinical settings related to their area of specialisation that last for specified durations. In Australia, the APS College of Clinical Neuropsychology (CCN) provides a description of these minimum requirements regarding practicum placements for postgraduate neuropsychology courses, the fulfilment of which provides students with the qualification they need to become eligible for college membership in the future:

Within a masters program, students are expected to complete a thousand hours (125 days) of placement. In a doctorate program, students are expected to complete a minimum of 1500 hours (200 days) of placement, of which 125 days are completed in the first two years of full-time (or equivalent part-time) study. It is mandatory that placements expose students to acute neurology/neurosurgery, rehabilitation, psychiatric, geriatric and paediatric populations (CCN Course Approval Guidelines, 2003, p. 10)

During placements the CCN requires that students extensively detail the cases that are seen and the way in which they are dealt with:

The casebook should demonstrate practical and theoretical understanding with a wide range of neuropsychological syndromes and should constitute part of the formal assessment of students' overall course results. The case reports should include the referral question, details of the client's past developmental, medical, and psychological history and any other background material. Any references or general orientations to literature that contributes to the case should be included in the introductory discussion of the case. There should also be a section which outlines the hypotheses that were tested with the assessment, based on the referral question and the background, and how the examination addressed these areas of interest in

terms of tests or techniques employed. Results of the tests administered and highlights of the assessment should always be included. A summary section including the interpretation of the results in line with the hypotheses, recommendations and treatment options should be provided. The same hypothetico-deductive model can equally be applied to intervention case reports. In these cases the therapeutic models need to be clearly described and the means of evaluation of outcome carefully elaborated. A case report is expected to contain more detail than the report that was submitted to the organisation from which the client came (CCN Course Approval Guidelines, 2003, p. 8).

This statement attempts to operationalise the scientific values of the SPM in terms of hypothesis testing (i.e., the hypothetico-deductive approach), which is construed as being the appropriate approach to practice in both neuropsychological assessment and treatment programmes. Moreover, the statement also includes the need for students to include literature reviews relating to particular cases. The operationalisation of these course requirements can be viewed as providing the hoped for means by which scientist-practitioner values may become inculcated into students, who will consequently maintain these values independently.

In the following dialogue, a neuropsychologist practitioner provides an account of the significance of practicum placements:

Interviewer (I): So, in terms of your education at the university, is there much of a discrepancy or things that you, perhaps, aren't prepared for when going into the various practice settings?

Participant (P): Yeh, I think that the course work prepares us as much as it can for what we're going to face, um, there is going to be things when you go out on placements that you haven't covered, but that, in a way, is part of the role of placement. I mean, my sense is you learn a hell of a lot more on placement than you ever do in a classroom or somewhere in books.

This practitioner sees the learning that occurs in practicum placements as being separated in significant ways from the formal education of the classroom, and relevant literature. The informant emphasises the inevitability of this separation, and even elevates the experience of practicum placements to a higher level of importance in the education of a practitioner than that of the other formal components of the educational experience.

The following interaction with a supervisor provides an additional account of the importance in his/her clinic for the education of students during practicum placements:

I: Could you tell me a bit more about the way the clinic operates?

P: Sure, the clinic runs 3 days a week. I normally have three to four students at one time on placement. We originally started with four students, but found that four students were just a little bit too much in terms of managing over three days. Now we have three students at a time for a two-hundred-and-fifty hour placement. Students are there for usually between 14 and 16 weeks. A lot of the students are on their first or second placement. I guess one of the reasons the clinic was established is because it's a very difficult placement for people: it's very difficult to go into a situation when you've had no experience, and the clinic offers the student a lot of the basic skills that they need to establish before they go on to other placements; such as interviewing, being able to obtain patient information from a medical record, working with other multidisciplinary staff, understanding the roles of the neuropsychologist within a hospital setting, as well as developing the skills required for assessment and testing, scoring, and writing reports. It's an important placement for them, and quite a steep learning curve, as you can imagine.

I: Yeh. Are there quite a few placement areas for them to go to?

P: You mean apart from here?

I: Yeh.

P: Yes, there's, I think, about 15-16 other placement areas. The students need to do four to five placements in all. As I said, they're skills a student needs to acquire on first and second placements. The first placements are time intensive for a supervisor, as the students just don't have the required skills to be able to work with much independence.

This supervisor intimates that the clinic in which he/she supervises was established partly because of its potential to serve as a foundation for the practicum experience of students. The work setting is viewed as being of use to trainees in their first or second placements and provides an intensive and broad induction into clinical practice. Moreover, the supervisor suggests that the clinic provides a foundation to working in a hospital setting, establishing clinical skills, and developing an understanding of multidisciplinary and institutional considerations in practice.

In this context, practicum experience can be seen as not only furthering the inculcation of scientist-practitioner values, but also as serving as a means through which to develop the socio-political knowledge relevant to clinical practice. Therefore, the primary outcomes of practicum experience can be seen as being both scientific and socio-political; that is, the experience provides exposure to the practice of essential scientist-practitioner skills, and also interdisciplinary interaction and institutional processes.

7.3 Clinical research, practice and teaching

The CCP provides an exemplification of the scientist-practitioner values by emphasising the desirability of teaching staff of graduate programmes to be actively involved in clinical research and practice: "Staff involved in clinical teaching should be involved in regular clinical work which has relevance to the course, and there should be evidence that this work is recognised and supported by the university;" and, "It is also desirable that all staff members, especially those who teach clinical research skills, continue to participate in clinical research projects of a clinical nature" (CCP Course approval

guidelines, 2003, p. 5). These statements can be viewed as supporting the SPM by attempting to ensure that educators are exemplars of the model's values. Consistently with this view, in the following interaction with an educator of neuropsychology, the educator comments on the significance of the relationship between clinical experience and teaching:

I: Right. So you were talking about the clinic that you're involved in, is that one at the university?

P: I have a, you know, (inaudible) an appointment at a hospital in aged-care and neurology and that involves a clinic, it's their diagnostic clinic, which, you know, I actually feel is really also essential to my capacity to teach, that is to say that my first x years here I was doing a little bit of clinical work but not a great deal, but I felt that my clinical skills and the currency of the kind of patient descriptions that I was offering the students and so on were quickly running kind of dry and out of immediacy and relevance and so on. And so, I just made the decision that, to be able to do this as well as I would like to, I need to be an active clinician.

In another extract, an educator in neuropsychology elaborates on this value further:

I: Just in terms of research and practice since you've, um, had a bit of experience in both, doing your Ph.D., has that been a benefit do you think in terms of understanding the needs of practice?

P: Oh, absolutely. I think it's actually crucial. I do some lecturing in the area as well at some of the universities locally here, and I don't think I'd be able to capture so well for the students what it's like to work in the field if I didn't have a bit of experience across the board between the two. I think it's pretty hard for them to understand exactly how you apply these skills at a clinical level when they're in the undergraduate studies usually focusing on the research methodology and so forth.

These educators see the benefit that active clinical and research experience has for students as being one of increasing the capacity to translate and impart knowledge to students effectively. The first educator suggests that his/her teaching suffered in the past as a result of engaging in less clinical practice. The second educator suggests that students find it difficult to understand what occurs in the field, and that experience in the field, in both research and practice, facilitates the imparting of the outcomes of this experience. The values alluded to by these educators suggest that, rather than relying solely on empirically established scientific knowledge and methods in

the teaching of aspirant scientist-practitioners, teaching is augmented by personal experience, and the absence of this personal component reduces the quality and adequacy of education. Thus, these interpretations of the significance of experience in education can be seen as transgressing the principle of a dispassionate scientific education to which the SPM aspires.

7.4 Research, practice and progress

As previously discussed, the SPM provides the framework in which the relationship between research and practice can be promoted and enhanced in psychology. The orientation of evidence-based practice, which involves empirical data collection practices and perhaps hypothesis testing, depends on the relevance that researched knowledge, techniques, and technologies have to practice settings. Due to the embedment of practitioners, they can readily be viewed as being in a unique position to contribute to the advancement of applied-knowledge because of their investment in clinical applications and outcomes. In this context, the CCP provides a prescriptive definition of the favoured mind-set and behaviour of the scientist-practitioner psychologist:

Thus within a scientist-practitioner model clinical psychologists maintain a scholarly and critical approach to the scientific foundations of their profession, and to the evaluation of their own practice. They also retain a desire to contribute to the further development of scientific clinical psychology, and to keep abreast of, and critically appraise, developments by others (CCP Course Guidelines 2003, p. 3).

In addition to its expression of the need for scientist-practitioners to maintain the desire to contribute to the furtherance of scientific knowledge in psychology, the scientist-practitioner is defined in this statement as being someone who continues to consider the scientificity of the discipline, their own practices, and the emerging knowledge of the discipline. This prescriptive statement can be viewed as being a mechanism of inclusion and exclusion that attempts to maintain the values of the SPM, and consequently establishes a narrow set of guidelines for behaviour.

In the following dialogue, a neuropsychologist practitioner considers the relationship between research and practice in relation to his/her own experience:

I: So what are the hopes and expectations, I guess, for translating your research into practice? What are the outcomes for practice?

P: Yeh, it's interesting isn't it? I guess it's a tricky one that, because, obviously, I think your research gives you a certain perspective on looking at any piece of information that you gather and, whether it's through the clinical work or your own research projects, I think you have a much more of an analytical view of what you're doing, both in research and in the clinic. It also exposes you to a lot more literature I suppose, than what you would otherwise necessarily have time to look at, just working full-time clinically, but I mean, for example, in my situation, I'm exposed to literature through my research, but I'm not exposed to literature, you know, pertaining to all the other various patient groups I have to deal with. So I guess, it's more...yes, it does give you specialist knowledge, which helps you in the clinic with that particular patient group, but in general I think it's more just an attitude thing: that it's a sort of a general skill thing that just makes you, I think, much more aware of the pitfalls of research as well. The good thing about research is it reminds you that you need to keep looking at literature to keep updating clinical knowledge and, I guess, it also gives a much more critical perspective when you're actually in the clinic looking at what you're doing, and looking at the data you've got from the patient or whatever.

Later in the Interview:

I: Yeh, so as a researcher and a practitioner then, you're able to focus, ah, more on bridging the gap and so forth?

P: Yeh, I guess so. I mean, ideally what I would hope is that what I'm doing is trying to be both: develop my clinical skills, but not lose sight of the fact that research is constantly happening and has to be impacting on your clinical abilities and your clinical knowledge and skills and so forth, but, at the same time, I would hope that, because I do want to be a practitioner and a researcher, that I don't, you know, sort of remove or lose sight of the fact that clinical skills and clinical experience and all the rest of it is also an important component in the clinic, and in fact informs your research as well, you know, it provides you so many of the questions, which you can actually direct your research towards answering I s'pose.

Although the question posed in the first passage appears to have been misunderstood, and the specific delineation of what is meant by "research" remains tacit, the practitioner provides an account that partially supports the authorised mindset and behaviour of the scientist-practitioner. The practitioner indicates that conducting research provides the opportunity to be exposed

to the literature; however, the literature only applies to a subset of the patient group he/she sees in the clinic. Moreover, due to time constraints, the practitioner suggests that it is difficult to keep abreast of the literature related to the set of clinical conditions that are seen in the clinic.

In partial contrast to this problem, the practitioner suggests that there are two main benefits of conducting research: 1) engaging in research provides the opportunity to hone and exercise critical skills that assist in evaluating other research, clinical practices, and patients' data in the clinic; and 2) conducting research reminds the practitioner of the importance of keeping abreast of developments made in applied research.

Moreover, in the second passage, the practitioner continues to emphasise the significance of the relationship between research and practice, and extends this by suggesting that clinical practice provides the opportunity to frame research questions. This interpretation echoes the emphasis in the SPM that the embedment of practitioners uniquely positions them to inform the direction of research; a belief that partially drives the impetus for the creation of scientist-practitioners. In this regard,

this practitioner intimates that researching and practising concomitantly fosters, first, the enactment of the authorised scientist-practitioner values and, second, the belief in the progressive and cumulative nature of neuropsychological applied research.

An important aspect of the SPM, which was discussed by this practitioner in the above extract, is the prescription that scientist-practitioners keep abreast of the scientific developments in the literature. In the following extract, a neuropsychologist practitioner discusses further the significance of this prescription:

I: ...So, there's quite a tight communication loop with the research work and practitioners and their practices?

P: Um, I think like in most areas in psychology there is necessarily a lot of everyday overlap between what happens in the world of research and what happens in the world of clinical practice, but I certainly spend a lot of time referring back to research work that underpins what I'm trying to do in clinical practice: I often see kids with things I've never heard of before, which means that I'm often doing lit' searches about neuropsychological implications. And one of the areas that probably hasn't changed too much in terms of my predecessors

and myself is research around in relation to interventions and management of neuropsychological impairments, and I certainly do my best to keep up with the literature on what's emerging now in terms of interventions. So, I'm certainly a big consumer of the research that's around.

This practitioner supports the notion of the significance of research to practice by suggesting that there is an ongoing need to keep abreast of the literature in order to extend clinical knowledge relevant to dealing with patients; a claim that is related to his/her own circumstances. The practitioner also alludes to the progress of research itself as a reason to keep abreast of the literature, with particular reference to the emerging research on neuropsychological intervention and management.

Conversely, the extent to which relevance and progress are seen as being absent in research can support the conditions for literature avoidance, and also the subversion of the other aspects of the prescriptions for the behaviour of scientist-practitioners. In another dialogue, a neuropsychologist practitioner discusses this possibility:

I: Just in terms of research and practice again, is there a decent culture in the evidence-based

approach to refer back to research and keep up with developments and so forth?

P: In my area is there a culture that I'm a part of or...?

I: Yep.

P: I think that most people who work in my area would like to be part of a strong culture that was moving to investigate the area and how better we can do, for instance, cognitive rehabilitation and so on; there's not a lot out there that's new under the sun, and I think that I keep abreast of the literature, and it's quite disappointing, um, it's quite boring to read, it's very academic, I get more ideas out of probably reading the New Scientist or HR journals or sports psychology than I would from the journals that are within my area, you know, such as the journal of head-trauma rehabilitation, clinical and experimental neuropsych' and that sort of stuff. They offer me nothing in terms of making a difference with people with brain injury.

I: Right...it doesn't seem to have that practice focus or it's not easily translated into what you do then?

P: No, I mean, when I look at neuropsych' abstracts, out of a thousand (sic) articles that might appear in any issue there may be three articles that are to do with rehab, and my sense is that we know a hell of a lot, relatively, about what's going on in the

brain, and where it breaks down, and why it breaks down, but we have absolutely no idea about how to go about putting the parts back together again, and that might reflect that it's a particularly difficult problem, um, it certainly is, but people, to my way of thinking, really aren't interested in the area, and for those who are interested, when they present their findings at conferences, I find it incredibly under-whelming, and they're concepts that I learnt in psych 101, you know, 20 years ago, and yeh, I go along to these conferences hoping for some new insights and new techniques and I don't get anything. Maybe I'm expecting too much, maybe I should start contributing to the area myself, but, and I have done to some degree, but I can't see my way forward with it either: when some of the smartest people in the area devote their lives to try and make a difference to people's brain injury and the best they can do is to come up with ideas like errorless learning, which is a nice little idea but it's pretty hard to put into practice.

I: What was that did you say?

P: Errorless learning.

I: Errorless?

P: It's a rehabilitation technique for severely impaired patients pioneered by Barbara Wilson from Cambridge, it's not rocket science stuff, and a lot of the techniques are really designed to show change in groups in office environments or out-patients

facilities, but trying to get those same changes in people's environments and communities and away from home; the office is a world away. So I try and keep my practice quite simple and work on those things that do make a difference. So, for instance, I completely ignore restorative type techniques that try and build up memory and attention, I don't think they work, and I resort to environmental manipulation, maybe some external cognitive strategies, and retain learning and, um, backing up, and adaptive habit formation, and all that sort of stuff that actually works for the people we deal with. A lot of them haven't been too sophisticated and don't have a long academic history behind them so they don't get interested in a lot of the smart mnemonic devices that some of the researchers come up with.

I: Yeh, so they can understand the approaches you use?

P: Yeh, understand them, and may even implement them. I would rather have a client of mine with memory problems getting out little yellow post-it notes and writing down what he needs to do on those and shoving it in his pocket rather than going and getting some wiz-bang electronic organiser or pocket PC and trying to get all these fancy programs up and running for him...or even trying to get him to make use of a diary.

The practitioner in this passage imparts his/her frustration regarding a perceived lack of progress in, and relevance of, rehabilitation research. The practitioner partially attributes this lack of progress and relevance to a bias in research interests, and also to the difficulties or complexities associated with the area itself. Although the practitioner suggests that he/she still keeps abreast of the literature, journals from other specialties are suggested as being more relevant. Nonetheless, the perceived general inapplicability of much of the research provides the grounds for implementing his/her own strategies that he/she believes to work, and to provide results for patients. Thus, this situation is taken as contributing to the slight contravention of the authorised scientist-practitioner values and, ironically, is seen as being guided by a concern with clinical applications and outcomes.

The SPM suggests that the implementation of its scientific values provides the means for psychological science to progress. However, in a multidisciplinary environment the perception and social implications of scientific progress may be more readily ascribed to developments in other specialties. Thus, the perpetuation of a specialty is to some extent dependent on the extent to

which it can avoid displacement resulting from knowledge and role substitution that favour another specialty. To counteract this, a specialty must attempt to incorporate the new knowledge and re-negotiate a position for itself in target areas of society.

Considering this issue, in the following extract, the interviewer and a neuropsychologist practitioner discuss the developments in diagnostic neuroimaging and its relationship to, and possible influences on, neuropsychological practice:

I: I was also just thinking about changes in practices, like with neuroimaging, 'cause I've noticed that in recent years they've started bringing out studies with diagnostic possibilities for neuropsychological issues. I was just wondering about neuropsychology's relationship with neuroimaging—that kind of thing?

P: I haven't, I don't do a lot of research and the research that I have been involved in has kind of been a little bit more clinical rather than sort of, I mean, I think these two things relate really, really well together, particularly for research purposes, but I can't really comment on that, it's not an area I've had a lot to do with.

I: Yeh, fair enough, I was just thinking, um, like, for instance, with neuroimaging patterns where they've decided that they can detect depressives and so forth with a particular pattern, and so how would that sort of interact with neuropsychology's assessments, because they're completely different assessments, I guess?

P: Yeh, I think they would be extremely useful to us. I guess you're talking about functional neuroimaging?

I: Mm.

P: Yeh, but the reality is that those procedures are still very, very expensive, and not widely used in the clinical setting so it's actually quite rare to have access to that sort of information, so, yeh, if I was seeing a patient, for example, who had cognitive difficulties, and it was suspected that it might be due to affective disturbance, I could only really hypothesise that there might be some organic dysfunction, you know, that's connected with that affective disturbance, I wouldn't be able to refer a patient to have a functional MRI or a SPECT-scan or anything like that, just because of how expensive it is, and it's not widely implemented, at least in the public setting.

I: Yep, fair enough.

P: I think definitely that's still in the research domain rather than in clinical practice.

I: Okay, so it's still a bit more prospective?

P: Yeh, but it's certainly very useful for us to learn about that sort of research and to, to then be able to use that in our theories and hypotheses about what's going on for a particular patient.

I: Oh, I see. So, the way they delineate the areas responsible?

P: Yeh, that's right, and to be able to...quite often if I'm writing a report, you know, you want to be able to refer to the latest research findings, for example, to comment that this particular cognitive problem or cluster of cognitive problems commonly occurs in people who suffer from depression and that there's research that shows that there are actual changes in the functioning of the brain. To be able to include in the report the knowledge base that's provided by research so that people aren't just thinking that it's an idea that you have, but rather that there is a scientific basis for your conclusion.

This practitioner lessens the threat of the diagnostic capabilities of neuroimaging technologies by suggesting that the technologies are not widely used because of their expense and that this area of knowledge is still largely limited to research. The practitioner also positions

neuroimaging as having higher epistemic status than that of neuropsychological diagnostics.

This is achieved in two ways: 1) the practitioner suggests that because it is rare for a neuropsychologist to have access to neuroimaging information about particular patients, they cannot defer to neuroimaging data to "confirm" hypotheses that are made by way of neuropsychological means; and 2) neuroimaging research itself can be deferred to by neuropsychologists to increase the scientific basis of their claims. The perception that neuroimaging research provides an auxiliary scientific reference for neuropsychological practice to defer to, demonstrates a way in which an established specialty can attempt to incorporate emerging knowledge for its own purposes of scientific augmentation; an impetus recommended by the SPM.

In spite of this, the emergence of applied neuroimaging research can also be viewed as being a potential role substitution issue for neuropsychology in the future, if and only if the technology becomes more accessible, and its practical diagnostic capabilities become more practicable and diverse than those of neuropsychology. This issue is amplified to the extent

that the technology can be more readily ascribed higher epistemic status within the relevant institutional hierarchy than is accorded to neuropsychological practices.

The possibilities discussed in the previous two passages create a problem for the philosophy of science associated with the SPM and, more generally, the advancement of a scientific specialty. An unfortunate interpretation of the purpose of applied research is the belief that it serves the interests of a particular group of practitioners by leading to an increase in their epistemic and institutional standing.

This result does not necessarily follow the establishment of applied research practices; rather, this can only be the hoped for result. The extent to which many overlapping, adjacent and remote specialties also have applied research and development objectives suggests that supersession (i.e., the emergence of a crossover application that results in substitution across specified territories) may come from many directions.

7.5 Conclusion

The sequential approach to the educational development of scientist-practitioners maintains a division between the formal and practicum aspects of education. Practicum experience itself extends the inculcation of scientist-practitioner values such as evidence-based practice (e.g., the hypothetico-deductive approach) and literature consultation, but also provides exposure to the interdisciplinary relationships and institutional processes; a situation that centralises the significance of socio-political exposure in practicum experience.

Moreover, the dispassionate education and training of aspirant scientist-practitioners, and the division between education and practicum experience could perhaps be reduced by scientist-practitioner educators who consider it their responsibility to attempt to communicate to aspirants the holistic context of research and practice. This may better prepare aspirants for the professional and socio-political components encountered in research and practice environments. Interestingly, the conditions for this possibility are set by the proliferation of scientist-

practitioners, and the value prescribed by the CCP that educators are active clinicians.

The creation of scientist-practitioners who participate in research activities is a mechanism that it is hoped will produce knowledge relevant to the advancement of psychological practice. Further, the SPM intimates that the input from scientist-practitioners and the focus on applied research will provide the cumulative progress of psychological science.

However, this assumption can readily be displaced when the many specialties with their own research and development agendas are taken into account. In this context, the substitution of knowledge and roles, and potentially the displacement of specialties, may result from developments made in another specialty, regardless of any applied research and development ethos fostered within a specialty. Thus, the cumulative progress hoped for in an applied-research culture that is aimed at subserving the practitioners of a particular specialty is contingent on, and subject to, the schismatic and chaotic effects of history, rather than just the establishment of a strong relationship between research and practice within a specialty.

Chapter 8

Identifying a Specialist

8.1 Introduction

This chapter discusses the development of trade guilds in the specialty of neuropsychology in both the United States and Australia. The emergence of a specialisation produces the need for the organisation of specialists. The creation of a trade guild is a useful mechanism for achieving this end.

The issues of identity and quality control are discussed in relation to trade guilds. It is concluded that, to develop, a trade guild needs to align the interests of the specialists and the specialty as a whole with its agenda for the specialty, thus becoming relatively indispensable, and positioning itself as the primary mechanism of quality assurance and identity creation and protection. In so doing, the guild promises various benefits, such as a high-status identity, with membership. Finally, the emergence of a trade guild sees the manifestation of diversity-truncation strategies that

systematically, when successful, lower the status and opportunities of non-members.

8.2 The importance of professional trade guilds to the development of a specialty

The professional trade guilds associated with neuropsychology in the United States are outlined by Sbordone and Saul (2000). Following the medical model, psychology has developed specialty boards designed to ensure the competence of its members. In the medical model, to qualify for membership, aspirants need to complete the required academic training, residency training, and written, oral and practical examinations.

According to Sbordone and Saul, board certification in neuropsychology was non-existent in the United States prior to 1983 and, as a result, the field of neuropsychology could be taken advantage of by what they call "instant neuropsychologists," who attempted to establish themselves as neuropsychologists after completing a two-to-three-day course in the administration of a neuropsychological test battery. Partly to combat this situation, in 1981, The American Board of Clinical Neuropsychology (ABCN) and, in

1982, The American Board of Professional Neuropsychology (ABPN) were established. Sbordone and Saul suggest that the boards were created "in order to protect the consumer" (p. 21); however, importantly, this interest can readily be confounded with the protection of the reputation of the specialty. A lack of quality control associated with the definition of a specialist provides an opportunity for inadequately educated people to take advantage of the laxity in standards. This could potentially bring the specialty into ill repute in the perception of the public and, particularly, of other instituted and relevant specialties and authorities. In this regard, the strict entrance criteria to these guilds have hopefully seen a heightening of the professionalisation of neuropsychology.

Reportedly, in 1996 and 1997, 27% of people (8 out of 27) were accepted for diplomate status in the ABPN (Horton 1999 cited in Sbordone and Saul, 2000), while 72% were accepted as diplomates in the ABCN in 1996; this latter pass rate is apparently similar to that of the American Board of Psychiatry and Neurology. Moreover, according to Sbordone and Saul, in 1997 the ABPN had granted 119 people diplomate status, while the ABCP had granted a total of 305 by 1996.

Although this instituted process attempts to tighten the inclusion criteria, and thus excludes many aspirants while providing the perception of quality assurance, Sbordone and Saul take note of the emergence in neuropsychology, in recent years, of what they call "vanity boards"—another professionally subversive manifestation. These boards provide psychologists with diplomate status on payment of a large fee without testing applicants' proficiency or requiring any specified neuropsychological education and training. Thus, regardless of the longevity and influence of these boards, they can be construed as an attempt to undermine the "legitimate" boards (i.e., the ABPN and ABCP) that present themselves as having more rigorous professional criteria that need to be fulfilled before diplomate status is awarded to aspirants. The notion of a legitimate trade guild can be construed as a professional mechanism that attempts to place specific controls and limits on the identity and standard of its specialists, thus moulding the shape of the specialisation.

8.3 The College of Clinical Neuropsychologists

In Australia, the neuropsychology trade guild is affiliated with the Australian Psychological Society [APS]

and is formally known as The APS College of Clinical Neuropsychologists (CCN). The guild is interested in promoting the interests of neuropsychology, its knowledge, practices, researchers and practitioners in Australia. The following passage is an extract of the College's objectives, which is presented on the APS website:

The objectives of the College are:

- To advance the scientific study and professional practice of clinical neuropsychology; promoting and improving research in clinical neuropsychology; promoting high standards of professional ethics, competence and conduct, education, qualifications and achievement amongst clinical neuropsychologists; promoting the dissemination of knowledge and thought in clinical neuropsychology through meetings, lectures, professional contacts, reports, papers and discussions; advancing scientific interest and inquiry in clinical neuropsychology.
- To promote improvements in and alterations to the conditions and facilities available for the assessment, rehabilitation and on-going support of individuals with acquired brain impairment; to advise on the adequacy of the conditions and facilities available for the assessment, rehabilitation and on-going support of individuals with acquired brain impairment, and their families where applicable; and to propose such changes as are necessary to maintain and improve professional standards.

- To arrange, provide for, and/or participate in activities necessary for establishing conferences, national exhibitions, business and social meetings, lectures, classes and discussions on subjects of special interest to persons interested in clinical neuropsychology, and to encourage and support the education and continuing professional development of neuropsychologists.
- To serve as a medium for exploration and discussion of issues relevant to research and practice within the field of community psychology.
- To work collaboratively with other associations, organisations or community groups with similar interests (CCN, as of 2005).

This list of objectives alludes to a systemic function of the college whereby it seeks to advance the position of neuropsychology and its institutionalisation on many fronts. One of its stated interests is to provide the standard for the education and training of neuropsychologists, which is formalised in its Course Approval Guidelines, which were discussed in chapter seven. Moreover, in combination, the objectives of the CCN and the course approval guidelines provide a framework in which the education and training of aspirant neuropsychologists can be construed as a process that channels trainees towards a narrow and controlled definition of what it is to be a

neuropsychologist. Consequently, this process increases aspirants' preparedness and eligibility for college membership. In this context, the college provides a statement of the minimum requirements of college membership:

Full membership of the College requires a minimum of six years of university training in psychology, including two years of postgraduate studies in clinical neuropsychology, plus two additional years of supervision in the field of neuropsychology (CCN, as of 2005).

8.4 The identity of the neuropsychologist

The quality control of trade guilds provides the framework for the specification of the identity of members and, importantly, non-members. Alluding to this, in the following interaction, a neuropsychologist practitioner discusses the identity of the neuropsychologist in Australia in relation to the CCN:

Interviewer (I): So what is the community of neuropsychologists like in Australia?

Participant (P): Mm, I only know...I've met some of them at national conferences over the years, I haven't been to a national conference recently, so a

lot of it is hearsay, which I'm sure is very familiar to you, there's this sort of overlap, like a Venn diagram of people who are practising neuropsychologists, and there are researchers, and some overlap between the two, and then we've got this concentric circle, 'cause there are people who do neuropsychological work and are members of the College of Clinical Neuropsychologists through the APS, and that's, mm, what should we call that?—A Trade Guild. And it's very difficult to get into, valued highly by most of the members, the usual dramas and dilemmas about letting people in. And there's a wider group of people who are doing neuropsychological work, probably similar neuropsychological work, but not linked with the college. So then some people think that neuropsychologists are just people linked with the college, and other people would think generally. Then there are all those people who could get in the college, but don't want to be in another group again.

This practitioner suggests that not all people who do neuropsychological work are linked to the college, and that, of those who are not, some are assumed to be uninterested in joining another group. This statement implies the possibility of a diverse group of specialists. Identity issues emerge when the practitioner suggests that some people associate neuropsychologists exclusively with college membership, while others are more liberal, in which

case they also include non-members in the definition of a neuropsychologist.

The practitioner also sees the CCN as being an elite trade guild because of its high entrance standards. Such a situation has the potential to create an imbalance in the perception of what it is to be a neuropsychologist; that is, it helps to create membership as a substantive point of difference in the making of identity attributions. Therefore, the practitioner provides an account of a variety of views that he/she believes to be held by people out in the world, regarding the perceptions and limits of the identity of neuropsychologists.

Later in the interview, the same practitioner discusses the implications of the specification of identity, and also alludes to some of the ways in which identity control is changing:

I: So, you can still work if you're not part of the College of Clinical Neuropsychologists?

P: You can, you'd probably have difficulty applying for and getting a neuropsychology job because most employers would specify they want someone from the college, but a lot of people would have other jobs

like a clinical psychologist in the mental health services, who's doing neuropsychological assessments and reporting them, but isn't linked with the college, and they aren't actually employed as clinical neuropsychologists, but they use their neuropsychological skills that they may have gathered along the way, through training, but they can't get into the guild, but they're doing work and they've often received a lot of supervision and training along the way from other sources like work mates, (inaudible), workshops, perhaps supervised by a neuropsychologist, so that their work is good, but they can't get into the college because they haven't got the clinical Masters at Uni. Occasionally there have been periods when you could get in without that, due to changes in the APS over the years, and at those times some could get in. Very early in the college you could just get in, like, with having a piece of paper, I think, (inaudible) being signed by two other members to certify that your work was at the same standard, this was a long time ago, and that's how colleges start, because you know...

I: You need members.

P: Yeh, that's right. I think, yeh. And then there was a period in the late 80s, early 90s where the college ran a national training program, and it was like another Masters, but it wasn't a Masters. But then that closed down because it was too much work for people to run, and at the moment the APS is working—I'm sure you know all this—towards another

form of admission by competency, where, if you've got the skills and you can demonstrate that, you'll be able to get in. But that hasn't happened yet. So there are people waiting around for that to happen who've done all the preparation, but (inaudible) done a lot of work, had a lot of supervision, but they aren't in because that hasn't started.

I: So is there...if they have a Masters degree, will there be admission tests that they will have to do to get in?

P: Yeh...I don't know what the criteria will be, whether it will require say Masters in clinical, or whether it will require a degree and registration, I don't know, but there are people who would meet some of those criteria, well, people with PhD's and registered psychologists, but I don't know (inaudible). So I don't know how the college is going to address the level of qualification, but what they won't require is a specialist Masters in neuropsych'. People will be able to demonstrate what they call equivalence--an equivalent level of skill--by having studied and perhaps done some supervised practice, and that's I think an ideological drive by the APS to make it less of a trade guild, (inaudible) all the people who demonstrate the skills will be able to get in, and that the university place system won't be a constraint on the ability of people in the states to acquire college membership, 'cause I think they can see that it is better to have people inside the tent rather than outside the tent, if they do good work

and they've got the skills. I think the APS has the view that, I think the federal government has the view that, competency is the way to go rather than requiring people to do certain courses in certain places. Then there are people who did other psychological training, often Masters in clinical, but doing that sort of work, some of them have a high level of relevant skills, others perhaps not, some who are simply waiting around for the college to modify its rules so they can get in, some who couldn't give a stuff and are just going to keep on doing what they are doing anyway.

This practitioner suggests that most neuropsychological positions require applicants to be college members, a suggestion which relates to the supposed benefits of membership and the perception employers have of the identity of neuropsychologists. Through alluding to the existence of clinical psychologists who have neuropsychological work experience and knowledge, the practitioner provides the basis for the possibility of an extension of the entry criteria of the college. The more relaxed standards held early in the college's history are taken, by both the practitioner and the interviewer, as being a convenient way of establishing a college through membership creation.

The current situation is seen by the practitioner as moving towards an admission by competency policy whereby, in the future, entry will not, exclusively, require a specialist degree in neuropsychology. This transformation in entry criteria is suggested to be due to the belief that membership is better than non-membership and, more extremely, that it is an attempt to reduce the status of the college as a trade guild. Interestingly, despite the increase in the accessibility to college membership that this change represents, the practitioner asserts that not all potentially eligible people are actually waiting to become members; if significant disadvantage does not result from their continued non-membership, this can be viewed as being an effective point of resistance against the college system.

The history of, and changes to, the college's entry criteria described in this practitioner's account provide an informative glimpse at a way of construing the identity of specialists and the specialty. The apparent attempt to increase the membership of the CCN can be construed as an attempt to narrow the definition of what it means to be a neuropsychologist, while expanding it in other ways: specifically, a neuropsychologist becomes increasingly seen to be defined as such by being a member of the college,

while membership is nonetheless achievable through a wider variety of routes. Moreover, the assertion that these apparent changes will reduce the college's status as a trade guild can readily be seen as implausible given the hoped-for increase in membership and the corollary of identity monopolisation.

8.5 The implications of membership

During the interview with a member of the CCN, he/she discusses the positive attributes of being associated with the college:

I: Can you tell me about the College of Clinical Neuropsychologists with regard to the benefits of membership and the function of the college?

P: Yeh, it doesn't have a very high profile in the state [of Australia] I'm in. With the group membership we have the benefit of having regular case conferences and discussions, and occasionally invited speakers and so on which is great. Ah, there's a...I guess there's a vanity factor in terms of being able to say that you're a member of the college, and also there is a requirement when you're employed in this state to be eligible for membership of the college.

During another interview, a member of the CCN makes some additional positive assertions regarding college membership:

I: Okay. I think basically for my last question I just want to ask you about what it's like to be in the college? Are there any particular benefits?

P: For me, gaining membership of the college, which I did through the entry by examination system, gave me legitimacy with my colleagues both within the state and also interstate. So, to say that you're a college member gives you a degree of respect from other psychologists that I don't think you necessarily get if you're a clinical psychologist doing exactly the same work...when you're trying to communicate with people interstate for example, so for me, it's had that benefit. And, as a group, we do some professional development activities together and the college obviously provides the only forum for that really, and so for that I'm quite grateful. I think that's a reason for continuing my membership.

These two members suggest that the professional development opportunities are an important part of the benefits of membership. In addition, they both allude to the legitimacy that is gained from membership. However, the member in the second extract asserts this in more

specific terms by contrasting the respect that is gained from other psychologists with that afforded to non-members, specifically, clinical psychologists doing similar neuropsychological work.

Finally, like the suggestion made by the member from the preceding section, the first member in this section also cites eligibility for membership of the CCN as being a requirement to acquire a neuropsychology position in his/her state. In this regard, the aspects of the extracts that focus primarily on the professional status and opportunities that are associated with membership, value positively its social exclusivity.

In contrast, in the following dialogue a practitioner, who is not a member, discusses the implications of membership in another way:

I: What do you do if you're not a member of the college? What are the implications?

P: At the moment there aren't any 'cause you still get to go to the professional development things that the college puts on. The title "neuropsychologist" has recently been deregistered I s'pose. So previously you had to be a member of the college to call yourself a clinical

neuropsychologist. A couple of years ago, I'm assuming this is only in Victoria, but in Victoria they deregistered that term, you know, it's now not something that is legal, it's not a legally-binding term anymore, so in reality there aren't any ramifications for me... for not being a member. I think in the long term it's something that you'd probably want to look at doing in more of a professional sense, in that, it's the professional body, and if you want to partake in your profession and develop your profession, you know, and all that sort of thing, then I think, essentially, you're going to have to be attached to that body because otherwise you can't do anything. So, I guess in that sense it's got ramifications, but they're more long-term and they're not directly related to your actual clinical practice I s'pose.

I: Yeh, and you can still get a job then?

P: Yeh exactly, none of those things have, you know, none of that's relevant for getting work or anything like that. Basically, you have to...the criteria tend to be, you are a registered psychologist and you have completed an M. Psych or D. Psych in clinical neuropsychology. There's no requirement that you're a member of the CCN. So in that sense, I mean, they shot themselves in the foot a little bit by deregistering the term because I think people see it as more of a question of, "Well, why should we join now?"

This practitioner provides an ambivalent interpretation of the implications of non-membership. Initially, the practitioner states that there are no implications of non-membership, which is later qualified by the concession that there are only long-term effects; specifically, in the long term membership provides practitioners with the opportunity to participate in the profession, a situation that is seen as being closed to people with enduring non-membership. However, in support of the view that there are no ramifications, albeit when prompted, the practitioner provides an adamant statement that non-membership bears no relation to the capacity of the practitioner to acquire a neuropsychology job, citing degree qualifications as being the only necessary prerequisites (N.B. This practitioner resides in a different state from the previous two informants who made assertions to the contrary.). Additionally, and importantly, the practitioner cites the legal deregistration of the term neuropsychologist in his/her state as being evidence that there are no ramifications for non-membership. The deregistration of the term "neuropsychologist" is intimated as implying that the definition of the term has broadened so that it is more readily dissociated from college membership. Consequently, the perception of the college's standing is considered to

be reduced among upcoming aspirants, who now can become "neuropsychologists" without waiting or striving for college membership. Therefore, this account positions the identity of the neuropsychologist, in Victoria at least, as being relatively flexible and, in the short term, beyond the narrow identity offered and controlled by the CCN.

8.6 Conclusion

The development of a specialisation eventually sees the emergence of the issues of professional identity and quality control. The transition to greater exclusivity and professionalism can be facilitated by the development of trade guilds, which attempt to converge the interests of the specialists with those of the trade guild; a potentially symbiotic and mutually beneficial relationship. Through the attempt to create such a relationship, mechanisms of exclusivity are created, which include the promise of benefits and high-status identity associated with membership. This exclusivity necessarily creates a contrast with non-members and truncates and controls the identity of specialists, which shapes the image of the specialty. Successful actions, deliberate or otherwise, increase the status of the trade guild itself, and concomitantly raise the potential for the longevity of, and positive regard for, the specialty in society.

Chapter 9

Positioning a Specialty in Society

9.1 Introduction

The emergence of a specialty suggests that it has relatively unique and important products or services to offer targeted segments of society. This chapter discusses the need to develop and maintain the differences between a particular specialty and other relevant specialties, and also the socio-political struggle that takes place in the process of creating and maintaining the position of a specialty in society. This is explored with primary reference to the specialty of neuropsychology and how it is related to social issues and to other disciplines. It is concluded that this political action is systemic and continuous, and thus comprises a significant and indispensable part of the process of achieving social significance; that is, successful specialties are not only lucky but also, apparently, politically astute.

3.2 Multidisciplinary neuropsychological interests

Clinical neuropsychology is situated within a complex of other disciplines. Some of the main specialties with which clinical neuropsychology can be compared with include cognitive psychology, cognitive neuropsychology, classical neurology, behavioural neurology, and neuropsychiatry (Ogden, 1996). Walsh (1994) suggests that the specialty of neuropsychology emerged out of the parent disciplines of neurological medicine and psychology. The new specialty overlaps with these progenitive disciplines in some of its concerns and methods while, owing to its unique positioning, it also provides supplementary input to the understanding of, research on, and practice in relation to, brain-behaviour relationships.

Ogden (1996) suggests that the relationships between some of the disciplines can be conceptualised in terms of a continuum, with neurology at one end and cognitive psychology at the other. Ogden believes that neurology is primarily concerned with the clinical indicators of nervous system pathology while, unlike neuropsychology, supposedly maintaining a lack of interest in the higher cognitive and behavioural functions and their relationships to the brain.

Similarly, Luria (1974) suggested that classical neurology is concerned with lower-level activities such as motor movements and reflexes.

At the other extreme of the continuum lies cognitive psychology, which is concerned with higher-cognitive processes. Cognitive psychologists primarily study normal subjects, and create models of cognitive functioning. Additionally, cognitive neuropsychology has a similar interest to that of cognitive psychology, in that it is primarily concerned with the processes of the higher-cognitive functions, but it has an additional interest in cognitive performance resulting from brain-damage. Due to this, Ogden (1996) indicates that, in contrast to clinical neuropsychologists, cognitive neuropsychologists are not primarily concerned with brain-behaviour relationships. The aims of cognitive neuropsychology do not necessarily have any immediate applied application, because the interest in neuropathology is used as a means to develop theories of cognitive functioning (Ogden 1996). Therefore, in this context, clinical neuropsychology can be seen as a specialty that is positioned between neurology and cognitive neuropsychology: it has an interest in higher-cognitive processes and brain-behaviour relationships, and

is also oriented towards applications in diagnosis and treatment.

Ogden emphasises that, in practice, as might be expected, the disciplines have considerable overlap. For instance, behavioural neurology, which emerged out of classical neurology, has a range of concerns similar to those of clinical neuropsychology (Ogden, 1996). Additionally, while the disciplines of behavioural neurology and neuropsychiatry had different origins, they also have considerable overlap, and it is now becoming increasingly difficult to distinguish these specialties (Trimble, 1989; Sbordone & Saul, 2000). Trimble (1989) suggests that neuropsychiatry has attempted to integrate knowledge from neurology and psychiatry. Thus, neuropsychiatry can be defined as a specialty that deals with the brain-behaviour relationships of psychiatric syndromes. In contrast, behavioural neurology is primarily concerned with the neurological basis of behavioural disturbances rather than psychiatric syndromes (Trimble, 1989; Sbordone & Saul, 2000). However, as a result of the knowledge that has emerged over the last century regarding the relationships between psychiatric syndromes and underlying physiology, this has necessarily created an

overlap between the interests of neuropsychiatry and behavioural neurology.

Additionally, there are a large number of applied technologies that have been developed in these specialties, which provide the means to assess cognitive functioning and identify specific brain dysfunctions (Sbordone & Saul, 2000). Despite this, Sbordone and Saul maintain confidence that clinical neuropsychology still has a supplementary role, because the tools available to the behavioural neurologists and the neuropsychiatrists are often insufficient to provide a "rigorous and comprehensive neuropsychological evaluation" (Sbordone, & Saul, 2000, p. 33). Sbordone and Saul suggest that these specialists still rely on clinical neuropsychologists for the answering of diagnostic questions and the development of treatment programmes. However, in the interest of the furtherance of psychiatry, Muller (1989) encourages it to position neuroanatomy as its basic science, and to attempt to incorporate more of the knowledge and practices of behavioural neurology and, importantly, clinical neuropsychology. Muller's recommendations for psychiatry indicate the potential for boundary transgressions in the development of a specialty, and thus the relative instability of the position of a specialty in society.

9.3 The relationship between clinical psychology and neuropsychology

The identity of a specialty is partially determined by the differences between it and other specialties, in knowledge-base and practices. The ways in which specialties overlap and differentiate affect their range of options in, and adaptation to, the marketplace. Within the discipline of psychology, the specialty of neuropsychology can be considered to have a relationship with clinical psychology, and thus elaborating this relationship provides an indication of the significance of the interaction between specialties. In the following interaction, a neuropsychologist practitioner provides an account of the differentials between the two:

Interviewer (I): Yep, and what about the flexibility, I guess, in practice settings between the two, is there...?

Participant (P): You mean can you go from one to the other or?

I: Um, I guess, just in terms of job prospects and, um, yeh, the breadth of opportunities to practice?

P: For neuropsychologists?

I: Yep, just in comparison to clinical psychs'...

P: Well, there's many more clinical psychology positions than there are clinical neuropsychology positions. I think that also relates to the areas where clinical psychologists can work. Like whether you're going to be working with people with cancer, or gynaecological problems, or in burns units—which can be a health psychology area—or working in mental health areas. There's a broader scope, I guess, for people in clinical psychology in terms of the different groups, or diagnostic groups, or just health areas they can work in, whereas with neuropsychology it's very much traumatic brain injury and rehabilitation, psycho-geriatrics, the degenerative dementias, neurology, neurosurgery. I guess the area that I'm sort of working in is a bit different from most, as neuropsychologists don't generally work in an acute medical or trauma situation where half of our work involves assessment or screening at the bedside; the neuropsychological work is done with outpatients.

This neuropsychologist suggests that an important difference between the two specialties in question is the number of positions available. Fewer positions are seen as being available for neuropsychologists, and this is attributed to its being a relatively more circumscribed area of specialisation.

Furthering this discussion, in the following interaction, a neuropsychologist practitioner considers the issue of job specifications and the two specialties:

I: The other thing is, I'm just wondering about clinical psychologists in your state, whether there are any ambiguities between neuropsychs' and them in terms of, like, some clinicians may have neuropsych' skills and knowledge but aren't technically neuropsychologist or members of the college, but perhaps there is related work that they do?

P: Yeh, I'm...I think this is an issue for a lot of people, it's not particularly an issue that I've been that interested in, but I know that in the state there are a lot of jobs that are neuropsychology positions, that somebody does require knowledge of neuropsychology to fill the position, and sometimes those are filled by people who officially have a clinical psychology degree, um, usually with some experience or training, you know, maybe one of their placements was in neuropsychology, um, so there is definitely an overlap then. I haven't seen it as being a problem yet, but could imagine that it will become an issue as more neuropsychology programmes develop with specialised training; there'll be an argument for hiring neuropsychologists into such positions.

This neuropsychologist suggests that there is an overlap in applicable positions for neuropsychologists and

clinical psychologists. Moreover, positions that require neuropsychological knowledge are suggested as having been given to clinical psychologists with neuropsychological experience. The practitioner continues by arguing that, although this is not a problem at the moment, as neuropsychologists proliferate, it may become one. The rationale provided for this is that there will be more neuropsychologists with specialised knowledge in the marketplace. Understandably, in this context, the specialist knowledge of neuropsychologists is regarded as positioning them competitively for jobs that require neuropsychological knowledge.

In contrast to the account of the previous practitioner, in the following interaction, a neuropsychologist researcher, practitioner and educator considers the ways in which both clinical psychology and neuropsychology can benefit from the overlap of their respective knowledge bases in the education and training of practitioners:

I: Um, so what about the education of the neuropsychologists then, is it broadening in terms of the knowledge base?

P: I think that it is, um, it's, and again, it varies across institutions, it certainly was the case, for example, when I trained in Melbourne and we did no clinical psychology in that programme when I trained, um, here there's quite a lot of course work in common between the clinical psychology and the neuropsychology programmes, everybody...so we have the notion that there is a corpus of knowledge and skills that anybody calling themselves a psychologist ought to have and be able to do, and to that end it's already the case that our clinical psychology students are very capable of undertaking neuropsychological assessments. And it is our intent that the neuropsychology students will be very capable of conducting cognitive behavioural therapy for mental health problems of variety and kind even though that is not their specialisation...that they will have the skills to be able to make assessments and, you know, do some therapy and so on as appropriate so, um, I think that that does represent quite a significant expansion of the knowledge base in both directions.

I: Yep.

P: I mean I certainly have the feeling that we are training people who will be much more competent than any of us are.

This neuropsychologist considers that the sharing of knowledge between the two specialties results in the provision of education of greater quality than that of the

past. Unlike the previous practitioner's, this practitioner's account of the established overlap of the specialties demonstrates the potential for the continued competition between neuropsychologists and clinical psychologists; a situation in which practitioners with knowledge from both specialties are more adaptive than those without. The perspective that this neuropsychologist imparts is that the expansion in the knowledge of both these specialties strengthens the discipline of psychology as well as the specialties—an account that emphasises the potential for symbiosis.

9.4 Role loss to specialties outside psychology

The multidisciplinary environment in which neuropsychology is embedded, which includes many more specialties than merely clinical psychology, suggests that there is potential for cooperation and competition between related specialties. In the marketing of a specialty, points of difference between itself and other specialties need to be established and maintained. In addition, to survive, a specialty needs to maintain the significance of its practices and the relevance of its knowledge. These two components are necessary because, without them, a

specialty would have no grounds on which to argue for its relative indispensability. In the following interaction, a neuropsychologist practitioner discusses his/her experience with this negotiation in the public system:

I: What about usurpation? Are other specialties usurping neuropsychological knowledge?

P: I don't know, I don't think so, I think there's always that tension at the boundary of your role, you know, there are things that I do, that psychiatrists do, that clinical psychs' do, that occupational therapists do, but I haven't experienced that as leading to a role loss, I think what's been probably helpful has been the move in medicine towards more evidence-based medicine, so the medical people are learning to do big brief screening measures like the hyper-hospital-anxiety and depression scale (an inaudible list of tests)...neuro-cognitive battery, but I suppose some people could see that as usurpation, but I certainly don't. I think it means that more of the patients are getting an objective measure than previously, and then the referrals we get are better informed, so by the time...sometimes when someone's referred they've already had a series of quite well standardised measures delivered by the doctors and they give me the scores, but sometimes the measures answer the doctor's questions and I don't even get the referral, and I'm happy with that. And sometimes they think there is a problem, the screen

suggests there's a problem, so "could you now check if this really is the problem?" And I'm happy with that. So no, I don't think there's a problem with usurpation, there may be elsewhere not in (inaudible), I think that's possibly because in the public sector we've seen that we've got way more work than we can do, there are many people who should be referred who are not, just because we won't have time to see them. So the more other people can do the better...yeh, this might be seen as usurpation, but I think there is often a wish by others that, for example, neuropsychologists give a whole lot of tests and so only see a certain percentage of patients, "could we find a short variety of tests to do the same thing?" But when they can't, and they don't want to spend two to four hours seeing a patient, at that point they hand them over.

This practitioner perceives there to be a certain amount of overlap of activities at the boundaries of specialties, but initially denies that this implies that there is a role loss. The practitioner continues by suggesting that the introduction of screening measures in medicine means that these measures may answer a doctor's questions without resorting to the referral to a neuropsychologist. If these measures do not answer the doctor's questions satisfactorily and they decide to seek out the services of a neuropsychologist, then the referrals

include some preliminary data, and thus the doctors and the neuropsychologists are better informed.

While the practitioner concedes that some people may see this phenomenon as usurpation, the practitioner attempts to maintain the view that this does not lead to a role loss because the demand for neuropsychological services is still more than can be dealt with by existing practitioners. In addition, the practitioner considers there to be a desire to bypass neuropsychological assessments due to the extensive length of time typically taken to conduct assessments; the cost of these assessments, to which the practitioner does not refer, could also be relevant to such decisions.

The practitioner provides an account of the way in which neuropsychology has been bypassed in a system that attempts to deal with patients in an economical way. While the neuropsychologist can plausibly maintain that role loss has not occurred due to the perceived fact that there are still too many patients to see, there is still a sense in which the role loss is, in fact, illustrated in this account; that is, some "ideal" neuropsychology cases are suggested as being dealt with by other specialists. Thus, this can be seen as implying a loss in the potential market

share of neuropsychology, partly caused by a lack of adaptive flexibility in its assessment procedures, reducing the number of referrals to neuropsychologists.

9.5 Compromising values

The scientist-practitioner model provides a positive valuation of an evidence-based approach to practice. The requirement that scientist-practitioners attempt to increase the science and reduce the art in practice is an attempt to provide a framework for increasing the legitimacy and standing of psychology. However, while these standards may be consciously espoused by various specialties and specialists, there remains the possibility that such standards might be subverted, intentionally or otherwise, in the context of competition and the general processes of practice. In the following interaction, a neuropsychologist practitioner provides an elaboration of this phenomenon in his/her experience:

P: In relation to speech, OT (occupational therapists), and physio' colleagues, I think, probably speech pathology and occupational therapy are more and more taking over. I think some of the roles that neuropsychology might have done previously, I know in relation to, for example,

assessing children's sensory and fine-motor skills, in this system, the occupational therapist sees that very much as their domain, whereas I'm aware that colleagues, particularly American colleagues—neuropsychology colleagues—would think that that was very much their domain, other examples are, examples that I think are most striking, are examples in relation to rehabilitation: neuropsychology literature is fairly sparse in relation to rehabilitation of children after brain injury, and there isn't a lot of evidence that might be helpful for these kids. However, our OT and speech pathologist spends a lot of time doing rehab' of language, memory, organisational skills, and attention and concentration, which I think should be quite reasonably within what a neuropsych' would do, but what they're doing doesn't have any, usually, any research evidence behind it, so that's a bit of a tension, and I think that's a similar picture in adult rehab' settings as well in terms of neuropsychologists feeling, like I do, that we're restrained in doing things which are evidence-based and some of our colleagues not feeling restrained by those things, and from the family's perspective, it's at that time when families are usually pretty vulnerable and grasping for whatever people think might be helpful. I think, you know, some of the kids spend a lot of their time doing rehab' exercises with the speech and OT in this place.

This practitioner suggests that competing specialties attempt to negotiate the expansion of their roles into what

can be defined as neuropsychological roles. The most alarming suggestion made here, however, is that the values of evidence-based practices are compromised by some of these competing specialties. The practitioner asserts that practitioners from other specialties provide services that lack the research that demonstrates their effectiveness—a practice that a scientist-practitioner would avoid. Even if it is assumed that the practitioners referred to had the best intentions for their patients, and that this situation did indeed occur, it is the very possibility of this and other similar situations that illustrates the limits of legitimate action associated with the SPM. These limits indicate the vulnerability that a specialty that attempts to uphold certain constraining values might face in a competitive environment, limits that might, in certain times and places, affect the market share of the specialty.

9.6 Neuropsychology's principle quality of difference among the specialties

Although the overlap and boundaries between the specialties can be seen as a source of substantial conflict and a potential threat to the existence of a particular specialty, the establishment of a substantive point of difference among the specialties provides the possibility

of perceiving the position of the specialty as being safe. This is discussed in the following interaction, by a neuropsychologist practitioner and educator:

I: Okay. What about neuropsychology's role definitions and boundaries with other specialties: how are the students educated around that?

P: I have to say that other people have always been much...other neuropsychologists have always been much more worried and troubled by this than I have, so I've worked in big hospitals for most of my working life and I just never regarded it as a major issue. I see that, sort of, the territory between disciplines is somewhat elastic and I also see that there is a certain amount of overlap and I see that, you know, there is a potential for anxiety around that, but I actually also feel that what neuropsychologists do, occupational therapists and speech pathologists don't do, and so, you know, I never did become very engaged in that issue really.

I: Okay, so what are some of those distinguishing features then?

P: Well, um, the principle thing and the most important thing, the thing that I think is often forgotten, is a very different knowledge base and conceptual framework: so the capacity to know whether a person is performing badly on a test because they're delirious or, you know, because

they've got specific (inaudible) deficits for example. So, um, insofar as, especially as neuropsychology is a diagnostic tool, which I principally regard it as being, anybody can administer, you know, OT's can administer tests, anybody can administer tests, but not anybody can know what the results of a test administration are or mean and it's that really...I think that therein the expertise in neuropsychology lies, and I think that that is well recognised by the doctors for whom we are often doing these assessments, you know, you don't see referrals to...in hospitals you don't see referrals to general mental health workers, you know, where it's inconsequential to what the discipline is, what you get are referrals to neuropsychologists for expert advice, really. I mean that doctors don't refer to generic mental health workers if what they want is a neuropsychological assessment.

Although this neuropsychologist does not answer the question which referred to the education of neuropsychology students, he/she goes on to discuss neuropsychology's strength among the specialties. Initially, the neuropsychologist claims that, while the territory between the disciplines is elastic, and there is potential for anxiety due to this, he/she lacks personal interest in the issue because of a sense of confidence regarding neuropsychology's position in society. For this

neuropsychologist, the principle difference that neuropsychology has from the other specialties is its knowledge base and conceptual framework.

Neuropsychologists are considered to be diagnosticians in that they are proficient in the interpretation of tests: while administering tests can be done by "anyone," neuropsychologists are in unique position to interpret the meaning of test results. Moreover, it is principally due to this expertise that neuropsychologists are respected and their services are sought. Interestingly, in this account the professional characteristics of the neuropsychologist are seen as being unique, and valued more highly than the mensuration technologies that diagnosticians make use of. Moreover, while this account provides a perceived point of difference for neuropsychology, and enables a sense of confidence about neuropsychology's position among the specialties, these differences are exactly what need to be defended. As discussed in Chapter Six, a perennial possibility is that developments in other fields may result in neuropsychology's services being bypassed.

Alternatively, another specialty may appropriate some of neuropsychology's interpretive framework and technologies, and incorporate them into their own practices, producing a competition between specialties, and thus potentially reducing neuropsychology's point of difference in that

particular area. The progress of science may or may not favour any particular specialty and, importantly, a specialty may not be in a strategic position from which it can respond adequately to protect its market share.

9.7 The incommensurability of the specialties

The interaction between the specialties in a multidisciplinary environment provides the possibility of an incompatibility between knowledge and practices. In the following interaction, a neuropsychologist practitioner discusses this situation in the public system:

I: ...right, and how are the role boundaries negotiated? Is the neuropsychologist's role fairly clear?

P: Um, I find from place to place yes and no. Ah, the place that I was at, my role was very clearly defined, but typically I find that, particularly with occupational therapists at least here, there's a lot of blurred boundaries: a lot of them are doing some cognitive screening with tests I've never heard of—I think they've designed them within their own field. But there's a lot of issues there in terms of what's appropriate for whom to do what, and I know there's been some serious battles within certain public sectors here where that's been more

of an issue and fortunately I haven't worked in those as much, but I'm definitely aware of them. Even just getting referrals from those places I've had some trouble trying to interpret some of the cognitive stuff that's been conducted by somebody who's not a neuropsychologist, and then finding that there was no neuropsychologist who saw them because it went to an OT—this is for people who sort of move into our district you know?

I: Yep.

P: And, so, I can't really get a good background and I end up having to redo a lot of stuff that supposedly was done by this other person, but because they don't use the same measures or approach it with the same conceptualisation it's almost useless. And so it seems like someone's been without neuropsych input for the two years or whatever—a year or six months or whatever they've been in the previous hospital—and often the most crucial information to me is the progress over the first few months post-injury and I wouldn't have it. So, I find that to be an issue looking at it from my own in-field perspective, you know?

This practitioner suggests that different instruments and conceptualisations between specialties can lead to problems in relation to the care of transferred patients. These differences between the specialties prevent interpretation of the information that comes with such a

transferred patient. The possibility described by this practitioner can be seen as an instance of incommensurability between the specialties, which might potentially impact on the effectiveness of patient care. The perpetuation of this condition is supported by a separation of the specialties; that is, the differences in language, knowledge and practices that occur between specialties.

Reducing incommensurability, in general terms, might be made possible in at least two ways: 1) a diffusion of knowledge and practices, which would see a reduction in the points of difference between the specialties; and 2) an increase in the proliferation of one of the specialties, thus reducing the issue of differences in practice. However, the problem with these apparent solutions is that they both might potentially exacerbate conflict between the specialties rather than facilitate a détente. The first solution may exacerbate conflict because the specialties are required to give up, by whatever mechanism, their knowledge and practices in favour of standardisation: a possibility that certain specialties might see as not being in their interests, if their niche and viability is substantially affected by such a process. On the other hand, attempts to increase the proliferation of one

specialty over others could be viewed by relevant specialties as a hostile activity, and thus such attempts might potentially create comparatively strong counteraction from the threatened specialties. Considering these possibilities, the solutions to the problem of incommensurability in practice, which might benefit all parties including the patients, are not easily found, and may even be seen as unlikely.

9.8 Multidisciplinary teams in practice

The difficulties associated with negotiating the roles and boundaries between specialists are evident in multidisciplinary teams that work together on the same cases. In the following interaction, a neuropsychologist practitioner elaborates on this in the context of neuropsychological rehabilitation in the public system:

I: So how does your role relate to other specialities in terms of seeing and dealing with patients on a day-to-day basis?

P: You mean, ah...that I work in an interdisciplinary team?

I: Yeh, that's right.

P: Yes, I work with occupational therapists and speech therapists, and so on, and ah, we like to think, I guess, that we work hand-in-glove with the other disciplines. Certainly, we speak weekly about progress with the clients and so on. I think, probably, the idea of doing interdisciplinary rehabilitation in this area is probably over-stated because I think it's hard to get that symbiosis in terms of two different therapists working with the same client at the same time.

I: What do you mean by that? Is it better to work one-on-one?

P: Yeh, I think...I'm under the suspicion that you would be better off having some more generalised skills perhaps in an area, um, sort of occupational therapy skills and so on as well, and perhaps working on those exclusively with a client, and working them back into a vocation, doing psychotherapy, assisting them with difficulty getting out into the environment and so on. Either that or in fact you really do have to call what you do multidisciplinary, and you regularly inform the other therapist what you're doing, um, and maybe give a little bit of advice here and there and receive advice back from them as how best to proceed with the client, but I don't think there's anything magical in the team approach to rehab', I guess.

I: Okay, so you think it's good to reduce them bouncing around from one specialist to another?

P: Yeh, I think they would get lost in it sometimes and you get a lot of overlap...and the other thing you get is the need to transfer large amounts of information between treating therapists and so on.

I: This touches on my next question, I guess, on role boundaries and overlaps, and perhaps role losses...?

P: Yeh, there is a fair bit of that that goes on in a team, um, I guess, specifically, the role of the psychologist or neuropsychologist on the team often overlaps with what social workers do, especially with regard to counselling, as they see it. So often you will go to see a client because you know that they have been referred for problems of a psychological nature and yet, for instance, the social worker may have been in there for a week or two prior and have started on a range of therapies, and I guess this has caused some consternation amongst the psychologists because we feel that...we feel that we spend, you know, four to six years learning how to do that stuff and really it's only part of the skills that you'd be taught within a social work course. So there's that sort of overlap. In my work as a neuropsychologist there's also an overlap with occupational therapy as well from time to time. Because I like to be very hands on in my approach, a lot of the strategies and so on that I would recommend to clients involve me actually getting hands on with them and looking at different ways to go about tasks using, perhaps, different cognitive strategies and so on, and that

does look a little bit like what occupational therapy does.

Although this practitioner expressed the belief that the members of his/her team like to think that they work hand-in-glove, the practitioner considers there to be considerable difficulties associated with the team approach. The practitioner suggests that it may be of greater benefit to the patients if they dealt with fewer practitioners who have more skills that overlap with those associated with other specialties rather than being subject to a set of practitioners who may inadvertently double up on a certain amount of what goes on in the course of therapy. This notion of streamlining therapy is also seen as potentially being of benefit to the general state of practice, not just to the patient, because of the problems that are associated with information transfer and inter-specialist communication in multidisciplinary teams. In addition, the practitioner suggests that some of his/her practices could be taken as being occupational therapy.

However, despite having no stated qualms about this, the practitioner continues by asserting disciplinary proprietorship over certain psychotherapeutic practices supposedly engaged in by specialists from other

specialties. Thus, the practitioner provides an ambivalent and asymmetrical account of the overlap and appropriation of knowledge in practice; one that indicates a certain disciplinary rivalry and bias.

The interface within multidisciplinary teams, as discussed here, provides an indication of the complex of issues that need to be negotiated when providing a service within such a context. The existence of multidisciplinary teams can, in some instances, be seen as cumbersome in relation to the provision of effective practice, while a streamlined solution involving fewer practitioners, with more general knowledge and skills, can also be seen as threatening to the specialties that have their knowledge appropriated and their services bypassed.

9.9 Negotiating the market forces in proliferation

The creation, maintenance, and furtherance of a specialty are inextricably interwoven with market forces. In Australia, the first postgraduate course in neuropsychology began at Melbourne University in the 1970s. Since then, many such specialist courses have been founded across the country. The burgeoning of the numbers of

neuropsychologist within Australia provides the context for an analysis of the ways in which neuropsychology can be seen to negotiate the market forces at the interface between the specialty and society. In the following interaction, a neuropsychologist practitioner provides a positive account of neuropsychology's proliferation potential:

I: Um, what I wanted to know, ah, just with the proliferation of neuropsychology postgrad' courses across Australia, I was just wondering whether there could be, ah, too many within the niche I guess, and um...?

P: Absolutely not, well, I don't think so, um, I think in psychology the number of...the work that we can do tends to be endless within the public health system and so, for example, you know, with clinical psychologists, as there's more and more courses and more and more graduates coming out, there's more and more positions, but I think the same would happen within neuropsychology. I think it's a great thing that there's more courses, and more graduates coming out.

Another neuropsychologist practitioner provides a similar theme:

I: In respect to the proliferation of postgraduate courses in neuropsychology in recent years, I was just wondering if there were currently, or foreseeably, any issues with supply and demand?

P: I think, um, I think the early thoughts we had about these courses coming on board was that there would be no jobs for graduates at the end, so, when I went through, I graduated in the mid 90's, we had to move interstate to get jobs, now there are four courses in Melbourne alone. My understanding is that graduates are getting work and it's having a bit of a reverse effect, such that, the more graduates that you churn out, the more jobs seem to be opening up. So I guess the word out in the marketplace is that neuropsychologists have something unique to offer, and I guess they're sort of well placed to provide those services.

I: Yeh, that's interesting. So there's a burgeoning effect I guess?

P: Yeh, I guess it's like, if you go and create a big freeway, you're going to get more traffic.

The practitioner in the first passage supposes that the supply and demand for neuropsychologists will follow the course of the proliferation of clinical psychology, which is claimed to have resulted in more jobs being created as the supply of clinical psychologists increased. This assumption is prefaced by the suggestion that there is

an endless amount of work in the public system for neuropsychologists, which positions the services of neuropsychology as being in demand.

However, the demand alluded to here refers to neuropsychology's "potential" market rather than the "actual" demand associated with paid positions and their work-load. An implication of this is that certain of the market forces that impinge on the proliferation of a specialty may preclude the potential demand from turning into actual jobs, thus halting the continuation of the increase in the number of positions becoming available. Thus, because of the fortuity of market forces, a specialty may not necessarily follow the developmental trajectory of any other specialty, which in this case is hoped to be, by the interviewee, that of clinical psychology.

The practitioner in the second passage makes empirical claims regarding the increase in the number of jobs, which, incidentally, are only spoken of hypothetically by the first practitioner. The second practitioner suggests that early trepidation about the proliferation of neuropsychology courses was allayed by the actual uptake of neuropsychologists into the system, the cause of which is claimed to be the awareness in the marketplace of the value

of neuropsychology's niche services. This view validates the marketing strategy of neuropsychology and the significance of its specialist services to its market segment.

In contrast to the above positive accounts of the proliferation of neuropsychology, in the following interaction, a neuropsychologist practitioner provides an appraisal of the personal difficulties associated with negotiating his/her position in the marketplace:

I: With the output of neuropsychologists then in the state is there any kind of issues with supply and demand? How are they taken up into the system?

P: ...I personally have not had trouble finding work as a neuropsychologist, but that work is more sporadic and the biggest thing that I find is that they don't usually have enough money to support them in the public system so there's a huge demand of...like at the brain injury unit that I worked at, it was a huge demand on, um, in terms of what you need to do versus the amount of hours that you had to do it in, and I was arguing up until the point I left to be making it a full-time position because it was for 50 patients and I was only there for...and I had to fight for two days a week. Originally it was only one day a week for 50 residents, which is just ridiculous considering that you're sort of liaising

between family members, and the testing takes a long time, and then you're trying to focus on some rehabilitative techniques. So, um, you can imagine, it's probably just a little bit unrealistic to try and meet all the needs in that time frame, ah, that level of employment, you know?

In another interview, a neuropsychologist practitioner discusses the same theme:

P: Um, I think there's a good demand for them (neuropsychologists) and I think there's always an interest for creating more positions from people that are referral sources, but I think because neuropsychology assessments aren't funded by Medicare, you know, the hospitals are reluctant to employ very many: they don't seem to be getting value for their money or something, I don't know, they really don't want to pay the salaries of somebody who can't charge Medicare. I don't think there's enough appointed to meet the needs and I know that within my own hospital we've had positions frozen for ages, so even positions that are in existence don't get filled because admin' is resistant to keeping them offered, they're not up to normal levels for some reason, I'm not sure why that is, whether that's just budget or the new award that they can't afford to pay people, I don't know, but I think it's short.

The first practitioner discusses the institutional struggle associated with increasing the amount of hours of a position so as to cope with the demands of the job, which are considered to require more hours than are allocated to the position. The second practitioner intimates that neuropsychologists are valued in the eyes of referral specialists but, despite this, and because of funding issues, and perhaps other unidentified matters, positions for neuropsychologists have been frozen and remain unfilled—it is indeterminate, considering the interview data, whether these jobs ever were in fact filled. These issues raised by the practitioners allude to the inhibitive influence that the market forces can have on a specialty's progress, in spite of the supposed demand in the market segment, and the positive regard significant others may have for the services of the specialty.

9.10 Conclusion

The existence of a specialty tacitly assumes that specialist knowledge is associated with it, and thus a substantive contrast or series of contrasts need to be made with other extant specialties.

This chapter discussed some of the ways in which a specialty negotiates its path through social politics in an attempt to secure its market segment in a competitive sector. Related to this pursuit is the need for the creation and maintenance of specialist knowledge in conjunction with the persuasion of significant others of the importance of the products and services proffered by the specialty to the target market.

The negotiation of organisational achievement requires a continuous and systemic promotional strategy that operates at all levels of the specialty's organisation and interfaces with society. Thus, this emphasises a continuing need to be responsive, pre-emptive, and strategic in the positioning and re-positioning of a specialty within its temporal market segment. This process can be seen as Machiavellian not just because the

achievement and maintenance of a specialty's position requires competitive, self-serving action to take priority over other factors when the continuance of the specialty is visibly threatened, but also because of the general need to engage in political action in the process of social proliferation.

Related to this phenomenon is the problem of securing and advancing the empirical content of a science and, in relation to neuropsychological knowledge and health-sciences in general, patient care. Unfortunately, these are considerations that may get in the way of socio-political struggle. Moreover, although this is so, favourable outcomes for science and society can always be promoted, by the victors of a conflict, as being concomitant with the resulting temporary resolution that favours them.

Chapter 10

Discussion

10.1 Introduction

The primary aims of the thesis were to develop a conceptualisation of scientific knowledge and progress, and to explore an area of scientific knowledge—neuropsychological knowledge and the specialty of neuropsychology. These aims were seen as being interlinked, and believed to aid the development of understanding in both areas; an understanding that would emerge from the consideration of a variety of conceptualisations, areas of investigation, and discursive sources of media in the hope to further or supplement knowledge and interpretation.

This chapter has two aims: 1) to discuss the conceptualisation of scientific knowledge and progress that was developed over the course of the thesis; and 2) to discuss issues facing the specialty of neuropsychology that emerged from its exploration.

10.2 Science, neuropsychology and interpretation

10.2.1 The philosophy and sociology of science

Chapter Two had two primary aims: 1) to develop a framework of understanding the development and progress of scientific knowledge; and 2) to prioritise an approach to investigating and interpreting the history and constitution of scientific knowledge. The Foucaultian approach to the conceptualisation and investigation of history was the first framework to be explored. The framework of discourse_F and power/knowledge proposes a way in which science, technology, society, and extraneous material phenomena can be understood to function together. Further, the elaboration and investigation of knowledge is dovetailed with the conceptualisation of history itself: the investigation of history is supposed to elicit the discontinuities in history, and thus reveal a series of transformations and schisms. However, any discontinuities that occur in history are, first, an empirical issue and, secondly, an effect of the way in which the researcher divides up and constitutes historical knowledge. Notwithstanding this, the expectation that historical analysis will reveal a series of discontinuities is a

reasonable one, but by the same token, so is the expectation that there will be certain continuities. Therefore, historical analysis should remain as agnostic as possible regarding the distribution and constitution of phenomena, and attempt to identify continuity and discontinuity wherever it can be suitably interpreted as occurring.

In the Foucaultian framework, the notion of power is conceptualised as the force that moves through knowledge and animates it. The energetic metaphor provides the framework for conceptualising the reciprocal processes of conductance and resistance. Foucaultian historical analysis can be seen as being primarily concerned with the elucidation of this phenomenon within the formation and functioning of knowledge.

The resistance of knowledge is of importance because the hegemony of knowledge implies a certain systematic organisation of discourse_F that envelops its subjects. Thus, knowledge that is high in conductance is effective in its capacity to manipulate and control its social components, technological panoply, and the subjects within its dominion; an understandably important component to the creation of knowledge. On the other hand, the reciprocal

process, resistance, is an important interest because it refers to the areas of discordance, rupture, inadequacy, and inhibition, in the functioning of knowledge, the illumination of which reveals the limitations and problems inherent in the formation of knowledge.

The Foucaultian approach to history can be seen as a broad interpretive framework that is applicable to a wide variety of social phenomena, including science. Science and scientificity are implicated in the conceptualisation because the concept of power/knowledge alludes to the relative systematicity of knowledge and the manner in which subjects are constituted, and manipulated by it. Nevertheless, while this approach to history and elucidation is compatible with the characteristics of scientific history, an investigation of the philosophy and sociology of science was seen as supplementing the understanding of what it is to be scientific and to make scientific progress. This exploration demonstrated the difficulties associated with providing science with an unambiguous account of what it is to be scientific and to progress cumulatively. Indeed, such a view was substituted by a mild relativist and paradigmatic framework that views scientific progress as non-cumulative. Nonetheless, notwithstanding the paradigmatic basis of representation

and interpretation, it would be extreme to suggest that all knowledge is equal: the hegemony of particular regimes of truth over others can readily be seen as being an instance of inequality. The question that needs to be considered in particular cases, then, is the extent to which this inequality is due to scientific or extra-scientific factors.

The work of Latour and Woolgar, (1979) and Latour, (1999) demonstrates the manner in which scientific asymmetry can be achieved through the systematisation of the means of production; a process that overlaps with the Foucaultian framework of power/knowledge. This account is a social constructionist one in which scientific knowledge is embedded within a thoroughgoing social context. A demonstration of the extent of this is indicated in the work of Callon (1986), who describes the requirements of achieving scientific hegemony in terms of translation or alliance formation, which involves social groups and the subjects of scientific investigation. The formation of alliances is viewed as being a persuasive process, in which the identities and actions of target subjects are shaped and directed. In this context, successful science is inextricably associated with successful political action. This framework overlaps with the Machiavellian one through

the shared interest in the examination and explication of what needs to be done to achieve and maintain social hegemony.

Although scientific knowledge is confounded with sociality in these views, the possibility remains that hegemonic scientific knowledge has substantive asymmetrical qualities in comparison to its competitors. This view is compatible with the Foucaultian conceptualisation of power/knowledge because of the emphasis on the discontinuities between regimes of truth and the differentials that become apparent in the ways in which power is made use of in knowledge.

The recommendations of Callon regarding the approach to the investigation of scientific knowledge can be seen as supplementing that of the Foucaultian framework. While the Foucaultian approach emphasises the description of knowledge, and the tracing of changes in knowledge during controversy, Callon draws attention to the significance of agnosticism, generalised symmetry, and free association.

Given this, the aim of historical investigation is to elucidate the constitution of, and transformations to, knowledge in the history of controversy, while

understanding knowledge within a framework of perpetual controversy. In this context, the aim of research is not to decide whose knowledge claims are right or wrong, but to illuminate the processes of knowledge-production by following the trail of controversy. Thus, while an investigation reveals the complexity and constitution of the subject matter, importantly, it also facilitates the understanding of the dynamics of power/knowledge.

10.2.2 The history of neuropsychological knowledge

The aim of Chapter Three was primarily to explore significant aspects of the history of neuropsychological knowledge. It was intended that this exposition would provide an initial context for the further exploration of the specialty of neuropsychology that occurred in many of the following chapters, and also a point of reference for the continued illumination of scientific knowledge-production and progress.

The history of neuropsychological knowledge demonstrates that there have been many frameworks that have been offered as models of neuropsychological phenomena. Importantly, the history indicates that there is a certain non-linearity in the history of change: the notion of

cumulative progress, which emphasises the extension and development of knowledge from a foundation, is inadequate to deal with historical change; instead, the emergence of the hegemony of one view over another does not necessarily mean historical views that have been displaced may not be revived and give rise to hegemony at some later time. This non-linearity creates a problem for representation, because knowledge is embedded within temporal and political struggles for hegemony.

Notwithstanding this, the history of neuropsychological knowledge also indicates the plausibility of there being knowledge that can be seen as being relatively irreversible; for instance, the priority of the brain as the seat of consciousness and the centre of behavioural control. Relative irreversibility, in combination with the notion of empirical systems, provides the potential for a possibility of the demarcation between scientific knowledge and politics. An empirical system can be seen as the discursive formation of scientific knowledge-production that creates and stabilises representations, and provides the possibility of trials of strength between regimes of knowledge.

In this regard, the rise of knowledge to hegemonic status and relative irreversibility may be seen as having the potential of being, in part, a result of the strength of the discursive formation of the science. Despite this conceptualisation, the problem of interpretation remains: the ascension of knowledge to hegemony requires political action and self-serving interpretations, which make the demarcation between science and politics, in any particular case, fraught with contention and controversy, and is itself political.

10.2.3 Textually-based discourse analysis

The textually-based discourse analysis prioritised in Chapter Four of this thesis is seen as being well suited to the interest in the development of an interpretive framework. The framework of Potter and Wetherell (1987) can be seen as being compatible with the Foucaultian approach, Kuhn's (1970) interest in paradigms, and Feyerabend's (1975) anarchism, Latour and Woolgar's (1979) social constructionism, and Callon's (1986) approach to alliance formation. All of these approaches emphasise the controversy involved in knowledge production, the incompleteness and contingency of knowledge, and the effects of power and influence of hegemonic knowledge.

Within the context of developing an interpretive framework, the focus on textually-based data provides the basis from which to interpret and elaborate on discourse itself. The significance of the framework of textually-based discourse analysis developed in the thesis is that it orients the limits and potential of knowledge: the qualitative data provide access to discourse, but do not provide a means by which to make inferences regarding the veracity of empirical claims contained within the data itself. Therefore, a discursive approach that emphasises discursive variations and possibilities, and considers the elaboration of discourse its chief concern, positions itself effectively for the development and elucidation of an interpretive framework of a particular area of discourse. The resulting interpretive framework is, of course, itself discursive, and thus needs to be considered in the same terms. The contribution to knowledge that this approach provides, however, need not be seen as being less than that of those approaches with empirical aspirations, because of the sensibly pervasive and significant character of interpretation and discourse_F.

10.2.4 The scientist-practitioner model in psychology

The scientist-practitioner model [SPM] was initially discussed in Chapter Five. As the authorised form of self-understanding, the SPM informs the education and training of psychologists, the research of psychological phenomena, and the presentation of psychology to society. The model was hoped to provide the means for psychology to progress scientifically and socially; central to this end was the establishment of scientist-practitioners and an applied research community.

Applied research was ascribed the potential of developing valid and relevant knowledge, while the deference to this knowledge by practitioners was intended to ensure that this validity would be maintained in the clinical setting. The scientist-practitioner was intended to provide feedback to the scientific research community, and participate in research, providing their unique perspective on the effectiveness of research, and facilitating the progress of applied research itself. Nonetheless, the cumulative view of science that is associated with the SPM is by no means easy to attain or maintain; indeed, the relevance and progress of knowledge

is the perpetual problem facing applied researchers and practitioners alike.

Although the practical objectives of the SPM are laudable, the SPM is considerably ambivalent towards the practitioner: while the practitioner is a central concern in the model, the model's philosophy of science values, for example, automation and standardisation. This results in the practitioner's knowledge and skills based on experience not being readily amenable to positive discussion within, and integration into, the model. Scientific values, such as those of the SPM, have the potential to position the input of the scientist-practitioner as a contaminant, of which, to attain validity, the science needs ultimately to be cleansed. However, at best, psychological practice can be called parascientific: the dependence on scientific evidence is only part of what is required in practice. Psychological practice is a professional endeavour that requires the background knowledge, the inter-personal skills, and interpretation of the practitioner; an understanding that supplements the narrow confines of the values attributed to the scientist-practitioner by the SPM.

The understanding that diagnosis and treatment in practice are not represented by a linear or clear process

has the potential to assist in the expansion of the authorised importance of the role of the practitioner. Further, a cyclical hermeneutic model demonstrates that diagnosis and treatment is a multi-leveled and non-linear process, and the interpretive input of the practitioner is central to the achievement of outcomes. This hermeneutic model of practice maintains the significance of both scientific knowledge and the position of the practitioner in positive terms, thus offsetting the potential for ambivalence towards the practitioner.

10.2.5 The framework and approaches of clinical neuropsychology

Chapter Six discussed the conceptual framework of clinical neuropsychology's approaches to assessment. The framework of neuropsychological syndromes is a totalised universe of discourse, that orients the possibilities for interpreting and positioning neuropsychological phenomena. The orientation interfaces with biological knowledge of brain organisation and, although this provides the possibility of localised deficit manifestation and potential detection, the framework also incorporates holistic aspects of functioning: it includes the possibility of cerebral redundancy, which suggests that

either certain areas of the brain are robust enough to take over the role of particular functions after damage is sustained or a mechanism for a system is distributed enough to continue operating effectively despite sustaining a limited amount of cerebral assault.

The main debate in the history of neuropsychological assessment has focused on the reliability, validity and applicability of two relatively antagonistic approaches: the quantitative and qualitative approaches. The battery approach to assessment is an instance of the quantitative approach, which, at its extreme, requires standardised application of a pre-set selection of tests: this approach eschews the inclusion of variables that cannot be reduced to numerical values.

In contrast, the qualitative approach (e.g., that of Luria) makes use of quantitative measures, but also considers the qualitative features of test performance to be indispensable to forming valid diagnoses. While this proposal can be readily viewed as being an empirical issue, it also remains true that the extremes of the standardised, quantitative approach runs the risk of missing important information because of its disregard for qualitative features.

Further, the tension between the approaches can be oriented around the notion of the reliability/validity trade off. The quantitative approach ensures a high degree of inter-rater reliability, at the potential expense of sensitive and valid diagnoses. In contrast, concerned with validity, the qualitative approach makes use of data that may cause problems with inter-rater reliability, and consequently makes the reliability and, in the individual cases, the validity of diagnoses problematic. Although other approaches may attempt to minimise the excesses of both of these approaches, as a totalised universe of discourse_F, the qualitative/quantitative continuum limits the potential for offsetting the reliability/validity trade-off: the best that can be achieved is a case-sensitive tension between extremes.

The tension also exists between the quantitative and qualitative approaches to neuropsychological rehabilitation. The quantitative approach focuses on the re-establishment of particular deficits and monitors this progress by measuring the particular function being targeted. In contrast, the qualitative approach considers the patient holistically: rehabilitation focuses on compensation strategies rather than functional re-establishment.

Nonetheless, these approaches can be seen as being complementary because they are both contained within the framework of "neuropsychological syndromes." Cerebral redundancy implies that functional reestablishment is possible if there is indeed redundancy for a particular function. In contrast, if the damage incurred is too severe, or there is inadequate cerebral redundancy, then functional reestablishment of a particular function could be precluded and, instead, relative compensation, in holistic terms, is all that may be achievable. Therefore, although the approaches may appear to be incompatible, their applicability appears, in practice, to be contingent upon the specifics of a particular case.

The remainder of the chapter discussed the applicability of neuropsychological assessments in different contexts. The diversity of neuropsychological approaches to testing can be seen as providing neuropsychology with adaptive capabilities that it might not have if one view predominated within the specialty, especially without a similar resolution occurring in the practice settings in which the specialty uses its diagnostics. This situation suggests that, despite philosophical and social struggles associated with differing practices, and any perceived need for resolution,

the victory and priority of a single approach may not result in a net benefit to the science and an increase in its relevance to society. On the contrary, a diversity of approaches may provide the potential for adaptation required to satisfy the various needs of a marketplace.

This view might potentially encourage the positive valuation of diversity in science, thus reduce the severity of conflicts. But it needs to be recognised that, as a contingency, the value of diversity is dependent on the particular context. Thus, certain situations may favour unity more than diversity. Despite this, in a complex and diverse science such as clinical neuropsychology, the diversity of clinical settings can be seen as increasing the need for a diversity of practices, a situation that might potentially provide the conditions for conflicting approaches to co-exist within a specialty.

10.2.6 Research and practice in neuropsychology

The discussion of the SPM continued in Chapter Seven. One of the central deviations from the ideals of the SPM is the sequential way in which the education and practicum training of scientist-practitioners occurs: formal education in the scientific knowledge and methods of

psychology precedes the practicum experience of scientist-practitioners until postgraduate education. Regardless of the impracticability that may be associated with altering this approach in many educational settings, it nonetheless promotes a divide between formal education and practicum training.

The reduction in the severity of this divide may be seen as being facilitated by educators attempting to communicate to students what they perceive practice to be like; this could include the political and systemic (or holistic) components that students could expect to be confronted with in a variety of practice settings. Supporting the relevance of this is the view that practicum training is not only an opportunity to inculcate scientist-practitioner values through experience but, no less importantly, it also exposes students to the political and institutional aspects of practice. Therefore, while these political and institutional components of practice diverge from the dispassionate education of scientific knowledge and methods that are promoted by the SPM's idealised education and training model of aspirant scientist-practitioners, they represent important aspects of the education associated with practicum training.

The SPM prescriptions allude to the ways in which research and practice can progress. For instance, scientist-practitioners are considered to be well-placed to inform the direction of research, thus heightening the probability that research will adequately address the needs of practice. Moreover, it is hoped that an applied research ethos will promote and strengthen the relationship between research and practice, by applying the scientific method to the problems faced in practice. In this context, ideally, psychological research and practice are fused, and promote cumulative progress. Nonetheless, the relationship between research and practice is a social achievement, the sustainment of which is contingent upon the vicissitudes of history. Additionally, for this relationship to be promoted, the continued relevance and progress of knowledge needs to be interpretively persuasive to practitioners themselves. Instances in which this is not perceived as being the case set the conditions for the possibility of weakening the relationship between research and practice.

Nevertheless, although the establishment of an applied research ethos is obviously required if practical knowledge is ever going to be developed, the proliferation of this ethos in a variety of specialties suggests that role

substitution and the displacement of knowledge may come from these other specialties. Therefore, the vigorous promotion of applied research and practice values within psychology needs to be supplemented by a more systemic or holistic view of emergence and change in science. The view that prioritises a historical struggle between specialties facilitates the establishment of an injunction to progress and, importantly, to establish and promote an effective means by which to achieve progress within the specialty.

10.2.7 Trade guilds in neuropsychology

The role of trade guilds in the specialty of neuropsychology was explored in Chapter Eight. The continued emergence of an applied scientific specialty, such as clinical neuropsychology, eventually results in the emergence of issues related to quality control, socially projected image, the social furtherance of the specialty, the identity of specialists, and the specialty itself. Trade guilds such as the College of Clinical Neuropsychologists attempt to become of central importance to a target specialty by promoting its interests as being in accordance with that of the specialty and those of the specialists.

To achieve this, the trade guild must promote itself as providing its members with status and opportunities greater than those of non-members, and thus persuade specialists, through this self-promotion, that these benefits will follow from the attainment of membership. Furthering its influence on the lives of specialists, a trade guild attempts to concomitantly increase its control over, and monopolisation of, identity, which ideally results in the notion of the specialist and membership with the trade guild becoming mutually dependent or synonymous, thus creating a lack of equality between members and non-members.

The quality control standards and strategies of a trade guild provide rhetorical assurance that its members have met these standards, and thus can be trusted to be of a highly professional standard; a rhetorical imprimatur to which non-members cannot appeal. Considering this, a trade guild, with its establishment and leverage strategies, becomes a political alliance that, when successful, fosters a symbiotic relationship between itself and its members: the success of its members validates the institution and its strategies, thus increasing the prospects of its continued relevance to its members.

10.2.8 Sharing and defining the knowledge of a specialty

The establishment of specialty associated knowledge and the sharing of knowledge were discussed in Chapter Nine. One of the primary assumptions associated with the notion of a specialty is that the knowledge and practices of any given specialty have significant points of difference from those of other specialties that are of practical significance to science and society. The significance of this is that a specialty must develop marketing strategies that suggest persuasively to important others that these differences are real and significant to the effective functioning and furtherance of scientific practices. Instances in which this is communicated successfully result in the specialty's products and services being incorporated into the practices of established science.

However, the establishment of this condition presents the specialty with an ongoing and systemic problem regarding the protection of its knowledge, identity and relevance. In a multidisciplinary environment, such as the one in which neuropsychology finds itself, the proximity to, and overlap of, the knowledge, practices, and interests of other specialties provide these specialties with an

increased potential for conflict regarding ownership of knowledge, and priority in practice. However, the problem of knowledge sharing need only be viewed as a problem when other specialties attempt to appropriate those aspects of a specialty that represent their significant point of difference, because a specialty without any special qualities has nothing to offer except for a supplementary labour force.

Notwithstanding this, the appropriation and sharing of its ancillary knowledge may be of no detriment to a specialty, and may in fact facilitate the effective functioning of practice for those giving and receiving knowledge. For instance, this may occur if workload delegation is of importance for an overworked specialty, thus the specialty in receipt of the knowledge would enhance its relevance merely through this appropriation without hurting the other specialty.

The problem of progress is particularly relevant in the context of interaction between specialties: the continuing progress of a specialty becomes a more significant requirement to the extent that that specialty is embedded within a competitive sector. For a specialty to survive the dynamics of change, particularly large-scale

change, it must have adaptive strategies and redundancy options that allow it to renegotiate its position without being completely displaced by new knowledge. Nevertheless, one of the difficulties with multidisciplinary progress is that developments in other fields may result in the displacement of the significant aspects of a specialty—something that may occur at any of the various levels of a specialty's organisation. Therefore, the result of disseminating knowledge may be the overwhelming of a variety, and perhaps all, of the adaptive strategies and redundancies of some of the specialties that lie within its targeted field of practices.

10.2.9 The demarcation between science and politics

The demarcation between science and pseudo-science was shown in chapter two to be difficult and complicated to establish, and even if an adequate theory of demarcation is established and accepted, social conflicts in the process of making demarcation attributions may still arise. Related to this consideration is the distinction between science and politics, which itself has demarcation difficulties: the negotiation of social hegemony necessitates the use of political action, and insofar as scientific knowledge production and dissemination is

situated within social hegemony, knowledge is saturated by sociality; that is, the social world of relationships, rhetoric, and personal action support and are inevitably related to the production of scientific knowledge claims. However, importantly, scientific knowledge becomes part of the rhetorical armoury of social groups, which stakeholders can make use of to increase the prospect of successfully negotiating trials of strength in hegemonic struggles.

Although much of the thesis discussed and demonstrated the conflation between science and social activity, the possibility of creating a significant rhetorical demarcation was also emphasised; for instance, the notion of empirical systems was described as an important rhetorical device by which attempts to demarcate science from politics can be achieved. However, the possibility of creating a demarcation cannot be taken to mean that knowledge can be cleansed of social contamination, because the achievement of scientific hegemony is a social activity, and thus, as scientific knowledge is produced and disseminated, it necessarily becomes embroiled in political struggle. However, an important rhetorical function of the idea of scientific knowledge is that stakeholders may make use of it as a reference in support of their cause, and

thus create the distinction between science and politics as it suits their needs.

Within a relativist framework that postulates knowledge differentials, certain regimes of knowledge are assumed to incorporate greater material influence and potential in their theory and practice than do their rivals. In this context, regimes of scientific knowledge might potentially be of practical significance to the outcomes of hegemonic struggles. At certain times during a social struggle, the political machinations and regimes of scientific knowledge of a particular group may be impotent in the face of the science of its rival. Nevertheless, although the practical significance of scientific knowledge can be viewed in this way, it still remains difficult to separate science from politics; the hermeneutics of which seem to be paradigm dependent, political, and thus, in principle, interminably contestable.

10.3 Conclusion

The main aim of this thesis was to develop a conceptualisation of scientific knowledge-production and progress. This was to be achieved through two main interlinked components: 1) the exploration of the philosophy and sociology of science; and 2) the exploration of an area of scientific knowledge. The discussion of the philosophy and sociology of scientific knowledge oriented interpretation and established an initial interpretive framework of scientific knowledge-production and progress. The exploration of the history of neuropsychological knowledge and the specialty of clinical neuropsychology provided an opportunity to explore and establish the relevance of this framework, and to augment it where it was needed.

Further, the philosophical interests of the thesis did not extend to an interest in the making of judgments regarding the intrinsic reliability and validity of neuropsychological regimes of knowledge: the aim was merely to make use of neuropsychological discourse to aid in the consideration of philosophical matters. In this context, the exploration of an area of science was considered to be

of importance to this philosophical pursuit, because it provides an immersed discursive reference from which to interact philosophically, thus it enhances the prospect of developing a substantive interpretive framework of the development and progress of scientific knowledge.

The interpretive framework that emerged from the exploration conducted in this thesis can be considered as a mild form of relativism. The framework emphasises the social construction of scientific knowledge, but does not set forth, firstly, a claim that scientific knowledge cannot bear any relation to material phenomena or, secondly, an extreme relativist view that all knowledge is equal. Instead, regimes of scientific knowledge are considered to differ systematically in the ways in which they deal with phenomena, and consequently impact on the world.

This is a meta-perspective that positions and predicts there to be substantial interpretive difficulties associated with the making of judgments about inequalities between, or the validity of, regimes of scientific knowledge in any particular case. Within the context of the possibility of asymmetrical regimes of scientific knowledge, it needs to be understood that the possibility

of certain interpretations being more scientific and valid than alternatives can also be admitted into the framework. Notwithstanding the social and political biases associated with interpretations, the current framework allows the possibility that certain languages of interpretation have a closer representational relationship to regimes of scientific knowledge, and the discourse_F contained therein, than do others. Nevertheless, because of the negotiation and contestation associated with the establishment of hegemonic scientific knowledge, the "science" of interpretation invariably becomes contaminated with sociality.

Appendix A: Categorised interview transcripts

1 Diagnosis and treatment in practice

Response 1

I: Can you tell me about hypothesis testing in practice and the battery approach, like in Australia—how they're used and any differences?

P: okay, well my understanding of it is that a battery approach is, kind of, about selecting a number of tests that will essentially give you some idea as to functioning in all of the different cognitive domains that there are. And from that, you kind of apply that, you really try and apply that to each and every patient irrespective of their history, irrespective of the referral question that you're given, and irrespective of the findings that are observed on particular tests or actual behavioural observations made during the actual assessment itself. Whereas hypothesis testing is more about formulating ideas about a particular patient: what kind of cognitive difficulties they might have, ah, what kind of neuropsychological, or neurological, or neurosurgical syndrome they might have, um, on the basis of information provided from their referral question, information in the chart, information provided by the patient and the patient's family, and while you're in the middle of testing, and also just your own observations of them while they're in the room with you, and then being flexible to add or subtract tests depending on all of that information. So in other words, you might find that, for a particular patient, their executive functioning seems to be particularly important so you don't spend two hours assessing, you know, another function, you spend much more time trying to answer hypotheses about their executive functioning. So, "is it primarily this aspect of executive functioning or that aspect?" all that sort of thing. And the idea I think that's also incorporated in that, is that you use one test to maybe generate a hypothesis, so from one test, or test result, you get an idea about what might be going on, and then you try to select something else that will either confirm or argue against that so you use a test that assesses similar functions or that assesses some of the same functions but is different in some ways, and really try and get to the bottom of the, you know, the processes that are affected that way.

Response 2

I: So, in Australia, with regard to Hypothesis testing and the battery approach, I guess, is there, um, do you know anything about that in terms of the way they're used in Australia?

P: In my experience the battery approach tends to be more with a medico-legal-type assessment where it's become, it seems pretty standardised in terms of what neuropsychologists use to assess, um, neurological deficits post-injury, and that tends to be the battery approach, um, whereas in my clinical practice, as I'm not doing a medico-legal report, I don't tend to do batteries, I'm more hypothesis testing, and I rely very heavily on the clinical interview with the parents and the school, in particular, to select which tools I'm going to use.

I: So why is it that the batteries are used in the medicolegal sort of area?

P: I think that it's become, I guess, a routine type of assessment. So I think, primarily, it's for comparative purposes because often one side will request the assessment and the other side will request a counter assessment, and if you're both using the same tools, then it's easier to do comparative analysis.

Response 3

I: A-ha, so why is the testing so extensive in the medico-legal area?

P: Because, I think it's really basically because the lawyers are very stringent in talking about test reliability, solely standardised procedure and, of course, the minute you deviate from that...

I: you open yourself...

P: Yeh, so there's a little bit of backside covering from that perspective. I think that can be argued, but certainly, um, it's not as, I don't see it as important in the clinical arena simply because we're doing the assessments for a completely different purpose.

Response 4

I: A-huh. So, do they teach hypothesis testing more these days? Is there, um, a tendency towards that in practice?

P: In my experience, I mean, I was educated, I went through the masters course work and that sort of thing several years ago, and what we tended to get taught in the university setting was probably a little bit more consistent with the battery approach, but they weren't necessarily saying, you know, "this is how you should assess people", they were more saying that, "these are all the different sorts of tests that you can use". I think more in clinical practice, like when you go and do placements and that sort of thing, then your supervisors--the people that are working in the field--are probably using the hypothesis testing approach to a greater extent, but a lot of times it depends, like in the public system you're constrained by time, you've got a huge waiting list, and you've got to have some idea of what you're going to do before you go in, and there's not a huge amount of flexibility because you might have another patient turning up at a particular time, do you know what I mean?

I: Yep.

P: Whereas, in private practice, in particular, you've got more medico-legal work, you've usually got more time so that the assessment will be much more comprehensive, your conclusions, um, have to be much more specific: you're not just doing it for the purposes of helping the patient, but you're actually doing it to answer very specific medico-legal questions. So it depends, to some extent, on the context that you're doing your assessment in as well.

I: Okay, so in the public system the hypothesis approach is just an effective time saving technique, I guess, as well?

P: Yes, it can be... yeh. Certainly, if you think that a patient has problems in some areas more than others and you kind of focus on those areas and de-emphasise others, but at the same time hypothesis testing is perhaps to some extent sometimes limited by the amount of time that you can spend with each patient, so you need to get a little bit of an idea of all areas of cognitive function and the extent to which you can really tap into, on a very finely-tuned level the, you know, the specific problem, which may be limited by time constraints and, I mean, we also believe too in, well, both public and private, that you can assess, or you can access a lot of information, just via what the patient's telling you or what their family's telling you, and you can target interventions based on that without necessarily needing to do this really fine-grained analysis of cognitive functioning. So again,

it depends, like if it's for medico-legal purposes, "do we need to know exactly what processes have been affected?" or if it's for clinical purposes, "do we need to find some way of helping this patient?" And the extent to which you do hypothesis testing and fine-grained assessments depends on the purpose to it.

Response 5

I: So are there any changes in testing in recent years, and also, um, in the future to look out for?

P: Um, from personal experience, I guess, when I was a student the advice was to get as much experience in practice at testing as you could, so I think initially, on graduation, we, as neuropsychologists, tended to over-assess and I think, and well, I can see for myself, as I get more experience and have more practice, I'm more likely to streamline the testing, the testing is more limited but it's more targeted, so I can get to the core of issues a lot quicker, rather than running through a whole battery of assessments.

Response 6

P: I think the other aspect too in diagnosis, which isn't necessarily addressed very well in the medicolegal arena, is that, for me, part of the important part of diagnosis is observational data, um, where people are completing tests. Now what's been happening in recent times is that some neuropsychologists are employing technicians to do the assessments and then the neuropsych' writes the report. Personally I have a little trouble with that, I know that its perhaps in America as well, but I have a little difficulty with that in that I prefer to actually observe the person carrying out tests because there's more than one way to do the same task, it's very difficult to get information on executive functioning, for example, purely on test scores.

Response 7

I: So are you involved in treatments with these patients?

P: Yep.

I: Can you just take me through an example of what you do with a patient how you, um, receive them and, yeh, just the course of your interaction.

P: I'm referred people I guess, um, from one of the doctors usually. They've been seen in the clinic and

so when I see them I'm basically conducting an interview on how they're going any problems that they're having collecting information that's relevant to pre-morbid functions, and then conducting a...what I mainly do is conduct a neuropsychological assessment, as well as assess psychological/psychiatric issues.

I: Right okay, so what sort of treatment interventions do you engage in?

P: I help with anger management also, I guess, more individual cognitive behaviour like cognitive depression, and anxiety, um, they're just probably the main things that sometimes help with behavioural management I guess. The treatment interventions I provide are cognitive behaviour therapy with individuals and groups for anxiety, depression, and anger management.

Response 8

I: Right, so students come and are supervised by you?

P: Yes, the clinic is two fold: it provides an acute care and trauma neuropsychological screening service for individuals who are admitted following a mild traumatic brain injury. For individuals who are having a poor recovery, following a mild traumatic brain injury we would see them for formal neuropsychological assessment as an outpatient. The clinic also provides a placement situation for Masters and Doctor of Clinical Neuropsychology students going through the university.

Response 9

P: That's pretty much my research side of things. On the clinical side of things I do quite different work; I've worked in a brain injury unit for a few years part of the public health system, um assisting people with very severe brain injuries and helping determine what we might do for rehabilitation. Helping them to adjust to long-term severe injury and disability. Also helping to try to determine whether there's anything we can do to improve their prognosis over time and even to help the diagnosis in some cases where it's not so clear-cut as to the cause and the nature of it. So that typically has happened in my private work more than in the brain injury unit where you've usually got a fairly, because it's such a severe injury, you've got people on site documenting what's happened and stuff so it tends to be more clear cut as far as the reality is concerned. So, um it's been fairly broad and wide-

ranging as far as I can tell with the application: I've worked with people with learning disabilities who have had, you know, obviously what you'd call more of a genetic or, you know, innate sort of disability rather than one that's acquired over time, which I find to be quite different of course working with them and what the goals are that you might have in mind, so um, but I find that neuropsychology applies to all of that regardless, you know, knowing what to test for, knowing what that means, and knowing how to write programs for behaviour management or rehabilitation programs depending on the nature of the problem you're addressing. So that's probably a snap shot of what I do.

Response 10

I: What sort of practices do they get up to in practice then, is it mainly just assessment? Do they get involved in the treatment program?

P: I mean, it depends what setting you work in, I guess in general in hospitals, your role is largely as an assessment diagnostic type of role, after saying that, I mean, you are, I guess, counselling patients on the basis of the findings that you have and things like that, so it's not just a case of seeing them then throwing them out the door, you know, acting like a technician, you do have to explain what the results are likely to mean in terms of their future life, a return to work or inability to resume work, and things like that. Ah, but in terms of more fundamental focused treatment, I suppose there's a lot of people in rehab settings, and their orientation is far more treatment approached rather than diagnostic, so it just depends a little bit on the setting you work in, but I suppose that would be the two major things, rehab or diagnosis to put it very simply.

Response 11

I: So your work at the moment as a practitioner...what do you get involved in there?

P: I have a range of roles, I do some individual counseling with the patients with acquired head injuries both inpatients and when they become outpatients. I do counseling around issues of grief and loss, possibly anger management or just managing frustration when they're an inpatient: the frustration of having a long stay in a hospital environment...it's frustrating. So I do one-on-one counseling. I also sometimes work with the families to explain, just kind

of "psych education", explaining the role, explaining the impact of the head injury on behaviour, on personality, and cognition. I also sometimes do that with the team as well, work with the team and help them, um, when there are say, for example, behavioural issues. I work with the team and support them whenever there are problem behaviours, which cause considerable stress for them. I do behaviour management that's probably the second thing, the first being the one-on-one, the second being behaviour management: if there is a behavioural turn like aggression or running out or refusing therapy. For example, I work with the team and I get to find the problem, come up with the solutions to the problem, implement that behaviour management program and monitor that and, um, make any changes to the program, and usually that all also ties in with the one-on-one stuff. I work a lot with the patient around that just explaining what the behaviour program is all about and why we're implementing the program, when it's possible; when the patient's cognition allows for it, I'll work with them a lot and I'll not just do it to them, but let them be involved in the process. The third role is in assessment and even though I'm a clinical psych I do neuropsych assessments and so that's the third part of the role. I do neuropsych assessments on the patient's, write reports, give them back to the team, the patients and the family, make recommendations for their rehabilitation both inpatient and outpatient rehab, which might be around issues of return to work and driving as well.

Response 12

I: Your current work is both diagnostic and rehab did you say?

P: No, not rehab, just pure diagnosis, um, well no; I take that back. Actually we have, we occasionally have, the odd rehab patients but no, generally not...it's fairly diagnostic, so I guess the majority of what I'd be doing would be assisting in diagnostic dilemmas with psychiatrists and neurologists, ah, and also doing pre and post-surgical workups of patients as well just to make sure things are going in the direction they should be around surgery and so forth, but it's certainly more diagnostic than rehab.

I: So in the work around surgery it's really just assessing their functioning in order to see if everything's OK?

P: Yes, I guess we - the hospital I'm working at - has a big (specific disorder X) programme so we see a lot of these patients come through the programme and we do diagnostic workups prior to surgery to make sure that, you know, there's nothing that would make it a problem in terms of, from our perspective, in terms of people going forward to surgery. Post-surgically we assess them, firstly, to make sure that there haven't been sort of any unforeseen changes that we weren't expecting, and also to talk to the patient, I guess, and help them to adjust to any changes that may be happening. There's sort of a counselling role in there, but I mean not a pure counselling role by any stretch of the imagination, but there's commonly counselling that goes along with that in that process, you know, getting them to understand what they can expect to happen and helping them deal with the current experience and if anything untoward happens.

Response 13

I: what do you do in terms of rehabilitation work?

P: Primarily I deal with people in the sub-acute phase; those that have been medically stabilised and they've moved home. I do home visits to them and provide, I guess, education about their injuries, and I provide assessments of changes in cognition, behaviour, and emotion...provide the strategies for getting around various cognitive and behavioural complaints in terms of functional problems that they might have, and psychotherapy as well in that context...for mostly the individual and their significant others and family.

Response 14

I: Right, okay. I'm just wondering about testing, um, hypothesis testing and the battery approach, I was wondering how this is done in Australia, have there been any changes in recent years?

P: Look, I think that in general, I mean, people certainly have different ideas and different perspectives, I trained at the university of Queensland so we all tend to have a similar kind of approach in that we might start off with a basic neuropsych battery of tests, which are our fundamental tests, like our Weschler scales and various other basic neuropsych test, but testing is always, as far as I'm concerned, always approached from a hypothesis testing perspective, so, for example, you might start out with your battery of tests and you might observe someone's performance or get certain responses or whatever which

might generate some kind of hypothesis at which point you're likely to use some other test to test out the hypothesis.

I: Right, so to progressively target then?

P: Yep.

I: Okay.

P: I think the other aspect too in diagnosis, which isn't necessarily addressed very well in the medico-legal arena, is that for me part of the important part of diagnosis is observational data, um, where people are completing tests. Now what's been happening in recent times is that some neuropsychologists are employing technicians to do the assessments and then the neuropsych writes the report. Personally I have a little trouble with that...I know that perhaps in America as well, but I have a little difficulty with that in that I prefer to actually observe the person carrying out tests because there's more than one way to do the same task, it's very difficult to get information on executive functioning, for example, purely on test scores.

I: Right, I see.

I: Are there any other changes in practice in recent years in terms of psychometrics and assessment in Australia?

P: I think that probably what's been happening is that, um, people are tending towards using shorter batteries and there are certainly some available now, for example, the Weschler Early Intelligence Scale has been abbreviated with the abbreviated scale of intelligence, um, in medico-legal we tend to use full batteries. We tend to, for example, a medico legal assessment is about 5 hours, part of that assessment of course is, a crucial part of that assessment, is the clinical interview, which is very comprehensive. So, there seems to be different practices from reading peoples reports and some neuropsychs who don't place a lot of emphasis on the clinical interviews who like to do a lot of testing, um, personally I really only use enough tests to get me the information I need and I probably spend an hour and a half doing a clinical interview and personality tests and all that kind of stuff.

I: Aha, so why is the testing so extensive in the medico-legal area?

P: Because, I think it's really basically because the lawyers are very stringent in talking about test reliability, solely standardised procedure, and of course the minute you deviate from that...

I: you open yourself...

P: Yeh, so there's a little bit of backside covering from that perspective. I think that can be argued, but certainly, um, it's not as, I don't see it as important in the clinical arena simply because we're doing the assessments for a completely different purpose.

I: Are there any other changes to look out for in the future in neuropsychology in terms of psychometrics or assessment or anything?

P: Um, I think you'd probably find that, um, I don't know, maybe there might be a movement towards more computerised tasks, which, again, we have to be very careful of: the literature doesn't necessarily say that they are as valid as we like them to be, I think that, for example, one example I can think of is the Wisconsin Card Sorting Test, which is a manual task, but it's also computerised, and whether or not that two dimensional computerised task is actually testing the same thing as the manual task I don't know whether that is and I think that that's an issue with computerised tests.

I: Right okay.

P: I think also that we have to be very careful of employing technicians and I think it's probably going to become more prevalent because I think it's more cost effective for a lot of neuropsychs to do that.

I: Okay.

2 Practicum experience in neuropsychological education

Response 1

I: OK, so do you have placements that you have to do?

P: Yes, I'm currently on my third placement, which also happens to be where I work. So I've done two already: one in aged psychiatry, one in general medical, and next year I'll go to a children's placement.

Response 2

I: So you had placements during that time?

P: Yep, we had, what did we have? We had one year of clinical, just clinical psych placements, and three years of neuropsych placements, I think in the second and third year that was two days a week for 40 weeks, yeh, it must have been forty weeks I think. I think there was about 80 days a year, and also we had classes as well, and since then I've just been working as a neuropsych with supervision.

Response 3

I: So could you just tell me a bit about the practice settings you've been in and what, um, you've had to do, and also perhaps the supervisory relationship?

P: Yep sure. OK practice settings. My current position is in an acute tertiary referral hospital in an acute neurology, neurosurgery and psychiatry population. I see mostly outpatients and with some inpatients still in the hospital, certainly very much an acute sort of setting. I've been there nearly two years now, prior to that I've worked at two different rehab hospitals just working as a rehab neuropsychologist in both those places. In terms of supervision, my current supervision process is that I'm supervised by a senior clinician at my work, and that basically consists of, now, probably around once every two or three weeks, but as I need it really, um, prior to that, when I was a bit...bit earlier after graduating or after starting work, I was being supervised, I would say, every week by someone. In both those places I was being supervised by a more senior clinician actually at the hospital.

Response 4

I: What have the placements been like in terms of the scope of experience and the supervision?

P: OK, um, I'll go one-by-one. My first placement was in aged psychiatry: it was basically an inpatient service for elderly people who might have, say, a dual diagnosis of some kind of psychiatric condition with potential for some other kind of problem like a stroke or a dementia. So having that dual diagnosis and the experience the exposure there was fantastic for that population it was a really good opportunity for that really quite difficult end of the spectrum, particularly for aged psychiatry. The supervision there was...my supervisor was excellent in the sense of his knowledge base and, you know, just what he knew and what he was able to teach me was very good, but, um, his style, his approach to supervision I found

difficult, because he had a difficult personality, but, you know, couldn't fault it in terms of the opportunities and the exposure that I had, it was good. The second placement was at a general hospital, not at an acute hospital but at a rehab hospital, but having a general...they had, you know, your orthopaedic, cardiac...again really quite good exposure it's a public hospital, they had a much wider exposure than I have at the private hospital where I work and the supervision was just exemplary, it was fantastic. I managed to have three supervisors in the 40 days that I was there. I did work in a what's called a CDAMS clinic, which is assessment for memory and cognition, it's a community based service so outpatients come in and people come in from the community and have an assessment of their memory to see if there's any dementia. Part of that placement was in the community field, then I worked on the general wards and also the aged wards and there I had a really good range of exposure, and good exposure, all my supervisors were excellent, they each had very good knowledge and they also had a really good style of, you know, bringing out the best in me really: encouraging and really supportive.

I: Did they spend a fair bit of time with you?

P: Yes and no. On the first part, when I was at the CDAMS clinic, my supervisor would be there while I would be doing an assessment. My supervisor spent a lot of time with me for each assessment; there was time at the beginning and at the end to work out what to plan, (he/she) would say, 'well what do you need to assess this person?' and I'd plan for that and then after I'd done the assessment he'd/she'd get me to go through the results and that was similar for the other supervisors I had in the hospital and also in my present placements as well, same thing. So they spent a lot of time, but they also let me do the assessments quite independently: they didn't observe a lot of my work directly in that regard because I'd already done a placement with direct supervision and having had that experience in assessment already for, you know, five years they didn't really think that it was necessary to observe me directly.

I: Right so early on they sit in with you if it's a first placement I guess?

P: Yeh. In fact, in the first placement I observed my supervisor more and then towards the end she/he observed me a few times and then I did a couple independently, but in my second placement most of my

later assessments were pretty much independent, and on my current placement my current supervisor hasn't observed any of my assessments directly, but just the planning and the results and the report writing.

Response 5

I: So in terms of your education at the university is there much of a discrepancy or things that you perhaps aren't prepared for when going into the various practice settings?

P: Yeh, I think that the course work prepared us as much as it can for what we're going to face um, there is going to be things when you go out on placements that you haven't covered, but that in a way is part of the role of placement. I mean, my sense is, you learn a hell of a lot more on placement than you ever do in a classroom or somewhere in books. They give you enough fundamentals that you don't, you know...I also had the added advantage of having so much more exposure to assessments and assessment settings and different work places having had already worked in a number of places before starting the degree, which my peers...they hadn't had that opportunity at all, so I think they probably feel less prepared, but I've only had to deal with, like, maybe some knowledge deficit rather than other things, which are more general like adopting a report style, or using a variety of tests.

Response 6

I: So because your course is a hybrid then, you have to do placements?

P: Yes that's correct.

I: So um...

P: You want to know a bit more about my training here in terms of the PhD here?

I: Yeh that would be good.

P: Yeh, I basically did 18 or 19 subjects essentially different course work and then in addition to that I had internships within the University. They have a couple of training centres that I've worked in with a specialist focus on neuropsychological cases, then I did, in addition to those two training placements, I did another three externship training placements, um, as a neuropsychologist you do an extra one instead of four, which is just the straight clinical psychology program. You do a 5th one that's specific to

neuropsychology and I conducted that within a hospital setting as they usually do and that is the only other thing they do. Also one of those four other regular placements has to have some specialist neuropsychology it's called a mixed specialist placement and if you're doing neuropsychology, then the other half of that has to be neuropsychology related of course. You get your extra training in your field that way, so that's how they do that, and then there are a few extra courses that you need to do as a neuropsychologist about two or three extra courses that you're required to complete. So it's not too intensive really compared to what you'd expect, I guess.

Response 7

I: Could you tell me a bit more about the way the clinic operates?

P: Sure, the clinic runs two days a week. I normally have three to four students at one time on placement. We originally started with four students, but found that four students were just a little bit too much in terms of managing over two days. Now we have three students at a time for a two hundred and fifty hour placement. Students are there for usually between 14 and 16 weeks. A lot of the students are on their first or second placement. I guess one of the reasons the clinic was established is because it's a very difficult placement for people. It's very difficult to go into a situation when you've had no experience and the clinic offers the student a lot of the basic skills that they need to establish before they go on to other placements, such as interviewing, being able to obtain patient information from a medical record, working with other multidisciplinary staff, understanding the roles of the neuropsychologist within a hospital setting, as well as developing the skills required for assessment and testing, scoring, and writing reports. It's an important placement for them and quite a steep learning curve as you can imagine.

I: Yeh, is there quite a few placement areas for them to go to?

P: You mean apart from here?

I: Yeh.

P: Yes, there's I think about 15-16 other placement areas. The students need to do four to five placements in all. As I said they're skills a student needs to acquire on first and second placements. The first

placements are time intensive for a supervisor as the students just don't have the required skills to be able to work with much independence.

Response 8

I: So you take in neuropsychology students and supervise them during their placements?

P: Yeh, there's usually only one student on clinical placement at a time and through the universities here they usually come for about a three month stay, um, for about 2 ½ to 3 days a week, yeh, and at our setting we only take them in their later placements, in fact, so we don't take the early placement students, and then I also have a number of people doing research degrees, so Ph.D. students, doctoral students and Honours students.

I: Right, so what's the supervisory relationship like with the students during the placements?

P: The clinical placements?

I: Yep.

P: Usually the students have a primary supervisor and they do a couple of cases with another supervisor in the unit so sometimes I'm the primary one, but sometimes one of my colleagues is the primary one for that particular student. None of us are directly involved in university teaching to any great extent so that one of the things that's been a bit of a struggle I suppose is communicating between the university and the clinical placement that, ah, sometimes there's not great contact between the two and sometimes I think it's a problem for the student.

I: Right so are there some sort of discrepancies between what they're...?

P: I think it's sometimes hard for the clinical supervisor in the hospital to know what's expected. It's not necessarily clear how many patients they're expected to see.

I: With the students, is there any sort of discrepancy between practice and their expectations from what they've been educated about practice?

P: They usually say it's more demanding than they thought I suppose to come into the clinic and see real patients and real problems. They tend to feel under-prepared is the generalisation. It's not so much here with the placement at least they're getting strong

supervision, but then they feel a little overwhelmed when they step into the new job.

Response 9

I: So what's the supervisory relationship like?

P: In which context? In the research or the clinical or both?

I: Yeh the clinical.

P: My experience with the clinical supervision has been that it's, I think it's decent, but it depends on where you go and what kind of experience you're trying to get. For the most part I can say it's lacking, um, because you get out there, for example, in one of my placements that I did in the externship I was left pretty much to my own entirely in this brain injury unit and there was absolutely nobody in town who was CCN registered who worked in the same area like doing long-term severe brain injury rehabilitation. I had nobody basically to get that particular...so I was often creating my own requirements and then seeing a supervisor who only had some familiarity with the area but relied heavily on my suggestions and discussions to sort of decide what direction I should be going with certain things. So it depends on the area you're in: like if wanted to go and do dementia screening and learn about that there's a number of people here who do that on a regular basis and who have a good hand in that, and then there's also these medico-legal cases and there are a few people out there that practice privately who you'd sort of recruit as a supervisor but you'd sort of have to pay them privately to do that. They don't have a lot of accessibility to those people through the university directly. So it just becomes a little bit difficult depending on what area you're into and whether there's somebody in the area who can actually provide that specialist input. Even within neuropsychology I find it's quite specialised: there's people in aging in neuropsychology, there's people in paediatric neuropsychology, people in the medico-legal private industry, and people in rehabilitation and you gotta sort of tee-up with these people and find somebody whose able to provide an appropriate level of input to that, so it's a bit tricky. I don't mean to insult people who are out there in saying that: it's just simply a lack of a lot of people that are established in that regard who are available to supervise.

3 The relationship between research and practice

Response 1

I: So in terms of the different practice specialties like, um, neuropsychology would only be one, with the sort of psychological interventions that you're talking about. Who are the target practitioners across the various specialties?

P: As in?

I: You're not just talking about psychologists who would take on these?

P: No, you're right, it would involve other types of practitioners in a mental health team working together collaboratively to, um, offer the person whatever sort of treatment that they needed, um, I think some of this is already happening in Melbourne; Melbourne's a good place for some of the most groundbreaking work that's happening on the treatment of psychosis even in the world, so some of this is already happening there, but it's not really offered nation wide and it's partly a funding problem and partly a knowledge base: we haven't really got proof of a lot of this stuff.

Response 2

I: Just in terms of research and practice again, is there a decent culture in the evidence based approach to cycle back into research and keep up with developments and so forth?

P: In my area is there a culture that I'm a part of or...?

I: Yep.

P: I think that most people who work in my area would like to be part of a strong culture that was moving to investigate the area and how better we can do, for instance, cognitive rehabilitation and so on; there's not a lot out there that's new under the sun, and I think that I keep abreast of the literature and it's quite disappointing, um, it's quite boring to read, it's very academic, I get more ideas out of probably reading the new scientist or HR journals or sports psychology than I would from the journals that are within my area, you know, such as the journal of head-trauma rehabilitation, clinical and experimental neuropsych and that sort of stuff...neuropsychology...

ah, they offer me nothing in terms of making a difference with people with brain injury.

I: Right...it doesn't seem to have that practice focus or it's not easily translated into what you do then?

P: No, I mean, when I look at neuropsych abstracts, out of a thousand articles that might appear in any issue there may be three articles that are to do with rehab, and my sense is that we know a hell of a lot relatively about what's going on in the brain, and where it breaks down, and why it breaks down, but we have absolutely no idea about how to go about putting the parts back together again, and that might reflect that it's a particularly difficult problem, um it certainly is, but people, to my way of thinking, really aren't interested in the area, and for those who are interested, when they present their findings at conferences, I find it incredibly under-whelming and they're concepts that I learnt in psych 101, you know, 20 years ago, and yeh, I go along to these conferences hoping for some new insights and new techniques and I don't get anything. Maybe I'm expecting too much, maybe I should start contributing to the area myself, but...and I have done to some degree, but I can't see my way forward with it either...when some of the smartest people in the area devote their lives to try and make a difference to people's brain injury and the best they can do is to come up with ideas like errorless learning, which is a nice little idea but it's pretty hard to put into practice.

I: What was that did you say?

P: errorless learning.

I: errorless...

P: It's a rehabilitation technique for severely impaired patients pioneered by Barbara Wilson from Cambridge, it's not rocket science stuff, and a lot of the techniques are really designed to show change in groups in office environments or out-patients facilities, but trying to get those same changes in people's environments and communities and away from home...the office is a world away. So I try and keep my practice quite simple and work on those things that do make a difference; so, for instance, I completely ignore restorative type techniques that try and build up memory and attention, I don't think they work, and I resort to environmental manipulation, maybe some external cognitive strategies, and retain learning and um backing up and adaptive habit formation and all that

sort of stuff that actually works for the people we deal with, a lot of them haven't been too sophisticated and don't have a long academic history behind them so they don't get interested in a lot of the smart mnemonic devices that some of the researchers come up with.

I: Yeh, so they can understand the approaches you use.

P: Yeh, understand them and may even implement them. I would rather have a client of mine with memory problems getting out little yellow post-it notes and writing down what he needs to do on those and shoving it his pocket rather than going and getting some wiz-bang electronic organiser or pocket PC and trying to get all these fancy programs up and running for him...or even trying to get him to make use of a diary.

Response 3

I: So what are the hopes and expectations I guess for translating your research into practice? What are the outcomes for practice?

P: Yeh, it's interesting isn't it? I guess it's a tricky one that, because obviously I think your research gives you a certain perspective on looking at any piece of information that you gather, and whether it's through the clinical work or your own research projects, I think you have a much more of an analytical view of what you're doing, both in research and in the clinic. It also exposes you to a lot more literature, I suppose, than what you would otherwise necessarily have time to look at, just working fulltime clinically, but I mean, for example, in my situation, I'm exposed to X literature through my research I'm not exposed to literature you know pertaining to all the other various patient groups I have to deal with, so I guess, it's more...yes it does give you specialist knowledge, which helps you in the clinic with that particular patient group, but in general I think it's more just an attitude thing: that it's a sort of general skill thing that just makes you, I think, much more aware of the pitfalls of research as well. The good thing about research is it reminds you that you need to keep looking at literature to keep updating clinical knowledge, and I guess it also gives a much more critical perspective when you're actually in the clinic looking at what you're doing and looking at the data you've got from the patient or whatever.

I: Yeh, so as a researcher and a practitioner then, you're able to focus, ah, more on bridging the gap and so forth?

P: Yeh I guess so, I mean, ideally what I would hope is that what I'm doing is trying to be both: develop my clinical skills, but not lose sight of the fact that research is constantly happening and has to be impacting on your clinical abilities and your clinical knowledge and skills and so forth, but at the same time, I would hope that because I do want to be a practitioner and a researcher that I don't, you know, sort of remove or lose sight of the fact that clinical skills and clinical experience and all the rest of it is also an important component in the clinic and in fact informs your research as well, you know, it provides you so many of the questions, which you can actually direct your research towards answering I s'pose.

Response 4

I: Right. So you were talking about the clinic that you're involved in, is that the one at the university?

, I have a, you know, (inaudible) appointment at a hospital in aged care and neurology and that involves a clinic, it's their diagnostic clinic, which, you know, I actually feel is really also essential to my capacity to teach, that is to say that my first x years here I was doing a little bit of clinical work but not a great deal, but I felt that my clinical skills and the currency of the kind of patient descriptions that I was offering the students and so on were quickly running in a kind of dry and out of immediacy and relevance and so on, and so I just made the decision that to be able to do this as well as I would like to I need to be an active clinician.

I: Okay, is there anything else about the relationship between research and practice in that regard that you could say?

P: Um, I don't know that there's anything that I'd want to say in a general way, I mean it seems to be such an individual thing, mm for myself, um I think that doing research lends a dimension to my clinical expertise that it wouldn't have otherwise and, um, vice versa really. That has a number of layers to it, I mean, one layer is that it means that one is more theoretically competent than one would be otherwise. So, actually, from a diagnostic point of view, it broadens and deepens your conceptual framework from which you are looking at clinical phenomena and that has another, um, component to it, which is doing research which means

being abreast of the literature and I think it's easy to decline to remain abreast of the literature, so, ah, and this field is changing really dramatically, so I certainly feel very strongly for myself that these two aspects of my work nourish one another and that either...both would suffer...either would suffer if I weren't doing the other.

I: and also I suppose being an educator as well.

P: Sure, it's another reason for keeping abreast of the literature, but, yeh, I mean, that's obviously true, but, um, it's kind of more obvious than the links that people might think of between the clinic and research.

I: Yeh.

Response 5

I: Just in terms of research and practice since you've, um, had a bit of experience in both, doing your Ph.D., has that been a benefit do you think in terms of understanding the needs of practice?

P: Oh absolutely. I think it's actually crucial. I do some lecturing in the area as well some of the universities locally here and I don't think I'd be able to capture so well for the students what it's like to work in the field if I didn't have a bit of experience across the board between the two. I think it's pretty hard for them to understand exactly how you apply these skills at a clinical level when they're in the undergraduate studies usually focusing on the research methodology and so forth. So I think it's pretty important for that, not only that, but for my own clients and for my own knowledge of exactly what it is that I do because it's so broad in the field, um, it really becomes quite difficult to really narrow down to a professional level of specialisation or expertise in an area you know what I mean?

I: Yep.

P: So basically I find that it helps a lot to go out there and get that experience because it certainly lets you know what you think you're going to be particularly talented at or particularly interested in and hopefully the two sort of come together. Yeh, so I just think most of my skills have actually been from being out there and doing the work rather than sitting in the class and trying to pick it up, you know, sort of second-hand through somebody else who's teaching who may themselves never have worked clinically in recent

years and don't have any, you know, the same experience to share. So generally speaking it's better to get out there and do it with supervision of course in the early stages.

Response 6

I: Also, what's the relationship then with practice with your type of research?

P: Yeh, well, in trying to understand the cognitive underpinnings of the certain symptoms, the aim is to be able to inform clinicians of the particular cognitive processes that can be targeted in psychological therapies for psychosis, so that's about as far as the treatment side of things goes: we're trying to, um, pinpoint the specific processes that you'd want to target in treatment. We don't offer treatment and I'm not trained in offering treatment, but I'm very keen to help steer treatment towards those certain processes, so that medication is not the dominant treatment, well, so it's not the only treatment, I guess, for people with psychosis.

I: Okay, so then it would be up to other researchers to develop treatments, is that what you're saying?

P: Um, Yeh, I'm keen to try to work with clinicians to develop some treatments and that's part of the long-term phase of this research. I am in contact with clinicians and we are putting in funding applications to do just that, um, but at the moment that's not really the focus because I'm just really in the beginning phases of my research and I'm trying to come up with the results to show that, first of all, that we know that these cognitive processes are worth targeting and that will be a long-term aim.

Response 7

P: Yep Okay, um, so what's the relationship like between research and practice in your area of research then? What are the hopes and expectations I guess?

P: Um, I think that for me over the years it's changed a bit; I've been in this setting for a number of years. I originally was putting more of my time directly into collecting my own research data and as the years have gone by I have become more and more the supervisor of students, and so at least an hour a week with each of my research students, um, with direct supervision and talking about their data and things, but they're doing most of the data collection and setting up the projects and things like that, so I'm less directly involved

with it. I love the research aspect of my job so it's never enough time to be putting into research, but then, on the other hand, the fodder for my research is the clinical population, so the more patients I see the more likely I'll be finding, you know, interesting people to study. So it's a challenge. I do a heavy enough clinical load that I'm going to be finding interesting things along the way.

Response 8

I: ...So, there's quite a tight communication loop with the research work and practitioners and their practices?

P: Um, I think like in most areas in psychology there is necessarily a lot of everyday overlap between what happens in the world of research and what happens in the world of clinical practice, but I certainly spend a lot of time referring back to research work that underpins what I'm trying to do in clinical practice: I often see kids with things I've never heard of before, which means that I'm often doing lit searches about neuropsychological implications. And one of the areas that probably hasn't changed too much in terms of my predecessors and myself is research around in relation to interventions and management of neuropsychological impairments, and I certainly do my best to keep up with the literature on what's emerging now in terms of interventions. So, I'm certainly a big consumer of the research that's around. Research in pediatric neuropsychology is difficult because lots of the kids have low incidence problems, and so you tend to need multi-centre studies and that requires a lot more organisation than a single clinician is able to put together. So, for example, while the majority of my work is neuropsychology, when I chose a Ph.D. topic, I'm actually not doing it in neuropsychology just because it wasn't going to be feasible to pull all the subject numbers.

Response 9

I: So, um, what's the relationship like between research and practice then in that respect?

P: Yeh, I think research is really important to inform practice, um, we sort of rely on the results of research to guide what we do.

Response 10

I: What about the relationship between research and practice. You've done a fair bit of research I guess?

P: Yeh.

I: What are some of the outcomes of your research for practice, that kind of thing?

P: I think, again, my experience is a little different from my peers because I was already working in the area of acquired brain injury before I started my research I knew exactly what I wanted, what questions I wanted to ask with my research, so it's directly related to my clinical practice. Here, I'm working in the field and, you know, everybody knows what it (specific problem X) is, everybody knows that patient is in and that patient is out, but we can say they're in or out, but really don't know what X is: we don't know what causes it, we don't know why it goes away, we don't know what patients can and can't do when they're in it, so my research is...the goal of my research is 100% to feedback into clinical practice, you know, whether we actual do a little bit more treatment with patients than we do currently. That's really the clinical outcome for my research.

I: Do students and researchers sometimes find it difficult to bridge the gap like that?

P: I think because each week we go to like a research presentation for the students to present their research, and sometimes I get to the end of listening to the presentation and my question is, 'well, what is the clinical implications for that?', cause really, that's where I'm coming from, so I often ask the question. So I think probably maybe like half of the time people haven't made that next leap for what are the clinical implications of their research, it's very much more theoretical...we need both, we still need lots of theory, and it's, you know, that whole scientist practitioner thing, I'm trying to make my research much more theoretical than it has been in the past: there have been other clinicians who have done research into it and they've been, if you like, more clinical and less theoretical and that's been one of the failings of their research, and cause it's irrelevant to outcomes if you haven't had that theoretical structure. So that's kind of what I'm trying to do. It's not easy.

I: So does, I guess, do they cover, um, ways of approaching research topics in the courses or is it

also just something that you have to pick up from experience?

P: We only had one topic on that kind of research methods and I do feel that the lecturer made every effort to make that link between research methods and if it's clinically significant to how it would impact. And also the projects that we had to do in the subject were...we did it with the health students and the clinical students, so the subject was run with all three groups, neuro, clinical, and health students. So each group had to do the subject within their stream, so they're trying to make it very practical, and therefore more clinically relevant. I don't think it fully succeeded in highlighting the issues of that link between science and practice.

Response 11

I: I was also just thinking about changes in practices, like with neuroimaging, 'cause I've noticed that in recent years they've started bringing out studies with diagnostic possibilities for neuropsychological issues. I was just wondering about neuropsychology's relationship with neuroimaging – that kind of thing?

P: I haven't, I don't do a lot of research and the research that I have been involved in has kind of been a little bit more clinical rather than sort of, I mean, I think these two things relate really, really well together, particularly for research purposes, but I can't really comment on that, it's not an area I've had a lot to do with.

I: Yeh, fair enough, I was just thinking, um, like, for instance, with neuroimaging patterns where they've decided that they can detect depressives and so forth with a particular pattern, and so how would that sort of interact with neuropsychology's assessments, because they're completely different assessments, I guess?

P: Yeh, I think they would be extremely useful to us. I guess you're talking about functional neuroimaging?

I: Mm.

P: Yeh, but the reality is that those procedures are still very, very expensive, and not widely used in the clinical setting so it's actually quite rare to have access to that sort of information, so, yeh, if I was seeing a patient, for example, who had cognitive difficulties, and it was suspected that it might be due to affective disturbance, I could only really

hypothesise that there might be some organic dysfunction, you know, that's connected with that affective disturbance, I wouldn't be able to refer a patient to have a functional MRI or a SPECT-scan or anything like that, just because of how expensive it is, and it's not widely implemented, at least in the public setting.

I: Yep, fair enough.

P: I think definitely that's still in the research domain rather than in clinical practice.

I: Okay, so it's still a bit more prospective?

P: Yeh, but it's certainly very useful for us to learn about that sort of research and to, to then be able to use that in our theories and hypotheses about what's going on for a particular patient.

I: Oh, I see. So the way they delineate the areas responsible?

P: Yeh, that's right, and to be able to...quite often if I'm writing a report, you know, you want to be able to refer to the latest research findings, for example, to comment that this particular cognitive problem or cluster of cognitive problems commonly occurs in people who suffer from depression and that there's research that shows that there are actual changes in the functioning of the brain. To be able to include in the report the knowledge base that's provided by research so that people aren't just thinking that it's an idea that you have, but rather that there is a scientific basis for your conclusion.

4 Changes in research and practice

Response 1

I: Have there been many changes in neuropsychology as regards the future? Any trends that you can think of that are interesting?

P: You mean since I've been practicing? Look, the only trend that I would say that I've noticed, and I haven't been practicing that long to notice any I would have to admit, it's more in terms of, I'd guess, the type of training that's going on because there's a real swing at the moment away from people just doing straight clinical degrees, there's now, I think, a much stronger push to getting these M. Psych, PhD programs going, which, I think, will eventually end up with a situation

where you probably have people who have been both a clinician and a researcher perhaps more often in the future than we do now. I'm not sure, I mean, it may be that people, sort of, in spite of having done that sort of degree, more often may decide that they don't like one aspect of it or decide to stick with the other, I'm not sure, but I mean that's the only trend I've seen, but I'm not the sort of person who would really notice 'cause it's too early in my career.

Response 2

I: Over the history of your research area what sort of developments or significant changes have there been in research and practice.

P: Well, I'd say that they're significant in one respect that usually a group of people have to get together to do a decent study these days. They don't necessarily have to be in different labs, but you need to have different expertise within the one lab. So that in the olden days a person with a junior could sit down and do a bunch of rats and publish a paper. Nowadays there may be three, four, or five different aspects of the same experiment that need to be kept on top of at one time, and that needs more people, and you have to get them on your team, which is very expensive and usually impractical, or you collaborate. And the same is true with the human work that I do, except, because I've collaborated with individuals who have already got staff positions in the university, we don't have to find funds for ourselves, and we're a good team without us actually being regarded as a different (inaudible noun). The other thing, I think has changed about research is that the amount of dollar availability is diminished, it may have gone up, you know, in Australia, but it's been whittled away by other activities so that what's left, for, um, shall we say biological research, is much less than it used to be.

I: Oh, so is that due to the proliferation of various fields?

P: Yes, so for example, cancer, and breast cancer, AIDS, schizophrenia, mental health, I mean everybody is turning up, there are an increased number of special interest areas, and there are increased levels of funding for conglomerates, and so all of these areas, as I perceive it anyway, use up more of the money so there is less uncommitted money that can be used for non-specified research.

I: So in the research funding process is there a hierarchy of importance that they allocate to?

P: I don't know how this is arrived at...I guess it's a political and medical thing. They've got x dollars, they divide so much towards...a proportion of it towards this and a proportion of it towards that and there's less proportion left.

I: It's a diminishing purse. When you were talking about the changes in the history of research, how easy or difficult is it in terms of publishing articles?

P: Well, if you've got a good experiment it's easy, if your experiment doesn't speak for itself or doesn't really strike a cord in a new area, then it's not much more difficult, it's just a bit more difficult, I'd say, than it used to be. I don't think there is too much difference overall in terms of ability to get published. There are far more journals these days, which has more than kept up with the increased numbers of papers being submitted from around the world.

I: So it is just a matter of getting the research off the ground in the first place.

P: Yeh.

Response 3

I: Could you just tell me how your field or discipline has changed, or improved and developed over the years?

P: Oh, things have changed enormously. I mean 20 years ago, if you had a brain injury, everybody thought that was it, like a neuron would never replace itself; whatever's dead in the brain is dead. Well that thinking has completely changed. I think that everybody now believes that you can actually save neurons and you can actually get new neurons growing in the brain. So, um, that's the biggest change: there's been a philosophical change from "we can't do anything about it" to "we can do something about it, we just have to find out exactly what and how."

I: What are some of the proposals for the "what and how?"

P: Okay, for example, a brain injury patient comes off the street from a motor vehicle accident. Many years ago they would have just been put in a bed and looked after and made comfortable. Nowadays, we give them different therapies because we believe these therapies will improve their outcome. And, so our job in

pathology research is to try and find therapies that will work. So that's a typical example. Understanding what happens in the brain, that's happened in the last 20 years, so people understand it better, and now that they know what's happening, and they can see - like the injury factors occurring - they try to make anti-factors that prevent the injury from happening. So that's the first thing that's happened. The second thing is there's a lot of promotion of neuronal growth going on, so they can give growth factors because they know that growth factors will promote new synaptic connections in the brain. There's a lot of research going on for that. So, twenty years ago there weren't many trials in traumatic brain injury on how to improve outcomes. Now there's dozens of trials looking at different ways you can improve outcomes.

I: Just with medication?

P: Yes, it can be medications, it can be cell therapy. I mean, down the road, I think there'll be gene therapy. That's not going on now, but there's a lot of research now going on into how gene regulation changes after injury. So I think in the next twenty years we're going to see a massive change towards gene therapy. But it all boils down to a change in philosophy; that is, "we can't do anything about it" to "we now know we can do something about it."

I: I see, exactly. So in terms of gene therapy, what is the proposal in terms of the mechanisms, how...?

P: Well, that's being studied now. I mean, people are doing what's called gene-chip-micro-array. So, they're looking at all the different genes, there's thousands of genes, and their expression changes after injury. And what they're looking at then is how do they change and how does that change affect functional outcomes in the patient?

I: Oh right, so then perhaps, 'how can we re-modulate the way that they function'?

P: Exactly, exactly, but right now we're in the stage of trying to identify what changes, and then after that will come the phase of, "OK, these are the important ones, we've got to see if we can modulate."

Response 4

I: What are some of the changes or developments that you've found in your area of interest that have been important?

P: Well there's been a huge move over the last, I guess, even before I came along, over the last ten years towards biological underpinnings of psychosis so there's a movement towards looking at neuroimaging studies, and they haven't knocked out the importance of other research, but they really are starting to dominate the psychiatric research scene anyway. And, as for the process, I think there's been a move recently to help us out regarding ethics applications because you're dealing with, as regards to health systems, because at the moment it takes us a lot of time to get ethics approval from each different hospital we work within and I'm pretty sure, it hasn't happened yet, but I'm pretty sure in the near future there's going to be a scheme brought in where there's a blanket ethics application that you could put in to do work within a health system, that way you don't waste, you know, you're wasting a lot of people's time really as well as your own filling out these application forms when the procedures have already been approved by one health service, so they're definitely not going to be interfering with the patients. So that's one big one that I'm pleased about because it does make our life difficult having to put in separate ethics applications to each hospital.

I: That's because you get so few participants from each one?

P: Yeh, we do. You get so few from one so you tend to then have to use about four or five hospitals and, um, that's just more ethics applications that you then have to keep updating every year and you just find most of your time wasted with the bureaucracy of that, not most of your time, but a lot of your time, yeh, when it could be easily dealt with by one central body that showed that you weren't going to do anything harmful to the participants.

Response 5

I: How long have you been practicing neuropsychology?

P: About 8 years.

I: OK. Just in your knowledge of the field, how has neuropsychological practice changed, developed, or improved over its lifetime as far as you're aware?

P: In child psychology, the kind of children that are referred have changed: the medical interventions that are available mean that the children who have acquired

brain injury survive much better and have much better outcomes than they used to; they're less likely to die, and on top of that they're less likely to come out of it with as much brain damage as they used to. The incidence of some things have changed, so the incidence...the overall incidence of traumatic brain injury has reduced with car safety...bike helmets had a big impact on the number of kids coming to this place. Some things haven't changed at all, um, another example is that kids with epilepsy...the medications that are available to control epilepsy currently are much, much more effective than they were at any time previously, and so...and that kind of example applies to a whole range of different kids that I see. So, kids are doing overall a lot better from a medical perspective: their brains are in much better condition than they have been previously, so that's nice. The other side of that coin though is that some, well, many more kids are surviving things like being born extremely prematurely than otherwise would, so there are some new groups of kids coming through that wouldn't previously have survived. So that's on that side.

The assessment tools that are available for children are getting better and better; the test batteries...there are a lot of test batteries that have been published in the last ten years, which have better norms and are put together better, and, most recently, there are much better tests available for adolescents: often people would start with designing a test for adults and then they'd design a test for the primary aged kids and the adolescents would be the last age group to get a test for them, and so they're beginning to come out now. So, the test that I've got available to me are much better and the research that backs up what I do in terms of...a kids got a certain disorder 'what's the neuropsychological profile usually for this kind of disorder'? Um, that research is also much better now than it has ever been, so I'm very glad that I'm not doing this job 30 years ago.

I: Yeh, exactly...it would have been very frustrating.

Response 6

I: So, since you've been practicing how has practice changed and what sort of developments have there been that are significant?

P: I guess there's more of a focus over recent years on, um, the statistical properties of the tests and even tests that have shown to be able to discriminate between, you know, brain injured and non-brain injured

groups with specificity and sensitivity, and also the interpretation of test results are more statistical rather than on a clinical basis. Although having said that, when you're mainly working clinically you do still rely on that, um, and, you know, I think probably in the states there was more of a battery approach at one stage, but here it's been more kind of hypothesis driven, you know, hypothesis testing to guide the assessments.

Response 7

I: Are there any sort of trends that you might care to mention regarding the future of neuropsychology with research and practice perhaps?

P: Um, well I guess there's more of a trend to, um, be well informed on relevant research and to use that guide in practice I think, you know, at one stage there was less research there and so, um...

I: So it was more dependent on the practitioners' personal experience?

P: Yeh, personal experience and also on, sort of, the body of accepted knowledge of what particular tests meant and, you know, looking at qualitative features of test performances, which is still important, but I think there's more of a sort of marrying of the two really. I guess some of the research and some of the practice in the area has been driven by the medico-legal arena and in that area the statistical, you know, having statistical proof and evidence of the statements you make is obviously more important because you're using that to support your findings and there's potentially a lot of money hinging on that and you're an expert witness so I think some of the research and some of the practice as well is sort of driven by that, it's not always, um, you know, it is a different kind of assessment though.

Response 8

I: Okay, in neuropsychology then, is there, in addition to diagnosis and treatment, is there much of a focus on psychotherapy and other sorts of skills?

P: Well, there is in that there are many neuropsychologists who are involved in rehabilitation and there are a small group of neuropsychologists who are interested in what they call neuropsychotherapy, which is a term that has come from the United States in the last year or so. If you're looking at

rehabilitation you're using techniques that have been shown in research, in clinical situations, to be able to help people in terms of rehabilitation with their cognitive deficits. In terms of neuropsychotherapy they're looking at people modifying, I guess would be a good word therapies like cognitive behaviour therapy.

I: Right I see.

P: Neuropsychotherapy is very much in its infancy in Australia. In that rehabilitation framework there's also an arm where you'd be looking at behavioural therapy you know for people who've got behaviour problems either through brain injury or dementia. A behavioural analysis of any antecedents or consequences that are reinforcing behaviour would be performed and interventions suggested to alter or modify the environment. There are techniques that have been developed for memory problems to help people with dementia, for instance, to learn very simple things, but to maintain their independence.

I: What range of disorders, or what have you, does this apply to the neuropsychotherapy I mean?

P Neuropsychotherapy would work with people emotional problems, but these individuals have cognitive loss say after neurosurgery or TBI you know traumatic brain injury. They probably work less with degenerative disorders or dementias although there is research to suggest that psychotherapy, in early Alzheimer's can be quite valuable.

Response 9

I: Okay, could you just tell me a bit about the history of neuropsychology in Australia if you know much about that and, um, how it came about I guess and any supply and demand issues and that kind of thing?

P: Well, I guess Kevin Walsh is considered the founder of modern neuropsychology in Australia. I think originally there was just a course in Melbourne, since then though there's a course at Macquarie University here in Sydney and they're actually looking at starting up another one at Sydney Uni. So I guess it's been a growth area perhaps over the last ten years or so. Um, supply and demand, oh, I think it just sort of goes up and down really at times there are no jobs and young graduates...new graduates looking for work and then at other times there doesn't seem to be anybody to fill the positions that we have, so yeh.

Response 10

I: I'm just wondering if you could just tell me a little bit about the history of neuropsychology in Australia and how it sort of developed, or in terms of like, um, the supply and demand, and yeh, just because of the proliferation of the courses of the last 10 years?

P: Yes, my understanding is that neuropsychology in Australia started with Kevin Walsh in Melbourne who set up the first course. In Sydney there were initially no neuropsychologists. At a hospital called Lidcombe Hospital were clinical psychologists who were interested in and specialised in neuropsychology and set up a department. One of the main people in that department was Robin Tate. They offered internships there for people after they graduated. What happened was that graduates from Melbourne came up to Sydney and gradually there were more trained college members from Melbourne University and that then produced the first clinical neuropsychology course at Macquarie University. And I imagine it's really a similar situation to what happened down in Adelaide: I know that Nina Geffen was instrumental in, I thin...I don't know whether she started a course down there, but certainly developing neuropsychology down in Adelaide, and she's now in Brisbane. I'm aware of the new course that's started in WA a couple of years ago now. Yeh, so I imagine that's the sort of development, that happened as neuropsychologists become more valued and recognised in medical professions positions have been set up and graduates from Melbourne have dispersed throughout the states really.

I: Right. How did that happen, I guess, was it because there were a host of neuropsychologists knocking on the door that positions started opening up and...?

P: I think that people realised that, in brain injury or rehabilitation just from education and in terms of what was happening in the United States as well, that they could benefit from Neuropsychologists. The small group at Lidcombe offered a small service: an inpatient as well as an outpatient service. Lidcombe was a rehabilitation hospital, and it was a general hospital, but there was brain injury: inpatient and community, psycho-geriatrics, and neurology so it was very much keyed toward neuropsychological assessment otherwise the patients wouldn't have been really getting an adequate service.

Lidcombe closed about 9 or 10 years ago and it's brain injury unit went to Liverpool; it became the brain injury unit at Liverpool there wasn't really a service out there for that area, and I think the psycho-geriatric service went to Bankstown.

Response 11

I: Is there any kind of coordinated effort for the future in terms of, um, perhaps bridging that gap...making its way to medicare and expanding roles like prescription capacities and drug monitoring and that kind of thing?

P: I think that the likelihood of a psychologist being allowed to do any kind of pharmacological stuff in Australia is way down the road. I know in the US there's a move a foot and there's some like in the Military in the US Psychologists can follow people for certain medications and such, um, but as far as a formal lobbying to get some changes, the APS is doing that to a certain degree, ah, interestingly the government just approached the APS for psychologists to come up with criteria for disability - for mental disability - and they knew that psychologists had the information about that, included them in the decision process about what should be used to determine it or whatever, and then the legislation was passed to determine who could actually do the evaluation and psychologists were removed: psychologists are not allowed to do disability evaluations even though we came up with the criteria. The reason why we were removed is because when the term psychologist was in there, there was no guarantee that the person who is called a registered psychologist had any training whatsoever, ah, any kind of clinical training because you could be called a registered psychologist. So the two problems are linked where the kind of lack of coordination within psychology in Australia, who's allowed to do independent clinical work interferes with any kind of attempt to get the government and other professional organisations like psychiatrists and GP's to recognise psychology seriously. They don't know who they're dealing with. I mean, we have people here where, an add comes out in the paper that says, you know, one in five people will get depressed in their lifetime and if you have concerns about your mood contact one of these specialists below and nobody on the list had any psychological training: they're like aromatherapist slash past life counsellors slash counsellors slash something. People who are referring cases see that and they say, you know, we're that...that's not a profession, it's like a bag of

people with various skills and until the profession decides that we're going to have professional requirements and more strict things about, you know, what kind of formal training is required it's going to be an uphill battle I think.

I: The proliferation of neuropsychology courses I suppose over the last 15 years in Australia has perhaps um assisted that in some way?

P: Yeh I think so, what it's going to come down to is that there has to be formal training programmes and the clinical college has to be involved in setting the standards for those programmes and so there's some assurance that if someone is a member of the college that they've met a minimum criteria and the college is doing a good job of that, however, there's no regulation against someone who has a four year degree who has read some books about neuropsychology and calling themselves a neuropsychologist there are no sanctions against that, so that kind of goes hand in hand...as the programmes become more and more available it's not til someone starts getting in trouble for calling themselves something that they're not, um, that it's going to be an issue, and, you know, the people who are doing the referring and the people who are using the service don't know enough to ask the right questions. I hear people and they come in here and I ask, 'did you ever see a neuropsychologist for this skull fracture that you had', 'oh yeh, I was referred by my GP and this person said they were a neuropsychologist', and it turned out the person was a four year trained psychologist who had gone and taken a class some place, had read about the tests, read a couple of text books and was marketing himself as one, and doing a terrible job. I get a copy of the report from the person and it's terrible; it's just malpractice.

5 Membership of the College of Clinical Neuropsychologists

Response 1

I: And that allows you membership of the college?

P: Ah, after completion of the degree I still have to do 2 years of supervised practice to be a member of the College of Clinical Neuropsychologists.

Response 2

I: Are you a member of the CCN at the moment?

P: No I'm not. I...it's a long story...basically to be a member of CCN at the moment, the requirements of CCN are that you need, when I went through, 18 months of equivalent fulltime work, and given that I've only been working part-time ever since I started working, I didn't think it was worth my while to work for ten years or whatever and eventually get membership. So no, I'm not, but when I finish my Ph.D I think I'm probably going to. My intention is to do clinical work a bit more for a short period of time and then probably get CCN membership after that.

I: So it has to add up to full-time work?

P: Yeh, as the criteria stands, as far as I know, CCN is actually a little bit worried because I think a lot of new graduates aren't trying to join, so the criteria may change in the not too distant future, I'm not sure, but that's how it stands at the moment.

Response 3

I: So what is the community of neuropsychologists like in Australia?

P: Mm, I only know...I've met some of them at national conferences over the years, I haven't been to a national conference recently, so a lot of it is hearsay, which I'm sure is very familiar to you, there's this sort of overlap, like a Venn diagram of people who are practising neuropsychologists, and there are researchers, and some overlap between the two, and then we've got this concentric circle, cause there are people who do neuropsychological work and are members of the College of Clinical Neuropsychologists through the APS (Australian Psychological Society), and that's, mm what should we call that?...a 'trade guild', and it's very difficult to get into, valued highly by most of the members, the usual dramas and dilemmas about letting people in. And there's a wider group of people who are doing neuropsychological work, probably similar neuropsychological work, but not linked with the college. So then some people think that neuropsychologists** are just people linked with the college, and other people would think generally. Then there are all those people who could get in the college, but don't want to be in another group again. What are they like? Well, there's the trade guild, then there's your academic researchers who are just like other academic researchers (final words inaudible).

I: So, you can still work if you're not part of the college of neuropsychologists?

P: You can, you'd probably have difficulty applying for and getting a neuropsychology job because most employers would specify they want someone from the college, but a lot of people would have other jobs like a clinical psychologist in the mental health services, who's doing neuropsychological assessments and reporting them, but isn't linked with the college, and they are *aren't* ** actually employed as clinical neuropsychologists, but they use their neuropsychological skills that they may have gathered along the way, through training, but they can't get into the guild, but they're doing work and they've often received a lot of supervision and training along the way from other sources like work mates, (inaudible), workshops, perhaps supervised by a neuropsychologist, so that their work is good, but they can't get into the college because they haven't got the clinical masters at Uni. Occasionally there have been periods when you could get in without that, due to changes in the APS over the years, and at those times some could get in. Very early in the college you could just get in like with having a piece of paper, I think, (inaudible) being signed in by two other members to certify that your work was at the same standard, this was a long time ago, and that's how colleges start, because you know...

I: You need members.

P: Yeh, that's right. I think, yeh. And then there was a period in the late 80's, early 90's where the college ran a national training program, and it was like another Masters, but it wasn't a masters (inaudible). But then that closed down because it was too much work for people to run, and at the moment the APS is working—I'm sure you know all this—towards another form of admission by competency, where if you've got the skills and you can demonstrate that, you'll be able to get in (inaudible), but that hasn't happened yet, so there are people waiting around for that to happen who've done all the preparation, but (inaudible) done a lot of work, had a lot of supervision, but they aren't in because that hasn't started.

I: So is there...if they have a Masters degree will there still be admission tests that they will have to do to get in?

P: Yeh...I don't know what the criteria will be, whether it will require say Masters in clinical, or whether it will require a degree and registration, I don't know, but there are people who would meet some of those criteria, well people with PhDs and registered (inaudible), but I don't know (inaudible)... so I don't know how the college

is going to address the level of qualification, but what they won't require is a specialist masters in neuropsych. People will be able to demonstrate what they call equivalence, an equivalent level of skill, by having studied and perhaps done some supervised practice, and that's I think an ideological drive by the APS to make it less of a trade guild, (inaudible) all the people who demonstrate the skills will be able to get in, and that the university place system won't be a constraint on the ability of people in the states to acquire college membership, cause I think they can see that it is better to have people inside the tent rather than outside the tent, if they do good work and they've got the skills. I think the APS has the view that, I think the federal government has the view that competency is the way to go rather than requiring people to do certain courses in certain places. Then there are people who did other psychological training, often masters in clinical, but doing that sort of work, some of them have a high level of relevant skills, others perhaps not, some who are simply waiting around for the college to modify its rules so they can get in, some who couldn't give a stuff and are just going to keep on doing what they are doing anyway.

Response 4

I: Can you tell me about the college of clinical neuropsychologists with regards to the benefits of membership and the function of the college?

P: Yeh, it doesn't have a very high profile in the state I'm in, with the group membership we have the benefit of having regular case conferences and discussions, and occasionally invited speakers and so on which is great. Ah, there's a...I guess, there's a vanity factor in terms of being able to say that you're a member of the college, and also there is a requirement when you're employed in this state to be eligible for membership of the college.

I: Right, so that's in neuropsychological practice settings you mean?

P: Yeh, in the public service, that's my understanding of it.

Response 5

I: Does that then allow you membership of the CCN and just the CCP as well?

P: Well, it does. The clinical college is a bit easier, the CCN's a bit stringent on their criteria: you actually

have to be practicing for a year and a half to become a full member under supervision of a current CCN member. So that's something that, ah, takes a little while to achieve of course, but I am with them currently as a student member and also the clinical college.

Response 6

I: OK. I think basically for my last question I just wanted to ask you about what it's like to be in the college? Are there any particular benefits?

P: For me gaining membership of the college, which I did through the entry by examination system, gave me legitimacy with my colleagues both within the state and also interstate. So, to say that you're a college member gives you a degree of respect from other psychologists that I don't think you necessarily get if you're a clinical psychologist doing exactly the same work...when you're trying to communicate with people interstate for example, so for me, it's had that benefit. And, as a group, we do some professional development activities together and the college obviously provides the only forum for that really, and so for that I'm quite grateful. I think that's a reason for continuing my membership.

Response 7

I: What do you do if you're not a member of the college? What are the implications?

P: At the moment there aren't any 'cause you still get to go to the professional development things that the college puts on. The title 'neuropsychologist' has recently been deregistered I s'pose, so previously you had to be a member of the college to call yourself a clinical neuropsychologist. A couple of years ago, I'm assuming this is only in Victoria, but in Victoria they deregistered that term, you know, it's now not something that is legal, it's not a legally binding term anymore, so in reality there aren't any ramifications for me...for not being a member, I think in the long-term it's something that you'd probably want to look to doing in a more of a professional sense, in that, it's the professional body, and if you want to partake in your profession and develop your profession, you know, and all that sort of thing, then, I think, essentially you're going to have to be attached to that body because otherwise you can't do anything. So, I guess in that sense it's got ramifications, but they're more long-term

and they're not directly related to your actual clinical practice I s'pose.

I: Yeh and you can still get a job then?

P: Yeh exactly, none of those things have, you know, none of that's relevant for getting work or anything like that. Basically, you have to...the criteria tend to be, you are a registered psychologist and you have completed a M. Psych or D. Psych in clinical neuropsychology. There's no requirements that you're a member of the CCN, so in that sense, I mean, they shot themselves in the foot a little bit by deregistering the term because I think people see it as more of a question of well, why should we join now?

I: I'm not quite sure by what you mean by deregistered?

P: Oh, okay, well, um, you know how, like, if you're registered as a psychologist you have to fulfil certain criteria and you can call yourself a psychologist and if you haven't fulfilled those criteria, then you can't call yourself a psychologist, you can call yourself a counsellor or whatever, but you can't say that you're a psychologist. You actually have to be registered through Victoria's law, in our case the Victorian registration board. The term clinical neuropsychologist used to be the same in that you had to have done an M. Psych or D. Psych and you had to have certain amounts of supervised clinical experience on-top of that and only then could you a) join CCN, and b) call yourself a clinical neuropsychologist. Prior to that you could only call yourself a psychologist and so forth, but because that term is not a legally registered term anymore you can call yourself a neuropsychologist, and as long as you're a psychologist and you've got some training and you can demonstrate, if there's ever a problem, that you can demonstrate that you have some expertise in this area, then it doesn't matter.

I: So you basically just have to be registered as a psychologist, but then you can also just say...?

P: I mean, officially you can just call yourself a neuropsychologist, but if you ever got into trouble then, supposedly, what any sort of governing body would look at is, well, have you got a reasonable level of expertise relative to your peers that the average person would say, well, yes you are a neuropsychologist? So, for example, you know, have you done an appropriate graduate degree and do you have a certain amount of experience and all the rest?

I: So what about membership of the APS?

P: That's also optional, I mean as a psych...you have to be registered with the Victorian registration board as a psychologist to say that you're a psychologist or neuropsychologist or any other kind of psychologist, but to actually be a member of the APS no that's a choice thing, um you don't have to go in if you don't want to.

I: Right even if you're a member of the college you don't have to be a member?

P: Oh no, if you want to join CCN you have to join APS. They're sort of intertwined, I guess, because CCN is just a component of APS: one of the colleges within the APS.

I: Yeh, I get it.

6 Clinical neuropsychology and clinical psychology

Response 1

I: have you had any issues in your work in terms of your neuropsych skills and work experience? Do you know what I mean?

P: Yes, what if I go back a few steps. When I did my Masters in Clinical Psych I did a placement under a neuropsychologist. I have perhaps more exposure to neuropsychology than other clinical psychs and I have a lot of interest in the area, so after I'd been practicing for a few years as a clinical psych, my job, my first job as a clinical psych was in doing assessments: psychiatric, intellectual, and some kind of cognitive screening type assessments all bordering on that assessment kind of focus already. And after two years of doing that I had the opportunity to work in a residential rehab facility for acquired brain injury, I was working under the supervision of the neuropsychologists and the reason I had the opportunity to work there was that there wasn't anybody in the state at the time who could take the last neuropsychologist's job, so I had sometime there, part-time, really building up my knowledge of brain injury, but mostly doing the clinical stuff and a little bit of assessment, not very much assessment, and then when I came here to this state it was a similar kind of situation where they couldn't find a neuropsychologist to take the job at the hospital and so they employed me, and seeing that they couldn't get anybody else to do it, they employed me and I worked under supervision of a neuropsychologist doing assessments. I had external supervision in my first year, and then, in the second year of the job, I went back to do my degree and

to get the qualifications really so that there wouldn't be any of that conflict, which is a potential problem otherwise. Does that answer the question?

Response 2

I: Just in terms of the speciality of neuropsychology is there a differential in the skill base between clinical psychologists and neuropsychologists?

P: Um, Yes there is, and I think there's the obvious one that neuropsychologists have a greater appreciation of brain behaviour relationships, and are probably a little light on in terms of psychotherapy and some of those sorts of skills, and the reverse is probably also true as well. But you do get clinical psychologists who have devoted years and years to their fascination with neuropsychology and have a broad understanding of the area and sometimes in-depth knowledge of one or two areas. My sense is that there are things that you learn from doing the neuropsych Masters course that you just can't pick up through text-books and workshops and reading the literature.

I: And when you said you do some psychotherapy was that included in the Masters or did you pick that up along the way?

P: Yes, ah, thankfully it was included in the Masters program. We shadowed the clinical course for the first year, did a lot of the same sorts of units, so, thankfully, one of the co-ordinators had quite a strong rehab bent and was keen to have units looking at rehabilitation skills and psychotherapy and so on as well.

I: So, yeh that may not be standard then across Masters courses?

P: No, I don't think it is; it certainly wasn't 10 years ago or so. I think times might be changing into...perhaps as a result of some feedback to the courses that they weren't perhaps practical enough, um, and too based in the skills of localising lesions and neuroanatomy and so on, whereas, the market place is requesting people who can be...who can produce change in people and who can get real world outcomes and make people's lives better.

Response 3

I: I've just got a couple more questions, um, I'm just wondering about the breadth and scope of neuropsychology's knowledge and skill base.

P: Where?

I: Where?

P: Yeh, are you talking about, you know, is it in my hospital, is it in me, over the city, how big is the breadth and scope?

I: Whatever level you think, I'm just thinking in terms of education, training, and practice in your experience. I guess, are there...?

P: Well, I was trained overseas and it was Ph.D. training, which was the usual. So, people did a lot more hours in internships and clinical placements than they do here at the masters level of training and I think that it trained up people to a different degree of professionalism so that when they're interacting with doctors and things I found it quite different overseas than it is here. I think people are less well trained, but I think that is changing, you know, there's more doctoral programmes and combined masters PhD programmes, which I think will improve professionalism, yeh, and I think we could use a little bit more in the rehabilitation realm that's more where neuropsychologists are going to be needed, and perhaps there needs be more emphasis on that.

Response 4

I: So what differences have you found, being both a clinical psychologist and a neuropsychologists, in terms of the breadth and scope of the roles and the practice settings between the two?

P: Well, I mean, I guess neuropsychology is a more specialised and circumscribed area in that you're basically assessing people who have had either some brain disease or brain trauma so the, um, just the number of applications is a lot smaller than in clinical psychology, which is quite diverse and, you know, you can work in community health or mental health or neuropsychiatry or, you know, there are a lot. There's a much wider range of positions I guess.

I: Is it a benefit then to have the normal clinical training as well, as you do?

P: Yeh, I think it is because I think that you're more aware of the psychological and psychiatric issues that come up working as a neuropsychologist and I think it is beneficial to have a background in those areas so that you're more likely to detect problems in those

areas and I guess it just makes it more interesting being able to also do some clinical treatment work as well.

Response 5

I: The other thing is, I'm just wondering about clinical psychologists in your state, whether there are any ambiguities between neuropsychs and them in terms of, like, some clinicians may have neuropsych skills and knowledge but aren't technically neuropsychologists or members of the college, but perhaps there is related work that they do?

P: Yeh, I'm...I think this is an issue for a lot of people, it's not particularly an issue that I've been that interested in, but I know that in the state there are a lot of jobs that are neuropsychology positions that somebody does require knowledge of neuropsychology to fill the position and sometimes those are filled by people who officially have a clinical psychology degree, um, usually with some experience or training, you know, maybe one of their placements was in neuropsychology, um, so there is definitely an overlap then. I haven't seen it as being a problem yet, but could imagine that it will become an issue as more neuropsychology programmes develop with specialised training; there'll be an argument for hiring neuropsychologists into such positions.

I: It's just with the professionalisation then?

P: Yeh.

Response 6

I: How would you talk about the neuropsychologist's role in contrast to the clinical psychologist's? Is one narrower than the other?

P: Um, my initial training was in clinical psychology and I guess my conception of it all is that clinical is a big umbrella and neuropsychology fits underneath that umbrella. Having said that I've got a Masters degree in clinical psychology and I'm a member of the clinical college and I was no way in a position to do the work that I do here with just that qualification. But I think that a lot of the things that drive my views about that is that working with children you need to see kids so much in the context of their family and their school that a lot of the conceptualisation of big picture stuff is stuff from my clinical psychology background probably rather than the kind of training that you'd get within a neuropsych course. I think

it's...yes, I'm happy with the way that I'm treated up here, I think that it's prepared me well for work in this kind of a setting. It's probably different if you're a neuropsychologist working in an adult setting where you might have to deal less with some of those systemic issues, and, I think, in this job, I still make notifications of child abuse, I do work in relation to children's behaviour; you've got to manage children while they're being assessed; you've got to work with separated and warring families, so, you certainly need some core counselling and therapy skills, I think, to work effectively, certainly with children.

Response 7

P: I'm kind of fired up about this, this week because I've been talking with a bunch of students who are thinking about whether they should be going into graduate school or not and it's tuff because when they can get jobs immediately, you know, in the graduate programme we charge 13 thousand 14 thousand dollars a year, they can get a job right now with a four year degree without any graduate training. They've got families and stuff like that it's a tuff call. So we're trying to make the point that it does make a difference, we had one of our fourth year students, when she graduated, went and worked in community mental health and in three weeks she had 25 patients in her case load, no clinical training no course work. She did have a seminar coming up, you know, but she was just getting one hour supervision a week, and so 6 months later she quit she said 'forget it', dealing with highly stressed cases, neuropsych cases also, and the supervisor was a speech pathologist.

I: So they're just thrown in the deep end you mean?

P: Absolutely, and I think that two things happen, one is that people who come to see her have a sense that she doesn't know what she's doing so they don't get additional care, you know, people who are in distress, they finally get up the gumption to go and say "I'm mentally ill and I need some help" and they're faced with someone who doesn't know what the heck they're doing and they're turned off and then they go back out into the bush, you know, cause they figure "I gave it shot and psychology was a bunch of..." you know was useless. Um, and that's kind of one of the tragedies is that I talk to people all the time who say, "oh I saw somebody"...I was at a residential school yesterday...students coming in from all over the country and they say, "Oh I went to see a psychologist

and he or she said this, that, or the other thing," and I said, "Well, that's not exactly right," you know, um, "What was the person's level of training?" "Well I don't know he charged me \$75 and that's all I know"...and, ah, is totally dissatisfied and so when I say, "Well maybe you should come to my clinic at some point and we can talk about it," "Oh, I don't know, psychology...I'm taking a class and stuff, but, you know, I think it's just a bunch of crap, you know? They just take my money and they don't really help me"...I don't want to hear that.

I: Yeh, that's right.

P: You know...and these are people in psychology...they're psychology students, so it's a little distressing, when it's a function of people actually going out and having negative experiences and the only place that you can get treatment for free is through community mental health and in many cases the best therapists aren't there, they're hiring fourth year psychologists who are totally overwhelmed...

I: And so the better therapists go elsewhere because the pay is better elsewhere is that what you mean?

P: Yeh, I think so. They go to where the pay is better elsewhere, or they, um, they go into private practice and only see a small segment of the patient population, or they go into academia where they're protected financially a little bit cause they have a salary, or they work for the university clinic or something, you know, and they get paid a salary to provide supervision or see some patients, um, but there's, ah, if you talk to people who are members of the college you really have to, there's no real system you can move into where you can be guaranteed reimbursement for your work, you know, when I was working overseas I could bill for my...as a psychologist I could bill medicare I could bill private insurance companies there are a hundred different private insurance companies, I could be reimbursed through all of those, um, and here if I see a patient it may be that even with people with private insurance it may not cover psychological treatments or, if it does, it covers three sessions or something like that, so that total benefit is a thousand dollars for the year. I spoke to a woman who is a widow and she said 'I've got my widow's gold card' or something like that and she's outside of our network, she had heard, you know, word about this is spreading like wild fire out here about this network because we're providing free neuropsychological assessments. Previously people just weren't assessed they could either go to the city

and so maybe one or two cases every couple of years were sent down there for evaluation, there was just no neuropsychological testing, now the GP's are finding out that there's a value and it really helps the care of the patient in some cases, um, people come in here to be tested and are told by their GP's they have Alzheimer's and they don't have Alzheimer's at all, they have some memory problem after cardiac surgery or something like that, and people are selling their houses and quitting their jobs and stuff because they got some bogus diagnosis, so people are finding out, and the doctors are finding out, that there's actually some value in this and so there are people calling saying, you know, "I wanna get this free testing," you know, and in Australia the Health system provides free care, but we're in the situation now where I've got one intern I have no time to see these patients for 6 or 7 hours to do a comprehensive evaluation so we're kind of in this situation now where people are getting ticked off because only some people get to be seen through the clinic where the other people are thinking, "Well, I should get free assessment too,"..."Well actually it's a \$165 an hour times 10 hours and that includes the report and that kind of stuff," you know, and they're just like shocked that they have to pay \$75 and out here it's 1700... "My god," you know, "What are you talking about?"...

Response 8

I: So, I'm just wondering about the breadth and scope of the neuropsychologists and possible differences with the normal clinical psychologist, yeh could you comment on that?

P: Well it's a different training, in that neuropsychology is part of the psychology stream, but people are specifically trained in brain behaviour relationships so that, their training is specific to clinical and theoretical knowledge about various disorders clinical syndromes and also clinical presentations in terms of neuropsychological profiles. It's really quite different to clinical psychology where it's much more, I guess it's more psychological rather than neuropsychological, if that makes sense.

I: Yep and what about the flexibility I guess in practice settings between the two is there...?

P: You mean can you go from one to the other or?

I: Um, I guess, just in terms of job prospects and, um, yeh the breadth of opportunities to practice?

P: For neuropsychologists?

I: Yep, just in comparison to clinical psychs...

P: Well, there's many more clinical psychology positions than there are clinical neuropsychology positions I think that also relates to the areas where clinical psychologists can work. Like whether you're going to be working with people with cancer, or gynecological problems, or in burns units can be a health psychology area as well as in mental health areas. There's a broader scope, I guess, for people in clinical psychology in terms of the different groups or diagnostic groups or just health areas they can just work in. Whereas with neuropsychology it's very much traumatic brain injury and rehabilitation, psycho-geriatrics, the degenerative dementias, neurology, neurosurgery I guess the area that I'm sort of working in is a bit different from most as neuropsychologists don't generally work in an acute medical or trauma situation where half of our work involves assessment or screening at the bedside, but the neuropsychological work is done with outpatients.

Response 9

I: Um, so what about the education of the neuropsychologists then, is it broadening in terms of the knowledge base?

P: I think that it is, um, it's, and again, it varies across institutions, it certainly was the case, for example, when I trained in Melbourne and we did no clinical psychology in that programme when I trained, um, here there's quite a lot of course work in common between the clinical psychology and the neuropsychology programmes, everybody...so we have the notion that there is a corpus of knowledge and skills that anybody calling themselves a psychologist ought to have and to be able to do and to that end already it's the case that our clinical psychology students are very capable of undertaking neuropsychological assessments. And it is our intent that the neuropsychology students will be very capable of conducting cognitive behavioural therapy for mental health problems of variety and kind even though that is not their specialization...that they will have the skills to be able to make assessments and, you know, do some therapy and so on as appropriate so, um, I think that that does represent quite a significant expansion of the knowledge base in both directions.

I: Yep.

P: I mean I certainly have the feeling that we are training people who will be much more competent than any of us are.

I: Yeh,

Response 10

I: Just in terms of neuropsychology I was just wondering about, um, what you might think about the job prospects, how it's going in terms of the breadth and scope of what practitioners are able to do in contrast to perhaps a normal clinical psych?

P: Well, compared to say within Australia, psychology has got a real battle on its hands I think and neuropsychology has even more of a battle, um, mainly because the diversity in the level of training that's allowed when you think about getting registered as a psychologist. So the fact that you can have a four year degree with no clinical training and become provisionally registered and then get supervision when they've had no clinical course work and they're kind of thrown into the deep end, it's shocking how people can do that, I don't know, um, but the problem is that 70% of people in Queensland are four year trained psychologists and so now that there are clinical programmes available, ah, and I think employers are seeing the difference between someone who has clinical training and people who don't have clinical training, they find that the training resources that they have to put into the person as far as the problems that come up with turnover and burnout and all those kinds of things, I think the tide may shift, and for neuropsychologists in particular the difference between training here and someplace like in the US, um, again is vastly different, they're just now developing Doctoral training programmes for clinical neuropsychology and the people that I've spoken to who have had the two year post honours programme, neuropsych training programme, ah, they're complaint is that they get good training in the theory and administration of tests, but they don't have enough time to really develop the other clinical skills that you would get in a typical clinical psychology training programme, so it's almost like a trade off, and for anyone who works in neuropsychology you find out very quickly you really need very strong interview skills very good skills like understanding social networks, and doing couples treatment, and dealing with your own grief and reaction to some pretty horrible situations that come down the pipe in neuropsych, so, um, as far as opportunities, the main barrier is that psychology

isn't funded through medicare, so you can go to a community mental health centre, but with all the private practitioners it's fee for service essentially, um, for neuropsychologists, in order to have a practice, you really have to get hocked up with insurance companies or with attorneys or to just essentially be available to those who can afford a hundred and sixty five dollars an hour, which is, you know, totally unfair to the people who can't, especially in rural areas, When I first got here I was the only neuropsychologist for quite a distance, so you'd have someone who would fly in periodically or whatever, but um it's a very different, you know, mentality, and so when you think about, are there opportunities for people in neuropsych? You have to really hustle and from what I can see there's a lot of GP's who don't even know what it is, and so they're not referring because they don't even know the usefulness of it. There's a lot of education that has to go on in the medical community to understand the value. Um, we're doing some stuff with head injury right now I'm meeting with physicians and talking about, you know, 'yes there are batteries of tests you can use to find out whether or not someone's concussion is resolved or not'. Um, speaking with a bunch of GP's on occasions I've said, 'so what do you do with people with head injuries'? 'Well, we can't even do anything so we don't even tell people it could be problem', and I say, 'well, there is neuropsychology, you know, and there's a battery of tests, and you can actually...', you know, especially if you have base-line data on people you can tell if they've changed on their various things. So, there's a huge need for educating the people who are controlling the money and also for the people who are controlling the referral system and that's true for neuropsychology, but also for this idea that GP's are seeing 70% or 75% of mental health cases is also idiotic, and, I mean, it just doesn't make sense to me.

7 Supply and demand for neuropsychologists

Response 1

I: Regarding the supply and demand for neuropsychologists, what have you noticed?

P: I'm not entirely clear on the demand in South Australia, but I know, in the past, the demand exceeded the availability there; there isn't a University based training programme in South Australia. So neuropsychologists would be trained via the college, which has a programme, so people would go via that route and I think it's 4 years of experience, so it's

the two years plus another two years I think. And as I said, there definitely is a, um, the demand is higher cause they can't get neuropsychologists to fill their positions over there. Here, currently the demand exceeds the availability of neuropsychologists, however, we've got 4 university based programmes and a couple of them are reasonably new and this year the first graduates from the Monash program will be released into the community and that will then probably balance it out, there'll be a balance there. Possibly in the future the availability will exceed the demand that's a possibility because we have these four programmes and Melbourne Uni has an intake every second year rather than every year. The other factor is there are quite a number of students, probably in all programmes who are taking longer than they should to finish, so they're going to finish at the same time.

Having said all of that, one of things is that there are more and more positions becoming available for neuropsychologists. The CDAMS that's pretty much a state-wide system: there's different regions and they have the community based clinics for assessing memory and the demand for that will, I mean, the demand is already there, there's huge waiting lists for all of the clinics. If the state responds to that level of demand then there'll be new positions created for those clinics.

I: So there's a demand it's just a funding issue I guess?

P: Yes.

I: And, then, perhaps, there's so many courses they might have to slow the output down a bit?

P: Yeh, also send people interstate cause there is only one neuropsychologist in Tasmania, and I think there's only one...there's definitely only one in the CCN, and Western Australia has very few CCN members, they have some neuropsychologists over there...the Northern Territory has one neuropsychologist, maybe, so yeh, whereas say in Queensland there's quite a few and New South Wales there's quite a few; Victoria has the most neuropsychologists.

I: So people might have to be prepared to move around a bit?

P: Yeh. And the other difference in one respect is that Victoria has civil indemnity for accidents. They have a no fault system so it doesn't matter whether you were

at fault in the motor vehicle accident or not you still get all of your medical services paid for. So in terms of neuropsychology that's the area I work in, so I work in a private hospital, but all my patients are covered by what's called the TAC, which is the no fault system for motor vehicle accidents.

I: So what does that do?

P: It just increases the availability of money to pay for neuropsychological services, unlike in other states where they might have a fault system like where you are, um, in South Australia.

I: It has to be paid by insurance is that what you're saying?

P: Who would pay for a neuropsychologist in South Australia? Well, unless you're a compensable you wouldn't get the same level of service, whereas here all motor vehicle accidents are compensable, and therefore everybody gets the service. So in terms of just the motor vehicle accidents, more people would get the service in Victoria than in South Australia because there's someone to pay for it and that's the TAC, but in South Australia, unless it's like if you were at fault, you wouldn't be compensable, and therefore you wouldn't get the same level of service.

I: Oh right

P: does that make sense?

I: You mean that they don't get treated?

P: They will be treated in the public system, and therefore, you know, that's going to be limited by the state's health budget, whereas here, they have this kind of additional area of source of funds and you see that with public neuro-rehab facilities...and that would be for if you fell off your roof or fell off your ladder or were assaulted, and so, for example, in South Australia, basically, motor vehicle accidents who are at fault, they go to the public system where they have to share resources with people who fall off ladders and fall off rooves. In Victoria there's no competition, you know, those people who were in motor vehicle accidents, they get treated in the private sector, and those who fall off rooves in the public sector, so they're not competing in the public sector. You know what I mean?

I: Yeh, I see.

P: And there's only so much money in the public system.

Response 2

I: In respect to the proliferation of postgraduate courses in neuropsychology in recent years, I was just wondering if there was currently or foresightedly any issues with supply and demand?

P: I think um...I think the early thoughts we had about these courses coming on board was that there would be no jobs for graduates at the end, so, when I went through I graduated in the mid 90's, ah, we had to move interstate to get jobs, now there are four courses in Melbourne alone. My understanding is that graduates are getting work and it's having a bit of a reverse effect, such that, the more graduates that you churn out, the more jobs seem to be opening up. So I guess the word out in the market place is that neuropsychologists have something unique to offer, and, I guess, they're sort of well placed to provide those services.

I: Yeh, that's interesting. So there's a burgeoning effect I guess?

P: Yeh, I guess it's like, if you go and create a big freeway, you're going to get more traffic.

I: Yeh, that's right.

Response 3

I: With the output of neuropsychologists then in the state is there any kind of issues with supply and demand? How are they taken up into the system?

P: Well that's a good question. I find that there's work available generally more than the neuropsychologists, um, not compared to a psychologist, cause obviously there's more psychologists to neuropsychologists and more coming out of the programmes accordingly, but that said, I personally have not had trouble finding work as a neuropsychologist, but that work is more sporadic and the biggest thing that I find is that they don't usually have enough money to support them in the public system so there's a huge demand of...like at the brain injury unit that I worked at, it was a huge demand on, um, in terms of what you need to do versus the amount of hours that you had to do it in, and I was arguing up until the point I left to be making it a fulltime position because it was for 50 patients and I was only

there for...and I had to fight for two days a week, originally it was only one day a week for 50 residents, which is just ridiculous considering that you're sort of liasing between family members and the testing takes a long time, and then you're trying to focus on some rehabilitative techniques. So, um, you can imagine, it's probably just a little bit unrealistic to try and meet all the needs in that time frame, ah, that level of employment, you know?

Response 4

I: With the burgeoning of the neuropsychology courses in recent years across Australia is there a corresponding place for them in practice settings?

P: Ah, I couldn't give you an accurate figure, but I am aware of the fact that in Melbourne where lots of courses are, I've been told, that it's relatively hard to get a fulltime job, and there's lots of people doing bits and pieces of sessional work here and there, but as for the other states, I really don't know. I think many of the University of Queensland graduates have probably got jobs in Brisbane because the course, I think, opened at a time when there was a need for clinicians, and so many of them went into jobs, whether that's absolutely current right now, whether they've flooded the market there, I don't know, you'd have to speak to the course controllers really to find out the answers to those questions.

Response 5

I: Do you know anything about the supply and demand for neuropsychologists in your state?

P: Um, I think there's a good demand for them and I think there's always an interest for creating more positions from people that are referral sources, but I think because neuropsychology assessments aren't funded by medicare, you know, the hospitals are reluctant to employ very many: they don't seem to be getting value for their money or something, I don't know, they really don't want to pay the salaries of somebody who can't charge medicare. I don't think there's enough appointed to meet the needs and I know that within my own hospital we've had positions frozen for ages, so even positions that are in existence don't get filled because admin is resistant to keeping them offered, they're not up to normal levels for some reason, I'm not sure why that is, whether that's just budget or the new award that they can't afford to pay people, I don't know, but I think it's short.

Response 6

I: What are the supply and demand issues for neuropsychologists at the moment?

P: In this city it's good, well good from our perspective, um, there seems to be more jobs than there are clinicians to fill them, but that varies. I remember when I was in about second year of my course there was a complete dearth of jobs and we were getting a bit worried that we wouldn't get jobs when we graduated, but it's really turned around since then and there's lots of positions and in fact I know in some places that they can't get someone to fill their job. That's what it's like in Melbourne, I have heard that it is more difficult in Sydney, but I don't really know.

Response 7

I: You're a member of the college of clinical neuropsychologists?

P: Yeh, I am.

I: Um, what I wanted to know, ah, just with the proliferation of neuropsychology post-grad courses across Australia, I was just wondering whether there could be, ah, too many within the niche I guess, and um...?

P: Absolutely not, well I don't think so, um, I think in psychology the number of...the work that we can do tends to be endless within the public health system and so, for example, you know, with clinical psychologists, as there's more and more courses and more and more graduates coming out, there's more and more positions, but I think the same would happen within neuropsychology. I think it's a great thing that there's more courses, and more graduates coming out.

8 Role boundaries between specialties

Response 1

I: What about usurpation, are other specialties usurping neuropsychological knowledge?

P: I don't know, I don't think so, I think there's always that tension at the boundary of your role, you know, there are things that I do, that psychiatrists do, that clinical psychs do, that occupational

therapists do, but I haven't experienced that as leading to a role loss, I think what's been probably helpful has been the move in medicine towards more evidence based medicine, so the medical people are learning to do big brief screening measures like the hyper hospital anxiety and depression scale (an inaudible list of tests)...neuro-cognitive battery, but I suppose some people could see that as usurpation, but I certainly don't, I think it means that more of the patients are getting an objective measure than previously, and then the referrals we get are better informed, so by the time...sometimes when someone's referred they've already had a series of quite well standardised measures delivered by the doctors and they give me the scores, but sometimes the measures answer the doctor's questions and I don't even get the referral, and I'm happy with that. And sometimes they think there is a problem, the screen suggests there's a problem, so could you now check if this really is the problem, and I'm happy with that. So no, I don't think there's a problem with usurpation, there may be elsewhere not in (inaudible), I think that's possibly because in the public sector we've seen that we've got way more work than we can do, there are many people who should be referred who are not, just because we won't have time to see them. So the more other people can do the better...yeh, this might be seen as usurpation, but I think there is often a wish by others that for example, neuropsychologists give a whole lot of tests and so only see a certain percentage of patients, could we find a short variety of tests to do the same thing? But when they can't, and they don't want to spend two to four hours seeing a patient, at that point they hand them over.

Response 2

I: What's the relationship like with other specialists that you mentioned when you're dealing with cases?

P: Oh, usually not too bad, you mean neurologists and psychiatrists?

I: Yeh.

P: Yep, usually not too bad, obviously I think it does depend on the individual a little bit. I mean, some consultants have more of a traditional perspective, I guess, in terms of not really, I think, understanding fully what neuropsychology offers. There have been other consultants who, I think, have been very respectful of neuropsychologists and their opinions and so forth. I think it really comes down often to what

their previous exposure's been; whether it's been to people who are good at what they do or whether they've been exposed to people who aren't particularly necessarily that good, and then they sort of make judgements about what neuropsych can and can't offer.

I: So they over-generalise perhaps?

P: Yeh, a little bit, but I mean in my particular work I've got a pretty good, bi and large, I've got a pretty good group of neurologists, usually, who I'm dealing with, that I work with. There's a couple that I think, you know, wonder a little bit why I get paid, but that's, I think, they're the exception rather than the rule, certainly.

Response 3

I: So how does your role relate to other specialities in terms of seeing and dealing with patients on a day-to-day basis?

P: You mean ah...I work on an interdisciplinary team?

I: Yeh, that's right.

P: Yes, I work with occupational therapists and speech therapists, and so on, and ah, we like to think, I guess, that we work hand-in-glove with the other disciplines. Certainly we speak weekly about progress with the clients and so on. I think probably the idea of doing interdisciplinary rehabilitation in this area is probably over stated because, I think, it's hard to get that symbiosis in terms of two different therapists working with the same client at the same time.

I: What do you mean by that, is it better to work one-to-one?

P: Yeh, I think...I'm under the suspicion that you would be better off having some more generalised skills perhaps in an area, um, sort of occupational therapy skills and so on as well, and perhaps working on those exclusively with a client, and working them back into a vocation, doing psychotherapy, assisting them with difficulty getting out into the environment and so on. Either that or in fact you really do have to call what you do multidisciplinary, and you regularly inform the other therapist what you're doing, um, and maybe give a little bit of advice hear and there and receive advice back from them as how best to proceed with the client, but I don't think there's anything magical in the team approach to rehab, I guess.

I: OK, so you think it is good to reduce them bouncing around from one specialist to another?

P: Yeh, I think they would get lost in it sometimes and you get a lot of overlap...and the other thing you get is the need to transfer large amounts of information between treating therapists and so on.

I: Yeh, time consuming.

Response 4

I: This touches on my next question, I guess, on role boundaries and overlaps, and perhaps role losses...

P: Yeh, there is a fair bit of that that goes on in a team, um, I guess specifically the role of the psychologist or neuropsychologist on the team often overlaps with what social workers do, especially with regards to counselling as they see it. So often you will go to see a client because you know that they have been referred for problems of a psychological nature and yet, for instance, the social worker may have been in there for a week or two prior and have started on a range of therapies, and, I guess, this has caused some consternation amongst the psychologists because we feel that...we feel that we spend, you know, 4 to 6 years learning how to do that stuff and really it's only part of the skills that you'd be taught within a social work course. So there's that sort of overlap. In my work as a neuropsychologist there's also an overlap with occupational therapy as well from time to time. Because I like to be very hands on in my approach a lot of the strategies and so on that I would recommend to clients involve me actually getting hands on with them and looking at different ways to go about tasks using perhaps different cognitive strategies and so on, and that does look a little bit like what occupational therapy does.

Response 5

I: So, um, in practice settings then are there multidisciplinary teams that you've been working with?

P: Absolutely, yep, in the majority of them yes. And, you know, it seems like, for example, the brain injury unit that I worked at you had a team of, ah, a rehab consultant specialist, a neurologist, and several nurses who would come in, you know, just whoever could just rotate in, and hopefully if they were...I'm talking about in terms of case reviews of patients, ah, because of course in there we don't have as much turn over of patients so we often do like a regular review

of them and so you'd do that with OT's, physios, speech therapists, social workers, and the other people I mentioned.

I: Right and how are the role boundaries negotiated is it fairly clear for the neuropsychologist's role?

P: Um, I find from place to place yes and no. Ah, the place that I was at my rolee was very clearly defined but typically I find that, particularly with occupational therapists at least here, there's a lot of blurred boundaries a lot of them are doing some cognitive screening with tests I've never heard of - I think they've designed them within their own field - but there's a lot of, um, issues there in terms of what's appropriate for who to do what and I know there's been some serious battles within certain public sectors here where that's been more of an issue and fortunately I haven't worked in those as much, but I'm definitely aware of them. Even just getting referrals from those places I've had some trouble trying to interpret some of the cognitive stuff that's been conducted by somebody who's not a neuropsychologist and then finding that there was no neuropsychologist who saw them because it went to an OT - this is for people who sort of move into our district you know?

I: yep.

P: And so I can't really get a good background and I end up having to redo a lot of stuff that supposedly was done by this other person, but because they don't use the same measures or approach it with the same conceptualisation it's almost useless. And so it seems like someone's been without neuropsych input for the two years or whatever - a year or six months or whatever they've been in the previous hospital, and often the most crucial information to me is the progress over the first few months post-injury and I wouldn't have it. So, I find that to be an issue looking at it from my own in-field perspective you know? So it does it certainly varies a lot I can say from place to place.

Response 6

I: OK. So what's the community like between various specialities in respect to the knowledge produced in research and practice?

P: Ah, what do you mean by specialities...in terms of neuropsych and clin' psych or do you mean more...?

I: Yeh, just in the cognitive neurosciences and the various practice specialities.

P: And you want to know how the information is shared around?

I: Yeh, whether they communicate particularly well and...

P: Um, from time to time we have workshops and speakers who have a bit of an interest in certain areas of cognitive neuroscience, um, we don't get a lot of it, there is probably a culture within this state of not going beyond the bounds of what we have been trained for, that is, not straying too far from the tree, I guess, of what you've been taught in your course. There have been a few more people recently that have come into the area challenging some of the traditional views of pure neuropsych and trying to expand the horizons of it, I guess, and that's been met with resistance because there's a feeling that sort of goes beyond our understandings and competencies.

I: What sort of expansion?

P: Into the area of psychopharmacology for instance, um...and my work that I do with brain injured people has been questioned because I was seen not to have done a clinical psych Masters, and really I was intruding in the area. So even though my job...if I'm going to feel like I do my job properly, I absolutely need to do psychotherapy, and it's probably the greatest tool that I have. It has been suggested to me that I'm not qualified to do that.

I: So with the speculation about the inclusion of pharmacology was that to include prescribing and monitoring?

P: No, well possibly getting into prescribing, but more in terms of the understanding of brain behaviour relationships, and perhaps referring or working through medically trained professionals to get change out of people.

I: So understanding how the drugs affect the neuro-behavioural activities and outcomes?

P: Yeh, and how different brain-states involving neurotransmitters, neurochemical, and hormonal changes affect behaviour as well.

Response 7

I: So, um, is there a fair bit of this research going on then?

P: Yeh, in different pockets and people are talking to each other and working on ways to collaborate across the country, which is good.

I: Are there any sort of organised research networks?

P: There is one that we've just put a proposal together for between some people from around the country who are each working together on different facets of the issue. So there's been a call recently from the Australian Research Council for proposals for networks to work together and try and get some funding.

I: So how do they get started then, do you just basically know the people who are working in your area?

P: Yeh, you just think about who, I mean, this call came out for the possibility for network funding and our centre had a meeting to talk about who might be some of the best people in the country to work with who have the expertise that we could learn from and how could we contribute as well to their work? And so we came up with a few names and contacted them and they were all very keen and supportive so it's grown from there and actually a lot more people that we didn't even think of have heard about it and been keen to get involved. So the list of people now that have put in on that network proposal is larger than expected so it is just a matter of keeping up with what other research groups are doing and then getting in contact with them and asking them if they're keen to collaborate.

I: What was the name of that organisation, did you say?

P: The Australian Research Counsel. So it's one of the nation wide funding bodies and we'd been thinking about ways of developing our work so that it is reaching clinicians and getting out there, and so this was a perfect way to try to do that.

Response 8

I: So, do you teach medical students then?

P: Yes.

I: Is it health psychology or is it a neuropsychological component specifically?

P: I don't any more, I used to certainly, I used to teach X-year medical students in an introduction to psychological assessment, and in particular, just sort of ran them through things like the WAIS and stuff like that to get them familiar with intellectual assessment, it's pretty low level stuff. And then I subsequently also taught medical students who would...used to rotate, they'd spend so many weeks in different settings, and when they came through the psychiatry setting I used to give them a lecture on basically what neuropsychology can do and when it is appropriate to refer to us, what sort of cases, so it was slightly more clinically oriented to help them down the track if they become practitioners.

Response 9

I: OK. So um, how do you receive patients then, is it just referrals within the hospital?

P: Oh, yeh, within the hospital from various medical units, medical and surgical units, but also probably close on a third of the referrals would actually come from outside of the hospital, from general practitioners or medical specialists outside of the hospital. We don't see everyone from those cases though, they basically have to either live within the hospital's catchment area or they must have a pre-existing record number with the hospital. So in other words, if you lived on the other side of the city and you've never been here, we wouldn't see you. If you lived outside the catchment area and you had a hospital medical record here we would see you, and if you lived in a suburb near the hospital, but didn't have a hospital record number, we would see you.

Response 10

I: Could we just talk a bit more about the sharing of knowledge, um, just anything that you can mention between disciplines?

P: Well, I think I'm very lucky because the research centre that I work within is very much a multidisciplinary centre where we have contact with other departments within the university such as philosophy and psychology. We also have already established links with some of the neuropsychological units in hospitals so there seems to be generally a very supportive and interdisciplinary team approach here, so I am always speaking to other people that are outside my discipline and it's very helpful to make you think about things from another perspective and to

influence the way that your work is run. I guess we have a lot of meetings, a lot of research presentations from outside the unit - the research unit - where the ideas can be exchanged. So that's how knowledge is shared: we would loosely just talk about things and have an open platform for that. Um, whereas, at other places where I've worked, that hasn't happened: it's been very much an insular sort of environment. This place is really good for that sort of sharing.

Response 11

I: What's the relationship like between practitioners from different fields? How do they interact in terms of sharing knowledge and the usurpation perhaps of neuropsychological knowledge?

P: What do you mean, different medical specialties?

I: Yeh, I guess.

P: What's their knowledge like? Oh, it depends, it really does; it depends. I mean, the people that use us quite a lot appreciate what we can and can't do, and you can tell that by the nature of the referral questions and the patients they send you. Generally speaking, those that have the best appreciation of what we can do, tend to be, and of course this is where most of the referrals come from, from psychiatry, neurology, geriatric medicine, neurosurgery, and rehabilitation medicine - don't think I've left any out - but after saying that, there's the odd person around - like I get a few referrals from peripheral areas - that have a reasonable understanding, but that's fairly much at an individual basis.

Response 12

I: What about GP's, do they send them to these other specialists in the hospital first?

P: Ah, they often send them directly to me. Mm, I'm sure they send them to other specialists as well and sometimes those other specialists then send them to me, but I do get a lot of referrals just direct from GP's, and again, it seems to be largely the same GP's that send people to me, or at least GP's from the same practices, as if over the years they have developed a knowledge of what we can and can't do, and I think there's a little, I suspect there's a bit of word of mouth out there in the suburbs between GP's, because I've seen, from 15 years ago, 2% of our referrals came

from GP's, now probably about a third do. So, obviously word got around that we can do certain things.

Response 13

I: What about in terms of collaboration in research?

P: What, for me or generally?

I: well, not for you specifically I suppose, but just in terms of the different fields like you mentioned in the hospital departments.

P: Yeh, neuropsychologists do tend to, particularly the clinically oriented ones, collaborate with other areas, it's almost a matter of necessity, cause the participants are patients and they usually have a disorder, or injury, or whatever that puts them under the management of some sort of medical team, or surgical team, so, often there is, out of necessity, a fair degree of collaboration. And I mean, there is lots and lots of research going on, I just can't give you great examples of other peoples work, but I do know that there is a fairly high degree of collaboration. I mean, in my field I collaborate with, particularly, (X type) surgeons and neurologists.

Response 14

I: Okay. So pathology fits in fairly broadly in terms of the differences between the specialties in medicine?

P: Yes, well, of course the pathology department has got lots of different pathology expertise, and with the neuroscience expertise, we basically are closely linked with the neuropathology divisions at hospitals.

I: Okay. Is the communication fairly good between researchers, their work, and practitioners?

P: Yes, we actually meet once a month for a seminar series to promote interaction between the diagnostic practitioners and the teaching staff at the university.

I: So in terms of collaboration, is there necessarily more these days than perhaps in the past?

P: You mean what...collaboration in research?

I: Yeh, collaboration in research...between researchers...

P: I think that's a given because research has changed so much now because you can't be an expert in everything. So, whereas before you could be publishing papers and just reporting on the pathology you see down a microscope, nowadays you have to give the complete story. So you have to add biochemistry, electrophysiology, physiology, and neurology outcomes. So when you do experimental research, it's really a team of multi-disciplinary researchers.

I: Right. So do researchers in the pathology department interact with researchers from other departments, as well, is that what you mean, or...?

P: Yes, although we also have a lot of expertise in house, because pathology is kind of like a very broad area, you can have molecular pathology, cellular pathology, anatomical pathology. So we do have a lot of expertise in house, but we certainly collaborate across disciplines. So for example, the team that studies brain injury is made up of neurosurgeons, neurologists, neuropathologists, and anatomists.

I: In that respect, in terms of the knowledge that is produced then, is there a problem with role boundaries and usurpation etc?

P: Not really. I think most of the work gets published, and everybody's a co-author on that paper who participates actively in the research. And then you'll find that different people go to different meetings. So for example, the neurosurgeons would go to a neurosurgery meeting, they might report on the research there, and the neuropsychology people would go to a neuropsychology meeting and report it there. So I think that each person feels that they own that piece of the research, and that's fine, and they're the frontrunner then - front-person - for that piece.

I: That's all the questions I've got for now. Is there anything more you'd like to comment on?

P: Not specifically no. I mean, basically you're just looking into new developments in neuroscience right?

I: Yeh, that's right, just how research is done and the interaction with practice.

P: Yes, I think pathology's kind of unique because we're interacting all the time with basic scientists and clinicians because that's what pathology's all about.

Response 15

I: So what's the community of neuropsychologists like in your state?

P: I find that here there are a fair number of neuropsychologists who are interested in liaising with each other and discussing cases and talking about research, we've organised for years, rounds that invite people from all around the city to come, um, and it gets varying attendance. It's just a difficult city to get around and of course everybody has lots of commitments, so it's not easy to get together. I sort of feel like of it's a bit of a network: you get to know who's in the different hospitals and people seem to be very cooperative if you call up and need results from some previous assessment, you know, that kind of thing works fine, but in terms of a big group getting together it doesn't happen often enough from my perspective. Luckily I work in a place that has a few other colleges right on site. I feel sorry for those people who are working as sole practitioners; I think that's really hard.

I: So the college doesn't put together too many professional development courses or...?

P: The College puts together a few a year as far as I know. One of the problems is that they tend to be held at X, which is quite a distant campus from where I am, and I don't make it to very many of those to be honest.

I: So is that kind of communication helpful when people have, like, because neuropsychology has various specialist areas so it's helpful to extend your knowledge, I guess?

P: Yeh, definitely and I've made a good effort to put together a list of contact addresses and how to get a hold of people in different areas.

Response 16

I: In terms of the patients that you see, are there any, ah, issues with the boundaries for the neuropsychologist's role and other specialists involved in cases?

P: In terms of the clinical work?

I: Yeh.

P: Oh, yeh, occasionally: there's boundary stuff to do with other members of Allied Health. Often with

patients undergoing rehab there's a lot of communication between the neuropsychologists and the occupational therapists, speech therapists, and the social workers and occasionally there are differences of opinion about whether the person might be able to go back to work or not or if they need further therapy or whether they can drive, just things like that, but, um, it works pretty well amongst our team and other members of the team at this hospital I think. Another thing that occasionally has happened...has been some debate about who was supposed to be giving these kinds of tests, but it's worked out pretty well here, like one of the things we discovered a couple of years ago was that the OT's were giving the stories from the Weschler memory scale as sort of therapy and we've worked that out: they don't use that sort of stimuli anymore, they use other stories for the same kind of therapy. And the Boston naming test and the PALPA batteries have sometimes been points of overlap with speech therapy, but it's not that bad. It's worked out. We share data when it's relevant.

Response 17

I: How do you, in your role, and neuropsychologists generally, relate to other specialists? How do the roles differ and overlap?

P: Well, in this hospital, the medical consultants are like a case co-ordinator: they hold the responsibility for anything that basically happens with all of the referrals. So, I kind of feel like I'm part of a team, and usually, the person that's directing what's happening within the team is a medical specialist. So, that's kind of where I sit. I think I've got a very good working relationship with the majority of the medical consultants that I work with; I think they usually make appropriate referrals, appropriate and timely referrals of patients that I want to see, and they are very happy for me to suggest referrals, um, and then, if I think that patients need to be referred on to other people within the hospital, then you've got to go through that person, but they're usually really happy to do that. So, working within that system, I think, it works reasonably functionally for the patients and for me. It might be...it's a different kind of system to other jobs where I've worked in a community-based setting where you've got more of a leading role in the overall management of your patients, so, in a hospital you're never at the top-rung of the ladder.

Response 18

I: So what other specialists do you deal with on particular cases?

P: In terms of specialists, my definition would include our speech therapists, occupational therapists, and physiotherapists. I deal directly with them in working with the patient, yeh, so it can really vary, like if the patient has a lot of memory problems, I'll work a lot with the speech therapist because the speech therapist has a lot of the memory remediation and memory therapy, so I'll assess them and then be talking to the speech therapist about approaches and stuff like that. If they have, say, a physical problem and they've got to do a lot of work with the physio I might work with the physio on things like motivation and goal setting and helping them to, you know, if they're struggling with therapy or if they've refused, or just anxiety sometimes around issues of standing and things like that, so I might work with the patient and with the physio' and with the OT. It might be something like...a lot of the time it's around goal-setting for return to work issues, like I'll do a lot of problem-solving and goal-setting and trying to help raise insight and awareness of various problems that might impact on their ability to return to work. And I work with the OT on what they've found functionally as being issues for return to work and then tie that back into my therapy to say, well this has been observed and this may impact on your ability to go back to work at the level you might expect to or in the time frame and so on. Also I'm close to the rehab consultant who is the doctor in charge of the patient's rehab, um, and he/she has a very overall kind of guiding approach for goal setting for inpatients and outpatients and making sure that all different areas of the patient are being taken care of so...

I: Right, so is that person's responsible for the case in general?

P: Yep. So both medically, you know, any high blood-pressure or any medical issue or injury, injury management or any of those things that's his/her role, and also the big picture stuff like what date of discharge and discharge destination and he/she would talk to the physio about level of tone and spasticity management and should we go down a route of Botox injection or surgery or should we just keep going with a range of movements and stretching and stuff like that. So she's/he's got input into all the different areas as well and that would be for me as well, say, if

there was an issue of depression he/she would have an input and say: 'Okay, well, should we go down the line of medication for managing this depression or should we continue on with more of just the counselling at this stage'? That kind of thing.

Response 19

I: In respect to the relationships with other specialists, um, is there a fairly clear boundary between roles and functions, like, is there a potential for appropriation or usurpation of neuropsychology's knowledge?

P: Ah, it's interesting because roles are different, and what I do and where the line is drawn between what I do and what someone else might do is different according to which specialist I'm working with: some specialists are very happy for me to do 90% of something, whereas another specialist will be very happy to do some of the, I guess, the more generic work themselves. So, some specialists, for example, will get a lot of history about a child's development and their school progress and so when I see a kid all that information's already been gathered. Other people, at the moment they hear school problems, will write a referral that says 'school problems', and will leave me to do all of that work. So that's in relation to medical colleagues. In relation to speech, OT (occupational therapists), and physio colleagues I think probably speech pathology and occupational therapy are more and more taking over, I think, some of the roles that neuropsychology might have done previously. I know in relation to, for example, assessing children's sensory and fine motor skills, in this system the occupational therapist sees that very much as their domain, whereas I'm aware that colleagues, particularly American colleagues - neuropsychology colleagues, would think that that was very much their domain, other examples are...examples that I think are most striking are examples in relation to rehabilitation: neuropsychology literature is fairly sparse in relation to rehabilitation of children after brain injury, and there isn't a lot of evidence that might be helpful for these kids. However, our OT and speech pathologist spends a lot of time doing rehab of language, and memory, and organisational skills, and attention and concentration, which I think should be quite reasonably within what a neuropsych would do, but what they're doing doesn't have any, usually, any research evidence behind it, so that's a bit of a tension, and I think that's a similar picture in adult rehab settings as well in terms of neuropsychologists

feeling like I do that we're restrained in doing things which are evidence based and some of our colleagues not feeling restrained by those things, and from the families perspective, it's at that time when families are usually pretty vulnerable and grasping for whatever people think might be helpful. I think, you know, some of the kids spend a lot of their time doing rehab exercises with the speech and OT in this place.

Response 20

I: So, um, just a few more things just in terms of role boundaries with other specialties such as neurology, neuropsychiatry and speech pathology...um is neuropsychology's role and knowledge base widely known or is it an education battle and that kind of thing?

P: No, I think it is, I imagine it depends on what hospital you're working in. The hospital where I work there's several neuropsychologists so the role of neuropsychology is quite accepted and well known, whereas in other hospitals there is sometimes just one neuropsychologist, and whether it's because services don't think they need someone or it's a money issue I'm not quite sure, but the role of neuropsychology is certainly generally quite well known I would think in most of the main teaching hospitals. And just in terms of other disciplines I think it's quite well known because there are conferences like the ASSBI meeting which is the Australian Society for the Study of Brain Impairment, which is a multidisciplinary meeting. There are a lot of rehab specialists, speech therapists, physios, and OT's who go to that meeting. So, if people are involved in that area whether it's neurosurgery, rehabilitation, or traumatic brain injury, then these other allied health areas would be familiar with the role of neuropsychology.

I: Okay, so in that respect, that helps with referrals and sending the patients to the right place for the right purposes I suppose then I guess?

P: Yes, well I believe so and I think that neuropsychology's well utilised. It's main difficulty is the time that's required to do an assessment, which lends it to be economically not as, I guess, not as well regarded. If you were an administrator you'd be thinking, well, you know, someone can see 5 cases...5 clients in the time that it takes one neuropsychologist to assess one client averaging out for face-to-face work, but that I guess is where it's important to have appropriate results.

Response 21

I: What about the future of neuropsychology and perhaps clinical psychology as well in terms of expanding roles or including pharmacology perhaps? Are there any kind of plans being made or...?

P: Well, not that I know of for neuropsychology. I know that in the states psychologists have limited prescription powers and I don't know, I mean, I've seen that occasionally mentioned here, but I don't know whether that's an issue. I wouldn't think that neuropsychologists would be in a position here to do that, and I also think that you'd probably be looking at a neuropsychologist needing to be Ph.D level, really very well trained and a clinical psychologist to have those sort of prescription rights. I don't think a Masters level person should be doing any prescription.

Response 22

I: What about role boundaries and definitions with other specialities, how is that negotiated and is it clearly understood do you think?

P: I think, it is really, yeh, there's probably...at times there can be a little bit of crossover perhaps: other medical specialities like psychiatry or perhaps neurology sort of like to do a little bit of cognitive testing, but I think that it's usually understood that that's just a very rough and unreliable indication, and the other overlap, I guess, would be with occupational therapists who, um, through the functional testing that they do, do get some indication from cognitive testing, but, you know, really we're looking at different areas so it's, yeh, probably not a major issue I think in most settings certainly not in my setting anyway.

I: How do those various specialities interact then? Do they, um, work on similar cases sometimes or handball patients around to various specialists?

P: In one setting that I worked the person would be seen also by a psychiatric registrar and as well as doing the usual interviewing they might also do some sort of, um, brief cognitive testing. So, the person would be seen by a number of different people: within a memory disorders clinic the person would be routinely seen by the registrar and also by me.

Response 23

I: Okay. What about neuropsychology's role definitions and boundaries with other specialties? How are the students educated around that?

P: I have to say that other people have always been much...other neuropsychologists have always been much more worried and troubled by this than I have, so I've worked in big hospitals for most of my working life and I just never regarded it as a major issue. I see that sort of the territory between disciplines is somewhat elastic and I also see that there is a certain amount of overlap and I see that, you know, there is a potential for anxiety around that, but I actually also feel that what neuropsychologists do, occupational therapists and speech pathologists don't do, and so, you know, I never did become very engaged in that issue really.

I: Okay, so what are some of those distinguishing features then?

P: Well, um, the principle thing and the most important thing, the thing that I think is often forgotten, is a very different knowledge base and conceptual framework: so the capacity to know whether a person is performing badly on a test because they're delirious or, you know, because they've got specific (inaudible) deficits for example, so, um, insofar as...especially as neuropsychology is a diagnostic tool, which I principally regard it as being, anybody can administer, you know, OT's can administer tests, anybody can administer tests, but not anybody can know what the results of a test administration are or mean and it's that really that I think that therein that the expertise in neuropsychology lies, and I think that that is well recognised by the doctors for whom we are often doing these assessments, you know, you don't see referrals to...in hospitals you don't see referrals to general mental health workers, you know, where it's inconsequential to what the discipline is, what you get are referrals to neuropsychologists for expert advice, really. I mean that doctors don't refer to generic mental health workers if what they want is a neuropsychological assessment. In NSW, especially in community health centres there has been the development of positions with this sort of title and people with a range of backgrounds: nursing, psychology, OT, speech pathology, etc are eligible, that is the specific training of the person is not thought to be essential to the job.

Response 24

I: My last question was covered in various ways. Maybe we can just draw it out a bit more I guess...the, ah, role boundaries with different specialties like neurology, neuropsychiatry, and speech pathology, and, um, I guess, what we've been talking about is that it's a constant battle...is there anything else you can mention about it?

P: Yeh, it's interesting because, um, as I continue to practice, people become aware of what neuropsychology has to offer. It's a great relief because they realise that they don't have to do everything now, they can actually refer somebody out and get an integrated report that includes a really good interview and all that kind of stuff. So, people are more willing to define their roles differently once they've had experience with a clinical neuropsychologist: people who are properly trained. As far as other areas of specialisation, if I could find a good speech pathologist I would love to refer, but in rural areas in particular we have one person, who again is minimally trained, who's going around and trying to provide speech pathology services for all of the schools in the region and one thing is that there's not a whole lot of time, you can't get in to see them, and then when they are seen, the quality of the evaluation isn't that high, so, um, at this point I'm not going to rely on those kind of resources. I come from a system where it's...there are people who are trained in speech and language, there are people trained in occupational therapy and it's great to be able to rely on those resources and to integrate that information into our report and not to have to do the whole thing myself. Um, as far as how other professions view neuropsychology...if you look at how neuropsychology is used in hospitals they have people who are treated as technicians in many cases and so unless somebody in neuropsychology makes the point and keeps fighting that battle typically it's, you know, the lowest ranked GP or registrar who's working on a medical degree still has more status in a hospital setting than a 20 year experienced neuropsychologist, which is in terms of roles there, they're not defined by the level of competence or experience or whatever it's defined by the MD versus the PhD kind of thing, um, and it's even more of a problem when the MD's don't know what the other - coming back to this point - the definition of the psychologist and neuropsychologist is so blurry that people outside of psychology aren't willing to share their role of patient responsibility when they don't know who they're sharing with, they don't know

what the level of expertise is, but I think we're just starting to educate people, and then I think the roles will become more clear, but again, in the rural areas the role thing is a non-issue because, for one thing, not many people get referred cause they can't get reimbursed for it. When we do work together the roles become more clear because I say 'this is my role', um, but if I don't say that, then the assumption is that people don't know what the heck I'm going to do. Over the last year I've been doing these medical education programmes and things and people are still asking "so what is it you do exactly"? You know? 'So, we can actually send someone to you and you'll help with diagnosis'?...which is totally foreign to me. Like somebody the other day, a GP, said, you know, 'why would you want to see a neurological report, a radiology report, on a CT scan or an MRI'? I'm used to actually sitting down with a neurologist and looking at the scans together with the patient so the idea that we should be left out of that process is ridiculous, you know? So anyway.

9 Research issues

Response 1

I: With your research, um, I guess it's experimental neuropsychology...have you had any issues with sample collection with special groups?

P: Um, my research is on an X population, I'm doing - um, it depends on what you mean by experimental neuropsychology - I'm not...I guess I'm doing two major things: the first part is very much a clinical type of approach to assessment and I don't have any problems recruiting subjects because I'm part of a much larger epidemiological study that's being conducted here, so that's, I mean it's research I suppose and in that sense it's experimental, but it's more sort of clinical type measures; the other part of my study is with a sub-sample of my group and I'm doing computer based experimental measures with them, reaction time stuff, so yeh, a bit of both. In terms of finding patients, I haven't had a problem, but um, as I said, that's because I'm part of a much larger study that was already happening. They've got huge amounts of funding and so forth here, so I just sort of slotted into that and got patients out of that, but I'm probably the exception rather than the rule, so I'm probably a bad person to ask cause most people doing research with clinical populations have terrible times getting sufficient numbers.

Response 2

I: OK, right. What is the funding like in that sort of research?

P: Awful.

I: Awful?

P: Yeh.

I: Oh, Okay.

P: Very, very, very competitive to get a H&MRC grant, which is the main source of funding.

I: Yeh.

P: It's nearly Bloody Hopeless.

I: Okay, so um do people improvise around that, try and...?

P: Yes, it's a continuing depressing, anxiety provoking activity.

I: What increases the likelihood of getting funding then?

P: I think you have to be excellent, and you also have to be lucky. So, I don't think I have been anything other than excellent, but I have been unlucky. I can say the same for other people, I don't think this is unique to me, that funding has been difficult, one seems to have, well, I can give you an example of a grant being submitted to one international body, non-Australian body, it was internationally peer reviewed, and it was funded so it must have been ranked in its top x percent, I don't know what to guess at, let's say the top twenty percent, the exactly the same research but with different kind of funding, so one was, let's say for equipment and the other one was for personnel, the other one was ranked at the bottom twenty percent by the H&MRC, so I've got strong evidence that it's a matter of, ah, well, I suppose I'd have to say that I was improperly assessed. And, but who gets to make the assessments of our projects is a random thing, and you can be unlucky and get assholes.

I: Yeh right, so they may not be specifically knowledgeable of the field or something?

P: Yeh, they may not be knowledgeable or they may be prejudiced against it, or they may be blind to the ideas, for personal reasons, I have no idea why we were assessed so poorly for this work that was so highly funded elsewhere.

I: So, what are the expenses for this kind of research.

P: Do you want some costs and some numbers?

I: Oh sorry, do you use neuro-imaging technology and so forth?

P: No, well we do, but it's not a cost to us because it's already being used clinically for the patients benefit, we just kind of attach ourselves to the investigations that were being done anyway, the costs in research are having people active on the ground getting things done, so research assistants, and research officers, mixed level and junior scientists, so their salaries are always very expensive, and the next thing is the equipment, so the equipment can run to some tens to hundreds of thousands of dollars. Now that's for doing EEG, a sophisticated EEG (electroencephalogram), and microscopes are always expensive to purchase, but I mean, you don't have to get too many of those and you've got all you'll ever need, um, the rats are quite expensive these days.

I: Okay, so what about the students and their future, um, I guess what kind of activities do they go into and what sort of opportunities exist in the field?

P: Well, the medical students have got this terrific option of becoming clinical doctors and basically earning a secure living, if they didn't have that option, how many of them would make their way in science I have no idea. From the priority of my science students, I've had (a number), and they've all, they've all managed to continue either doing academic work or research. As I've said, I haven't had very many graduate students.

Response 3

I: What sort of research are you doing?

P: In general, my research has to do with memory and in relation to how different kinds of brain lesions or neurological conditions affect memory. I'm particularly interested in memory for the past, so retrograde memory, and how that's affected by lesions in different parts of the brain.

Response 4

I: Are the target participants difficult to get a hold of for that kind of research?

P: Um, not really because I'm in the hospital setting where they come through so I go to different rounds where either scans are being conducted or patients are being presented on a weekly basis and basically catch them that way or they sometimes are referrals to the neuropsychology unit, so I have a lot of contact with them in the clinic and then it's not that hard to recruit them.

Response 5

I: My last question...I just want to go back to, um, your research and sampling. In neuropsychology there's some difficulties in gaining samples within specialised areas, I guess, ah, how did you find it in your area?

P: you mean in terms of the disease?

I: Finding your target samples and um...

P: Oh obtaining them. That wasn't too hard because I actually got in on a larger project that was looking at X treatment therapy, and therefore I had access immediately to that whole group that was being taken through, then I had to add some other people onto that because I needed a few more numbers effectively, so I went to, um, I tried again to utilise the programs in town to get those subjects and once we offered \$10 for them to spend an hour filling out paperwork I had no problem getting subjects. It was just that we really needed to offer some sort of reimbursement for the time, um, keeping them in the office for longer than they want to be there is pretty difficult, you know, I would imagine in most cases these people want to get on with their lives and get out and do something, but yeh it was just a bit of an incentive it wasn't a problem to attract people and ah we have the means in the funding for the project to do that so that wasn't too difficult. But I would imagine there are some cases where I hear of people having quite a hard time attracting subjects or keeping subjects. I can certainly say that in the treatment program we had a hard time retaining them: we had quite a horrible attrition rate, so I didn't really get to look at the longitudinal data so much as I wanted to because the numbers were just too low, so, but that's fairly typical in my area.

Response 6

I: Okay then, could you tell me a bit about your research then?

P: The current work?

I: Yep.

P: Well, I'm studying basic cognitive processes that are implicated in social cognition, um and it's because that particular area in psychosis - social cognition - that seems to be deficient, so my current work is trying to elucidate the particular cognitive processes, I guess, that are breaking down and are relevant to poor social cognition in schizophrenia and other psychoses. I guess, I use a variety of experimental techniques as well within that research: I study eye movement to study attention to particular social information as well as using basic cognitive tasks.

Response 7

I: do you do any research?

P: Yeh.

I: Do you want to talk about that for a bit?

P: Yeh OK. Not much of my work is actually neuropsychological. Participation in neuropsychological research is very small, what I mainly research is sort of relevant to a lot of the patients I see, but it's not neuropsychological research, I don't do any tests, I don't see any patients, it's not that sort of research, it's really...it's social psychology. (Nonetheless, the participant did state that he/she does on occasions collaborate with other researchers on research that is more neuropsychological.)

I: So they do a fair bit of research in hospitals?

P: Yeh lots. They're sort of getting increasingly interested I suppose you could say, in asking what is the cognitive impact of this new sort of treatment on a person's efficiency, and therefore, you know, the neuro quality of life is a health outcome, rather than just survival, it's all part of that. I get to see a lot of other people's research protocols and often they have a measure of quality of life, and sometimes they have a measure of anxiety or depression, or mental functions.

I: What about funding, are there areas that are easier to get funding or that are proliferating?

P: It's hard to say. Historically, probably rehabilitation has increased. Do you mean clinical?

I: Yeh, research.

P: Probably aging in and dementia has an increasing focus because of the dementia drugs there has been a lot of research on mental functioning in dementia. The drug companies want to establish that their drugs are better than everybody else's drugs, and they've done a lot of studies with people with dementia who have taken their drugs or not taken their drugs, heaps of that, and that's been quite good methodologically, it's led to, for example, much better quality of life measures for the elderly to be valued evaluated on scales. A lot of work done on cognitive screening, all of it funded by drug companies because this is an outcome issue, to evaluate their drugs, that's all happened from my perspective in the last ten years. So I think this has established the drugs on the market, which are being prescribed quite routinely, they've got continuous funding, I think that that probably won't drive future research the way it has, but as far as clinical practice goes, no it's very hard to get money.

Response 8

I: Okay, and, ah, you collaborate with the hospitals did you say?

P: Yes I collaborate with psychiatrists in inpatient and outpatient centres, um, not really within a local radius, they're all over the place, so it's just a matter of finding people who are able to help and are willing to allow their patients to be seen by us because I guess the work we do doesn't fit into the usual treatment that you would get in a hospital, so people are a bit wary: what are we doing to them and are we going to harm them? But it usually takes a little while unless you get a psychiatrist who's very interested in research and they can see the benefit, sometimes it's a bit of a struggle to get people to help.

Response 9

P: Basically as far as what my research involved is it's a project that's involved in primarily looking at etiology and maintaining factors of X and I'm of course being a neuropsychology focus I'm particularly

interested in the cognitive aspects that might, ah, be involved and there hasn't been a whole lot looked at that with X: some studies have been conducted but they're quite limited in terms of how they measure it and so forth. And so I'm looking partly...what I've done is to expand applications of existing measures for the purpose of exploring deficits in (population of X) so and I'm also looking overtime in a particular treatment program what are the shifts? Because it will help address the question of are these pre-existing deficits or are they sort of deficits that are acquired as a consequence of X over time. So, basically that is what my research is in and I've collected data over the past few years and I've particularly focused on a few of the typical neuropsych assessment measures, which sort of try to interpret how the executive functioning's looking, I mean, particularly executive cognitive functioning, which has been most associated with X in general and I'm using a body of measures that are sort of more traditional, mostly brief measures that I've combined to try and get a good picture of motor and executive functioning because often motor speed processing is associated with that. Then I've also actually included a self-report questionnaire that's fairly new that's been published called the behavioural assessment of Dysexecutive syndrome I found that particularly useful as well cause then you're getting also these people's sort of report of how it effects them on a behavioural level as a result of these executive functioning disturbances.

Response 10

I: Okay, so what is it like communicating with practitioners then? Are they generally receptive to your work and its aims?

P: Um, overall I guess I'd have to say yes and I find most of them are helpful. It's sometimes other staff members that aren't as helpful even though a director of an institution may be very helpful and cooperative, when it comes to the crunch of organising things with other staff sometimes barriers can be put up because they haven't been told the whole story by the director or whatever, um, so it's not...I mean, everybody is supportive, but it's not as easy as it sounds to get people to cooperate and I think it's more of a communication and a time issue: people don't have time to do more than what their job entails, so when somebody from the outside is wanting to do extra work it seems like a burden to them, even when we don't really want it to be bad and we don't try and set it up that way - that they're working for us - it's just a

matter of allowing us to get in there and have access to people and negotiating the logistics of that. So yeh, it's a little bit abrasive sometimes at first, but once people realise that you're not asking them to work for you they're quite helpful.

I: We've talked about changes that have happened, are there any other trends for the future that you can see happening?

P: I think there is actually a movement towards psychological interventions for the treatment of psychoses so that, um, as I said, there's been this big move towards trying to find biological explanations and that's justified, but also there is a huge gap in our treatment service in Australia where medication is the dominant treatment and other types of psychological therapies don't have enough funding and they don't quite fit into our health system at the moment, so that is a trend that is happening and it's not to downplay the need for medication, but it's just to open up another area of...a different type of treatment that some people will benefit from, and so the work that I'm doing is pretty important, I guess, to help those psychological treatments.

10 Synopsis of activities

Response 1

I: Can you just tell me a bit about what you do?

P: Yeh, right, so I'm a practitioner, I'm qualified in both clinical psychology and clinical neuropsychology, ah, I work in a brain injury unit, I mainly see outpatients: people who have had a brain injury, I assess their cognitive function, um, and report on the results and give feedback and guide therapy and things like that. I also do some other things like often running anger management groups.

Response 2

I: Can we just start off with a synopsis of what you do?

P: I'm currently working as a clinical psychologist in brain injury rehabilitation and I'm also doing my doctorate in neuropsychology, so I'm studying fulltime and working part-time and my area of research is X.

Response 3

I: Could you just tell me a little bit about what you do?

P: I'm a clinical neuropsychologist and also a clinical psychologist and I work as a clinical neuropsychologist and student supervisor and manage a clinic for people with mild traumatic brain injury.

Response 4

I: Can you tell me a bit about what you do?

P: I'm a research fellow...a clinical research fellow. I work in cognitive science, um, but also applied to clinical populations. So I deal with people who suffer psychotic disorders, also doing basic research in cognition in healthy people. I also study the way those processes break down in people with psychosis, but I'm based at a university and have to work collaboratively with the hospitals around the area.

I: Okay, so you have a Ph.D., is that right?

P: Yes.

Response 5

I: Can we just start off with a general synopsis of what you do?

P: Yep sure. I'm a neuropsychologist, I work clinically two days a week, and I'm also finishing my Ph.D. in the field of neuropsychology, and I've been working clinically, I guess, for about three and a half years. All of that time in a part-time capacity because I've been doing my PhD at the same time, that's about it really.

Response 6

I: Would you just be able to tell me a bit about what you do? Are you a researcher, educator, and a practitioner?

P: OK, I'm basically a researcher, which is my primary role, and I do some teaching.

Response 7

I: All right, could you just tell me a bit about what you do and, ah, just a general synopsis?

P: Okay, I work in a neuropsychology unit in a teaching hospital and I'm a member of a unit that normally has several clinical neuropsychologists. And clinically we do only diagnosis - only assessments - we don't do any therapy so mostly diagnosis, but also management: kind of a few rehabs that kind of thing. Um, I also supervise a number of research students and students on clinical placements and do some of my own research.

Response 8

I: What is your work exactly? Are you a practitioner or a researcher?

P: Practitioner.

I: So what is it that goes on in the department? Is it a neuropsych department?

P: Sort of. What happens for me is that I get what are called referrals from all over the hospital, or even from doctors or whoever...

I: So what kind of assessments do you carry out, is it psychometric?

P: Yep.

I: So what sort of patients do you see?

P: All ages, adults, anyone from 18 up, and I'll...if they have problems like head injury, or stroke, or dementia, HIV infection, they're the common ones.

I: So the HIV patients have neuropsych problems or some dementia do they?

P: Yeh, virtually everyone I see is thought to have cognitive impairment. Because neuropsychologists are in quite short supply in the public system, my referral...my patients are very much skewed towards people whose treating professionals are pretty sure they've got cognitive impairment. I don't get to see people as a matter of routine in case they have cognitive impairment, it's nearly always because people are pretty sure they do have, and I will meet the patient, interview them, ask them about their education, occupation, hobbies, and what they think the problem is, and some people don't think they've got a problem at all, and some people agree with the doctor that they do, and after that I'll conduct a whole lot of psychometric tests, score them as I go along, at the end I'll give the patients some feedback as to what my

opinion's going to be in the report, I'll give the patient a whole lot of questionnaires to take home, add to that inventories of neuro-behavioural problems, screening for anxiety and depression, a measure of health about quality of life, all of that the patient posts back. And once I've got all that, I write the report and send it to the doctor, and sometimes to the patient as well, not always because the patients don't want, don't ask, don't seek. Sometimes, I'll just write in the hospital case notes if it's an in-patient, and that's it. So that's the end of my work with that patient.

I: So treatment is up to the GP or some other...?

P: Yeh, that's right. In that sense I'm really just like another cat scan, or pathological test; people are sent to me for information, and I send that back to the Doctor, and that's the end of it.

I: Is that the general approach for neuropsychological practice?

P: yes.

I: Or is it just in the hospital departments?

P: Ah it is probably, again because of short supply, its general in hospitals, it would be rare for a neuropsychologist to do treatment in some hospitals because they don't have time, in rehabilitation settings we would see neuropsychologists getting involved in counselling, or intervention, or perhaps even some kind of cognitive rehabilitation strategy, and also they may be what's called the case manager, but in general hospital settings neuropsychologists are never the case manager, it's always the doctor, (inaudible sentence), I might...my form of treatment is just feedback, and the only intervention I would do is to inform, making the point to give feedback to the patient, perhaps the patient's family, or with the patients consent writing a letter - that can be copied - to the patients employer or to another agency like Centrelink, or say they're a University student (inaudible) get more time to study. So pretty information based type of involvement, giving information about the deficits, no other treatment. I might give some advise on where to go or what to do, like if I think it's really about anxiety, I'll give them an anxiety screen on the spot, and if it looks worrying I'll tell the patient and the doctor that that's what needs to happen, but I don't do the treatment.

I: That they need to be assessed more by a...

P: A clinical psychologist or psychiatrist...

I: And do you sometimes recommend brain scans and that kind of thing?

P: Again, because I'm just like one brain scan myself, I'll say, and in some cases I'll ring the doctor, "I think this person needs an MRI or a *SPECT*", but because of the provisional *professional* role that (inaudible) it's never, I can't order any of those things, a CAT scan, nor can I directly tell the doctor that the person needs one...

I: So it's just a suggestion?

P: Yeh.

I: And they can follow it up?

P: Yeh, or not, but I document it, and they know that I've put it in my report and it's a fairly strong pressure to do it, cause if they don't do it when it's been suggested, then it's a duty of care issue. So you do have a bit of pressure you can apply sometimes.

Response 9

I: Would you be able to tell me a bit about what you do?

P: I work as a clinical neuropsychologist, and I'm employed in the public service, and I run a private practice...I deal largely with rehabilitation of brain injured people and medico-legal assessments.

I: And in your private practice are the medico-legal assessments neuropsychological?

P: Yes.

Response 10

I: Would you just be able to tell me a bit about what kind of work you do?

P: Well, I'm a clinical neuropsychologist in a general teaching hospital. So I see patients...a lot of my time is spent seeing patients with known or suspected brain injury or disease. So, that's my clinical work, and I do a small amount of teaching, and probably about a quarter or a third of my time doing some research.

I: Could you just tell me a little bit about what you do?

P: Yes, I work in a children's hospital and my role in the department I'm in is neuropsychology work primarily, but my training is also in clinical psychology. So, if some of the kids I'm seeing for neuropsychology also need clinical psychology I do that too, but the majority of my work is neuropsych, and the kids that I see are kids mainly from four sections of this hospital, from neurosurgery, so that's kids with brain tumours and who've had head injuries; I see kids from neurology, so that's kids with epilepsy; I see kids from the metabolic unit and that's kids with a range - usually low incidence metabolic disorders that can affect development; and I see kids from the craniofacial...obviously, if your craniofacial development isn't normal, then often your brain development isn't normal either. So, that's the majority of the work that I do.

I: Ok, what kind of metabolic disorders are they?

P: They're things like Phenylketonuria (PKU) and there's a whole lot where there's maybe just a few kids in the state who've got it, so there's odd things like maple syrup urine disease or...and a whole lot of things with names I can't say. My role with those kids is...as well as supporting any kind of clinical needs they may have in terms of learning difficulties or whatever, they've usually got conditions, which, if they're not managed well...so, if the family isn't compliant with the medication and their tests and everything, then the kids will often sustain brain damage cause their levels or whatever aren't right and a neuropsychological assessment will often be able to document that or confirm that everything's going OK. So part of my role is to try and help the kids, but the other part of it is sort of a quality assurance role for the metabolic physicians because a normal neuropsych profile means that they feel better cause it means they're doing things right.

I: I see. Diagnosis and monitoring function is what you're mainly involved in?

P: Yep, the majority of my work is assessing kids level of function and then providing that feedback to whoever's caring for their medical management, and so sometimes that relates then back to the medical management and what they might be doing with the kids from a medical point of view, and the other half of what I do is supporting the kid with their family,

their school, the kid themselves in coping with whatever disability or impairment they've got. I do lot's of liaising with schools and special education co-ordinators and guidance officers and people like that.

Response 11

I: Can you just tell us a bit about what you do?

P: I'm a professor, I teach medical students, and some students in another course, a neuroscience course, cognitive science course, I do medical research in a rat lab and in a human lab, mainly studying epilepsy, the neural basis of seizures, and I look after patients with neurologic disease.

I: Okay, What do you do with the patients with neurologic disease.

P: Well I consult with neurologists, sometimes I look after them in hospital, I do regular clinics, where people come to the clinic and I interview patients at the clinic. So, standard neurological practice.

I: Do you recommend and implement treatments and so forth?

P: Yes.

I: What sort of neurological patients do you see, are they mainly epilepsy or are they a variety?

P: A variety.

I: How does your research fit in with practice in the various fields of application?

P: Well, It's an advantage to me doing research in a subject, which is relevant to my clinical practice. I used to do research in another area, I must say not a very exciting area, most people would...non-technical people would fall asleep as soon as I started talking about my other research, but, everybody but everybody is interested in epilepsy research, so that has been a benefit. But the change in subject matter brought it into line with my medical practice as well, so that was good. So I do expect the research to have an impact on managing patients with epilepsy in the future, and I have, I mean, that's basically why my research activity is important to me. And we have a very good chance of succeeding in doing that, but at the moment, there is

no direct way in which my research changes the way I handle patients.

I: OK. So it's still prospective?

P: Yes.

I: Right, um, so what's the communication like with other researchers and practitioners in that area? Is there...

P: Very intense usually.

I: Okay. So there's quite a few people working on a similar kind of programme?

P: Not at all similar. There's lots and lots of people working on Epilepsy, but they're all doing different things.

Response 12

I: You've got a clinical practice?

P: I do, yeh, I have a private business, but frankly I don't have a lot of time to see a lot of patients, but I do forensic evaluation work for some attorneys, ah, for people who want comprehensive evaluations and they don't want to be seen by an intern, um, for various reasons like, for example, if they think it's going to be a court case I'm going to testify anyway, so I have to be primarily responsible for the testing, um, and so having an intern involved sometimes doesn't go as well when you have to go to court, so I do those sort of things, and I have a few psychotherapy patients who I see intermittently.

I: So the forensic cases, they're fairly broad are they?

P: Ah, yeh it usually involves head injuries or learning problems in children or, um, I've been involved in one having to do with competence: whether someone should be allowed to make decisions about their finances, things like that.

Response 13

I: In terms of the way you get referrals, do they come from certain specialists, I guess, is the neuropsychologist's role widely known?

P: Too widely, too widely. We get heaps of referrals, we get referrals from everyone basically, and we take them from just about everyone. Most of our referrals come from our specialists at this hospital, so the majority of them come from neurologists at this hospital, but they can also come from other specialists in the hospital, for example, cardiologists, liver transplant people, or whatever. For example, they might need a cognitive assessment of somebody who's had a liver transplant because they're wondering 'is he ready to go back to work'? We also take them from GP's and then we take them from other health care workers in the community as well, say alcohol counsellors, if they have a question about whether the person has alcohol related brain damage...yeh, so a variety of sources. We do not take self-referrals: we don't let a patient just call up and say they want a neuropsych assessment, um, we always make sure there's someone to report back to, preferably a medical person.

I: So patients at a minimum go to a GP in the suburbs before they come to see you?

P: That's right, and that person might just write a note, you know, he's worried about his memory, so at least now we can say to that GP, 'this person is dementing, you'd better run the blood tests and everything else that needs to be done now', you know, so, we have someone who can follow through.

Response 14

I: So do you do medico-legal work?

P: Yes I do.

I: ...and anything else?

P: I do medico-legal, I do doctor referral type things, ah, clinical referrals, um, I get patients from neurologists and neurosurgeons, those kinds of people, I deal with people with neurological disorders and head injuries, um, neurological disorders including Parkinson's, Multiple Sclerosis, dementia all pretty much what comes as neurological, I also do a bit of rehab' as well and I also do a little bit of clinical work in anxiety treatment and that kind of thing.

Response 15

I: Can you tell me a little bit about the network?

P: Sure, we've got a grant to set up a network that includes the GP, geriatrician, um, there's like quite a few different aged care agencies in the area and they gave us some funding, so now what goes on is that the GP identifies someone who has a memory problem they contact the coordinator and the coordinator arranges for an appointment with the geriatrician and, ah, an appointment at our clinic here. So we see...we provide comprehensive neuropsych evaluations, dementia screening and then we set up a case conference where the patient and their family members, the GP's, the geriatricians, someone from our team, and the coordinator sit down and talk about the test results from the various perspectives: the medical data, the neuropsych data. We give them feedback and give them suggestions about what they can do, and then they get hooked up to the appropriate services, um, and our report is provided to these various services so there's a more coordinated approach in providing for them.

Response 16

P: And the private practice is a bit difficult because nobody sort of covers the cost of neuropsych assessments so it's usually out of the person's pocket. Now they usually will do that if they think that they might get some medical-legal compensation, which will then cover that cost, but as you probably know the cost of neuropsych assessment is fairly prohibitive for most people, and so I think it could be a lot more...you'd have a lot more people working in it if there was some sort of subsidisation of the costs, but that's almost never the case.

I: So does private practice mainly do the medico-legal assessments?

P: Well typically, because those are the people it's usually worth it for them to pay for it. They could get a payout as a consequence, but other than that you often find that they're paying out a pocket, some people will, but the majority just don't have the money for it or don't see it as being so necessary to pay out of pocket for? They're sort of avoiding health issues some of them anyway, so, um, it's difficult in that regard.

Response 17

I: So is the public system the main place for neuropsychologists to practice?

P: Well, there are a number of neuropsychologists who do private work and the mainstay of that has been the medico-legal work and certainly there are likely, I think, to be more neuropsychologists in hospital and university systems than there are privately, I would think so.

11 Education

Response 1

I: So the department teaches medical students?

P: Yes. We teach medical students, science students, and health science students.

I: What sort of material is taught in terms of neuroscience?

P: We cover a lot of neuroscience including traumatic brain injury, and stroke, and headache, but we also cover organic diseases, depression, Alzheimer's disease, neurodegeneration. We cover all those areas basically.

Response 2

I: Could you tell me a bit about the neuropsychologist practitioners in Australia: how practice operates?

P: Ah, how it sort of all happens and the network and so on?

I: Yeh.

P: Well, currently there are courses in...one in the University of Queensland, Macquarie Uni in Sydney, in Melbourne there is Latrobe, the university of Melbourne, a new course in Monash, and one in the University of Victoria, so there's a few in Melbourne, and finally one course at the university of Western Australia.

I: And they're all Masters degrees is that right?

P: Ah, Masters and or PhD courses, postgraduate courses that enable membership of the Australian Psychological society and the College of Clinical neuropsychologists, so that's where all the current day training comes from pretty much, and I would say that the absolute vast majority of neuropsychologists in the country have probably completed one or other of those courses at some time. What else would you like to know about

that? Um, I think I said to you earlier, originally there was one course in Australia and that was at the University of Melbourne and that started in the late seventies I suppose, and probably remained the only course up until, oh I don't know, the late 80's early nineties, something like that. And so I guess the vast majority of people have probably come from the University of Melbourne course and the people that teach the other courses now are University of Melbourne graduates...So there's quite a heritage there I suppose, from Melbourne uni, permeating through much of Neuropsychology in Australia.

Response 3

I: What sort of work do the various students end up going into, what are their potential roles?

P: Well, obviously the undergraduate students, lets start with them, the undergraduates are basically in professional degree programs, so the medical students come out as medical doctors, the dentists come out as dentists, the health science students and the science students, take it as a broader degree. So they can go into many different areas, but at least they know a little bit about the mechanisms associated with disease. So I suppose they're learning it as a broad education in their area of interest. As for research students, obviously we get some honours students who then apply to go into medicine later, we get some honours students who become research technicians, they get a laboratory job straight away as part of a team, and we get students that go onto Ph.D. and become academics in their own right.

I: So the health science and the science students what do they go into? I would have thought that they would go into research mainly?

P: Not really, to get into research you have to get an honours degree. It's pretty rare that you would get a good research position straight out of an undergraduate degree. I mean it has happened, you can get a job as a technician, but I think you're always competing with an honours student who has much more laboratory experience than an undergraduate student.

I: I see. So the health science students can still go through to honours then Ph.D.?

P: Some of them, not many. I mean there would only be 10-15% of the class that would go on to honours. The

rest of the class would go out and get jobs in a number of areas that a broad degree would give them.

Response 4

I: So I suppose you've got a Masters in Clinical Neuropsychology yourself?

P: I got a Masters in Clinical Psychology and then I did the college membership by external board entry.

I: Oh yeh, so was that an examination at the time?

P: Yes, three examinations, and it's very similar to the masters, you know, where you have to complete a university course in neuroanatomy and there are three examinations in the main areas in neuropsychology. They are written examinations, you have to produce a logbook of 50 cases and 10 long cases which are presented to the College of Clinical Neuropsychologists. With these logbooks and the examination results and they deem you meet the requirements for membership based on the completion of that course work.

I: Okay they're planning to do something different now aren't they?

P: I think they're reviewing it at the moment.

Response 5

I: I suppose it would be rare for neuropsychologists to have both a clinical and a neuro qualification?

P: Yeh, it is. Most neuropsychologists are...that's all they've done: they haven't done the clinical psych and there's only a few who have membership of both CCN and also College of Clinical Psych. There are a couple, and I think I met one of them just before I started my degree and I thought yep that's the direction that I wanted to take so that's why I started to go back and do the doctorate, just to make my role more legitimate.

Response 6

I: Is there a significant component of counseling and psychotherapy education in the degrees now in neuropsychology?

P: Um look, I'd hate to say what's happening right this minute, because it's been a fair few years since I graduated it's been almost four years since I went

through. When I went through there was exposure to psychotherapy and counselling I s'pose, in the sense that there was theoretical exposure. There was certainly no practice or anything like that, it was more sort of general clinical counselling type abilities to give some very basic level stuff and anything beyond that it was a bit of luck of the draw, you know, who you got as a supervisor, um, as to whether they had a particular bent towards counselling type stuff, also people who, when you do rehab type placements or if you work in rehab you're exposed much more to that sort of counselling type of role so you tend to pick up skills when you work in those settings as well.

Response 7

I: So was there an option just to do the Masters instead of the PhD?

P: There was but my understanding is that they're phasing that out entirely now and only allowing it as a PhD or D.Clin here, which is something that I think is in transition at the moment.

I: Oh right is that just at your university or is that Australia wide?

P: Um, That's a good question actually I would suspect that it'd be Australia-wide because I believe that's being governed by our body the APS and in hand with the registration boards. So I would expect that it's an Australia-wide phenomenon but given that it's sort of still, I'm not even clear because my glance of it as to the talk that's been going around combined with the fact that the talk that's going around is sort of by people who still aren't clear as to what's happening, I'm not getting a straight story on that at this stage I'm still waiting to actually find out exactly what's going on, not waiting but, you know, out of curiosity. I haven't satisfied my understanding of exactly what they're doing yet to change that, so I know that our programme is unique in Australia in that it has the clinical psych and clinical neuropsych combined specialisation and I know that the APS was not happy with that. I think that that is a shame because I think that, as a neuropsychologist, not have any standard clinical training in addition to that leaves you pretty limited in what you can actually practice especially if you're going to start doing more rehabilitation with people, you know, when there's anxiety and basic clinical issues overlap with that, so I think that's a mistake on their part, but you know, I

don't have control over their decisions. I just understand that they've been trying to phase that out here and make it straight one or the other for people, the rationale for that I don't understand.

Response 8

I: Right. I suppose it's a bit of a trend then developing the doctorate and Ph.D. programmes?

P: I think that Australian Universities are really struggling with how to do this, most places that I'm aware of have tried to do it by offering a masters and a clinical doctorate...a master and a doctorate programme and that's combined in various ways with either incorporating research in the clinical degree or adding a PhD to the clinical degree, um but I ah my own feeling is that it's a bit of a dog's breakfast around the country really.

Appendix B: Information sheet



Information sheet

A study of research and practice in neuropsychological knowledge

My name is Robert Burns and I am a Ph.D candidate in the Psychology department at Adelaide University. I am studying research and practice in the neurosciences and neuropsychology. I am interested in speaking informally with researchers and practitioners about the issues associated with knowledge-production and application in their neuro-related activities, or how science is done. I am looking for 15-20 participants across Australia. Although there is expected to be overlap, it is hoped that half will be researchers and the other half practitioners. The target researchers I am interested in speaking with are only limited by their focus on matters neuroscientific, while I would prefer to speak with neuropsychological practitioners from the college of clinical neuropsychologists, and other clinical psychologists with neuropsychological skills and work experience.

I would like to engage in individual informal discussions where there will be 'seed' questions to guide and facilitate the discussion towards areas of interest and to the participants' areas of speciality.

The interviews are to be conducted over a speakerphone, recorded and later transcribed. Verbatim quotes will be included in the written up study. The data will be organised into categories and analysed in terms of the functions of the ideas and the associations between them, and what bearing this has on research and practice. Additionally, due to the nature of interview research, a diversity of views and opinions are likely to be gathered, and in this respect the researcher may have a different perspective to those expressed by participants, as much as, or as little as participant's views differ from each other's. Therefore, I see it as important to respect the diversity and present the study in such a way.

Protecting the identity of participants will be a priority and the interview transcripts will be scrutinised and adjusted as required in order to avoid the possibility of identification. To ensure that this is taken to an appropriate level,

participants will be given the option to go over selected passages that are to be used on the condition of participant approval. Participants can give feedback regarding any adjustments that they feel need to be made in order to protect their identity further. The resulting list of passages will put into the appendices with some appearing as quotes within the text of the study. It is also important to note that the study is national and the passages will be organized in categories, not by participants, so a diffusion of identity is further enhanced. Additionally, on completion, a copy of the written up study will be circulated to those participants interested in reading the discussion.

The hopes and expectations for the study are that it will be informative for those being inducted into, and those already engaged in, the target fields by continuing the tradition of facilitating and fostering an interest and awareness of theory and practice in the related fields and science generally.

The interviews are expected to take only 15-30 minutes depending upon the time-constraints of the participant and the speed at which we explore to our satisfaction the topics being discussed.

Participants have the right to withdraw at any stage during the interview, and also if they determine on reflection that the transcripts are unable to be adjusted sufficiently to protect their identity.

I hope to have all the interviews completed by the end of the year, and the study written up and circulated by January or February.

If you prepared to take part in this research, please e-mail me at:

robert.burns@psychology.adelaide.edu.au

or ph: 8332 6633

My supervisors are:

1) Dr Peter Delin. Senior Lecturer and Human Ethics Convenor, Psychology Department, Adelaide University.

pdelin@psychology.adelaide.edu.au

Ph: 8303 5007

2) Professor Ian John. Visiting Research Fellow, Psychology Department, Adelaide University.

Ph. 8362 1413

Thanks for your time,

Robert Burns

Appendix C: Consent form

THE UNIVERSITY OF ADELAIDE HUMAN RESEARCH ETHICS COMMITTEE

STANDARD CONSENT FORM FOR PEOPLE WHO ARE SUBJECTS IN A RESEARCH PROJECT

1.	I, ... (please print name) consent to take part in the research project entitled:
2.	I acknowledge that I have read the attached Information Sheet entitled:
3.	I have had the project, so far as it affects me, fully explained to my satisfaction by the research worker. My consent is given freely.
4.	Although I understand that the purpose of this research project is to improve the quality of medical care, it has also been explained that my involvement may not be of any benefit to me.
5.	I have been given the opportunity to have a member of my family or a friend present while the project was explained to me.
6.	I have been informed that, while information gained during the study may be published, I will not be identified and my personal results will not be divulged.
7.	I understand that I am free to withdraw from the project at any time and that this will not affect medical advice in the management of my health, now or in the future.
8.	I am aware that I should retain a copy of this Consent Form, when completed, and the attached Information Sheet.
..... (signature) (date)	

WITNESS

I have described to (name of subject)
the nature of the procedures to be carried out. In my opinion she/he understood the explanation.
Status in Project:
Name:
.....
(signature) (date)

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