Occupational therapists' judgement of referral priorities: expertise and training.

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Philosophy
By

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Abstract

The British government currently requires mental health services to be targeted at the most needy (Department of Health, 1999). For occupational therapy services, where service demand far exceeds service availability, skill in referral prioritisation is essential. The studies in this thesis describe how experienced occupational therapists' referral prioritisation policies were used to successfully educate novices. 40 British occupational therapists' referral prioritisation policies were modelled using judgement analysis. Individuals' prioritisation decisions were regressed onto 90 referral scenarios to statistically model how referral information had been used. It was found that the reason for referral, history of violence and diagnosis were most important. The occupational therapists' capacity for self-insight into their policies was also examined by comparing statistically modelled policies derived from their behaviour with their subjective view of their cue use. Self-insight was found to be moderate (mean r = 0.61).

A Ward's cluster analysis was used on the statistically modelled policies to identify if subgroups of therapists had differing referral prioritisation policies. Four clusters were found. They differed according to several factors including the percentage of role dedicated to specialist occupational therapy rather than generic work. The policies that led to more of an occupational therapy role were found to give particular importance to the reason for referral and the client's diagnosis. The occupational therapy professional body supports this latter method of working as it has recommended that occupational therapists should use their specialist skills to ensure clients' needs are met effectively. Therefore the policies that focussed on clients' occupational functioning were used to train the novices. Thirty-seven students were asked to prioritise a set of referrals before and after being shown graphical and descriptive representations of the policies. Students gained statistically significant improvements in prioritisation. Students' pre-training policies were found to be those of generic therapists; a method of working that has been found to be leading to reduced work satisfaction and burnout (Craik et al.1998b). The training is therefore needed to ensure undergraduate occupational therapy students develop effective referral prioritisation skills. This will help to ensure that clients' needs are met most effectively and work stress is reduced.

Contents

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Chapter 1 Literature Review

1.1 Introduction

One essential skill that has to be learnt by occupational therapy students in their undergraduate training is the ability to prioritise referrals appropriately (Department of Health and Social Care 1999). Knowing which clients most need occupational therapy will determine if the appropriate referrals are accepted. This clinical skill is particularly necessary for occupational therapy students who chose to work in the field of Community Mental Health. In this field the demand for services far exceeds the service capacity, therefore skill in referral prioritisation is absolutely essential (Job 1996). The National Service Frameworks for Mental Health (Department of Health 1999) stipulate that services must be targeted at the most needy. If the most needy clients are not prioritised they will not receive the services they vitally need.

There is another difficulty in ensuring effective occupational therapy services are provided; staff shortages. Occupational therapy services were last assessed as having a 20% shortage; one in five posts were empty (Dean 2000). In 1989, the Blom-Cooper report identified significant shortages of Occupational Therapists in community mental health (Blom-Cooper, 1989). At this time the rate at which Occupational Therapists were leaving the profession was found to be worryingly high. Sweeny (1991) identified, that a lack of role clarity was found to be the major reason for burn out amongst Occupational Therapists. The British government had been encouraging the lessening of the boundaries between each professional's role; they supported the cheaper option of the untrained generalist worker (Audit Commission 1986). This had led to role confusion and erosion of professionally delineated roles in community mental health work.

A survey of occupational therapy managers in mental health has been undertaken in order to identify the current situation (Craik et al. 1999). The problem of role clarity was still found to be one of the causes of therapists leaving the profession; the lessening of boundaries was still taking its toll.

A recent debate in the occupational therapy literature has identified that some occupational therapists are able to provide a specialist occupational therapy service whilst others provide a generic service (Parker 2001; Corrigan 2002; Dunrose and Leeson 2002; Forsyth and Summerfield Mann 2002; Harries 2002; Stone 2002). Research is needed to identify how occupational therapists are focussing their service for clients in the UK. Identifying occupational therapists' referral prioritisation policies is one way of making explicit the current focus of the service. These policies could help novices learn how to prioritise referrals effectively. If the type of client need that occupational therapists should meet is clarified, the current role confusion may lessen and perhaps retention would improve. The more occupational therapists are retained in the profession, the more occupational therapy services will be available for clients. The services are currently falling short of the level of client need; increased service provision is essential if clients' needs are to be met effectively.

The type of referrals occupational therapists receive needs explanation at this point. Occupational therapists in community mental health teams receive two types of referrals. The majority of referrals they receive are team referrals, which are discussed and allocated within the team. They also receive direct referrals, which are sent to occupational therapists by psychiatrists, General Practitioners (G.P.s) and fellow community mental health team members (social workers and community psychiatric nurses). Team referrals make up the majority of the referrals and therefore team prioritisation policies have rightly received research attention (Job 1996; Slade et al. 2000). However, it is common for occupational therapists to receive direct referrals. In order to prioritise the direct referrals, novice occupational therapists have to know how to prioritise referrals for occupational therapy. Knowledge has to be learnt from experienced therapists, as there is no other source available that pertains to occupational therapy referral priorities. The analysis of expert occupational therapists' prioritisation policies is therefore invaluable for the education of undergraduate occupational therapists.

Occupational therapists' thinking in relation to referral data has been the subject of previous research (Grime 1990; Job 1996; Harries 1996a; Harries 1998). However the methodologies that have been used in such research appears to be of limited validity and reliability (Harries,

1998). To date, knowledge of clinicians' judgement policies in prioritising referrals has only been based on a small number of clinician's 'ideas' (Job 1996). As a consequence only small samples of clinicians have been accessed (Hagedorn 1996; Munroe 1996; Roberts 1996; Harries 1996a; Harries 1996b). There is agreement that knowledge of how expert clinicians' reason is necessary for teaching good clinical decision-making (Abernathy and Hamm 1995). Certainly, clinical education has to be 'evidence-based' to ensure that students' knowledge is up to date and effective at meeting clients' needs (Lloyd-Smith 1997).

Formal research on clinical reasoning in Occupational Therapy has mainly been qualitative in nature, often using an information processing approach (Newell & Simon, 1972). Methods of data collection have been limited to stated policies and the ability to access the more intuitive expert judgement policies has been lacking (Roberts 1996; Harries and Harries 1998). Research has also shown that clinicians are not fully able to explain their well-practised policies as their thinking has become too rapid and automatic for full conscious awareness (Doherty and Kurz 1996).

There is currently a need for a larger scale research study that uses methods, which can model the whole spectrum of thinking including the more highly developed intuitive (tacit) experts' policies. Models of experts' policies can then be used as evidenced-based practice for clinical education. A method that has the potential to access such expert thinking is that of Judgement analysis, the methodology of Social Judgement Theory. This methodology has significant potential for overcoming the limitations of the information processing approach as it has the potential to model experts' judgements (Cooksey 1996). The rationale for this methodology has been published (Harries & Harries 2001). It is therefore the purpose of the researcher to utilise judgement analysis to capture expert occupational therapists' referral prioritisation policies.

The researcher intends to use the experts' modelled policies to establish if occupational therapy students are able to learn expert policy. If these students can learn expert policy this would establish a valuable method of education. Firstly, expert policy will be obtained (study 1). The second study will identify if there are particular types of policies that are used and

whether these pertain to any particular demographic characteristics. The third study will consider the level of self-insight of the participants. The self-insight of these participants has not been examined and the opportunity to compare statistically modelled policy with reported policy would be possible at this stage. The fourth and final study will examine novices' referral prioritisation policies and identify if they are able to learn the experts' policy.

By capturing expert policies it will also be possible to provide information for clinicians: the individual tacit policies can be compared with individual's stated policies in order to improve individual's insight as to their own judgement policies. The results can also inform professionally isolated clinicians about their colleagues' policies. If novices are able to learn the policies, the training package can eventually be made available on the World Wide Web so that other occupational therapists can access the training information. This would allow open access for undergraduate and novice clinicians and maximise the usefulness of the findings.

The first aim, therefore, is to use judgement analysis to identify the policies that expert occupational therapists use in the prioritisation of occupational therapy referrals within the field of community mental health. The second aim is to identify any sub group of therapists within the participants that have the most optimal policies needed to train novices. The third aim is to identify the level of self-insight of these experienced clinicians, with regard to their judgement policies. Fourthly this study will examine if novices are able to learn the expert policies thereby allowing them to prioritise referrals with greater clinical skill.

1.2 Literature Review

This literature review discusses literature pertinent to the research study. The research concerns the following main areas: firstly how a particular clinical decision is made, how much self-insight there is into the policies, how expert that decision is and how effectively novices can learn expert policy. The clinicians making the referral prioritisation decisions are experienced occupational therapists. The novices used in this study are undergraduate occupational therapy students. The decision under scrutiny is that of referral prioritisation. The

referrals, which require prioritisation, describe people living in the community who require help with mental health needs.

There are five sections to the literature review. Firstly, an introduction that describes the nature of occupational therapy practice, defines some key terms in the decision-making field and identifies the relevance of the subsequent three sections. The second section discusses decision-making schools of thought: Decision analysis, process tracing & judgement analysis. The third section concerns decision-making research in occupational therapy. The fourth section discusses aspects of expertise: expertise development, self-insight and feedback. Finally, the review concludes with the key issues that will shape the research study.

1.3 The nature of occupational therapy practice.

Occupational therapists are concerned with individuals' capacity to work, play and carry out tasks of daily living (Kielhofner 1995). Occupations can include dressing, shopping, childcare, sports and work. Illness, disability, the effects of ageing or addictions can interrupt an individual's capacity to undertake such occupations (Canadian Occupational Therapy Association 1997).

Occupational engagement can also influence health. For example, engaging for an extended period of time in an occupation that is unchallenging can lead to boredom and depression (Zemke and Clarke 1996). At the other extreme, engaging in an occupation that is too challenging can lead to anxiety and phobic behaviour (Zemke and Clarke 1996). The balance between the demands of the environment and the capacity of the individual is something that requires continual readjustment throughout the lifespan to maintain physiological and psychological health (Kielhofner 1995). For some this balance can be achieved independently, but for others help is required, especially if the individual is learning to cope with a new disability or illness. Occupational therapists aim to enable individuals to achieve occupational performance in relation to the type of occupations that the individual values. The goal is to enable the individual to lead a life that is meaningful and satisfying.

When individuals engage in an occupation they do so using cognitive, psychosocial and sensorimotor skills (Reed and Sanderson 1992). They also perform the occupation within a specific environment, which has physical, social and cultural characteristics (Reed and Sanderson 1992). When an occupational therapist assesses a client's capacity to manage an occupation, be it dressing or looking after a child, they are concerned primarily with the client's achievement of the occupation itself. This is the essential outcome that relates to successful occupational adaptation. The cognitive, psychosocial and sensorimotor skills needed to conduct an occupation, are not the primary focuses as individuals can have the capacity to achieve even with a skill deficit. For example, a blind person may have lost a sensory skill but they may be entirely capable of managing their job. The type of environment is also not the primary focus, as it may not indicate an occupational dysfunction. For example a person with multiple sclerosis may have the energy to look after their children as they have chosen to have help with the household cleaning.

It is only when an individual feels that their capacity to carry out their occupations is impaired, that they might see an occupational therapist. Clients may be referred by a doctor, social worker, and psychologist or by the client themselves. The occupational therapist will assess the client by asking them to practically demonstrate their performance of the occupation. This may be cooking a meal, driving a car or socialising in a group. Clinical reasoning is then used by the occupational therapist to consider the strengths and needs of that individual and to decide on an appropriate intervention (Hagedorn 1997). Occupational therapists are trained in both medical knowledge and the social model. Knowledge of the medical condition is vital so that the therapist can understand the underlying aetiology, pathology, treatment and prognosis. For example, knowing that hot baths can exacerbate the fatigue caused by multiple sclerosis would influence the occupational therapist's decisions in relation to bathing interventions. Knowing that high expressed emotion can trigger a relapse of schizophrenia would influence the occupational therapist's choice of social networks that they would encourage the client to use (Cohen and Hart 1988). The social model of disability is also necessary to help the occupational therapist recognise when it is society and not the disability that is impairing the individual's capacity to function. Not being able to work may be due to the lack of wheelchair access to an office or to the prejudice of employers. Therefore, the methods that the

occupational therapist uses to enable clients to maintain satisfactory occupational performance may be very varied. They may include changing the occupation itself (changing to a new type of work after sustaining a hand injury), skills training (stress management strategies for an alcoholic), or environmental adaptation (ramped wheelchair access following a spinal cord injury).

Theories of psychology heavily influence occupational therapists' practice and comprise a substantial part of the professional training. For example if a client is referred because they are not eating, the type of assessment and intervention that will be used will depend largely on the psychological theories of why the difficulties are occurring. Examples will now be given that illustrate the application of differing psychological theories.

If the client is not eating because they have anorexia nervosa, an occupational therapist may view their needs from a psychoanalytical perspective. Their unresolved emotional conflict could be thought to be the result of prior life experiences. Their withdrawn childlike state could be seen as a sign of emotional underdevelopment. An occupational therapist could involve the client in projective art, dramatherapy and creative group work to facilitate the psychosocial development of the client's emotional maturity. The use of an occupation in group therapy is an essential part of occupational therapist training. The ability to express oneself, to develop a sense of self-efficacy and self-esteem would be necessary before the client will develop the wish to eat. Once partial psychosocial capacity is achieved, the occupational therapist would add an educational perspective, for example teaching skills in cooking, budgeting, and giving advice as the client resumes social and work activities.

If however, the client were not eating because they had severe rheumatoid arthritis, their needs would be viewed from a very different perspective. Their difficulties may due to the physical weakness, pain and limited range of movement that can cause problems with cutting up food, opening cans and turning on taps. In this case a biomechanical and compensatory perspective may be taken (Hagedorn 1997). Joint protection advice would be provided to try to reduce the risks of further hand function deterioration. Altering kitchen work surfaces may be suggested, to allow heavy pans to be slid rather than lifted, so that ulna deviation is not exacerbated.

Splints may be made by the occupational therapist to stabilise radiocarpel joint and metacarpal phalangeal joints in a functional position. Fatigue management advice may be given to ensure periods of rest are balanced with periods of activity. Equipment such as tap turners, stair rails and elastic shoelaces may be provided to maximise independence and thereby provide some privacy for dressing and bathing occupations. Advice and support to engage in valued leisure or work occupations would also be essential to ensure the client has a good quality of life.

If however a client with a physical disability has developed depression as a result of their capacity to cope with their disability, psychological theories may also be needed. Cognitive behaviour theories would be used to promote positive thinking and to change challenge cognitive distortions (Beck 1976). However, an occupational therapist would not conduct cognitive behaviour therapy in isolation but would use it alongside occupational engagement. The benefits of engaging in a valued occupation that assists the client to recognise their own skills and potential can help to reinforce positive thinking. The key is to find occupations that are matched to the individual's capacity and value system, thereby ensuring a sense of self-efficacy and achievement.

Occupational deprivation certainly affects health and development, but those with disability or illness are especially at risk of being occupationally deprived (Wilcox 1998). Although the benefits of valued occupational engagement are generally recognised, empirical evidence has not been available until recently. In the 1990s the Institute of Occupational Science was started in California, to study the occupational activities of individuals (Wilcox, 1998). The occupational therapist of the 21st century will have this new source of information to support their clinical reasoning (Yerxa 1993). This information will help to ensure that individuals maximise their health through their engagement in a life of meaning and quality. To enable individuals to achieve this engagement is the role of occupational therapy.

1.4 Key concepts

In order for clinicians to be effective in their work, they need to be able to reason effectively, judge what is of importance, solve problems and make good clinical decisions (Higgs and Jones 2000). To clarify the differences between these cognitive tasks, it is useful to give some detail to these terms.

Reasoning implies the drawing of conclusions (Eysenck 1993). Reasoning may be deductive, when the conclusion is necessarily drawn given that certain statements are true, or inductive, when the conclusion drawn is only possible and needs to be tested in light of available information. For example, if a rash is characteristic of only one disease then a clinician may use a 'if...then' rule. This is an example of deductive reasoning. If the rash is characteristic of several diseases, then the clinician must use inductive reasoning. The clinician must hypothesise about the diagnosis and then consider it in light of the other signs and symptoms available.

A judgement requires the clinician to consider the importance of an option. The assignment of a weighting, reflecting a level of importance, is the task of making a judgement (Eysenck 1993). For example, when a clinician judges which alternative will be more appropriate, he is making a judgement.

Problem solving involves generating alternatives to select from. This is very common when considering a difficult diagnosis or when considering a wide possibility of treatment options. The final cognitive task, that of decision-making, is when the clinician makes the selection from the possible alternatives.

Researchers studying these different cognitive tasks have used a wide variety of terms to describe these types of thinking (Gale and Marsden 1985). These terms reflect the theoretical

and therefore methodological orientation of the researcher. Those most interested in the outcome of thinking tend to compare how information has been used with the decision that has been taken. This allows for, for instance, identification of statistical weightings of judgements or the calculation of the probability that a particular decision has been, or will be, made. These quantitative methodologies are characteristic of the schools of judgement analysis and decision analysis respectively. Researchers more interested in describing the actual processes of thinking, as opposed to the decision outcome, have focussed their attention on the skills of reasoning and problem solving. These latter researchers tend to use more qualitative methodologies such as those of process-tracing and ethnography. Each of these schools of thought; decision analysis, process-tracing, ethnography and judgement analysis will be presented in section 2.

In occupational therapy, the profession of the researcher and the field in which this research study is being conducted, the methodologies that have been most commonly employed are those of ethnography and process-tracing. However, it is argued that these methods have not been very effective in accessing the clinical thinking processes of *expert* clinicians (Kirwan et al. 1986). A critique of the research methodologies used in occupational therapy is necessary in order to examine the validity of the methods used to date. This critique will be presented in section 3.

More effective methodologies will allow for the examination of expert thinking. Development of expertise and insight is necessary for clinicians so that they can continue to improve their own expertise as well as that of the novice clinicians for whom they are responsible. The most effective methods for improving expertise are important when teaching novices professional policies. The topic of expertise development, self-insight and the use of feedback are considered in section 4.

1.5 Decision making schools of thought: decision analysis, process tracing & judgement analysis.

1.5.1 The decision analysis approach.

In 1954, Paul Meehl published a review of twenty studies comparing intuitive clinical judgements and statistical combinations of the same information. This seminal book showed that, even on simple tasks, statistical methods were more accurate than human judgement, (Meehl 1954). A need to study clinical decisions through statistical means was clear. The behavioural researchers took up this challenge (Elstein and Schwartz 2000). Their work was aided, in the 1960's by the arrival of computers. This allowed tasks of human decision-making and judgement to be statistically analysed and modelled to depths that had previously been limited (Arkes and Hammond 1986). Decision analysis was now considered limitless. By the 1970's decision-making research was increasing rapidly in the clinical field. There was a surge of publications including a special issue on clinical decision analysis in the New England Journal of Medicine. The Society for Medical Decision Making was founded in 1979 and it produced its own medical decision making journal.

It is relevant to give some detail of the decision analysis approach at this point. Decision analysis was a quantitative approach to understanding decision-making. It drew on theories from operation research, game theory, microeconomics and utility theory (Dawson and Cebul 1990). The majority of medical decision analysis was based on expected utility theory (EUT) (Hershey and Baron 1987). The expected utility theory was, in turn, based on certain axioms. For example, the transitivity axiom stated, that if you prefer A to B and B to C then you would prefer A to C (von Neumann & Morgenstern, 1947). The likelihood of the event occurring was represented by a probability value. The desirability of the outcome was represented by a utility

value. The component parts of the decision were then multiplied together to suggest a decision. All these factors were represented in a 'decision tree'.

Where no objective probability values were available, subjective probabilities, that is, individual's beliefs of the probability of the expected outcome could be used (subjectively expected model) (Savage 1954). These two utility models, expected utility theory and subjective expected utility theory, were developed to describe decisions that contained an element of risk. Other models such as multi-attribute utility theory, elimination by aspects, satisficing and the lexicographic method were developed to describe riskless decision-making (Gilhooly 1996). Clinical decision-making was categorized as risky as the outcomes of clinical decisions were commonly unknown.

Decision analysis was viewed as a prescriptive or normative approach to understanding decisions as it attempted to suggest how decisions **should** be made. It attempted to analyse the decision before it took place. This was known as a priori decomposition as opposed to a posterori decomposition. The type of information that decision analysis could yield was thought to have great potential for assisting clinicians. The probability statistics could be used to inform clinical decisions. They could be used to provide data for clinical guidelines to plan for optimal screening and treatment decisions (Hershey and Baron 1987).

The cognitive theorists viewed decision analysis outcomes as superior to those of human cognition (Elstein 1976). They felt clinicians' decisions were unhelpfully influenced by 'cognitive bias' (Dawson 1987). They viewed this bias as detrimental to both human information synthesis and probability estimates (Dawson 1993). Cognitive bias was thought to be caused by such things as clinicians' use of heuristics (rules of thumb) (Tversky and Kahneman 1974). These could lead to a less than optimal decision being made. Simon (1957) agreed that human cognition was limited but held that the use of heuristics was necessary. He felt people had to manage huge cognitive demands and therefore had coped intelligently by having 'bounded rationality'. But decision analysts felt it was preferable for computerised 'decision support systems' to manage the vast amounts of statistical clinical information. They felt clinical decisions could be based on the quantitative knowledge of the effectiveness of

treatment, chance of survival, cost effectiveness and the patient's resulting quality of life (Dawson and Cebul 1990). They expected that clinicians and patients alike would recognise the superior value of formal decision analysis. It was thought that they would welcome the opportunity to use such valuable information, but this was not to be the case.

Cognitive theorists found clinicians very resistant to attempts to introduce such systems (Elstein 1976). Clinicians felt that the calculations of decision analysis were unmanageable. They felt they were time consuming and they had little faith in the validity of the analyses themselves. Clinicians were not sure that the probability figures had been derived from appropriate or accurate information. Clinicians were also concerned that such quantitative approaches negated the intuitive nature of their decisions (Elstein 1976).

Decision analysts attempted to remedy some of the clinicians' criticisms of their theories whilst continuing to promote the value of their work (Dawson 1987). But by the 1980's the medical decision making community began to be less confident about the contribution it could make to clinical decisions. It was having little impact in incorporating its research into the daily lives of clinicians. The society members felt out numbered by the clinicians. They felt swamped by the vast number of medical decisions that needed to be understood before sufficient data could be provided (Fryback 1983). At the same time, behavioural decision theorists had begun to show that the axioms of Expected Utility Theory, although sounding plausible, actually differed from how clinicians reasoned (Tversky and Kahneman 1981). This demonstrated that humans were not always rational and that utility probabilities would therefore not necessarily lead clinicians to the decisions that the decision analysts would have expected. It was therefore acknowledged that the theories were not 'descriptive' of how decisions were made in clinical practice (Hershey and Baron 1987). In an article in the British Medical Journal in 1983, Fox and Alvey recognised that probabilistic methods were going to be unworkable (Fox and Alvey 1983). They felt that the computers used in clinical settings were usually too small to hold sufficiently large databases i.e. all diseases along with the statistically valid epidemiological data. Even if the data were to be made available to the clinician, the probability numbers presented would be unfamiliar and open to misinterpretation. For example if a diagnosis of an ulcer is represented by 0.75, what would

this mean and how would this relate to whether surgery should be conducted or not was not clear (Fox and Alvey 1983).

A few clinicians were less resistant. They could see some value in decision analysis so they worked alongside the statisticians to try to produce information that was more user friendly (Seymore et al. 1990). Seymore, Green and Vaz used the Spiegelhlater-Knill-Jones (1990) approach to predict postoperative respiratory complications in a group of elderly surgical patients. It combined elements of Bayesian analysis with logistic regression analysis. (Bayesian probability theory utilises test results to estimate the probability of a disease occurring.) The weightings of risk factors were calculated using these methods leaving the clinician only to add, subtract and use a reference table. It had the benefit of producing statically accurate data that was also clinically acceptable. However, this type of information was still only available for a few clinical decisions and the full range of clinical decisions still required analysis.

The use of probability based decision support systems continued to remain unpopular with the majority of clinicians. Knowledge-based information systems began to take its place. The knowledge-based systems were developed to provide rules or small units of information written in text. This form of information was more acceptable to clinicians. Instead of using probabilities, the system would ask the clinician questions and then use logic to draw a conclusion from the knowledge base (Fox and Alvey 1983). The knowledge-based systems have been used to provide the general public with a new telephone advice service 'NHS direct' (NHS 2000). Whether the service proves to be of value remains to be seen. Clinicians have not been very ready to take the time to access the knowledge-based systems provided for health professionals. For example the systems developed to provide advice on such topics as bacterial infections and glaucoma have been developed, but their use by general practitioners or hospital doctors has not been popular. It had been thought that at a minimal level, knowledge based systems would be used to confirm the clinicians' decisions (Fox and Alvey 1983). But, as time is short in clinical settings, clinicians tend to rely on their own knowledge rather than checking with a computer database. If the systems are not used, it is unlikely that information will be up-dated due to the vast costs required (Gordon 1991). The value of the

knowledge-based systems therefore appears limited. They are limited in terms of the time it takes to develop them, the time it takes to use them and the cost of maintaining and up-dating them. The key will be to make information accessible and understandable for clinicians. Research continues to try to reach this goal (Hoffrage et al. 2000)

1.5.2 The process-tracing approach

Decision analysis had not been able to produce a descriptive model of decision making (Hershey and Baron 1987). Only a symbolic (paramorphic) model had been created (Hoffman 1960). Cognitive researchers wanted to study the actual process of thinking so that an exact (isomorphic) model could be described (Gale and Marsden 1985). This motivation led to research using a process tracing approach. Process tracing focussed on the processes involved in reaching judgements and solving problems rather than the input-outcome method of structural research (Elstein et al. 1978).

Process-tracing researchers wanted to reveal what was occurring in the mind of the decision maker, in order to understand what had occurred in the process between 'attending to information' and 'making a decision'. The process-tracing approach differed from the structural approach, as the interest was in the decision process, rather than in the decision outcome (Ford et al. 1989). In structural approaches, the mind itself had remained a 'black box'(Denig and Haaijer-Ruskamp 1994): the focus only being on the input and outcome of the 'box'. (Comparing input and outcome had generated mathematical models of processing.)

"For information-processing researchers, understanding and explanation take precedence over prediction and control"(Elstein et al. 1978)p.43.

In process-tracing, the researcher was more interested in accessing the 'black box' in order to understand the processing as it occurred. The subsequent modelling of the process was therefore of secondary interest.

In process tracing, analysis occurred after the decisions were made. This was therefore a posterori approach as opposed to a priori approach. Methods used to study process-tracing, reflected the researcher's attempts to access the thoughts of the decision maker. For example, information boards and response times were used to show the order and length of time that information was attended to.

Some researchers also used ethnographic approaches. This involved spending time with the decision maker in their natural environment in order to closely observe their problem solving processes. The aim was to gather a detailed understanding of the situation: rich descriptive data was obtained. The "whole real-life situation" was needed in order to put the meaning of the processes in context (Benner 1984).

The process-tracing method most commonly used was the verbal protocol analysis. The commonest way of obtaining a verbal protocol was by recording a 'think aloud'. For this, participants were asked to think out loud as they carried out a task. The verbalisation could then be transcribed verbatim and then analysed for themes or thought strategies. Although this method could increase the time of the thinking task, the method itself was not found to lead to any changes in the actual judgements or decisions (Ericsson and Simon 1980). However, there were many potential difficulties in obtaining valid and reliable data from verbal reports.

The validity of the report related to how well the verbalisations corresponded with the thought process. Some participants were found to be very sparse in their verbalisations (Gilhooly 1986). Encouragement to expand on thoughts risked altering the thought processes and therefore interruptions had to be minimised to such phrases as " keep talking" (Ericsson and Simon 1993). Although transcripts could be recorded by audiotape or videotape (when invented), the analysis still needed to be coded by more than one coder in order to ensure coding reliability. Agreement between coders needed to be greater than 80% to ensure a minimal acceptable level (Miles and Huberman 1994). When presented with familiar information, thinking was much faster. Due to experience of the thinking process, thinking did not need to be fully conducted when a situation was familiar. It therefore became minimalised. This rapid, minimalised thinking was described as 'intuitive thinking' (Abernathy and Hamm

1994). During intuitive thinking, the researcher had difficulty recognising that a thought had occurred. The participant had not necessarily been aware of the rapid, dramatically shortened form of thought and the thought was not therefore verbalised. Verbal protocols did not, therefore, elicit intuitive thought effectively.

In some circumstances, it was not even possible for concurrent think alouds to be obtained. For example, in a clinical setting, a doctor would not be allowed (ethically) to think aloud in front of a patient. In these circumstances, retrospective reporting would be used (Elstein et al. 1978). Retrospective reports were obtained by asking participants to describe the thinking they thought they had used during a task. However, these were found to be less accurate than concurrent verbalisations even when the retrospective report occurred immediately after the task (Elstein et al. 1978; Denig and Haaijer-Ruskamp 1994). Accuracy was partly reduced as some thoughts were lost to recall. Problems could also be caused by participants becoming increasingly analytical in an attempt to rationalise the thoughts they had had during the task itself (Denig and Haaijer-Ruskamp 1994). It was also found that, when compared with concurrent verbalisations, there was more focus on the end result of the thinking rather than on the processing of the decision (Denig and Haaijer-Ruskamp 1994). To overcome the need to use retrospective reports, where possible, simulated problems were developed. These produced more accurate data than retrospective reports (concurrent verbalisations could still be obtained). They also had the advantage of allowing standardised patients to be presented repeatedly to different decision makers. This opened up the possibility for quantitative analysis to be conducted. One concern with simulated problems remained: were they valid representations of real tasks? Research has since shown that as long as the relevant factors are presented in a method appropriate for the task, then simulations are regarded as a valid method for eliciting the thinking process (Holzemer et al. 1981; Morrell and Roland 1990).

One of the important contributions of the process-tracing research has been the research on the development of expertise. One of the earliest uses of think aloud was seen in de Groot's studies of the thought processes of expert chess players (de Groot 1965). He set up chess games in mid play and then asked the players to think aloud as they played the games. He analysed the verbal protocols in order to determine the importance (weight) of each alternative

and the factors influencing which choices had been made. De Groot's aim was to identify how expertise effected processing. His findings showed that that participants, at differing levels of expertise, considered the same number of choices and the same depth of each choice (6-7 moves). However, the more expert players were able to select the better moves.

Although researchers, such as Newell and Simon (1972), continued with de Groot's aim to support process tracing studies, there were still times when experimental research was still needed (Elstein et al. 1978). When descriptions of thinking were elicited through process-tracing methodologies, hypothesis testing was still needed to discover **why** the processing has occurred. For example having recognised that the processes of expert thinking was linked to previous experience, researchers then needed experimental design to prove the relationship between levels of expertise and use of memory patterns (schemata) (Gilhooly 1996).

The 1960s and 70s saw the process tracing approach gather momentum. One significant contribution came in the presentation of the information processing theory (Newell and Simon 1972). This suggested that the task environment determined the possible structures for viewing problems (problem space) (Newell and Simon 1972). It was felt that the structures of the problem space would determine how the problem was subsequently considered. The decision maker was therefore viewed as 'adaptive' in relation to the type of task being thought about.

In terms of medical studies, Arthur Elstein and his colleagues conducted the first major study to link process-tracing with clinical problems. Their findings, were presented, in 1978, in the book 'Medical problem solving: an analysis of clinical reasoning' (Elstein et al. 1978). This was followed in 1990 by a ten-year retrospective of their results along with a review of further developments in the field (Elstein et al. 1990). The original studies published in 1978, used three methods of data collection: direct observation of problem solving using simulated clinical problems, concurrent think aloud and retrospection (whilst viewing video footage) (Elstein et al. 1978). When analysis found conflicting information from the three sources, data was weighted in the previously stated order: observation holding the most weight (Elstein et al. 1990). The aims of the medical problem solving study were three fold. It aimed to identify

experts' reasoning processes, consider the context of these theories in relation to individual's attributes and existing psychological theories and finally to develop direction for future medical education. The findings included identifying a type of reasoning described as 'hypothetico-deductive reasoning'. This type of reasoning was found to involve a process of generating and testing hypotheses. The number of hypotheses generated was found to be small and the number did not vary between novices and experts. However the experts were found to have interpreted data more accurately when testing their hypotheses. Personality attributes were found to have little bearing on problem solving expertise. Instead it was the extent of clinical experience within the particular domain that was important. These finding had implications for medical education, as contrary to what had been thought, it was not the reasoning strategies themselves that improved clinicians' problem solving but the domain specific knowledge that was important. Pre-registration problem solving training would, therefore, not create experts: lifelong learning would be necessary to achieve mastery of knowledge domains.

Education subsequently made a move away from problem-solving training and toward problem-based learning (Norman and Schmidt 1992). This new method of education increased clinical knowledge through facilitating exposure to clinical case scenarios. Cognitive theorists continued to focus their attention on researching knowledge bases and how information had been used. Research on memory was now also necessary to identify how experienced clinicians organised memory 'chunks' and how recall mechanisms facilitated recognition of previously encountered scenarios (Norman and Schmidt 1992). Groen and Patel (1985), identified that Elstein's work had neglected the recognition component in thinking. They reanalysed Elstein's data in order to demonstrate this. They found that novice problem solvers reasoned backwards from hypotheses generation to data, whereas experts reason forward using 'if....then' rules (propositional reasoning). It was apparent that to use these propositional rules experts had drawn on their well-structured knowledge bases (Johnson-Laird and Shafir 1993). Elstein acknowledged this but reminded theorists that as expertise is domain dependent, when an expert is confronted with an unfamiliar problem they will revert back to methods of hypothesis testing (Elstein et al. 1990).

The decision analysts, continued to hold differing views to the information processing theorists. They criticised the methodology of process tracing. Although their own methods had flaws they did not believe that process tracing methodologies had the ability to describe the true decision process either. Their rationale for this criticism was that the importance of cues described in verbal protocols did not correlate, when compared with decision outcomes, to the weights they had actually been given to the cues. The decision analysts felt experts' insight was lacking and therefore verbalisations were not a valid method of describing thinking. This tension between the normative and descriptive theorists was very apparent in the 1980s and 1990s. But neither camp appeared to have all the answers. In 1993, Elstein, in an attempt to forge co-operation between the theorists, devoted a special issue in the journal Cognition to this very topic. This went some way to informing both camps about each other's fields.

However, there was a third camp of theorists who had turned their attention to applying a different methodology. This methodology was that of judgement analysis.

1.5.3 Judgement Analysis

Judgement Analysis developed from three theories; Probabilistic Functionalism, Social Judgement Theory and Cognitive Continuum Theory (Cooksey 1996).

Probabilistic Functionalism was the idea of Egon Brunswik (1903-1955), an Austrian-American psychologist (Doherty and Kurz 1996). Ken Hammond, a graduate student of Brunswik's at Berkeley University in California, took Brunswik's ideas and developed them into the Social Judgement Theory and the Cognitive Continuum Theory. Brunswik's ideas had been developed in relation to perception in the 1930s. They had remained unpopular in psychology until the 1960's when Hammond applied them to the field of judgement.

Brunswik's ideas were born from his concern that research into cognition was mainly experimental and situations presented to subjects lacked the natural inter-cue correlations that would be found in the ecology. He identified the need to use 'representative design' to present similar information to the real environment. Brunswick emphasised that situations must be based on the types of information that would actually occur in the natural environment (Brunswik 1952).

Brunswik also recognised the need to understand a range of individuals' judgements in a range of situations. He felt research had sampled subjects effectively, but had neglected to sample the ecology with such care. He viewed ecological validity as the correlation between the environmental cues available (distal criteria) and the person's perception of these cues (proximal cues)(Brunswik 1952). He felt the interaction between the environment and the individual, both in the perception of the environment and in the response to the perception (functional response), were 'probabilistic' (unpredictable) and therefore research needed to examine peoples' (or other organism's) perceptions on a range of possible situations.

The importance of the probabilistic structure of the environment can be seen in a study by Tape, Heckerling, Ornato and Wigton (1991). The accuracy of physicians' judgments about the probability of pneumonia in patients was higher for physicians in Nebraska than in Virginia or Illinois. Accuracy was measured through comparing X-ray results. However, accuracy should be measured not only from the point of view of the decision maker but also in context of the predictability of the environment. When the environment was studied it was found that the X-ray results had a clearer relationship to the symptoms in Nebraska than in

Illinois and Virginia. Physician's use of information in making their judgment was appropriate for the environment (the set of cases) in which they practiced.

Brunswik's concern for representative design in the ecology also extended to the subjects. Traditionally, experimental design had aimed to find trends in data, thereby using nomothetic design to allow for analysis that would average results across subjects. Instead, Brunswik advocated an idiographic-statistical approach (Brunswik 1952). This required analysis to be conducted on each individual in a range of situations. Brunswik's interest lay in finding, for each **individual**, the relationship between the distal criterion and the functional response. This relationship was viewed as the level of 'achievement'. Brunswick developed a 'lens model' a representation of the relationship between a person and their environment (Brunswik 1952) (Fig. 1).

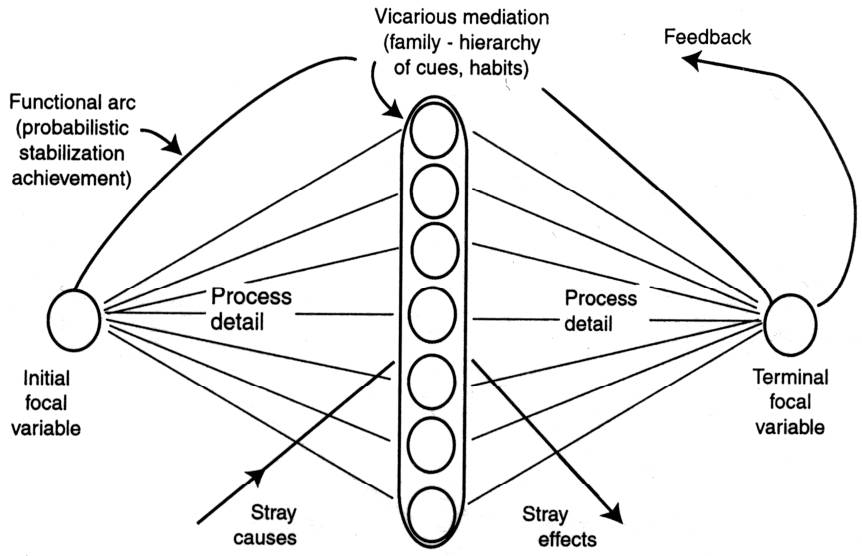


Fig. 1 Brunswik's original lens model (Brunswik, 1952).

This lens model represented, on the left, the perception of the ecology (task system) and on the right, the cognitive processing of that perception (cognitive system). Achievement would occur when the individual was able to perceive the ecology successfully: the individual would be able to use "cues in accordance with their level of ecological validity"(Cooksey 1996) p.8. Brunswik thought that the use of correlation statistics would allow this level of achievement to be identified.

Hammond's Social Judgement Theory, took Brunswik's ideas on perception in the physical environment and applied them to the study of human judgement within the social environment (Hammond 1955) (Fig 2).

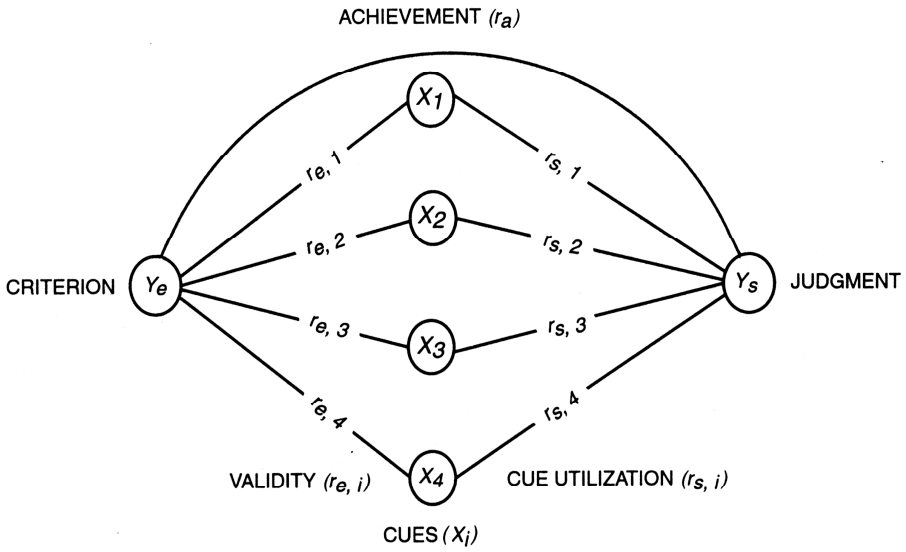


Fig. 2 The lens model adapted for social judgement theory.(Hammond et. al. 1975)

In their adapted model, achievement (r_a) is the correlation between the judgement (Y_s) and the criterion (Y_e). Social Judgement Theory was not viewed strictly as a theory as it provided no testable hypothesis. Rather it was viewed as a metatheory, giving direction to research on judgement (Brehmer 1988). Out of Social Judgement theory, Hammond developed Cognitive

continuum Theory (Cooksey, 1996). This was his attempt to integrate the ideas of such theorists as Brunswik, Newell & Simon. The theory focussed specifically on the continuum between intuitive and analytical thinking. The five premises of Cognitive continuum Theory are summarised as follows:

1. Forms of cognition were viewed along a continuum, the poles being represented by analytical thought and intuitive thought. The cognitive continuum index (CCI) was a method developed for quantifying the position of the decision maker along the continuum.
2. The mode of cognition between the poles was described as quasi-rational thought. This was composed of a mixture of both analytical and intuitive thought of differing proportions. No position on the continuum reflected a more superior mode than any other point.
3. Characteristics of the judgement or decision tasks (complexity of task structure, ambiguity of task content, form of task presentation) would induce the form of cognition. These characteristics also formed another continuum, the Task Continuum Index, identifying modes of thought that tasks were likely to induce. The Task Continuum Index (TCI) was developed to quantify the level of cognition likely to be induced by the type of task.
4. The mode of cognition used by the decision-maker was not static. It could alter according to three issues: a mode had been successfully used, if there was previous experience of the task or if the task characteristics changed.
5. The CCI describes a range of cognitive modes from intuitive to analytic with quasi-experimental processing as a mid-point. This continuum is in contrast to the dichotomy often drawn between processes that are implicit and unconscious and those that are explicit and fully conscious.

Judgement analysis therefore involved making decisions on a large number of hypothetical scenarios, in which the information (cues) had been varied. This allowed the weightings given to cues to be statistically identified. The weightings represented the decision maker's tacit

judgement policies. The weightings that had been given by the individual and the extent to which different individuals agreed on these weightings, were of great interest to judgement analysts.

There was also interest as to how much insight individuals had about these weightings. One way in which insight could be identified began with asking individuals to state the weightings they thought they had put on cues (stated policies). These were then compared with the statistically derived weights (tacit policies) (Evans et al. 1995). The degree of agreement between stated and tacit policies reflected the level of insight. In general insight was found to be poor. However, later studies showed this to be the fault of methods of accessing subjective policies rather than lack of insight. The developments of studies of insight are discussed in section 4.

Although the interest for judgement analysis lay in representing accurate individual policies, it also allowed for the grouping of judges. This was known as policy clustering (Cooksey 1996). Following the identification of individual weighting policies (idiographic analysis), group-level analysis (nomothetic analysis) could then be conducted to identify any groups of judges with similar policies. Some Multiple Cue Probability Learning (MCPL) studies experimentally manipulated groups of judges and carried out blocks of policy learning in repeated trials (Cooksey 1996). ANOVA, a statistical method of analysis, was then conducted to identify changes in group policy. However in other studies, where no known groups of judges existed, researchers used measures of Euclidean distance to capture both variability and magnitude of policies (Cooksey 1996). The results then allowed for policy clustering. If the researcher had hunches as to reasons for groupings, the results could be externally validated with demographic data to see if the results tallied.

Hammond also developed Cognitive Continuum Theory (CCT) (Cooksey 1996). This had implications for identifying the most appropriate research methodologies for the particular cognitive task under study. The theory encompassed Brunswik's ideas on the importance of

the organism-environment interaction. CCT described a theory of human judgement that related the environmental characteristics to differing types of cognition. The types of cognition ranged along a continuum from analytical to intuitive. Analytical thought was described as a slow, step-by-step, conscious, logical process. There would be high confidence in the method itself as cues were interpreted objectively and a formula would be followed. Errors would only occur if a mistake, in the method, went unnoticed. Confidence in the method was higher, therefore, than in the outcome. Tasks that would induce analytical thought included those where an organising formula was available, those where the outcome was available, and those with less than five available cues. The cues would usually have been objectively measured and nearly all the cues were required to make the judgement. The cues would also be presented successively, be of unequal weightings in the ecology and would be used in a non-linear way. Alternatively, intuitive thought was described as a fast, automated process. The decision maker would not be aware of how they had arrived at the judgement and therefore there would be low cognitive control and consistency (Hammond and Summers 1972). There would also be minimal conscious awareness and there could therefore be poor levels of insight. Confidence would be higher in the outcome than in the process. Cues would be perceptually evaluated, used in a linear way and only a small number of the cues of those available would actually be used. The task would normally have more than five cues and they would present simultaneously. The cues would have equal weighting and the decision maker would utilise a weighted average strategy. CCT did not assume, a priori, that either analysis or intuition was a superior mode of thought. Success, in terms of high task achievement, would only depend on whether the characteristics of the task were well matched to the attributes of cognition that would be required. In presenting the task characteristics appropriate to the mode to thought, Hammond had also described a 'task continuum'.

Hammond purported that cognition was, however, rarely purely analytical or intuitive, and therefore the central region, that consisted of a mixture of the two cognitions was the most common mode. This was identified as 'Quasi-rational' cognition. Clinical judgements were viewed commonly as involving some intuitive thought and some analytical thought. They therefore fell into this quasi-rational area. In many clinical tasks, process-tracing techniques were going to be, therefore, of little value in accessing the full range of thinking. The process-tracing methodologies were limited where intuition occurred. During intuitive thought there

was little conscious awareness or insight. Judgement analysis was therefore of greater value as it did not rely on the participant's ability to make policies explicit. Judgement analysis only required the decision maker to make judgments or decisions as they normally would. There was no requirement for the participant to access the processing stage. Judgement analysis did not, therefore, rely on insight, subjective interpretations, the ability to make implicit policy explicit, or to describe a process that had become minimalised, if not completely automatic and unconscious. In this way it was a more valuable methodology for researching clinical judgements.

Judgement analysis was successfully applied in a wide variety of fields including finance (Waller 1988), and weather forecasting (Stewart 1990). Hammond's ideas were also recognised as being very well suited to the study of clinical judgement (Wigton 1996). Indeed, the earliest studies judgement analysis studies began with the examination of clinical judgement (Wigton 1988; Wigton 1996). Although judgement analysis was viewed as a paramorphic (symbolic) rather than an isomorphic (exact) representation of the decision process, as the policy derived from the multiple regression analysis was not necessarily an exact model of the actual policy, its findings were a closer description of what actually happened in practice than the findings of the decision analysis. No generalisations of policy use could be made from process-tracing studies. This was due to the fact that process-tracing studies used comparatively few, carefully selected clinical scenarios. Therefore the sample would be too small for statistical analysis to be conducted. Judgement analysis allowed the statistical analysis to describe the relationship between information available and the judgement or decisions made.

A study by Kirwan and colleagues (1986) confirmed the superiority of the judgement analysis approach. They examined 89 rheumatologists' policies for prescribing anti-inflammatory medication. As the rheumatologists saw patients, they were asked to record five cues (pieces of information) such as early morning stiffness, as well as the medication they then prescribed. This was used to identify the prescribing policies they actually used in practice. They were then asked to give an in-depth interview to explain how they assessed patients. This was to simulate teaching their stated policies to medical students. The policies they used in practice were compared with the policies they thought they had used (stated policies). This was found to be a poor predictor of their policies (R^2=34%). This showed that experienced practitioners

lacked awareness when trying to verbally report factors that had influenced their clinical decision-making and that the judgement analysis approach was more effective at eliciting policies than verbal protocols. (Kirwan et al. 1986).

The cue information recorded in the clinics was then used to create a set of 50 paper patients (including a replicate set of 20 to test for test-retest reliability). The clinicians then tried prescribing for the paper patients and the results were examined. This stage was the methodology of judgement analysis. The judgements over real patients correlated well with those over paper patients (R^2=88%). But again, on paper patients the stated policies were poor predictors of actual policies used (R^2=39%). One explanation for this was that, some unconscious processing had occurred and therefore clinicians were not able to accurately describe their practice policies. It appeared that the more experienced the participants were the less able they were to say what they knew (Nisbett and Wilson 1977; Hoffman 1987). (This issue of expertise, task familiarity and related modes of thought is discussed in section 4). The teaching of students may well have reflected the textbook theories on prescribing, as these would have been the original sources of their knowledge. In practice, their learning would be gained mainly from discussions with their colleagues (Wyatt 1991). If, when discussing policies, the information spread was not representative of practice policy, then learning would be less effective than it could be. It is important that methods of research into clinical judgement avoid relying on verbalisations. Methods are necessary that can find out not just the cues used but the weighting and combination of these cues. Judgement analysis can allow this to be done. In addition, the statistically identified policies can be compared with the subjective policies (how they think they have made their judgements). These can then be used to improve the awareness of practice policies.

Comment [CH1]: Either it's adjusted R, or R squared (most likely if it's reported as a %) or there's a chance it might be a Fisher's z transformation of R but I don't remember a * in the paper.

In turning attention back to the earlier mentioned issue of representative design, the small number of situations considered in process-tracing studies had been recognised as a weakness in methodology (Elstein et al. 1990). Judgement analysis, however, did involve presenting participants with a large number of scenarios. Brunswik even advocated the need for representative design within these scenarios. This ideal was commonly compromised in

studies of judgement analysis. Often, although any one judgement had been made on a realistic scenario, the correlations between the types of information presented in each scenario had been minimised ($r<0.02$). This had been done so that the role of any one piece of information could be clearly measured (orthogonal design) (Evans et al. 1995). In terms of this representativeness of the design, the process-tracing approaches could have been said to have advantages over judgement analysis. However, methods such as observation and interview were only possible with a limited number of scenarios. This made it difficult to generalise about decision policy. In addition, observations and interviews have been shown to be poor predictors of actual practice (Kirwan et al. 1986). Indeed it is unlikely that even if every possible scenario were discussed in an interview the policy on any one scenario will be consistently applied. On balance, even though judgement analysis does not achieve an isomorphic representation of judgements, nor does it usually achieve Brunswik's ideals of representative design, it has been shown to be the most effective of the three approaches for eliciting clinical policies (Kirwan et al. 1986).

1.6 Decision-making research in occupational therapy.

As the methodology of judgement analysis had been effectively used for identifying clinical policies, it could be applied within the researcher's profession of occupational therapy. However, its use with occupational therapists has so far only been studied by one researcher (Unsworth et al. 1995; Unsworth 1996; Unsworth et al. 1997). Her research has been within the context of studying team decision-making (in which occupational therapists were included). The majority of methodologies used to study occupational therapists' decision making have employed methodologies from the ethnographic and process-tracing approaches. These qualitative methods had been adopted for several reasons.

1.Qualitative methodologies provided a logical starting point for new research to begin. However, how occupational therapists reasoned had not been identified, let alone become available for some type of quantitative testing. Qualitative research was therefore an exploratory approach suitable for a first stage of research.

2.Research in the occupational therapy profession also began at a time that medical research had used qualitative methodologies successfully. New strategies, such as that of the hypothetico-deductive strategies had been identified (Elstein et al. 1978). It was logical, therefore, that as these approaches were being used by reputable medical researchers, they should also be suitable methodologies to use in the field of occupational therapy.

3. Qualitative approaches were in keeping with the holistic frame of reference associated with the profession of occupational therapy. The environmental 'context' of the reasoning was valued in the qualitative approaches. The reductionist approach of decision analysts, with their roots in the traditional sciences, was unpopular with the profession. Occupational therapists valued the social context and humanistic perspective of decision-making. The term 'reasoning' was linked more to the descriptive approaches than those of 'decision-making'. 'Reasoning' was therefore adopted as the common term used in the occupational therapy literature.

Judgement analysis methodologies seemed to have gone almost unnoticed in occupational therapy. Up to the year 2001, only one occupational therapy researcher cited it as a methodology used (Unsworth et al. 1995; Unsworth 1996; Unsworth et al. 1997). Unsworth had found it a useful methodology for studying discrete occupational therapy decisions but argued that it had yet to be appropriately applied to the study of referral acceptance (Unsworth 2001). Although judgement analysis had many useful attributes, (it valued the environmental context and was able to produce a closer description of clinical policies than decision analysis), it had yet to be thoroughly used in occupational therapy research. However, its potential was apparent.

As the term clinical reasoning was the main term adopted in the occupational therapy field, it shall be used for next section. This section will critique the development of the clinical reasoning studies that have been conducted to date in the field of occupational therapy.

1.6.1 Views of the 1980s and 1990s.

The first major study to explore the reasoning strategies used by occupational therapists in their clinical work was published in 1991. The American Journal of Occupational therapy published findings of a 'Clinical Reasoning Study' that had been sponsored by The American Occupational Therapy Association (A.O.T.A.) and the American Occupational Therapy Foundation (A.O.T.F.) (Fleming 1991a; Fleming 1991b; Mattingley 1991). This study used an ethnographic and action research approach: interviewing, observing and videoing seventeen Occupational Therapists over a two-year period. The researchers identified reasoning 'tracks' or styles and linked these to reasoning strategies. The researchers had incorporated the work of Donald Schon (1983) who placed value on reflection as a means of understanding implicit or tacit reasoning (Mattingley and Fleming 1994). The findings of the 1991 papers greatly influenced subsequent clinical reasoning studies in the field of Occupational Therapy.

1.6.2 Reasoning 'tracks' or styles

The researchers in the AOTA/AOTF study argued that the specific style of occupational therapists' reasoning had been dependent on the content of the task being thought about (Mattingley and Fleming 1994). For example if a clinician had thought about identifying an occupational dysfunction, a style named 'procedural reasoning' would be used (Fleming 1991b). Thought relating to a client's perspective of their needs was termed 'interactive reasoning' and thought relating to a client's context and future potential was termed 'conditional' reasoning (Fleming 1991b). The findings also identified other reasoning terminologies such as 'narrative' reasoning' (Mattingley 1991). Subsequent research on 'tracks of reasoning' in Occupational Therapy therefore recognised statements by task content (Fortune and Ryan 1996; Fossie 1996) This sometimes appeared a little forced. For example, questions relating to future prognosis were purposely asked to elicit 'conditional' reasoning (Ryan 1990; Alvervik and Sviden 1996).

1.6.3 Reasoning strategies or processes

The A.O.T.A./A.O.T.F. study also searched for evidence of reasoning processes previously identified in the fields of psychology and medicine. Hypothetico-deductive strategies (Schmidt

et al. 1990) were thought to be used primarily in procedural reasoning and intuitive strategies were thought to be primarily used in interactive reasoning (Fleming 1991b). Mattingley and Fleming may not have meant that their findings, linking content with process, should be understood in such a purist light. Indeed, in their book published in 1994 they were able to give greater depth to the understanding of the nature of the reasoning strategies used. However the pervading links seem to have been grasped firmly and applied to much of occupational therapy research. As a result of this many researchers have classified occupational therapists' clinical reasoning either by the style describing the thought content (e.g. procedural) or by the reasoning strategies recognised in the thought processing (e.g. hypothetico-deductive) (Alvervik and Sviden 1996)

Although these approaches were chosen to try to give a holistic understanding of thinking in terms of context, they appear to have been limited in terms of their ability to represent the holism of the actual thinking. Their lack of validity relates specifically to the difficulty the approaches had in reliably accessing experts' well-practised thinking. Two studies that illustrate these limitations will be discussed: the ethnographic study of Munroe (1996) and the information-processing study of Harries (1996a).

Munroe (1996) carried out an ethnographic qualitative study with 29 Scottish Occupational Therapists based in social work departments. Participants were field observed (by the researcher as a non-participant) during 83 home visits whilst seeing clients and carers. Field notes were kept by the researcher and given to participants in order for key reflection points to be highlighted. The key reflection points were defined as times when they were *aware* of their thinking. These points were then the focus for in-depth interviews. Three parties checked the analysis of the interviews: focus groups of non-participants, the participants and selected externals. It was specifically the times of conscious thought that the researcher focussed on in her data collection and analysis.

Munroe stated that she had expected to find greater evidence, in the field notes, of procedural reasoning. For example, the routine giving of equipment would be expected to follow the procedural reasoning track. However there was minimal evidence for this. What was perhaps

not considered was that the repetitive nature of routine thinking task could have resulted in thinking processes becoming largely subconscious and intuitive (Abernathy and Hamm 1994). Therefore once subconscious, the thinking was barely accessible to the researcher or to the participant. It was not therefore, that procedural reasoning had not occurred, but rather that it was minimalised and difficult to access.

In each retrospective interview Munroe asked the participant to reflect on the thinking that had occurred during the home visits. She felt, at this point, that some clinical reasoning occurred but admitted that the interviews " came later, much later", and the reasoning was usually in response to requests for interpretation or explanation of the thinking processes"(Munroe 1996 p.200). It could be said that it is hard to assure the reliability and validity of the retrospective content of this reasoning. Firstly, if earlier thinking has not been initially fully conscious, how then can awareness be regained at a later date? Secondly, the poor reliability of retrospective methodologies would be compounded by some inevitable difficulty in recall. Munroe recognised the weaknesses of using self-reflection as an accurate tool for accessing reasoning (Dreyfus and Dreyfus 1980).

In 1996, a study on community mental health occupational therapists was conducted to examine the factors influencing their acceptance of referrals (Harries 1996a). It was common for occupational therapists to be swamped with direct referrals from GPs and psychiatrists as well as colleagues within their own team. Referral prioritisation was therefore an essential skill for effective caseload management. Occupational therapists' prioritisation policies needed to be known so that the reasoning of experienced clinicians could be taught to undergraduate occupational therapists. Policies for prioritising 'general team' referrals had received research attention (Job 1996; Slade et al. 2000) but these policies were not necessarily applicable for direct referrals received by the occupational therapist. The reason that it was necessary to equip occupational therapists with professionally appropriate policies related to the fact, that in taking a post in a community mental health team, they would be commonly the only occupational therapist. They would therefore need to have some knowledge of how to manage direct referrals in order to manage their own caseloads (Department of Health and Social Care 1999). Appropriately accepted clients would facilitate

the provision of an appropriate occupational therapy service within the community. It was expected that team priorities, which were shaped by mental health legislation, would most certainly influence the occupational therapists own prioritisation policies.

The researcher's design was drawn from the qualitative paradigm. However, instead of using the AOTA classifications and analysis, it used methodologies from the information processing approach. Clinicians were asked to 'think aloud' as they read real referral letters. These 'think alouds' were followed immediately with an individual in-depth interview. It was found that factors mentioned in the 'think alouds' were sometimes not acknowledged in the interviews. For example, when reading a referral a participant reflected on the worthiness of the referrer making the referral and yet, when interviewed, stated that they would view all referrers on an equal basis. There appeared to be a mismatch between the explicit reasoning processes in the 'think aloud' and those in the in-depth interview. Researchers have suggested that where findings conflict, more weight should be placed on the findings of 'think alouds' than interviews (Elstein et al. 1990). Although this suggestion may have been based on some post hoc rationalisation, the 'think alouds' are considered to have more validity than interviews, as they are concurrent rather than retrospective and therefore reduce issues such as accuracy of recall.

The findings drawn from vocalised 'think aloud' data showed several points of interest. Participants had their own personal method of framing the data. This was seen through the way in which they always attended to two or three particular factors regardless of the referral information. The referral information influenced those factors that were attended to. For example the second referral letter mentioned alcohol abuse, which led some of the participants to consider the appropriateness of the referral to their team's service. The need to fit the criteria of the team overrode such issues as the needs stated in the reason for referral.

Although the 'think aloud' accessed some points of interest, the methodology did have some weaknesses. Firstly, the think aloud did not access all the thinking that had occurred. For example, the participant would read the client's diagnosis but make no further comment. However in the interview there was lengthy explanation as to the necessary relevance of the client's diagnosis. This disparity may again be explained by the recognition that the

experienced clinician uses minimal processing to make sense of familiar information (Abernathy and Hamm 1994).

Another weakness of the 'think aloud' related to the difficulty in understanding which vocalised thoughts were relevant to the decision task under study and which were not. For example, it was only through the interview that it became apparent that some thoughts related to the decision to accept or reject the case and others had related to issues such as treatment planning. It was not surprising that the decision to accept the case would be intertwined with other thinking tasks. Other researchers have found that experienced clinicians do not use each stage of the occupational therapy process in a linear pattern (one stage following another) but rather in a much more complex way (Hagedorn 1996; Roberts 1996). Had the think aloud been used without the interview, the purpose of the reasoning would not have become apparent. The think aloud is a common method for examining reasoning but in this instance it lacked the ability to identify those factors that were significant to the task (Newell and Simon 1972). These points illustrate that in this study some of the methodologies of process-tracing have had difficulties accessing accurate findings.

To understand why there are difficulties in researching clinical thinking, one key issue still requiring discussion is how clinical policies can be identified when expert clinician's intuitive thoughts are difficult to access. Is it the case that insight is actually lacking, and can it be improved? The next section therefore examines experts' thinking strategies, insight and how feedback can be used to teach clinical polices.

1.7 Expertise: expertise development, self-insight and feedback.

In order to better understand why certain thoughts are difficult to access, it is necessary to gain a deeper understanding of how and why differing modes of thought occur. Hammond's Cognitive Continuum Theory (CCT) can be valuable in understanding these issues (Hammond and Brehmer 1973). Hammond's CCT described a range of cognitive modes from intuitive to analytic with quasi-experimental processing as a mid-point. Hammond felt that in more intuitive reasoning, strategies such as pattern recognition and heuristics (rules of thumb) were used. In this case, information available (cues) would immediately be linked to known patterns (Larkin 1979). This was therefore a largely subconscious, rapid, automated process and was essentially 'non-recoverable' (Hammond and Brehmer 1973). At the other end of continuum, analytical thought would occur. In this mode of thought, hypothetico-deductive reasoning was used: a slower, step-by-step method of thinking that would be highly conscious. In hypothetico-deductive thinking, cues would be used to generate possible hypotheses and further cues used to test these hypotheses.

Only when previous experience was available, could pattern recognition and heuristics be used. Prior experience allowed the intuitive mode of thought to be available to the decision maker. The mode of thought was therefore influenced by the experience of the decision-maker and hence their level of expertise. Other theorists agreed that when less practised in a cognitive task, analytical processing would have to be used but when more practised in a reasoning task, and the information is familiar, intuitive strategies were used (Benner 1984; Norman et al. 1994; Elstein et al. 1990). In addition to the role of expertise, the cognitive continuum identified the influence of task characteristics on reasoning strategy. Task characteristics, such as stability and availability of task information were though to have a strong influence on the possible types of cognitive processing (Shanteau 1992). Different types of reasoning task, involving different content, would have had different task characteristics, and would therefore be associated with different types of cognitive mode.

Therefore the mode used was a result of the combined effect of level of experience and task characteristics.

Hypothetico-deductive reasoning was more accessible than intuitive thought as it was conscious and more thinking occurred. As it was more apparent to researchers its relative importance appeared to be given too much emphasis in early research results. Elstein et al (1978) identified hypothetico-deductive reasoning as the strategy for diagnosis formation in medicine. Occupational therapists therefore also looked for, and found, hypothetico-deductive reasoning through 'occupational dysfunction' diagnosis (Fleming 1991a). However, when later clinical research was conducted, within the specific task of diagnosis formation, it was found that there were other forms of thinking occurring within the specific task of diagnosis formation. These were apparent when comparing differences between novices and experienced practitioners' reasoning strategies (Elstein et al. 1990). Researchers (Schmidt et al. 1990) found that experts, in familiar situations, did not usually display explicit hypothesis testing. As experts had the advantage of previous experience they had developed a store of 'scripts' (Abernathy & Hamm, 1994). If a client had a familiar problem they had used pattern matching to trigger the direct automatic retrieval of an appropriate script. Therefore experts confronted with a familiar problem used a rapid and automatic form of processing that was acknowledged as intuitive reasoning (Abernathy & Hamm, 1994).

Roberts (1996) and Robertson (1996) recognised the influence of expertise on occupational therapist's reasoning. The AOFT/AOTA study had focussed on hypothetico-deductive strategies in problem identification tasks. Roberts however demonstrated that reasoning varied according to the level of expertise and the nature of the task. In her research, thirty-eight practitioners wrote down their thoughts immediately after reading three referral letters. Although some of the reasoning may have been lost before the participant began to write down their thoughts, some interesting findings were made. Some practitioners initially used rapid formulations of the issues involved (pattern matchers/heuristic reasoners). They mentioned their recognition of the scenario and recalled previous cases. Others searched for cues and reasoned using various hypotheses, sometimes not reaching any specific formulation.

They appeared to have less experience to draw on. The rapid formulators did not show intuitive reasoning exclusively. Evidence of hypothetico-deductive reasoning was seen when considering some aspects of the case. In these instances participants were thought to have been less familiar with the information. This would concur with the view that reasoning strategies result from interaction between both the experience of the practitioner and the nature of the task.

1.7.1 Methodological issues of accessing intuitive thinking.

The reason that early research into clinical reasoning did not accurately access the full range of reasoning, from the analytic to the intuitive, may have been due to methodological limitations. In the early studies of clinical reasoning, qualitative methodologies from the process tracing and ethnographic approaches were mainly used. The first medical study, conducted by Elstein et al.(1978), had used process-tracing approaches to analyse the verbal protocols of clinicians. Roberts (1996) and Munroe (1996) conducted the first large studies on occupational therapists reasoning processes; they advocated the process tracing approaches and ethnographic approaches respectively. The A.O.T.A./A.O.T.F study (Mattingley and Fleming 1994), the first large study of American occupational therapists reasoning, used the ethnographic approach. (The ethnographic techniques are derived from anthropological approaches that value participant observation and in-depth interviewing.) In these early studies intuitive reasoning was not given much attention. For example in the A.O.T.A./A.O.T.F. study, intuitive reasoning was only nominally identified and described as "difficult to map"(Fleming 1991b). No details of the ways in which the mapping was attempted were described.

The ethnographic and information processing methods therefore appeared to have little success establishing thoughts used in clinicians' intuitive thinking. The methods had relied heavily on the reasoner's awareness of how information was being used to make judgements; they were limited in their ability to access the more unconscious, rapid and unrecoverable reasoning at the intuitive end of the continuum (Ericsson and Simon 1980).

Whilst these studies were being conducted, some theorists were concurrently drawing into question the efficacy of using verbal reports to access thinking. With regard to accessing the thinking of experts in particular, verbal reports were recognised by some as an inefficient and misrepresentative (Hoffman 1987). Concurrent verbalisations, at best, only got to the content of working memory, or the information attended to (but not necessarily how it is used) and retrospective verbalisations were prone to forgetting and post-hoc rationalisation (Ericsson and Simon 1980). If intuitive thought was 'non-recoverable' the issue of whether decision-makers would have any access into their thinking became apparent (Nisbett and Wilson 1977). Whether the decision-makers have access or not would be reflected in their levels of self-insight (Ericsson and Simon 1980).

1.7.2 Self-Insight

In the 1970's, researchers turned their attention to studying self-insight. Self-insight in this context can be defined as the knowledge of, and ability to describe, their own decision making policies (Harries et al. 2000a).

To identify levels of self-insight, early research compared how decision makers thought they had used information (cue weights) with how they had actually used it. This was most commonly done by comparing subjective weights with statistical weights derived from regression analysis or by comparing R^2 values derived from predictions on subjective weights with R^2 values derived from regression weights. Results from these methods generally showed that insight was poor (Brehmer and Brehmer 1988). Decision makers usually overestimated the number and importance of cues (Elstein et al. 1978). The development of expertise tended to lessen rather than improve self-insight (Slovic and Lichenstein 1971).

Some researchers began to consider whether self-insight itself was not the main block in obtaining accurate descriptions of policies, but rather it was the method being used to access the subjective policies that was lacking (Cook and Stewart 1975; Reilly and Doherty 1992; Harries and Harvey 2000b). Cook and Stewart (1975) compared seven methods for obtaining

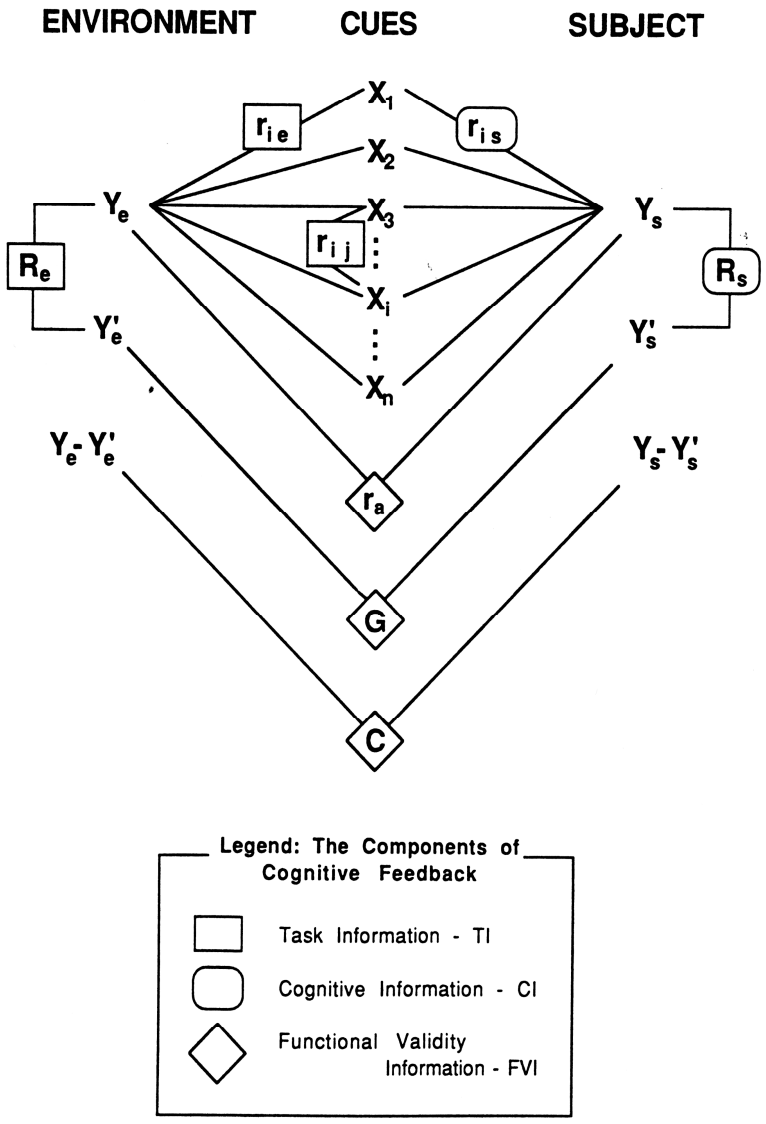
subjective policies in an attempt to identify if any of the methods were more effective than each other. The methods included both linear and non-linear methods, which was a positive attribute of the study design. Research up to that point had most frequently used the procedure of asking judges to distribute 100 points across the cues (to show the relative importance of cues in judgements). This was found to be as an effective a method as any of the other six methods tested. The correlation between predicted judgements (using subjective weights) and the actual judgements were used as the performance criterion. This was thought to be a fairer test than the comparison of subjective and objective weights, as when cues are inter-correlated, correlations between weights may be low even when predicted judgements correlate well with actual judgements. This method of measuring self-insight has found support from other researchers (Schmitt and Levine 1977; Ikomi and Guion 2000). However it could be suggested that caution is needed in using the predicted judgements as a measure of self-insight. Although subjects may have insight into their weighting policy it does not mean they will make judgements identical to predicted judgements. Predicted judgements may not be accurate representations of policy, as the degree of the individual's cognitive control would influence how the subjective weights would translate into actual judgements. Using predicted subjective policies may not therefore be a true representation of the subjective judgements.

In order to improve judgements, researchers started to give participants the 'correct' answers or weighting policies for them to compare with the ratings they thought they had used. They then reassessed them on a new set of profiles to see if their policies had become more consistent. This was the beginning of research on the phenomena of 'feedback'.

1.7.3 Feedback

In the literature two main types of feedback were tested for their usefulness: outcome feedback (OFB) and cognitive feedback (CFB). Balzer, Doherty and O'Connor (1989) present a useful diagram to illustrate the components possible in feedback information (Fig 3).

Fig 3. Framework for cognitive feedback measures (Balzer et al.1989)



OFB involved giving the 'correct' answer ('criterion' judgement, Y_e) in order that a subject could reattempt the task to see if the outcome knowledge helped them to move their own answer (Y_s) nearer to the correct one. Correct answers were not available for all decisions, but for some tasks the 'criterion' judgement could be found from the task environment. For example, in order to give medical students OFB on how to predict the risk of cardiovascular death, the correct levels of risk could be calculated by using a published logistic regression equation derived from the Framington Heart Study (Tape et al. 1992).

The other type of feedback most commonly investigated was cognitive feedback. This involved giving information on three types of relationships: relationships between the cues and the criterion judgements made (task information), the cues and the subject's judgements (cognitive information), and the criterion judgement's with the subject's judgements (functional validity information).

Task information related to information about the task system (i.e. the environment). Three types of task information were possible. r_{ie} is the relationship between the cue (X) and the criterion (Y_e) thereby representing how the cue is used. This may include the function form (linear or otherwise). The task predictability, defined as the degree to which the criterion could be predicted given knowledge of the cues was presented in the multiple correlation indices (R_e). Intercue correlations were identified with $r_{ij.}$ Task information could also be provided on the standard deviations of the criterion across the profiles (SD_{Ye}) (Balzer and Sulsky 1992).

Cognitive information provided information about the decision makers own cognitive system. The individual's judgements on each profile were Y_s. The relationship between the cue (X) and the criterion (Y_s) was represented both by the cue weight (r_{is}) and the function form (linear or otherwise). The judgement consistency, or what may be more comprehensively termed as cognitive control (Hammond et al. 1975), was defined as the degree to which the criterion could be predicted given knowledge of the cues. This was presented in the multiple correlation indices (R_s). R_s would be influenced by two factors: the degree to which the individual had

used a linear model and how consistently they had applied their model (Hammond et al. 1975). Cognitive information could also be provided on the standard deviations of the criterion across the profiles (SD_{Ys})(Balzer and Sulsky 1992).

Functional validity information linked the task system and the cognitive system. The achievement index (r_a) was the correlation between the actual criterions in the task system and the judgements. This essentially showed how close the individual was able to judge correctly. The correlations between the predictions of the linear model of the environment and the linear model of the judge was known as G. The correlation between the residuals from the predictions of these two models was known as C.

Where the environment did not provide the possibility of task information, judgement policies would first have to be 'captured' so that they could be used as feedback. The judgements could then be used as feedback for subsequent trials. In these 'single system' scenarios, where polices where had to be 'captured', cognitive information was otherwise the only feedback information available. An example of policy capturing for use as feedback can be seen in one of Kirwan's studies of rheumatologists. The rheumatologists were asked to agree on the entry criteria for patients to be used in a clinical trial (Kirwan et al. 1983). Each judged the suitability of 90 paper patients. The relative importance (weights) they attached to each of the cues in the profile was identified by regressing their 'suitability for entry' decisions on to the paper patient profiles they had examined. These policies were then used to examine the effects of cognitive feedback by comparing their agreement scores before and after they were given their own policies. Their agreement improved with cognitive feedback. This was shown by the increase in their correlation scores between their two sets of ratings: r = 0.63 increased to r = 0.76. Prior to having been given their own weighting policies, the rheumatologists were given an hour to discuss their decisions with each other. It was found that their agreement did not improve through their discussions. The discussions provided them with each other's decisions i.e. 'outcome' feedback but r =0.63 only increased to r =0.64. The benefits of cognitive feedback, over outcome feedback have been found to be a common research result (Hammond and Summers 1972). It has even been found that cognitive feedback on its own has been more beneficial than giving combined cognitive and outcome feedback. This rather surprising

finding was thought to be due to the fact that judges preferred to 'chase an error' (reinforced by outcome feedback) rather than make use of the information available (cognitive feedback) to increase their knowledge (Doherty and Balzer 1988).

In a few studies where outcome feedback has been purported as being more effective than cognitive feedback, there appears to have been a differing view as to what defined cognitive feedback (Balzer et al. 1989). The confusion seemed to have been due to the fact that feedback of the criterion judgements (Y_e), although defined as outcome feedback, is actually also part of the task information of cognitive feedback. The presentation of Y_e after producing Y_s was therefore only a weak form of task information (Doherty and Balzer 1988). Some studies had chosen, incorrectly, only to give the cognitive information part of cognitive feedback, (as opposed to including the task information as well), viewing task information as more closely associated with outcome feedback. Two studies that identified outcome feedback as superior to cognitive feedback did not recognise task information as part of cognitive feedback (Balzer et al. 1989; Tape et al. 1992). For example one of these studies gave their control group the task information of ideal cue weights (which improved their scores) and gave the 'cognitive feedback' group cognitive information only (own use of weights) (Tape et al. 1992). As task information, which is normally also part of cognitive feedback, had already been given to the control group, it was not surprising that the cognitive feedback group's scores did not improve over those of the control group (or as much as the 'outcome feedback' group). In fact, subsequent research has shown that it is actually the task information, rather than the cognitive information or the functional validity information that is the valuable part of cognitive feedback (Balzer et al. 1989; Balzer and Sulsky 1992). How the terms have been defined has certainly varied between investigators. It is necessary to ensure the types of feedback information are defined in order for various studies to be critiqued on an equal footing.

Balzer and colleagues had conducted an extensive review of the literature in 1989, but in 1992 they also conducted their own very thorough investigation of the effect of the different types of feedback on performance. Undergraduate students (N=133) were used as participants in a laboratory experiment. Balzer and colleagues set out to test the effects on performance of using all combinations of the major cognitive feedback components ie task information,

cognitive information and functional validity information. They also incorporated a control group who received no feedback. Participants had to accurately predict the number of wins for baseball teams. Effects on R_s, r_a, G and C were used to examine effectiveness of the differing conditions. Self-report was also used to collect subjective views of the helpfulness and understandability of the feedback. Task information, on its own, was found to be the most effective feedback for producing significant changes in performance. This was identifiable through changes in r_a (achievement) and G (knowledge). Those participants who received cognitive feedback did not differ significantly in their results from those who received no feedback. When task information was combined with other types of feedback, no additional improvements were made compared to using task information alone. Participants did not report any particular type of feedback as being more or less useful then any other. Participants were therefore not aware of how beneficial the feedback was to them.

Conclusions that arise from this research indicate that task information is the most valuable type of information needed to promote learning. However as task characteristics can affect how cues are used, other tasks with different characteristics may yield different results. Balzer's task had used cues with low intercue correlations and linear cue relationships (Balzer and Sulsky 1992). Tasks using high intercue correlations and configural cue relationships may require differing feedback to maximise their use.

In conclusion, the task information component of cognitive feedback has been found to be the most useful information for improving performance. This is the most beneficial information for judgements that use cues with low intercue correlations and with linear relationships to the criterion. r_a (achievement) and G (knowledge) can be expected to improve as an indication of improved performance. The effect of improved performance on other lens model indices, such as C, is less well understood. Research is needed to develop information that can be used as task information. Policy capturing studies with clinicians are needed to provide this information. The aspiration to use feedback to train clinical students can then be realised (Chaput de Saintonge and Hattersley 1985; Tape et al. 1992). In the clinical field where practitioners must make "multiple-cue judgements of some distal, imperfectly knowable

criterion" (Balzer et al. 1989) p. 430, task information has been viewed as having 'extraordinary potential'.

1.8 Conclusion

From a methodological perspective, expert occupational therapists' thinking has not been fully investigated. In order to understand how experienced clinicians make decisions, methods for effectively accessing their thinking are required. More specifically, ways of understanding intuitive reasoning strategies are necessary. From an examination of the literature relating to the development of expertise in clinical reasoning and from the author's research into clinicians' clinical reasoning strategies it appears necessary to compliment the ethnographic and information processing with the judgement analysis approach. This had successfully been applied to other clinical fields but has yet to be used in occupational therapy. The methodology of Social Judgement Theory (Cooksey 1996), known as judgement analysis, is proposed as an effective avenue for studying clinical reasoning in the occupational therapy profession.

To summarise: the methods used so far to understand Occupational therapists' clinical decision-making are lacking in several respects.

1. It is likely that experts' thinking is largely automatic: processing has become reduced to a minimum (Ericsson and Simon 1980). Some factors are also used unconsciously and are not made explicit during data collection (Doherty and Kurz 1996). Concurrent verbal reports are sometimes inappropriate for the clinical setting so retrospective reports are then recorded after the situation has occurred. This unfortunately allows for some memory loss of significant factors, which therefore leads to missing data.

2. Hypothesising about policy judgements used in clinical decisions has been found to be an unreliable reflection of the judgement policies in actual use (Nisbett and Wilson 1977; Evans et al. 1995). Due to the focus of the qualitative research, the data collected has usually been collected from small numbers of subjects on a small number of scenarios. The ability to generalise about an individual's decision making or indeed about the

profession's policies of decision making has not been intended. Another methodology is necessary to identify the wider picture.

One essential reason for establishing the policies of our clinical experts is to ensure that education is truly evidence-based. Lack of sufficient data on expert policy has limited the potential for training novices. Examples of case scenarios have been used to help novices build up their own theoretical experience of clinical examples (Abernathy and Hamm 1995). However, as the case scenarios have been developed from explicitly stated information processing, (commonly using retrospective reports), the qualitative information used for training may lack the reliability and validity that the judgement analysis approach could yield. The level of each clinician's insight can be established from comparing subjective and tacit policies. Cognitive feedback can be given to clinicians to improve awareness of professional policies. Reliable and valid knowledge of how the profession's experts identify and use information can be gathered to train students in good decision-making. It is therefore important to apply judgement analysis as a method for understanding clinical decisions.

With regard to the proposed study, to which this literature review pertains, the subject chosen for the application of judgement analysis is that of the reasoning used to prioritise occupational therapy referrals in the field of community mental health. Previously, research into this clinical decision has used the information processing approach. Policies derived from this approach have been found to be of limited validity and reliability (Harries 1998). It would be valuable to pursue this same clinical decision using the judgement analysis approach. The aim of the research is, therefore, to use judgement analysis to identify the expert occupational therapists' referral prioritisation policies (within the field of community mental health) and to use task information from these policies to promote novices' performance.

Chapter 2 Capturing expert policy

2.1 Introduction

In Britain, all health services are in short supply (Spalding, 1999). Priority setting is unfortunately necessary where demand for services exceeds service availability. The need to maximise the effectiveness of occupational therapy services and minimise attrition of occupational therapists is an international aim (Sturgess and Poulsen, 1983; Bailey, 1990; Yau, 1995).

In mental health, the need to recruit and retain occupational therapists is high on occupational therapy managers' agendas (Craik et al., 1999). In community teams, occupational therapists can often be professionally isolated and the needs of severely ill clients can take their toll on the therapist (Bassett and Lloyd, 2001). The picture is not all negative: some experienced occupational therapists are reporting that they are able to provide effective services and are satisfied that they have a valued role (Parker, 2001). What is apparent is that some therapists may value guidance from other therapists and that research is needed to identify and share methods of effective practice.

One issue of effective practice for community mental health practitioners is the ability to balance responsibilities for professionally skilled intervention with generic care co-ordination responsibilities. Where generic responsibilities are time consuming there can be little time given to professionally skilled intervention. The combination of providing care co-ordination alongside specialist services concerns the occupational therapy profession (Corrigan, 2002; Harries, 2002; Forsyth and Summerfield Mann, 2002). In Britain, the College of Occupational Therapists has identified that occupational therapists need to focus the majority of their time on clients requiring occupational therapy (Craik et al., 1998a). Therefore, when taking responsibility for care co-ordination, occupational therapists have to consider if clients' needs would best benefit from an occupational therapy perspective. Those referrals that require

occupational therapy intervention must then be prioritised according to degree of occupational dysfunction. These dysfunctions may be in the occupational areas of self-care, work/productivity or leisure (Reed and Sanderson, 1992). Skill in prioritising referrals in this way maximises the effectiveness of services at a time of staff shortages.

In order to prioritise effectively, occupational therapists have to develop appropriate prioritisation policies. Once they accept a client onto their caseload they have responsibility for that client and they may not be able to have the case re-allocated. If they accept inappropriate referrals they may be unable to manage their clients' needs effectively or feel their skills are not being used satisfactorily. Many occupational therapists wish to maintain a specialist role and are keen to avoid burnout (Craik et al., 1998b). Therefore taking appropriate referrals has two potential benefits: effective use of professional services and improved work satisfaction.

It is therefore necessary that expert occupational therapists' prioritisation policies be identified in order to provide evidence for the education of novice occupational therapists. Knowledge of experienced clinicians' reasoning can improve less experienced clinicians' decision-making (Abernathy and Hamm, 1995). Good practice needs to be shared in order to promote effective services for the client (Department of Health, 1999).

Research on occupational therapists' ability to examine referral data is not new (Grime, 1990; Job, 1996; Harries, 1996a; Harries 1998). Formal research on clinical reasoning in occupational therapy has mainly been qualitative in nature, often using the information processing approach (Newell and Simon, 1972). Research has shown that clinicians' well practised policies can become too rapid and automatic for full conscious awareness and that intuitive thinking cannot be reliably elicited by asking for a description of thinking (Doherty and Kurz, 1996). To complement the qualitative research, there is certainly a need for research using methods that can access the more highly developed intuitive (tacit) experts' policies. In addition only small samples of clinicians' prioritisation policies have been accessed, therefore reducing possibilities for generalisability (Hagedorn, 1996; Munroe, 1996; Roberts, 1996; Harries, 1996a; 1996b). If research is done on a larger scale, experts' policies can be used as

evidence based practice for clinical education ensuring that new knowledge will be up to date and hence effective in meeting clients' needs (Lloyd-Smith, 1997).

As discussed in chapter 1, a method that has the potential to access such expert thinking is that of judgement analysis; the methodology of Social Judgement Theory. Social Judgement Theory took the ideas of Egon Brunswik (1952) on perception in the physical environment and applied them to the study of human judgement within the social environment (Hammond, 1955). It was not viewed strictly as a theory as it provided no testable hypothesis. Rather it was viewed as a metatheory, giving direction to research on judgement (Brehmer and Joyce, 1988). The methodology of judgement analysis has significant potential for overcoming the limitations of the information processing approach as it has the ability to model intuitive thinking (Cooksey, 1996). It has been successfully used to analyse the relationship between individuals' decision making in multidisciplinary teams (Unsworth et al., 1997). It has also been recommended as an appropriate method for examining decision making on occupational therapists' referrals (Unsworth, 2001). Therefore the aim of this research was to use judgement analysis methodologies to capture expert occupational therapists' referral prioritisation policies (Harries and Harries, 2001a).

2.2 Methodology

The methodology of Social Judgement Theory has been selected as it has significant potential for overcoming the limitations of the information processing approach (Cooksey, 1996). For further details of the selection of research methodology the reader is referred to Harries and Harries (2001a; 2001b). This quantitative method does not require the researcher to make subjective interpretations during data collection, nor for the subject to attempt to make implicit policy explicit or to hypothesise unreliably about policy. One design for conducting judgement analysis research (that has been adopted by the researcher) is by the use of computer-generated scenarios or 'profiles'. Profiles, in this instance, are referrals printed on paper referral forms. The large number of referrals that can be used allows for large-scale decision-making by participants (Evans et al., 1995). The correlation between cues in each scenario can (and has) been controlled (correlation coefficient less than 0.02), so that any policy judgements made by the participant can be statistically analysed by correlating the cues with the decision made (orthogonal design). The statistics for analysing policy when cues hold their natural intercue correlations are more complex and the interpretability of analysis is compromised to a degree. However, this approach would be worth considering for future studies if such complex statistical support is available.

Both the content and the face validity were maximised. The content of the scenarios was based both on the results of previous research (Harries, 1998) and on consultations with current practitioners. Harries (1998) elicited the content of the possible factors that are thought about as the community occupational therapist examines a referral. Thus information, such as the possible referrers and the type of diagnosis were identified. In addition, currently practising clinicians in the field were consulted to ensure the factors were appropriate. The presentation of the referrals was based on real referral forms in order to maximise face validity.

However in this research design, decisions could only by based on information in the referral forms. In the clinical setting occupational therapists commonly see clients before making a final decision on referral prioritisation (Job, 1996). On discussion with experienced clinicians

it became apparent that the main reason for seeing a client was to validate the referral information. Whether the information came from a referral form or a first contact, it was the issue itself that gave the occupational therapist an indication of the level of prioritisation of need and less importantly the source of that information. The referral information was therefore felt to be a possible starting point for establishing prioritisation policies.

In designing the referrals for the research, some factors were fixed in the referral while others were varied. Factors need to be fixed if they were already known to have a categorical effect on the decision making. For example, addresses of clients must be located within the geographic area of the team. If they lived outside the geographical area then the referral would always be rejected.

Factors which had the potential to influence the degree of priority given (figure 2.1) were randomised into the computer-generated referrals using Visual Basic as the programming too1[1]. All the levels of the cues were presented in the referrals at least once. In order to give these factors numerical status for entering them into the statistical analysis, the content of these variables were rank ordered by a separate group of experienced occupational therapists, who did not participate in the study (Harries & Harries, 2001b).

[1] Programmed by Dr Clare Harries, Research Fellow, Department of Psychology, University College London Psychology, University College London

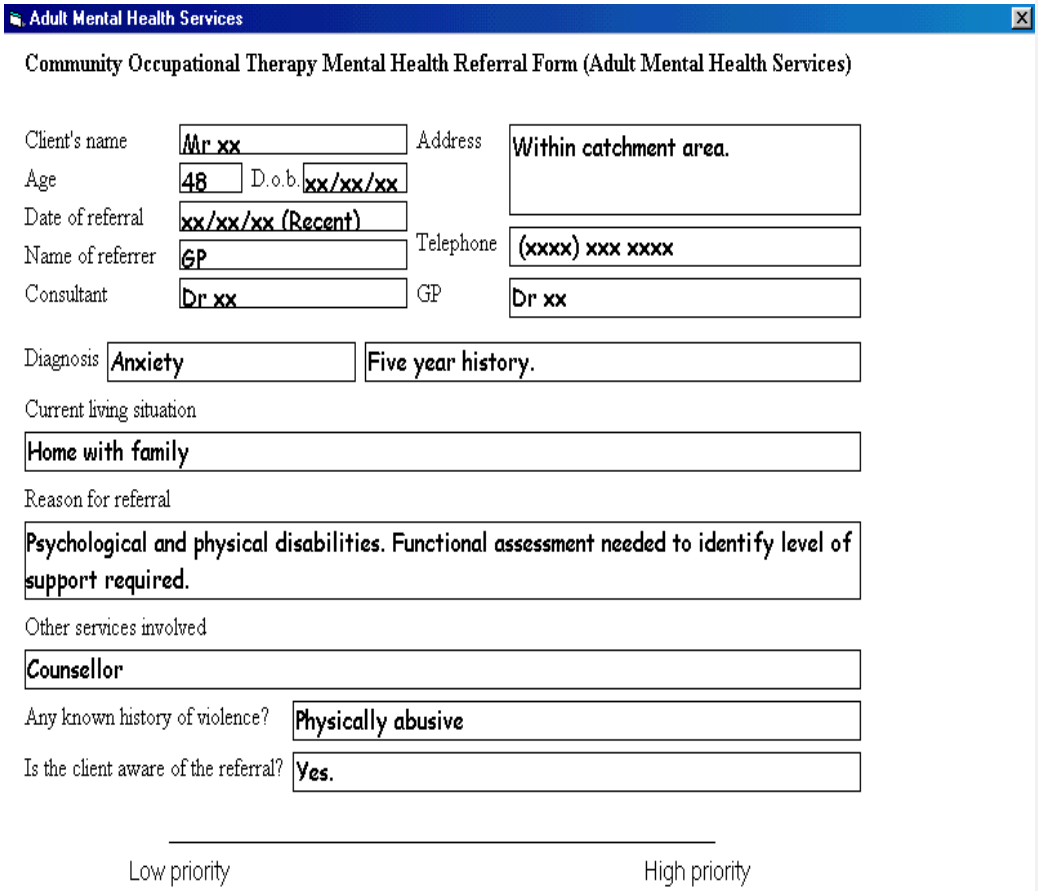
Figure 2.1 Cues and their levels.

Gender	Male
	Female
Age	20-55 years old
Referrer	Colleague (CPN or Social Worker)
	GP
	Psychiatrist
Diagnosis	Anxiety
	Anxiety and Depression
	Obsessive Compulsive Neurosis
	Depression
	Schizophrenia
Length of history of mental health problems	One year history
	Five year history
	Ten year history
Current living situation	Home with family
	Group home staff live out
	Home alone
Reason for referral	Recent change in medication. Please support and monitor in the community.
	Managing work and maintaining friendships but having difficulty getting on with family.
	Managed to stabilise drinking (3-4 pints per day). Persisting memory problems and quality of life issues.
	This client is not using their time very effectively but lacks motivation to change.
	Needs support, especially as embarking on a college course.
	Likely to relapse following imminent redundancy.
	Lost confidence with going out and is not looking after themselves very well.
	Psychological and physical disabilities. Functional assessment needed to identify level of support required.
Other services involved	Counsellor
	Day centre
	No other
Any known history of violence	No
	Physically abusive
	Verbally abusive
	Suicidal

Each referral, generated on the computer, was presented on an individual piece of paper as a completed referral form (Figure 2.2). Participants were given their own bound book of 120 referrals. All participants saw the same set of referrals in the same order. They were allowed to make notes on the referral and were able to move back and forward between the sheets. They were asked to make their own initial prioritisation ratings. (For instructions to participants see appendix 2.1).

In order to generalise about an individual's policy use, judgement analysis requires each participant to make judgements on a large number of scenarios (Cooksey, 1996). Judgement analysis advocates that data are idiographically understood at the individual level before generalisations about behaviour patterns across individuals are made (Cooksey, 1996). In order to generalise about the policy use across individuals, 40 participants in the chosen group were asked to make the decisions on 90 scenarios (Cooksey, 1996). Thirty repeat referrals were included to check for test–retest reliability (Cooksey 1996). At the bottom of each referral there was a horizontal line (visual analogue scale). The two ends of the line were labelled low priority and high priority, respectively. Participants were asked to indicate their rating of priority by making a mark on the line. Individual participant's ratings were therefore collected for each profile. The mean group rating for each profile was also calculated across judges by summing the ratings for each profile and then dividing this by 40.

Figure 2.2 Example of referral



Adult Mental Health Services

Community Occupational Therapy Mental Health Referral Form (Adult Mental Health Services)

Client's name	Mr xx	Address	Within catchment area.
Age	48 D.o.b. xx/xx/xx		
Date of referral	xx/xx/xx (Recent)		
Name of referrer	GP	Telephone	(xxxx) xxx xxxx
Consultant	Dr xx	GP	Dr xx

Diagnosis: Anxiety — Five year history.

Current living situation

Home with family

Reason for referral

Psychological and physical disabilities. Functional assessment needed to identify level of support required.

Other services involved

Counsellor

Any known history of violence? Physically abusive

Is the client aware of the referral? Yes.

Low priority ——— High priority

Sampling

Experienced clinicians were approached via the British Special Interest Group for Occupational Therapists in Mental Health. To obtain a random sample, letters were sent to the first 100 occupational therapists on the mailing list (appendix 2.2). In order to recruit experienced clinicians, participants were required to be at a senior occupational therapist grade or above. To ensure they had formed some stability in their prioritisation policies they had to have worked for at least one year in their current post. Only those who might take direct occupational therapy referrals, either from their own team colleagues or from those outside their team were invited to participate. Those meeting these criteria were invited to participate in the study.

Data collection

All the participants (n = 40) were asked to give a prioritisation rating to a set of 120 referrals (90 initial referrals, 30 recurrent referrals). Demographic and clinical practice data were collected through a questionnaire (appendix 2.3). This allowed for examination of the relationship between participants' clinical experiences and prioritisation policies. Following analysis, participants were sent their own and their colleagues' results (coded to protect confidentiality) (for example see appendix 2.4). Participants were offered the opportunity to contact the researcher to discuss their results. Up to two hours of each of the 40 participating clinicians' time was required. An honorarium of £15 each was provided on completion of the study.

Methods of data analysis

To analyse how each participant had used the referral information (cues) to prioritise the referrals, multiple linear regression analysis was used. This involved regressing individual's 90 ratings onto the content of the 90 respective referrals. Nine standardised regression coefficients were obtained for each participant. These represented the individual's prioritisation policy. The group prioritisation policy was also obtained by regressing the mean standardised ratings for the group onto the standardised referral profiles. The coefficients indicated the influence each of the nine factors of referral information had had, such as the diagnosis or the reason for referral. For those statistically significant cues the greater the size

of the regression coefficient the greater the importance (or weighting) that had been placed on it.

The fit of the multiple linear regression models was examined. If the model was found to be a poor fit, this tacit policy would not be a good description of behaviour. Poor fit can be attributed to such factors as lack of consistency of the participant in prioritising factors (as measured by duplicate cases). If the test–retest consistency was found to be high but the model was a poor fit, a non-linear model would be tried. Multiple linear regression assumes a linear relationship between the variable and the prioritisation judgement. This may not have been the case with the rank ordering of the variables. To examine this, the relationship was plotted between each variable and the judgement at the pilot stage. For example, a significant weighting of diagnosis could have been reflective of the importance of schizophrenia over the other diagnoses, rather than a steady increase of importance with different diagnosis (Harries and Harries 2001b). The subjective rank orders identified by the experienced therapists were found to be a reasonable match with pilot subjects' use of cue levels. Linear fit was also found to be reasonably good for each of the pilot participants. The subjective rank orders were therefore accepted for the main study.

Individuals' consistency in using their policies was identified by correlating ratings on original and repeat referrals. Agreement between participants on the rating of the original 90 referrals were identified using Kendal's coefficient of concordance (W) (Howell, 1997).

Ethical considerations

A full information sheet was provided before informed consent was obtained. Anonymity and confidentiality was assured for all participants involved in the study. All participants' information was coded prior to data collection and the names and codes held separately, thereby assuring confidentiality. Modest honorarium fees were awarded to cover participants' time costs in the study. Ethical approval for the study was granted from the university department.

2.3 Results

Participants

Of the 40 occupational therapists, five were male, 35 were female. Occupational therapists from England, Scotland and Wales participated. Seventy-five percent were Senior 1/Head IV grade. Eighty percent were working full-time with a mean 33 hours.

Seventy percent had worked as an occupational therapist for more than five years. Eighty-eight of the occupational therapists had worked for more than three years in the community and 53% of those had more than three years in their current post. Seventy percent of the work was being carried out in urban settings with 15% in suburban and 15% in the countryside. The majority of the work was in poor regions.

Half the teams had waiting lists for initial screening of clients, allocating them to an occupational therapist or initiating direct interventions. For 23% of teams there were waiting lists for all three stages. The longest period of waiting tended to be after allocation when the mean length of time before being seen by an occupational therapist was 53 days.

The number of client referrals made to the mental health teams ranged from eight to 105 in one calendar month with a mean of 37. The number of these team referrals taken by the occupational therapist, ranged from one every other month to 20 a month with a mean of five. The number of referrals made directly to the occupational therapists ranged between one every other month to 12 a month with a mean of four. The occupational therapists accepted from a range of one client every other month to 12 a month with a mean of three. Fifty five percent of the teams and 40% of the occupational therapists had their own prioritisation policies. These were sometimes formal (in a policy document) and sometimes informal (not documented).

Caseloads

Half the occupational therapists felt their caseloads were just the right size and half felt they were too large. Two felt their caseloads were small. Ninety five percent had a generic role

(delivering care for any type of need and having responsibilities for overall care co-ordination). The mean percentage of time spent in this role was 53%. Half the occupational therapists felt their generic role was too large and half felt it was the right size. All but one occupational therapist had an occupational therapy role. Mean percentage of time spent in occupational therapy roles was 52%. Half the occupational therapists felt their roles were just the right percentage with the other therapists being equally divided between feeling their occupational therapy role was too small or too large. The caseload balance was found to be somewhat correlated with level of satisfaction. As the percentage of generic cases in the caseload increased, the level of satisfaction decreased moderately ($r = -0.4$, $p = 0.042$).

As part of the generic responsibilities, the occupational therapists co-ordinated the care of their clients. The number of clients on their caseload, for whom they held this responsibility, ranged between two and 67 with a mean of 19 clients (64% of their caseloads). Thirty percent of the occupational therapists only took responsibility for co-ordinated care if the client's main needs were of an occupational nature. Eighty-eight percent of the occupational therapists ran groups.

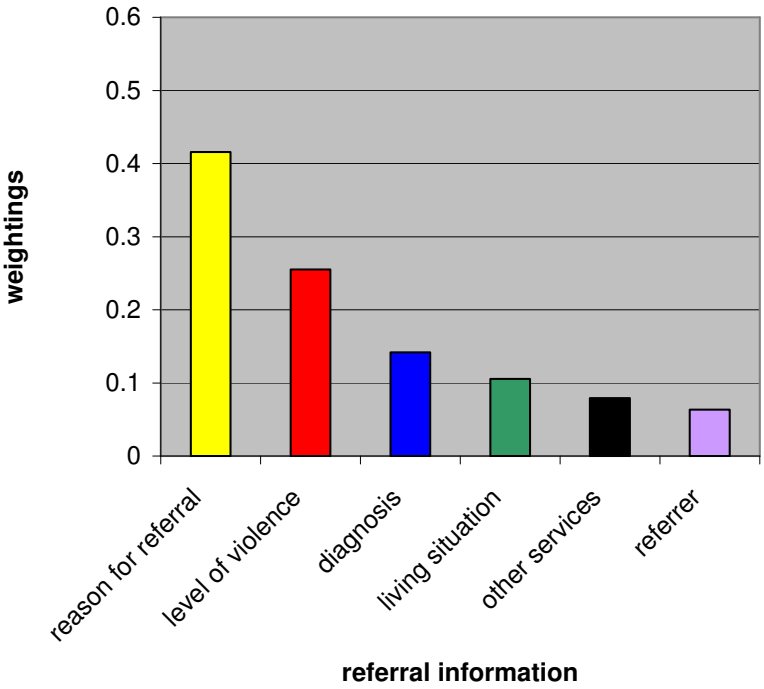
Analysis of tacit judgement policies: the objective weightings

Nine variables were identified in the study. These were (1) the referrer, (2) the client's gender, (3) age, (4) diagnosis, (5) living situation, (6) length of history, (7) reason for referral, (8) other services involved and (9) level of client violence to others or to self.

A prioritisation policy was calculated for each of the 40 occupational therapists using multiple regression analysis (see appendix 2.5). The prioritisation policies consisted of sets of standardised regression coefficients or weights. The larger the regression weight, the larger the impact of the cue. These policies showed how each participant had used the referral information to prioritise the referrals. Referral cues were defined as being used if their regression weight was significantly different from zero ($p < 0.05$). The referral prioritisation policies were sent as feedback, in a graphical form to all participants. For examples of graphical feedback see Harries and Harries (2001b).

The prioritisation policy for the total sample (n = 40) was also calculated by regressing the mean standardised rating for each profile onto the standardised referral profiles. Of the nine variables, six were of significance for the group (Figure 2.3).

Figure 2.3 Weightings given to referral information when prioritised by experienced occupational therapists.



Reason for referral was given the most weighting, followed by history of violence, diagnosis, living situation, other services involved, and the referrer. The three referral cues that were insignificant were gender, age and length of history. Figure 2.2 describes the mean cue weights of the six cues used by the 40 occupational therapists. The fit of the model was calculated by taking the predicted judgements (weights x value within standardised range) and correlating them with the actual judgements. A good fit was found (R^2 = 82%). This global measure of use assumes a linear relationship between cues and judgements. Analysis of variance and post hoc pair-wise comparisons reveal if this is appropriate. For several variables it was one level of the variable, rather than an increasing trend, that led to change in judgement. For example, for the variable level of support, living alone was given substantially more weighting than either living at home or living in a hostel. Participants used between one and four cues (mean 2.68) (appendix 2.6).

The nine cues in the referrals were presented at differing levels. For example five different types of diagnosis were represented and eight different reasons for referral. Analysis of variance was used to examine how the cue levels, for each cue, influenced each individual's prioritisation judgements. The procedure that was used will now be outlined. The first cue type was selected e.g. gender. The standardised cue level represented in each of the 90 referrals was used to represent the independent variables. The individual's standardised ratings for each of the 90 respective referrals were used as the dependent variables. The ANOVA results therefore showed the mean rating given to each of the levels of that cue for that individual. The next cue was then selected and the levels of that cue were entered as the independent variables. ANOVA's were again calculated for that same individual. Each of the 9 cues was therefore considered in turn. This process was repeated for each of the 40 participants so that the use of the cue levels could be determined for all participants (see appendix 4.4).

The multiple regression analysis had identified the cues that the participants had used. It had been found that participants had only used between 1 and 4 cues (to a level of statistical significance of <0.05). For example, 7 individual's used the referrer cue. The ANOVA results

were examined to establish how the cue's levels had been used. The level of cue with the highest mean rating for that individual, indicated it had been given the highest priority out of the available levels (appendix 2.7). For example, individual's 7,8,11,14 & 26 (by original code) gave the highest mean weighting to the psychiatrist when using the referrer cue. It was therefore possible to identify how the content of the cues had influenced the prioritisation of the referral. With regard to the cue 'reason for referral', 68% of participants prioritised the most severe occupational dysfunction described. This level included both physical and psychological dysfunction and requested a functional assessment. None of the participants prioritised requests to monitor changes in medication or to help family dynamics where the individual's occupational dysfunction was not impaired. Eighty-three percent prioritised suicidal history (aggressive to self) over those clients who were physically or verbally aggressive to others. Eighty-eight percent prioritised schizophrenia over those with other psychotic or neurotic disorders. For the cue describing living situations, 93% prioritised those living alone over those living with family or in group homes. With available support, 100% of therapists prioritised no support as the highest level of cue over those seeing a counsellor or having a day centre place. Seventy-two percent prioritised referrals from psychiatrists over those from the general practitioner or colleagues.

Agreement between occupational therapists' prioritisation ratings were calculated using Kendal's coefficient of concordance. The cue weights derived from the regression analysis were also used to check group agreement. For the 40 participants the agreement was 0.4 (W) for both measures. (One indicates full agreement and zero indicates no agreement.)

To compare judgements made by each participant on the 30 repeated profiles (individual consistency) Pearson's correlation coefficient was used. Consistency for the 40 occupational therapists ranged from $r = 0.29$ to $r = 0.96$. The mean consistency was derived by utilising Fisher's transformation to correct for non-normality distribution of correlation coefficients. Following calculation of the mean, the Fisher's score was then converted back to the Pearson's score. Mean consistency (r) was found to be 0.74.

2.4 Discussion

The results provided useful policy and clinical practice data that shed light on the issues surrounding occupational therapists' prioritisation policies. From the demographic data, one of the most important findings is that half of the occupational therapists felt their caseload was too large. They were accepting the majority of their direct referrals as well as a proportion of team referrals. Occupational therapists appear to be under pressure from their team or referrers to accept too many referrals.

Half of the occupational therapists felt they had too much responsibility for generic casework. On average they had care co-ordination responsibilities for 64% of the clients on their caseload. All but one occupational therapist had a care co-ordinator role but only one third of therapists in this role were taking occupational therapy type referrals only. As the percentage of generic cases in the caseload increased, the level of satisfaction with their work decreased ($r = –0.4$, $p = 0.042$). Too much generic responsibility may be causing dissatisfaction in their work. Those who spent less than half their time on their generic casework were more satisfied with their work. This supports reports by some occupational therapists that minimising generic casework may improve the effectiveness of the service and improve work satisfaction (Parker, 2001).

Occupational therapy services may be limited by generic casework co-ordination. Many therapists are not satisfied with this situation. The profession has to be aware that occupational therapists are under pressure to take too many cases and too much generic responsibility. These members of the profession are at higher risk of leaving their posts and potentially the profession: a situation the profession can ill afford (Craik et al., 1998b).

It is likely that the other team members are also under pressure as half of the community mental health teams had waiting lists: clients could be waiting up to four months to receive services. As a result of this 55% of teams and 40% of the occupational therapists were using prioritisation policies. It is encouraging that occupational therapists are being proactive in

identifying priorities and that they have policies that identify these priorities to others. In keeping with the requirements of the National Health Service framework, more teams may have identified priorities since the data were collected in 2000.

Care co-ordination does have benefits for clients such as ensuring responsibility is taken by an individual for the comprehensive assessment and provision of services to a client. Occupational therapists support this client-centred approach as opposed to one that is professionally centred (Corrigan, 2002). However, due to the relatively small number of occupational therapists in community mental health teams, occupational therapists may be in a difficult position if they give the majority of their time to generic casework. It appears that the role the profession advocates, that of having a majority of casework focusing on occupational therapy need, may be the optimal balance for occupational therapists to take. Perhaps in this way occupational therapists' skills can be best used and clients' needs most effectively met.

A key issue that requires some attention relates to how some, but not all, of the occupational therapists felt they could get an appropriate balance in their caseload. The prioritisation policies that the 40 individual occupational therapists used to prioritise the referrals did vary and their agreement in how to implement policies was not always consistent. However, when using the content of the cues themselves, e.g. the different types of diagnosis, there was very good agreement on what was of highest priority. For example, 88% prioritised schizophrenia as having the highest priority. Ninety-three percent used living alone as opposed to those living with family or in group homes as having a high priority for service. With regards to support, 100% of the therapists used no support as the highest level of cue as opposed to seeing a counsellor or having a day centre place. Eighty-three percent used suicidal (aggressive to self) as a higher priority for service than those who were physically aggressive or verbally aggressive to others. These results indicate that the National Health Service framework priorities for serious illness and suicidal intentions are being consistently used and prioritised by occupational therapists. Interestingly though only two therapists used the length of history of illness as a factor. Those who did prioritised shorter case histories rather than longer case histories. The National Health Service framework priorities (1999) that relate to long-term mental health problems do not seem to be accounted for. Perhaps taking some

clients with shorter histories is preferred if there is greater potential for positive change. With a caseload of long-term severely ill clients, as described by Bassett and Lloyd (2001), some clients with shorter histories may be considered better prospects for intervention.

Although there was positive agreement on the use of the levels of cues (W = 0.4), the order in which they used the cues themselves varied. The most important cue, used by three-quarters of the occupational therapists, was the reason for referral. This was encouraging, as this is essentially where cue information about the degree of occupational dysfunction would be described. The second most used cue was 'history of violence' (including suicide as violence towards self) and the third was 'diagnosis'. In this research the history of violence included suicide risk. This is part of a larger governmental prioritisation policy (Department of Health, 1995). Community mental health teams would have an important role in helping to achieve this and are encouraged to support this policy. Diagnosis also indirectly gave information as to the nature of the occupational dysfunction. Schizophrenia is recognised as having a detrimental effect on occupational functioning, indeed more so than other diagnoses, such as anxiety and depression. Clients with schizophrenia often have difficulties around self-care, concentration, motivation, use of time, occupational deprivation and limited socialisation. These difficulties commonly benefit from an occupational perspective (Creek, 1990). Schizophrenia would therefore draw the particular attention of the occupational therapist.

Post hoc correlations between the top three cues used and the percentage of generic casework showed that the history of violence was possibly related to the percentage of time spent on generic cases ($r = 0.3$, $p = 0.04$). Suicide risk was the main concern within this cue. It appears that occupational therapists with more of a generic focus may be more likely to take a referral of a suicidal client than occupational therapists with an occupational dysfunction focus. Although the occupational therapist can assist clients to find meaning in their life and hence reduce the wish to commit suicide it is perhaps more the role of other team members to consider suicide risk when working in the community. If clients are at risk to themselves or others they may need to be sectioned under the Mental Health Act. In this case the community psychiatric nurse, psychiatrist or social worker have the authority to hospitalise clients and may therefore be best suited to managing suicidal crises. If clients have the acute symptoms of

psychosis or depression they may need medication. Knowledge of medication benefits would be more in the field of expertise of the community psychiatric nurse or the psychiatrist. By reducing priority of referrals for clients at risk from suicide, the occupational therapist may lower their generic role.

Judgement analysis produced a good model of the occupational therapists' policies (R^2 = 82%). From a methodological point of view, one further step could have been undertaken to establish the robustness of the fit. This step is the process of cross validation (Cooksey 1996). Cross-validation requires participants to make judgements on a large number of new profiles. These additional requirements on participants together with the time constraints on the researcher made this difficult to achieve. However it is a valuable step that should ideally be incorporated into a judgement analysis design. The profiles are usually divided in half with one half serving as the derivation sample and one half serving as the validation sample. The participants make judgements on both sets of profiles. The derivation sample is firstly used to identify the cue weighting policy. This policy is then used to predict the judgements that would be made on the validation sample. The fit of the predicted judgements with the actual judgements is then calculated for the validation sample only. This R^2 value is viewed as a more valid measure of the fit of the model (Cooksey 1996).

The primary purpose of this research was to elicit how experienced occupational therapists prioritise their services. However the sampling criteria did not guarantee them as expert clinical reasoners. Their length of time working as a community occupational therapist, membership of a special interest group and seniority of grade did not ensure they had policies that were consistently applied. For example, when correlating one participant's ratings on the original and repeat referrals she was found to have poor consistency in applying her prioritisation policy (r = 0.29). When a policy is inconsistently applied this is a sign of limited expertise (Shanteau, 2001). Also, some occupational therapists in the sample mainly worked generically. This amount of generic working is not in keeping with the professional body's recommendations so their referral prioritisation policies may not be the optimal ones for use in education.

Further debate and research is needed to identify the optimal policy, both in terms of whether policies that lead to a focus on occupational dysfunction are most appropriate and if so can these policies be applied with some consistency.

Conclusion

The objective of this research study was to describe the referral prioritisation policies of occupational therapists working in community mental health teams in Britain. Forty experienced occupational therapists' referral prioritisation policies were analysed. Further research is required to identify the optimal and most stable policies within this group.

The British occupational therapists' professional body feels that its members need to target the majority of their services at those clients most needing therapy (Craik et al., 1998a). If novices can learn to use the optimal referral prioritisation policies in their clinical reasoning they will then be able to maximise the effectiveness of the occupational therapy service provision to clients.

The clinical needs of the client should be the ultimate objective of the occupational therapist. Good clinical practice is based on research evidence. Clients who can benefit most from occupational therapy interventions should be in the top priority ranking for receiving a service. The results of this study demonstrate that the policies for prioritising clients for service by occupational therapists are important in best utilising the skills and abilities of occupational therapists, and best serving the needs of clients.

2.5 Summary

Occupational therapists in British community mental health teams have been debating how the most effective services can be targeted at the most needy clients. This chapter presents the results of a quantitative study that examined 40 British occupational therapists' referral prioritisation policies. Results showed half of the participants felt their generic responsibilities, which involved having care co-ordination responsibilities, were too large. Only thirty percent of participants co-ordinated care for clients whose needs were related to occupational dysfunction. Judgement analysis, that involved regressing the 40 individuals' prioritisation decisions onto the 90 respective referral scenarios, was used to statistically model how referral information had been weighted. Group agreement of prioritisation was moderate with the reason for referral, history of violence and diagnosis being given the most weighting. Consistency in policy application, as measured by examining prioritisation decisions on identical referrals, showed wide variability. Further research is required to identify the optimal and most stable policies within this group.

Chapter 3 Cluster analysis: identifying different types of expert policy

3.1 Introduction

There has recently been a debate in the British occupational therapy literature as to the optimal type of casework for occupational therapists working in community mental health teams (Parker 2001, Corrigan 2002, Dunrose and Leeson 2002, Forsyth and Summerfield-Mann 2002, Harries 2002, Stone 2002). One of the issues of the debate is how much time should be given to generic casework and how much time should be given to clients who primarily have difficulties in occupational performance.

Three patterns of working have been described in the literature: generic casework, specialist occupational therapy casework and a mixture of the two. Some occupational therapists are working solely as a generic case coordinator, a role that has been considered by some to be the most effective method of providing services to the client (Parry-Jones et al 1998). This role began in the early 1990s, when it became government policy that a single professional should be responsible for the management of a client's needs (Department of Health 1990). Taking a generic role is a common expectation in many community teams (Brown et al 2000).

Unfortunately, generic working has had some drawbacks. In theory, each professional can refer to the other team members when needed but, owing to workload pressures, this does not always occur. Therefore, team members do not necessarily feel skilled in meeting all the needs of the client and they may have to work outside their areas of expertise (Brown et al 2000). Team members recognise that they must not focus on their own areas of professional interest

but on the needs of the client. These needs must lead the orientation of the service provision. In relation to generic working, role stress and role confusion have been commonly reported (Parry-Jones et al 1998).

Some occupational therapists work only as occupational therapy specialists, therefore accepting only occupational therapy type referrals. This type of casework may include case coordination, but only if the client's main needs can be met by occupational therapy.

Finally, some occupational therapists hold a mixed generic and specialist caseload. From the data collected prior to the cluster analysis, this appeared to be the most common method of working (Harries and Gilhooly 2003). The professional body for occupational therapists recommends that, in this type of mixed caseload, occupational therapists should spend the majority of their time on specialist occupational therapy interventions (Craik et al 1998a). This suggestion has been necessitated because occupational therapy services are in short supply. If too much time is spent on generic work, there will be clients with unmet occupational therapy needs. If there were larger numbers of occupational therapists in each team, as there are community psychiatric nurses, there would be less problem in extending the role to generic work. However, there is usually only one occupational therapist in a team so there is limited flexibility (Harries and Gilhooly 2003).

One key way in which the generic-specialist caseload balance becomes operationalised is through the process of referral acceptance. The occupational therapist's referral prioritisation policy determines which clients are taken onto the caseload. Research on occupational therapists' referral policies has already been conducted with 40 occupational therapists in Britain to identify individual referral prioritisation policies (Harries and Gilhooly 2003); demographic and practice data were also collected in this study. It was found that half the occupational therapists' generic caseloads were too large and it appeared that the greater the generic responsibilities the lower was the level of work satisfaction ($rho = -0.35$, $p = 0.039$). The profession is correct in thinking that occupational therapists are under pressure to take too much generic responsibility. Those occupational therapists that are dissatisfied are at a higher

risk of leaving their posts and possibly the profession, a situation that the profession can ill afford (Craik et al 1998a).

According to Harries and Gilhooly (2003), the three most important pieces of referral information used by the 40 occupational therapists to prioritise referrals were reason for referral, history of violence and diagnosis. Post hoc analysis showed that use of the history of violence information was the only cue that correlated with the percentage of time spent on generic cases ($r = 0.28$, $p = 0.047$). Suicide risk and physical aggression were given the highest ratings within this cue. Therefore, the occupational therapists with a greater generic focus were more likely to take a referral of a suicidal or aggressive client than the occupational therapists with a focus on occupational dysfunction. If the policies of some therapists were leading to an unsatisfactory caseload balance, then the use of the information about violence needed to be examined in greater depth. Using the results of the 40 occupational therapists, research was required to identify if there were any subgroups of occupational therapists that had differing referral policies. Were any of these policies leading to the caseload balance that the profession advocates?

The aims of this research were, therefore, to use cluster analysis to identify any subgroups of occupational therapists that were using differing referral prioritisation policies and to examine the factors influencing their policy use.

Of particular interest would be whether the subgroups were differentiated by the balance of specialist versus generalist casework and the levels of satisfaction with this balance.

3.2 Methodology

In order to understand the data on which the cluster analysis was conducted, it is first important to provide the details of how the data were obtained. This is a prerequisite to describing the cluster analysis methodology and results (Brenner and Fox 1999, Lustig and Crowder 2000). Additional details of the methodological approach and the results can be found in Harries and Harries (2001b) and Harries and Gilhooly (2003).

Participants

A sample of 40 experienced occupational therapists working in community mental health teams had been recruited via the Special Interest Group for Occupational Therapists in Mental Health for the referral prioritisation policies study (Harries and Gilhooly 2003). This sample was the same sample that was recruited for the first study. To obtain a random sample, letters were sent to the first 100 occupational therapists on its mailing list. In order to recruit experienced clinicians, potential participants were required to be at Senior Occupational Therapist grade or above. To ensure that they had formed some stability in their prioritisation policies, they had to have worked for at least one year in their current post. Finally, only those occupational therapists who would accept direct occupational therapy referrals were invited to respond. It was on these 40 occupational therapists' policies that the cluster analysis would be conducted. Occupational therapists from England, Scotland and Wales had participated. Seventy-five per cent were at Senior I/Head IV grade, 80% were working full time and 70% had worked as an occupational therapist for more than 5 years. Seventy per cent of the work was being carried out in urban settings, with 15% in suburban settings and 15% in the countryside. The majority of the work was in deprived areas.

Almost 50% of the participants had felt that their caseloads were just the right size and the other 50% that their caseloads were too large; 5% had felt that their caseloads were a little small. Ninety-five per cent had a generic role, the percentage of which ranged from 100% to 5% (mean 53%). Half of these participants had felt that their generic role was too large and

half that it was the right size. All but one of the participants had an occupational therapy role. The occupational therapy roles ranged from 100% to 0% of their work (mean 52%). Half had felt that theirs was just the right percentage, with the other half being equally divided between feeling that their occupational therapy role was too small or too large.

All but one of the participants had a coordinator (key worker/case manager) role. The number of clients for whom the participants coordinated care ranged between 2 and 67, with a mean of 19 clients (equivalent to 64% of their caseloads). Thirty per cent of the participants were key workers for only occupational therapy type referrals and 88% of the participants ran groups.

Procedures

The prioritisation policies to be entered into the cluster analysis had been derived from the following procedures.

The 40 participants had been asked to prioritise individually a set of 120 referrals: 90 referrals plus 30 repeated referrals (to check for consistency). They did this by putting a mark on a line at the foot of each referral. One end of the line was named low priority and the other end was named high priority (a visual analogue scale). Nine types of information (cues) varied in the referrals. These were the referrer and the client's gender, age, diagnosis, living situation, length of history, reason for referral, level of support and history of violence.

Additional demographic and practice data were systematically collected through the use of a questionnaire (see appendix 2.3). The demographic data included such information as the participants' length of time in community practice and the weekly hours worked. The practice data included such information as the staffing in the team and the decision-making pathways used. The responses were coded and divided into parametric or non-parametric data according to standard statistical requirements. These data could then be used to correlate participants' working situations; for example, the type of catchment area and the prioritisation policies. Following analysis, the participants were sent by post their own and their colleagues' results

(coded to protect confidentiality). The participants were offered the opportunity to contact the researcher to discuss their results.

Up to 2 hours from each of the 40 participating occupational therapists was required. An honorarium of £15 each was provided on completion of participation. A full information sheet had been provided to these expert occupational therapists before consent was obtained. Anonymity was assured for all the participants involved in the study. All the participants' information was coded prior to the data collection and the names and codes held separately, thereby assuring confidentiality. Ethicalapproval from the relevant university department had been obtained.

Consistency and agreement

An individual's consistency in using his or her policies was identified by correlating the ratings on the original and repeat referrals. Pearson's correlation coefficient for the 40 occupational therapists ranged from $r = 0.29$ to $r = 0.96$. The mean consistency (r) was found to be 0.74. A correlation score of zero indicates no consistency in policy use (the individual would give two identical referrals completely different priorities), whereas a correlation score of one indicates the use of a completely consistent policy (same priority rating given to identical referrals).

The agreement of participants' ratings on the original 90 referrals was identified using Kendal's coefficient of concordance (W). This is an appropriate statistical test to calculate a group agreement correlation. For the 40 participants, the agreement was found to be 0.367 (W), $p = 0.0001$. (No group agreement on how referrals should be prioritised would give a correlation score of zero. Complete group agreement on how referrals should be prioritised would give a correlation score of one.) As individual consistency of policy use was far higher than group agreement on policy use, cluster analysis could potentially identify clear subgroups with differing policies.

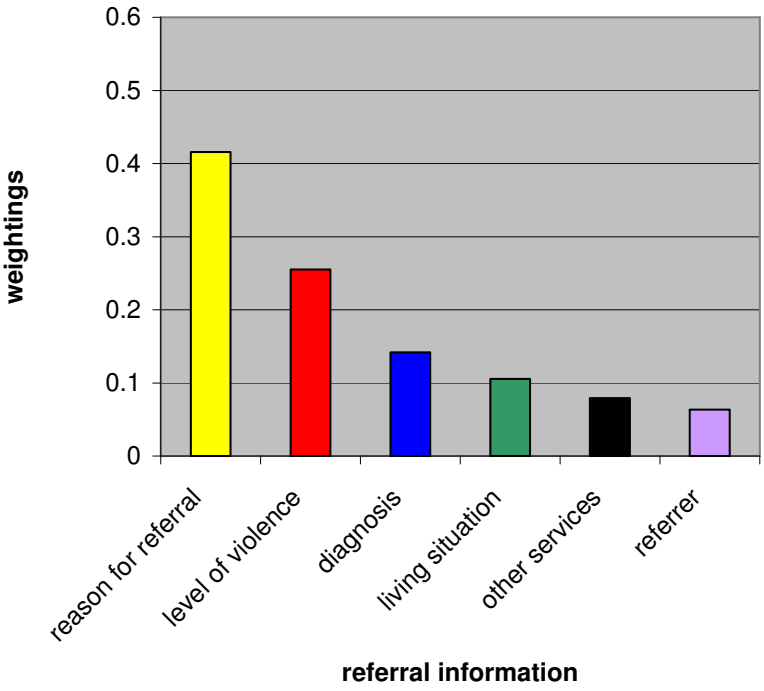
Prioritisation policies

To analyse the cue use for each participant, multiple regression analysis was used. This test allows the prediction of one factor from the knowledge about others. For example, can children's test scores be predicted from their heights and ages? Each item of knowledge can influence the prediction to differing degrees, that is, differing amounts of weight can be attributed to the respective pieces of information. Thus, in the referral prioritisation study, standardised regression coefficients (beta weights) derived from multiple regression analysis indicated the influence that each piece of referral information had had on the referral prioritisation, such as the bearing that the diagnosis had or the bearing that the reason for referral had. The larger the regression weight, the larger was the impact of the cue.

The tacit (objective) standardised regression coefficients were sent as feedback, in a graphical form, to all the participants. The heights of the columns in the graphs indicated the importance given to the different types of referral information. The cues were defined as being used if their regression coefficient was significantly different from zero ($p<0.05$). These regression coefficients (beta weights) were the data to be entered into a cluster analysis to identify subgroups of differing policies.

As a group, the importance placed on different types of referral information was analysed. The mean cue weights for the total sample (N = 40) were calculated by regressing the average standardised rating for each referral onto the cue values. Of the nine cues, six were of significance (Fig. 3.1). The reason for referral was given the most weighting (ß = 0.42, p = 0.0001), followed by history of violence (ß = 0.255, p = 0.0001), diagnosis (ß = 0.14, p = 0.0001), living situation (ß = 0.11, p = 0.001), support available (ß = 0.08, p = 0.008) and the referrer (ß = 0.06, p = 0.033). The three referral cues that were not significant were gender (ß = 0.03, p = 0.38), age (ß = -0.04, p = 0.23) and length of history (ß = -0.009, p = 0.75). Fig. 3.1 illustrates the mean cue weights of these six cues used by the 40 occupational therapists.

Figure 3.1 Weightings given to referral information when prioritised by experienced occupational therapists.



Analysis of variance (ANOVA) was then used to examine the means of the levels of cues that each individual had used; for example, how each different diagnosis had been prioritised. For a detailed description of how the ANOVA's were calculated refer to section 2.3. ANOVA is needed to examine means when there are three or more groups; for example, five types of diagnosis. (T-tests are used for two groups.) Of particular interest was the level of cue with the highest mean, indicating that it had been given the highest priority. For the cue reason for referral, 68% of the participants had prioritised the most severe occupational dysfunction described. This level had included both physical and psychological dysfunction and requested a functional assessment. None of the participants had prioritised requests to monitor changes in medication or to help family dynamics where the individual's occupational dysfunction was not impaired. Eighty-three per cent had prioritised suicidal history (aggressive to self) over those who were physically or verbally aggressive and 88% had prioritised schizophrenia over those with other psychotic or neurotic disorders. For the cue describing living situations,93% had prioritised those living alone over those living with family or in group homes. With regard to available support, 100% had prioritised no support as the highest level of cue over those seeing a counsellor or having a day centre place. Seventy-two per cent had prioritised referrals from psychiatrists over those from general practitioners or colleagues.

Cluster analysis

Cluster analysis was then used to identify the subgroups of occupational therapists with differing policies. The method of cluster analysis chosen for this study was Ward's (1963) method. It has been shown to be a more effective method of clustering than other methods (Blashfield 1976, Mojena 1977). It is also recognised as an appropriate method for discovering groups of judges within a data set (see, for example, Cooksey et al 1990).

Ward's method of cluster analysis is a type of 'hierarchical' cluster analysis. These hierarchical methods are used to discover the natural number of clusters present in the data (Everitt 1974). This differs from non-hierarchical cluster analysis which specifies, a priori, how many clusters to group data into. In the social sciences, a researcher is often interested in

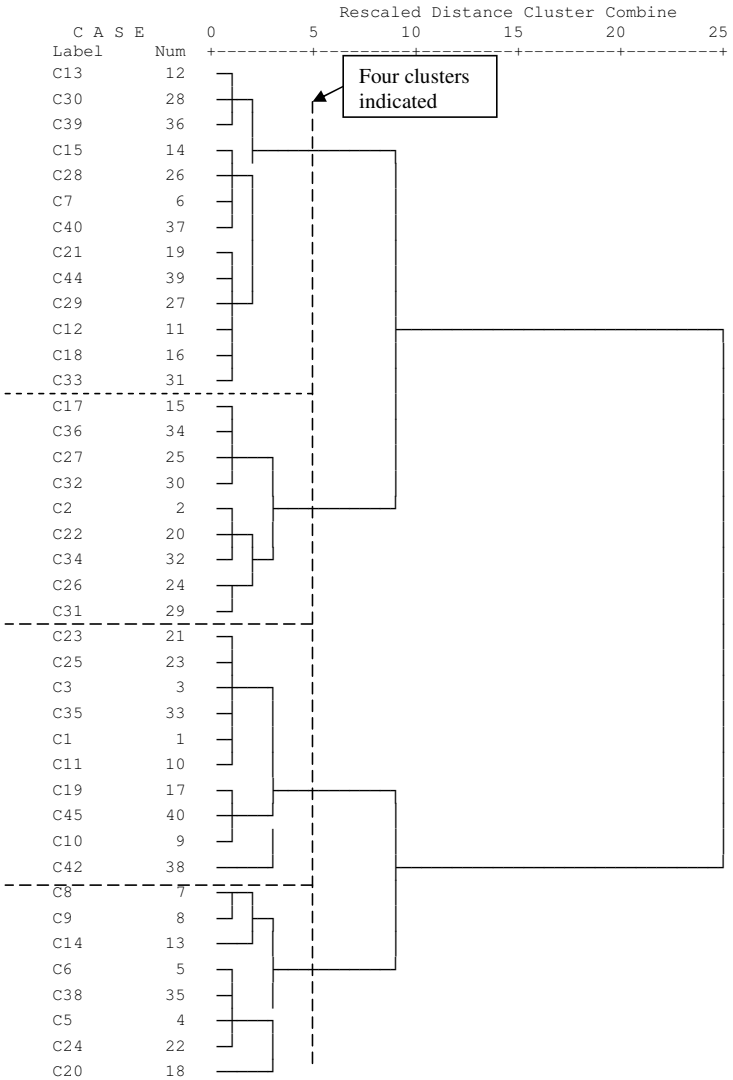
discovering the natural groupings that may occur in the research data (Dillon and Goldstein 1984). Ward's method gradually builds up groupings, according to similarity using the error sum of squares, to make a sequential aggregation of groupings, starting with all individuals and, finally, making one large group. The results of these agglomerative methods are displayed in a dendrogram showing the succession of fusions. The number of clusters has to be identified visually from the dendrogram. Confirmation of the number of clusters can be identified by the change of angle ('elbow') in a scree line plot. To plot an inverse scree graph, agglomeration coefficients have to be plotted against the number of clusters. The resulting scree line can be used to confirm the appropriate number of clusters. For example following Ward's cluster analysis, a marked change in the Euclidean distances is indicated where the scree line appears. These elbows differentiate between one cluster and the next.

The ultimate purpose of using the cluster analysis was to allow the clusters to be examined according to relevant issues of interest. For example, mean cue weights could be plotted for each cluster to identify the cues most responsible for differentiating the clusters. The clusters could also be checked against other relevant data to examine external validity (Cooksey 1996). For example, the participants' demographic data could be examined to see if variations in treatment settings, caseload balance or expertise could be associated with the clusters of prioritisation policies. Any patterns that supported the groupings would add external validity to the cluster groupings.

3.3 Results

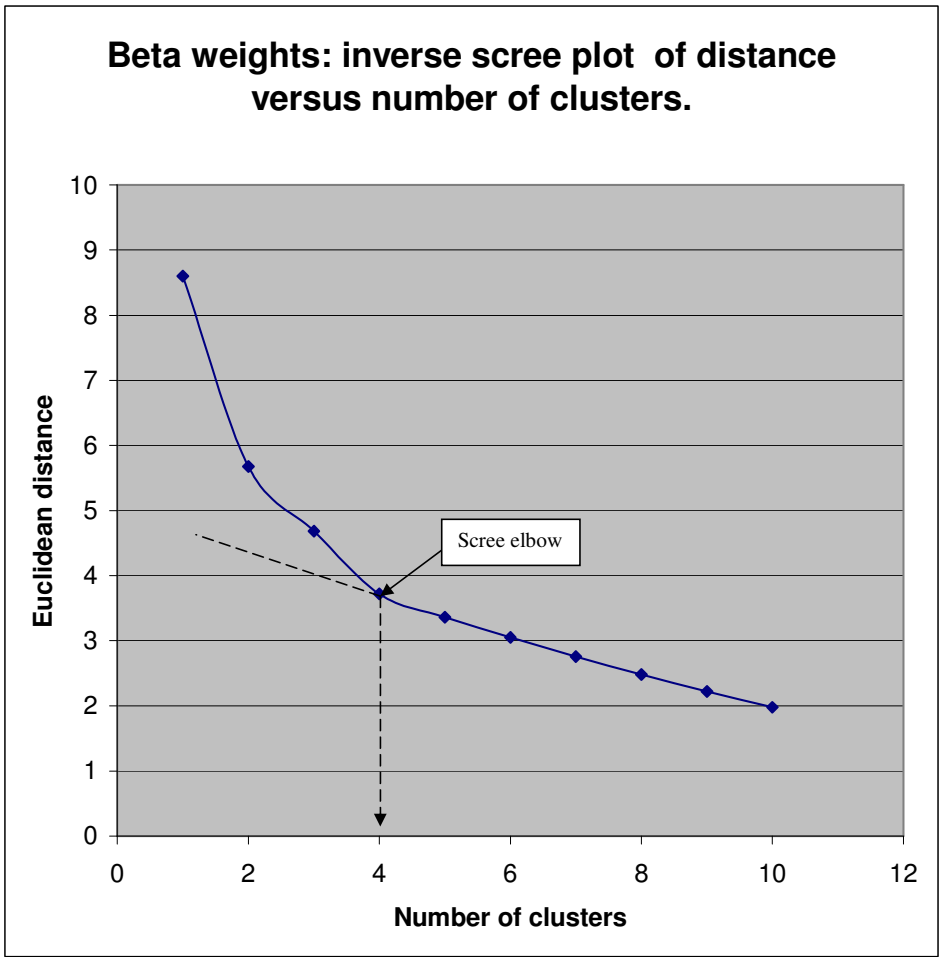
Initial examination of the Ward's cluster analysis dendrogram suggested that four potential clusters were present (Fig. 3.2).

Figure 3.2 Dendrogram of occupational therapist's beta weights using Ward Method



A scree graph confirmed that this was the correct number of clusters to interpret (Fig. 3.3).

Figure 3.3 Beta weights: inverse scree plot of distance versus number of clusters



Therefore, there were four main types of referral prioritisation policy used by the 40 occupational therapists. In order to identify any differences in the cue weights used to separate the clusters, the mean cue weights were plotted for the four clusters (Figs 3.4-3.7). These four types of policy were then validated against patterns in the demographic data to identify any reasons that these participants had been grouped together.

The demographic characteristics that differed significantly ($p<0.05$) using the Mann-Whitney U test are shown in Table 3.1. Both the key factors of interest – the size of the generic role and the level of satisfaction with this role – were found to be statistically significant between some of the clusters. The demographic data did not vary significantly between the clusters in relation to the participants' age, grade, type of catchment area, length of waiting list, size of caseload, percentage of caseload with a care-coordinator role, number of community psychiatric nurses in team, number of social workers in team, general facilities, location, transport and equipment, whether the team was full and whether they had sufficient staff when the team was full. It could be suggested that there is a risk of a type I error occurring as a large number of tests were conducted on the data. To identify if any type of demographic data were related to cluster membership, 24 types of data were examined. Nine types of data were found to be statistically related to cluster membership. In using a 0.05 level of significance, only one test in 20 would be expected to be of statistical significance. For 24 tests this would suggest 1.2 tests would be found to be statistically significant. The finding of nine statistically significant tests therefore suggests that results were not obtained by chance.

Using the demographic and practice characteristics of each cluster, statistically different results were most notable between cluster 1 and cluster 2 (see table 3.1). Compared with cluster 1, the participants in cluster 2 had less of a generic role ($U = 28$, $p = 0.038$) and more of an occupational therapy role ($U = 27$, $p = 0.33$), worked fewer hours ($U = 28.5$, $p = 0.035$), had a greater level of expertise in the team (number of psychiatrists $U = 23.5$, $p = 0.014$, and number of untrained community support workers $U = 26$, $p = 0.026$), received a greater number of team referrals ($U = 23$, $p = 0.027$) and were more likely to have a team prioritisation policy ($U = 30$, $p = 0.049$).

Table 3.1 Descriptions of clusters formed by Ward's analysis on beta weights.: mean scores and percentages.

Characteristics	Cluster 1 (n=13)	Cluster 2 (n=9)	Cluster 3 (n=10)	Cluster 4 (n=8)	Clusters that differ significantly (Mann Whitney U test)
% time in OT role	44%	63%	42%	58%	2>1,3
% of time in generic role	56%	37%	56%*	41%	2<1,3
% of OT who feel generic role is too big	69%	44%	20%	44%	1>3
No, of psychiatrists in team	1.5	2.4	1.9	1.9	2>1
No. of community support workers in team	2.3	1	1.5	1.4	2<1
Teams with prioritisation policies	31%	70%	67%	63%	1<2
OT's with prioritisation policies	39%	20%	70%	25%	3>2
No. of team referrals	26	48	45	32	2>1
No. of hours worked each week	36.5	30.6	34.1	31.2	2<1
Mean consistency (Pearson's) in applying policy on the 30 repeated referrals	0.82	0.71	0.78	0.55	4<1,3

*Participant 25 in cluster 3 did not total the percentages of time in role to 100%

The participants in cluster 3 differed significantly in that they had spent more time in a generic role in relation to those in cluster 2 ($U = 18.5$, $p = 0.028$). They were also more satisfied than those in cluster 1 with the time they spent in a generic role ($U = 31$, $p = 0.034$). Cluster 3 also had a greater number of participants with their own referral prioritisation policies compared with cluster 2.

The participants in cluster 4 were only differentiated by their low level of consistency when applying their policy on identical referrals.

The participants in cluster 1 were labelled the aspiring specialists, those in cluster 2 the satisfied specialists, those in cluster 3 the satisfied genericists and those in cluster 4 the chameleons. The chameleons were the most changeable in terms of their view of what constituted a priority referral. Even when identical referral information was presented they may view it as high priority at one point in time and low the next.

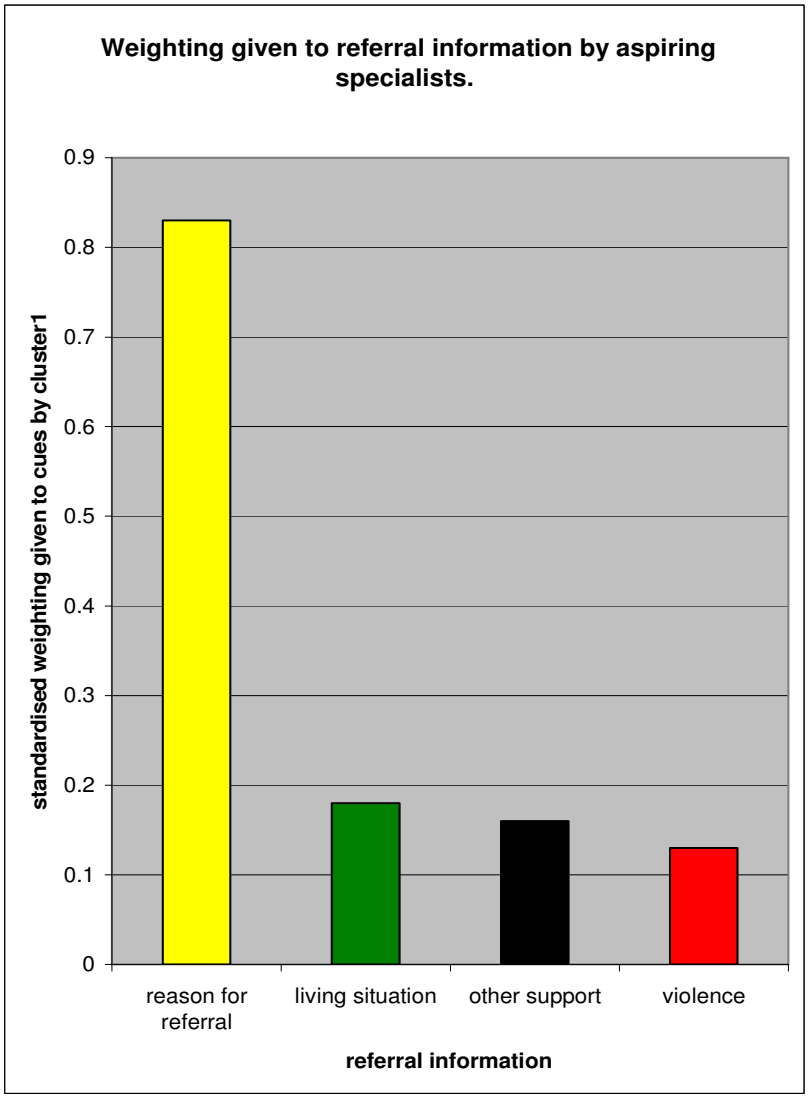
The aspiring specialists (cluster 1)

The aspiring specialists ($n = 13$) were characterised by full-time staff who, compared with the satisfied specialists, were taking a greater percentage of generic cases (56%). Compared with the satisfied specialists, their teams were less professionally qualified (fewer psychiatrists and more untrained community support workers).

The aspiring specialists took the same percentage (56%) of generic cases as the satisfied genericists. However, 69% of the aspiring specialists were dissatisfied with this situation compared with only 20% of the satisfied genericists. The aspiring specialists sought to take a greater occupational therapy role.

The aspiring specialists placed high importance on the cue reason for referral ($ß = 0.83$) (Figure 3.4). The client's living situation, other support and history of violence were also used (statistically significant to a level of <0.05), but given much less importance.

Figure 3.4 Weighting given to referral information by cluster 1 (aspiring specialists, n = 13)

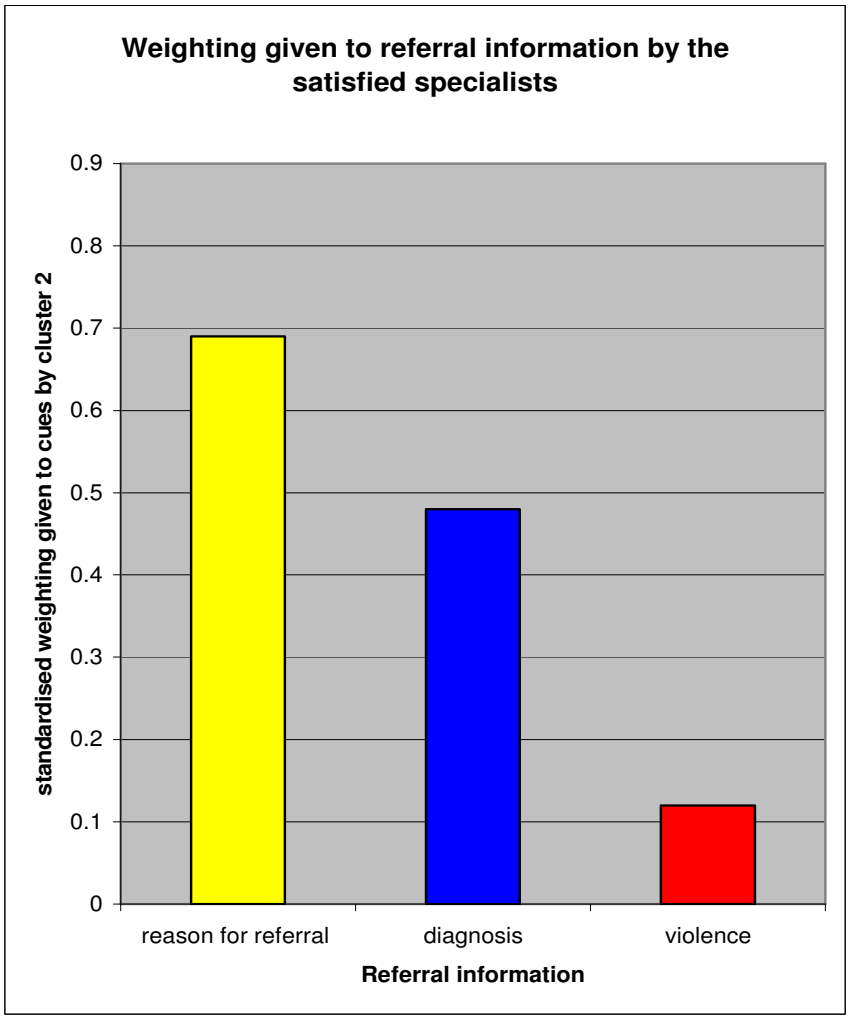


The satisfied specialists (cluster 2)

The satisfied specialists (n = 9), compared with the aspiring specialists, were characterised by part-time staff, who were being referred a greater number of cases and whose caseload held a greater percentage of professionally focused cases. Their teams were more professionally qualified (more psychiatrists and fewer untrained community support workers).

The satisfied specialists placed high importance on the reason for referral (ß = 0.69) and moderate importance on diagnosis (ß = 0.48)(Figure 3.5). The level of violence was considered by only two of the nine members of the satisfied specialists. In addition, the diagnosis cue was the cue that differed the most between the aspiring specialists and the satisfied specialists ($t = -6.923$, $df = 19$, $p = 0.0001$).

Figure 3.5 Weighting given to referral information by cluster 2 (satisfied specialists, n = 9)

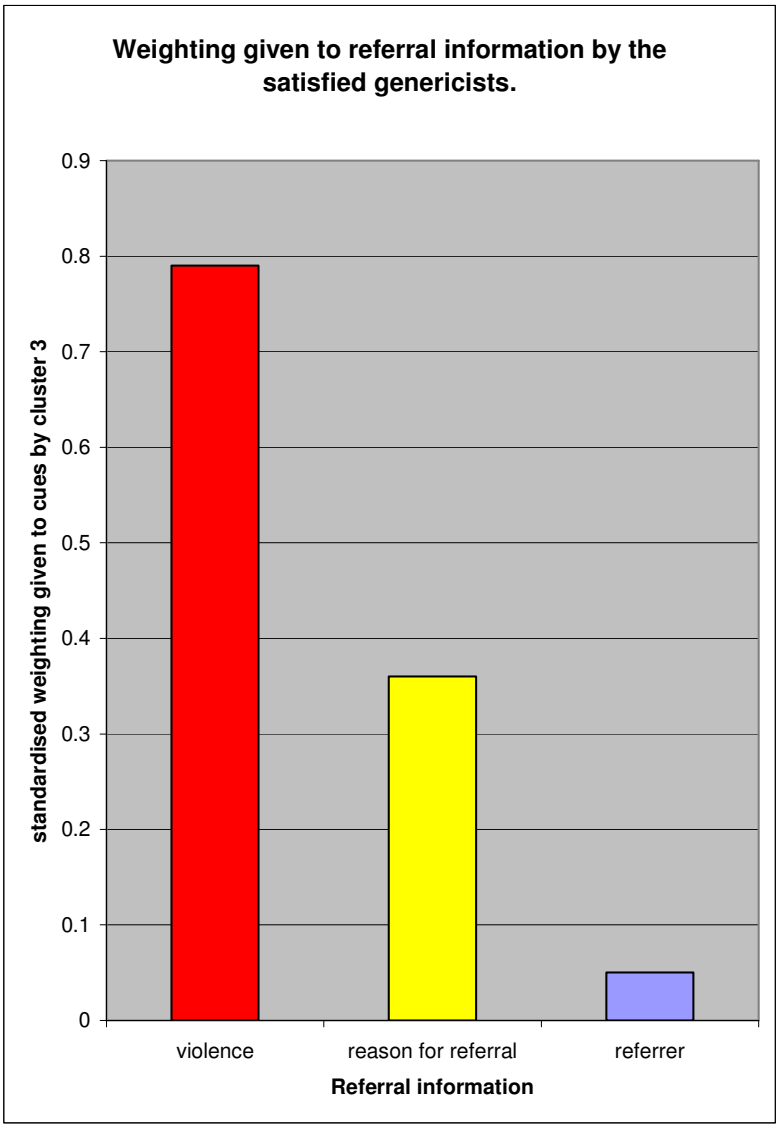


The satisfied genericists (cluster 3)

The satisfied genericists (n = 10) had a mainly generic role and were the most satisfied with their role. The participants in this cluster were the most likely to have their own prioritisation policy.

The satisfied genericists placed high importance on the history of violence (ß = 0.79) (Figure 3.6). Moderate importance was placed on the reason for referral (ß = 0.36). The referrer was considered but given minimal importance.

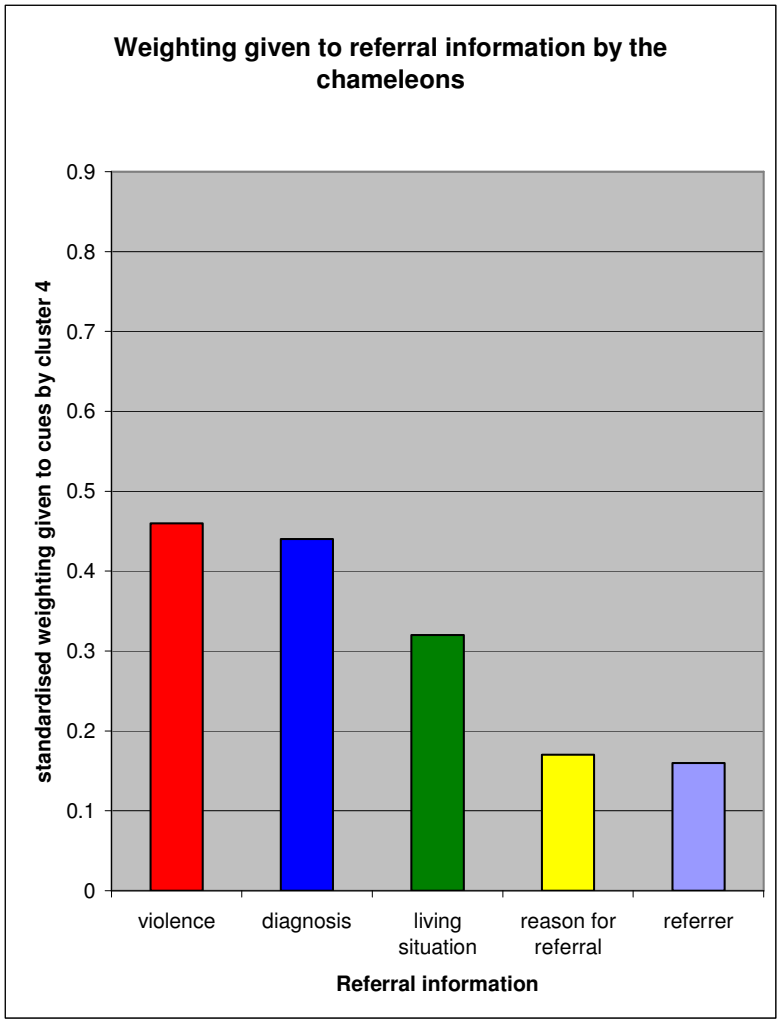
Figure 3.6 Weighting given to referral information by cluster 3 (satisfied genericists, n = 10)



The chameleons (cluster 4)

The chameleons (n = 8) had the flattest graph: they used the most cues and gave no particular emphasis to any one cue. The chameleons placed low to moderate importance on five cues (Figure 3.7). The highest of these were history of violence (ß = 0.47) and diagnosis (ß = 0.45), with reason for referral being given low importance. Of the 40 participants, the chameleons tended to have the lowest consistency scores. Indeed, the chameleons had the lowest mean consistency score of the four subgroups (mean r = 0.5). Their consistency scores were significantly lower than those of the aspiring specialists ($t = 3.397$, $df = 19$, $p = 0.003$). Since the chameleons had the lowest weighting for reason for referral, a hypothesis was considered that consistency might be positively correlated with the use of this cue. A post hoc correlation was therefore conducted on the results of the 40 participants to examine the relationship between consistency scores (using Fisher's scores to correct for non-normality of distribution) and the weightings given to the reason for referral cue. This relationship was found to be significant ($r = 0.348$, $p = 0.028$, $N = 40$). Those participants who were least consistent in applying their policies were less likely to use the reason for referral cue.

Figure 3.7 Weighting given to referral information by cluster 4 (chameleons, n = 8)



In order to examine how the occupational therapists in each cluster had used the levels of each cue, for example, how they had prioritised the different types of diagnosis, ANOVA tests were utilised. The procedures involved will now be outlined. The level of the cue represented in each referral was used to represent the independent variable. The mean standardised ratings (composite judgements) for the 90 referrals were then calculated for each cluster. These 90 mean standardised ratings represented the dependent variables for each cluster. An ANOVA was calculated for each type of cue for each cluster. Each of the 9 cues was therefore considered in turn. The results showed the mean rating given by each cluster to each level of the cues. It was found that the use of the cue levels was similar between clusters. Therefore it was not so much the content of the cues that altered policy, but the importance placed on the cue itself that determined the priority a referral was given.

3.4 Discussion

Four subgroups were identified out of the 40 occupational therapists in the original study. Not all these participants may have been optimally clustered because Ward's method tends to produce clusters of equal sizes. It is therefore possible that, in some data sets, small groups of unusual data can be grouped in large clusters; consequently, a small radical faction may not be appropriately represented. However, the subgroups could be clearly differentiated by demographic and practice factors, which adds external validity to the findings. There are several key points of interest.

The satisfied genericists

A quarter of the sample was happy to have a strong generic role. This original sample was taken only from those therapists who took direct occupational therapy referrals, so some occupational therapists in purely generic roles may not have participated in the study. The percentage of satisfied generic therapists may, therefore, be even greater than that reported here.

This may be progressive in terms of team working, but these therapists are not working as their professional body would wish. The professional body for occupational therapists has recommended that occupational therapists spend the majority of their time on specialist occupational therapy interventions (Craik et al 1998a). However, the satisfied genericists in the study have chosen to take up the call of generic work and have generally found their niche. Owing to limited professional supervision, they are probably in closer contact with their team than they are with their occupational therapy colleagues. Their allegiance may well be with their team more than with their profession.

In the 1980s, only 10% of community mental health teams had a manager (Onyett 1997); now the large majority of teams have managers who have taken a strong role in the allocation of cases (Onyett 1997). Indeed, some managers see specialist working as a form of professional

protectionism (Parker 2002). This attitude may have led to greater pressure to consider generic working and therapists may have had less individual choice in the matter.

The aspiring specialists

The largest cluster comprised those participants who wished to have a greater occupational therapy role. They had the same mean percentage of generic cases as the satisfied genericists, but they were generally unsatisfied with this role. They worked the longest hours of the four subgroups and may have been under pressure from their teams to take too many cases, especially generic ones. It has been recognised that strong professional leadership is needed to maintain a professional focus (Craik et al 1999). Each professional group values differing approaches to maximising health. Health achieved through occupation is most highly valued by occupational therapists. Team managers are rarely occupational therapists and it can, therefore, be difficult to get professional support for the occupational therapy perspective.

The teams of this cluster were the least likely to have a prioritisation policy. In fact the occupational therapists themselves were more likely to have a prioritisation policy than their teams were. So perhaps, rather than being under pressure to work in a certain way, they lacked guidance and were, therefore, having to set the goals themselves.

This cluster also, however, had different referral prioritisation policies to those of the other clusters. They gave the greatest weighting to the reason for referral cue. This would have helped them to take an occupational perspective because the opportunity to identify an occupational need is most likely to be contained in this information. However, unlike the satisfied specialists they did not give importance to the diagnosis cue. Had they given greater importance to the diagnosis cue, they might have been more likely to give priority to clients with schizophrenia (the top weighted level of the diagnosis cue by 88% of the 40 occupational therapists). Clients with schizophrenia often have difficulties around self-care, concentration, motivation, use of time, occupational deprivation and limited socialisation. These difficulties commonly benefit from an occupational perspective (Creek 1990).

The satisfied specialists

The occupational therapists in this cluster were working in well organised, highly professional teams. This cluster had the most trained professionals and usually had clear team prioritisation policies (70%). The difference that this type of able team can indeed make to the effectiveness of the occupational therapist's role has indeed been acknowledged in the recent professional debate (Stone 2002). The occupational therapists in this cluster were able to take the greatest occupational therapy role and they were even keen to increase this. They were usually not working full time so may have had a little more time to reflect. However, their hours were still substantial (mean 30.6 hours per week) and they were therefore making a significant and apparently satisfying contribution to the team. They may have been less in need of their own prioritisation policies (20%) because they were happy with the strong policies of the team, which tended to support professional training.

The chameleons

Although the sample comprised experienced occupational therapists, many in this cluster did not seem to have found their feet in terms of both a specific policy to apply and when to apply it. The methodology of incorporating a large number of scenarios with repeated profiles did allow for this group to be recognised. It is common for studies to use only a few scenarios for participants to make decisions upon (Reich et al 1998), but it is risky to use only a small number of scenarios if generalisations about policy are to be made. The judgement analyst values sampling the environments as much as sampling the participants (Cooksey 1996). Both are needed to give a representative picture.

For the chameleons, there were no particular referral cues that were highly valued. This made it difficult for them to have a fixed policy. Like those in the total sample, they were under pressure to take too many generic referrals and 44% of them felt that their generic workload was too large. Having a clear policy may help them to manage their caseload more effectively and reduce workload responsibilities. Nevertheless, the participants in this cluster were working in keeping with the professional body's ideal, that is, focusing mainly on the

occupational perspective. They were able to hold an occupational therapy role in 59% of each of their caseloads.

Improving effectiveness

As mentioned above, in order to promote an occupational therapy perspective, careful attention must be paid to the reason for the referral and the client's diagnosis when prioritising referrals.

The cue that perhaps needs less attention in prioritisation is the history of violence. This cue was valued most highly by the generic therapists and less so by the specialists and aspiring specialists. It contains information relating to suicidal or aggressive intent. This type of information would certainly indicate a priority for the team because of the risk that the client may harm himself or herself or others. The client is certainly a priority, but various members of the team can undertake a risk assessment. The social worker, the psychiatrist and the community psychiatric nurse may be in a better position to take decisions about using a section of the Mental Health Act to allow a client to be hospitalised or about considering the use of medication. An occupational therapist may more appropriately use his or her skills in assisting clients with occupational dysfunction when the acute crisis has passed. The satisfied specialists in the study appeared to be opting for this method of prioritising new referrals. The appropriate use of services is paramount to ensure that clients get their needs met effectively (Department of Health 1999).

It is interesting that, in the education and training of undergraduate occupational therapists, the violence cue is often over-valued when prioritising referrals (Harries et al 2002). Education about each profession's skills can help occupational therapy students to recognise that they do not have to take all suicidal or aggressive clients themselves. Occupational therapists need to learn how to make their level of casework manageable and their contribution effective.

There is certainly pressure from many community mental health teams for occupational therapists to be generic workers. Long waiting lists of individuals in severe need may cause managers to allocate cases without due consideration for matching need with team members'

skills. Through follow-up discussions, it is apparent that some occupational therapists have managed to promote the effectiveness of their occupational therapy contribution whilst others have reluctantly fallen in with the expectation that they join the generic workforce. By promoting knowledge of effective prioritisation policies, ideas can be generated and practice continually developed.

3.5 Summary

The aim of the research in this chapter was to conduct a cluster analysis on data from 40 community mental health occupational therapists to determine if subgroups of therapists had differing referral prioritisation policies. A Ward's cluster analysis showed four clusters to be present.

These four subgroups of occupational therapists were found to differ according to several factors: the percentage of role dedicated to specialist occupational therapy or generic work, satisfaction with the balance in these roles, the number of hours worked, the number of professionally trained team members and the presence of referral prioritisation policies. The subgroups were named the aspiring specialists, the satisfied specialists, the satisfied genericists and the chameleons (those not set in applying a consistent or specific policy).

The policies that led to mainly generic working gave greatest importance to clients who were potentially violent or at risk of suicide. The policies that led to more of an occupational therapy role gave particular importance to the reason for referral and the client's diagnosis.

The College of Occupational Therapists has recommended that the majority of casework should be focused on specialist occupational therapy interventions (Craik et al 1998a): most of the participants in this study were not meeting this recommendation. Although some aspired to being more specialist, the pressures to work generically may have been affecting referral policies.

Chapter 4 Experts' self-insight of policy use

4.1Introduction

This study aimed to examine 40 occupational therapists' self-insight into their referral prioritisation policies (subjective policies). The prioritisation polices that the 40 occupational therapists used on 90 hypothetical referrals had previously been modelled using judgement analysis (objective policies) (Harries and Gilhooly 2003). These were therefore available for comparison with the reported policies. Judgement analysis was used as the initial methodology as it was thought to be more effective than using self-report to identify experienced professionals' judgement policies (Cooksey 1996).

Self-insight of the occupational therapists had yet to be examined in relation to referral prioritisation. Different professional groups have been shown to vary with regard to their capacity for self-insight (Ikomi and Guion 2000), therefore it is important that the occupational therapists' capacity for self-insight is explored.

The literature that is presented as background to the self-insight study pertains to following; methodological considerations of researching self-insight, occupational therapists interest in reflective practice, the benefits and costs of such introspection and the influence of task characteristics and experience.

<u>The methodological considerations pertaining to self-insight research.</u>

In the 1970's, researchers recognised that it could be the method of accessing self-insight that was lacking as opposed to the individual having poor self-insight. Indeed a variety of non-verbal tracing methods, such as eye movement tracking and the use of information boards were developed for the very reason that additional methods were thought to be needed to overcome the limitations of self report (Ericsson and Simon 1993).

Subjective weights had traditionally been elicited by asking individuals to give numerical values to cues to identify how they had influenced their judgement (whilst assuming all other cue values were held constant). This method was usually conducted before or after decisions were made on a large set of profiles (Reilly and Doherty 1992). No attempt to allow for measurement of subjective cues in relation to each decision profile was considered in the early research and the possibility of inter-cue correlation was not accounted for. Researchers became concerned that the methods they were using were inefficient (Cook and Stewart 1975; Reilly and Doherty 1992) and began to re examine their methods of eliciting self-insight. Cook and Stewart (1975) tested seven different methods of eliciting subjective weights, including the one just described, but none were found to be more advantageous than any others (see chapter 1 for more detailed discussion).

Researchers also began to identify that levels of self-insight were better than had previously been thought (Kirwan et al. 1986). For example a study undertaken by Reilly and Doherty (Reilly and Doherty 1989; Reilly and Doherty 1992), involving a recognition method, was found to identify good levels of self-insight. In their research, university students were asked to rate the desirability of 100 profiles of hypothetical roommates. They were then asked to allocate an importance rating to the individual attributes described in the hypothetical profiles. The researchers derived the participant's true weightings by regressing their 100 'desirability rating' judgements on to the 100 profiles. The individual's actual weighting policies were then presented to them in a matrix. The matrix showed their own policy along with another 19 weighting policies. They were asked to try to recognise their own policy. Subjects showed high levels of self-insight as they were able to recognise their own policy from the matrix, at a level significantly greater than chance. Interestingly, those best able to recognise their own policy were also best able to describe an accurate subjective weighting policy. Therefore, there is the possibility that the ability to identify policy could be related to the ability to articulate policy.

It has been suggested that it is much easier to identify one's own policy than describe it; recognising the most important or least important cue could be sufficient to identify the correct

policy (Harries 1995). If a policy can be recognised by one or two cues, it does not imply that the participant has self-insight into every aspect of their own policy (Harries 1995).

The recognition method of establishing self-insight was confirmed in another unexpected way (Doherty and Balzer 1988). At the end of another study a researcher had posted individual policies to participants: the participants did not recognise their results and requested the researcher check the allocations. The researcher had indeed sent the wrong policies to the participants. The participants must have had some degree of self-insight into their own policies to know that the ones sent to them were not theirs.

There was one more issue that contributed to a more positive view of self-insight; the effect of feedback. Although cognitive feedback had been found to improve judgements, it was found that it was the task information component of cognitive feedback (relationships between the cues and the criterion judgements) rather than the cognitive information component (relationship between the cues and the subject's judgements) that was accounting for this improvement (Balzer et al. 1989). The finding that cognitive information did not improve individual's judgements suggested that being told how they had used cues did not help the decision-maker to improve. Perhaps they already had awareness of how they used the information.

Self-insight has now been researched in many different groups of people such as doctors (Kirwan et al. 1986; Harries 1995), financial analysts (Mear and Firth 1987), accountants (Reilly and Doherty 1989), flight instructors, professors and coaches (Ikomi and Guion 2000). Occupational therapists' capacity for self-insight has yet to be published. The judgement analysis study reported in chapter 1 can provide the objective judgement policies to which the reported policies can be compared (Harries and Gilhooly 2003). This is the traditional method of eliciting self-insight. It is not expected that the occupational therapists' self-insight will be unlike those of other most other professional groups but this is yet to be confirmed.

Occupational therapy and reflective practice

Although a formal study of occupational therapist's self-insight has yet to be conducted in the U.K., occupational therapists have been trying to gain self-insight into the different types of thinking that they use. This has been as part of a wider attempt to make professional reasoning explicit. The ideas of Donald Schon (1983) have been used to assist this process. He advocated 'reflection-in-action' as a means of developing awareness of the intuitive, tacit type of thinking which governs every-day practice. His ideas have been warmly welcomed by the occupational therapy profession and have been subsequently incorporated into both the clinical supervision of qualified practitioners as well as the clinical education of occupational therapy students (Department of Health and Social Care 1999). However, occupational therapists have not been aware of the wider literature pertaining to the capacity to introspect on cognitive processes, particularly the evidence that disputes the value of such introspection or reflection. This literature needs consideration. An empirical investigation into occupational therapists' capacity to accurately report their judgements will also add knowledge to this field within the profession of occupational therapy.

Nisbett and Wilson (1977) provided some of that evidence the negated the value of introspection. They argued that many mental processes are actually subconscious and are not open to introspection. They showed that people only reported shared theories on the causes of their behaviour rather than explaining the actual causes of their own behaviour. This, they felt, impeded their ability to reflect on their own policies. If people do report shared policies then in a study of individual's self-insight, group agreement will be higher for reported policies than for those based on behaviour. This is an issue that can be considered when studying occupational therapist's self-insight.

Benefits and costs of introspection

Researchers have also shown that self-insight is not an automatic result of reflection. Indeed, it can degrade judgement quality (McMackin and Slovic 2000) and interfere with learning (Reber 1989). It has even been suggested that it can be unhelpful to think too much about what has not been used. Wilson and Schoolers' studies (1991), for example, confirmed that this could be the case in the decisions they studied (jam tasting and choosing college courses). They found that introspection led to lower a correlation with expert opinion as compared to a control group who had not been instructed to introspect. Decisions can therefore deteriorate if individuals, as a result of introspection, come to depend too heavily on utilising non-optimal information. Reber (1989) suggested that certain kinds of learning, namely implicit learning, are best done independently of conscious efforts to learn. He felt that the tacit knowledge, developed from implicit learning, could not be subsequently understood by asking individuals to explain their lines of thought. He stated that

"looking for rules will not work if you cannot find them" Reber, 1976, p.223.

So it appears that although reasons for judgements may not be reported with any dishonest motive, they are not always the actual causes of individual's decisions.

During a qualitative study on occupational therapists referral acceptance policies, the difficulty of accurately reporting a rule based decision-making policy was clearly apparent (Harries 1998). When occupational therapists were asked how they took account of their referral sources such as the family doctor or psychiatrist, they stated that they did not use it, as the referral priority would depend on the client's type of occupational dysfunction. However, some participants, when asked to do a concurrent think aloud on three new referrals clearly took account of the referral source and let it influence their decision as to whether or not to accept a referral. For example, some subjects felt they had to accept the referral when the referrer was in a position of power.

"umm..Usually if my consultant writes me a letter I have to take it anyway but still….."(Harries 1996a)p.57

If they had a good relationship with the referrer they would also be encouraged to accept the referral.

"but I would probably [accept this] if this was one of our CPNs (community psychiatric nurses). I would take this on face value as we have a good relationship between us in terms of clients that we see and I would arrange to go and visit this guy purely based on the fact that my colleague suggested that he thinks I might be able to help this person." (Harries 1996a) p.57

Qualitative interview methods therefore appear to encourage reflection on what may be tacit knowledge. This can lead to some disparity between individual's actual practice policies and their reported policies. In addition this information, on its own, does not identify if the consultant or the colleague would be given the highest priority. The G.P. is also not mentioned, as it was not presented within the referral examples. A quantifiable measure of referrer prioritisation is not easily obtained from a think-aloud method (Ericsson and Simon 1993). For the purposes of clinical education the information gained from think aloud is difficult to clarify for novices who need to have understandable rules and explicit policies to follow. The information needs to be available on not only how individuals' think they use different types of cues but also on how individual's think they use the content of cues (Harries 1995). Interviewing may not, therefore, be the optimal tool to access these two aspects of self-reported policies.

If qualitative methods of reflection and think aloud have drawbacks how do the quantitative methods fair? Most research in this paradigm has required participants to identify numerical values to represent the importance of the influence of the cue on the decision. These subjective reported weights have then been compared with the statistically modelled weights. The results show some disparity between the two sources of information.

The statistically derived objective weights have usually been identified from the favoured method of Multiple Regression Analysis (MRA) (Ikomi and Guion 2000). However others such as Schmitt & Levine (1977) pointed out that different statistical methods produce different statistical weighting policies. The method of calculating the objective weights could therefore influence the validity of the results. This concern was partly allayed by, Dawes and Corrigan (1974), who showed MRA was as good as any other statistical method. MRA still appears to be a favoured method to derive statistical weights as it is very effective at prediction (Howell 1997).

However, multiple regression analysis does assume that the cues have been used in a linear fashion. If the individual participants' use of the levels of each cue are examined this would help to clarify if this assumption is valid (Harries 1995). For example, the 'reason for referral' cue used in the study in chapter 1 had eight levels. Although the categorisation of these levels was originally rank ordered by a small group of experienced clinicians in order that numerical assignments could be made for the purposes of regression analysis, some individuals may have varied from this order. Indeed if all occupational therapists were in agreement on these rank orders the study would not have been needed at the outset. Therefore if some participants used the levels of a cue differently from that in the rank order, then their use of the levels of the cues may not be best represented by a linear regression analysis. Studying the self-insight pertaining to the use of the content of the cues is therefore needed to give greater depth and accuracy to any study of self-insight (Harries 1995).

Not all researchers view individual's capacity for self-insight negatively (Schmitt & Levine,1977). Erricson and Simon (1980) defended individuals' ability to reflect. They argued that introspection could indeed assist in the identification of cognitive processes. They identified the circumstances that could best elicit accurate verbal reports and showed that the poor results of some studies were due to forcing participants to infer reasons for their thinking, rather than simply asking them to remember their mental processes (Ericsson and Simon 1993).

The influence of task characteristics and experience.

Other researchers such as Kellogg (1982) have taken the middle ground on the question of whether thinking can be accurately reported. Kellogg suggested that it was the demands of the task that would determine if introspection would be a useful research tool. He thought that learning derived from automatic frequency processing would not benefit from introspection, whereas learning derived from hypothesis processing would allow for access to the conscious processes. Kellogg's ideas were akin to those of Hammond (1986) in that the task characteristics can influence the nature of the thinking and hence the level of self-insight.

It is therefore important to consider the nature of the judgement task under study; referral prioritisation. Following Kellogg's theory, if hypothesis testing has occurred in the process of referral prioritisation, then even where the thinking has been practised, it should still be accessible. This type of analytical thinking would certainly be used in the early stages of the individual's career when the occupational therapist has got less experience to draw on. The occupational therapist would have to hypothesise about the occupational dysfunction of the client and then obtain further cues to support the hypothesis when seeing the client. At a later stage the therapist may be able to rely more heavily on the referral information to inform their judgements. It is also likely that if they are following a set decision making protocol, such as the team prioritisation policy, analytical thinking would be the likely mode of thought.

Expertise has been shown to be domain specific (Shanteau 2001) and therefore when the occupational therapist comes up against a complex or unfamiliar type of referral hypothetico-deductive thinking may be used. Analytical judgements may therefore be used for all the aforementioned reasons. In these situations thinking would be largely conscious and self-insight would be more likely.

However, there are equally valid reasons that suggest that occupational therapists will use intuitive judgements when prioritising referrals. These would be quick, automatic processes that would render self-insight less likely. The reasons for intuitive thinking being used will be outlined here.

Firstly, although the team policy would require the occupational therapist to prioritise clients with particular types of diagnoses or particular types of risky behaviour, it would be unusual to have the nature of the occupational dysfunction included in the team prioritisation policy. Therefore, although mechanical decision making algorithms are sometimes available, it would be important to use professional experience when undertaking professional judgements. It is usually required that occupational therapists have a year's experience in an in-patient setting before they are even allowed to take a community post. This implies that experience would need to be drawn on; intuitive thinking would therefore be more likely.

Some might argue that occupational therapists could be using their own prioritisation policy (to provide referrers with guidance on occupational therapy service priorities). However, these would not be used to guide the therapists own thinking; they would be have resulted from the experience of the therapist. They are not a guide for the therapists' thinking but rather the therapists attempt to make their intuitive thinking explicit.

Another reason that intuitive thinking is likely relates to the characteristics of the task. Tasks that can induce intuitive thinking have, for example, more than five cues, simultaneously presented, with no task outcome available (Dunwoody et al. 2000). These are characteristics that are representative of a referral prioritisation task.

Experience is also a consideration. The occupational therapist would gain a great deal of experience from making many judgements on this type of task, usually on a daily basis. Experience would be gained in a short space of time, which could lead to expert intuitive judgements being made.

Of course experience does not automatically result in more expert judgement. Some of the participants in study 1 were poor in their ability to consistently apply their own policy, even though they had years of experience (range r_p = 0.29 to 0.96). Low consistency in applying a policy can be a sign of limited expertise (Shanteau 2001). Also, studies that aim to recruit so-called experts can also recruit participants that lack awareness of their limitations (Kruger and

Dunning 1999). Kruger and Dunning (1999) identified that those who were least skilled were the least aware of their lack of expertise. The participants in study 1 may therefore have included occupational therapists that were limited in their expertise.

It is expected that, for all the reasons discussed, there is likely to be a range of levels of self-insight amongst occupational therapists. The goal of this second study is therefore to examine the self-insight of the 40 occupational therapists that participated in study 1. This would include the study of self-insight pertaining to cue use as well as use of the content of the cues. Objective and subjective cue weights would be compared. Group agreement on reported policies needs to be compared with that on statistically derived policies. Therefore, the aims of this study are as follows:

To identify the level of self-insight pertaining to the use of the referral cues in the prioritisation of referrals

To identify the level of self-insight pertaining to the use of the content of the cues in the prioritisation of referrals.

To identify if capacity for self-insight were related to any particular type of reported cue use

To compare group agreement on reported policies with group agreement on statistically derived policies.

4.2 Methodology

A design was needed that could examine occupational therapists' self-insight with regard to referral prioritisation policy. To measure self-insight, subjective and objective measures of cue use needed to be compared. Objective measures had already been collected through the judgement analysis study in chapter 2. These could provide the two types of objective measures needed to measure each occupational therapist's self-insight: their nine cue weights (cue use) and their 33 measures of how the content of the cues had been used (identified through ANOVA).

The key issue for the design at this stage was to decide how best to collect the equivalent subjective data. This needed to involve collecting each individual's report of how they used the cues as well as how they thought they had used the content of the cues (the cue levels).

As objective policies had been identified one methodology, that of policy recognition (Reilly and Doherty 1992), could have been considered. However, the policy recognition method appeared to be reliant on participants knowing only their most and least important cues (Harries 1995). It does not assess self-insight with regard to the cue use in the middle of the spectrum. This methodology, therefore, did not appear to be sufficiently comprehensive for an initial study on occupational therapists self-insight.

Qualitative designs, such as recordings of teaching sessions or semi-structured interviews, have been used to elicit subjective descriptions of importance of cues (Kirwan et al. 1986; Ikomi and Guion 2000). However these descriptions have then had to be quantified to make it possible to compare reported weights with the objective weights. It therefore appeared more appropriate to ask individuals to allocate their own quantitative values to information rather than risk a researcher's misinterpretation of qualitative descriptions. Quantifying this type of information whether done by the researcher in the case of the qualitative design or by the individual in the case of the quantitative would risk some loss of accuracy if intuitive thinking has been used (Reber 1989). Intuitive thinking cannot easily be described and reduced into separate components. The method of asking individual's to assign weights to data does not

therefore provide a perfect tool but may provide some understanding of how individual's use information on some cues.

Data collection of subjective cue use

The questionnaire was used that required participants to identify subjective cue use. This was done by asking individual participants to give a numerical value to each cue to represent the influence that that cue has on the prioritisation of the referral (whilst assuming the values of the other cues are held constant) (see Fig. 4.1). Participants were asked to give each of the nine cues a rating between 0 and 10 to indicate the bearing the cue had on the judgements of the referral priority. Research has shown that this method of allocating importance is as valid as any other of the common methods for eliciting subjective weights (Cook and Thomas 1975). A score of 0 indicated that the information had no influence on the judgement. A score of 10 indicated that the information had a maximum bearing on the judgement.

The objective weights of the participants had already been identified in study 1 (Harries and Gilhooly 2003). These were identified using multiple linear regression analysis; each individual's 90 prioritisation ratings were regressed onto the content of the 90 respective referrals. Nine standardised regression coefficients were obtained for each participant. These represented the individual's objective weights. The coefficients indicated the influence of each of the nine pieces of referral information had had, such as the diagnosis or the reason for referral. For those statistically significant cues, the greater the size of the regression coefficient the greater the importance (or weighting) that had been placed on it.

Both these sets of data could then be correlated to identify the level of self-insight of the participants. A good match would indicate a good level of self-insight and visa versa. The method of data collection and analysis used to examine the self-insight on cue use represented a standard method that had used by other researchers. If the cues had been inter-correlated then other measures such as the predicted policies can be used to provide an indication of self-insight (Schmitt & Levine,1977). However in this study the inter-cue correlation had been minimised and this additional analysis was therefore not necessary.

Data collection of subjective use of the content of the cues.

How the content of the cue had influenced the prioritisation of the referrals would be necessary information for understanding the subjective policy in greater depth. Advice on methodological design was taken from Dr. Clare Harries (University College London) who had experience of conducting in-depth studies on the self-insight of clinicians(Harries 1995). She identified that in research on self-insight, participants had sometimes reported giving a moderate importance rating to a cue, such as gender, but then when asked about the use of the content they did not differentiate between the cue levels. They therefore should not have initially given the cue itself more than a zero rating as they did not subsequently use the levels of the cue to determine the decision made. Without this second level of analysis this would have not have become apparent. She suggested that the levels of cues could be identified from a 'functional plot' that could be used in graphical form, to show how the levels of the cue were used in relation to each other. This valuable advice was incorporated in the method and was used to design the second part of the questionnaire (Fig 4.2).

The second part of the questionnaire asked participants to indicate how the content of the cue had influenced their prioritisation of the referral. Of the 9 cues, content could range from 2 up to 8 levels. Instructions explained that there was a scale next to each possible piece of information; it ranged from high priority to low priority (figure 4.2). This scale was designed to be as similar as possible to the referral rating task to try to match the methods of eliciting information and hence maximise the validity of comparing subjective and objective information. Participants were asked to put a small cross on this line to indicate how this piece of information influenced the priority rating of a referral, were other things to be kept equal. The order in which the cue levels were presented, was altered from the order to which they were entered in the regression analysis so that they did not represent an increasing continuum. Participants may have otherwise been tempted to gradually increase the values they gave to the cue levels rather than independently think about the values they were giving to the levels of the cues.

Participants.

The participants were the 40 occupational therapists whose objective policies had been derived in the results of study 1. Sampling methods are identical to study 1 as the participants were recruited for both studies simultaneously. As a reminder, experienced clinicians were approached via the British Special Interest Group for Occupational Therapists in Mental Health. To obtain a random sample, letters were sent to the first 100 occupational therapists on their mailing list. In order to recruit experienced clinicians, participants were required to be at a senior occupational therapist grade or above. To ensure they had formed some stability in their prioritisation policies they had to have worked for at least one year in their current post. Only those who might take direct occupational therapy referrals, either from their own team colleagues or from those outside their team were invited to participate. Those meeting these criteria were invited to respond.

Data collection

Five of the respondents approached were invited to participate in the pilot research project. Four did so. (For analysis and results see Harries P & Harries C, 2001b)

As changes to the pilot data collection tools were not required, a further group of 36 participants were asked to complete the research tasks. Forty participants were therefore involved. After participants had completed the ratings of the 120 referrals in the referral booklet they were asked to do two tasks. The first was to give an importance rating to the nine cues available in the referral (see Figure 4.1). They were encouraged to feel free to use the whole scale and were allowed to give the same rating to more than one item of information.

Figure 4.1 Policy questionnaire

In this questionnaire we would like you to describe how the information in the referrals affected your judgement of priority. We do not want you to look back at the booklet of referrals whilst completing this task.

There are two parts to recording your prioritisation policy. On each of the referrals we varied nine categories of information. These are listed below. All you have to do is give each a rating between 0 and 10 to indicate the bearing it had on your judgements over the referrals. A score of 0 indicates that the information had no influence on your judgement. A score of 10 indicates that the information had a maximum bearing on the judgement. Feel free to use the whole scale and to give the same rating to more than one item of information. If you are unsure as to what the category of information refers to then see the details on the following page.

Category of information	**Rating**
Gender	
Age	
Referrer	
Diagnosis	
Length of history	
Current living situation	
Reason for referral	
Other services involved	
Any known history of violence	

Figure 4.2

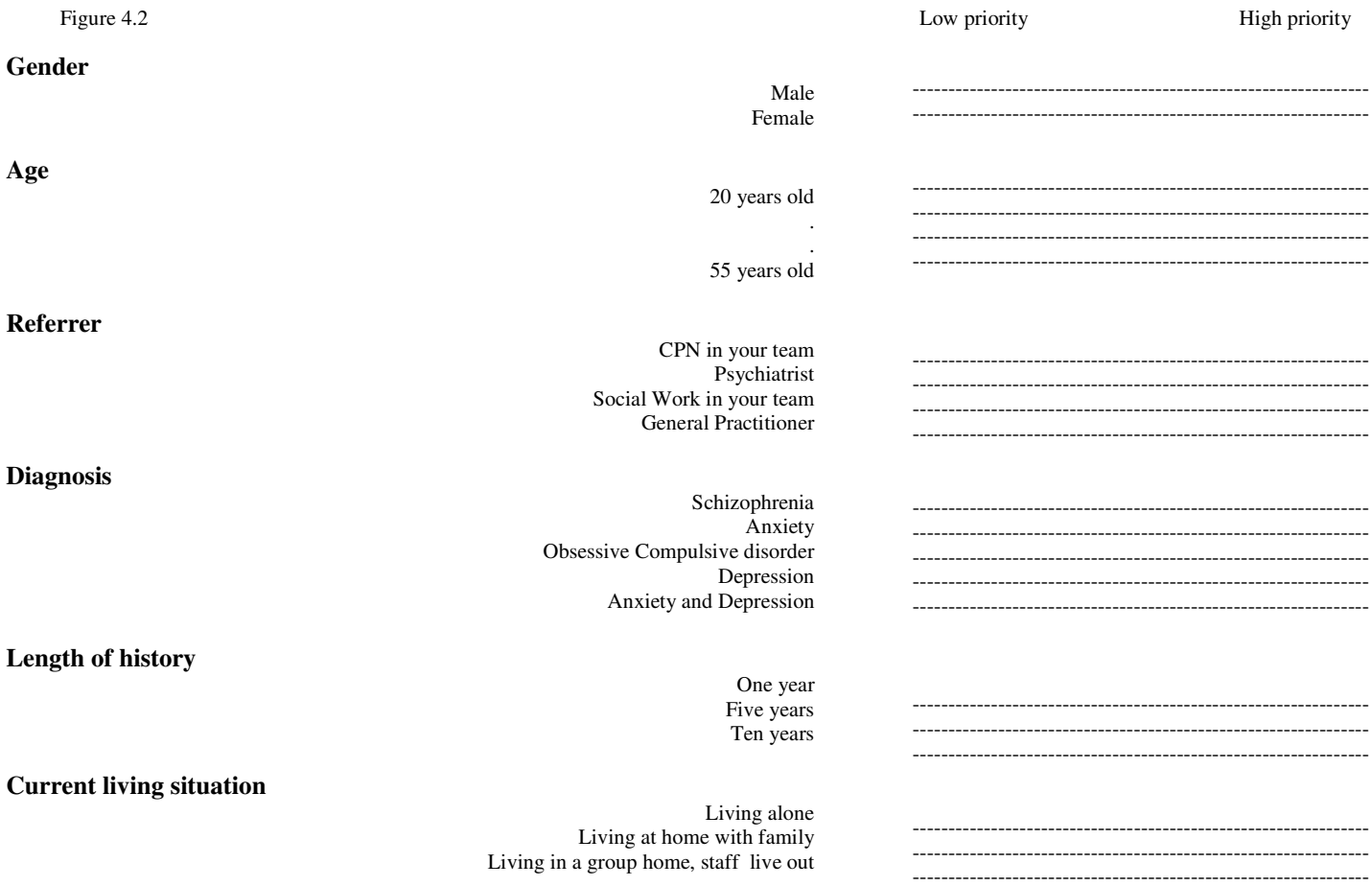

Low priority
High priority
Gender
Male
Female
Age
20 years old
.
.
55 years old
Referrer
CPN in your team
Psychiatrist
Social Work in your team
General Practitioner
Diagnosis
Schizophrenia
Anxiety
Obsessive Compulsive disorder
Depression
Anxiety and Depression
Length of history
One year
Five years
Ten years
Current living situation
Living alone
Living at home with family
Living in a group home, staff live out

Figure 4.2.cont.

Low priority High priority

Reason for referral

‘Recent change in medication. Please support and monitor in the community.’ ----------

‘Psychological and physical disabilities. Functional assessment needed to identify level of support required’ ----------

‘Likely to relapse following imminent redundancy’ ----------

‘Needs support, especially as embarking on college course’ ----------

‘Lost confidence going out and is not looking after themselves very well’ ----------

‘Managed to stabilise drinking (3-4 pints a day). Persisting memory problems and quality of life issues’ ----------

‘This client is not using their time very effectively but lacks motivation to change’ ----------

‘Managing work and maintaining friendships but having difficulty getting on with family’ ----------

Other services involved

Counsellor involved ----------
No other services involved ----------
Day centre ----------

Any known history of violence

No ----------
Suicidal ----------
Physically aggressive ----------
Verbally aggressive ----------

Methods of data analysis

The four aims were explored using the following methods of analyses. The aims pertained to self-insight on the use of the cues, self-insight on the use of the cue content, self-insight on the type of policy used and the level of group self-insight.

1. The subjective reported values were correlated with the objective cue weights for each individual. As the subjective weights could not be reported as negative weights the absolute values were correlated. The individual participant's subjective and objective cue weights were also plotted in a bar chart to allow for a visual comparison. To make the data comparable the subjective weights were transformed to the same scale as the objective weights using the Dennis conversion (Harries 1995). See appendix 6.1. The graphs were sent to the participants for information. To identify the group level of self-insight the mean correlation was calculated across the forty occupational therapists using Fisher's transformations to correct for non-normality of correlation coefficients. The mean correlation coefficient identified the occupational therapists' level of self-insight pertaining to the cues used in the prioritisation of referrals. The higher the correlation the greater the level of self-insight.

2. Two measurements of self-insight, pertaining to the use of the content of the cues, were conducted by comparing subjective values given to the use of the content of the cues with objective values given to the use of the content of cues derived in study 1 (Harries and Gilhooly 2003). For these analyses the objective values were taken from the mean scores (obtained through ANOVA analysis), which had been used to identify the objective values of cue levels in chapter 2. For a detailed explanation of how these ANOVA's were calculated, please refer to the methodology used to identify the prioritisation policies in section 2.3. The comparison of the mean objective scores and the subjective values given to the cue levels in the questionnaire (Fig 4.2) were used to identify two measures; the individual's level of self-insight across the cue levels as well as the group's self-insight on

the use of each of the cue levels. Means for the group for each of these two measures were also identified following Fisher's transformations to correct for non-normality of distribution of correlation coefficients. The higher the correlation the greater the level of self-insight.

3. A third set of analyses was also used to identify self-insight pertaining to the use of the cue content in the prioritisation of referrals. The functional plot included in the second part of the questionnaire (Fig 4.2) not only identified the values given to the levels of the cues, but also allowed for the researcher to fit a regression line to the values to identify the slope (b) that resulted from these values. Each slope was then correlated with the corresponding beta weight derived from the multiple regression analysis for each cue for each individual. For cue content, which matched a linear progression of values, this would give another valuable measure of self-insight on each cue. It would also be apparent if the use of the levels of the cues had not been linear; a recategorisation of both the subjective and objective levels could then be done see if self-insight had been misrepresented.

4.A Ward's cluster analysis was also conducted to identify if self-insight scores were related to any particular type of reported cue use. The reason for using Ward's method was justified in study 2. The cluster analysis was conducted on the subjective values given to the 9 cues by the 40 participants. The mean level of self-insight was then calculated for each cluster and compared to identify any significant differences.

5. The group agreement on the subjective use of the cue weights was compared with the group agreement on the objective use of the cue weights. Kendal's coefficient of concordance was used to conduct this analysis. If agreement was higher on the subjective policies this would suggest that the participants were reporting views of shared policies rather than polices they had actually used.

Ethical considerations

A full information sheet was provided before consent was obtained. Anonymity was assured for all participants involved in the study. All participants' information was coded prior to data collection and the names and codes held separately thereby assuring confidentiality. Honorarium fees were minimal to cover participant's time costs only. Ethical approval from the University department had been given.

Following analysis clinician's were sent their own and their colleagues results for their information (coded to protect confidentiality). Participants were offered the opportunity to contact the researcher to discuss their results. Up to two hours of each of the 40 participating clinicians was required was required to complete the referral prioritisation task, the demographic questionnaire and the self-insight questionnaire. An honorarium of £15 each was provided on completion of participation.

4.3 Results

The level of self-insight pertaining to the use the referral cues.

Self-insight was examined by correlating the individual participant's objective and subjective cue weights (Table 4.1). See appendix 2.5 for the full set of objective weights and 4.1 for the full set of subjective weights. The mean for the 40 participants was found to be r = 0.61(df = 39, N = 40), range 0.081 to 0.862. This indicated a fair degree of insight for the group but a wide variation of self-insight between individuals. The subjective weights were transformed using the Dennis conversion (Harries 1995) to equate the subjective weightings to the scale of the objective weights. These are visually displayed in histograms, see appendix 4.2. These histograms showing individual's subjective and objective weights, were returned to the respective participants for information. The histograms demonstrated that insight was greatest for the most and least important cues (see appendix 4.2.5 for examples).

Table 4.1 Self-insight :Mean correlation (r) of subjective and objective cue weights (following Fisher's z transformations (r').

Participants	r	*p*	r′
1	0.456	0.217	0.492
2	0.845	0.004	1.238
3	0.785	0.012	1.058
4	0.721	0.012	0.91
5	0.786	0.012	1.061
6	0.77	0.015	1.02
7	0.559	0.117	0.631
8	0.172	0.659	0.174
9	0.476	0.195	0.518
10	0.542	0.132	0.607
11	0.551	0.124	0.62
12	0.862	0.003	1.301
13	0.589	0.095	0.676
14	0.842	0.004	1.228
15	0.648	0.059	0.772
16	0.225	0.561	0.229
17	0.661	0.053	0.795
18	0.433	0.245	0.464
19	0.607	0.083	0.704
20	0.544	0.13	0.61
21	0.551	0.124	0.62
22	0.749	0.02	0.971
23	0.638	0.065	0.755
24	0.594	0.092	0.684
25	0.549	0.126	0.617
26	0.433	0.245	0.464
27	0.195	0.615	0.198
28	0.0807	0.009	0.081
29	0.399	0.287	0.422
30	0.65	0.058	0.775
31	0.555	0.121	0.626
32	0.614	0.078	0.715
33	0.48	0.191	0.523
34	0.448	0.226	0.482
35	0.812	0.008	1.133
36	0.716	0.03	0.899
37	0.573	0.107	0.652
38	0.631	0.068	0.743
39	0.46	0.213	0.497
40	0.806	0.009	1.116
SD	0.18	0.3	
skew	-0.72	0.12	
mean r'			0.702
mean r	0.605		

Insight on use of content (levels) of cues

Self-insight pertaining to the use of the content of the cues was investigated. This was done in three ways. The first method of analysis involved comparing the subjective values given to the use of the content of the cues with the objective values given to the use of the content of cues derived in study 1. See appendix 4.3 for subjective values given to cue levels and 4.4 for objective use of cue levels. For these analyses the mean objective values of cue levels were identified using the ANOVA in chapter 1. The comparison of the mean objective scores and the subjective values given to the cue levels in the questionnaire (Table 4.1) were used to identify two measures.

Firstly each individual's level of self-insight across all the 33 cue levels was calculated by comparing the individual's 33 scores (means identified through ANOVA), identifying their objective use of the levels with their 33 subjective ratings of the cue levels. For all 40 participants the mean level of self-insight pertaining to this use of the cue content was found to be $r = 0.495$, range 0.18-0.65 (Table 4.2). Means for the group was identified following Fisher's transformations to correct for non-normality of distribution of correlation coefficients.

Secondly the self-insight on each of the cue levels was calculated by identifying the 40 mean objective scores for the group (means identified through ANOVA) with the 40 subjective values given to that cue level. The mean group self-insight score across all 33 levels was found to be $r = 0.59$ ($p < 0.01$) (See table 4.3).

Table 4.2 Self-insight: the influence of the content of the cue on referral prioritisation (over all 9 cue values).

Participants	r	*p*	r'
1	0.526	0.002	0.585
2	0.76	0.001	0.996
3	0.605	0.001	0.701
4	0.387	0.092	0.408
5	0.41	0.018	0.436
6	0.604	0.001	0.699
7	0.444	0.01	0.477
8	0.243	0.172	0.248
9	0.667	0.001	0.805
10	0.552	0.001	0.621
11	0.187	0.37	0.189
12	0.584	0.001	0.669
13	0.305	0.084	0.315
14	0.423	0.014	0.451
15	0.544	0.001	0.61
16	0.462	0.007	0.5
17	0.162	0.367	0.163
18	0.369	0.035	0.387
19	0.376	0.031	0.395
20	0.471	0.006	0.511
21	0.45	0.009	0.485
22	0.37	0.039	0.388
23	0.651	0.001	0.777
24	0.453	0.008	0.488
25	0.58	0.001	0.662
26	0.597	0.001	0.688
27	0.613	0.001	0.714
28	0.532	0.001	0.593
29	0.613	0.001	0.714
30	0.21	0.241	0.213
31	0.616	0.001	0.719
32	0.75	0.001	0.973
33	0.43	0.012	0.46
34	0.65	0.001	0.775
35	0.41	0.019	0.436
36	0.317	0.08	0.328
37	0.49	0.004	0.536
38	0.537	0.001	0.6
39	0.406	0.019	0.431
40	0.53	0.003	0.59
SD	0.15	0.2	
skew	-0.33	0.16	
mean r'			0.543
mean r	0.495		

Table 4.3 Correlation between mean values given to the levels of cues by 40 occupational therapists

cue levels	mean subjective values	mean objective values
1	1.59	5.15
2	1.51	4.95
3	2.56	5.63
4	2.19	4.31
5	2.87	4.89
6	2.89	5.07
7	3.11	5.29
8	4.33	4.72
9	3.46	4.96
10	6.11	5.72
11	3.88	5.06
12	3.51	5.05
13	3.33	5.13
14	1.95	4.44
15	3.07	4.47
16	4.05	5.22
17	5.78	6.08
18	2.68	4.8
19	4.29	4.87
20	2.93	5.26
21	4.16	5.08
22	5.33	5.71
23	2.81	4.78
24	2.51	5.06
25	5.89	5.51
26	1.65	3.37
27	2.83	4.14
28	3.3	4.99
29	2.96	4.16
30	3.13	6.55
31	4.17	6.7
32	4.82	6.07
33	5.43	6.7

correlation r = 0.593, p = 0.01, df = 32.

A third method of analysis was used to examine the level of self-insight pertaining to the use of the content of the cues. This involved using data from the functional plot as suggested by Dr. Clare Harries. The functional plot included in the second part of the questionnaire (Fig 4.2) required the participants to give values to the levels of the cues. One of the reasons that this method of data collection was used was due to the fact that participants sometimes give a moderate importance rating to a cue, but then do not report differentiating between the cue levels (Harries, 1995). This phenomena did occur in this study, for example participant 10 gave a rating of 5 to the cue gender but then gave equal importance to the two levels of that cue i.e. male and female. As the values were obtained for the use of the cue levels, the researcher could fit a regression line to the values to identify the slope (b). If the values given to the cue content were equal this gave a slope of zero, thereby giving an accurate indication of their use. The slope could therefore represent the subjective use of the cue. This slope was then calculated for every cue for every participant (see appendix 4.5). For each of the 9 cues, the 40 individual's subjective slope values were correlated with the 40 individual's beta weight values derived from the multiple regression analysis. The beta weight values identified the objective use of the cue. This allowed for the examination of the self-insight pertaining to how the group understood how they had used each individual cue. It was found that for 4 of the 9 cues the level of self-insight was statistically significant. The cue which had the highest level of self-insight was length of history ($r = 0.73$, $p < 0.01$), next highest was history of violence ($r = 0.62$ $p < 0.01$), followed by reason for referral ($r = 0.57$ $p < 0.01$) and diagnosis ($r = 0.53$ $p < 0.01$). Self-insight for the other 5 cues was not significant; gender ($r = -0.04$, $p = 0.81$), age $r = 0.261$, $p = 0.113$), referrer ($r = -0.089$, $p = 0.607$), living situation ($r = -0.146$, $p = 383$), support ($r = 0.158$, $p = 0.337$). By visually examining the plots it was apparent where the fit of the slope was poor. For example in the cue 'living situation' 30 of the 40 participants had given the second level of the cue the lowest score. How the individual's subjective cue levels had been scored needed to be compared with how the individual actually used this cue (means identified from ANOVA for the levels of this same cue). It was apparent that for 10 of these 30 participants, the subjective order did indeed match the order of the objective values (derived from the objective regression weights). For these ten participants recategorisation of both the subjective and objective

levels was done to reorder the levels on both sets of data. The middle level was altered to the first level and the first level altered to represent the middle level. See for example Figure 4.3 & Figure 4.4 that demonstrates the recategorisation of levels. These show an improved fit with regard to the use of the participant's subjective values.

Figure 4.3 Plot of participant 16's subjective view of their use of the cue 'living situation'.

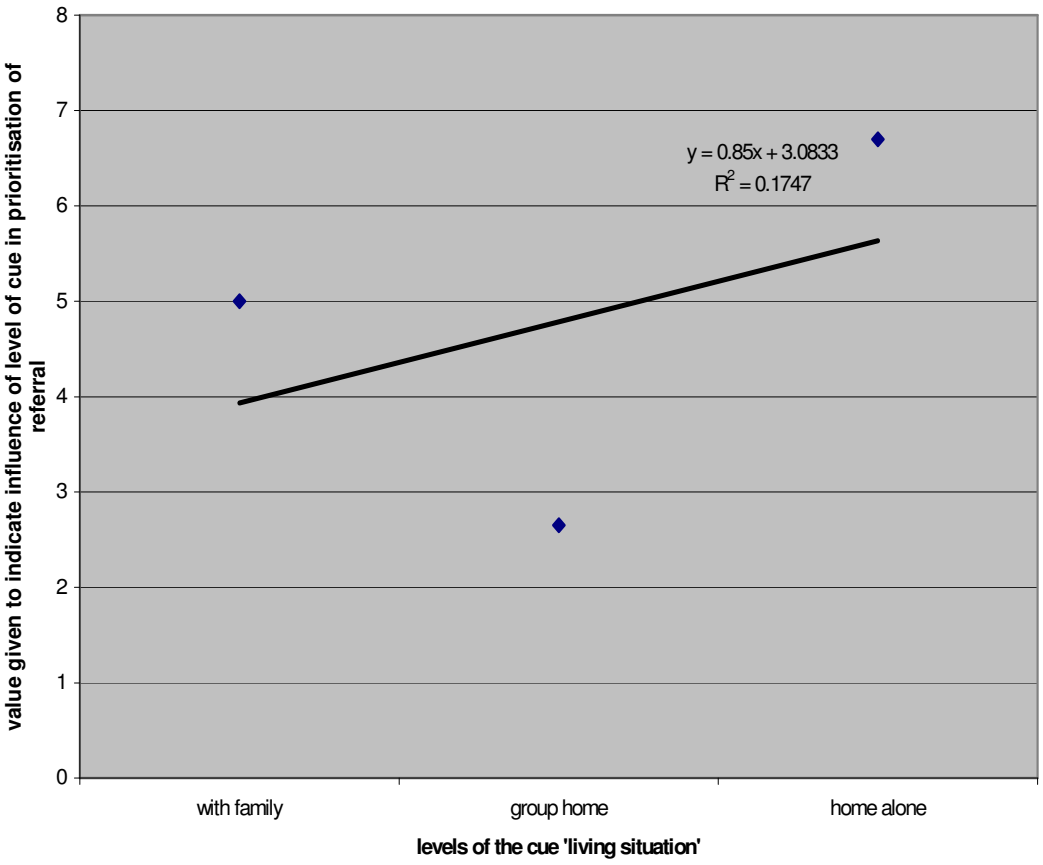
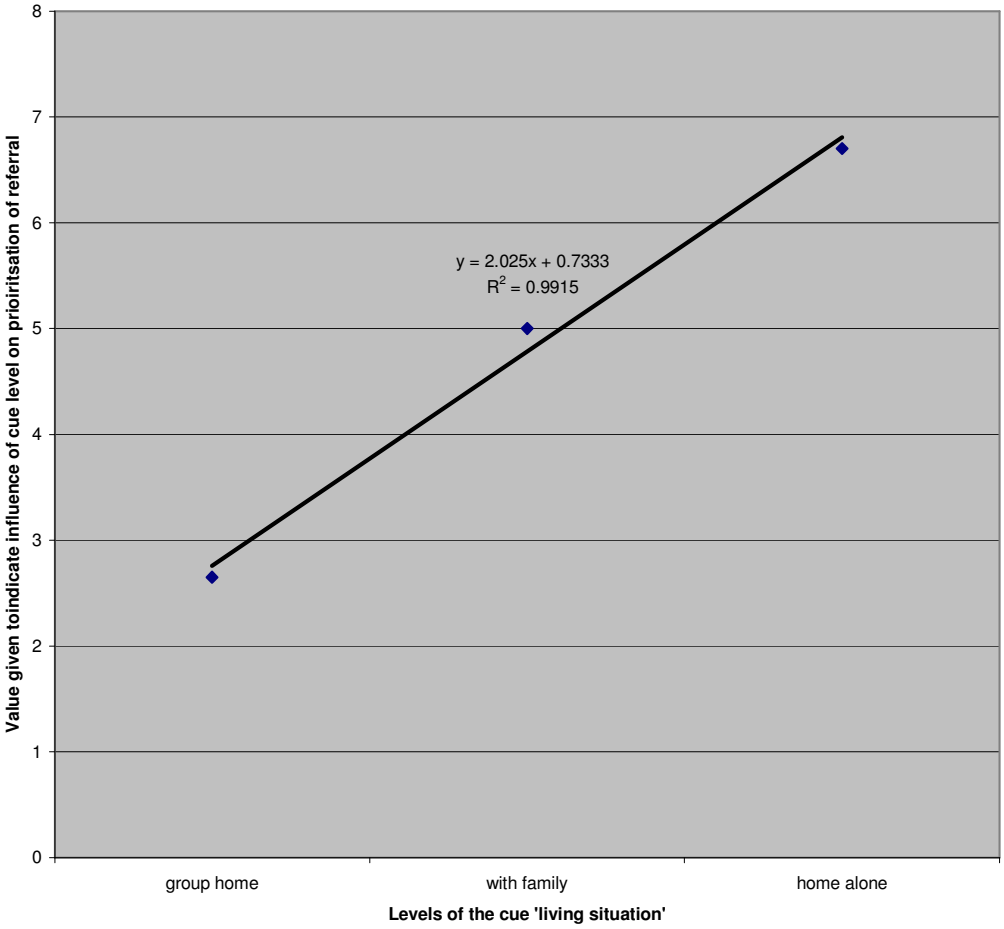


Figure 4.4 Recategorized plot of participant 16's subjective view of their use of the cue 'living situation'.



The slopes were then recalculated on the recategorised subjective values. They were also calculated using the recategorised mean objective values for the 10 respective participants. See figure 4.5 & 4.6 for the recategorisation. For these ten participants, the level of self-insight was found to now be significant, correlating moderately at 0.46. However when these participants results were integrated back into the 40 participants scores the overall self-insight capacity for the cue of living situation was still not statistically significant (r = - 0.03). The majority of participants were still not actually using the cue in the way which they reported they did.

Figure 4.5 Plot of participant 16's objective use of the cue 'living situation'.

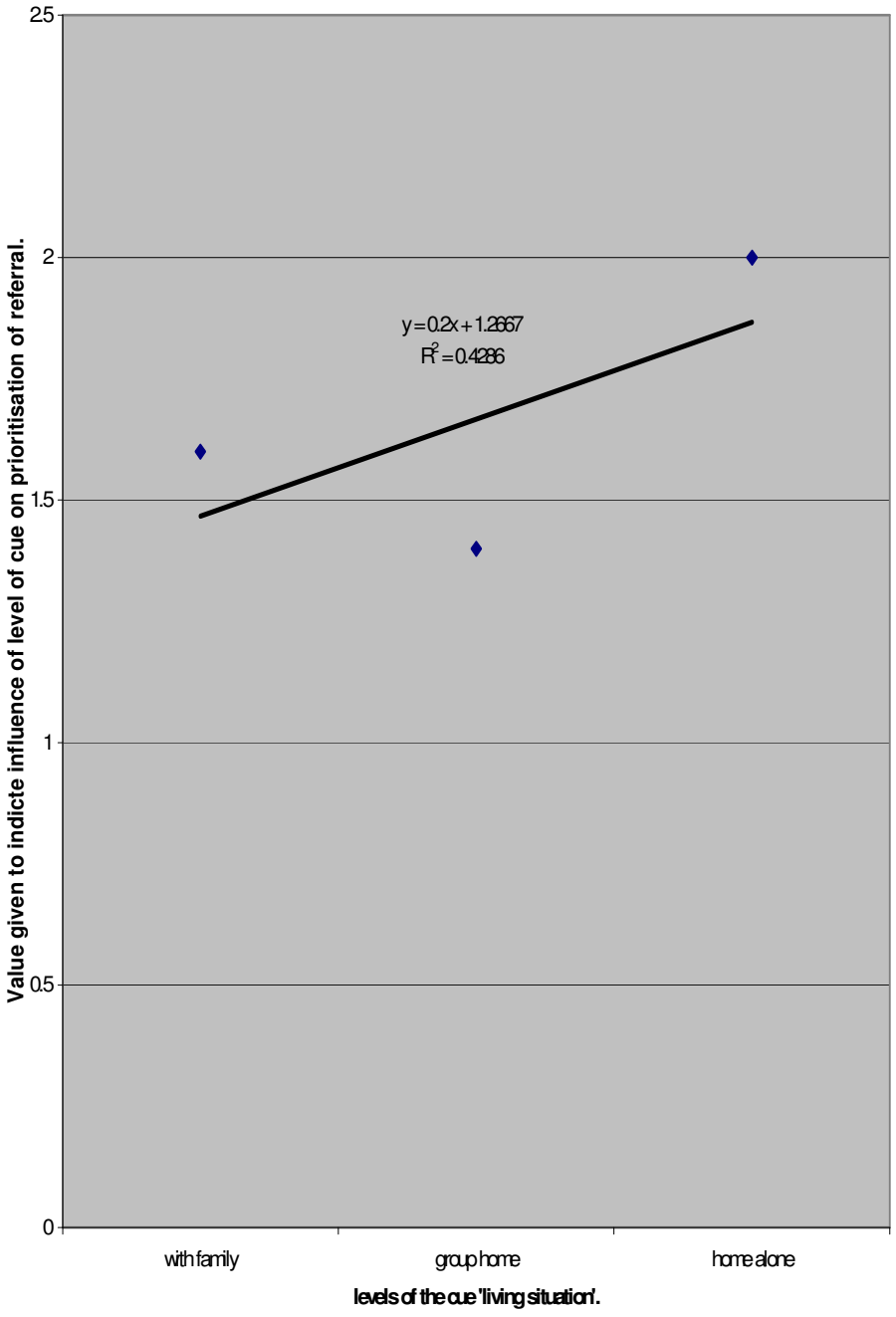
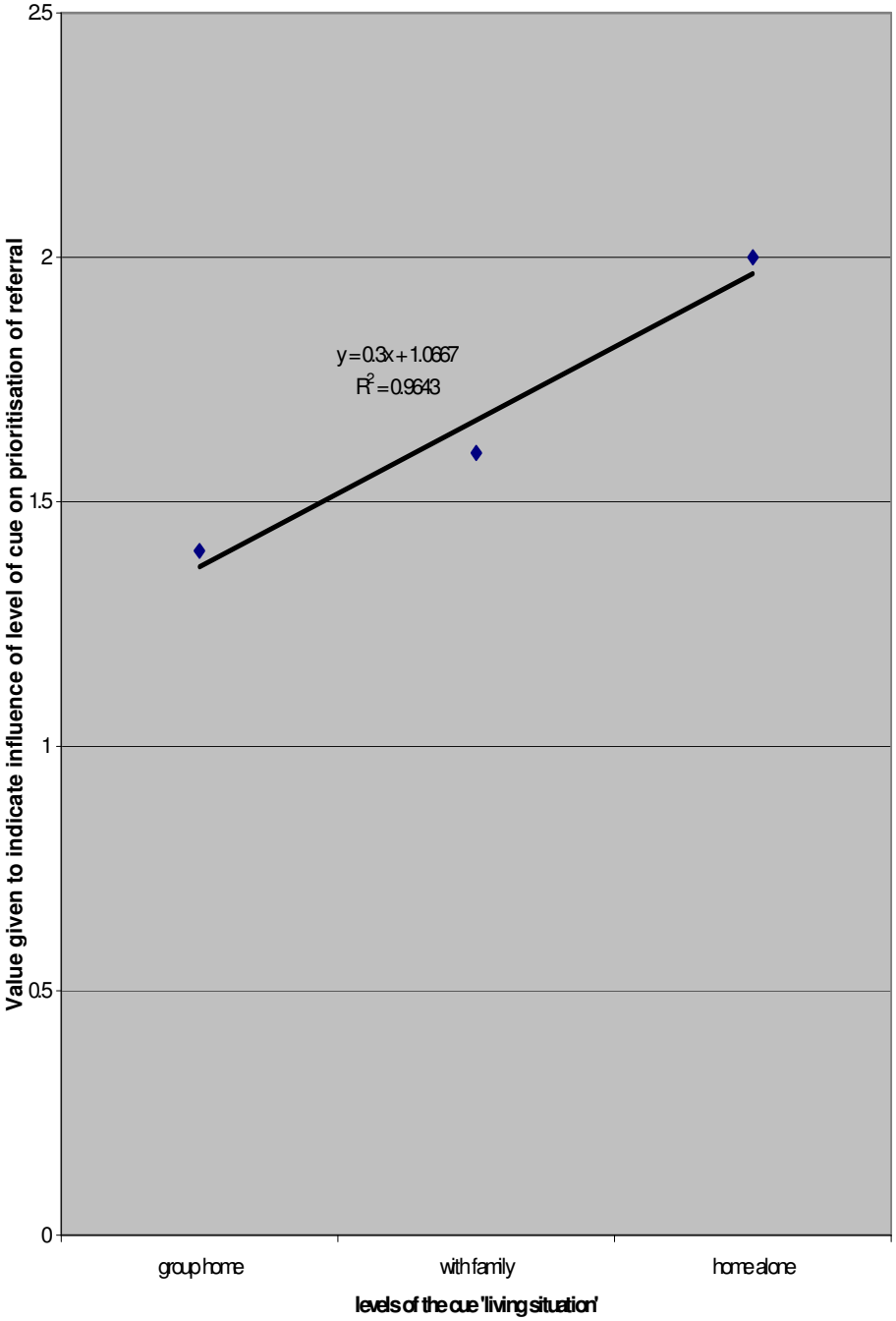


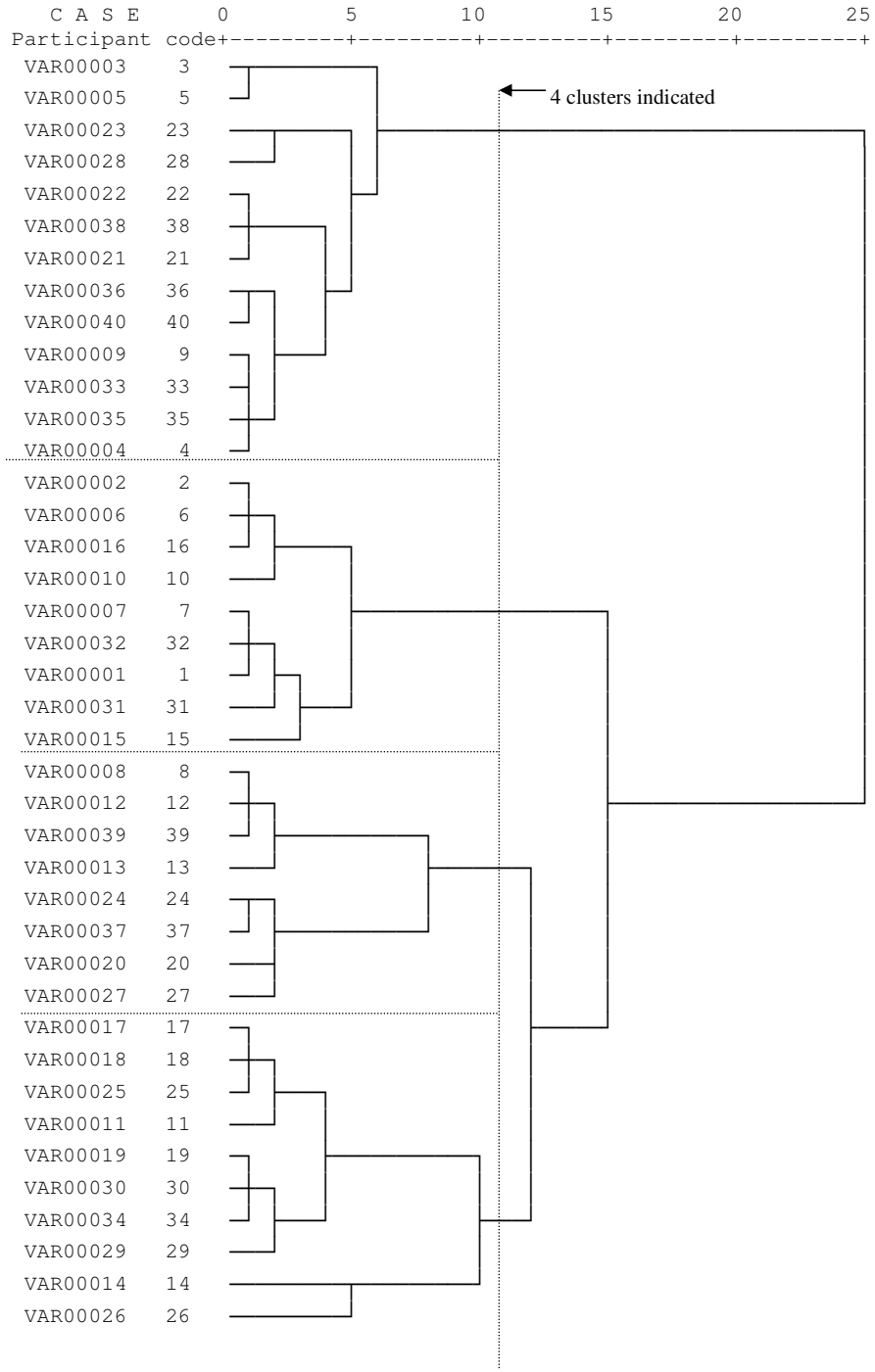
Figure 4.6 Recategorized plot of participant 16's objective use of level of cue 'living situation'.



Policy type and self-insight

A cluster analysis was also conducted on the subjective reported policies. Ward's method was used. This cluster analysis was used to identify if any particular subjective policy was related to a particular degree of self-insight. Four clusters were found to be present (Figure 4.7). The total number of individuals in the clusters was found to be identical to those in the cluster analysis that had been done on the objective policies. A cross tabs calculation was run on the output of the two cluster analyses to examine the relationships in two patterns of clustering. The cross tabs revealed that this was purely coincidental and that no error in the clustering procedures had occurred (appendix 7.1).

Figure 4.7 Dendrogram clustering the subjective cue weighting policy of 40 occupational therapists (Ward Method)



The self-insight for each of the 4 clusters was compared (Table 4.4). Results were calculated using Fisher's z transformations but were returned to Pearson's correlation coefficients for ease of understanding.

Table 4.4 Level of self-insight for differing types of reported cue use.

Clusters based on reported type of cue use	Mean level of self-insight for cluster	Median level of self-insight for cluster
1 (N=13)	0.67	0.72
2 (N=9)	0.57	0.57
3 (N=8)	0.47	0.55
4 (N=10)	0.55	0.55

Descriptive statistics showed that mean self-insight into cue use was highest in cluster 1 (mean r = 0.67, median = 0.72) and lowest in cluster 3 (mean = 0.47, median 0.55). However a one way ANOVA identified no significant difference between the self-insight of the clusters 1 and 3 ($F = 0.81$, $p = 0.497$).

Agreement

Finally the group agreement on the subjective use of the cue weights was compared with the group agreement on the objective use of the cue weights. Group agreement on subjective cue weights, identified by Kendal's coefficient of concordance, was $W^a = 0.514$, p=0.0001 and group agreement on objective cue weights was $W^a = 0.429$, p=0.0001. Group agreement on subjective use of the content of the cues was $W^a = 0.367$, p = 0.0001 and group agreement on objective use of the content of the cues was $W^a = 0.416$, p = 0.0001.

4.4 Discussion

The mean correlation between the objective and subjective cue weights (r = 0.61) was found to be similar to that identified in previous studies on self-insight (Harries 1995; Reilly 1996). On examination of the histograms of individual participant's self-insight, where subjective cue weights were plotted against objective cue weights, it did appear that there was fair recognition of the most and least important cues. See appendices 4.2.5 for examples i.e. graph of participant 4 and participant 21. In relation to the policy recognition research of Reilly (1992), it does appear possible that their research was successful as participants could identify their policies just by using their most or least important cues (Harries et al., 2000). Their recognition methodology, did not allow for the poorer levels of self-insight, pertaining to the cues in the middle of the spectrum, to be acknowledged. In the occupational therapists' results, those cues that were not given very high or very low importance were generally over estimated in terms of the degree of influence that they have had. This is a phenomena that has been recognised since the early clinical studies in decision making (Elstein et al. 1978).

Self-insight into the use of the content of the cues was examined in several ways. Each individual's insight was examined across all 33 levels of the cues, by comparing subjective and objective values (mean r = 0.49, $p< 0.01$). All 40 participants self-insight was then examined across each of the 33 cue levels. In this second method of analysis the level of self-insight was found to be higher (r = 0.59, $p< 0.01$). Therefore the results appear more impressive when considering group capacity for self-insight on use of the cue content as opposed to individual's capacity.

The most interesting results, which involved the use of the 'slopes' calculations, could be used to identify the level of self-insight for each of the 9 cues. Of the 9 cues available for use, self-insight was statistically significant on only four. Three of these four were the cues used by participants when prioritising referrals (see study 1); reason for referral, diagnosis and violence. Attempts were made to correct for the poor modelling of the use of some cue levels, but even with this additional analysis the participants were still found to be less able to understand the use of these cues in comparison to those which were more valued.

The ‘attention hypothesis’ may have relevance to this finding (Harries et al. 2000). Harries et al. (2000), examined the sequence to which information was selected prior to decision-making. They found that the subjective weights correlated more closely with the attention paid to the cues than to the relative importance of the use of those cues. Perhaps, by paying attention to the more useful cues, greater self-insight into the use of the levels has been developed. This would account for levels of self-insight being greater on those cues that were given most weight. Harries et al. (2000) do note however that the attention paid to particular cues may also have been due to Nisbett and Wilsons’ shared views theory (1977). Nisbett and Wilsons’ research (1977) showed that people only reported shared theories of the causes of their behaviour rather than explaining the causes of their own behaviour. If participants are holding shared views of what should be used this will direct them to pay attention to those particular cues. This will also influence them to use those cues and to report use of those same cues (Harries et al. 2000).

If shared policies have been reported, there should be greater group agreement on subjective policies than on objective policies. Agreement was found to be higher on subjective cue use, than on the objective cue use. However with regard to the use of the content of the cues, the objective values showed greater agreement than the subjective values. Greater validity could be attributed to the data derived from the slopes (as illustrated by the values given by participant 10). Therefore this would suggested that the reporting of shared values may not have occurred in this study. When using the slopes as the measure of subjective cue use, participants did show greater variation in their subjective policies than in their objective policies.

Although the self-insight of the group was fair, the range of self-insight varied greatly amongst the participants. The wide range of values suggests that it is not only the type of task that influences self-insight but also the capacity of the individual.

Some participants had poor self-insight scores. Several reasons can be considered in relation to this. They may have been the least able of the participants; Kruger & Dunning, (1999) have shown that those who have less ability often have less self-insight. Conversely they may have been those with the most ability; poor self-insight can indicate expert intuitive thinking is being used (McMackin and Slovic 2000).

As some occupational therapists have been found to have less self-insight, to presume the certain benefits of reflective practice may have been a little unrealistic. If self-insight is less than optimal, reflection can lead the individual to focus on inappropriate information thus leading to a deterioration of subsequent decisions (Wilson and Schooler 1991). Reflective practice may be valuable for novice therapists who are using analytical thinking or for those following explicit team policy. But for more intuitive thinkers, reflective practice should be done in relation to information that has been used in practice. Judgement analysis is one such method that can be used to model this information. For the intuitive thinkers, reflective practice could be focussed on information that is actually used in their decision making rather than that, which is not.

Methodological issues.

Usually the method of obtaining subjective reports involves taking a single estimation of a weighting policy at the end of the prioritisation of 120 referrals. This has been shown to be less representative than allowing for subjective weightings to be recorded after each individual judgement (Harries and Harvey 2000). If subjective weights had been collected after each referral was prioritised, the results would have more validity.

Another methodological consideration that needs noting is that in real life, referral cues would be inter-correlated. For example, participants may use the referrer rather than the length of history to indicate the severity of need; a client referred by a psychiatrist is more likely to have had a serious mental health problem than someone who is referred by the G.P. This method of substituting cue use is a recognised characteristic of experienced therapists (Roberts 1996). Reilly and Doherty clustered inter-correlated cues in their policy recognition exercise. Their results showed a higher level of self-insight that the results in this study. Their use of inter-correlated cues could have accounted for their finding that self-insight was high (Harries et al.2000).

In conclusion, how much self-insight occupational therapists have into their referral prioritisation policies, is not clear-cut. It does seem that the group had wide variation in their capacity for self-insight. For those with less self-insight, be it due to intuitive thinking, lack of ability or dynamic policy use, the use of reflective practice as a means to improve occupational therapists clinical judgements may not be as valuable as previously

thought. Indeed, without the feedback as to what has actually been used in practice, we may be encouraging thinking to focus on non-optimal information and which can reduce the quality of subsequent judgements (McMackin and Slovic 2000). The research methodology must be that which most effectively represents the true level of self-insight. Studies that effectively obtain the reported policies are of utmost importance and are vital to the correct interpretation of any future research on self-insight. The measurement and fit of the use of cue content were found to give much greater depth to the understanding of the data. This more in-depth analysis was able to show that self-insight on the some of the cues, particularly those that were used the most, was good.

4.5 Summary

Self-insight has the potential for improving clinical decision making, facilitating clinical education and promoting professional agreement (Harries et al. 2000a). However, experienced professionals have been found to have difficulty explaining their policies, especially if they have used an intuitive mode of thinking (Hoffman 1987). In order to examine occupational therapists' capacity for self-insight, this chapter compares participants' self-reported referral prioritisation policies with their statistically modelled policies derived from their behaviour (Harries and Gilhooly 2003). Capacity can vary between professional groups and between types of task (Ikomi and Guion 2000). This is the first study of occupational therapists' self-insight pertaining to the task of referral prioritisation.

The methodology involved asking 40 Occupational Therapists to allocate values to referral cues, as well as the levels of those cues, to indicate the importance that these factors had on their prioritisation of referrals. Their self-insight was then examined by comparing their objective policies, which were statistically modelled from their behaviour, with their subjective (reported) referral prioritisation policies. Self-insight into how referral information was used, found from correlating objective and subjective cue weights, was found to be moderate (mean r = 0.61). Self-insight on some individual cues was found to be much higher than on others (range r = 0.73 to – 0.146). Participants were found to be

most aware of how they used those cues that were most commonly used in practice. The range of self-insight varied greatly between participants.

Results are discussed in relation to cognitive demands of the research tasks, methodological issues, the influence of task characteristics, the 'attention hypothesis', the influence of social pressures and the benefits and costs of analysing judgements.

Chapter 5 Training novices in referral prioritisation policies

5.1 Introduction

The purpose of the study in this chapter is to identify whether expert judgement policies can be used to train novices. To be more specific, to identify if undergraduate occupational therapists can learn the expert occupational therapists' referral prioritisation policies.

The literature pertaining to the following issues needs to be considered in order to prepare such a study: effectiveness of training with expert policies, optimal ways to present expert policy, optimal type of information to present, optimal quantity of information to present and finally optimal timing of information presentation.

These issues will be discussed in order to identify the most appropriate methodology to be used for the proposed study.

Effectiveness of training with expert policies

Expertise can be used to promote novices' understanding of a particular domain through a variety of methods. Teaching is a common method by which novices learn from those who have experience of making decisions in a particular domain. The expert can instruct novices in what information is important to consider and use. A study by Shanteau and collegues showed just this: student nurses' judgement policies were shown to improve in both cue acquisition and cue combination (Shanteau et al. 1991). Shanteau's study aimed to increase effective use of knowledge rather than nursing knowledge itself. Previous research, based on using normative decision rules had not shown teaching to be very effective at improving decision making skills (Lichtenstein and Fischhoff 1980). It has been suggested that hands on experience is also needed to "cement" the learning (Gaeth and Shanteau 1984). Shanteau and colleagues used lecturing and nursing practicum (Shanteau et al. 1991). They had a greater impact improving the students thinking processes than previous researchers (Shanteau et al.1991).

Another perspective that has been used to promote novice judgement policies is the social judgement theory perspective. It utilises the Brunswikian lens model indices to represent the types of expert policies used in making accurate decisions. The values of these indices can be identified through capturing experts' policies (Luckett and Hirst 1989) or by using test results to determine relative cue weights (Wigton et al. 1990).

Luckett and Hirst (1989) used three partners in an auditing firm to identify a gold standard for the assessment of staff performance. The gold standard identified the ideal cue weights needed to make the optimal judgement on staff performance. Forty-eight student auditors were then trained with this 'official policy'. The five cues each had two cue levels: satisfactory or unsatisfactory. Students were able to benefit from training both in terms of cue weight policies and their agreement. Students who received task information had a post training agreement with each other of 0.89. Students who had no training had an agreement of 0.78. The students who were in the control group continued to use the most important cue as the least important. Although the partners' weightings were subjectively obtained and therefore did not necessary reflect the actual policies of the partners, it is still apparent that the students were able to learn effectively.

In other studies, students have been shown to learn from weighting systems derived from test results. Wigton (1990) trained student health physicians and medical students to accurately diagnose pharyngitis. Seven cues were used to represent the patients' profiles and each cue has two levels: present or absent. The medical students were able to learn the weighting system more quickly and effectively than the student health physicians. The students increased their accuracy (r_a) from 0.34 to 0.93. Their cognitive control (R_s) increased form .9 to .98. Their knowledge (G) increased from 0.33 to 0.94. The researchers found that the more experienced group were less willing to change their policies. It was also thought that they might have wished to continue to use all available information to try to out perform the rules supplied. Negative cue weights were not learnt as well as positive cue weights. Improvements in judgement policies were found to be more related to knowledge (G) than cognitive control (R_s). The study did show that weighting policies can be quickly and effectively learnt by the students.

Policy capturing can also involve asking experienced individuals to make decisions on real or simulated situations so that the cue weights that have been used to reach decisions can be statistically modelled. The captured expert policy may identify such information as the correct judgement (Y) as well as the relative cue weights used to reach such a judgement (r). The mean values of the experts' indices are then calculated to give a consensus expert policy. Once this 'gold standard' is identified, it can be used to train novices in a particular judgement policy. This type of 'gold standard', based on consensus expert policy is viewed as the optimal policy available at that point in time.

The study in chapter 2 was a policy capturing study. It was conducted to gather 40 experienced occupational therapists' policies of referral priorities. Experienced therapists' policies were needed to train student occupational therapists in the clinical skill of referral prioritisation. In order to identify the most expert of the 40 participants, a cluster analysis was conducted (chapter 3). Sub-groups of occupational therapists, using differing policies, were identified from the cluster analysis. The best judgement policies were found to be those used by the sub-group of occupational therapists in cluster 2. Therapists in cluster 2 mainly focussed on prioritising referrals for clients with a need for occupational therapy. The British College of Occupational Therapists had published a position statement recommending occupational therapists focus the majority of their casework on occupational therapy type of need (Craik et al. 1998a). Cluster 2 therapists were therefore those whose type of work the professional body advocated. In chapter 3 these occupational therapists were named the 'satisfied specialists' as they were satisfied with their role and able to provide a largely professionally focussed service. These were the occupational therapists that provided the 'gold standard' upon which undergraduates could be trained. For the purposes of this chapter the judgement policies of the satisfied specialists will be known as the 'expert' policy.

When a policy has been captured the double system lens model can be created (Cooksey 1996). In the double lens model the expert's cognitive system becomes the task ecology, that is the criterion to be achieved. The task environment then provides the criterion judgements (Y_e), which can be used as a measure for checking accuracy (r_a).

Optimal ways to present expert policy

In order to use expert policy for training the judgement policies can be represented in several ways. In some studies the cue weights can be represented with the regression equation (Tape et al. 1992). The minus sign denotes a negative cue weight that would lower the judgement value. A plus sign denotes a positive cue weight that would raise the judgement value. The degree by which the judgement is influenced depends upon the size of the cue weight itself. For the expert occupational therapists, the cue weight that was most influential on the prioritisation rating was the last one; the reason for referral. This is the regression equation for the expert occupational therapists.

Std mean expert ratings = - 0.000 - 0.0002 gender std - 0.0366 age std + 0.0633 referrer std – 0.0525 living situation std + 0.0647 length of history std + 0.123 aggression std + 0.483 diagnosis standardised + 0.0417 other support std + 0.693 reason for referral std. ('Std' refers to standardised.)

A study that tried this method of training, recognised in hindsight that it may not be a form of information accessible to most clinicians (Tape et al. 1992). Understanding a regression equation is not part of undergraduate clinical students' statistical curriculum so this method of presenting training information appears too complex for use in the clinical field.

Another method of representing the lens model indices has been the lens model diagram itself (Doherty and Balzer 1988). This was done by varying the thickness of the lines between variables to represent the covariance between respective variables (Doherty and Balzer 1988). Occupational therapy students would find this a difficult form of material to understand, as again it would be a very unfamiliar type of information representation.

More commonly, the cues weights are presented graphically. Indeed, graphical representation has been the most favoured method for representing lens model indices (Doherty and Balzer 1988). For example bar graphs have been used to demonstrate relative cue weights. Best-fit curves have been used to represent cue function forms. Subject's cue coefficients or judgements have been plotted on the same graph as criterion values, to allow for comparison between the two sources. Hammond (1971) encouraged the pictorial presentation method in order to ease understanding

Some researchers have presented purely verbal information, whereas others have used combinations of presentations. If information presentation is too complex for subjects to understand, they may attempt to guess at the profiles' value rather than use the information provided (Cooksey 1996). This can reduce the reliability of the ratings gathered and result in low consistency scores (reflecting reduced ability to form the required policy).

Optimal type of information to present.

Chapter 1 reviewed literature that concluded that task information was the essential type of information needed to improve performance (Balzer et al. 1989; Balzer and Sulsky 1992). The weighting policies of the experts can now be used as the task information for the students. This use of giving task information, prior to doing the decision task, is recognised as feedforward (Cooksey,1996).

Studies comparing the effectiveness of feedback, as opposed to feedforward, found minimal evidence to suggest one is better than the other (Balzer et al. 1989). Change was measured using the lens model indices, especially the FVI indices. r_a (correlation between Y_e and Y_s, the achievement correlation), Rs (correlation between subjects judgement and the optimal least squares combination of the cues, that is the multiple correlation) and G (correlation between the predictions from the linear model of the subject and from the linear model of the environment). Effectiveness of feedback was measured by increased levels of these indices (in relation to the same number of trials). All seemed to have been positively influenced by TI.

It has also been reported that change had been most marked when measuring R_s (Balzer et al. 1989). However the fact that the decision maker had become more consistent or gained better cognitive control does not necessarily mean that decision maker has adopted the criterion policies. Therefore, although this index did show the most change it is not the index to show that policies have improved in relation to the criterion. This is can be most effectively seen from r_a. r_a, where available, is the most valid indicator of judgement accuracy.

Optimal quantity of information to present.

It has been suggested that decisions can be adversely affected when too much information is available. Several studies have shown this theory to be valid (Chewing and Harrell 1990; Stewart et al. 1992). Chewning & Harrell (1990) tested this theory by manipulating the amount of information available to individuals predicting a firm's financial forecasts. Four, 6 and 8 cues were presented at differing stages of the study and the effect on cue usage was examined. The numbers of cues were chosen on the basis of Newell & Simon's evidence that showed that individuals are able to utilise 5-7 dimensions within their short-term memory (Newell and Simon 1972). Eight cues could therefore cause an overload for some individuals but may be within the capacity of some. It was found that individual's capacity did indeed vary. Fifty-five participants increased their cue usage as the number of cues increased. However 29 deteriorated in their cue usage when they were moved up the last stage of eight cues. Indicators of decision accuracy, such as consistency (Ashton 1982) and group agreement, were also examined and found to show loss of accuracy for those whose capacity to use 8 cues had been poor. Ashton (1982) reviewed evidence relating accuracy and consistency and identified that information overload will cause a decline in decision consistency. Consistency can therefore be an indicator of decision accuracy.

What was most interesting about their findings was the information gained from the self-report on overload. There was found to be no difference between the more accurate judges and the less accurate judges in the levels of perceived overload. They lacked self-insight into their deteriorating cognitive skills and their lack of capacity to integrate high levels of information. Studies on confidence have even shown that individuals think their judgements improve as they are given additional information. And yet their accuracy has not improved (Arkes et al. 1986).

Important lessons learnt from their study suggest that more information does not always mean improved decision making accuracy. These findings have also been confirmed in the study of weather forecasters (Shanteau et al. 1991; Stewart et al. 1992). Expecting individuals to utilise cues on as many as eight dimensions can cause inferior decisions to be made. Where possible, information should be provided on those cues which are the most likely to influence the decision outcome, i.e. those cue that account for the most variance. Individuals may not be conscious of cognitive overload and may be overly confident when given too much information.

Chewing and Harrell (1990) used consistency and agreement to identify accuracy. Others have also used G (the experts ability to integrate information according to the requirements of the task) and reliability (Stewart et al. 1990). Stewart, Heideman, Moninger, and Reagan-Cirincione (1992) recommended that concern must be with improving the use of information rather than increasing the quantity of information.

In feedback research, consideration has to be given to how feedback has been presented and the type of information (derived from the indices) that has been used. The frequency and timing of giving the information can be varied. The way in which the statistical information has been presented ranges can range from graphical, to verbal and pictorial methods. Computer systems, such as 'conograph' have also been used to return policies to the decision-maker whilst the judgement task is being done (Hammond and Summers 1972).

The most common indices used to demonstrate relationships between the 'judgements and cues' and the 'cues and criterion' are the correlation coefficients and beta weights (Schmitt and Levine 1977). Each index can be represented by several possible statistical measures. These may be represented in various ways to maximise the usefulness of the information provided. Usefulness may be influenced by the type of decision that has to be made, the knowledge level of the decision makers and the number of relationships among the cues (Schmitt and Levine 1977). If cues are intercorrelated, caution is necessary in selecting the indices to be used. Schmitt and Levine (1977) have shown that different indices will alter the statistical measures both in terms of the absolute values and the rank order. Rarely has more than one statistical measure been presented to give information on the same index. Research has yet to be conducted to understand if this would be helpful or confusing (Balzer et al. 1989).

Optimal timing of information presentation.

The frequency and timing of feedback is the last issue. By 1989, a review of the efficacy of providing cognitive feedback, detailed the following findings (Balzer et al. 1989). They found that the timing of feedback had ranged from immediate to several weeks after the judgements have been made. The frequency of feedback information given to judges had

varied from once to ten times. The effect of these variations had yet to be researched at that time. Cooksey (1996) discussed the rationale for immediate feedback and repeated feedback cycles to increase the regression policy stability (Cooksey 1996). He argued that in judgement analysis, the quality of data yielded for nomothetic comparison was high, the data being based on many observations that had already undergone idiographic analysis. Therefore smaller sample sizes could be used, as the standard error of the test would be reduced. However, it is important to note that the comprehension of feedback data in addition to the rating of the profiles in the learning phase, still would add greatly to the cognitive demands of the task. The policy stability therefore, can be compromised, as a low number of profiles have to be used to reduce the cognitive demands on the judges. Cooksey (1996) also stated that the effectiveness of learning was increased when the testing and learning phases were accomplished in one sitting. This was viewed as feasible only with limited numbers of cues, especially when linear and non-linear cue use was detailed in the feedback.

In summary, in order to maximise the likelihood of effective training, the experts task information should be used to train the novices and must be made as comprehensible as possible (Balzer and Sulsky 1992). Cognitive overload would need to be avoided by minimising the number of cues used (Chewing and Harrell 1990). Task information may best be presented graphically (Doherty and Balzer 1988). Training sessions, where possible need to be accomplished in one sitting (Cooksey 1996). Achievement (r_a), should be used as the most valid indicator of the novice's level of accuracy in the judgement task (Cooksey 1996). Other indicies can be examined to identify whether improvements are due to improved knowledge (G) or cognitive control (R_s) (Hammond and Summers 1972). Group agreement on policy weightings would usually improve following training with a cue weighting policy (Luckett and Hirst 1989).

The aim of the study was to investigate whether undergraduate occupational therapists can use the expert occupational therapists' referral prioritisation policies. The following hypotheses were proposed on the assumption of a positive effect from training.

H1 The level of conformity with the expert referral ratings (r_a) will be higher for students in the post training group than in the pre-training group.

H2 The level of conformity with the expert cue weighting system will be higher for students in the post training group than in the pre-training group.

H3 The level of conformity with the expert use of the content of cues (cue levels) will be higher for students in the post training group than in the pre-training group.

H4 The level of group agreement (W^a) will be higher for students in the post training group than in the pre-training group.

H5 The students' consistency (test-retest) of policy use will be higher for students in the post training group than in the pre-training group.

H6 Cognitive control (R_s) and linear knowledge (G) will be higher for students in the post training group than in the pre-training group.

5.2 Methodology

Design

A one group pre-test, post test design was chosen to measure any effect of training. Occupational therapy students comprised the 'group'. Students were asked to give priority ratings (dependent variables) to occupational therapy referrals before and after training (feedforward phase)[2]. The presence of the training information represented the independent variable. The training information gave the optimal prioritisation policies of experts in cluster 2. This information was designed to improve the students' ability to recognise referral priorities.

The stages of design shown in table 5.1 used Cooksey's recommendations for cue training for participants who have "seldom, if ever, made these judgements in real life" (1986:153). Occupational therapy students would certainly have not had responsibility for referral prioritisation task until the clinical placement at the end of their final year. However, their final placement may not necessarily be in the field of community mental health. Therefore they would be inexperienced in the task at this stage but would require the skills before graduating. The profile numbers have been adjusted to represent a nine-cue profile. Replicates have also been added to the testing phase to make the post-testing phase more comprehensive.

[2] These referrals would have been sent from other health professionals to the occupational therapists, requesting a community occupational therapy service for clients with mental health problems. Prioritisation of the referrals is a necessary process as the number of referral requests far exceeds service availability

Table 5.1 Table to show the stages of the design for student training.

Baseline phase	Judge 52 cue profiles plus 22 replicated profiles to check for judgement reliability.
Feedforward phase	Provide task information immediately following completion of learning phase.
Testing phase	Judge 38 cue profiles plus 10 replicated profiles to check for judgement reliability (tests the extent of improved performance due to feedforward).

The referrals presented to the students were identical to those used with the expert group (N=40) as described in chapter 2. This was done to facilitate direct comparison between expert and novice prioritisation ratings. If, following training, the students' prioritisation ratings became more like the experts' then the training would have had its desired effect. The set of 90 referrals that the experts rated was divided into two sets to provide a pre and post set for the students (Cooksey, 1996). Fifty-two referrals were used pre-training to establish the students' initial judgement policies. Thirty-eight referrals were used post-training to test how well the students had been able to use the expert policies. In order to analyse consistency of policy application, 22 replicates of the pre-training referrals were added to the end of the pre-training set and 10 replicates of the post-training referrals were added to the end of the post training set.

One possible problem with this design related to the cognitive demands that would be placed on the students. There were two reasons why the students may find the task design cognitively taxing. Firstly the students had limited experience of the task and would lack any intuitive strategies that would ease the process. Secondly, the comprehension of the training information was an additional component. Fatigue could be an issue. Cooksey (1996) noted that the effectiveness of learning is increased when the testing and learning

phases are accomplished in one sitting. It was therefore decided that the three phases should be attempted in one sitting. A key reason for the pilot study would be to establish if the heavy cognitive demands of the design were within the students' capacities or whether fatigue would affect performance.

Generation of training materials

The success of the design would be optimised if the training information was easily comprehensible. The training materials were therefore shown to individuals in the year to ensure for understanding. In the context of the pre-test post-test design, the training information was provided once between the two testing phases. Essentially the training information was therefore used to 'feedforward' (Steinmann 1976). The purpose of training was to change behaviour in the second set of prioritisation ratings. There has been minimal evidence to suggest that there is any difference in learning between using feedback or feedforward information (Balzer et al. 1989). Indeed feedforward can be likened to traditional education where information is presented to promote a higher level of understanding.

The essential issue, apparent from the literature, was that the training information should comprise of task information as opposed to cognitive information (Hammond and Summers 1992; Balzer et al. 1989; Balzer and Sulsky 1992). One type of task information is the cue weight policy needed to make the desired decisions. In this case the cue weight policy needed to prioritise referral effectively. The identification of the optimal cue weights used by a sub group of occupational therapists, the satisfied specialists (N=9) had been identified as the gold standard in chapter 3. These were therefore the cue weight policies needed to train novices judgements. How the cue weights could best be presented to the students was next considered.

Graphical methods have been found to be the favoured mode to represent cue weights (Hammond 1971; Doherty and Balzer 1988). The experts had used three cues in the policies. Therefore the three relative mean cue weights (reason for referral, diagnosis and level of violence) were plotted as bar charts (figure 5.1 second page). The cue weights told students which cues to pay attention to (and to what degree) and the content of the cue then influenced how the referral should be prioritised.

The ratings given for the levels of the three cues used were also represented graphically (figure 5.1 third, fourth & fifth page). For example for the levels of the reason for referral cue 'physical and psychological needs' would require a very high rating whereas 'monitoring of new medication' would require a very low rating. Both levels of knowledge (cue weights and ratings for differing level of cues) were needed to develop student's judgements.

In order to promote understanding of why the experts had used their policies and to assist memory of such quantitative data, descriptive information was also provided. This identified the related clinical reasoning that would support such policies. This was particularly important in relation to cue levels as other studies usually use simpler cue information. For example Luckett and colleagues (1989) stated two levels of cue: whether staff performance characteristics were satisfactory or unsatisfactory. The levels of the cues to be presented in the referrals were much more complex and not obviously ordinal in nature. Therefore students needed descriptive guidance on how to use the cue levels. The descriptive information was drawn from the comments included on the questionnaire of study one as well as telephone discussions with participants in the feedback phase of study one. An important part of the pilot phase would be to ascertain if the training information was understandable and if it could cause the required changes in judgement policy.
The training information that was designed is presented in Figure 5.1

Figure 5.1 Training information for Occupational Therapy students

You have now managed to prioritise a large set of referrals. Well done!

Don't worry, the second set is smaller and I will give you some guidance on how to do it to see if you can improve your skill in referral prioritisation. There will be an extra £5 book token for those ten students who manage to improve their referral prioritisation policies the most!

In the referrals there were nine pieces of information (cues) that you could use to judge priority. These nine factors were gender, age, referrer, diagnosis, length of history, current living situation, reason for referral, other services involved and any known history of violence.

In 2001, 40 experienced occupational therapists were asked to prioritise these same referrals. They were members of the College of Occupational Therapists' Association for Occupational Therapists working in Mental Health (AOMTH). They came from England, Scotland and Wales and they had years of experience working in community mental health teams. Of the 40 occupational therapists, 9 occupational therapists had the most effective prioritisation policies. They were the most effective in that they managed to achieve a satisfactory balance between generic and specialist occupational therapy work. Therefore, using these 9 experts' policies, I can now tell you how much importance they placed on each piece of referral information. This is the information you may find helpful when trying to prioritise referrals effectively.

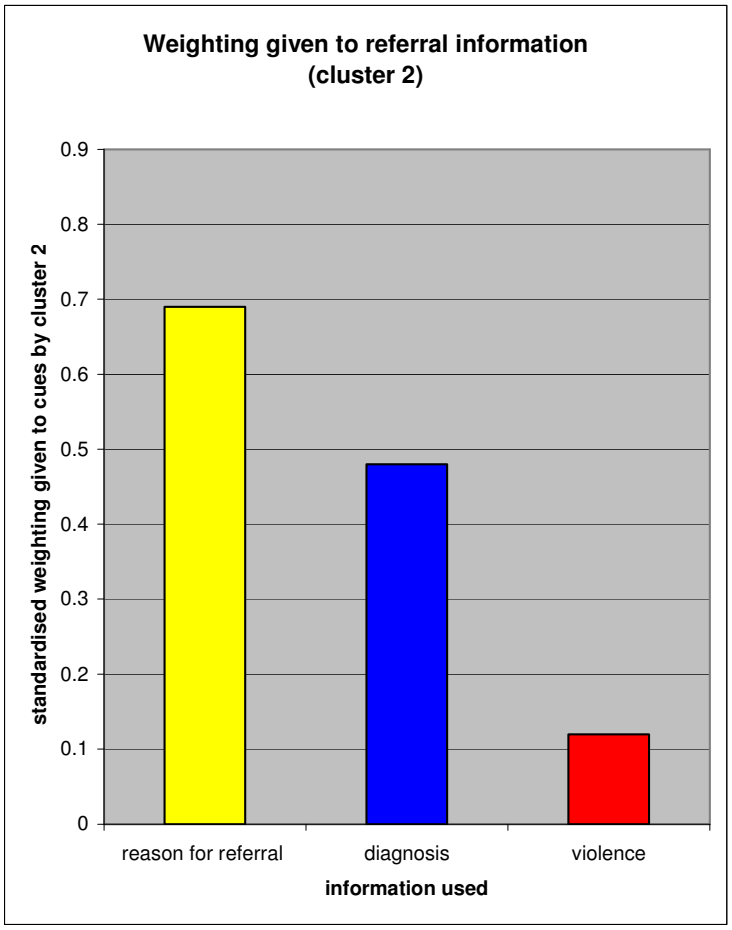
Remember, occupational therapists in community mental health teams are overwhelmed with referrals so they have to be selective and decide which clients really need occupational therapy. You may feel a client needs attention but does it have to be the occupational therapists. A suicidal client may really need the skills of the community psychiatric nurse, social worker or psychiatrist. These professionals regularly practise skills in risk assessment: they can get someone into hospital if they are unsafe by using a section of the Mental Health Act. Now read the information on the next few pages and then prioritise the second booklet of referrals in terms of the need for occupational therapy.

Of the nine pieces of referral information the 9 most effective occupational therapists only used **three**.

Reason for referral, diagnosis and any known history of violence. These were their three significant cues they used to determine priority. (These were the only statistically significant cues used).

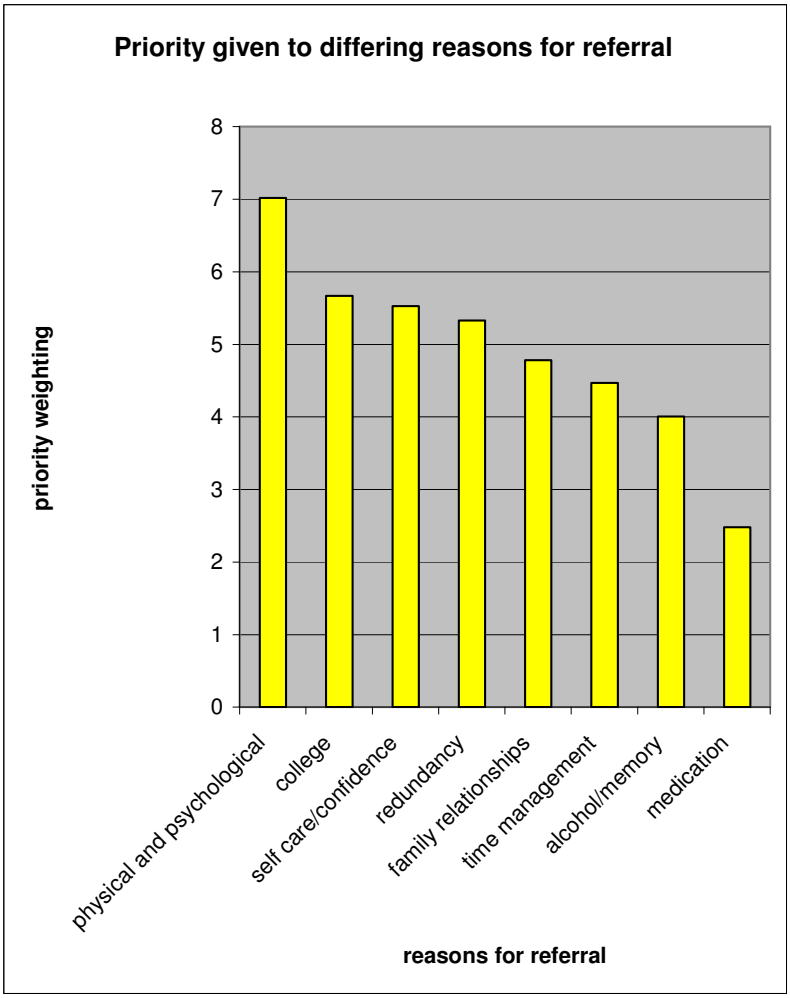
The client's living situation, other support services, the referrer, gender, length of history and age were not used to a statistically significant level.

The multicoloured graph shows you the relative weightings given to each of the cues. For each of the cues there is a graph, which gives you more detail of how the content of that cue. For example the blue diagnosis bar has a corresponding blue graph showing the relative weightings given to the schizophrenia, depression, OCD, etc.



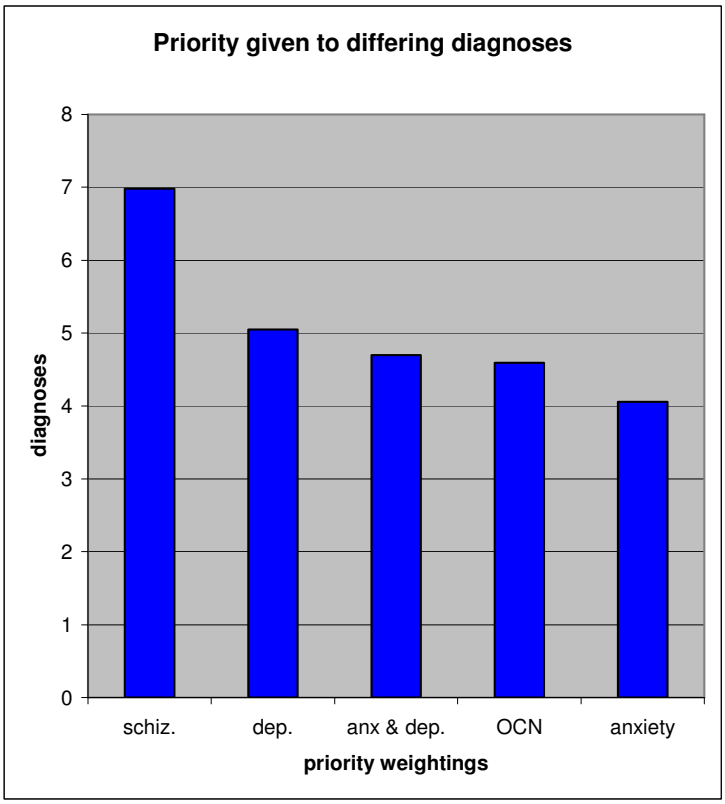
1. Reason for referral (Yellow Graph)

From the yellow graph you can see that the 'reason for referral' was the most important cue. The reason for referral was given nearly twice as much weighting as the next most important cue. Therefore to help you improve your ability to judge the priority of a referral you may need to give this cue the most attention. This cue told the occupational therapist if the client had a problem that required the attention of an occupational therapist. It contained information about any skill deficits in self-care, productivity or leisure and identified environmental (physical/social) demands on the client. It could also identify what the referrer wanted you to do with the client. It appears that this is therefore the most important cue. It tells you whether occupational therapy is the most appropriate service for this client. The need for functional assessment of 'physical and psychological' need was clearly viewed as a very appropriate type of referral and has been given the highest weighting. Those with the lowest weights relate to needs that may have been better addressed by another profession eg. community psychiatric nurse would usually monitor medication.

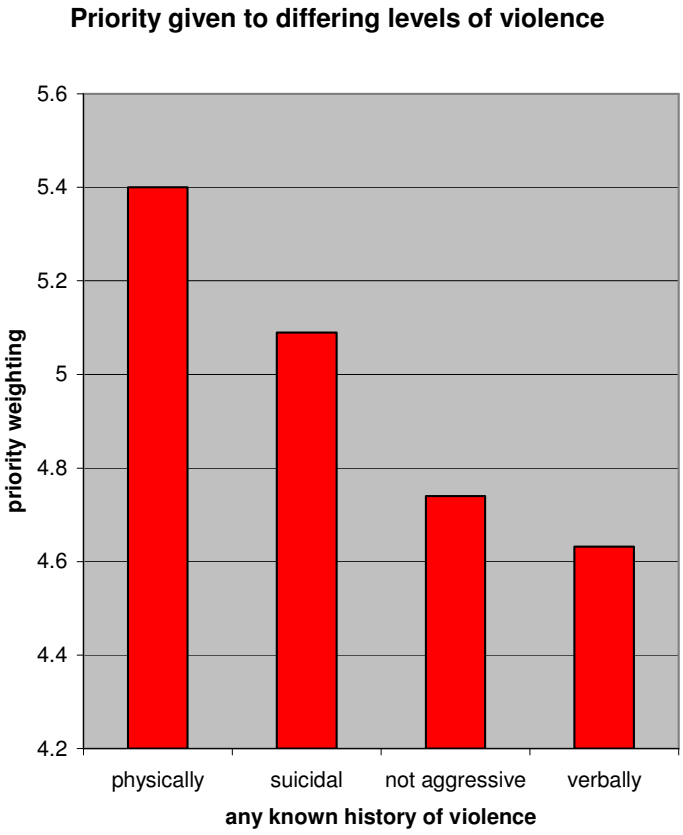


2. Diagnosis (Blue graph).

This was the second most important cue in determining priority. It was given nearly half as much weight as 'reason for referral' but four times more than the client's 'level of violence'. If the client had schizophrenia, this was of key importance in terms of prioritisation. This may be due to the fact that current legislation requires that that serious illness must be prioritised. Psychotic illnesses are viewed as the most serious illnesses. **Schizophrenia** is the most likely illness to have psychotic features although severe depression can also have **psychotic** features. Not surprisingly, depression is recognised as the second most important level of this cue. This is probably also linked to the risk of suicide. Another relevant factor in prioritisation is that in the long term **schizophrenia has more of a detrimental effect on client's functional abilities than would a neurotic or mood disorder**. This is therefore another reason why occupational therapists will prioritise clients with schizophrenia. Obsessive-compulsive disorder can be very disabling and prevent clients working, socialising and managing their daily routines. This is therefore prioritised over anxiety but below depression.



3.Any known history of violence (Red graph)
This was the third most important cue. The content of this relates to whether the client could be violent to themselves (suicidal) or to others (verbally or physically). Physically aggressive and suicide were given the most weighting. Reducing suicide is a 'Health of the Nation' target. Occupational therapists can help reduce suicidal feelings by enabling clients to find meaning in their life. Clients who were not violent were not considered to very different than those who were verbally aggressive.



I hope this information is helpful in developing your ability to judge referral priority. What you need to consider is if the client requires OT and prioritise accordingly. Have a go at prioritising the last set and do use the information to assist you if you wish. Just do your best! Many thanks for taking part.

Sample criteria

Although the participants were to be relative novices (in order to learn from the 'experts'), only occupational therapy students as opposed to the general public, were considered appropriate participants for the task. Students of the occupational therapy profession would have sufficient knowledge of what an occupational therapy service could offer. They had to know what type of service they were prioritising for in order to aim to prioritise the referrals appropriately. Knowledge of the service provision would therefore be a necessary prerequisite to the prioritisation task itself.

Occupational therapy students at Brunel University were chosen as the potential participants (N=100). As this university educated the largest group of occupational therapy students in the U.K. it was felt that this would increase the possibility that a reasonable number of students would participate.

It was felt that 'final' year students would be the most appropriate participants. In earlier stages of training students would not have sufficient understanding of the referral content to be able to make informed prioritisation decisions. Only by the final year of training would a student be likely to have a fair understanding of, for example, what support a group home could provide or have developed knowledge of how schizophrenia could impair functioning.

Following undergraduate training they could take a post where they would have responsibility for the prioritisation of referrals. They therefore need learn how to prioritise referrals effectively before graduation.

Sample recruitment

To obtain a random sample, the 100 final year occupational therapy students were invited to participate. This was done through three methods. A full information sheet was provided as a flyer in each student's pigeon-hole (Appendix 5.1). The flyer stated the aims of the research and the requirements of any participants. Students were told they would be given feedback about their scores. Confidentiality of results was assured for all participants involved in the study. (Information would be coded prior to data collection and the names

and codes held separately.) £10 honorarium fees were offered to cover participant's time costs only. Care was taken to time the research procedures so they were not close to any exam period or should put students under any undue pressure. Ethical approval from the University department had been granted.

A notice was placed on the year board describing the forthcoming research (Appendix 5.2). Lastly a verbal invitation to the students was made at the beginning of a year lecture.

Two students who offered to participate were used in the initial pilot study. Feedback at this stage related to the students' concern that a low priority rating would lead to no service, occupational therapy or otherwise, being provided. An additional sentence was added to the training information to allay this concern as some referrals could, in the real course of events, be allocated to another professional in the team. The students reported that they did not find the cognitive demands of the task too heavy and they were able to complete the three stages in one sitting. Most importantly, analysis of the pilot student's ratings identified that they were able to use the expert's policies. Using several different methods of analysis, as described later in this section, the performance of the pilot study participants significantly improved. The main study was then conducted.

Procedure

37 students participated. Each student was seated at an individual table in a large room and given the first booklet of referrals to prioritise. Students were asked not to discuss or compare their ratings. Written instructions were given at the start of the booklet (appendix 5.3). When a student had prioritised the first booklet of referrals they handed it in to the researcher in return for the training information and the second booklet of referrals. They were instructed to read the training information (Figure 5.1) and then referred to it as they prioritised the second booklet of referrals. As an incentive to do their best the training information informed them that those students most able to match the prioritisation ratings of the experts would receive an additional £5 honorarium.

When they completed their prioritisation of the second booklet of referrals they handed it with the training materials to the researcher and left the room.

5.3 Results

A variety of methods of analysis were used to identify whether students had been able to use the expert prioritisation policies.

Training effect on students' ability to prioritise referrals (r_a)

H1 The level of conformity with the expert referral ratings (r_a) will be higher for students in the post training group than in the pre-training group. This hypothesis was supported.

The method used to test this hypothesis was to correlate the individual students' raw prioritisation ratings (Y_s) both pre and post training with the experts' ratings on the same referrals (Y_e). In the lens model equation this is known as the achievement correlation, r_a. If this correlation (Pearson's) became larger following training this would indicate that the student had been able to prioritise the referrals more like the expert. Followed Fisher's Z transformations of the students' correlations, a paired samples t-test would indicate if there had been a significant training effect on students' skill in referral prioritisation.

The individual students' raw ratings (Y_e) pre training were correlated with the mean ratings of the satisfied specialists on identical referrals. For 37 students, the mean correlation was r = 0.23

The individual students' raw ratings (Y_e) post training were then correlated with the mean ratings of the satisfied specialists of those same referrals. For 37 students, the mean correlation was r = 0.7

Table 5.2 Individual student's ratings correlated with mean expert ratings (cluster 2) pre and post training.

(means of pearson's correlations derived using Fisher's r' conversions.)

students	r pre training	r' pretraining	r post training	r' post training
1	0.07	0.07	0.75	0.98
2	0.13	0.13	0.85	1.26
3	0.02	0.02	0.8	1.1
4	0.25	0.25	0.35	0.54
5	0.09	0.09	0.36	0.55
6	0.61	0.71	0.81	1.13
7	0.44	0.47	0.8	1.1
8	0.2	0.2	0.87	1.33
9	0.2	0.2	0.38	0.4
10	0.08	0.08	0.79	1.07
11	0.06	0.06	0.67	0.81
12	0.09	0.09	0.69	0.85
13	0.1	0.1	0.59	0.68
14	0.22	0.22	0.76	1
15	0.25	0.26	0.33	0.34
16	0.25	0.26	0.61	0.71
17	0.21	0.21	0.86	1.29
18	0.07	0.07	0.64	0.76
19	0.24	0.24	0.86	1.29
20	0.24	0.24	0.66	0.79
21	0.05	0.05	0.64	0.76
22	0.33	0.34	0.81	1.13
23	0.3	0.31	0.72	0.91
24	0.27	0.28	0.65	0.78
25	0.34	0.35	0.51	0.56
26	0.36	0.38	0.52	0.58
27	0.19	0.19	0.79	1.07
28	0.29	0.3	0.7	0.87
29	0.11	0.11	0.46	0.5
30	0.18	0.18	0.6	0.69
31	0.61	0.71	0.78	1.05
32	0.28	0.29	0.8	1.1
33	0.17	0.17	0.63	0.74
34	0.26	0.27	0.82	1.2
35	0.16	0.16	0.37	0.39
36	0.14	0.14	0.7	0.87
37	0.23	0.23	0.81	1.13
mean r'_a		0.23		0.87
mean r_a	0.23		0.7	

A paired sample t-test comparing student correlations (with expert's) pre and post training showed a large effect ($t = -13.36$, df 37, $p < 0.01$). The level of conformity with the expert referral ratings (r_a) was found to be higher for students in the post training group than in the pre-training group.

Training effect on student's judgement policies (cue weights).

The weighting policies used by the 37 students pre and post training are presented in Appendices 5.4 & 5.5 respectively.

H2 The level of conformity with the expert cue weighting system will be higher for students in the post training group than in the pre-training group. This hypothesis was supported.

The method used to test hypothesis two was to examine students' cue weights pre and post training and correlate them with the expert's cue weights presented in the training information. If this correlation (Pearson's) became larger following training this would indicate that the student had conformed to a cue weighting policy that was more like the experts. Followed Fisher's Z transformations of the students' correlations, a paired samples t-test would be used to indicate if there had been a significant training effect on students' cue weighting policy.

The results showed that, pre-training, the students' used 5 statistically significant cues (Table 5.3). The regression equation was found to be

std pret rats = 0.0000 + 0.147 stdgen - 0.0130 stdage + 0.105 stdref + 0.206 stdliv - 0.0496 stdhist + 0.694 stdviol + 0.0261 stddiag - 0.179 stdother + 0.361 stdreason

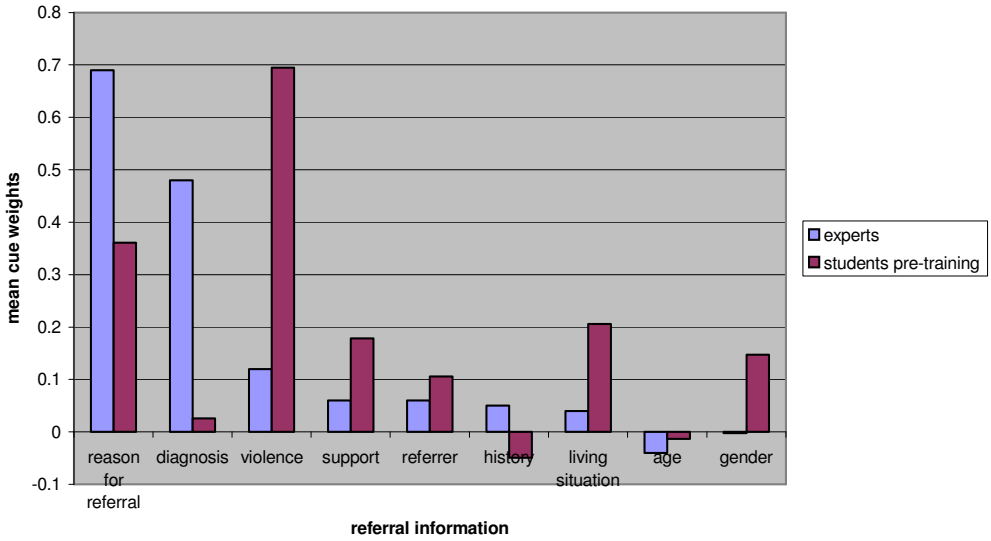
Table 5.3 Referral cues used by students pre-training.

Predictor	Coef	StDev	T	P
Constant	0	0.0669	0	1
gender	**0.14696**	0.0702	2.09	**0.042**
age	-0.01297	0.7438	-0.17	0.862
referrer	0.10537	0.0711	1.48	0.146
living situation	**0.20623**	0.0726	2.84	**0.007**
length of history	-0.04958	0.0688	-0.72	0.475
history of violence	**0.69439**	0.0715	9.71	**0.0001**
diagnosis	0.02612	0.0698	0.37	0.71
other support	**-0.17852**	0.0708	-2.52	**0.016**
reason for referral	**0.36096**	0.069	5.23	**0.0001**
R-Sq =80.8%		R-Sq(adj) = 76.6%		

Violence ($\beta = 0.69$) and the reason for referral ($\beta = .36$) were the two most important cues. Although diagnosis had been given importance by the experts, it was given very little weight by the students ($\beta = .02$) see Figure 5.2[3].

[3] The value for the cue 'other support' was found to be a negative weight in the regression equation. When the levels of this cue were entered into the profile generation programme they were entered in the opposite order to that which was required. Therefore to correct for this the value has been entered into the graph as a positive weight.

Figure 5.2 Comparison of mean cue weights used by the experts and the students pretraining.



To calculate the post-training group cue policy, the standardised means of the post training ratings given to the 38 referrals were regressed on to the 38 standardised cue profiles. The regression equation was found to be

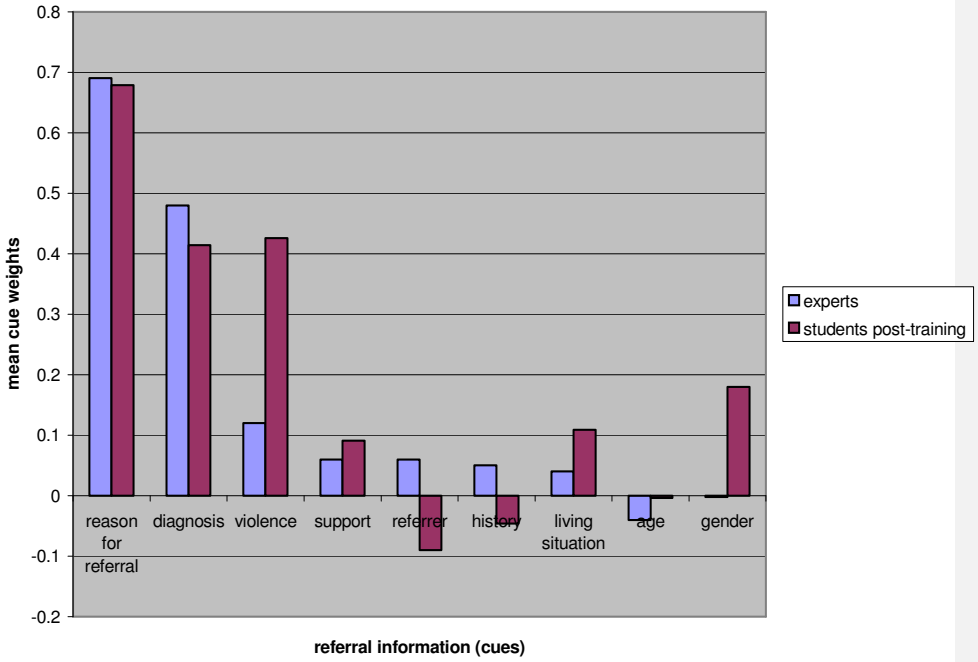
std pret rats = 0.0000 + 0.180 std sex - 0.0036 stdage - 0.0897 stdref + 0.109 stdlivsit - 0.0460 stdhist + 0.426 stdviol + 0.415 stddiag- 0.0914 stdothe + 0.678 stdreas

Table 5.4 Referral cues used by students pre-training.

Predictor	Coef	StDev	T	P
Constant	0	0.07	0	1
gender	0.18	0.09	2.02	0.05
age	-0.003	0.08	-0.05	0.96
referrer	-0.09	0.08	-1.11	0.28
living situation	0.11	0.08	1.33	0.19
length of history	-0.046	0.08	-0.56	0.58
history of violence	**0.43**	0.08	5.48	**0.0001**
diagnosis	**0.42**	0.08	5.38	**0.0001**
other support	-0.09	0.08	-1.08	0.288
reason for referral	**0.68**	0.08	8.2	**0.0001**
	R-Sq = 84.4%		R-Sq(adj) = 79.3%	

Post-training the students used the same most important three cues as the experts (Figure 5.3[4]). The number of cues they had used were reduced from 5 to 3.

Figure 5.3 Comparison of mean cue weights used by experts and students post-training.



[4] The value for the cue 'other support' was found to be a negative weight in the regression equation. When the levels of this cue were entered into the profile generation programme they were entered in the opposite order to that which was required. Therefore to correct for this the value has been entered into the graph as a positive weight.

Reason for referral was correctly given the most weighting (β = .68). Violence (β =0.43) and diagnosis (β = 0.42) were given very similar weightings. Violence was still over weighted. The change in student's policy from pre to post training was confirmed with the use of correlation tests. Pre-training, the correlation between students' mean cue weights (mean r_{is}) and experts mean cue weights (mean r_{ie}) was 0.3. Post-training the correlation between students' mean cue weights (mean r_{is}) and experts mean cue weights (mean r_{ie}) was r = 0.84.

The increased correlation thereby indicated that, following training, the students had improved their judgement policies and had weighted the referral cues much more like the experts (r = 0.84).

A paired sample t-test was used to compare the pre and post training correlation's of the use of the cue weights showed a large effect. Using Fisher z transformations to correct for non-normality of distribution, the weighting policies were found to have been significantly affected by the training (t = -9.563, df = 36, p = 0.0001). The level of conformity with the expert cue weighting system was found to be higher for students in the post-training group than in the pre-training group.

Linear fit (R^2)

The mean linear fit, was compared pre and post training. When derived from summing the participant's individual R^2 values and dividing by the number of participants R^2 pre training = 52.01. Post training it increased to 66.79.

When identified from the multiple regression results obtained by regressing the mean judgements made on the profiles, R^2 pre training = 80.8. Post training it increased to 84.3

Training effect on student's use of cue content (level of cue)

H3 The level of conformity with the expert use of the content of cues (cue levels) will be higher for students in the post training group than in the pre-training group. This hypothesis was supported.

In the training information the three types of referral information that should most influence the priority ratings had been presented (see figure 5.2). These were 'reason for referral', 'diagnosis' and 'violence'. How to respond to the content of these three cues had also been provided. For example within the diagnosis cue, priority ratings should vary according to whether the level of diagnosis was 'anxiety', 'anxiety and depression', 'obsessive compulsive disorder', 'depression' and 'schizophrenia'. Diagnosis had five different levels, the reason for referral had eight, and violence had four. Analysis was needed to identify if, following training, the student's responses to the levels presented in the referrals liken to the responses of the experts. Taking each cue in turn for each student, a one way ANOVA was conducted to identify the mean prioritisation rating given to the referrals when each respective level of cue was presented in the referral. For example, for the referrals with schizophrenia as the diagnosis, what was the individual student's mean ratings for those referrals. The rating for those specific referrals were the dependent variables and the level of the cue (schizophrenia, level 5), was the independent variable. The pre and post training means for the 37 students are presented in Appendices 5.6 & 5.7 respectively. Table 5.5 presents the mean values of the use of the cue content for the students pre and post training. The student's use of referral content was then compared with expert's use of referral content. To do this, the students mean scores (identified from ANOVA) were calculated pre and post training and correlated with the same data for the experts (cluster 2) see Appendix 4.4.

Table 5.5 Mean use of cue content pre and post training.

	students	students means pre-training	Students mean post-training
cues	levels of cues		
level of aggression	not violent	5.05	4.41
	verbally aggressive	4.41	4.64
	physically aggressive	6.39	7.67
	suicidal	7.36	5.88
diagnoses	anxious	6.04	4.07
	anxious and depressed	5.7	5.05
	obsessive compulsive	7.05	4.07
	depression	6.37	5.92
	schizophrenia	5.27	8.29
reason for referral	medication monitoring	5.71	2.74
	family relationships	3.71	5.32
	poor memory	6.75	3.68
	time management	3.97	5.04
	starting college	5.45	7.88
	imminent redundancy	6.47	6.09
	poor self care	7	6.67
	physical and psychological	6.86	8.69
Correlation with experts use of cue content		r = 0.15	r = 0.93

Graphs of the results were plotted for each of the three cues both pre and post training (figures 5.51, 5.52, 5.61, 5.62, 5.71, 5.72).

Figure 5.51 Comparison of ratings given by experts and pre-trained students for each of the levels of the 'reason for referral' cue.

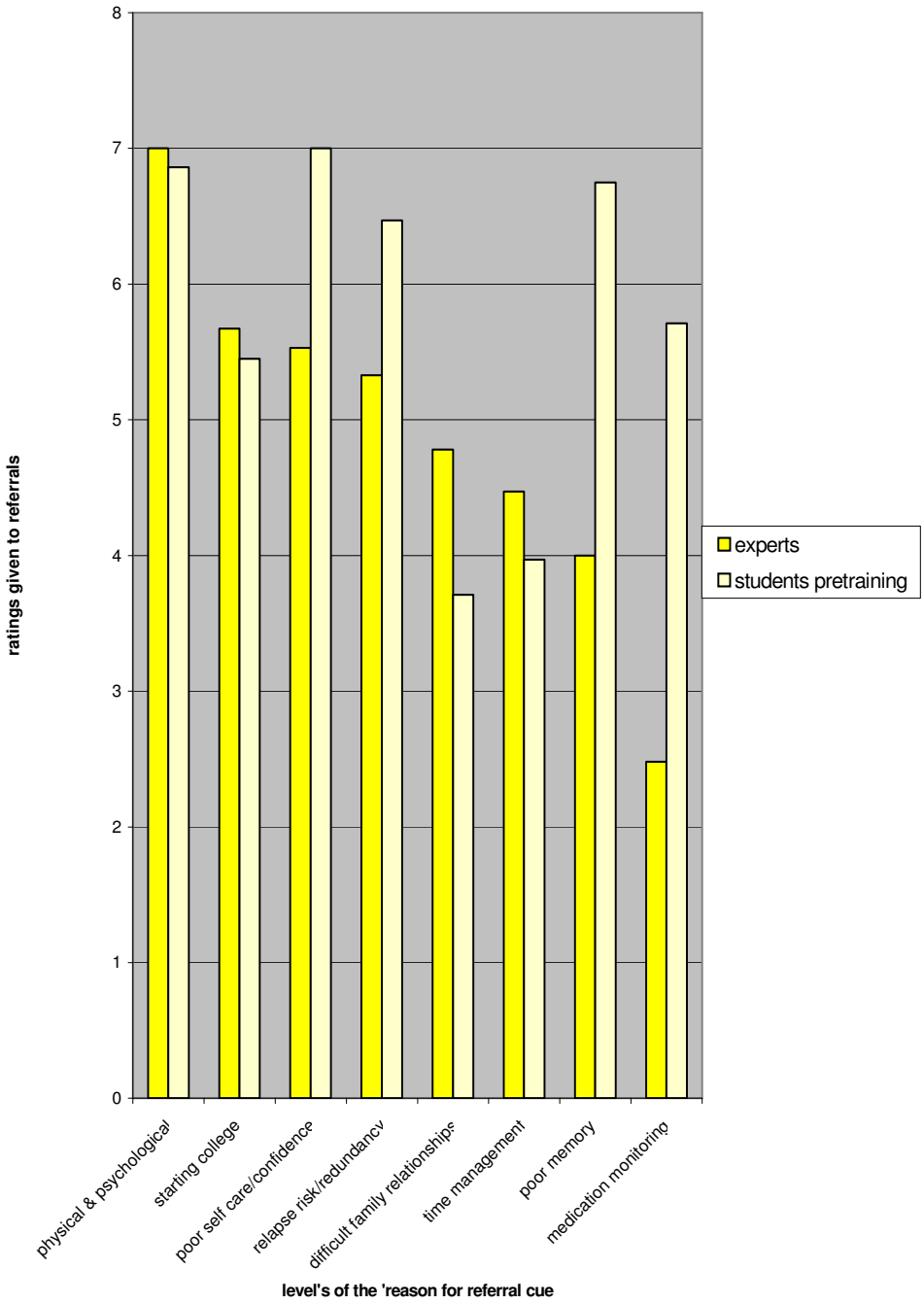


Figure 5.52 Comparison of ratings given by experts and post-training students for each of the levels of the 'reason for referral' cue.

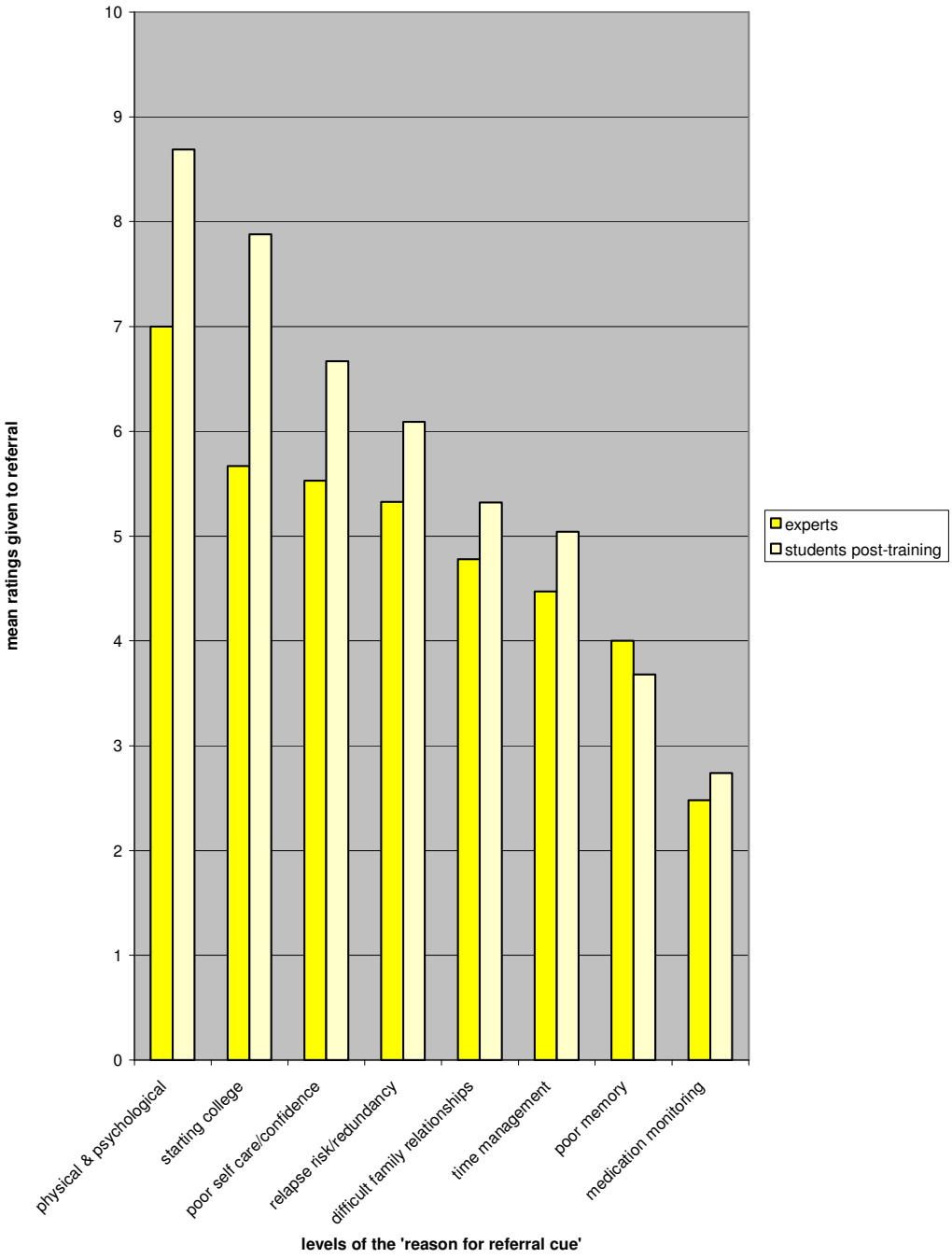


Figure 5.61 Comarison of ratings given by expert and pre-trained students for each of the levels of the 'diagnosis' cue.

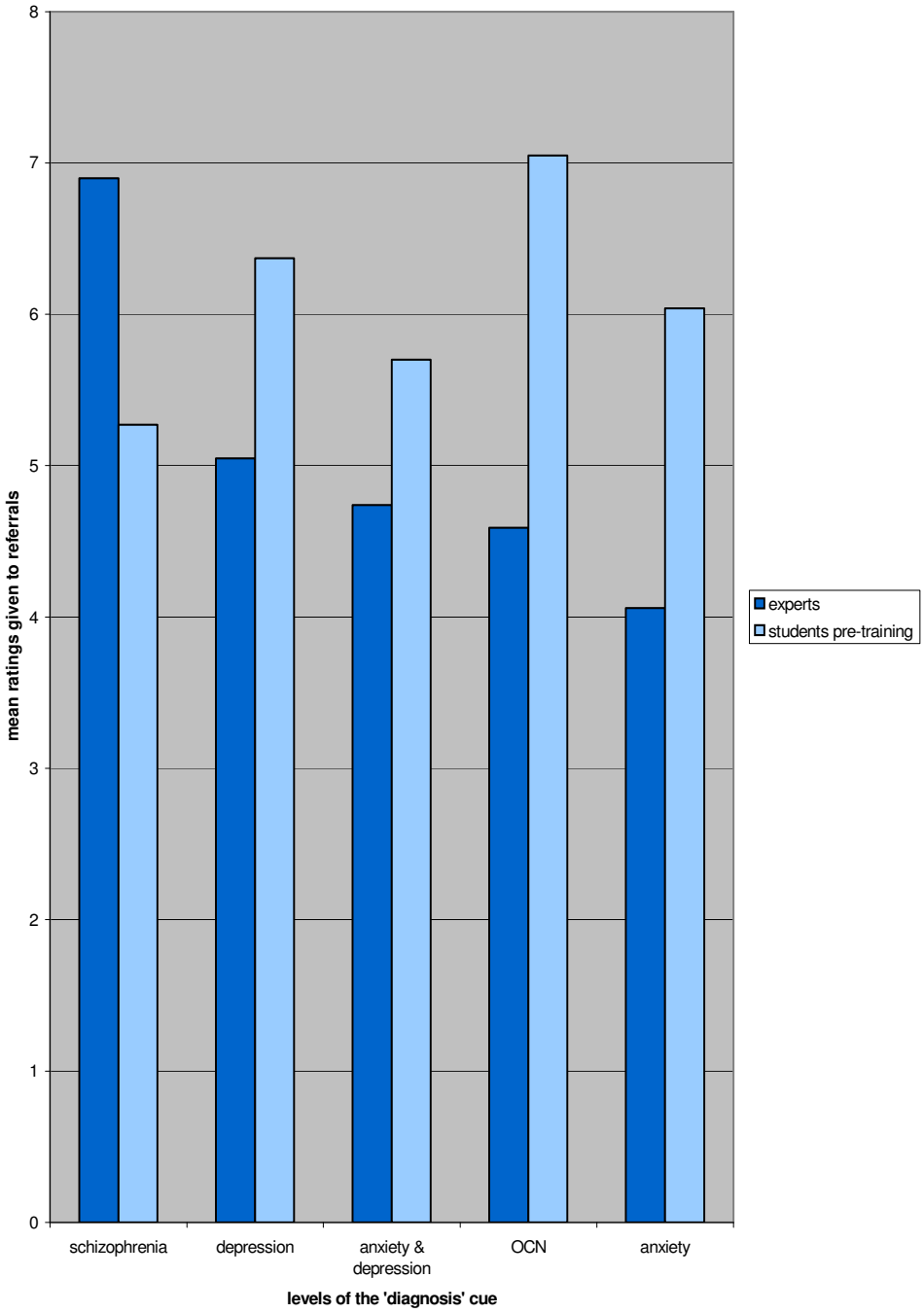


Figure 5.62 Comparison of ratings given by experts and post trained students for each of the levels of the 'diagnosis' cue

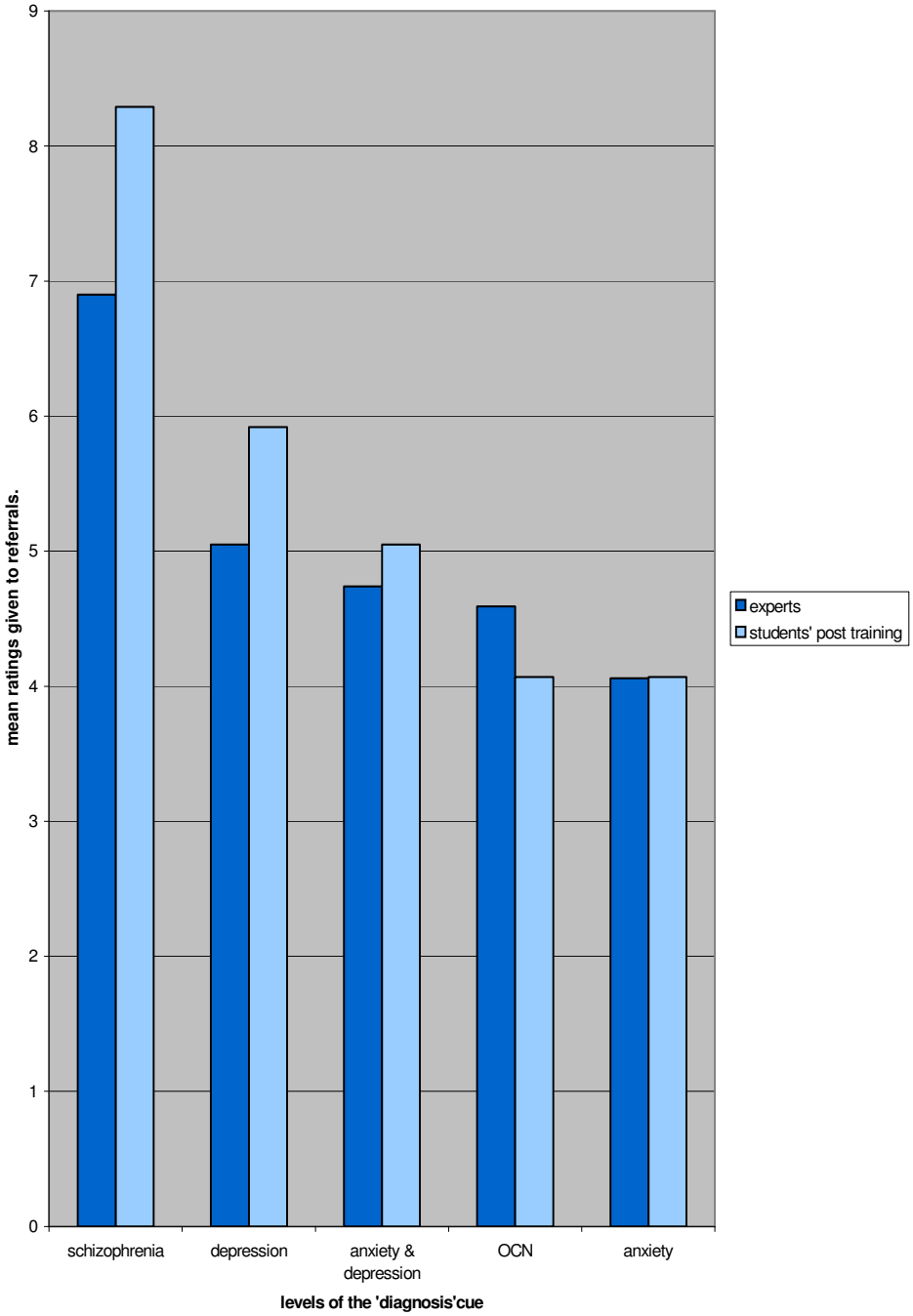


Figure 5.71 Comparison of ratings given by expert and pre-trained student's for each of the levels of the 'violence' cue.

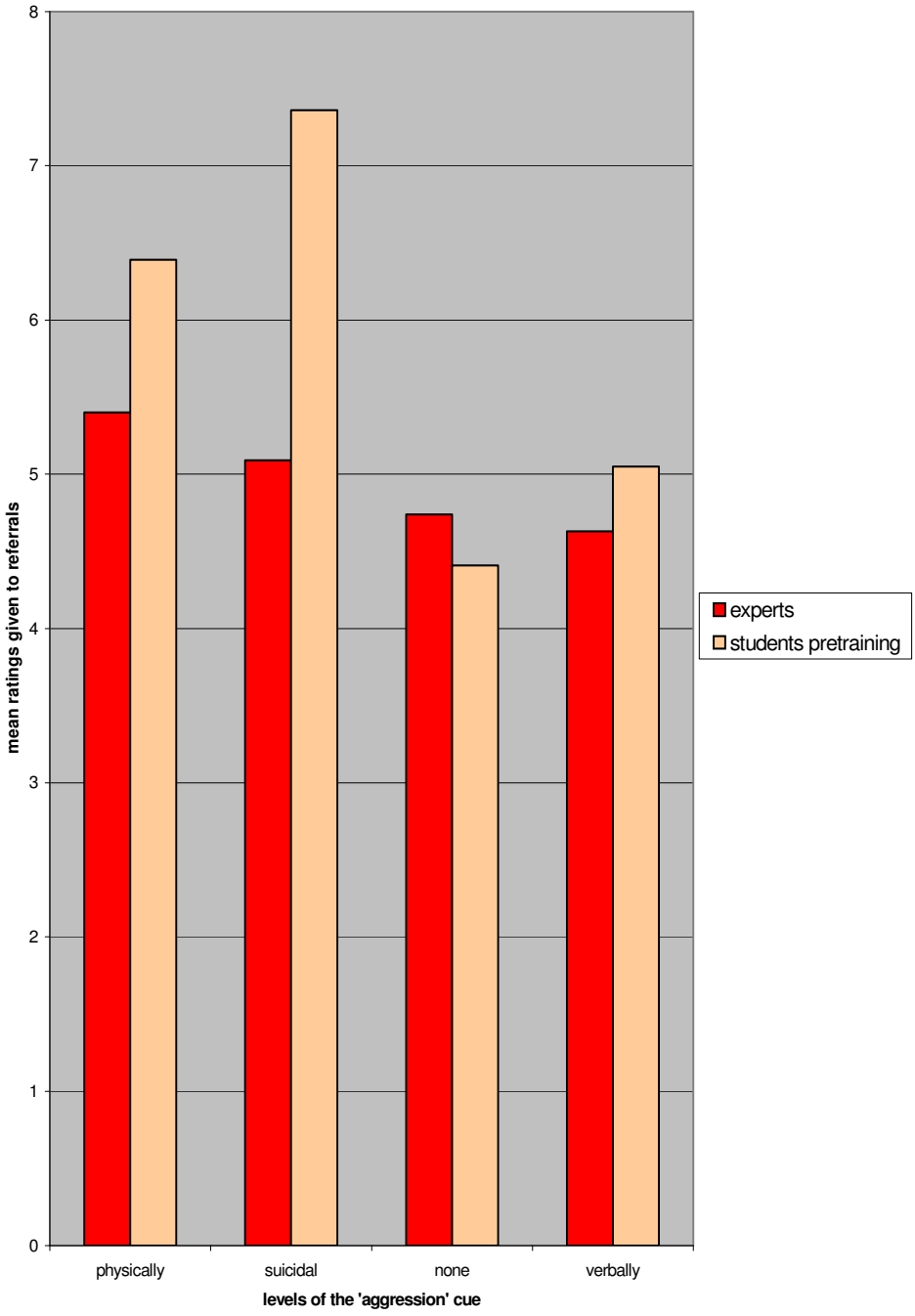
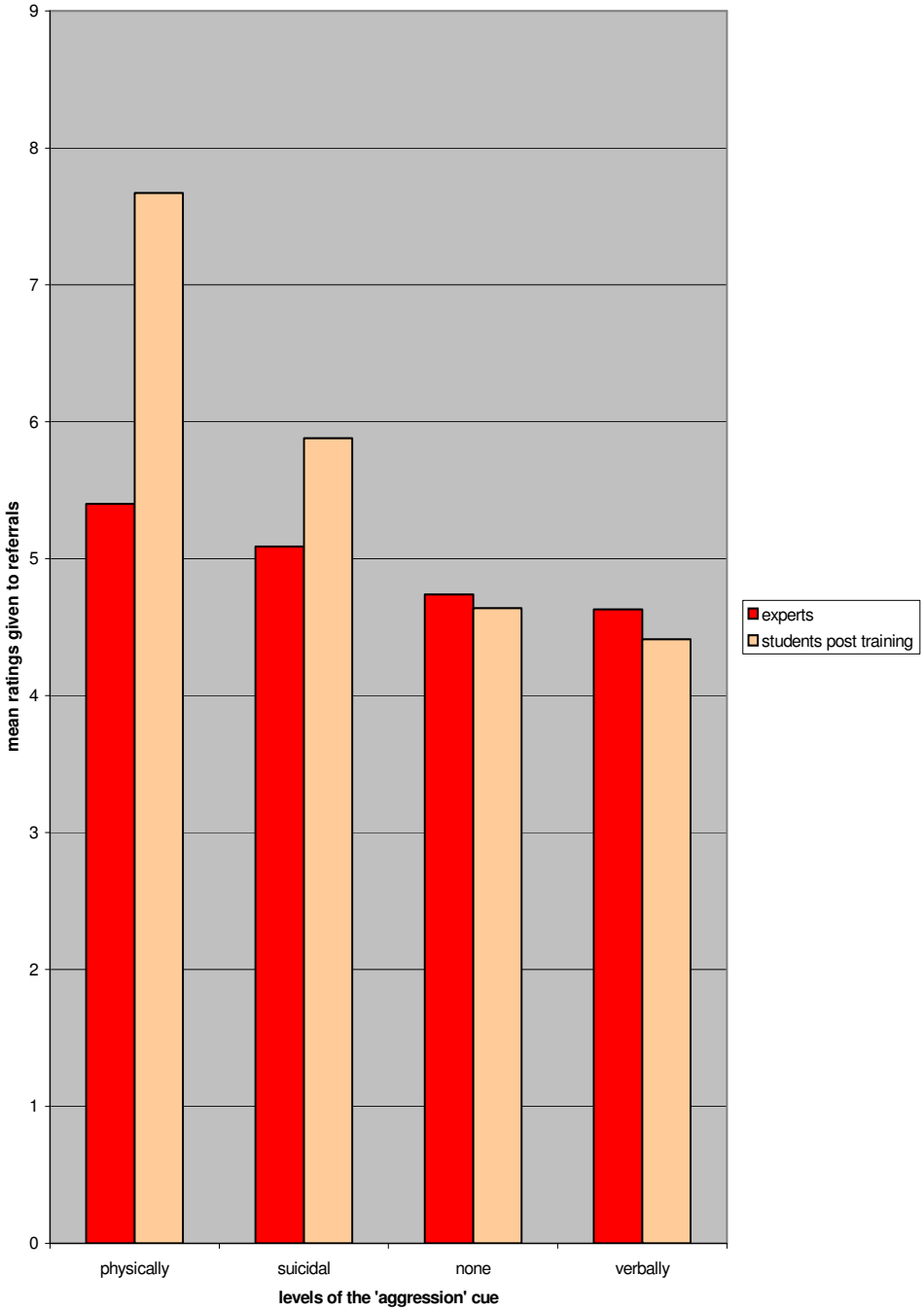


Figure 5.72 Comparison of ratings given by experts and post-trained students for each of the levels of the 'violence' cue.



It can be seen that, post training, the students were able to mirror the order of responses to differing cue levels in the same way as the experts. A correlation of the mean scores for the three cues between the students and the experts was conducted pre and post training. Pre-training the correlation was low r = 0.15, post training the correlation was large r = 0.93. This large correlation post training showed that students had learnt to prioritise referrals according to the differing types of referral content for the three most important cues. It is also apparent that the students generally tend to give higher prioritisation ratings.

Agreement

H4 The level of group agreement (W^a) on both referral ratings and cue weighting policies will be higher for students in the post training group than in the pre-training group.

Analysis of the student group agreement was conducted using the Kendal's coefficient of concordance test (W^a). This was done both for raw ratings and for cue weightings. Agreement of ratings pre-training were Kendall's W^a = 0.386, N=34, df =51, p<.01 whereas post training they were W^a = 0.624, N=35, df 37, p<0.01.

Agreement of Cue weights pretraining was W^a = 0.531, N=37, df=8, p<0.01 whereas post training W^a = 0.663, N = 37, df = 8, p<0.01.

Training effect on student's consistency (test-retest)

(Individual student's consistency scores pre and post training are presented in Appendix 5.8)

H5 The students' consistency (test-retest) of policy will be higher for students in the post training group than in the pre-training group. This hypothesis was supported.

Student's ability to consistently apply their policy was measured with Pearson's correlation tests. These tests were used to examine how students had rated identical referrals. In the pre-training data , 22 of the original referrals had been repeated. In the post-training referrals, 10 of the originals had been repeated. The Pearson's correlations were calculated for each student (N=37) to provide pre and post training consistency scores (see Appendix 8). The mean consistency scores were then calculated for the group of student's, pre and post training, using Fisher's conversions to correct for non-normality of distribution. Pre-training the students' mean consistency score was r = 0.633. Post-training the student's mean consistency score was r = 0.88.

A paired t-test test was used to identify any significant difference between the pre and post training consistency scores. The result was $t = 5.904$, $df=35$, $p<0.01$, thereby indicating the training had had an effect on improving student's consistency.

Knowledge and Cognitive control.

The pre and post training lens indices scores, G, Rs and C (Cooksey, 1996) are presented for individual students' in Appendices 5.9, 5.10 & 5.11 respectively.

H6 The students' cognitive control (R_s) and linear knowledge (G) will be higher for students in the post training group than in the pre-training group. This hypothesis was supported.

G represents the decision rule used by the participant. Pre-training the students' mean G score was $r = 0.36$. Post-training the student's mean G score was $r = 0.85$.

A paired t-test test was used to identify any significant difference between the pre and post training G scores. The result was $t = -11.41$, $df = 36$, $p<0.01$, thereby indicating the training had had an effect on improving student's knowledge (G).

Pre-training the students' mean R_s score was $r = 0.73$. Post-training the student's mean R_s score was $r = 0.83$.

A paired t-test test was used to identify any significant difference between the pre and post training R_s scores. The result was $t = -6$, $df = 36$, $p<0.01$, thereby indicating the training had had an effect on improving student's cognitive control.

C represents the extent that the participant systematically deviates from a linear decision rule. It is the correlation between the residuals of the linear equation for the experts and the residuals of the linear equation for the students.Pre-training the students' mean C score was $r = 0.03$. Post-training the students' mean C score was $r = 0.36$.

A paired t-test test was used to identify any significant difference between the pre and post training C scores. The result was $t = -7.89$, $df = 36$, $p<0.01$, thereby indicating the training had had an effect of making students non linear cue use more similar to the non linear cue use of the experts. Students had become more like the experts in their linear and non linear knowledge.

Table 5.3 Significant differences between mean G, R_s and C scores for student's pre and post training.

	df	G (linear knowledge)		Rs (Cognitive control)		C (Non linear knowledge)	
students (N=37)	df	Pearson's mean	T	Pearson's mean	T	Pearson's mean	T
pretraining	36	0.36	-11.41	0.73	-6	0.03	-7.89
post training		0.85		0.83		0.36	

5.4 Discussion

The most important result was that the students had been able to use the information to improve their referral prioritisation policies. By using the training information, students were more able to rate the referrals like the experts: they increased their level of achievement, r_a, from 0.23 to 0.7. If a student was now given ten referrals and asked to put them in order of priority they should be more informed, in theory, and hence be able to order the referrals in a similar way to expert occupational therapists. Improvements were shown in indices G, C and R_s therefore indicating improvements in knowledge and cognitive control. The students' weighting policies also improved with training: correlations with the experts' weighting policies increased from r = 0.3 to 0.84. Students had also used less cues, a skill that has been shown to be a sign of expertise (Shanteau et al.1991; Stewart et al. 1992).

Although the students' weighting policies improved more than referral ratings, changes to the referral ratings were counted as the most valid illustration of improvement. Weighting policies were certainly an indicator of improvement but the weighting policies would be subject to the judges' level of cognitive control and would not necessarily be applied absolutely accurately (Hammond et al. 1975). The ratings would be the only behavioural measure of the prioritisation skill itself.

The results were not quite as good as the results obtained by Wigton and colleagues in 1990. Their medical student sample achieved a mean r_a of 0.93. However this was only achieved after several training sets were used, with feedback being given after each set. Should the occupational therapy students be given further training and opportunities to practise using their skill their achievement scores may also increase to the level of the medical students.

A few students did not appear to benefit from the referral prioritisation training. These students made only minor changes to the ratings they gave. Some studies have found that those with more experience are not always so keen to accept the expert policies as more valid than their own (Chaput de Saintonge and Hattersley 1985; Wigton et al. 1990). It is certainly true that some occupational therapy students have experience of healthcare prior

to training. This experience is what often has led them to select the occupational therapy professional (Craik et al. 2001). They may have worked in an assistant capacity to an occupational therapist or have been involved in caring for disabled or unwell relative. If these more experienced students saw themselves as having prior experience this may have been less willing to change their policy and this may have contributed to their minimal change in learning.

Another possibility is that the cognitive demands of the task were too great for some of the students. If they were not able to understand the policies very well they may have had difficulty applying it. If so their cognitive control scores would be lower (R_s). This will be explored under the discussion of R_s.

Correlating degree of improvement in referral ratings (r_a) with course grades may show if the students' with less capacity to learn were the academically weaker students. Ethical permission to conduct this post hoc analysis is being sought. Post-test interviews with these individuals may also be valuable in eliciting why they were less able to change their policies although insight may affect how easily participants can explain their results.

Cue weighting policies

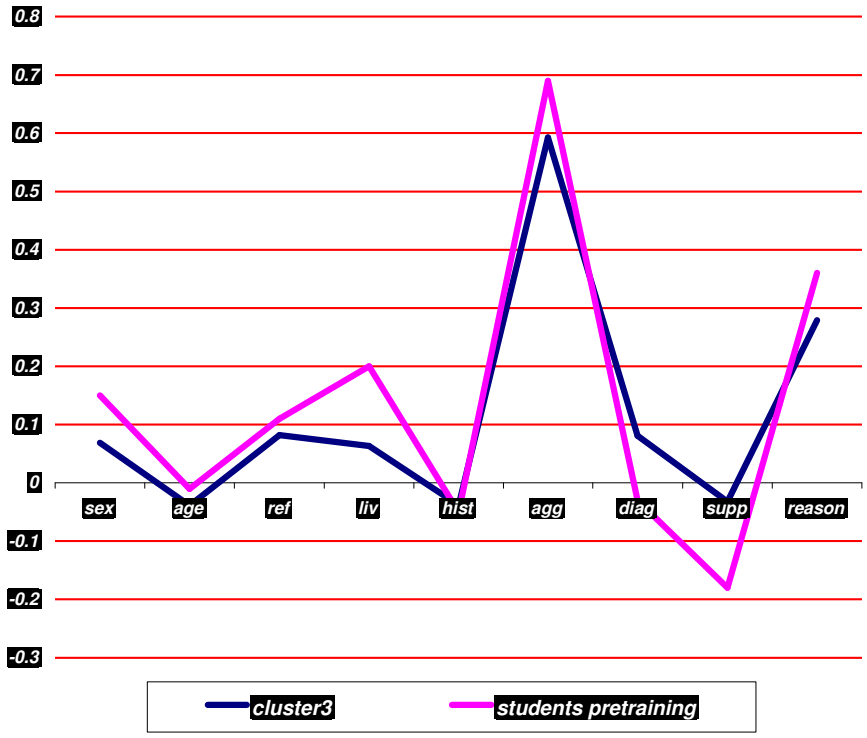
The students' cue weighting policies became more like the experts' cue weighting policies following training ($r = 0.84$). It is interesting to examine how each of the three cues, reason for referral, history of violence and diagnosis, were used pre and post training.

Prior to training, the reason for referral was rated as the second most important cue. Post training it was recognised the most important cue. There are perhaps two reasons for this. Pre training the students were very concerned about suicidal and aggressive clients and felt they must take care of the risks that these clients posed. They may have seen risk as an over ridding factor to the reason for referral. They were also less knowledgeable about the reasons for referral that most warranted an occupational therapy perspective. Therefore they appeared to focus their attention on what was a clear need - a client who may kill themselves or harm others. Post training they had perhaps used the training information to recognise that other professionals were most appropriately trained for the crisis intervention required in managing a violent or suicidal client. Paired with this they were

now primed to scan the reason for referral in order to identify those clients most needing a specialist occupational therapy service. They had become more capable in using the reason for referral cue and now understood its importance.

Pre-training, the student's had over valued the history of violence cue compared to the expert group (satisfied specialists). In the cluster analysis of chapter 3, those occupational therapists working mainly as generic therapists had used this cue as the most important one (satisfied genericists). It was then considered whether the students had used other referral information in the same way as the genericists. A post hoc correlation between students' pre-training policies and those of the 'satisfied genericists' showed a high correlation between the weighting policies of these two groups ($r = 0.95$). The figure 5.8 demonstrates how similar the cue weighting policies are for these two groups.

Figure 5.8 cluster 3 and students pretraining:mean cue weights



This finding will be of concern to the occupational therapy professional body as they do not support the large percentage of generic casework that is undertaken by some of the profession's members (Craik et al. 1998a). If students are not trained in the specialist referral policies they may go out to work using policies that will generate largely generic casework. It had been considered in chapter 2, that the pressures from community mental health teams were leading the occupational therapists to work generically but the students were not subject to these pressures (Brown et al. 2000). They were using policies that focussed on risk and were not using appropriate policies because they did not appreciate the skills of other team members in relation to their own. This finding is in keeping with Parry-Jones and colleagues (1998) who have reported that generic working is linked to role stress and role confusion. The need to train the students in the specialist referral prioritisation policies is apparent if occupational therapists are not going to automatically slide into generic working.

The third cue of importance, diagnosis, was undervalued by the students pre-training. This finding can perhaps be understood in light of the changes to the theoretical approaches used in occupational therapy. In the undergraduate training, although the main focus is occupational functioning, occupational therapy students are now encouraged to take a client centred perspective that values the social model of disability rather than a medical model approach (Warren 2002). The client is empowered to identify their own needs and these must be central to intervention. The social model views society as limiting the capacity of the individual rather than the illness or disability being key. Change, therefore, has to be achieved through changing the social and physical environment rather than 'treating' the incapacity itself. For many individuals with chronic disability this can be an empowering model to work with for both the client and the therapist. This may have discouraged attention to the diagnosis as the students may have seen taking note of the diagnosis as strongly linked with the medical model.

The genericists and specialists in study 1, however, did use diagnosis as one of the top three cues in their prioritisation policies. They recognised its importance. The students had not. Although students are taught that the client centred approach is essential for ensuring the client's needs are identified appropriately, there is perhaps more teaching needed to encourage the use of the diagnosis to direct the way in which those needs are met.

A clinical example can help to explain this rationale. If a client were not eating properly, the occupational therapist could determine the interventions used according to diagnosis. For example, if the eating difficulties were due to depression, the therapist would take a cognitive behavioural approach in which mastery, self esteem and confidence would be promoted through occupational engagement. The interventions would still be client centred as the types of occupations chosen to engage the client, whether they were self-care, leisure or work occupations, would only be those valued by the client. If however the individual had difficulties eating due to a diagnosis of a moderate learning disability, an educational approach may be more suitable. The interventions may then comprise skills training to help the individual to budget money, to use transport to get to the shops, to cook food and to balance their domestic activities. If their skills cannot reach a level necessary for full independence, a compensatory approach may also be incorporated, and support may be provided in the form of a main meal at a day centre.

These examples show how essential the diagnosis can be in influencing how an occupational therapist would work with a client. The client centred perspective is more empowering than the medical model for many individuals but the diagnosis still has a key role in influencing how interventions are delivered by the professional. Deciding whether a referral is a priority includes consideration of whether a client will benefit from an occupational perspective and this can be influenced by a combination of the diagnosis and the reason for referral.

Use of cue content

The students made great improvements in their use of the cue content following training. Prior to training their use of cue content correlated with the experts at a level of 0.15. Post training it correlated at 0.93. The training information explained how the students could use the cue content, for example, it explained the relevance of the differing diagnosis to expert prioritisation policies. Before training they gave schizophrenia the lowest weighting whereas after training, in keeping with the expert's policies, they gave it the highest prioritisation. The handout also explained why suicidal individuals were not the main priority for occupational therapy interventions. It was apparent that the cognitive demands of using the cue levels were not too great for the majority of students. Indeed, the students made significant and appropriate changes to the use of cue content.

This finding is important as most previous studies have tended to use dichotomous cues or a scale to quantify the cue content (Harries 1995; Wigton et al. 1986; Luckett and Hirst 1989). This study used complex and realistic information in the cues and yet the students were able to make sense of it and use it more so than the cue weightings themselves. Indeed the results showed that the improvements in the knowledge index, G, greatly increased and therefore accounted for most of the improvement in the achievement R_a.

Level of group agreement (Kendal's Coefficient of Concordance)

Student's group agreement improved from 0.386 to 0.624 on ratings and from 0.531 to 0.663 on weighting policies. It is not surprising that students had some agreement pre-training as many students did have policies pre-training, just not the ones of the expert group. Studies that use control groups can show surprisingly high levels of agreement for those not receiving any training (Luckett and Hirst 1989). The improvement in agreement

was greater in the ratings of referrals rather than the weighting policies. It was perhaps the excellent use of the cue content rather than the use of the cue weights themselves that contributed to this result. Other studies have shown increased agreement following training with cue weightings but their results are not always readily comparable as their methods of identifying agreement can widely differ (Chaput de Saintonge and Hattersley 1985; Luckett and Hirst 1989) .

Consistency (test-retest) of policy (r)

The students' mean consistency in rating the identical referrals improved from 0.63 to 0.88. This was again a reasonable level of consistency prior to training and perhaps reflects the presence of pre-training policies. The improvement in consistency was good but must be considered in relation to cognitive control, R_s.

Cognitive control (R_s)

Consistency identifies similarity of repeated judgements on identical profiles whereas cognitive control identifies the similarity between individual's judgements and predictions on judgements using the modelled policy (Hammond et al. 1975). Cognitive control therefore included consistency as well as a measure of how well the policy has been modelled. Cognitive control prior to training was 0.73; post training it increased to 0.83. For some students, it therefore appears that prior to training a lack of consistency contributed to the reduction in cognitive control but it probably had less of effect post training.

There were several students whose consistency deteriorated post training: it is interesting to examine why. Figures 5.9& 5.9.5 below show the graphs of ratings given to the ten original and repeated profiles on the post training sets, for student 5 and 26. These two students' consistency scores deteriorated post training.

Figure 5.9 student 26 rating given to repeated profiles in the post training set.

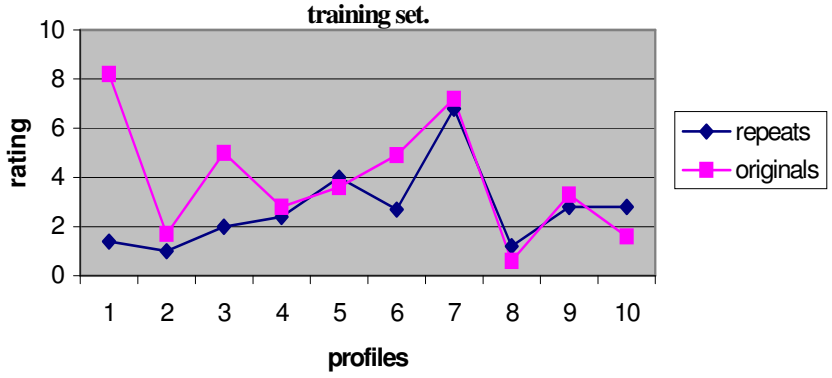
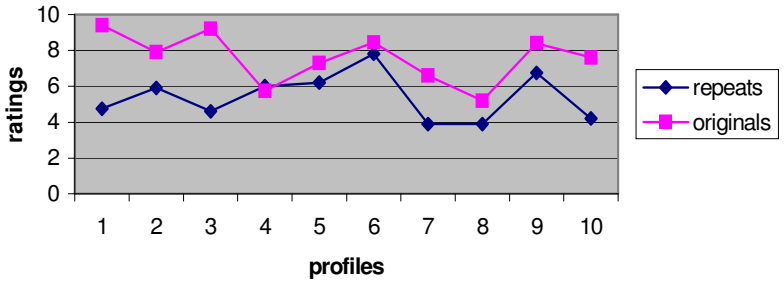


Figure 5.9.5 student 5: ratings given to repeated profiles in the post training set.



The repeated profiles were at the end of the set in the booklet. It is possible to see that consistency improved as the students progressed through the profiles. This can be confirmed by correlating ratings on all ten of the repeated profiles and comparing that with the correlation of the ratings given for the last six profiles. Student 26 had a correlation of 0.42 on all ten ratings and an improved correlation of 0.87 on just the last six. A similar result was found for student 5 whose scores changed from 0.27 to 0.64. It appears that these students were less consistent as they were learning the new policies but did gradually improve and became more consistent.

Critique of methodology and recommendations for future research.

There are several issues that can be considered in relation to improving the design of the study. These include the consideration of a control group, additional test stages, improvements to face and content validity and other methods of analysis to model the policies.

Theorists have recommended a control group be used to confirm that the experimental group actually improved as a result of training (Balzer and Sulsky 1992). In this study students who wished to participate could either have been assigned to a control group or to a training group. Both groups would be tested on the two sets of referral profiles. The training group would have been given the training information when they were asked to prioritise the second set of referral profiles. Incorporating a control group may have increased the validity of the results. As the 'pre-test/training/post test' design was conducted in one sitting, it was unlikely that any additional variables such as academic studies or maturation effects would have effected the results.

A second post test stage could also have been incorporated six months after the first stage to examine how well newly attained policies were retrained. Predictive validity could be verified by examining policy use once students had become practising clinicians.

The process of bootstrapping could have been used to verify the robustness of the fit of the model (Cooksey 1996). Although cross-validation can also serve this purpose, (see chapter 2), the criterion values were available therefore the process of bootstrapping was possible. This process was not conducted, as it would have involved asking participants to make judgements on a large number of new cases. These additional requirements on participants together with the time constraints on the researcher made this difficult to achieve. The process would have involved using two new sets of profiles: the derivation sample and the judgmental bootstrap sample. The participants would have been asked to make judgements on both sets. The derivation sample would be used to identify the policy. The policy would then applied to the profiles in the bootstrap sample in order to predict the judgements. The predicted judgements would then correlated with the criterion values for those same profiles in order to identify the fit of the model. This fit is viewed as more valid than that originally derived.

Face and content validity may have been improved by using real referrals. When obtaining referrals for the qualitative study on occupational therapy referrals (Harries, 1998), clinicians were reluctant to release such referrals even though any confidential information had to be removed. They were concerned how anonymous the referrals would be as they could easily still contain identifying material relating to employment or family issues. If sufficient information was removed to reduce this risk the type of information that is needed to make prioritisation decisions may not be available. If real referrals had been used the cognitive demands of the task would have been increased as the referrals would take a wide variety of forms. This may have overburdened the students and been detrimental to their learning. It is also perhaps appropriate to limit the content of the cues when training undergraduate students, as they would not be expected to develop prioritisation policies for all possible scenarios at this stage of training. Most of their learning will occur when they are novice practitioners. The researcher therefore limited the breadth of cue content for this reason. If the design is later used to train novice occupational therapists it would be appropriate to widen the breadth of cue content. For example the diagnosis cue may be broadened to include such diagnoses as personality disorders and pre-senile dementia.

Multiple regression analysis was used to generate the training materials and model the students' judgement policies. This method of analysis assumes the judge has used a linear

model in making judgements. The data could also be analysed with methods that assume non-linear models. Research has shown that fast and frugal models can be useful in in many situations for example in modelling professional policies (Dhami and Harries 2001), and for comparing expert and novice policies (Andersson 2002). Also, although multiple regression analysis may appear to fit a policy more effectively than fast and frugal methods, fast and frugal methods have been shown to be superior in terms of predicting judgements (Gigerenzer and Kurz 2001).

A final recommendation pertains to the use of the training package: the pre-test, training, post-test package. It may be possible to make the training package available through the World Wide Web. Occupational therapy students at other universities and novice occupational therapists could then access the training package and use it to establish their current policies, be up dated on the policies of experienced occupational therapists, and if they so chose, train themselves in the expert policies. These policies would only be valid for occupational therapy in the U.K. as it is likely that differing countries would have differing health and educational policies that would affect the prioritisation policies that may need to be used. The policies of occupational therapists in other countries could be collected in other to provide parallel training databases.

Conclusion

Students can learn from experts' cue weighting policies. They can also benefit enormously from understanding how to use the content of cues even when cue content is complex and needs explanation. Improvement was measured in many aspects of the student group; achievement (r_a), linear knowledge (G), non linear knowledge (C), cognitive control (R_s), consistency on repeated referrals (r_p), and group agreement (W^a). The unmodelled knowledge, C, increased post training, indicating a greater degree of systematic non-linear use immediately following training.

Students' overvalued the client's history of violence and undervalued the reason for referral and the client's diagnosis. Two key areas of the training information were identified that had improved this imbalance: the need to use diagnosis in determining interventions and an understanding of the different roles of the team members. Prior to training the students were using the policies of genericists and therefore did not focus on clients who required an occupational therapy service. The professional body of

occupational therapists is rightly concerned that its members are taking too much of a generic role (Craik et al. 1998a) and without appropriate training, like that used in this study, client's needs will not be met effectively. Training is needed to ensure services in short supply are targeted at the most needy (Department of Health 1999).

5.5 Summary

Currently, British health policy requires health services to be targeted at the most needy (Department of Health, 1999). This is particularly necessary for occupational therapy services where referral demand far exceeds service availability (Job, 1996). In this chapter experienced therapists referral prioritisation polices were used to train undergraduate occupational therapists in the skill of referral prioritisation. Thirty-seven students were asked to prioritise a set of referrals before and after being shown graphical and descriptive representations of these experts' policy. Students' judgement policies were examined to identify changes in policy. Students showed significant improvement in prioritisation, as well as developing greater group agreement. Students pre-training policies were found to be those of generic therapists; a method of working that has been leading to reduced work satisfaction and burnout (Craik et al.1998b). Generic working can also prevent clients being helped by the most appropriate professional. Training is therefore needed to ensure undergraduate occupational therapy students develop their referral prioritisation skills. This will help to ensure that services are used more effectively.

Chapter 6 General Discussion

6.1 Introduction

The most interesting finding of the research was that the novices were able to learn the experts' cue weighting policies. The goal of training occupational therapy students with experienced clinicians' policies was therefore achieved. What was of key importance was that the appropriate expert policy had to be identified before training could occur. This was done in two stages. The referral prioritisation policies of 40 experienced occupational therapists were identified using a judgement analysis methodology (study 1). A cluster analysis was then conducted on the 40 policies, to identify if there was an optimal type of policy used by any of the participants (study 2). Four subgroups of policy type were identified. By comparing the demographic characteristics of the participants with the type of policy used, the optimal policy was identified. The participants using this gold standard policy type were chosen as they showed two key characteristics. Firstly, they selected referrals specifically on the grounds of the client's degree of occupational dysfunction. Secondly, these were also the participants who used the type of policy that led them to spend the majority of their time on providing occupational therapy services (as opposed to generic services). The occupational therapy professional body currently advocates this way of working (Craik et al. 1998a). These participants gave the greatest weighting to the cue containing the reason for referral, as this was the cue that indicated if the client had any occupational needs. These participants were largely satisfied that they were achieving an effective specialist occupational therapy service and were therefore named the satisfied specialists (N= 9).

In order to examine if the participants would have been able to report their policies as opposed to have them statistically derived, study 3 was conducted. Participants were found to have a fair degree of self-insight as to how they had used the most important cues. However, they were not as aware of how they had used the cues that were of less importance. Judgement analysis was therefore useful in modelling policy use as it represented the full policy for each participant.

In study 4, the novice occupational therapy students were trained with the optimal policies of the satisfied specialists. Not only did the novices learn to prioritise the referrals like the experts, but also they became more consistent in their ability to apply a policy. They also developed greater group agreement in their use of their policies. This is therefore an example of how evidenced-based practice can be implemented: selective examples of good practice have been shared and used to promote more effective services (Department of Health,1999).

Implications for the working practices of the novices

Knowing the priorities for occupational therapy could be helpful in increasing professional confidence when starting work. Occupational therapists in community mental health teams rarely receive supervision from a member of their own profession (Craik et al. 1998a) therefore individuals have to be confident that they know how to deliver their own service. Clarity of role may reduce the chance of burnout and increase the likelihood that novices will remain working in the profession (Craik et al. 1999). Retaining greater numbers of occupational therapists could help to reduce the numbers of empty posts, thereby having the very important benefit of increasing the availability of services for clients.

Specialist practice versus generic working

Although some of the occupational therapists used policies that aimed to provide a specialist service, 53% of the participants' time was spent on generic work. Some occupational therapists were satisfied working in a generic role (N =10). Some were not satisfied with this role and wished to have more of an occupational therapy focus to their service (N =13). The therapists who had the most self-insight into their referral prioritisation policies were found to be those in generic roles (study 3). As generic therapists, they were probably following their team's explicit referral prioritisation policy. Those trying to provide a specialist occupational therapy service were less able to report their policies. They were probably using dynamic rather static policies in an attempt to shift their prioritisation policies to those that would provide a service for clients in need of occupational therapy.

The government recommends generic working, as it wants the client's care to be well co-ordinated (Department of Health 1990). In generic working one professional is responsible for the majority of the client's care and has the key role of co-ordinating that care. As there is normally only one occupational therapist in a community mental health team, if an occupational therapist takes a generic role and spends their time co-ordinating and providing care for the clients on their caseload, they may have insufficient time to focus on other clients' occupational therapy needs. However, if they wish to provide a specialist occupational therapy service to clients they may be seen to be going against the government recommendation of generic working. The variety of prioritisation policies was reflected in the range of policies that the occupational therapists held (study 1). Some were aiming to have policies that would allow for generic working but others used policies that aimed to meet clients' occupational needs. This dilemma as to which type of service to provide has been debated in the British Journal of Occupational Therapy (Parker 2001; Corrigan 2002; Dunrose and Leeson 2002; Forsyth and Summerfield Mann 2002; Harries 2002; Stone 2002). It is still on-going.

Understanding the reasons for why generic working was recommended by the government need to be reconsidered in order to make sense of the results of the research. When generic working was first recommended, it was at a time when the government was keen to reduce costs of professional education (Audit Commission 1986). This recommendation was not mindful of the likely decrease in the quality of services available for clients. The other reason that it was needed was to try to improve the co-ordination of community mental health services (Audit Commission 1986). Previously the community psychiatric nurse had been the key provider of community psychiatric services, but with the closing of the many psychiatric hospitals other professional groups were added to the community teams to try to meet the clients' needs (Brown et al. 2000). With so many services available in the community it was thought that the care needed to be organised through one key person. If the needs of the client were found to be outside the skills of the key worker then the key worker was expected to involve other professional services. This sounded a plausible and rationale recommendation.

Occupational therapists were relatively new members of the community mental health team and some attempted to adopt the generic role of the community psychiatric nurses (Brown et al. 2000). This role encompassed delivering the full range of services from

monitoring medication to supporting daily living. However, as the hospital services were reduced, the ideals of key working became harder and harder to achieve. The number of hospital beds became so limited that when clients were very unwell, it was not always possible to get them admitted. This meant that the clients' level of need was extremely high in some cases and the responsibility on the community key worker was enormous. The second difficulty lay in the general staff shortages (Dean 2000). These impeded the capacity of the community service even further. These two factors led to huge demands being placed on community workers; the possibility that a colleague could assist if the key worker was in need of specialist help became rare. All team members were already busy managing the needs of their own clients. Occupational therapists were left to manage independently clients' severe mental health problems including being responsible for crisis management and monitoring of mental state (Bassett and Lloyd 2001). Their skills lay in helping clients' meet their practical daily living needs; they were not trained for this role.

Some occupational therapists attempted to take care co-ordinator responsibilities only for clients who had difficulties with occupational function. Although this seemed a reasonable position to try to take, it was found not to be a solution to the problem. Those clients, whose mental health needs were affecting their capacity to function in daily living tasks, tended to have the most severe mental health needs. They therefore needed the most crisis intervention and the most help to cope with medication, housing and family relationships. This therefore meant that help with non-urgent tasks of managing daily living tasks became even more unlikely. The clients' occupational functioning was still not receiving attention.

By 1998 the occupational therapy professional body recommended that occupational therapists should reduce their generic working responsibilities and return to spending the majority of time on meeting occupational therapy need (Craik et al. 1998a). This position was felt to be of benefit to the client, as needs would be met by the professional most trained to meet them. It would also increase the work satisfaction of the occupational therapist, thereby encouraging them to stay in the profession. If occupational therapists follow the recommendations of their professional body, and return to providing an occupational therapy specific service, occupational therapists may have to let go of the role of care co-ordination. Although all but one of the participants in the study had a care co-ordinator role (study 1), this may become less common if clients are to have their

occupational needs met. It may be more appropriate for community psychiatric nurses to be the main care co-ordinator but to have the additional support of the occupational therapist when a need for occupational therapy services is identified.

Students' pre-training policies

What was a very surprising finding of this research was that pre training, the novices' referral prioritisation policies were found to be almost identical to those of the 'satisfied genericists'. If the sample of students in study 4 is representative of students at other universities then this suggests that novices are entering the work environment using generic referral prioritisation policies. If occupational therapy needs to be reintroduced, the training of novices with the satisfied specialists' referral prioritisation policies will be necessary.

At the pre-training stage, the students' referral prioritisation policies gave the clients' level of violence the most weight. Generic workers would also give top priority to the level of violence. Clients, who were suicidal or aggressive, would of course need to be seen urgently. The other members of the team would be more able to deal with crisis intervention strategies than the occupational therapist. Although an occupational therapist would have the skills to talk therapeutically to a distressed client they would not be able to give medication or admit a client to hospital under a section of the Mental Health Act (Department of Health. 1991). The novices were about to go into practice and prioritise clients who they were not well equipped to help. It was very important that they learnt that although these were clients were a high priority, their needs could be best met by the skills of a community psychiatric nurse, a social worker or a psychiatrist. These professionals had the skills in either prescribing appropriate medication or recommending compulsory hospital admission.

However, it was not only role awareness that was affecting the students' ability to prioritise the referrals effectively. It was also their lack of understanding of the impact of an illness on an individual's occupational performance skills. Out of the 16 experienced therapists who used the diagnosis cue, 14 gave schizophrenia top priority. This was due to their recognition of the impact that schizophrenia can have on occupational functioning. Before training the novices thought that schizophrenia was the diagnosis that required the

lowest priority. After training the students had learnt to give schizophrenia the top priority it required.

This key issue, of how diagnosis effected prioritisation, was well understood by the experts but had not previously been learnt by the novices. The ability to report policy may have affected this lack of effective communication. In study 3, the reported cue values were compared with the statistically derived weights derived from behaviour. The range of self-insight was found to vary greatly amongst the participants. There was some differentiation found that related to the method of working. Those working in generic roles were found to be the best at explaining their policies and those in occupational therapy roles the least. Perhaps the novices received clearer information from the generic therapists and were therefore more able to apply a generic type of policy. Alternatively the generic policies may have developed through the academic university based training. In their undergraduate training, they would be informed about government polices on such issues of generic working and the need to prioritise clients who are potentially suicidal (Department of Health 1999). Undergraduate students may therefore hold the view obtained from studying legislation or published policies but would not have an understanding of how those policies would, in practice, be managed in a community mental health team. It may be that most novices expect to prioritise suicidal clients but then break away from the generic role responsibilities when they realise they aren't able to meet clients occupational needs.

Post training policies

When the students had the key information to learn, they were able to do it. In terms of cue use, they moved from a match of $r = 0.23$ with the experts to a match of $r = 0.7$. In terms of learning how to use the levels of the cues they were able to move from $r = 0.15$ to $r = 0.96$. This dramatic effect of training showed that when the essential information was presented in a form that makes sense, novices show an excellent capacity to learn. These positive results parallel those of Wigton et al.(1990) who had success in training medical students in the ability to accurately diagnose pharyngitis. Wigton, however, had less success in training student health physicians with the same policies. Perhaps those who have less training are more open to learning. However, the learning may not be so effective if they have too little knowledge. Their knowledge base needs to be sufficiently broad and deep

that they can understand the professional terminology and the context for the application of the knowledge.

The students managed to reduce the number of cues when they used the experts' policies. This finding supports Shanteau's (1992) view that knowing what is essential is a key to expertise. The judgement analysis methods did provide very clear measures of how judgements were made. These were clearer than the measures obtained from verbal reports given by experts in the field (Munroe 1992; Harries 1998). Judgement analysis also provided an opportunity to conduct an idiographic investigation which allowed for the identification of each individual's judgements (Cooksey 1996). Without this, the subtleties of individual's differing policies would not have been as easily linked to the differing types of practice delivery.

To assess whether the effect of learning was sustained, another post-test assessment of ability to prioritise referrals could have been included. This could have been conducted six months after the first post-test. If it was done much later the novices would have been working and would then have been influenced by other variables. It is not likely that an occupational therapist would begin work in a community mental health team as their first post as normally one years' minimum experience is required before community responsibilities are given. However, with the reduction of hospital beds this opportunity for in-patient experience may not always be possible in the future.

Potential benefits of occupational therapy

The benefits of counselling, medication, good housing and financial payments may not be sufficient to ensure health. What a person does in their day can make the difference between having a life that is worth living and having one that is not. The client's whole range of needs have to be met to best ensure health is achieved. Many people who have a severe mental illness find it difficult to maintain employment and therefore have to find ways of spending their time that are inexpensive and enjoyable. Being occupationally deprived can be depressing and can lead to feelings of suicide or worthlessness. If occupational therapy is not provided, a client may not have any quality of life. Clients with mental health problems commonly have difficulties managing money, getting to appointments on time or managing domestic chores. For example a client with

schizophrenia was referred to an occupational therapist for just these types of reasons. He had been unable to understand how to use a washing machine so his clothes were getting very dirty. As a result his friends had stopped visiting him or inviting him out. He became depressed and lost confidence. By using a graded educational programme with an occupational therapist, he became independent in his domestic skills and was able to resume his social life. Occupational therapists are trained to understand how to grade activity to match the ability of a client with a disability. Occupational therapy may deal with the basic components of living but its effects can impact on the whole person's health and lifestyle.

6.2 Methodological issues and implications for future research

Getting information from experts is not easy (Chewing and Harrell 1990). One of the reasons for this, is that intuitive thinking is not easily described (Reber 1989). Judgement analysis does not require experts to describe their thinking but instead models their judgements from their behaviour. Although it produces a paramorphic rather than isomorphic model of a policy (Hoffman 1960), the model can be used to reproduce experts' judgements. This means that judgement analysis can provide a source of information that is valuable for educational purposes. The most accurate model may not always be that produced by judgement analysis. Researchers have recently tried differing methods such as fast and frugal ones (Dhami and Ayton, 2001; Dhami and Harries 2001). One particular model of judgement has not been shown itself to have major advantages at this stage. Further use of different types of modelling needs to be continued to identify which models are best suited to representing which types of judgements.

The need to use judgement analysis to identify experts' judgement policies was supported by the self-insight findings. Although some participants showed good self-insight, others' self-insight was very poor. Considering those who had the least self-insight were those whose policies were needed to train the novices, it would have been risky to have only relied on self-reports as a source of policy information. The reported policies may not have represented the experts' thinking and learning may not have been as effective as it was able to be here.

Self-insight is an issue that has not yet been discussed within the occupational therapy literature. The use of reflective practice as a method of developing clinical judgement has been used without consideration for the effect that poor self-insight may have on the ability to reflect. Poor self-insight can be an indication of intuitive expert thinking or of poor ability (Kruger and Dunning 1999): awareness of the effects of focussing on non-optimal information needs to be highlighted and a less assuming view of the benefits of reflection taken. It is perhaps most safely reserved for the novices who are most likely to be using analytical thinking or to assist clinicians to think about how they tackled a novel situation. In these circumstances, when analytical thinking is the primary tool, reflective practice can be of benefit.

The method of calculating slopes, using the reported use of the cue levels, was found to be a more valuable method of identifying self-insight capacity than the traditional measures that have been used. This method, suggested by Dr. Clare Harries, was able to show when use had been poorly modelled. With the recategorisation of cue levels, some participants were shown to have self-insight, which had not been previously apparent. This method is recommended as having potential in future research as it can improve the validity of self-insight measurement. It would also be very valuable for studies in self-insight to ask for reported cue weights after each profile has been judged. This has been shown to be a more accurate method of assessing self-insight as different cues may be used in differing profiles(Harries and Harvey 2000).

Although the studies in this thesis utilised a quantitative approach, the design and interpretation was informed by qualitative knowledge (Harries 1998). A qualitative study, undertaken during the researcher's Masters studies allowed for the identification of key issues in community mental health practice. For example, it became apparent during that early research that teams could have referral prioritisation policies and individuals could have referral prioritisation polices. This helped to decide which policies needed to be researched. Referral information was also thoroughly considered at this stage. This was important as only key information could be used in the judgement analysis design. The qualitative knowledge, arising from the use of think aloud and interviews, certainly benefited the design of the judgement analysis study (Harries 1998).

After the judgements had been modelled, the findings were published (Harries and Harries 2001a; Harries and Harries 2001b; Harries 2002; Harries and Gilhooly 2003). This led to opportunities for discussion and debate which helped to enrich the interpretation of the results (Parker 2001; Corrigan 2002; Dunrose and Leeson 2002; Forsyth and Summerfield Mann 2002; Harries 2002; Stone 2002). Therefore although the quantitative design of judgement analysis was chosen as the optimal method for modelling a large number of experts' policies, qualitative knowledge enhanced the design of the study and the interpretation of the results. It is therefore suggested that qualitative research is helpful in maximising the benefits of judgement analysis research.

Although the studies here benefited from the qualitative study of the components of the judgement and the environment those judgements are made in, the intercue correlations were controlled so that the effect on judgement of each individual cue could be measured. However, in order to move closer to the Brunswikian ideals of representative design, real referrals could have been used. These would have held the natural intercue correlations that would occur in the environment. The reason they were not used was due the problem of confidentiality. Real referrals had been used in previous research as stimuli for 'think aloud'(Harries 1998). At this time a small number of referrals were obtained from occupational therapists, but there were concerns that confidentiality could be breached. Although clients' names and addresses were removed, the names of the places they had worked or the issues for family members may have made it possible to identify the client from the referral. If too much information had been removed then the referral would have lost its content validity. This was therefore a difficult balance to obtain. The generation of computer simulated referrals was chosen for the judgement analysis studies as large numbers of profiles were needed. Other research, especially non-clinical studies, may not present theses types of difficulties and would therefore be able to use scenarios that have retained their natural intercue correlations.

If training is conducted using judgement policies derived from judgement analysis, it should not be assumed that the individual would be prepared for any type of situation within the field pertaining to the training. They will only have been trained with the information that is presented in the profile. Because of cognitive limitations, the number of cues used has to be limited. This was not a problem for the studies undertaken here, as novices do not have to know how to deal with every possible type referral. At the point of

qualification they only need to have sufficient knowledge to begin to practice. They will still receive supervision and remain part of a multidisciplinary team. The level of knowledge they gained from their training was therefore appropriate for the level of responsibility they will be given.

When novices take their first post they may benefit from being encouraged to carefully consider the type of role they will take. Occupational therapists have reported that they have applied for an occupational therapy post but are surprised to find that the expectation is that they will work in a generic role. The teams that the satisfied specialists were working in, appeared to have the most qualified professionals and the least untrained support workers. Their teams also received the most referrals. These teams allowed clients' needs to be matched to the most appropriate professional trained to meet that need (Parker 2001). They valued professional training and the delivery of high quality services. Perhaps occupational therapists who wish to be occupational therapists, have to be proactive in the clarifying the type of work that will be expected of them and identify if the team will support a role that utilises professional training.

Students' referral prioritisation policies now need to be researched at other universities to establish if other universities' students are using referral prioritisation policies that will lead to generic working. If this is found to be the case it would be important to look at the training that they receive and identify where the knowledge they have developed has come from. If it is found that students are going to use policies that will led to generic working, a national project to orientate students' referral prioritisation policies may be required. This could be provided through a web based training package, which the differing universities involved in the training of occupational therapists, could access. However, the training would not be of value if the information becomes out-dated. Health care policies are subject to many influences and these could affect the prioritisation policies of the occupational therapy profession. The experts' judgement policies would therefore need to be reassessed regularly, using judgement analysis methods, to ensure that the policies used for training are up to date.

Health care practice will continually evolve to meet the needs of clients. The influence of government policy may be beneficial or detrimental to this process. Evidence is needed to inform the discussions between the health service professionals, clients and the policy

makers. The research presented in this thesis may help to provide some of that evidence and perhaps help develop the effective delivery of services to clients.

References

Abernathy, C., M and Hamm, R. M. (1994). Surgical scripts : master surgeons think aloud about 43 common surgical problems. Philadelphia, Hanley & Belfus.

Abernathy, C. M. and Hamm, R. M. (1995). Surgical intuition : what it is and how to get it. Philadelphia, Hanley & Belfus.

Alvervik, A. and Sviden, G. (1996). "On clinical reasoning: patterns of reflection on practice." The Occupational Therapy Journal of Research. **16**(2): 98-110.

Andersson, P., M. Ekman, et al. (2002). Forecasting the fast and frugal way: A study of experts' and novices' performance and information processing strategies when predicting the World Cup 2002 in soccer. Annual meeting of the Judgement and Decision Making Society, Kansas City.

Arkes, H., Dawes, R. M. and Christensen, C. (1986). "Factors influencing the use of a decision rule in a probabilistic task." Organizational Behavior and Human Decision Processes. **37**: 93-110.

Arkes, H. A. and Hammond, K. R. (1986). Judgement and decision making. Cambridge, Cambridge University Press.

Ashton, R. H. (1982). Human information processing in accounting, American Accounting Association.

Audit Commission. (1986). Making a reality of community care. London, HMSO.

Bailey, D. (1990). "Reasons for attrition from occupational therapy." American Journal of Occupational Therapy. **44**: 23-29.

Balzer, W. and Sulsky, L. (1992). "Task information, cognitive information, or functional validity information: which components of cognitive feedback affect performance?" Organizational behavior and human decision processes. **53**: 35-54.

Balzer, W. K., Doherty, M. E. and O'Connor, R. (1989). "Effects of cognitive feedback on performance." Psychological Bulletin **106**(3): 410-33.

Bassett, H. and Lloyd, C. (2001). "Occupational Therapy in Mental Health: managing stress and burnout." British Journal of Occupational Therapy **64**(8): 406-11.

Beck, A. (1976). Cognitive therapy and the emotional disorders. New York, Meridian.

Benner, P. (1984). From novice to expert: excellence and power in clinical nursing practice. Menlo Park, Addison-Wesley.

Blashfield, R. K. (1976). "Mixture model tests of cluster analysis: accuracy of four agglomerative hierarchical methods." Psychological Bulletin **83**: 377-88.

Blom-Cooper, L. (1989). Occupational therapy: an emerging profession in health care. London, Duckworth & Co.

Brehmer, A. and Brehmer, B. (1988). What have we learnt about human judgement from thirty years of policy capturing? Human Judgement: The SJT View. B. Brehmer and Joyce, C. North Holland, Elsvier Science.

Brehmer, B. (1988). The development of social judgement theory? Human Judgement: The SJT View. Eds B. Brehmer and Joyce, C. R. B. North-Holland, Elsevier Science.

Brenner, V. and Fox, R. A. (1999). "An empirically derived classification of parenting practices." The Journal of Genetic Psychology. **160**(3): 343-56.

Brown, B., Crawford, P. and Darongkamas, J. (2000). "Blurred roles and permeable boundaries: the experience of multidisciplinary working in community mental health." Health and Social Care **8**(6): 425-35.

Brunswik, E. (1952). The conceptual framework of psychology. International Encyclopedia of Unified Science. Chicago, Uni. of Chicago Press. **1 No.10:** 1-102.
Canadian Association of Occupational Therapists, (1997). Enabling occupation; an occupational therapy perspective. Ottawa, ON., CAOT Publications ACE.
Chaput de Saintonge, D. M. and Hattersley, L. A. (1985). "Antibiotics for otitis media: can we help doctors agree?" Family Practice **2**(4): 205-12.
Chewing, E. and Harrell, A. (1990). "The effect of information load on decision maker's cue utilization levels and decision quality in a financial distress decision task." Accounting, Organizations and Society. **15**(6): 527-42.
Cohen, R. I. and Hart, J. J. (1988). Student psychiatry today. Oxford, Heinemann.
Cook, R. L. and Stewart, R. S. (1975). "A comparison of seven methods for obtaining subjective descriptions of judgement policy." Organizational Behavior and Human Performance **13**: 31-45.
Cooksey, R. W. (1996). Judgement analysis: theory, methods and applications. London, Academic Press.
Cooksey, R. W., Freebody, P. and Bennett, A. J. (1990). "The ecology of spelling: A lens model analysis of spelling errors and student judgements of spelling difficulty." Reading Psychology: An International Quarterly **11**: 293-322.
Corrigan, K. (2002). "CMHT's:embedding the occupational perspective." British Journal of Occupational Therapy. **65**(2): 100.
Craik, C., Austin, C., Chacksfield, J. D., Richards, G. and Schell, D. (1998a). "College of occupational therapists: position paper on the way ahead for research, education and practice in mental health." British Journal of Occupational Therapy, **61**(9): 390-2.
Craik, C., Chacksfield, J. and Richards, G. (1998b). "A survey of occupational therapy practitioners in mental health." British Journal of Occupational Therapy. **61**: 227-34.
Craik, C., Austin, C. and Schell, D. (1999). "A national survey of occupational therapy managers in mental health." British Journal of Occupational Therapy **62**(5): 220-8.
Creek, J. (1990). Occupational therapy and mental health. Edinburgh, Churchill Livingstone.
Dawson, N. V. (1987). "Systematic errors in medical decision making." Journal of General Internal Medicine **2**(May/June): 183-7.
Dawson, N. V. (1993). "Physician judgement in clinical settings: methodological influences and cognitive performance." Clinical Chemistry. **39**(7): 1468-80.
Dawson, N. V. and Cebul, R. C. (1990). "Advances in quantitative techniques for making medical decisions: The Last Decade." Evaluation in the Health Professions **13**(1): 37-62.
de Groot, A. D. (1965). Thought and choice in chess. The Hague, Mouton.
Dean, B. (2000). "Reduce shortages in three years." Occupational Therapy News **8**(3): 1.
Department of Health (1990). NHS and Community Care Act. London, HMSO.
Department of Health (1999). National health service framework for mental health. London, HMSO.
Department of Health (1991). The Mental Health Act. London, HMSO.
Department of Health (1995). Building Bridges: a guide to inter-agency working for the care and protection of severley mentally ill people. London, HMSO
Department of Health and Social Care (1999). BSc (Hons) Occupational Therapy: student course handbook. London, Brunel University.
Denig, P. and Haaijer-Ruskamp, F. M. (1994). "'Thinking aloud' as a method of analysing the treatment decisions of physicians." European Journal of Public Health. **4**: 55-9.

Dhami M.K. and Ayton P. (2001). Bailing and jailing the fast and frugal way. Journal of Behavioral Decision Making. 14(2), 141-168.
Dhami, M. K. and Harries, C. (2001). "Fast and frugal versus regression models of human judgement." Thinking and Reasoning **7**(1): 5-27.
Dillon, W. R. and Goldstein, M. (1984). Multivariate analysis: methods and applications. New York, Wiley.
Doherty, M. and Balzer, W. (1988). Cognitive feedback. Human Judgement: The SJT approach. B. Brehmer and Joyce, C. R. B. Amsterdam.
Doherty, M. E. and Kurz, E. M. (1996). "Social judgement theory." Thinking and Reasoning **2**(2/3): 109-40.
Dreyfus, H. L. and Dreyfus, S. E. (1980). Mind over machine. Oxford, Basil Blackwell.
Dunrose, S. and Leeson, J. (2002). "Differentiating work in mental health settings." British Journal of Occupational Therapy. **65(3)**: p.150.
Dunwoody, P. T., Haarbauer, E., Mahan, R. P., Marino, C. and Tang, C. (2000). "Cognitive adaption and its consequences: a test of cognitive continuum theory." Journal of Behavioral Decision Making. **13**: 35-54.
Elstein, A. (1976). "Clinical judgement: psychological research and medical practice." Science **194**: 696-700.
Elstein, A. E. and Schwartz, A. (2000). Clinical reasoning in medicine. Clinical reasoning in the health professions. Eds J. Higgs and Jones, M. Oxford, Butterworth-Heinemann.
Elstein, A. S., Shulman, L. S. and Sprafka, S. A. (1978). Medical problem solving: an analysis of clinical reasoning. Cambridge, MA, Harvard University Press.
Elstein, A. S., Shulman, L. S. and Sprafka, S. A. (1990). "Medical problem solving: a ten year retrospective." Evaluation and the Health Professions **13**(1): 5-36.
Ericsson, K. A. and Simon, H. A. (1980). "Verbal reports as data." Psychological Review **87**(3): 215-51.
Ericsson, K. A. and Simon, H. A. (1993). Protocol analysis: verbal reports as data. Cambridge, Mass., MIT Press.
Evans, J. S., Harries, C., Dennis, I. and Dean, J. (1995). "General practitioners' tacit and stated policies in the prescription of lipid lowering agents." Br J Gen Pract **45**(390): 15-8.
Everitt, B. (1974). Cluster analysis. London, Heinmann.
Eysenck, M. (1993). Principles of cognitive psychology. Hove, Lawrence.
Fleming, M. H. (1991a). "Clinical reasoning in medicine compared with clinical reasoning in occupational therapy." American Journal of Occupational Therapy **45**(11): 988-96.
Fleming, M. H. (1991b). "The therapist with the three-track mind." American Journal of Occupational Therapy. **45**(11): 1007-14.
Ford, J. K., Schmitt, N., Schechtman, S., Hults, B. and Doherty, M. (1989). "Process tracing methods: contributions, problems, and neglected research questions." Organizational Behavior and Human Decision Processes. **43**: 75-117.
Forsyth, K. and Summerfield Mann, L. (2002). "Generic working." British Journal of Occupational Therapy **65**(6): 296-7.
Fortune, T. and Ryan, S. (1996). "Applying clinical reasoning: a caseload management system for community occupational therapists." British Journal of Occupational Therapists. **59**(5): 207-11.
Fossie, E. (1996). "Using the occupational performance history interview (OPHI): therapists' reflections." British Journal of Occupational Therapy. **59**(5): 223-8.

Fox, J. and Alvey, P. (1983). "ABC of computing." British Medical Journal. **287**(10 Sept.): 742-6.
Fryback, D. (1983). Decision maker, quantify thyself! 5th Annual Meeting of the Society for Medical Decision Makers, Toronto.
Gaeth, G. and Shanteau, J. (1984). "Reducing the influence of irrelevant information on experienced decision makers." Organizational Behavior and Human Performance. **33**: 263-82.
Gale, J. and Marsden, P. (1985). Diagnosis: process not product. Decision-Making in General Practice.
Gigerenzer, G. and Kurz, E. (2001). Vicarious functioning reconsidered: a fast and frugal lens model. The essential Brunswik: beginings, explications and applications. Eds H. K.R. and T.R., S. New York, Oxford University Press.
Gilhooly, K. (1996). Thinking: directed, undirected and creative., Academic press.
Gilhooly, K. J. (1986). "Individual differences in think-aloud performance." Current Psychological Research & Reviews. **5**(4): 328-34.
Gordon, C. (1991). "Supporting acts." The British Journal of Healthcare Computing, September: 29-30.
Grime, H. (1990). "Receiving referrals: decision making by the community occupational therapist." British Journal of Occupational Therapy. **53**(2): 53-6.
Groen, G. J. and V. L. Patel (1985). "Medical problem-solving: some questionable assumptions." Medical Education **19**: 95-100.
Hagedorn, R. (1996). "Clinical decision making in familiar cases: a model of the process and implications for practice." British Journal of Occupational Therapy **59**(5): 217-22.
Hagedorn, R. (1997). Foundations for practice in occupational therapy. New York, Churchill Livingstone.
Hammond, K. (1986). A theoretically based review of theory and research in judgement and decision making. Boulder, C.O., Center for Research for Judgement and Policy, University of Colarado.
Hammond, K., Stewart, T., Brehmer, B. and Steinmann, D. (1975). Social judgement theory: applications in policy formation. Human Judgement and Decision Processes. M. Kaplan and Schwartz, S. San Diego, Academic Press**:** 271-312.
Hammond, K. R. (1955). "Probabilistic functionalism and the clinical method." Psychological Review. **62**: 255-62.
Hammond, K.R., Hursch, C.J. and Todd, F.J. (1964). Analyzing the components of clinical inference. Psychological review.**71**(438-456)
Hammond, K. R. (1971). "Computer graphics as an aid to learning." Science **172**: 903-8.
Hammond, K. R. and Brehmer, B., Eds. (1973). Quasti-rational and distrust: implications for international Conflict. Human Judgement and Social Interactions. New York, Rineholt & Winston.
Hammond, K. R. and Summers, D. A. (1972). "Cognitive control." Psychological Review **79**(1): 58-67.
Harries, C. (1995). Judgement analysis of patient management: General Practitioners' policies and self-insight. Psychology. Plymouth, Plymouth.
Harries, C., Evans, J. and Dennis, I. (2000). "Measuring doctors' self-insight into their treatment decisions." Applied Cogntive Psychology. **13**: 455-477
Harries, C. and Harvey, N. (2000). "Taking advice, using information and knowing what you are doing." Acta Psychologica **104**: 399-416.

Harries, P. and Gilhooly, K. (2003). "Generic and specialist occupational therapy casework in community mental health." British Journal of Occupational Therapy. **66**(3): 101-9.
Harries, P. A. (1996a). A Study to Identify, in the field of mental health, the factors influencing occupational therapists' decision making as to whether or not to accept a referral. Exeter, Exeter.
Harries, P. A. (1996b). Naming and framing occupational therapy practice in community mental health work. Vth European Congress of Occupational Therapy, Madrid.
Harries, P. A. (1998). " A study to identify, in the field of community mental health, the factors influencing OTs' decision making as to whether or not to accept a referral." British Journal of Occupational therapists **61**(4): 156.
Harries, P. A. (2002). "CMHT's: specialist versus generalist roles." British Journal of Occupational Therapy **65**(1): 40-1.
Harries, P. A. and Gilhooly, K. (2003). "Identifying occupational therapists' referral priorities in community health." Occupational Therapy International. **10**(2): 150-64.
Harries, P. A., Gilhooly, K. and Harries, C. (2002). Educating novices to make good clinical judgements. 13th World Congress of Occupational Therapists: Abstracts., Stockholm, World Federation of Occupational Therapists.
Harries, P. A. and Harries, C. (1998). Listening to reason: accounting for clinical decisions. 12th International Congress of the World Federation of the Occupational Therapists, Montreal.
Harries, P. A. and Harries, C. (2001a). "Studying clinical reasoning, part 1:have we been taking the wrong 'track'?" British Journal of Occupational Therapy. **64**(4): 164-68.
Harries, P. A. and Harries, C. (2001b). "Studying clinical reasoning, Part 2: applying social judgement theory." British Journal of Occupational Therapy **64**(6): 285-92.
Hershey, J. C. and Baron, J. (1987). "Clinical reasoning and cognitive processes." Medical Decision Making **7**(4): 203-11.
Higgs, J. and Jones, M. (2000). Clinical reasoning in the health professions. Oxford, Butterworth & Heinman.
Hoffman, P. J. (1960). "The paramorphic representation of clinical judgement." Psychological Bulletin. **57**: 116-31.
Hoffman, R. R. (1987). "The problem of extracting the knowledge of experts from the perspective of experimental psychology." AI Magazine.: 53-67.
Hoffrage, U., S. Lindsey, et al. (2000). "Communicating statistical information." Science **290**(5500): 2261-2262.
Holzemer, W. L., Schleutermann, J. A., Farrard, L. L. and Miller, A. G. (1981). "Simulations as a measure of nurse practitioners' problem-solving skills." Nursing Research **30**(3): 139-44.
Howell, D. (1997). Statistical methods for psychology. Belmont, Duxbury Press.
Ikomi, P. and Guion, R. (2000). "The prediction of judgement in realistic tasks: an investigation of self-insight." International Journal of Aviation Psychology. **10**(2): 135-53.
Job, T. (1996). "A system for determining the priority of referrals within a multidisciplinary community mental health team." British Journal of Occupational Therapy **62**(11): 486-90.
Johnson-Laird, P. N. and Shafir, E. (1993). "The Interaction between reasoning and decision-making: an introduction." Cognition **49**: 1-9.
Kellogg, R. T. (1982). "When can we introspect accurately about mental processes." Memory and cognition **10**(2): 141-144.

Kielhofner, G. (1995). A model of human occupation theory and application. Baltimore, Williams and Wilkins.
Kirwan, J. R., Chaput De Saintonge, D. M., Joyce, C. R. and Currey, H. L. (1983). "Clinical judgement analysis; practical application in rheumatoid arthritis." Br J Rheumatol **22**(3 Suppl): 18-23.
Kirwan, J. R., Chaput de Saintonge, D. M., Joyce, C. R., Holmes, J. and Currey, H. L. (1986). "Inability of rheumatologists to describe their true policies for assessing rheumatoid arthritis." Ann Rheum Dis **45**(2): 156-61.
Kruger, J. and Dunning, D. (1999). "Unskilled and unaware of it: how difficulties in recognizing one's own incompetence lead to inflated self-assessments." Journal of Personality & Social psychology. **77**(6): 1121-34.
Larkin, J. H., Ed. (1979). Information processing and science instruction. Cognitive Process Instruction. Philadelphia, Franklin Institute.
Lichtenstein, S. and Fischoff, B. (1980). "Training for calibration." Organizational Behavior and Human Performance. **26**: 149-71.
Lloyd-Smith, W. (1997). "Evidence-based practice and occupational therapy." British Journal of Occupational Therapy **60**(11): 474-8.
Luckett, P. F. and Hirst, M. K. (1989). "The impact of feedback on inter-rater agreement and self-insight in performance evaluation decisions." Accounting, Organizations and Society. **14**(5/6): 379-87.
Lustig, D. and Crowder, M. (2000). "The quality of life of persons with severe and persistent mental illness: a typology based on cluster analysis." Journal of Applied Rehabilitation Counselling. **31**(3): 22-9.
Mattingley, C. (1991). "The narrative nature of clinical reasoning." American Journal of Occupational Therapy. **45**(11): 998-1005.
Mattingley, C. and Fleming, M. H. (1994). Clinical reasoning: forms of inquiry in a therapeutic practice. Philadelphia, Davis.
McMackin, J. and Slovic, P. (2000). "When does explicit justification impair decision making?" Applied Cognitive Psychology. **14**: 527-41.
Mear, R. and Firth, M. (1987). "Cue usage and self-insight of financial analysts." The Accounting Review **LX11**(1): 176-82.
Meehl, P. (1954). Clinical versus statistical prediction: A theoretical analysis and a review of the evidence. Minneapolis, University of Minneapolis.
Miles, M. B. and Huberman, A. M. (1994). Qualitative data analysis: an expanded sourcebook. London, Sage.
Mojena, R. (1977). "Hierarchical grouping methods and stopping rules: an evaluation." Computer Journal **20**(4): 359-63.
Morrell, D. C. and Roland, M. O. (1990). "Analysis of referral behaviour: responses to simulated case histories may not reflect real clinical behaviour." British Journal Of General Practice **40**: 182-5.
Munroe, H. (1992). Clinical reasoning in community occupational therapy: patterns and processes. Aberdeen, Aberdeen University.
Munroe, H. (1996). "Clinical reasoning in community occupational therapy." British Journal of Occupational Therapy **59**(5): 196-202.
Newell, A. and Simon, H. (1972). Human problem solving. Englewood Cliffs, Prentice Hall.
NHS (2000). The NHS Plan. London, NHS.
Nisbett, R. and Wilson, T. (1977). "Telling more than we can know: verbal reports on mental processes." Psychological Review **84**: 231-59.

Norman, G. R. and Schmidt, H. G. (1992). "The psychological basis of problem-based learning: a review of the evidence." Acad Med **67**(9): 557-65.
Norman, G. R., Trott, A. L., Brooks, L. R. and Smith, E. K. M. (1994). "Cognitive differences in clinical reasoning related to postgraduate training." Teaching and Learning in medicine. **6**: 114-20.
Onyett, S. (1997). "The challenge of managing community mental health teams." Health and Social Care in the Community. **5**(1): 40-7.
Parker, G. (2002). "Guest editorial:10 years of the 'new' community care: good in parts?" Health and Social Care in the Community. **10**(1): 1-5.
Parker, H. (2001). "The role of occupational therapists in community mental health teams." British Journal of Occupational Therapy. **64**(12): 609-11.
Parry-Jones, B., Grant, G., McGrath, M., Caldock, K., Ramcharan, P. and Robinson, C. (1998). "Stress and job satisfaction among social workers, community nurses and community psychiatric nurses: implications for the care management model." Health and Social care in the Community. **6**(4): 271-85.
Reber, A. (1976). "Implicit learning of synthetic languages: the role of instructional set." Journal of Experimental Psychology: General. **118**: 219-235.
Reber, A. (1989). "Implicit learning and tacit knowledge." Journal of Experimental Psychology. **118**(3): 219-35.
Reed, K. and Sanderson, S. (1992). Concepts of occupational therapy. Baltimore, Wilkins and Wilkins.
Reich, S., Eastwood, C., Tilling, K. and Hopper, A. (1998). "Clinical decision making, risk and occupational therapy." Health and Social Care in the Community. **6**(1): 47-54.
Reilly, B. A. (1996). "Self-insight, other-insight, and their relation to interpersonnal conflict." Thinking and Reasoning. **2**(2/3): 213-23.
Reilly, B. A. and Doherty, M. E. (1989). "A note on the assessment of self-insight in judgement research." Organizational Behavior and Human Decision Processes. **44**: 123-31.
Reilly, B. A. and Doherty, M. E. (1992). "The assessment of self-insight in judgement policies." Organizational Behavior and Human Decision Processes. **53**: 285-309.
Roberts, A. E. (1996). "Approaches to reasoning in occupational therapy: a critical exploration." British Journal of Occupational Therapy **59**(5): 233-6.
Robertson, L. (1996). "Clinical reasoning, Part 2: novice/expert differences." British Journal of Occupational Therapy **59**(5): 212-6.
Ryan, S. (1990). Clinical reasoning: a descriptive study comparing novice and experienced occupational therapists. Columbia, Columbia University.
Savage, L. J. (1954). The foundations of statistics. New York, Wiley.
Schmidt, H. G., Norman, G. R. and Boshuizen, H. P. A. (1990). "A cognitive perspective on medical expertise: theory and implications." Academic Medicine. **65**: 611-21.
Schmitt, N. and Levine, R. L. (1977). "Statistical and subjective weights: some problems and proposals." Organizational Behavior and Human Performance. **20**: 15-30.
Schon, D. (1983). The reflective practitioner: how professionals think in action. New York, Basic Books.
Seymore, D. G., Green, M. and Vaz, F. G. (1990). "Making better decisions: construction of clinical scoring systems by the Spiegelhalter-Knill-Jones approach." British Medical Journal **300**.
Shanteau, J. (1992). "Competence in experts: the role of task characteristics." Organizational Behavior and Human Decision Processes **53**: 252-66.
Shanteau, J. (2001). Evaluating expertise. The Brunswik Society Newsletter. **October:** 16.

Shanteau, J., Grier, M. and Berner, E. (1991). Teaching decision making skills to student nurses. Teaching decision making to adolescents. J. B. V. Brown. Hillsdale, NJ., Lawrence Erlbaum**:** 185-206.

Simon, H. A. (1957). Models of man: Social and Rational. New York, Wiley.

Slade, M., Powell, R., Rosen, A. and Strathdee, G. (2000). "Threshold assessment grid (TAG): the development of a valid and brief scale to assess the severity of mental illness." Society of Psychiatry and Psychiatric Epidemiology. **35**: 78-85.

Slovic , P. and Lichenstein, S. (1971). "Comparison of Bayesian and regression approaches to the study of information processing in judgement." Organizational Behavior and Human Performance. **6**: 649-744.

Spalding, N. (1999). "The assessment of surgical priority of occupational therapists." British Journal of Occupational Therapy **62**(5): 229- 231.

Steinmann, D. (1976). "The effects of cognitive feedback and task complexity in multiple-cue probability learning." Organizational Behavior and Human Performance.: 168-79.

Stewart, T., Heideman, K., Moninger, W. and Reagan-Cirincione, P. (1992). "Effects of improved information on the components of skill in weather forecasting." Organizational Behavior and Human Decision Processes. **53**: 107-34.

Stewart, T. R. (1990). "A decomposition of the correlation coefficient and its use in analysing forecasting skill." Weather and forecasting. **5**: 661-6.

Stone, H. (2002). "Experience of community mental health teams." British Journal of Occupational Therapy **65**(3): 151.

Sturgess, J. and A. Poulsen (1983). "The prevalence of burnout in occupational therapists." Occupational Therapy in Mental Health. **3**: 47-60.

Sweeney, G., K. Nicholls, et al. (1991). "Factors contributing to work-related stress in therapists: results from a pilot study." British Journal of Occupational Therapy. **54**(4): 284-287.

Tape, T. G., P. S. Heckerling, et al. (1991). "Use of clinical judgment analysis to explain regional variations in physicians' accuracies in diagnosing pneumonia." Medical Decision Making. **11**: 189-197.

Tape, T. G., Kripal, J. and Wigton, R. S. (1992). "Comparing methods of learning clinical prediction from case simulations." Medical Decision Making **12**(3): 213-21.

Tversky, A. and Kahneman, D. (1974). "Judgement under uncertainty: heuristics and biases." Science **211**: 453-8.

Tversky, A. and Kahneman, D. (1981). "The framing of decisions and the psychology of choice." Science **211**: 453-8.

Unsworth, C. A. (1996). "Team decision making in rehabilitation." American Journal of Physical Medicine and Rehabilitation. **75**: 483-84.

Unsworth, C. A. (2001). "Studying clincial reasoning." British Journal of Occupational Therapists. **64**(6): 316-7.

Unsworth, C. A., Thomas, S. A. and Greenwood, K. M. (1995). "Rehabilitation team decisions on discharge housing for stroke patients." Archives of Physical Medicine and Rehabilitation. **76**: 331-40.

Unsworth, C. A., Thomas, S. A. and Greenwood, K. M. (1997). "Decision polarization among rehabilitation team recommendations concerning discharge housing for stroke patients." International Journal of Rehabilitation Research. **20**: 51-69.

von Neumann, J. and O. Morgenstern (1947). Theories of games and economic behavior. Princeton, Princeton University Press.

Waller, W. S. (1988). Brunswikian research in accounting and auditing. Human Judgement: The SJT view. B. Brehmer and Joyce, C. R. B. Amsterdam, Elvsevier.

Ward, J. H. (1963). "Hierarchical grouping to optimize an objective function." Journal of the American Statistical Association. **58**: 236-44.
Warren, A. (2002). "An evaluation of the Canadian model of occupational performance and the Canadian occupational performance measure in mental health practice." British Journal of Occupational Therapy. **65**(11): 515-20.
Wigton, R. S. (1988). Applications of judgement analysis and cognitive feedback to medicine. Human Judgement: The SJT View. Eds B. Brehmer and Joyce, C. R. B. Amsterdam, Elsevier Science.
Wigton, R. S. (1996). "Social judgement theory and medical judgement." Thinking and Reasoning. **2**(2/3): 175-90.
Wigton, R. S., Kashinath, D. P. and Hoellerich, M. D. (1986). "The effect of feedback in learning clinical diagnosis." Journal of Medical Education **61**: 816-22.
Wigton, R. S., Poses, R. M., Collins, M. and Cebul, R. D. (1990). "Teaching old dogs new tricks: using cognitive feedback to improve physicians' diagnostic judgements on simulated cases." Academic Medicine **65**(9): S5.
Wilcox, A. (1998). An occupational perspective of health. Thorofare, NJ, Slack.
Wilson, T. and Schooler, J. (1991). "Thinking too much: introspection can reduce the quality of preferences and decisions." Journal of Personality and Social Psychology. **60**(181-192).
Wyatt, J. (1991). "Use and sources of medical knowledge." The Lancet **338**: 1368-72.
Yerxa, E. J. (1993). "Occupational Science: a new source of power for participants in occupational therapy." Journal of Occupational Science. **1**(1): 3-10.
Zemke, R. and Clarke, F. (1996). Occupational Science: the evolving discipline. Philadelphia, F.A. Davis.

Appendices

Appendix 2.1 Instructions for completing the three tasks; prioritisation of referrals, self-insight questionnaire and demographic questionnaire.

Dear

Thank you for agreeing to participate in the study. There are three parts for you to complete. The first task is to prioritise a number of referrals. These are contained in the booklet and the instructions for this are on the first page. When you have completed this task by making a judgement on every referral, please open the brown envelope and complete the two questionnaires enclosed. Finally, please send the whole package back in the pre-paid envelope. (I would be grateful if you could wrap some cellotape around the parcel to reinforce the paper.)

We will also post the results of the study to you with the £15 honorarium. Your data will be coded in order to protect confidentiality. Please make a note of your code (at the top of this letter) so that when we contact you with the coded results of the study you will be able to recognise your own. Codes and names will be kept separate to data and all information will be held securely. Individual and employer anonymity will be protected in any publication of results. You are free to withdraw from the study at any time.

If you have any queries please feel free to contact me on Telephone no.0208 891 0121. E-mail – priscilla.harries@brunel.ac.uk

I very much appreciate the time you have taken to participate and I hope you find this study interesting.

Yours sincerely,

Priscilla Harries
Lecturer in Occupational Therapy
Brunel University

Appendix 2.1 cont.

As an Occupational Therapist in an adult community mental health team you may consider some general referrals which have been sent to your team and some which have been sent directly to you as the Occupational Therapist. The hypothetical referrals in the booklet fall into the second category: they have been sent directly to you. We would like you to look at these and indicate the degree of priority you feel the referral warrants. We appreciate that in real life you may also wish to see the client before making a fully informed judgement. However, here we wish to understand just your initial impressions of whether you would work with the client.

You will find on the referrals, that the following factors are always the same.

They have all been recently referred to you.
All clients have a GP and Psychiatrist.
All clients live in your catchment area and are on the phone.
All clients have been informed that they have been referred to you.

There are a lot of referrals so work steadily through them. Don't panic! It is expected that the task will take approximately an hour and a half. There is no time limit during which you must complete the task so do take breaks if you need to. However, please try to prioritise the referrals during a period of a few hours so that you do not leave the task for too long. If you do have a break please write this on the last referral you look at before taking the break

On the referrals, at the bottom of each page, there is a scale to mark your judgement. It ranges from high priority to low priority. Please put a small cross on this line to indicate the priority you would give the referral. You may use the whole scale. In addition please feel free to write on the paper referrals in any way in which you might normally do.

Please do this task as if it was for real and prioritise the cases just as you would in your current post. Since we wish to be able to give you feedback about your own judgements in relation to other's, please do this task on your own. Appendix 2.3 Recruitment letter sent to 100 occupational therapists.

Appendix 2.2 Recruitment letter for referral prioritisation task

Dear AOTMH member,

Are you currently working in a community mental health team that is referred adult clients?

If so, I would like to invite you to participate in our exciting new project that aims to identify the factors that influence you when you prioritise your referrals. I can appreciate that everyone's work context differs and that prioritisation policies must vary because of this. I will be recruiting occupational therapists from all over the U.K. and I hope you will be one of them. Occupational Therapists taking part will receive a £15 honorarium. The project will provide results which can be used in undergraduate education as well as giving you the opportunity to understand more about your own policies and how they relate to those of your colleagues.

If you would like to participate in our project, you will have to prioritise a set of referrals and answer some questions. Others researchers have examined how team referrals are prioritised but our project will focus on the prioritisation of those direct referrals which you may receive from colleagues in your own team or from local GPs or Psychiatrists. I appreciate that in real life it is ideal to see a client before making a fully informed judgement. However, here I wish to understand just your initial impressions of whether you would work with the client. I will be investigating the relationship between the information available and the decision you make. Statistical analysis can reveal facets of decision-making that are not obvious even to the decision-maker. I will be able to identify details of your own policies for you and show you the policies of your occupational therapy colleagues. (Your own and your Trusts anonymity will be protected as everyone will only be able to recognise their own policy results by their own code.) Information will be regarded as completely confidential. The study will not involve clients or affect your current practice in any way. Ethical approval for the project has been given by Brunel University.

I do hope you would like to take part. Please return the slip in the prepaid envelope indicating whether or not you would like to participate. If you would like to participate, the referrals and questions will then be sent to you to complete by yourself. It doesn't have to be done all in one go and in total it shouldn't take you much over an hour. You can then return them in an enclosed prepaid envelope.

This is a large-scale study so the results will provide evidenced-based practice. You and your colleagues are the ones having to do the task in the real world so it is to you that we must look to see how you do it. The results will not only be of benefit to you and your colleagues but will provide a sound basis for educating the less experienced!

I very much look forward to hearing from you. If you have any queries please feel free to contact me on telephone no. 020 8748 4268. E-mail – priscilla.harries@brunel.ac.uk

Yours sincerely

Priscilla Harries Dip.C.O.T, MSc(OT). Lecturer in Occupational Therapy, Brunel University.

I would/would not like to participate in the named study.

Name…….
Position
O.T, Senior II O.T, Senior I O.T, Head IV O.T, Head III O.T, Head II O.T, Head I O.T, other……..

Work Address
……
…..…….
……
WorkTel.no……
Email……

Length of time working in current CMHT 0-6 months, longer than 6 months
(delete as appropriate)

Appendix 2.3 Demographic questionnaire.

Please circle the appropriate answer

About You

Gender? Male/Female
Age? 21-25, 26-30, 31-35, 36-40, 41-45, 46-50, 51-55, 56-60, 61-65.
Your Grade? Occupational Therapist / Senior II / Senior I / Head IV/ Head III / Head II / Head I / other……
Ethnic background? White UK/Irish / White European/ Black African/ Black Caribbean/ Indian/ Pakistani/ Chinese/ Bangladeshi/ Other.....

No. of years working as an OT? 0-5, 6-10, 11-15, 16-20, 21-25, 26-30, 31-35, 36-40.

No. of years working as a community mental health OT? 0-2,3-4,5-6,7-8,9-10,11-12,13-14,15-16,17-18,19-20.

No. of years working in your current post? 0-2,3-4,5-6,7-8,9-10,11-12,13-14,15-16,17-18,19-20.

In relation to your CMHT work, how many hours do you work a week?…….
(If you work for more than one CMHT , please feel free to photocopy the forms or contact the researcher for a duplicate set.)

Referral data

How would you describe your catchment area e.g. urban/suburban/countryside, deprived/working class/middle class/ affluent, main ethnicgroupings……..

Does your team have a waiting list for clients to be
a) first seen Y/N if Yes, how long is it? …….
b) allocated Y/N if Yes, how long is it?……..
c) worked with Y/N if Yes, how long is it?…….

Approximately how many referrals does your team receive each month……..Approximately how many of these do you personally accept?……

Are team referrals prioritised using any sort of policy?Y/N. If Yes, please expand or if possible enclose policy with this form when returning it to the researcher……..

Do you use any policy for prioritising your own direct referrals? If Yes, please expand or if possible enclose policy with this form when returning it to the researcher……..
What is your procedure for receiving/allocating team referrals (include whom referrals can be accepted from)?

Approximately how many direct OT referrals do you receive each month?……..
Approximately how many of these do you personally accept?……..
What is your procedure for receiving/allocating direct OT referrals (include whom referrals can be accepted from)

In your work do you feel the caseload you manage is
much too large/ a little too large/ just right/ a little too small/ much too small.

Do you have generic role? Y/N . If yes, what percentage?
Do you consider your generic caseload to be too large/ too small/ just right?
Do you have an OT role? Y/N . If yes, what percentage?
Do you consider your OT caseload to be too large/ too small/ just right?

Who decides the balance of time given to these roles?…….

Do you have a key worker/ case manager role? Y/N. If Yes, how many clients do you usually, have as a key worker?…….What percentage is this of your total CMHT caseload?…….Do you have to be key worker for only OT type referrals?…..Y/N.

Do you run any groups?Y/N. If Yes, please expand……..
Can you fill in the timetable to show a rough example of how you spend your average week. Eg 'seeing individual clients', 'running group', 'admin' etc

am	am	am	am	am
pm	pm	pm	pm	pm
Monday	Tuesday	Wednesday	Thursday	Friday

Practice Setting

Who would be in your practice team when fully staffed (include yourself!)?

Occupational Therapists 0,1,2,3,4
Psychiatrist 0,1,2,3,4
CPN 0,1,2,3,4
Social Worker 0,1,2,3,4
Community Support Workers 0,1,2,3,4

Other Please specify title and how many

Is the team currently full? Yes No => Please specify the vacant posts

Do you currently have sufficient staff to take all appropriate referrals? Yes/no

Are certain types of case accepted by specific team members? No,
yes =>
Is this on the basis of

Appropriate initial/professional training? Y/N
Post qualification training? Y/N
Experience gained through work? Y/N
Previous experience in working with client? Y/N
Other…….

Physical Setting
Are there appropriate settings for you to work with clients in terms of
Facilities y/n
Equipment y/n
Locations y/n
Transport y/n

Does your Adult Community Mental Health team service prioritise working with particular client group? Please circle any that apply.

Psychoses Neuroses
Long history Short history
Other (please specify)

Are there any client groups your team would <u>not</u> work with?
Particular primary diagnosis?

Eating disorders
Alcohol dependency syndrome
Drug dependency syndrome
Personality disorder
Mania
Hypomania
Psychoses
Neuroses
Other (please specify)

Particular client behaviours

Physically aggressive
Verbally aggressive
Suicidal
Non-compliant

Other (please specify)

Particular Stage of Illness

Acute

Chronic

Particular Length of History

Less than six months, 1 year, 2 years, 3 years, 4 years, 5 years

More than 5 ,…..60

What relevant training have you had prior to this post?

What relevant experience have you had prior to this post?

What particular frame of reference/theories do you draw on?

Do you aim to have any particular focus to your work?

Any other relevant information? (feel free to use the back of the page)

Appendix 2.4 Example of results letter sent to the 40 participants

Participant 1

Thank you very much for completing the research pack last year. The information you sent was very valuable. The results gained so far are described in this letter. I hope to gain further results as the analysis continues and in the next stage, I plan to use the findings to develop occupational therapy students' understanding of how to prioritise referrals in CMHTs. There are two BJOT articles due to be published in the Spring. They describe the literature and present the pilot study. I hope to publish the main study results in due course. Confidentiality will be maintained by the use of codes. Here are your honorarium and feedback as promised. Sorry the results have taken a little longer than expected but I had a third little boy in August and with three preschool children my time for analysis was limited!

Description of study participants

The results are based on the data returned, in the autumn of 2000, by 40 Occupational Therapists, each working in individual community mental health teams. All participants were recruited via the special interest group for community mental health. Forty-five participants agreed to take part but due to time pressures, participants 4, 16, 37, 41 and 43 withdrew. Participants completed three tasks.

1. The prioritisation of 120 simulated referrals. These were direct to the OT from a Psychiatrist, a G.P. or a colleague (C.P.N. or S.W.).
2. A rating was allocated by the OT as to the importance, in terms of referral prioritisation, of each piece of information that was contained in the referral. The researcher then compared the ratings the OT thought they had used (subjective values) with the weightings (objective values) calculated from the prioritisation of the referrals.
3. Completion of a demographic questionnaire giving details of the OT, their work and their setting.

Demographic data.

Of the 40 OTs, 5 were male, 35 were female. 75% were Senior 1/Head IV. 39 were Caucasians and 1 was African Caribbean. 80% were working full-time (mean 33 hours) and 70% had worked as an OT for more than six years. 35 of the OTs had worked for more than three years in the community, 21 of those had more than three years in their current post. 70% of the work was being carried out in urban settings with 15% in sub-urban and 15% in the countryside. The majority of the work was in deprived areas.

30% of the teams had waiting lists for clients to be seen. This could range from 5 to 90 days. Mean of 32days. 25% of the teams had waiting lists for allocation of cases. This ranged from 7 to 90 days. Mean of 31 days. 35% of teams had waiting lists for clients to be worked with. This ranged from 20 to 120 days. Mean of 53 days. The number of referrals made to the **teams** ranged from 8 to 105 in one calendar month. Mean of 37. The number of these team referrals taken by the OT, (part-time OTs have had their referrals numbers increased in order to equate their hours with full-timers), ranged from one every other month to 20 a month. Mean of 5. The number of referrals made directly to the **OT** ranged between one every other month to 12 a month. Mean of 4. The OTs accepted from one every other month to 12 a month. Mean of 3.

22 of the teams and 16 of the OTs had their own prioritisation policies.

Half the OTs felt their caseloads were just the right size and 18 felt they were too large. 2 felt their caseloads were a little small. 95% had a generic role. The percentage of this role ranged from 100% to 5%. Mean of 53%. Half the OTs felt their generic role was too large and half felt it was the right size. All but one OT had an OT role. OT roles ranged from 100% to 10% of their work. Mean of 52%. Half the OTs felt theirs was just the right percentage with the other OTs being equally divided between feeling their OT role was too small or too large. All but one OT had a 'key worker/case manager' role. The number of clients key worked, ranged between 2.5 to 60. Mean of 19 clients (64% of their caseloads). 12 of the OTs were only key workers for OT type referrals. 35 of the OTs ran groups.

Consistency and ability to predict your prioritisation policy.

Out of the 120 referrals you rated, 30 of them were repeated. If you were perfectly consistent in prioritising identical referrals you would have scored 1. If you showed no consistency you would have scored 0. The average score was 0.7, which is high for clinical studies. You scored 0.58.

The weightings you gave each cue were calculated from the 120 referrals you prioritised. When the weightings you used for the nine cues were combined with referral information scenarios, a prediction of the

prioritisation rating can be made. If the weightings perfectly matched the prioritisation prediction a score of 1 would be obtained. The mean was 0.71. Your score was 0.68. This value was influenced by your consistency as well as such issues as how well the mark on the line reflected your thinking. It is important that weightings are fairly good at predicting prioritisation policies, as it is the weightings that have to be used to train the student OTs. Some have tried training by giving feedback on the outcome only e.g. how well the referral has been prioritised. However this has been shown to be a less effective in producing the appropriate policy than giving information on how the cues should be actually be weighted and used.

Judgements (weightings)

Nine types of information (cues) varied in the referrals. These were the referrer, the client's sex, age, diagnosis, living situation, length of history, reason for referral, level of support and level of aggression. In prioritising the set of referrals, you used 2 out of the 9 types of cues available to you (to a level of significance of 0.05). The other participant's used between one and four cues. The mean being 2.68 cues used.

The cues you used were the client's 'living situation' and the stated 'level of aggression'.
The cues for 'living situation' were living alone, living with family and living in an unstaffed hostel. You gave the greatest weighting to client's 'living alone'.
The cues for 'aggression' were no aggression, verbal aggression, physical aggression, suicidal (aggression to self). You gave the greatest weighting to clients who were 'suicidal'.
With regard to the 40 OTs participating, the table shows the 'level' of cue given the highest weighting by each OT (for statistically significant cues).

Insight

You were asked to give a numerical value to each of the nine cues to reflect the weighting you thought you gave it. I compared these subjective weights with the objective weights obtained in the analysis of the prioritisation task. The comparison can be seen in the graph. The shaded columns represent how you thought you used the cues. How you actually used cues are represented by the black columns. The significant cues used are highlighted.

Most participants were able to identify the cues they gave the greatest weighting to. However they tended to overestimate the number and importance of the other cues. The fact that clinicians tend to do this goes someway toward explaining why our verbal reporting of clinical judgements is less accurate than we expect. The important information is clouded by the overestimation of less important information.

You may have felt that the opportunity to give your own view of the weightings you used was limited by the method provided. By asking you to give a value to individual cues, one at a time (whilst all other cue values remained constant), stopped you being able to explain the influence of one cue upon another (non-linear cue use). For example would the fact that a client had a CPN alter your concern about them living on their own? There are statistical methods, which have been used to test linear and non-linear cue use. Although clinicians tend to feel their decisions are based on non-linear cue use, when the statistical methods are applied to the data of large ratings tasks (e.g. the prioritisation booklet) the weightings identified from the cue use are the same, whether cue use has been linear or non-linear. I hope this goes some way towards allaying your concern over the validity of my methods.

If you would like further information about the results, please do not hesitate to contact me on 0208 891 0121. Alternatively e-mail me on priscilla.harries@brunel.ac.uk

I hope you find the results interesting.

Many thanks for taking part and for all your hard work in completing the pack.

Yours sincerely
Priscilla Harries

Lecturer in Occupational Therapy
Brunel University

Appendix 2.5 Occupational therapists' regression coefficients (<0.05 level of significance in bold), achievement and consistency scores.

OT	R^2	gen	age	ref	liv	hist	agg	diag	supp	reas	consi
1	46.7	0.02	-0.05	0.12	**0.19**	0.001	**0.6**	0.12	-0.07	0.15	0.58
2	52	-0.08	0.02	0.09	0.13	0.04	0.05	**0.29**	0.07	**0.59**	0.5
3	59	0.11	-0.09	0.14	0.11	0.01	**0.66**	0.05	**0.17**	0.15	0.87
4	41.7	0.09	0.08	-0.09	**0.42**	-0.03	**0.42**	0.06	**0.21**	0.11	0.29
5	43.5	-0.02	0.03	0.001	**0.24**	-0.06	**0.42**	**0.33**	**0.21**	0.12	0.38
6	59	0.03	0.03	**0.18**	0.95	0.03	0.14	-0.02	0.07	**0.72**	0.76
7	37.7	0.03	0.07	**0.3**	0.14	0.08	**0.33**	**0.31**	0.05	**0.24**	0.46
8	20.1	**0.21**	-0.1	0.17	0.1	-0.04	0.16	**0.23**	0.04	**0.22**	0.73
9	58.3	-0.03	-0.13	0.10	0.13	0.03	**0.46**	0.05	-0.13	**0.55**	0.75
10	62.4	0.08	-0.06	**0.26**	-0.02	0.08	**0.70**	0.09	-0.07	**0.24**	0.79
11	43	0.03	-0.13	-0.04	0.05	**-0.20**	0.12	-0.14	0.06	**0.62**	0.8
12	63.7	-0.05	-0.01	0.15	**0.23**	0.06	**0.17**	-0.09	**0.27**	0.60	0.73
13	62.8	-0.04	-0.01	**0.55**	0.11	0.04	**0.33**	**0.49**	-0.02	0.03	0.77
14	56.2	-0.10	-0.01	-0.03	0.10	0.02	0.008	-0.13	0.09	**0.70**	0.93
15	45.2	-0.01	-0.01	-0.01	-0.09	0.14	0.14	**0.44**	-0.07	**0.49**	0.8
16	50.1	0.1	-0.06	**-0.20**	0.04	-0.03	0.05	-0.01	0.08	**0.65**	0.85
17	47.7	0.07	-0.08	-0.01	0.07	-0.05	**0.41**	0.23	**0.30**	**0.35**	0.81
18	41.9	0.097	-0.07	0.01	**0.36**	-0.17	-0.09	**0.49**	0.07	0.06	0.83
19	59.7	-0.06	-0.06	0.09	0.12	-0.03	**0.22**	0.01	**0.19**	**0.64**	0.57
20	36	-0.05	0.05	-0.68	0.14	0.1	0.05	**0.21**	-0.02	**0.49**	0.63
21	65.4	**0.15**	-0.01	0.02	**0.15**	-0.57	**0.75**	-0.08	0.01	**0.19**	0.8
22	39.9	-0.01	-0.12	0.01	**0.29**	0.16	**0.42**	**0.23**	-0.03	0.11	0.32
23	61.8	0.06	-0.01	0.01	0.13	0.04	**0.69**	-0.06	0.1	**0.3**	0.76
24	45.7	-0.05	-0.15	**0.21**	-0.12	0.01	0.08	**0.25**	0.02	**0.61**	0.7
25	29.1	0.02	-0.08	0.07	-0.13	-0.08	**0.21**	**0.36**	0.05	**0.35**	0.53
26	52.4	-0.09	-0.07	0.01	0.13	0.02	-0.14	-0.05	0.03	**0.67**	0.81
27	70.7	-0.01	-0.04	0.02	0.07	-0.07	**0.14**	-0.05	**0.28**	**0.74**	0.74
28	47.6	-0.01	-0.05	0.16	**0.2**	0.06	**0.18**	-0.14	**0.2**	**0.48**	0.77
29	37.7	-0.13	-0.05	**0.19**	-0.02	0.1	-0.13	0.14	0.13	**0.51**	0.6
30	55.9	0.05	-0.04	0.03	-0.1	0.12	-0.02	**0.66**	0.2	**0.32**	0.91
31	61.6	0.1	-0.03	-0.04	**0.18**	-0.18	**0.22**	0.09	-0.01	**0.7**	0.57
32	48.6	0.03	0.04	0.15	**0.19**	0.04	**0.22**	**0.18**	-0.03	**0.58**	064
33	50.9	0.12	-0.04	0.09	0.04	0.04	**0.61**	0.12	0.07	**0.31**	0.5
34	48.8	0.12	-0.04	-0.09	**0.18**	-0.05	0.31	**0.35**	0.03	**0.59**	0.81
35	30	0.08	0.02	-0.01	**0.22**	0.03	**0.27**	**0.35**	**0.23**	-0.07	0.34
36	47.5	-0.01	-0.02	-0.03	**0.36**	-0.07	**0.17**	0.04	**0.26**	**0.43**	0.79
37	74.2	0.08	-0.07	0.1	**0.23**	-0.1	0.01	-0.06	0.03	**0.8**	0.96
38	60.1	0.14	0.04	0.11	-0.05	**-0.49**	**0.55**	-0.03	-0.05	0.12	0.82
39	56.1	0.08	-0.09	0.02	0.08	-0.03	0.12	0.14	**0.16**	**0.68**	0.8
40	54	-0.02	0.02	-0.01	-0.01	0.02	**0.5**	**0.33**	0.01	**0.43**	0.92

Appendix 2.6 Frequency of cues used by the 40 occupational therapists.

OT	gender	age	referrer	liv.sit	history	violence	diagnosis	support	Reason for referral	Total cues used
1				*		*				2
2							*		*	2
3						*		*		2
5				*		*		*		3
6				*		*	*	*		4
7			*						*	2
8			*			*	*		*	4
9	*						*		*	3
10						*			*	2
11			*			*			*	3
12					*				*	2
13				*		*		*	*	4
14			*			*	*			3
15									*	1
17							*		*	2
18			*						*	2
19						*		*	*	3
20				*			*			2
21						*		*	*	3
22							*		*	2
23	*			*		*			*	4
24				*		*	*			3
25						*			*	2
26			*				*		*	3
27						*	*		*	3
28									*	1
29						*		*	*	3
30				*		*		*	*	4
31			*						*	2
32							*		*	2
33				*		*			*	3
34				*		*	*		*	4
35						*			*	2
36				*			*		*	3
38				*		*	*	*		4
39				*		*		*	*	4
40				*					*	2
42					*	*				2
44								*	*	2
45						*	*		*	3
totals	2	0	7	14	2	24	16	11	31	

Appendix 2.7 Frequency of highest cue level (for statistically significant cues) for the occupational therapists.

1.Two OTs used the 'gender of client' cue to prioritise referrals

Gender	highest priority of level (by Code number of OT)	Cue total
male	9	1
female	23	1
		2

2.No Ots used 'age of client' cue to prioritise referrals

3. Seven OTs used the 'referrer' cue cue to prioritise referrals

referrer	highest priority of level (by Code number of OT)	Cue total
CPN/SW in team	18	1
GP	31	1
Psychiatrist	7,8,11,14,26.	5
	total	7

4. Fifteen OTs used the 'living situation' cue to prioritise referrals

Living situation	highest priority of level (by Code number of OT)	Cue total
Home with family	36	1
Group home, staff live out		0
Home alone	1,5,6,13,20,23,24,30,33,34,38,39,40.	13
	total	14

5. Two OTs used the 'length of history' cue to prioritise referrals

Length of history	highest priority of level (by Code number of OT)	Cue total
One year	12,42.	2
Five years		0
Ten years		0
	total	2

6. Twenty four OTs used the 'level of aggression' cue to prioritise referrals

Aggression	highest priority of level (by Code number of OT)	Cue total
No	14	1
Verbally aggressive		0
Physically aggressive	5,8,21	3
Suicidal	1,3,6,10,11,13,19,23,24,25,27,29,30,33,34,35,38,39,42,45.	20
	total	24

7. Seventeen OTs used the 'diagnosis' cue to prioritise referrals

Diagnosis	highest priority of level (by Code number of OT)	Cue total
Anxiety		0
Anxiety and depression		0
Obsessive compulsive neurosis	34	1
Depression	9,	1
Schizophrenia	2,6,8,14,17,20,22,24,26,27,32,36,38,45.	14
	total	16

8. Eleven OTs used the 'level of support' cue to prioritise referrals

Level of support	highest priority of level (by Code number of OT)	Cue total
None	3,5,6,13,19,21,29,30,38,39,44.	11
Day centre		0
Counsellor		0
		11

9. Thirty one OTs used the 'reason for referral' cue to prioritise referrals

Reason for referral	highest priority of level (by Code number of OT)	Cue total
1 Change in medication-support and monitor		0
2 Work /friends OK-difficulties with family relationships		0
3 Stabilised drinking-memory problems and quality of life issues	34	1
4 Not using time effectively-unmotivated to change	31	1
5 Needs support-embarking on college course	10,11.	2
6 Likely to relapse following imminent redundancy	9,35.	2
7 Lost confidence going out – not looking after self	13,22,39,40.	4
8 Psychological and physical disabilities-functional assessment needed	2,7,8,12,15,17,18,19,21,23,25,26,27,28,29, 30,32,33, 36,44,45.	21
		31

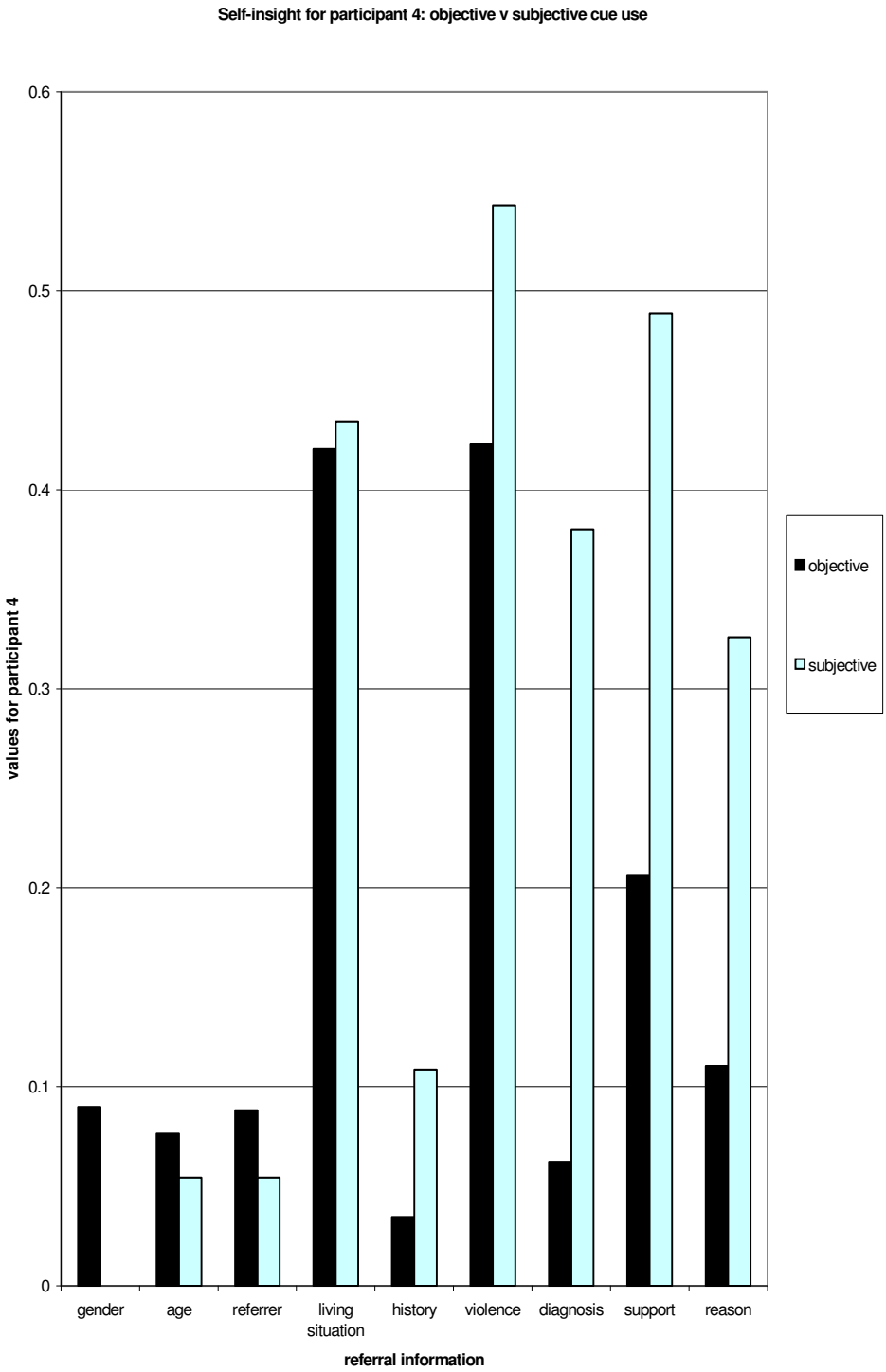
Appendix 4.1 Subjective ratings given to the nine referral cues by the 40 participants.

	subjective use of cues								
OT	gender	age	referrer	living situation	length of history	level of violence	diagnosis	support	reason for referral
1	5	4	0	8	4	8	8	6	5
2	5	6	7	8	6	5	7	6	10
3	0	0	0	5	0	10	4	4	5
4	0	1	1	8	2	10	7	9	6
5	5	5	0	10	5	10	10	10	10
6	5	5	5	6	3	6	5	6	8
7	2	2	3	8	6	8	9	5	8
8	0	0	7	8	2	4	7	7	8
9	0	0	0	9	5	9	7	9	8
10	5	5	9	7	4	9	9	7	7
11	0	3	0	8	8	5	3	7	9
12	0	0	5	8	2	5	5	7	10
13	0	0	8	5	2	10	10	5	10
14	0	0	2	5	0	0	1	5	10
15	2	5	5	5	8	7	10	4	6
16	7	10	10	10	10	10	7	10	10
17	2	3	2	6	8	7	8	8	9
18	0	5	0	8	7	7	8	6	10
19	0	0	1	6	6	5	8	8	10
20	3	7	8	7	5	0	9	6	9
21	0	0	0	8	6	10	4	8	4
22	1	4	0	8	8	10	8	8	6
23	1	3	4	8	4	10	1	8	7
24	0	2	6	5	5	2	6	4	7
25	2	3	0	6	4	3	5	6	8
26	5	8	0	10	5	0	0	9	10
27	0	5	6	8	7	0	5	7	6
28	0	2	1	8	2	5	2	7	10
29	0	0	5	5	8	3	8	8	8
30	0	0	3	7	5	5	10	10	10
31	5	5	0	10	8	8	8	3	9
32	4	4	3	8	3	8	8	6	8
33	0	0	0	10	4	10	8	8	10
34	0	0	0	6	6	3	6	7	7
35	0	0	0	10	5	9	10	8	8
36	0	2	0	5	4	8	5	6	8
37	0	0	8	10	5	0	7	6	10
38	2	3	0	7	8	10	3	7	6
39	0	1	8	8	5	8	7	7	10
40	0	0	2	6	5	10	10	6	10

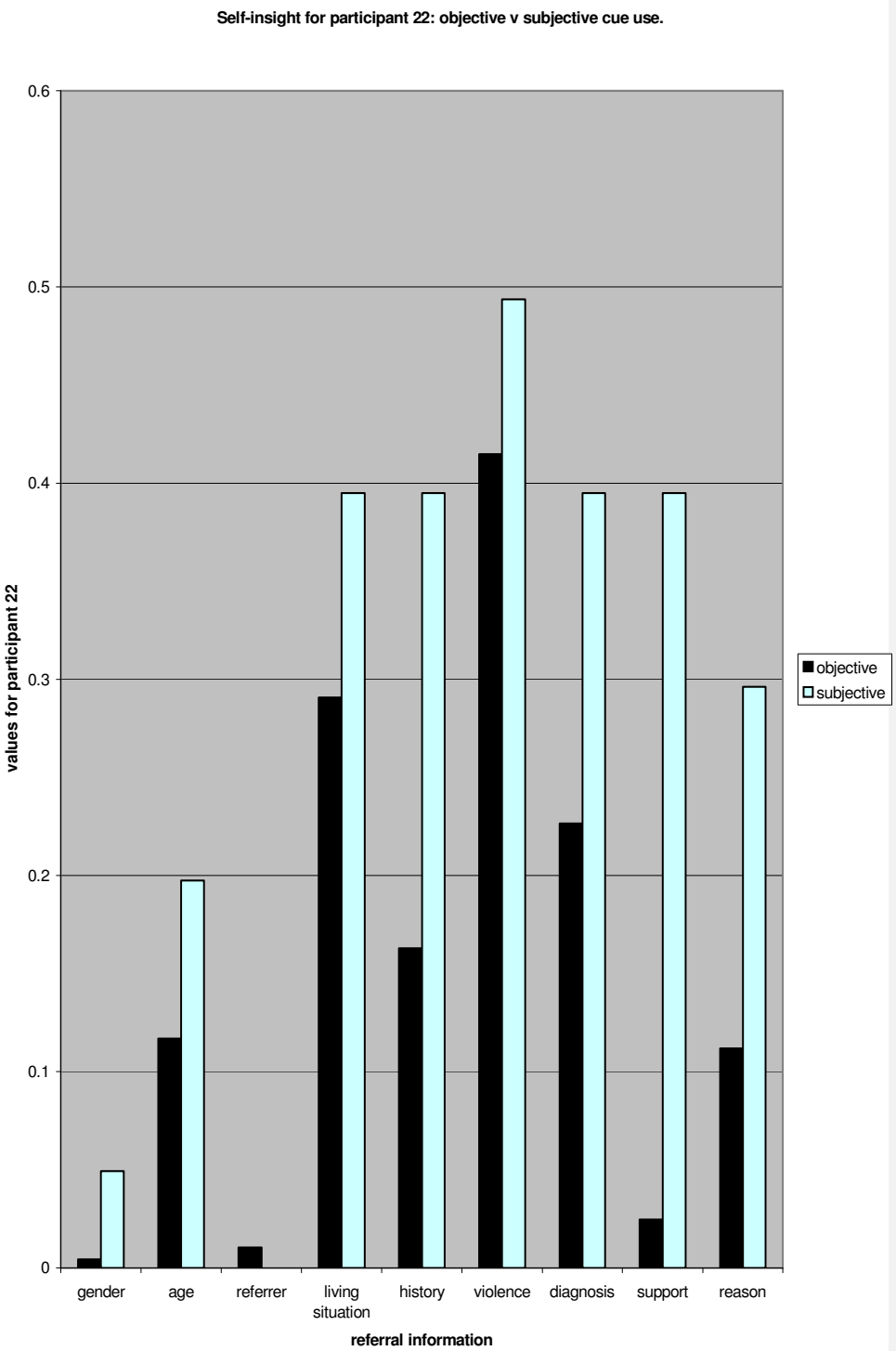
Appendix 4.2 40 participants subjective ratings following Dennis conversion (1985).

OT	gender	age	referrer	living sit.	history	violence	diagnosis	support	reason
1	0.29	0.23	0	0.46	0.23	0.46	0.46	0.34	0.29
2	0.25	0.3	0.35	0.4	0.3	0.25	0.35	0.3	0.5
3	0	0	0	0.37	0	0.74	0.3	0.3	0.37
4	0	0.05	0.05	0.43	0.11	0.54	0.38	0.49	0.33
5	0	0	0	0.37	0	0.74	0.3	0.3	0.37
6	0.31	0.31	0.37	0.18	0.37	0.31	0.37	0.49	0.33
7	0.1	0.1	0.16	0.42	0.31	0.42	0.47	0.26	0.42
8	0	0	0.4	0.45	0.11	0.23	0.4	0.4	0.45
9	0	0	0	0.45	0.25	0.45	0.35	0.45	0.4
10	0.24	0.24	0.43	0.34	0.19	0.43	0.43	0.34	0.34
11	0	0.17	0	0.45	0.45	0.28	0.17	0.4	0.51
12	0	0	0.29	0.46	0.11	0.29	0.29	0.4	0.57
13	0	0	0.39	0.25	0.1	0.49	0.49	0.25	0.49
14	0	0	0.16	0.39	0	0	0.08	0.39	0.79
15	0.11	0.27	0.27	0.27	0.43	0.38	0.54	0.22	0.33
16	0.26	0.37	0.37	0.37	0.37	0.37	0.26	0.37	0.37
17	0.1	0.16	0.1	0.31	0.41	0.36	0.41	0.41	0.47
18	0	0.25	0	0.4	0.35	0.35	0.4	0.3	0.5
19	0	0	0.05	0.33	0.33	0.27	0.44	0.44	0.54
20	0.15	0.36	0.41	0.36	0.26	0	0.46	0.31	0.46
21	0	0	0	0.46	0.35	0.58	0.23	0.46	0.23
22	0.05	0.2	0	0.39	0.39	0.49	0.39	0.39	0.3
23	0.06	0.17	0.23	0.45	0.23	0.56	0.06	0.45	0.4
24	0	0.14	0.43	0.36	0.36	0.14	0.43	0.28	0.5
25	0.14	0.21	0	0.42	0.28	0.21	0.35	0.42	0.55
26	0.25	0.39	0	0.49	0.25	0	0	0.44	0.49
27	0	0.3	0.35	0.47	0.41	0	0.3	0.41	0.35
28	0	0.12	0.06	0.49	0.12	0.31	0.12	0.43	0.62
29	0	0	0.28	0.28	0.45	0.17	0.45	0.45	0.45
30	0	0	0.15	0.34	0.24	0.24	0.49	0.49	0.49
31	0.24	0.24	0	0.47	0.38	0.38	0.38	0.14	0.43
32	0.22	0.22	0.16	0.44	0.16	0.44	0.44	0.33	0.44
33	0	0	0	0.46	0.18	0.46	0.37	0.37	0.46
34	0	0	0	0.4	0.4	0.2	0.4	0.46	0.46
35	0	0	0	0.46	0.23	0.42	0.46	0.37	0.37
36	0	0.13	0	0.33	0.26	0.52	0.33	0.39	0.52
37	0	0	0.4	0.5	0.25	0	0.35	0.3	0.5
38	0.11	0.17	0	0.4	0.45	0.57	0.17	0.4	0.34
39	0	0.05	0.39	0.39	0.24	0.39	0.34	0.34	0.49
40	0	0	0.1	0.3	0.25	0.49	0.49	0.3	0.49

Appendix 4.2.5 Example of histograms sent to participant to illustrate self-insight on cue use



Appendix 4.2.5 cont. Example of histogram sent to participant to illustrate self-insight on cue use



Appendix 4.3 Subjective values given to the cue levels by 40 participants

OT	gender		age		referrer		
	male	female	age twenty	age fifty five	cpn/sw	gp	psychiatrist
1	4.1	3.7	4.35	3.6	3.8	3.8	3.8
2	1	1	1	1	.	.	.
3	0.1	0.01	3.3	0.01	1.8	0.05	7
4	.	.	.	.	.	.	.
5	3.1	3.1	3.05	5.1	2.9	2.9	2.85
6	3.3	3.35	3.4	3.4	2.25	3.3	3.1
7	0.8	0.6	1.1	0.9	1.8	1.85	2.35
8	0.45	0.4	0.6	0.6	3.3	5.8	4.5
9	4.3	4.4	3.7	3.9	5.5	5.75	5.6
10	3.6	3.6	3.6	3.7	0.4	6.2	6.3
11	0.25	0.2	5.4	3.8	5.5	4.3	5.8
12	0.01	0.01	0.01	0.01	0.01	6.5	0.01
13	0.01	0.01	0.01	0.01	3.25	6.05	0.05
14	0.05	0.1	0.05	0.1	0.55	0.7	0.9
15	3.45	3.5	4.3	3.8	4.2	4.45	4.6
16	3.45	3.55	3.45	3.6	5.8	2.2	5.9
17	.	.	.	.	.	.	.
18	0.05	0.1	6	4	0.01	0.01	0.01
19	0.2	0.2	0.2	0.2	1.5	0.6	1.55
20	1.3	1.3	4.3	3.35	4.7	2.3	4.7
21	3.9	3.9	3.85	4	3.9	4	3.9
22	1.3	0.35	4.7	3.45	6.3	6.2	6.3
23	2.4	1.4	4.2	3	5.2	2.4	2.45
24	0.5	0.5	1.3	0.6	2.85	1.6	3.6
25	0.6	0.6	3.7	3.7	.	.	.
26	3.2	3.1	4.5	3.65	3.3	3.3	3.2
27	0.01	0.01	4.2	4.25	3.9	7.45	6.15
28	0.4	0.5	0.7	0.8	0.4	0.5	0.4
29	0.2	0.25	0.1	0.2	5.4	2.1	3.4
30	3.65	3.7	3.8	3.9	3.9	4	3.95
31	3.2	3.2	5.6	3.6	3.25	3.25	3.3
32	4.35	3.15	4.6	3.4	2.4	4.15	2.4
33	0.2	0.2	0.05	0.15	0.2	0.15	0.15
34	3.65	3.7	3.6	3.7	3.6	3.6	3.65
35	0.5	0.6	0.4	0.4	0.3	0.4	0.4
36	0.05	0.1	0.1	0.1	0.05	0.15	0.15
37	0.1	0.1	0.1	0.1	2.1	0.4	0.4
38	0.1	0.1	0.15	0.1	0.1	0.1	0.1
39	1.15	1.1	1.1	1	5.9	0.75	5.9
40	.	.	.	.	.	.	.

Appendix 4.3 cont. Subjective values given to cue levels by 40 participants

living situation			length of history		
home with family	group home	alone	one year history	five year history	ten year history
4.25	3.2	5.7	3.7	3.75	3.75
.	.	6.7	.	.	.
3.4	0.85	4.8	0.05	0.1	0.1
4.95	2.3	7.15	6.55	6.6	6.45
5	5.55	5.95	5.75	4.95	4.05
2.4	3.2	5.5	2	1.5	1.5
5.8	2.4	6.8	6.65	5	5
3.8	3.7	5.1	1.55	1	0.95
4.9	6	7.1	6.25	6.1	5.5
4.2	5.9	6.95	4.2	4.1	4.05
5.8	3.3	7.1	6.9	4.7	2.3
4.2	0.3	7.35	0.15	0.1	0.05
2.3	2.3	4.05	0.01	0.01	0.01
3.2	3	4.5	0.1	0.1	0.05
5.3	3.6	6.8	0.3	3.6	4.3
5	2.65	6.7	6.6	4.9	4.95
.	.	.	.	.	.
4.1	5.1	6.35	6.1	5.35	4.7
4.9	4.95	6.1	6.3	5.7	5.7
3.8	4.9	6.2	3.5	3.6	3.6
3.7	3.6	5.35	2.85	3.5	4.35
4.75	2.8	6.8	4.8	6.6	6.7
3.9	2.8	7.7	5	3.9	2.8
4.15	2.55	4.55	4.05	3.2	3
4.3	1.1	5.6	5	3.5	5.1
6.2	4.8	6.8	5.45	4.15	3.6
3.5	4.8	2.35	.	.	.
3.7	4.6	6.05	0.9	1.1	1.15
5	5.2	5.4	3.7	4.25	4.8
4.35	3.55	6.1	3.8	5.8	5.9
3.3	2.2	6	5.8	3.15	1.35
3.7	4.3	5.7	4.15	3.5	2.9
5.1	5.9	6.4	4.3	4.25	4.25
5.95	1.25	5.95	5.05	3.8	2.7
4.6	3.25	6.95	0.2	0.15	0.15
3.2	3.2	6.2	.	.	.
4.8	3.3	6.75	5.95	3.4	3.35
3.3	0.5	7.1	7	0.3	0.3
6	4.8	6.5	3.6	3.6	3.55
3.9	3.8	7	1.5	6.95	6.95

Appendix 4.3 cont. Subjective values given to cue levels by 40 participants

level of violence				diagnosis				
not violent	verbally aggressive	physically aggressive	suicidal	anxiety	anxiety & depression	O.C.D.	depression	schiz
1.6	5.25	6.5	6.7	2.05	5.7	2.2	5.1	6.1
.	.	.	.	3.9	.	.	.	6.4
0.1	2.7	2.7	7.1	3.6	5.3	4.35	3.6	6.85
0.6	5.5	6.85	7	0.1	6.7	0.15	6.75	6.9
1.6	3.7	3.75	5.4	4.85	5.5	3.6	4.55	5.9
1.9	3.8	3.7	5.4	2.2	2.3	2.25	2.25	5.9
0.3	1.4	5.1	6	0.6	1.3	2.5	3.3	5.45
2.3	3.6	4.55	4.55	3.3	5.35	4.2	5.2	5.3
2.6	4.2	3.8	6.3	6.7	5.8	5.55	6	5.55
1.8	3.1	2	7.1	2.2	4.05	4.05	4.1	6.55
0.35	2.8	5.4	7.35	2.9	7.05	3.7	6.5	5.85
0.2	0.01	4.55	7.4	2	5.2	3.05	5.1	4.7
0.01	0.01	6.8	6.8	0.9	1.05	0.95	1.1	6.4
0.15	0.15	0.2	0.7	0.3	0.8	0.4	0.8	0.6
0.5	1.6	4.7	4.75	0.55	3	4.9	2.65	6.95
5.1	3.25	3.4	5.1	5.1	5.15	1.5	5.1	5
.	.	.	.	.	.	.	.	.
2.25	2.9	3.4	4.2	2.4	4.4	3.6	5.25	6.3
5	5	5	5.6	5.3	5.5	5.3	5.35	6.1
0.55	0.7	0.7	0.7	3.55	5.1	3.6	4.4	6.1
0.9	2	5.3	6.6	2.8	5.05	2.85	5.2	5.05
.	4.85	4.8	7	2.65	6.45	4.5	6.4	6.4
1.1	3.1	4.25	5.8	3.4	3.4	3.45	3.4	3.45
3.6	3.6	3.6	4.5	3.65	4.2	3.85	3.8	5
3.7	1.65	1.7	5.65	3.7	4.85	2.3	3.7	5.4
3.45	3.5	3.6	6.15	3.4	3.4	3.4	3.4	3.45
3.7	3.7	3.7	7.35	3.6	3.7	3.6	3.6	3.8
1.1	1.2	1.15	5.9	0.9	0.9	0.8	0.8	0.9
3.6	3.7	3.65	3.6	3.35	4.9	4.85	3.4	6.3
4.15	4.2	4.2	5.6	0.4	5.8	0.4	5.75	7.1
0.6	2.9	2.95	6.4	3.2	4.4	1.4	3.8	5.6
1.85	2.7	4.9	5.4	2.5	4.3	2.5	4.35	5.3
0.3	4	5.7	7.05	1.9	4	1.9	4	4.55
3.5	4.4	4.4	4.5	1.05	5.7	1.1	5.7	6.4
0.3	5.5	5.55	6.85	3.4	6.25	6.25	7.1	7.05
5	5.6	5.5	6.75	4.1	6.3	3.2	6.2	6.1
3.4	3.35	3.3	5	3.3	3.4	3.4	3.4	3.5
0.2	0.2	7	7.1	0.2	0.25	0.1	0.2	0.15
4.5	4.6	4.5	7.15	4.2	6.3	5.3	6.4	6.3
0.15	2.15	0.95	6.95	0.25	0.25	0.2	0.2	7.1

Appendix 4.3 cont. Subjective values given to cue levels by 40 participants

other support			reason for referral		
day centre	counsellor	none	medication monitoring	family relationships	memory
3.95	1.9	5.7	3.8	3.9	1.9
2.3	2.2	6.4	1.25	1.2	3.65
0.1	0.9	5.6	3.3	0.15	3.15
2.6	5.65	7	.	5.45	.
3.7	1.15	6	5.1	2.2	3.45
4.25	3.6	3.65	1.1	1	4.3
3.75	1.4	6	1.85	3	1.1
3.6	4.3	5.2	4.6	3.7	4.75
5.45	4.75	6.05	4.3	4.6	5.7
1.35	1.35	6.9	0.45	0.85	0.1
1.45	2.05	7.2	0.05	1.8	5.05
0.8	2.7	7.4	0.01	0.5	3.5
1	0.9	0.9	0.8	4.9	5.25
4.25	1.5	5.9	2.7	0.5	5.9
4	1.2	6.95	0.4	5.3	0.2
3.6	1.6	6.5	0.2	0.4	0.75
.	.	.	.	.	.
2.7	2.7	5.4	1.4	5	5.6
0.75	1.4	5.6	0.75	2.1	4.35
3.8	3.75	5.25	1.1	3.7	2.4
2.7	2.5	5.1	2.7	2.35	2.65
3.45	0.6	6.3	2.6	2.1	3.7
1.7	2.9	4.85	2.2	3.5	3.55
3.3	3.25	3.6	1.1	3.55	3.45
2.7	1.75	5.85	1.7	6.75	0.6
4.8	5.4	6.3	0.15	5.7	5.4
2.65	2.6	7.45	0.05	1.35	2.6
2.2	2.5	5.75	0.6	1.6	6
3.25	3.3	4.5	1.6	4.1	2.9
2.4	2.5	6.25	1.3	2.5	4.1
3.3	1	5	0.8	0.4	1.9
3.7	2.55	5.25	1.45	2.5	5.6
1.75	3.3	6.95	0.65	0.4	0.15
2.35	2.45	5.9	1.1	3.7	0.6
1.55	1.95	6.6	6.2	2.8	5.25
1.75	1.7	6.7	1.45	3.45	5
3.25	3.3	6.9	0.1	0.4	0.45
0.15	0.25	7.15	3.4	3.45	3.4
5.7	5.6	7.15	0.4	4.5	3.4
3.7	3.6	6.7	0.01	5.1	3.6

Appendix 4.3 cont. Subjective values given to cue levels by 40 participants

reason for referral cont.				
time management	starting college	redundancy	Selfcare	psychological & physical
3.9	4	3.85	3.9	3.9
3.7	4.9	4.9	4.95	5.7
1.1	1.5	4.4	1.85	3.2
6.6	.	.	.	.
2.3	2.4	3.4	3.9	3.4
6	2.55	5	5.85	6.2
1.2	0.95	4.4	4.3	3.7
2.7	4.3	4.2	4.8	4.6
3.15	6.2	6.5	6.1	5.95
0.2	2	3.9	0.9	7
0.45	2.3	5.6	6.25	7.05
2.6	3.3	5.45	6.15	4
5.1	4.5	5	5.25	5.3
3	2.2	2.4	6.9	6.45
3.3	2	2.95	4.7	7
0.2	0.4	0.3	2.35	6.1
.	.	.	.	.
3.6	4.1	3.7	6.3	5.95
3.7	4.6	4.05	4.9	5.8
1.1	3.7	3.6	4.4	4.85
1.4	3.15	1.9	2.45	2.7
2.1	5.45	4.25	5.7	5.65
2.3	3.5	3.5	4.4	5.1
3.2	3.6	4	5.05	4.35
2.5	2.3	2.65	5.5	5.75
6.55	5.9	5.4	6.8	6.4
3.45	3.6	4.9	4.9	6.8
2.9	2.35	2.3	5.35	6.35
5	4.35	4.3	4.8	3.7
5.4	5.4	5.4	5.45	6.2
1.2	1.95	2	3.05	5.55
1.95	5.3	5.3	5.6	4.4
3.35	0.15	6.8	3.3	6.6
3.75	2.15	3.6	5.2	6
1.9	1.95	5.3	3.7	5.3
4.2	2.4	3.45	6.7	6.55
1.15	1.2	1.85	5.5	7
0.15	0.4	6.9	3.45	3.4
5.55	4.6	4.6	5.8	7.15
3.55	3.2	6.6	6.75	5.2

Appendix 4.4 Objective use of cue levels (using means identified from ANOVAs) by 40 participants

OT	gender		age		referrer		
	male	female	age twenty	age fifty five	cpn/sw	gp	psychiatrist
1	5.13	4.9	4.9	2.8	4.6	4.8	5.4
2	4.9	4	3	3	4.1	3.4	5.3
3	4.3	4.2	4.6	1	3.6	3.4	5.3
4	6	5.9	6.2	6.1	5.9	6	6
5	4.53	4	3.8	3.7	4.1	4.5	4.3
6	5.1	4.8	5	3	4.6	4.8	5.4
7	4.9	4.3	5.4	5.7	3.7	5.1	5.4
8	6	6.3	7	5.9	5.7	6.7	6.3
9	7.3	7	7.3	4.2	6.9	7.1	7.6
10	4.9	4.8	5.8	2.7	3.7	4.6	6.1
11	6	6	10.2	2.8	6	6.2	5.8
12	4	3.2	3.3	2.5	3	3.7	3.9
13	8.2	7.8	9.5	4.9	5.9	9.1	9.3
14	6.1	5.3	7.4	4.8	5.9	6.7	5.3
15	4.2	3.7	3.8	2.8	4.1	4	3.6
16	1.6	1.8	3.5	2.2	2.6	1.3	1.2
17	5.3	5.1	5.6	4.3	5.2	4.9	5.3
18	6.8	6.7	6.9	6.6	6.5	7.1	6.7
19	5.1	4.4	5.3	3.6	4.5	4.9	4.9
20	5.5	5	5.5	5.3	5.6	4.9	5
21	4.2	4.4	4.2	3.1	4.2	3.9	4.7
22	7.6	7.3	6.1	5.7	7.3	7.3	7.6
23	5.6	5.5	6.6	4.8	5.6	5	5.8
24	5.6	5.2	6	5.1	5.4	4.8	5.8
25	5.9	5.5	4.6	5.7	5.5	5.7	5.8
26	6.6	6	6.8	6.8	6.4	6.2	6.1
27	4.7	4.1	6.2	3.7	4.4	4.2	4.4
28	3.4	4.4	6.5	5.7	4.3	4.8	5.4
29	3.7	5	4.2	4.2	4.9	5.6	5.4
30	5.4	5.1	5.6	4	5	5.9	4.9
31	4.4	4.4	6.1	2.7	4.5	4.5	4
32	5.4	5.1	5.9	4.6	5	5.2	5.5
33	4.9	4.9	6	4.7	4.8	4.3	5.4
34	4.1	4.3	3.8	4.9	4.8	4.3	3.6
35	4.8	4.6	4.8	3.9	4.5	5	4.7
36	6.6	6.1	7.3	6.9	6.2	6.6	6.3
37	3	3	4.9	1.8	2.6	3.5	2.9
38	4.6	5	4.7	5.3	4.5	3.9	5.8
39	5.2	5	7	5.1	5.5	4	5.4
40	4.6	3.8	4	5.9	4	4.8	3.9

Appendix 4.4 cont. Objective use of cue levels (using means identified from ANOVAs) by 40 participants

living situation			length of history		
home with family	group home	alone	one year history	five year history	ten year history
4.6	4.6	5.8	5.1	4.7	5.1
3.9	4.3	5.3	4.2	4.5	4.7
3.4	4.7	4.7	4.4	3.3	4.6
5.4	5.6	7	6	5.7	6
3.7	4.6	6.61	4.3	4.1	4.3
4.5	4.6	5.9	4.6	5.6	4.9
4.5	4	5.8	4.5	4.9	4.9
6	6	6.6	6.2	6.2	6.1
6.4	7.4	8	7.1	7.2	7.4
4.5	5	5.1	4.8	4.1	5.4
5.9	5.7	6.4	6.6	5.9	5.4
2.9	3	4.7	3.2	4	3.6
7.5	7.8	8.8	7.7	8.2	8.3
5	5.7	6.2	5.3	6.4	5.5
3.5	4.8	3.5	3.3	3.5	4.8
1.6	1.4	2	1.6	1.9	1.7
4.8	5.5	5.2	5.1	5.4	5.1
6	6.8	7.5	6.9	6.7	6.6
4.3	4.7	5.3	4.6	5	4.6
4.5	5.6	5.6	4.9	5.4	5.4
3.8	4.2	4.9	4.5	4	4.2
6.7	7.4	8.2	7.1	7.2	7.8
5.4	5.6	6.6	5.4	5.6	5.6
5.4	5.1	5.6	5.3	5.5	5.4
6.2	4.9	5.9	5.8	5.72	5.6
5.8	6	7	6	6.7	6.2
4	4.4	4.8	4.2	5	4
4.3	4.2	6.2	4.7	4.9	5
5.2	5	5.7	5	5.4	5.5
5.4	4.8	5.4	4.7	5	5.9
3.8	3.8	5.7	4.6	4.7	4
4.6	5.4	5.8	5	5.4	5.3
4.4	5.1	5	4.9	4.3	5.2
4.7	3.9	4	4.1	4.4	4.2
4.3	4.8	5.1	4.7	4.1	5
5.7	6.1	7.3	6.4	6.2	6.3
2.1	2.3	4.5	3	3.4	2.6
5.3	4	5	7.6	2.7	3.4
4.7	5	5.8	5	5.2	5.1
3.9	4.4	4.4	4	4	4.4

Appendix 4.4 cont. Objective use of cue levels (using means identified from ANOVAs) by 40 participants

history of violence				diagnosis				
not violent	verbally aggressive	physically aggressive	suicidal	anxiety	anxiety & depression	O.C.D.	depression	schiz.
3.7	4.2	4.9	6.9	4.8	4.9	5.3	4.6	5.8
4.2	4	5.5	4.3	3.6	3.9	5	4.7	5.9
2.5	2.3	2.8	8.8	4.2	3.9	6	3.2	5
5.2	5	7	6.6	6	5.6	5.6	6	6.4
3.7	3.5	4.7	5.1	3.8	3.9	4	4.2	5.7
4.8	4.1	4.9	6	4.9	4.9	6	5	4.5
3.4	4	6	5.4	4.3	3.8	5.5	4.5	6.8
6	5.8	6.5	6.4	5.6	6.4	6.1	6.5	6.4
6	6.3	6.7	9.7	7	7.1	8.5	6.9	7.6
2.7	3	3.7	10	4.8	4.4	5.9	4.5	5.5
5	6.2	6	6.5	6.5	6.2	6.5	5.7	4.8
3.2	3	3.3	5	3.4	3.8	4.2	3.3	2.9
8.7	5.3	8	8.6	6.8	7.3	8.9	7.7	9.7
5.8	5.2	5.3	6.1	6.1	5.4	5.7	6.5	4
3.2	3.6	4.9	4	3	2.6	2.6	3.9	8.3
1.3	2	1.5	1.9	2	1.6	0.7	2	1.5
5	4.4	5.7	6	5.2	4.8	4.7	5.1	6.3
7	6.6	7	6.5	5.7	6.5	6.6	7.3	8
4	4.1	5	5.3	4.9	4.2	4.7	4.7	5.4
5	5.3	5.1	5.3	4.6	5.1	5	5.2	6.4
2.6	3	3.8	7.3	4.7	4.1	5.1	4.1	3.5
6.6	6.9	7.7	8.4	7.1	6.9	7.5	7	8.9
4.1	4.7	5.4	7.5	6	5.1	5.8	5.4	5.4
5.3	5.2	5.2	5.7	5	5.2	5.7	5.1	6.3
5	5.5	5.6	6.6	4.7	5.6	5.3	5.6	7.9
6.7	6.4	5.9	6	6.1	6.4	6.3	6.7	5.6
4	3.8	4.5	5	4.8	4	4.6	4.7	3.7
4	4.7	4.9	5.8	5.5	4.3	6	5.1	3.6
5.9	4.8	5.1	5.3	4.5	5.5	6.1	5.1	5.8
5.6	4.4	6.5	4.7	3.3	5.1	3	5.6	9.3
3.8	3.5	4.8	5.3	4.5	4	3.2	4.5	5.1
5	4.7	5.5	5.8	4.7	5.1	5.8	5.3	5.7
3	4	4.9	7	4.3	4.8	6.2	5	4.6
3.6	3.9	5.1	4.2	3	4.4	2.7	4.8	6
3.9	4.5	5	5.2	4	4.7	4.7	4.3	6.4
5.8	6.3	6.4	6.7	6.2	6.1	6.7	6.6	6.2
2.8	2.9	2.9	3.1	3.1	3.3	2.1	3	2.5
2	4.2	4.8	7.7	5.1	5.2	6.7	3.6	4.3
4.7	4.8	5.1	5.8	4.8	4.8	5	5.9	4.9
2.7	2.8	5.3	5.8	3.2	3.7	4.5	4.2	5.9

Appendix 4.4 cont. Objective use of cue levels (using means identified from ANOVAs) by 40 participants

other support			reason for referral				
day centre	counsellor	none	medication monitoring	family relationships	memory	time manage.	starting college
5.3	4.2	5.5	4.9	4.4	4	5	5.7
4.2	4.1	5.1	1.4	2.8	4.1	4.5	6
3.6	3.5	5.9	4.1	2	4.6	3.2	5.5
5.6	6	6.4	5.6	5.1	7	5	5.5
4	4	5	3.7	4.1	4.1	3.8	4.6
4.4	5.3	5.4	1.8	1.5	6.1	5.4	3.8
4.4	4.8	5	4.2	4.3	5.1	2.5	4.7
6.1	6.1	6.4	6	5.5	6.7	4	7
7.5	7	7.3	5.5	4.4	7.3	3.4	9.8
4.7	4.7	5.3	4.3	4.2	3.8	2	6.6
5.5	6.5	5.9		4.35	6.1	3.3	4.6
2.7	3.5	4.7	1.2	0.8	4.8	3	3.3
8.4	6.9	9.1	6.5	9	9.1	8.4	7.9
5	6.1	5.9	3.2	1.6	7.9	4.9	5.2
3.6	4.5	3.5	0.9	3.9	0.7	4	5.5
1.1	2.4	1.6	0.4	0.4	0.9	0.2	0.4
4.5	5.3	5.8	4.8	3.9	5.7	4.3	5.3
6.9	6.2	7	4.7	7.4	7.4	7	7
4	5	5.4	2.7	2.8	5.4	3.8	5.2
5.1	5.2	5.3	2.8	5	5.6	3.3	6.2
4.1	4.2	4.6	4.3	2.9	4.6	2.8	5.2
7.3	7.4	7.5	7.2	6.9	7.1	6.1	8.3
5.1	5.6	6	5.3	4.6	5.7	4.3	5.4
5	5.6	5.5	3.4	5.5	4.9	4.9	5.4
5.4	5.5	6.3	3.8	6.4	4.5	4.8	5.4
6	6.6	6.3	1.8	5.9	6.7	7	6.5
3.4	4.4	5.5	1.2	3.2	3.8	3.8	3.9
3.9	5.1	5.8	2.9	2.5	7.7	3.8	3.5
5	5.1	6	2.5	4.4	4.3	7.1	6.6
4.9	5	6	3.3	5.6	3.7	5.6	5.9
4	4.7	4.2	2.4	2	2.7	2.7	4.2
5.3	4.9	5.6	3.3	4	6.3	3.3	5.9
4.6	4.5	5.6	4	4.1	4.2	3.4	4.3
3.7	4.8	4.2	0.9	5.4	1.7	2.7	4.1
4.5	4.3	5.4	4.5	5.2	5	3.4	4.7
6	6	7.1	5	5.6	6.7	6.4	55.1
2.5	3.3	3	0.1	0.4	1	2.4	2.8
5	4.6	4.7	5	4.7	4.3	2.7	3.6
4.4	5.4	5.7	1.6	3.8	5.2	5	4.8
4.5	4.2	3.8	0.05	5.4	4.3	2.4	4.7

Appendix 4.4 cont. Objective use of cue levels (using means identified from ANOVAs) by 40 participants

reason for referral cont.		
redundancy	selfcare	psychological & physical
5.1	5.2	5.3
5.7	4.7	6.3
5.5	4.2	4.6
5.7	7	6.4
4	5.1	4.1
7.2	6.6	8
5.7	4.8	6.1
7	6.8	6
9.3	8	9.4
5.4	5	6.3
6.5	7.9	8.2
4.7	5.6	5
9.2	8.9	6.3
4.2	8.9	9.1
3.4	4	8.2
0.7	3.9	5.9
5.2	5.4	6.7
6.7	7.4	5.9
4.8	6.2	6.8
4.8	6.9	6.3
4.4	4.4	5.4
7.3	8.1	7.3
5.2	5.7	7.5
6	6.1	6.7
5.8	5.55	8.2
5.7	7.9	8.7
4.9	6.1	7.5
4.1	6.2	8.5
6.4	5.7	5.5
55.8	5	6.7
4.2	7.4	8.1
6.4	6.1	6.2
6.7	5.5	5.7
3.5	5.4	8.7
5	4.7	4.6
5.8	8.2	7.7
3.5	6.3	6.2
7.2	5.2	5
4.5	7.5	8.4
4.7	5	5.9

Appendix 4.5 Data for self-insight analysis on levels of cue use: 40 participants' subjective use of cues (slopes derived from subjective cue level values).

subjective use of cues (slope of subjective cue level values)									
OT	gender	age	referrer	living situation	length of history	level of violence	diagnosis	other support	reason for referral
1	-0.4	-0.8	0	0.73	0.03	1.65	0.75	0.88	0.08
2	0	0	.	.	.	.	0.5	2.05	0.65
3	0	-3.3	2.6	0.7	0.03	2.1	0.48	2.75	0.14
4	.	.	.	1.1	-0.05	2.05	1.34	2.2	.
5	0	2.1	-0.03	0.48	-0.85	1.15	0.12	1.15	-0.04
6	0	3.4	0.43	1.55	-0.03	1.04	0.74	-0.3	0.69
7	0	-0.2	0.28	0.5	-0.83	2.08	1.17	1.1	0.35
8	0	0	0.6	0.65	-0.3	0.77	0.39	0.8	0.07
9	0	0.2	0.05	1.1	-0.38	1.07	-0.21	0.3	0.29
10	0	0	2.95	1.4	-0.08	1.48	0.86	2.78	0.71
11	0	0	0.15	0.65	-2.3	2.36	0.54	2.88	0.89
12	0	0	2.17	1.56	-0.05	2.61	0.53	0.33	0.75
13	0	0	-1.6	0.88	0	2.71	0.11	-0.05	0.38
14	0	0.1	0.18	0.65	-0.03	0.17	0.06	0.83	0.56
15	0	-0.1	0.2	0.75	2	1.58	1.23	1.48	0.6
16	0	0.2	0.05	0.85	-0.83	0.02	-0.03	1.45	0.59
17	.	.	.	.	.	.	.	.	.
18	0	-2	0	1.13	-0.7	0.64	0.87	1.35	0.39
19	0	0	0.03	0.6	-0.3	0.18	0.14	2.43	0.59
20	.	-1	0	1.2	0.05	0.05	0.44	0.73	0.43
21	0	0.2	3.9	0.83	0.75	2.04	0.47	1.2	0
22	0	-1.3	0	1.03	0.95	1.07	0.75	1.43	0.53
23	0.95	-1.2	-1.38	1.9	-1.1	1.53	0.01	1.58	0.31
24	0	-0.7	0.38	0.2	-0.53	0.27	0.23	0.15	0.39
25	0	0	.	0.65	0.05	0.59	0.23	1.58	0.34
26	0	-0.9	-0.05	0.3	-0.93	0.82	0.01	0.75	0.58
27	0	0.1	1.13	-0.58	.	1.1	0.03	1.45	0.06
28	0	0	0.43	1.17	0.13	1.44	-0.01	1.78	0.56
29	0	0	-1	0.2	0.55	-0.01	0.44	0.63	0.26
30	0	0	0.03	0.89	1.05	0.44	1.34	0.19	0.63
31	0	-2	0.03	1.35	-2.23	1.75	0.42	0.85	0.57
32	-1.2	-1.2	0	0	-0.63	1.29	0.57	0.78	0.46
33	0	0	-0.03	0.65	-0.03	2.19	0.53	2.6	0.87
34	0	0	0.03	4.38	-1.18	0.3	1.07	1.78	0.59
35	0	0	0.05	1.18	-0.03	1.97	0.82	2.53	-0.02
36	0	0	0.05	1.5	.	0.52	0.39	2.48	0.54
37	0.05	0	0.05	0.98	-1.3	0.48	0.04	1.83	0.93
38	0	0	-0.85	1.9	-3.35	2.75	-0.02	3.5	0.13
39	0	0	0	0.25	-0.03	0.79	0.43	0.73	0.67
40	0	0	4.18	1.55	2.73	1.92	1.37	1.5	0.63

Appendix 5.1 **Information sheet: referral prioritisation task.**

I have been conducting a research project that aims to develop occupational therapists' ability to prioritise referrals. When you begin working you may be swamped with referrals and will need to know how to prioritise them. By participating you will be developing a useful clinical skill and assisting much needed occupational therapy research. I have already gathered the prioritisation policies of experienced occupational therapists working in England Scotland and Wales. I have now identified the weightings that our most experienced clinicians give to information in referrals. I would now like to research the possibilities of teaching these prioritisation policies to undergraduate occupational therapists.

If you take part, you will be asked to prioritise two sets of referrals. The total time this is likely to take an hour and a half. You will get a short break in the middle. Each of the two sets contains the type of referral that has been sent to occupational therapists in community mental health teams. After prioritising the first set of referrals you will be given written information that shows you how experienced occupational therapists use referral information. You can then try to use the expert policies to guide you when prioritising the second set of referrals. When I have analysed your results I will be able to give you feedback on your own referral prioritisation policies and identify whether you have improved your skill in referral prioritisation. Although all data will be coded to protect individual's anonymity you will be able to identify your own coded results and compare them to other occupational therapy student's.

Ethical approval has been granted for this research project by Brunel University. Your decision to participate (or not) will in no way affect your status at the university. If you chose to participate the anonymity of your results are assured. If you wish to withdraw at anytime you are free to do so.

If you would like to participate, come to GLO/6 on Wednesday 9th October.
Come as soon as you can after 1pm.

If you want to go and have lunch after your literature review seminar and then come, that is fine. But don't leave it too late!

Priscilla Harries

Appendix 5.2 Notice to recruit students to study.

Third Year OT Students!!!

Would you like to develop your clinical reasoning skills and receive £10?

Can you give an hour or so of your time to take part in an exciting occupational therapy research study?

By taking part you will learn to prioritise referrals, get some feedback on your new skills and get a £10 book token.

Results will, of course, will be confidential!

The venue will be here one Wednesday afternoon.

Information about how to take part will soon be announced in a one of your lectures.
It would be great if you would consider participating!

Appendix 5.3 Instructions to complete prioritisation task

As an Occupational Therapist in an adult community mental health team you may consider some general referrals which have been sent to your team and some which have been sent directly to you as the Occupational Therapist. The hypothetical referrals in the booklet fall into the second category: they have been sent directly to you. We would like you to look at these and indicate the degree of priority you feel the referral warrants. We appreciate that in real life you may also wish to see the client before making a fully informed judgement. However, here we wish to understand just your initial impressions of whether you would work with the client.

You will find on the referrals, that the following factors are always the same.

They have all been recently referred to you.
All clients have a GP and Psychiatrist.
All clients live in your catchment area and are on the phone.
All clients have been informed that they have been referred to you.

There are a lot of referrals so work steadily through them. Don't panic! It is expected that the task will take approximately an hour and a half. There is no time limit during which you must complete the task so do take breaks if you need to. However, please try to prioritise the referrals during a period of a few hours so that you do not leave the task for too long. If you do have a break please write this on the last referral you look at before taking the break

On the referrals, at the bottom of each page, there is a scale to mark your judgement. It ranges from high priority to low priority. Please put a small cross on this line to indicate the priority you would give the referral. You may use the whole scale. In addition please feel free to write on the paper referrals in any way in which you might normally do.

Please do this task as if it was for real and prioritise the cases just as you would in your current post. Since we wish to be able to give you feedback about your own judgements in relation to others' please do this task on your own.

Appendix 5.4 The students' pre-training weighting policies; linear fit of the policy (R^2) and modelled cue weights (statistically significant cue use in bold).

N	gender	age	referrer	living situation	history	violence	diagnosis	support	reason for referral	R^2
1	0.07	0.005	-0.07	-0.23	-0.05	0.23	-0.176	-0.15	0.05	22.1
2	0.14	**-0.24**	0.17	0.18	0.008	**0.64**	0.14	0.1	0.05	63.8
3	0.14	-0.16	0.03	**0.21**	**-0.22**	**0.59**	0.03	**-0.32**	0.08	64.3
4	0.03	-0.01	-0.011	0.21	0.07	**0.67**	0.18	-0.05	0.2	56
5	0.078	-0.06	-0.005	-0.04	0.06	**0.85**	-0.009	-0.015	0.02	73.8
6	0.042	0.11	0.15	0.095	0.02	**0.283**	**0.234**	-0.143	**0.643**	65.4
7	0.223	0.134	0.056	0.16	0.009	0.122	0.081	-0.016	**0.64**	70.1
8	0.18	-0.08	0.03	**0.27**	0.02	**0.5**	-0.17	-0.01	**0.38**	56.7
9	0.21	-0.04	0.07	0.21	-0.02	**0.63**	0.05	0.15	0.19	52.7
10	0.19	-0.16	0.09	0.28	-0.06	0.07	-0.14	-0.22	0.14	27.4
11	0.08	-0.09	0.1	0.25	0	**0.38**	0.01	-0.09	0.12	29.4
12	0.13	0.03	0.09	**0.33**	0.01	**0.28**	-0.04	**-0.3**	0.19	36.6
13	**0.26**	0	0.1	0.16	-0.06	**0.6**	-0.06	-0.16	0.13	55.8
14	-0.24	0.29	-0.17	0.21	-0.13	0.32	0	-0.1	0.2	33.1
15	0.1	-0.22	0.18	-0.01	-0.03	0.14	-0.12	-0.19	**0.46**	41.3
16	-0.06	0.05	0.14	**0.29**	0.01	**0.26**	-0.16	-0.22	**0.41**	47.2
17	0.02	-0.11	0.16	0.04	-0.12	**0.53**	-0.01	-0.1	0.15	44.8
18	**0.29**	0.03	0.19	0.14	-0.11	**0.66**	-0.18	0.06	-0.11	64.3
19	0.14	-0.02	**0.26**	-0.08	-0.15	**0.61**	0.11	0.11	0.16	53.6
20	0.02	-0.2	-0.04	0.08	-0.13	**0.28**	-0.08	-0.08	**0.37**	33
21	0.23	-0.16	0.07	0.16	-0.03	0.27	0.01	0.06	0.13	20.8
22	0.15	0.12	0.09	**0.25**	0.1	**0.56**	**0.25**	-0.05	0.2	53.5
23	-0.06	-0.06	0.11	**-0.22**	**-0.32**	**0.5**	0.12	**-0.29**	0.16	63.3
24	0.07	0.14	0.2	0.15	-0.14	**0.44**	0.1	**-0.39**	0.08	50.9
25	0.03	0.19	-0.03	**0.25**	0.07	0.21	-0.07	**-0.24**	**0.5**	47.9
26	0.07	-0.04	0.09	0.19	0.07	**0.69**	0.18	0.13	**0.21**	63.1
27	0.03	-0.06	0.01	**0.56**	0.01	**0.64**	0.12	-0.01	0.14	76.2
28	0.01	0.02	0.05	-0.15	0.09	**0.8**	0.12	-0.03	**0.19**	76.6
29	**0.27**	0.01	0.09	0.17	0.14	**0.62**	0.18	-0.15	-0.04	57.8
30	0.07	0	0.12	0.11	-0.02	**0.67**	0	0.19	0.18	53.7
31	-0.02	0.08	0.12	0.13	-0.15	0.18	0.07	**-0.35**	**0.63**	66
32	0.02	0.11	0.07	0.08	0.02	**0.59**	0.05	**-0.23**	0.14	50.5
33	0.08	0.02	0.1	-0.07	-0.11	**0.7**	-0.01	-0.06	0.11	58.4
34	0.09	0.01	0.17	0.18	-0.04	**0.43**	-0.07	-0.18	**0.28**	44.4
35	**0.26**	-0.07	-0.11	0.17	0.05	**0.49**	-0.05	0.12	**0.35**	44.1
36	0.01	0.02	-0.04	0.07	**-0.34**	**0.36**	-0.09	**-0.51**	0.12	58.8
37	0.17	-0.1	0.14	0.23	-0.01	**0.47**	0.14	-0.23	0.04	46.8
mean										52.01

Appendix 5.5 The students' post training weighting policies; linear fit of the policy (R^2) and modelled cue weights (statistically significant cue use in bold).

students	gender	age	referrer	living situation	history	violent	diagnosis	support	reason for referral	R^2
1	0.18	-0.07	-0.19	0.11	0.04	0.1	**0.53**	0.02	**0.66**	65.6
2	0.23	-0.08	-0.07	0.04	-0.02	0.16	**0.34**	-0.08	**0.76**	75.8
3	0.22	0.08	-0.05	0.08	0.06	**0.42**	**0.49**	-0.1	**0.55**	75.5
4	**-0.24**	-0.13	-0.06	-0.01	0.12	**0.74**	**0.34**	**0.22**	-0.0064	76.8
5	0.04	**-0.31**	-0.17	0.25	0.11	0.33	**0.085**	0.13	0.22	43.9
6	0.12	-0.05	-0.01	0.13	0.2	**0.31**	**0.32**	-0.12	**0.69**	74.5
7	0.17	0.03	-0.16	0.12	-0.07	0.09	**0.25**	-0.09	**0.73**	70.1
8	0.21	-0.02	-0.04	0.07	0.04	**0.28**	**0.53**	-0.09	**0.58**	74.8
9	-0.25	-0.28	-0.03	0.15	-0.09	0.09	-0.11	0.08	**0.5**	49
10	0.09	-0.03	-0.03	0.15	0.1	0.09	**0.27**	0.15	**0.57**	52.2
11	0.09	-0.04	0.08	-0.03	-0.09	**0.46**	**0.3**	0.07	**0.61**	62.2
12	0.14	-0.04	-0.14	0.19	-0.18	0.22	**0.27**	-0.01	**0.63**	56.7
13	0	0.02	0.15	0.11	0.16	**0.48**	0.13	0.02	**0.71**	76.2
14	0.08	-0.15	-0.12	0.08	-0.17	**0.31**	**0.33**	0.02	**0.56**	57.7
15	0.13	0.02	-0.14	0.25	0.11	**0.5**	-0.12	**-0.5**	0.07	55.8
16	-0.01	-0.01	0.01	-0.02	-0.02	**0.72**	**0.28**	-0.08	**0.47**	77.2
17	**0.23**	0.11	-0.04	0.18	0	**0.29**	**0.43**	-0.15	**0.66**	81
18	0.25	-0.04	-0.25	0.12	-0.19	**0.27**	**0.3**	-0.2	**0.63**	69.3
19	0.15	0.1	-0.12	0.16	0.08	0.19	**0.38**	-0.1	**0.63**	74.3
20	0.14	0	0.13	**0.24**	0.05	**0.42**	**0.22**	-0.13	**0.6**	68.9
21	0.1	-0.03	-0.11	0.1	-0.02	**0.36**	0.15	-0.004	**0.57**	50.4
22	0.16	0.1	-0.14	0.16	0.03	0.07	**0.3**	-0.08	**0.58**	57
23	0.19	-0.07	-0.01	0.05	-0.14	**0.26**	**0.41**	-0.09	**0.65**	64.3
24	**0.28**	0.1	**-0.29**	**0.27**	**-0.24**	**0.27**	0.16	-0.22	**0.63**	73.6
25	**0.31**	0.11	0.01	0	-0.18	0.09	**0.66**	0.09	**0.44**	64.1
26	0.24	0.05	0.2	0.02	-0.09	**0.36**	0.11	-0.25	**0.49**	38.6
27	0.13	0.08	-0.2	0	-0.18	**0.34**	**0.43**	-0.18	**0.61**	75.5
28	**0.33**	0.05	-0.03	-0.02	-0.13	**0.5**	**0.55**	-0.09	**0.55**	78
29	0.09	0.04	-0.07	-0.03	-0.03	**0.74**	**0.42**	0.08	**0.36**	79.6
30	-0.02	0.06	-0.11	0.02	0.02	**0.7**	**0.37**	-0.09	**0.35**	79.3
31	**0.29**	0.08	-0.2	0.1	0.08	0.14	**0.39**	-0.13	**0.53**	63.1
32	0.11	-0.03	-0.1	0.05	-0.04	**0.35**	**0.42**	-0.04	**0.61**	69.7
33	0.32	0.01	-0.09	0.01	-0.08	**0.45**	**0.45**	-0.2	**0.45**	62.3
34	0.16	-0.14	0.01	-0.06	-0.1	**0.34**	**0.33**	-0.12	**0.68**	65.2
35	0.06	0	-0.07	0.1	0	**0.85**	0.12	-0.19	0.11	78.4
36	0.18	0.11	-0.05	-0.11	-0.04	0.19	**0.66**	-0.05	**0.37**	59.2
37	0.14	-0.02	-0.14	0.07	-0.02	**0.42**	**0.42**	-0.12	**0.58**	75.4
mean										66.79