CHAPTER 9: GENERAL DISCUSSION

9.1. Summation of findings in the six studies.

In this thesis six studies were described. These investigated the ability of two closed-head-injured subjects to use pragmatic information in both expressive and receptive aspects of communication. The results of these investigations revealed overlapping but individually distinct patterns of competencies and impairments in the two subjects across the various tasks. These are summarised in Table 9.1.

Table 9.1 Summary of findings of the CHI subjects A.S. and P.B. on the range of pragmatic tasks given.

A. EXPRESSION			B.COMPREHENSION		
TASK	DEFICIT?		TASK	DEFICIT?	
1. DICE GAME	**P.B.**	**A.S.**	**4. LANGUAGE ANTICIPATION**	**P.B.**	**A.S.**
Overly repetitive	Yes	No	Guessing word from context	No	No
Too little detail	No	Yes	Guessing TV program from context	Yes	No
Confusing	Yes	Yes			
Disorganised	Yes	Yes			
Ineffective	Yes	Yes			
Lack of lexico-grammatical cohesion	No	No	**5. INDIRECT SPEECH ACTS**		
Too few lexical ties	Yes	Yes	Recognising direct speech act	No	No
Ambiguous reference	Yes	Yes	Recognising correct (non-literal) end to indirect speech act	No	No
Too few different propositions	No	Yes	Rejecting literal response to indirect speech act	Yes	No
Too many repeated propositions	Yes	No			
Sequencing of propositions	?	?			
Focus on irrelevant propositions	Yes	Yes	**6. SARCASM**		
2. POLITE REQUESTS			Interpreting literally consistent sentence pairs	No	Yes
Recognition	No	No	Interpreting literally inconsistent sentence pairs	Yes	Yes
Generation	No	No			
3. HINT GENERATION					
Logically remote	Yes	Yes			
Indirect	No	No			

Both subjects retained a sensitivity to salient aspects of the communication context in which they found themselves. This was demonstrated for example in their ability to describe important features of the dice game. It was also apparent in their sensitivity to the relative contributions of familiarity, conventionality and level of cultural imposition when making a simple request. Their ability to anticipate language in contextually rich video clips similarly reflected this capacity.

Faced with tasks which required analysis of these salient and sometimes familiar elements, they were able to incorporate them reasonably effectively into a communication strategy. Their polite requests reflected their perception of the social dynamics of the situation and were worded appropriately to the circumstances. In the dice game, both subjects were operating on the basis of discourse plans which had elements in common with normal texts.

Even so, their capacity to produce an extended discourse, of which the dice game was an example, was seriously compromised. The impressions of judges reading a transcript of their productions was that the CHI subjects were disorganised and confusing in their communication. In the subsequent analysis of these texts both subjects were found to have made discrete sequencing errors in delivering their explanations. Whether this reflected a disorganisation of the plan itself, or a disruption in its execution, is not clear. However there were numerous other linguistic and logical features of their performances in the dice game, as well as other tasks, which indicated that both subjects had major deficits in the execution and monitoring of their productions. The deficits were however, manifested differently in the performances of the two subjects.

P.B. did not monitor his explanation of the dice game accurately. He was distracted by concrete associations, failed to re-establish lexical links in his language and did not identify his referents clearly. He also did not know when to terminate his production. In the absence of accurate self monitoring

his communications were also repetitive. He did occasionally recognise an inadequacy in his performance and would then self-correct. Unfortunately this was usually after the event and the disruption to the flow of his discourse was not prevented. Poor monitoring also contributed to his clumsy attempts at hinting. No matter how he formulated them initially, P.B. inevitably "ran on" until he ended up making the bald request. His responses to more demanding polite requests also indicated an incapacity to self-evaluate.

Whenever P.B. was at all successful in the formulation of his output, this was at the beginning of his output (first segment of the dice game, some of the hints). This suggests that his success was related to a conscious effort to control his language to meet the pragmatic requirements of the "test". Once his focused attention waned however, as the task continued or he became distracted by other issues, his control lapsed and non-adaptive language patterns emerged. Conscious attention to language output is unlikely in spontaneous conversational contexts. His performances on these tasks therefore probably underestimates the extent of his monitoring deficits.

A.S., also failed to accurately monitor his dice game explanation. But in his case this appeared to be a more pervasive impairment. At no stage did he indicate that he had was aware of inadequacies within his performance, nor did he ever self-correct. He gave a rushed insufficient explanation of the dice game and did not supplement this on completion. As with P.B.'s effort, errors in monitoring lead to failures to link discourse elements clearly, or to

inhibit concrete associations. However in contrast to P.B.'s repetitiveness, A.S.'s performance on the dice game reflected poor impulse control. His verbal production was impoverished in terms of the demands of the task, supplemented instead by tangential, irrelevant and disinhibited remarks.

Like P.B., his hints, no matter how they began, would end up as a bald requests. In his case the responses also had an aggressive undertone, quite inappropriate to the stated pragmatic requirements. His poor verbal control was detrimental to his perceived competence on all tasks, even those which were not directly measuring manner of speech, such as the literal interpretation of the literal interchanges in Chapter 8,

Despite the fact that A.S. demonstrated such poor impulse control in his verbal productions, and was less able to exercise control over this than P.B., his deficits were not absolute. In unstructured casual conversations, his tangential and irrelevant discourse would eventually return to the topic with which he started. So at some level he continued to be aware of his communication goal, and he was able eventually to guide his verbal behaviour in that direction. Here again this may be due to a capacity to control language production in an effortful act of concentration. However, in the demanding reality of competing attentional demands, this can only occur on a sporadic basis.

Deficits in **non-effortful** monitoring and sustained regulation of verbal productions were thus a major disruptive influence on the two subjects'

pragmatic language skills. On more demanding tasks the two subjects also demonstrated impairments at the level of language formulation and comprehension. This reflected a failure to analyse the available information from a conceptual perspective. This was apparent in P.B.'s performance on even quite simple tasks. He was unable to reject literal responses to indirect speech acts, even although he could also appreciate that non-literal responses to the same items were appropriate. Similarly, his misinterpretation of television programs on the basis of single instances, indicated that he was unable to ignore specific concrete attributes. A.S. was not concrete in his responses to these simpler tasks but he had as much difficulty as P.B. when required to appreciate abstract relationships in complex communication tasks.

Problems were evident for both subjects in the qualitative features of their performances on more complex requests, where they had difficulty considering the situation from the other person's perspective. It was then grossly apparent on the tasks requiring production of hints and understanding sarcasm.

When attempting to hint the CHI subjects were unlikely to refer to conceptual antecedents of the communication context in formulating their responses, unlike the controls. Their responses were mainly directly related to the actual request, and unsuccessful. Faced with the task of detecting a sarcastic interchange neither subject could form an inferential link between

two contrary pieces of information. As a result, neither subject was capable of understanding the conversational implicature.

9.2. Model of Frontal Lobe Function and Language

The performances of the CHI subjects on pragmatic tasks were consistent with predictions made on the basis of their known frontal lobe impairments, as described on neuropsychological assessment. The one exception to this was that A.S. was not expected to have difficulties with the conceptual analysis of information. The neuropsychological tests used were obviously not taxing this capacity as directly as were the novel pragmatic tasks.

The pragmatic tasks developed in these studies were motivated by current theoretical views concerning how language and context interact. In both the expressive and receptive domains the tasks represented a cline of pragmatic demands that the subjects (i) could meet easily, (ii) could meet with difficulty (iii) could not meet at all.

A model of normal language processes can be sketched on the basis of neuropsychological and cognitive principles which encompasses the pragmatic theories upon which each of the tasks was based. The performances of the two subjects can then be used to specify, more exactly, the role of the frontal lobes in language processing.

9.2.1. Language Expression

9.2.1.1. Activation and Intention

According to Luria's formulation, language expression begins with an intention. Frontal lobe impairment may disrupt normal activation of cerebral processes and thereby disturb development and maintenance of intention. P.B. had an inertia of thought processes and concomitant rigidity which was interpreted as reflecting a reduced level of activation. This was not so gross as to prohibit him from formulating any communication intention, unlike a number of adynamic mute patients described by Luria (1976b.). However, this lowered activation was reflected in the perseveration of particular ideas, which he repetitively expressed. This lowered activation also impacted on the formulation of his verbal productions, and the execution of his verbal output as will be discussed below. A.S. on the other hand, suffered from over-activation. He therefore had difficulty maintaining one stable intention in the presence of competing impulses. His productions reflected these uncontrolled thought patterns. As with P.B. this also influenced the manner in which his output was formulated and executed.

9.2.1.2. Formation of Verbal Utterance.

Verbal production, according to Luria's conceptualisation (1976b), requires an intermediate step in which the communicative intention is converted into a multidimensional semantic schema. Once this has occurred lexical units are selected on the basis of paradigmatic (text external) and syntagmatic (text internal) relationships. This is achieved via dynamic interaction of activation

and inhibition of individual units until finally the schema is represented in an externally recognisable, linguistic form.

It is suggested that the activation deficits experienced by both CHI subjects disrupted this process. P.B.'s speech was repetitive not only in the expression of ideas, but also in the frequent repetition of lexical items. This behaviour may well have reflected a fault in the selective activation and inhibition of lexical items, resulting in the perseveration of particular lexical choices. Conversely, A.S.'s use of peculiar phraseology, commented on throughout the thesis, would result from over-activation of weakly associated, semantically inaccurate lexical units.

In the process of converting an intention into a verbal utterance, contextual information is incorporated. Linguistic debate continues to grapple with how this occurs. Much of the cognitive literature is concerned with natural language **comprehension** (e.g. Hirst, 1977; Cheng & Holyoak, 1985; Johnson-Laird, 1981; Waltz & Pollack, 1985). There has been relatively little discussion of the process of incorporating context in language **production**. None-the-less, in a general sense, it has been argued that context is utilised in language formulation to guide lexical choice and ensure a continuity and overall sense to the final production (Luria, 1976b; Vygotsky, 1962).

According to this framework incorporation of context into language must occur at all levels of discourse production from basic linguistic selection to the development of a sustained and sophisticated output. While contextual

influences on primary linguistic processes are unlikely to be affected by frontal lobe pathology, the frontal lobes can be argued to be integral to the incorporation of context into language production at a more complex level. What is required is further specification of the stage of production and the type of language which requires this frontal lobe involvement.

It can be assumed that formulation of an utterance is preceded by a preparatory analysis of the context in which the communication takes place. As was well exemplified by the study on the production of hints, the context provides an important infrastructure upon which the verbal communication can be built. By referring to conceptually relevant aspects of the context, the speaker can guide the listener's attention to his/her pragmatic intent without stating this explicitly.

Review of the pragmatic literature indicated that this is in fact, the more usual "modus operandis" in social communication for good reasons explained elsewhere (see Chapter 4). Even if the intention of the verbal communication is stated explicitly, incorporation of aspects of the communication context, in the verbal structure, as in the formulation of polite requests, is an important means by which social relationships are tacitly maintained.

Ability to analyse context is thus an integral process in the formulation of successful verbal communication. From the behaviour observed in the two CHI subjects studied, this capacity is not necessarily disrupted with frontal lobe impairment. Provided the communication context is familiar, simple or

straightforward, the salient features of the context can be readily detected and brought into play. Salient features not only include physical attributes of the environment, but also well defined social relationships, cultural values etc. Shallice's concept (1988) of routine operations and contention scheduling would appear to be of relevance here. Familiar communication contexts can be analysed routinely and appropriate verbal utterances selected on the basis of this, automatically.

Frontal lobe involvement was however required in order to deal with novel or complex communication demands adaptively. Frontal lobe functions appear to be necessary to analyse the context critically, to differentiate between those features which may be salient in the environment but not relevant, and those which may have an inferential connection only but which are more pertinent to the communication. The greater the distance between these perspectives, the more frontal lobe involvement is required, and the more disabled P.B. and A.S. became.

Frontal lobe pathology may disrupt these capacities in two different ways. P.B.'s inability to appreciate pertinent conceptual features in the environment stemmed from his inertia and concomitant rigidity as was apparent on neuropsychological assessment. This locked him into particular response sets and prevented him from seeing beyond the most concrete attributes. On the other hand, while A.S. was not rigid in this fashion, he was unable to perceive, or maintain a perception of, more elusive qualities of the communication context. Over-activation of cerebral processes resulting in

instability may have partially accounted for this, although this is unlikely to be the only contributing factor.

Deficits in planning an organised response have often been attributed to frontal lobe pathology. It is reasonable to speculate therefore, that frontal lobe functions may be integral in devising the overall structure of verbal productions also. There were discrete sequencing errors made by both CHI subjects in relating the dice game. Unfortunately, it is not possible to ascertain whether this was due to a planning deficit or arose in the execution of discourse.

9.2.1.3. Execution of Verbal Production.

The role of the frontal lobes in the execution of verbal productions has already been discussed in some detail. As defined by Luria, the frontal lobes perform a monitoring function which ensures the verbal output is in keeping with the original intention. This monitoring maintains the direction of the discourse and introduces corrections when deviations begin to occur. It might also be surmised that in normal frontal lobe function, monitoring and regulation of speech is a continuous process which **anticipates** the output.

Both A.S. and P.B. had major deficits in the self evaluation and monitoring of their utterances. This became more apparent the longer their utterance went on, whether this was a monologue, as in the dice game, or an interactional discourse, as in the more complex requests. Furthermore, the ability to correct deviations after the event, as demonstrated on occasion by

P.B., was unlikely to reflect normal correctional procedures. Neither subject had complete loss of regulation of speech. Both were able to maintain the goal of their utterances in broad terms, however deviations frequently rendered their communications clumsy, confusing and socially inadequate.

In the absence of accurate monitoring, the two subjects deviated from the discourse path in manners which represented their different activation problems. P.B.'s lowered drive resulted in a repetitive speaking style weighed down by myopic, concrete detours. A.S.'s over-activation resulted in frequent tangential digressions as he temporarily lost track of his initial goal in pursuit of irrelevant associations.

9.2.2. Language Comprehension

From these studies it seems that the frontal lobes are not only integral not only to verbal expression but to comprehension as well, although once again, involvement varies at the different stages of language reception.

In Chapter 6, both subjects showed their capacity to anticipate language when asked to guess the next word in video clips taken from popular television programs. According to the model of language comprehension advocated by Marslen-Wilson and Tyler (1980), language anticipation occurs due to the contextual effect of the preceding utterance. As the input is processed, it is mapped onto internal representations of lexical form. From these, higher level processes extract broader semantic and discourse features. These properties, extracted from the accumulating input, are available on a

continuous basis to restrict subsequent lexical mapping to legal or plausible options.

It would appear from the study in Chapter 6, that P.B. and A.S. were anticipating language normally. It could therefore be inferred that, at least in that task, the contextual processes involved represented basic linguistic functions and were not disrupted by frontal lobe pathology. Consideration of the material used however, raises important issues. The items chosen had a high degree of normal subject accuracy. This reflected the fact that in each item the verbal context was redundant in terms of its semantic, syntactic and "pragmatic" relationships. In other words, anticipation of the missing word was aided by simultaneous cues, all of which were consistent with each other at a number of levels.

This redundancy is often present in everyday communication, although perhaps over-represented in the media from which the video clips were taken. However, as was demonstrated in the experiments in Chapter 7 and 8, not all communication has a literal meaning which is simultaneously guided by its context, whether this be textual or nonverbal. In fact a great deal of language meaning is communicated by deliberately creating discrepancies between the various sources of information. In such cases, the tension between the context i.e. what is anticipated, and what is said intentionally conveys a different meaning altogether.

Sometimes, as with the indirect speech acts described in Chapter 7, the discrepancy is not great and there are elements of the context and the utterance in common which aid the interpretation. In others such as the sarcasm material in Chapter 8 normal subjects understand the conversational implicature because there is nothing in common between the context and the literal meaning of the utterance.

The pattern of deficit demonstrated by the two CHI subjects on the three tasks can thus be used to delineate a model of frontal lobe function in language comprehension. According to this model, the frontal lobes are not required to process familiar, redundant verbal material. This appears to a more automatic or basic process. To use Shallice's terminology, it progresses satisfactorily by contention scheduling alone.

The mental structure of the discourse, as described by Marslen-Wilson and Wilson (1980) is thereby constructed and used to facilitate subsequent language analysis. Frontal lobe involvement does however become integral, when the distance between what is expected and what occurs is deliberately manipulated by the speaker. As the discrepancy increases, so does the hearer's reliance on frontal lobes functions in order to resolve it.

As was seen in Chapter 7, P.B. began to have difficulty in the interpretation of very conventional indirect speech acts. This was considered to reflect his inertia and concomitant inability to shift from the concrete interpretation of the utterance. While A.S. managed this task normally, he was quite unable to

interpret contrary statements as reflecting a sarcastic interchange. In his case this impairment appeared less related to rigidity and more likely to reflect a specific failure to analyse the conceptual i.e. pragmatic relationships.

9.2.3. Summary of Model

In summary, frontal lobe function is integral to language processing in normal social communication settings. Proper cerebral activation is required to enable stable intentions to be formed which are the basis for the verbal utterance. Proper cerebral activation is also essential at all stages of language production, including preparatory analysis, lexical choice, execution, monitoring and self-evaluation. Impairments of both lowered and heightened activation will affect these skills although the particular manifestation of the language disorder will differ accordingly.

While routine utterances can be formulated without frontal involvement, novel social communication cannot. Frontal lobe function is integral to the adaptive conceptualisation of the communication context. This, in turn, is mandatory in order to produce effective, socially acceptable language which takes important contextual factors into account. The more subtle the conceptual requirements, the more reliant the speaker is on frontal lobe processes. There is also suggestion that the frontal lobes are integral to planning the overall structure of the discourse.

The frontal lobes are also integral in keeping the discourse on target, and for preventing deviation. Their role appears to encompass self evaluation and correction in an anticipatory fashion.

Comprehension is similarly dependent on intact frontal lobes. Routine, contextually redundant information can be processed effectively without frontal involvement. However, social language which is communicated by creating discrepancies between context and utterance is reliant on normal frontal function. The greater the tension between contextual cues, such as occurs with sarcasm, the more important is the reliance on frontal lobe processes to resolve it. Frontal lobe deficits lead to an inability to appreciate the inferential relationship between context and utterance for two possible reasons. One is the inability to ignore concrete features which precludes other analyses, the second is in inability to make the inferential connection itself.

9.2.4. Limits of model.

The model described above fits in well with the types of impairments experienced by P.B. and A.S.. It also extends current views of frontal lobe function into the realm of pragmatic language processes. However, there are a number of issues which require further exploration.

Firstly, the communication problems experienced by the two head-injured subjects were likely to be a product of a complex interplay of disrupted frontal processes. The frontal lobes constitute a large heterogenous area of cerebral tissue, with a highly complex role in the organisation and control of

thought and behaviour. The multi-focal nature of closed head injuries is therefore likely to have resulted in a breakdown of multiple processes in both cases. If there are indeed a number of processes contributing to these behaviours, then it is reasonable that these can be fractionated further.

Greater specification of frontal lobe processes in communication is therefore both desirable and empirically possible. A fruitful avenue may be the observation of the individual performances of other frontally impaired subjects on the tasks described in this study. Observation of the differences between A.S. and P.B. helped differentiate the role of some frontal functions in language. Presumably the extension of such observations with other frontally impaired subjects will enable delineation of other processes as well.

A second source of exploration lies in the formulation of new hypotheses concerning likely frontal involvement in other pragmatic language tasks. Empirical investigation of these would be useful to further refine both a model of frontal lobe function in communication as well as a model of pragmatic language use.

Another issue relates to the fact that the applicability of this model to other CHI subjects is limited. The model of language use described relies on the assumption that it is the frontal lobes and no other which are damaged. This was a reasonable assumption in the case of the two patients who were the subjects of this study given that both were clinically assessed as having mainly frontal impairments. It was also the result of a reasonable

methodological strategy which was to focus on cases with relatively pure frontal deficits, in order to delineate the effect of disruption to one cognitive system. The resultant model will have ramifications for a large proportion of CHI cases in whom it is mostly the frontal lobes which are disturbed.

However this model will not apply to a great number of CHI subjects with impairments in other cognitive systems. Not only, does frank aphasia occur in a small proportion of long-term CHI victims, but pathology to other areas of the brain may also affect language processes. The body of literature investigating right hemisphere lesions and language is a good example of speculation regarding non-frontal, non-left hemisphere contributions to linguistic performance. The role of memory impairment in communication skills also requires particular consideration since so many CHI subjects have major short term memory deficits.

9.3. Implications of Findings for Rehabilitation

9.3.1. Clinical Application of Methods Devised for Language Assessment

There are insufficient clinical tools with which to evaluate communication disorders after closed head injury. It is therefore pertinent to review the methods used in this thesis for their potential as clinical assessment techniques. These tasks were designed to explore language deficits in frontal patients and are therefore probably most useful in this type of assessment. This is particularly true since they presume a basic level of linguistic skill. Even so, given the tasks represent a more pragmatically oriented approach to

language assessment than many conventional procedures, they should certainly be tried as part of the assessment of other types of language impairments.

It was established in Chapter 4, that the frontal lobe impairments experienced by A.S. and P.B. were not disruptive to their ability to formulate simple requests. Nor were they compromised in their capacity to anticipate language in contexts which incorporated a high degree of redundancy (Chapter 6). So these tasks, while useful for exploring the level at which language processing broke down in the two CHI subjects, did not in themselves reveal language deficits. Furthermore, using the frontal lobe model advocated above, there is no apriori reason to believe that other frontal lobe injured patients would experience difficulties on them. Nor is it apparent, what other type of linguistic deficit would lead to a specific failure on such tasks. They therefore have limited potential as clinical assessment techniques.

The dice game proved however, to be a very useful stimulus to elicit measurable language impairment. Group data on the subjective rating scales confirmed that the CHI subjects were performing in a way which was qualitatively inferior to normals. What is required however, is a less ambiguous and more economical scoring system.

Cohesion analysis as defined by Hasan (1984) was a time consuming process and ultimately not productive with these cases. The exception to this was

the measurement of exophoric and endophoric possessive pronouns. This analysis was not particularly difficult, and the results were useful in identifying where and how the discourse lost continuity.

The most useful analysis in terms of measuring the overall organisation of the discourse was that which detailed the number and order of propositions made. Once preliminary work had established the potential range of propositions, break-down of individual texts into the various propositions was a relatively simple procedure. Problems with repetition, detail, sequencing, irrelevant intrusions, and poor monitoring were then easily apparent.

This is a welcome finding since there is a conventional wisdom within clinical settings that many of the deficits seen following head injury are not elicited in formal structured settings. The dice game task, while quite structured, was sufficiently complex to elicit many of the discourse impairments the CHI subjects suffered in spontaneous situations. Its advantage over monitoring of spontaneous conversation was that the constraints of the task requirement and the stimulus material made the expressive output amenable to uniform measurement and therefore cross comparison. This is an important asset in both experimental research and clinical practice.

Another procedure that was sensitive to the CHI subjects impairments was the hinting task. This required an extensive amount of preparatory work in order to establish a hierarchy of responses. Once these are in place, classification of subject responses is not difficult. Ratings of directness, while

theoretically of interest, proved not to be so productive in the final analysis. The hinting task therefore holds considerable promise in the assessment of communication disorders. It would enable the clinician to assess the patient's ability to perceive and use conceptual aspects of the communication context.

In order to make the hinting task useful as a clinical assessment technique, it would be valuable to include a greater variety of tasks. This would necessitate further work in the collection of normal responses. These are necessary, not only to delineate the normal range, but also to establish the chain of practical logic commonly being utilised. This would be a fruitful line of enquiry, not only as a means to generate assessment material for clinical populations, but also to further understanding about the reasoning normally involved in the formulation of social language. The parameters of the task might well be broadened to encompass speech acts other than requests. For example some data, which was not formally reported in this thesis, was generated by asking subjects to make complaints and to make a criticism diplomatically. By broadening the range of speech acts investigated differential impairments might well be uncovered in different clinical cases. For example it is anticipated on the results of the findings of this study that A.S. with his poor impulse control and agitation, would be particularly poor at making a complaint in a socially acceptable manner. P.B. on the other hand, with his negatively polite, apologetic demeanour, may well manage this type of interaction more successfully. This area of research thus represents one of the richest ones for future research and is especially ecologically relevant.

The indirect speech act material (Chapter 7) produced useful measures of P.B.'s concrete stimulus-bound behaviour. This behaviour had however, already been elicited using more conventional neuropsychological techniques. Otherwise, as demonstrated by the two subjects, and as anticipated on the basis of the language model advocated, there is little reason to believe that frontal damage would lead to impairments on this task. Its contribution to clinical assessment of such disorders is therefore not so innovative as some of techniques developed in this thesis.

Finally the sarcasm task differentiated between the controls and the CHI subjects extremely well. It also elicited an incapacity to make inferential links by A.S. which was not otherwise demonstrated. The task is therefore potentially of clinical use. However, for clinical application to be considered, a better, less arduous scoring system is required.

There was some variability between judges concerning the particular category individual responses fell into, when the responses were inadequate. This was the case for both literally consistent and conflicting sentence pairs. This variability was dealt with by collapsing categories in the analysis. There was however, very little disagreement between judges in their classification of the CHI responses as not indicating a sarcastic interpretation. In future applications scoring of responses would be simplified greatly simply by using a criterion of either "sarcastic" or "not sarcastic".

From this overview it can be concluded that three out of the six tasks used in this study, have important clinical application. These three tasks are useful for both the detection of pragmatic language failure and also as a means of exploring the nature of the failure. Further research does however need to be done to expand the range of techniques, to elaborate their scope and in some instances to refine the scoring techniques.

9.3.2. Implications for Therapeutic Intervention.

There is a growing body of literature which has addressed various issues in the clinical management of communication disorders following closed head injury (e.g. Malkmus, 1989; Marquardt, Stoll & Stussman, 1988; De Pompei & Zarski, 1989; Ylvisaker & Szekeres, 1989; Erlich & Stapes, 1985; Sohlberg & Mateer, 1989). This literature reflects increasing awareness that CHI communication deficits are highly disabling in terms of social interaction and that their remediation should therefore be cast within that framework.

Rehabilitation of communication has traditionally focused at three levels; retraining of the deficit skills, usually by repetitive exposure; training of alternative strategies to overcome impairments and management of the patients' environment so as to ameliorate the impact of their deficits on their lives.

The usefulness of direct retraining in other language disorders, such as aphasia, is a controversial issue. Direct retraining of frontal lobe functions is patently unlikely to succeed. The frontal lobes are mainly involved in

detection and adaption to novel situations. The idea of retraining this capacity by repetitive exposure is therefore somewhat paradoxical and would have to be handled in a divergent way. Frontal lobe functions, such as executive control and conceptual abilities are notoriously resistant to direct therapeutic intervention (Lezak, 1987).

Development of alternative strategies to overcome impaired frontal processes may prove a more fruitful avenue. Ylvisaker and Szekeres (1989) have described a variety of interventions designed to improve self monitoring and self evaluation in communication. These include the use of progressive feedback from the therapist to help orientate the patient to his/her strengths and weaknesses. They also advocated the use of external feedback such as graphs and charts and the development of self questioning strategies to improve monitoring.

Other researchers have reported the use of groups to improve awareness of communication practices. Gajar, Schloss, Schloss & Thompson, (1984) utilised either therapist controlled or group controlled feedback in the form of light signals to improve group conversational skills. Ehrlich and Sipes (1985) have advocated the use of role models and role plays to provide strategies and feedback.

So a variety of techniques are being developed to address remediation of communication skills after CHI. These techniques are also aimed at improving skills within a social context. Detection of communication

incompetancies and feedback in therapy in all cases described, was reliant on listener intuition, although observations made by Gajar et al. (1990) and Erlich and Sipes (1985) were guided by discourse theory. While obviously, this is an ecologically valid approach, there is also room for further specification of the communication behaviours observed. Feedback as a technique is only as effective as it is specific. Careful diagnosis is therefore crucial to the success of such remediation strategies.

The communication disorder needs to be addressed by; 1) specifying the particular cognitive impairment the patient is suffering; 2) specifying the particular pragmatic demands of communication tasks he/she is faced with and; 3) anticipating how the cognitive impairment will be manifested in the patient's communication output. Once these parameters are articulated, a new source of potential feedback to the patient becomes available to provide an external source of monitoring and specific instruction will become possible. A pragmatic analysis of each communication task attempted will provide explicit information for the development of effective communication strategies. The methods described in this thesis are of relevance here.

The third direction of rehabilitation involves the re-integration of the patients into their social environment. As part of this process counselling and educational input to the family of the head injured patient is integral (De Pompei & Zarski, 1989). The implications of the findings of this thesis for communication breakdown between family members and the CHI individual are clear. Constellations of frontal lobe deficits may lead to failure of the CHI

patient to detect nuance, implicature, hints, etc. and may simultaneously result in a blunt ineffective communication style. Furthermore, because these deficits are not basic, that is do not disrupt primary language functioning, it is natural that family and friends are likely to interpret them incorrectly as volitional and to react with aggression and rejection. By pinpointing these pragmatic deficits as real organic impairments, family processes can be adapted to encompass them. Specific education of family members will minimise their potential misunderstandings of poor communication practices and will also enable them to communicate with the patient clearly by avoiding overly complex or subtle conversational strategies.

9.4. Conclusion

This study was primarily concerned with delineating communication disorders after closed head injury. Firstly, it was shown that techniques could be developed which reliably detect communication disorders not detected and analysed using conventional assessment techniques. By the use of control subjects and blind raters it was shown that the CHI subjects were performing differently on certain tasks compared to the normal range and confirmed empirically that this difference was detrimental to the communication competence of the subjects.

Secondly, it was demonstrated that the nature of the language deficits perceived could be explained on the basis of known cognitive impairments associated with frontal lobe pathology. The behaviour of the two CHI

subjects on the range of pragmatic tasks given, enabled a model of frontal lobe involvement in language to be specified. This model attributed a specific role to frontal lobe functions, in the pragmatic production and interpretation of language.

Thirdly, as an adjunct to the primary aim of this research, the process of developing the techniques resulted in empirical evaluation of some pragmatic theories. This yielded new insights into an understanding of pragmatic language processes. These were incorporated into the model of language described.

Finally the study yielded useful diagnostic tools for the assessment of pragmatic language skills and demonstrated the scope for further research in this field.

REFERENCES

Alexander, M.P., Benson, D.F., & Stuss, D.T. (1989). Frontal lobes and language. Brain and Language, **37**, 656-691.

Alexander, M.P. & Freedman, M. (1984). Amnesia after anterior communicating aneurysm rupture. Neurology, **34**, 752-757.

Armstrong, E. (1987). Cohesive harmony in aphasic discourse and it's significance to listener perception of coherence. In Brookshire, R.H. (Ed.). Clinical Aphasiology (Volume 17), Minneapolis: BRK Publishers. 210-215.

Aten, J.L., Caligiuri, M.P. & Holland, A.L. (1982). The efficacy of functional communication therapy for chronic aphasia patients. Journal of Speech and Hearing Disorders, **47**, 93-96.

Beck, A. (1984). The processing of sounds and meanings of ongoing speech by aphasic patients. Brain and Language, **22**, 320-338.

Benton, A.L. (1968). Differential behavioural effects in frontal lobe disease. Neuropsychologia, **6**, 53-60.

Bernstein-Ellis, E., Wertz, R.T., Dronkers, N.F. & Milton, S.B. (1985). P.I.C.A. Performance by traumatically brain injured and left hemisphere CVA patients. In Brookshire, R.H. (Ed.). Clinical Aphasiology (Volume 15). Minneapolis: BRK Publishers. 97-106.

Bihrle, A.M., Brownell, H.H., Powelson, J.A. & Gardner, H. (1986). Comprehension of humerous and nonhumorous materials by left and right brain-damaged patients. Brain and Cognition, **5**, 399-411.

Bolton, S.O. & Dashiell, S.E. (1984). Interaction Checklist for Augmentative Communication: An Observational Tool to Assess Interactive Behaviour. Idyllwild, C.A.: Imaginart Communication products.

Bottenberg, D., Lemme. M. & Hedberg, N. (1987). Effect of story content on narrative discourse of aphasic adults. In Brookshire, R.W. (Ed.). Clinical Aphasiology (Volume 17). Minneapolis: BRK Publishers. 202-209.

Brain, L. & Walton, J.W. (1969). Brain's Diseases of the Nervous System, (Seventh Ed.) London: Oxford University Press.

Braun, C.M.J. & Baribeau, J.M.C. (1987). Subclinical aphasia following closed head injury: A response to Sarno,Buonaguro and Levita. In Brookshire R.W. (Ed.). Clinical Aphasiology (Volume 17). Minneapolis: BRK Publishers. 326-333.

Brown, P. & Levinson, S. (1978). Universals in language usage: Politeness Phenomenum. In Goody, E.N. (Ed.). Questions and Politeness: Strategies in Social Interaction. Melbourne: Cambridge University Press.

Brown, P. & Levinson, S. (1978). Politeness: Some Universals in Language Use, Cambridge: Cambridge University Press.

Brownell, H.H., Michel, D., Powelson, J. & Gardner, H. (1983). Suprise but not sensitivity to verbal humor in right hemisphere patients. Brain and Language, **18,** 20-27.

Brownell, H.H., Potter, H.H. & Bihrle, A.M. (1986). Inference deficits in right brain damaged patients. Brain and Language, **27,** 310-321.

Brownell, H.H., Potter, H., Michelow, D. & Gardner, H. (1984). Sensitivity to lexical denotation and connotation in brain damaged patients: a double dissolution? Brain and Language, **22,** 253-265.

Campbell, J. (1976). Psychometric theory. In Dunnette, M.D. & McNally, R. (Eds.). Handbook of Industrial and Organisational Psychology, Chicago: Rand McNally College Publishing Company.

Canavan, A., Janota, I. & Schurr, P.H. (1985). Luria's frontal lobe syndrome: Psychological and anatomical considerations. Journal of Neurology, Neurosurgery and Psychiatry, **48,** 1049-1053.

Caplan, D. (1981). On the cerebral localisation of linguistic functions: Logical and empirical issues surrounding deficit analysis and functional localisation. Brain and Language, **14,** 120-137.

Caplan, D. (1986). Theoretical and methodological considerations in aphasia research and practice: Connections between linguistics, neurosciences and aphasia. In Brookshire, R.W. (Ed.). Clinical Aphasiology (Volume 16). Minneapolis: BRK Publishers. 14-22.

Caramazza, A. (1984). The logic of neuropsychological research and the problem of patient classification in aphasia. Brain and Language, **21,** 9-20.

Caramazza, A. (1986a). Theoretical and methodological considerations in aphasia research and practice: Valid inference about the structure of normal language processes from patterns of acquired language dysfunction are only possible for single case studies. In Brookshire, R.W. (Ed.). Clinical Aphasiology (Volume 16). Minneapolis: BRK Publishers. 2-13.

Caramazza, A. (1986b). On drawing inferences about the structure of normal cognitive systems from the analysis of patterns of impaired performance: The case for single-patient studies. Brain and Cognition, **5,** 41-66.

Caramazza, A. & Badecker, W. (1989). Patient classification in neuropsychological research. Brain and Cognition, **10,** 256-295.

Caramazza, A. & McCloskey, M. (1988). The case for single patient studies. Cognitive Neuropsychology, **5,** 517-527.

Caramazza, A, & Zurif, E.B. (1976). Dissociation of alogorithmic and heuristic processes in language comprehension: Evidence from aphasia. Brain and Language, **3,**

572-582.

Chapman, S.B. & Ulatowska, H.K. (1989). Discouse in aphasia: Integration deficits in processing reference. Brain and Language, **36,** 651-668.

Cheng, P.W. & Holyoak, K.J. (1985). Pragmatic reasoning schemas. Cognitive Psychology, **17,** 391-416.

Chertkow, H. & Bub, D. (1990). Senatic memory loss and dementia of the Alzheimer's type. Brain, **113,** 397-417.

Cicone, M., Wapner, W. & Gardner, H. (1980). Sensitivity to emotional expressions and situations in organic patients. Cortex, **16,** 145-158.

Clark, H.H. (1979). Responding to indirect speech acts. Cognitive Psychology, **11,** 430-477.

Clark, H.H. (1982). The relevance of common ground: Comments on Sperber and Wilson in Smith N.V. (Ed.). Mutual Knowledge, London: Academic Press.

Clark, H.H. (1987). Four dimensions of language use. **in** Verschueren, J. and Bertercelli-Papi, M.B. (Eds.). The Pragmatic Perspective: Proceedings of the 1985 International Pragmatic Conference. Amsterdam, Philadelphia: John Benjamins.

Clark, H.H. & Gerrig, R.J. (1984). On the pretense theory of irony. Journal of Experimental Psychology: General, **113,** 121-126

Clark, H.H. & Haviland, S.E. (1982). Comprehension and the given-new contract. In Freedle, R.O. (Ed.). Discourse Production and Comprehension: Advances in Discourse Processes,(Vol 1). New Jersey: Ablex Publishing Corporation.

Clark, H.H. & Lucy, P. (1975). Understanding what is meant from what is said: A study in conversationally conveyed requests. Journal of Verbal Learning and Verbal Behaviour, **14,** 56-72.

Clark, H.H. & Schunk, D.H. (1980). Polite responses to polite requests. Cognition, **8,** 111-143.

Cole, P. (Ed.). (1978). Syntax and Semantics: Pragmatics (Vol. 9). New York: Academic Press.

Cole, P. (Ed.). (1981). Radical Pragmatics. New York: Academic Press.

Cole, P. & Morgan, J.L.(Eds.). (1975). Syntax and Semantics: Speech acts (Vol. 3). New York: Academic Press.

Courville, C.B. (1945). Pathology of the Nervous System (Second Edition). California Pacific Press: Mountain View, California.

Cronbach, L.J., Gleser, G.C., Nanda, H. & Rajaratnam, N. (1972). The Dependability of

Behavioural Measurements: Theory of Generalisability for Scores and Profiles. Canada: John Wiley and Sons.

Damasio, A.R. & Van Hoesen, G.W. (1983). Emotional disorders associated with focal lesions of the limbic frontal lobe. In Heilman, K.M. & Satz, P. (Eds.). Neuropsychology of Human Emotion. New York: Guilford Press.

Damico, J.S. (1985). Clinical discourse analysis: A functional approach to language assessment. In Simon C.S. (Ed.). Communication Skills and Classroom Success. San Diego; Taylor and Francis.

Davis, G.A. (1986). Theoretical and methodological considerations in Aphasia research and practice: Communication. In Brookshire, R.W. (Ed.). Clinical Aphasiology (Volume 16). Minneapolis: BRK Publishers. 29-37.

Deane, A. (1987). "Like I'm not raving an I?": Ability to shift and maintain topic following severe blunt head injury. Honours thesis (unpublished), Macquarie University, Sydney.

Delis, D., Wapner, W., Gardner, H. & Moses, J. (1983). The contribution of the right hemisphere to the organisation of paragraphs. Cortex, **19**, 43-50.

De Pompei, R. & Zarski, J.J. (1989). Families, head injury, and cognitive-communicative impairments: Issues for family counselling. Topics in Language Disorders, **9**, 78-89.

Drewe, E.A. (1975). An experimental investigation of Luria's theory on the effects of frontal lobe lesions in man. Neuropsychologia, **13**, 421-429.

Dunnette, M.D. & McNally, R. (Eds.). (1976). Handbook of Industrial and Organisational Psychology Chicago: Rand McNally College Publishing Company.

Edgington, E.S. (1980). Randomisation Tests: Statistics, Textbooks and Monographs (Vol. 31). New York: Marcel Dekker, Inc..

Eppel, M.L., Gatz, M. & Frank, S.J. (1983). The relationship between children's development of abilities in social and spatial perspective taking. Journal of Genetic Psychology, **143**, 143-144.

Ehrlich, J. & Barry, P. (1989). Rating communication behaviours in the head injured. Brain Injury, **3**, 193-198.

Ehrlich, J. & Spies, A. (1985). Group treatment of communication skills for head trauma patients. Cognitive Rehabilitation, **3**, 32-37.

Field, C., Kneebone, A. & Reid, M.W. (Eds.). (1986). Brain Impairment: Proceedings of the Eleventh Annual Brain Impairment Conference. Australian Society for the study of Brain Impairment c/o Bethesda Hospital, 30 Erin Street, Richmond Victoria.

Flavell, J.H. (1975). The Development of Role Taking and Communication Skills in

Children. New York: R.E. Krieger Publishing Company.

Fodor, J.A. (1983). The Modularity of Mind. Cambridge, M.A.: M.I.T.Press.

Foldi, N.S. (1987). Appreciation of pragmatic interpretations of indirect commands: comparison of right and left hemisphere brain damaged patients. Brain and Language, **31,** 88-108.

Franick, E.P. & Clark, H.H. (1985). How to make requests that overcome obstacles to compliance. Journal of Memory and Language, **24,** 560-568.

Freedman Stein, R., Ulatowska, H., Baker, T. & DeLacoste, P. (1984). Disruption of written language in aphasia: A case study. Brain and Language, **22,** 181-205.

Friederici, A. (1985). Levels of processing and vocabulary types: evidence from on-line comprehension in normals and aggramatics. Cognition, **19,** 133-166.

Gallagher, T.M. & Prutting, C.A. (Eds.). (1983). Pragmatic Assessment and Intervention Issues in Language. California: College Hill Press.

Gardner, H. (1975). The Shattered Mind. New York: Knopf.

Gardner, H., (1983). Frames of Mind. New York: Basic Books.

Gardner, H., Ling,K., Flamm, L. & Silverman, J. (1975). Comprehension and appreciation of humor in brain damaged patients. Brain, **98,** 399-412.

Gardner, H. & Winner, E. (1985). Attitudes and attributes: Childrens' understanding of metaphor and sarcasm, In Perlmutter, M. (Ed.). Minnesota Symposium on Child Psychology. New Jersey: Hillsdale.

Gibbs, R.W. (1982). A critical examination of the contribution of literal meaning to understanding non literal discourse. Text, **2,** 9-28.

Gibbs, R.W. (1986). On the psycholinguistics of sarcasm. Journal of Experimental Psychology, **115,** 3-15.

Goffman, E. (1971). Relations in Public. New York: Basic Books.

Goffman,E. (1976). Replies and responses. Language in Society, **5,** 257-313.

Goodglass, H. & Kaplan, E. (1972). The Assessment of Aphasia and Related Disorders. London: Henry Kimpton publishers.

Goody, E.N. (Ed.). (1978). Questions and Politeness: Strategies in Social Interaction. Melbourne: Cambridge University Press.

Gordon, D. & Lakoff, G. (1971). Conversational postulates Papers from the seventh regional meeting of the Chicago Linguistic Society

Gordon, D. & Lakoff, G. (1975). Conversational postulates in Cole, P & Morgan, J.L. (Eds.). Syntax and Semantics: Speech Acts (Vol. 3). New York: Academic Press. (Reprint of 1971 paper)

Graham, L.F., Holtzapple, P. & La Pointe, L.L. (1987). Does contextually related action facilitate auditory comprehension? Performance across three conditions by high and low comprehenders In Brookshire, R.W. (Ed.). Clinical Aphasiology (Volume 17). Minneapolis: BRK Publishers. 180-187.

Grice, H.P. (1975). Logic and conversation, In Cole, P. & Morgan, J. (Eds.). Syntax and Semantics: Speech Acts (Vol. 3). New York: Academic Press.

Grice, H.P. (1978). Further notes on logic and conversation, in Cole, P. (Ed.). Syntax and Semantics: Pragmatics (Vol. 9). New York: Academic Press.

Groher, M. (1977). Language and memory disorders following closed head trauma. Journal of Speech and Hearing Research, **20**, 212-223.

Grosswasser, Z., Mendelson, L., Stern, M.J., Schecter, I. & Najenson,T. (1977). Re-evaluation of prognostic factors in rehabilitation after severe head injury. Scandanavian Journal of Rehabilitation Medicine, **9**, 147-149.

Hagan,C. (1984). Language disorders in head trauma. In Holland, A. (Ed.). Language Disorders in Adults. San Diego: College Hill Press.

Hagan,C. (1982). Language-cognitive disorganisation following closed head injury: A conceptualisation. In Trexler, L. (Ed.). Cognitive Rehabilitation: Conceptualisation and Intervention. New York: Plenum Press.

Halliday, M.A.K. (1985). An Introduction to Functional Grammar. Sydney: Edward Arnold.

Halliday, M.A.K. & Hasan, R. (1976). Cohesion in English, (English language series 9). London: Longmans.

Halliday, M.A.K. & Hasan, R. (1985). Language, Context, and Text: Aspects of Language in a Social-semiotic Perspective. Victoria: Deakin University Press.

Hasan,R. (1984). Coherence and cohesive harmony. In Flood, J. (Ed.). Understandimg Reading Comprehension. Newark, Delaware: International Reading Association.

Hasan, R. (1985). The texture of a text. In Halliday, M.A.K. & Hasan, R. Language, Context, and Text: Aspects of Language in a Social-semiotic Perspective. Victoria: Deakin University Press.

Hecaen, H. (1978). Right hemisphere contribution to language. In Buser, P.A. & Rouget-Buser, A. (Eds.). Cerebral Correlates of Conscious Experience. Elselvier: North Holland Biomedical Press.

Heilman, K.M., Safran,A. & Geshwind, N. (1971). Closed head trauma and aphasia.

Journal of Neurology, Neurosurgery and Psychiatry, **34,** 265-269.

Heilman, K.M. & Satz, P. (Eds.). (1983). Neuropsychology of Human Emotion. New York: Guilford Press.

Hier, D.B., & Kaplan, J. (1980). Verbal comprehension deficits after right hemisphere damage. Applied Psycholinguistics, **1,** 279-294.

Hillis Trupe,E. & Hillis,A. (1985). Paucity versus verbosity: Another analysis of right hemisphere communication deficits. In Brookshire, R.W. (Ed.).Clinical Aphasiology (Volume 15). Minneapolis: BRK Publishers. 83-96.

Hirst, G. (1977). Focus in reference resolution in natural language understanding. Paper presented at the Language and Speech Conference, University of Melbourne, 1977.

Hirst, W., LeDoux, J. & Stein, S. (1984). Constraints of processing indirect speech acts: Evidence from aphasiology. Brain and Language, **23,** 26-33.

Holbourn, A.H.S. (1943). Mechanics of head injuries. Lancet, **2,** 438-441.

Holland, A.L. (1977). Some practical considerations in aphasia rehabilitation. In Sullivan, M. & Kommers, M.S. (Eds.). Rationale for Adult Aphasia Therapy. Nebraska: University of Nebraska Medical Center.

Holland, A.L. (1982). Observing functional communication of aphasic adults. Journal of Speech and Hearing Disorders, **47,** 50-56.

Holland, A.L. (1984). When is aphasia aphasia? The problem of closed head injury. In Brookshire, R.W. (Ed.). Clinical Aphasiology (Volume 14). Minneapolis: BRK Publishers. 345-349.

Holland, A.L. (Ed.). (1984). Language Disorders in Adults, San Diego: College Hill Press.

Hough, M.S. (1990). Narrative comprehension in adults with right and left hemisphere brain-damage: Theme organisation. Brain and Language, **38,** 253-277.

Huber,W. & Gleber, J. (1982). Linguistic and nonlinguistic processing of narratives in aphasia. Brain and Language, **16,** 1-18.

Joanette,Y., Goulet, P., Ska.,B. & Nespoulous, J. (1986). Informative content of narrative discourse in right brain damaged right handers. Brain and Language, **29,** 81-105.

Johnson-Laird, P.B. (1981). Comprehension as the construction of mental models. Phil. Trans. R. Soc. London, **295,** 353-374.

Jorgenson, J., Miller, G., & Sperber, D. (1984). Test of the mention theory of irony. Journal of Experimental Psychology: General, **113,** 112-120.

Kacmarek, B.L.J. (1984). Neurolinguistic analysis of verbal utterances in patients with focal lesions of the frontal lobes. Brain and Language, **21,** 52-58.

Kahn, H.J., Joanette, Y., Ska, B., & Goulet, P. (1990). Discourse analysis in neuropsychology: Comment on Chapman and Ulatowska. Brain and Language, **38,** 454-461.

Kaplan, J.A., Brownell, H.H., Jacobs, J.R. & Gardner, H. (1990). The effects of right hemisphere damage on the pragmatic interpretation of conversational remarks. Brain and Language, **38,** 315-333.

Kertesz, A. (1981). Western Aphasia Battery. New York: Grune & Sratton.

Kraus, J.F., Black, M.A., Hessol, N., Ley, P., Rokaw, W., Sullivan, C., Bowas, S., Knowlton, S., & Marshall, L. (1984). The incidence of acute brain injury and serious impairment in a defined population. American Journal of Epidimiology, **199,** 186-201.

Kruez, R.J. and Glucksberg,S. (1989). How to be sarcastic: The echoic reminder theory of verbal irony. Journal of Experimental Psychology: General, **118,** 374-386.

Lakoff, R. (1973). The logic of politeness; or minding your p's and q's. In Papers from the Ninth Regional Meeting, Chicago Linguistic Society. Chicago: Chicago Linguistic Society. pp. 292-305

Lakoff, R. (1977). What you can do with words: Politeness, pragmatics and performatives. In Rogers, A., Wall, B. & Murphy, J.P. (Eds.). Proceedings of the Texas conference on Performatives, Presuppositions and Implicatures. Arlington, Va.: Center for Applied Linguistics.

LeDoux, J.F., Blum, C. and Hirst, W. (1983). Inferential processing of context: studies of cognitively impaired subjects. Brain and Language, **19,** 216-224.

Leech, G.N. (1980). Pragmatics and Beyond: Explorations in Semantics and Pragmatics. Amsterdam: John Benjamins BV.

Lemme, M.L. (1986). Theoretical and methodological considerations in aphasia research and practice: Response to Caramazza: Information Processing. In Brookshire, R.W. (Ed.). Clinical Aphasiology (Volume 16). Minneapolis: BRK Publishers.23-28.

Lesser, R. & Reich, S. (1982). Language disorders. In Burton,A. (Ed.). & Herriot, P. (general ed). Psychology in Progress: The Pathology and Psychology of Cognition. London: Mathuen.

Levin, H.S., Grossman, R.G. & Kelly, P.J. (1976). Aphasic disorders in patients with closed head injury, Journal of Neurology, Neurosurgery and Psychiatry, **39,** 1062-1070.

Levin, H.S., Grossman, R.G., Rose, S.E. & Teasedale, G. (1979). Long term neuropsychological outcome of closed head injury. Journal of Neurosurgery, **50,** 412-422.

Levinson, S.C. (1983). Pragmatics. Sydney: Cambridge University Press.

Lezak, M.D. (1978). Living with the characterologically altered brain injured patient. Journal of Clinical Psychiatry, **39,** 592-598.

Lezak, M.D. (1983). Neuropsychological Assessment. New York: Oxford University Press.

Lezak, M.D. (1987) Assessment for rehabilitation planning. In Meier, M., Benton, A.L. & Diller, L. (Eds.). Neuropsychological Rehabilitation. New York: Guilford Press.

Luria, A.R. (1973). The Working Brain. London: Penguin.

Luria, A.R. (1976a). Higher Cortical Functions in Man. London: Basic Books.

Luria, A.R. (1976b). Basic Problems in Neurolinguistics. The Hague: Mouton & Co.

McCloskey, M. & Caramazza, A. (1988). Theory and methodology in cognitive neuropsychology: A response to our critics. Cognitive Neuropsychology, **5,** 583-623.

McDonald, S. & Wales, R. (1986). An investigation of the ability to process inferences in language following right hemisphere brain damage. Brain and Language, **29,** 69-80.

McFie, J. and Thompson, J.A. (1972). Picture arrangement: A measure of frontal lobe function? British Journal of Psychiatry, **121,** 547-552.

McKinlay, W.W., Brooks, D.N., Bond, M.R. Martinage, D.P. & Marshall, M.M. (1981). The short term outcome of severe blunt injury as reported by relatives of the injured persons. Journal of Neurology, Neurosurgery and Psychiatry, **44,** 527-533.

Mackisack, L.E., Myers, P.S. & Duffy, J.R. (1987). Verbosity and labelling behaviour: The performance of right hemisphere and non brain damaged adults on an inferential picture description task. in Brookshire, R.J. (ed.), Clinical Aphasiology (Volume 17). Minneapolis: BRK Publishers. 143-151.

Malkmus, D.D. (1989). Community re-entry: Cognitive-Communicative intervention within a social skill context. Topics in Language Disorders, **9,** 50-66.

Marquardt, T.P., Stoll, J. & Sussman, H. (1988). Disorders of communication in acquired cerebral trauma. Journal of Learning Disabilities, **21,** 340-351.

Marsh, D.T., Serafica, F.C. & Barenboim, C. (1981). Interrelationships amongst perspective taking, interpersonal problem solving and interpersonal functioning. Journal of Genetic Psychology, **138,** 37-48.

Marshall, J.C. (1986). The description and interpretation of aphasic language disorders. Neuropsychologia, **24,** 5-24.

Marslen-Wilson, W.D., Brown,C. & Tyler, L.K. (1988). Lexical representations in spoken language comprehension. Language and Cognitive Processes,

Marslen-Wilson, W.D. & Tyler L.K. (1980). The temporal structure of spoken language understanding. Cognition, **8**, 1-71.

Mehler, J., Morton,J. & Jusczyk, P. (1984). On reducing language to biology. Cognitive Neuropsychology, **1**, 83-116.

Mentis, M. & Prutting, C.A. (1987). Cohesion in the discourse of normal and head injured adults. Journal of Speech and Hearing Research, **30**, 88-98.

Milner, B. (1964). Some effects of frontal lobectomy in man. In Warren, J.M. & Akert, K.(Eds.).The Frontal Granular Cortex and Behaviour. New York: McGraw Hill.

Milton, S.B., Prutting, C.A. & Binder, G.M. (1984). Appraisal of communication competence in head injured adults. In Brookshire, R.W. (Ed.). Clinical Aphasiology (Volume 14). Minneapolis: BRK Publishers. 114-123.

Milton, S.B. & Wertz, R.T. (1986). Management of persisting communication deficits in patients with traumatic brain injury. In Uzzell, B.P. & Gross, Y. (Eds.). Clinical Neuropsychology of Intervention. Boston: Martinus Nijhoff Publishing.

Molloy, R., Brownell, H.H., & Gardner, H. (1990). Discourse comprehension by right hemisphere stroke patients: Deficits of prediction and revision. In Joanette,Y. & Brownell, H.H. (Eds.) Discourse Ability and Brain Damage: Theoretical and Empirical Perspectives. New York: Springer-Verlag.

Myers, P.S., Linebaugh, C.W. & Mackisack-Morin, L. (1985). Extracting implicit meaning: right versus left hemisphere damage. in Brookshire,R.J. (Ed.). Clinical Aphasiology (Volume 15). Minneapolis: BRK Publishers. 72-80.

Najenson, T., Sazbon, l., Fiselzon, J., Becker, E. & Schecter, I. (1978). Recovery of communication functions after prolonged traumatic coma, Scandanavian Journal of Rehabilitation Medicine. **10**, 15-21.

Norman, D.A. & Shallice,T. (1986). Attention to action: willed and automatic control of behaviour. In Davidson, R.J., Schartz, G.E. & Shapiro, D. (Eds.). Consciousness and Self Regulation (Vol.4). New York: Plenum Press.

Novoa, O.P. and Ardila, A. Linguistic abilities in patients with prefrontal damage, (1987). Brain and Language, **30**, 206-225.

Ober, B., Dronkers, N., Koss, E., Delis, E. & Friedland, R. (1986). Retrieval from semantic memory in Alzheimer's type dementia. Journal of Clinical and Experimental Neuropsychology, **8**, 75-92.

Oppenheimer, D.R. (1968). Microscopic lesions in the brain following head injury. Journal of Neurology, Neurosurgery and Psychiatry, **31**, 299-306.

Porch, B.E. (1981). The Porch Index of Communicative Ability: Administration, Scoring and Interpretation. Palo Alto: Consulting psychologists press.

Preisler, B. (1986). Linguistic Sex roles in Conversation. Berlin: Mouton de Gruyler and Co.

Prigatano, G.P., Roueche, J.R. & Fordyce, D.J. (1986). Neuropsychological Rehabilitation after Brain Injury. Baltimore: John Hopkins University Press.

Prutting, C.A. (1982). Pragmatics as social competence. Journal of Speech and Hearing Disorders, **47,** 123-134.

Prutting, C.A. & Kirchner, D.M. (1983). Applied pragmatics. In Gallagher,T. & Prutting, C.A. (Eds.). Pragmatic Assessment and Intervention Issues in Language. San Diego: College Hill Press.

Prutting, C.A. & Kirchner, D.M. (1987). A Clinical Appraisal of the pragmatic aspects of language. Journal of Speech and Hearing Disorders, **52,** 105-119.

Rivers, D.L. & Love, R.J. (1980). Language performance on visual processing tasks in right hemisphere lesion cases. Brain and Language, **10,** 348-366.

Roman, M., Brownell, H.H., Potter, H.H. & Seibold, M.S. (1987). Script knowledge in right hemisphere damaged and in normal elderly adults. Brain and Language, **31,** 151-170.

Rollins, J. & Deane, A. (1987). Language and Head Injury. Paper presented at the annual conference of the Australian Association of Speech and Hearing, Canberra

Ross, E.D. & Mesulum, M.M. (1979). Dominant language functions of the right hemisphere? Prosody and emotional gesturing. Archives of Neurology, **36,** 144-148.

Rubens, A.R. (1976). Transcortical motor aphasia. **In** Whitaker,H. & Whitaker, H.A. (Eds.). Studies in Neurolinguistics. New York: Academic Press.

Sadock, J.M. (1974). Towards a Linguistic Theory of Speech Acts. New York: Academic Press.

Sarno, M.T. (1980). The nature of verbal impairment after closed head injury. Journal of Nervous and Mental Diseases, **168,** 685-692.

Sarno, M.T. (1984). Verbal impairment after closed head injury: Report of a replication study. Journal of Nervous and Mental Diseases, **172,** 475-479.

Sarno, M.T. (1988). 1. Head Injury: Language and Speech defects Scandanavian Journal of Rehabiltation. (Med. Suppl.), **17,** 55-64.

Sarno, M.T., Buonaguo, A. & Levita, E. (1986). Characteristics of verbal impairment in closed head injury patients. Archives of Physical Medicine and Rehabilitation, **67,** 400-405.

Schwartz, M.F. (1984). What the classical aphasic categories can't do for us why. Brain and Language, **21,** 3-8.

Seigel,S. & Castellan, N.J. (1988). Nonparametric Statistics for the Behavioural Sciences, Sydney: McGraw-Hill.

Searle, J.R. (1969). Speech Acts, Cambridge, M.A.: Cambridge University Press.

Searle, J.R. (1975). Indirect speech acts. in Cole,P. & Morgan, J.L. (Eds.). Syntax and Semantics: Speech acts (Vol.3). New York: Seminar Press.

Shallice, T. (1979). Case Study approach in Neuropsychological Research. Journal of Clinical Neuropsychology, **1,** 183-211.

Shallice, T. (1988). From Neuropsychology to Mental Structure, New York: Cambridge University Press.

Shantz, C.V. (1975). Empathy in relation to social cognitive development. The Counselling Psychologist, **5,** 18-21.

Shrout, P.E. & Fleiss. J.L. (1979). Intraclass correlations: Uses in assessing rater reliability, Psychology Bulletin, **86,** 420-428.

Simon, C.S. (Ed.). (1985). Communication Skills and Classroom Success. San Diego; Taylor and Francis.

Slugoski, B.R. & Turnbull, W. (1988). Cruel to be kind and kind to be crual: Sarcasm, banter and social relations. Language and Society, **7,** 101-121.

Snow, P., Lambier, J., Parson, C., Mooney, L., Couch, D. & Russell, J. (1986). Conversational skills following closed head injury: some preliminary findings. In Field, C., Kneebone, A. & Reid, M.W. (Eds.). Brain Impairment: Proceedings of the Eleventh Annual Brain Impairment Conference. Australian Society for the study of Brain Impairment c/o Bethesda Hospital, 30 Erin Street, Richmond, Victoria.

Snow, P., Mealings, M. & Ponsford, J. (1984). Pragmatic aspects of communication issues and management. In Field, M., Hendy, J., Roberts, C. & Hopkins, P. (Eds.). Proceedings of the Eighth Annual Brain Impairment Conference. Australian Society for the study of Brain Impairment c/o Bethesda Hospital, 30 Erin Street Richmond, Victoria.

Sohlberg, M.M. & Mateer, C.A. (1989). Introduction to Cognitive Rehabilitation: Theory and Practice. New York: The Guilford Press.

Sperber, D. (1984) Verbal irony: pretense or echoic mention? Journal of Experimental Psychology: General, **113,** 130-136.

Sperber, D. & Wilson, D. (1981). Irony and the use mention distinction in Cole, P. (Ed.). Radical Pragmatics. New York: Academic Press.

Sperber, D. & Wilson, D. (1986). Relevence: Communication and Cognition. Oxford: Basil Blackwell.

Sperber, D. & Wilson, D. (1987). Precis of Relevence: Communication and Cognition. Behavioural and Brain Sciences, **14,** 697-754.

Strayer, J. (1980) A naturalistic study of empathic behaviours and their relation to affective states and perspective taking skills in pre-school children. Child Development **51,** 815 - 822.

Stritch, S. (1956). Diffuse degeneration of the cerebral white matter in severe dementia following head injury. Journal of Neurology, Neurosurgery and Psychiatry, **19,** 163-185.

Stritch, S. (1970). Lesions in the cerebral hemispheres after blunt head injury. In Sevitt, S. & Stoner,H.B. (Eds.). The Pathology of Trauma. London: BMA House.

Stubbs,M. (1983). Discourse analysis: the sociolinguistic analysis of natural language. Language and Society; Number 4, Oxford: Basil Blackwell.

Stuss, D.T. & Benson, D.F. (1986). The Frontal Lobes. New York: Raven Press.

Stuss., D.T., Alexander, M.P., Leiberman, A., & Levine.H. (1978). An extraordinary form of confabulation. Neurology, **28,** 1166-1172.

Tate, R.L., Broe. G.A. & Lulham, J.M. (1989). Impairment after severe head injury: the results from a consecutive series of 100 patients. Acta Neurologica Scandinavia. **79,** 97-107.

Tate, R.L., Lulham, J.M., Broe, G.A., Strettles, B. & Pfaff, A. (1989). Psychosocial outcome for the survivors of severe blunt head injury: The results from a consecutive series of 100 patients. Journal of Neurology, Neurosurgery and Psychiatry, **52,** 1128-1134.

Tompkins, C.A. & Mateer, C.A. (1985). Right hemisphere appreciation of prosodic and linguistic indications of implicit attitude. Brain and Language, **24,** 185-203.

Thomsen, I.V. (1975). Evaluation and outcome of aphasia in patients with severe closed head trauma. Journal of Neurology, Neurosurgery and Psychiatry, **38,** 713-718.

Thomsen, I.V. (1984). Late outcome of very severe blunt head trauma: A 10-15 years second follow up. Journal of Neurology, Neurosurgery and Psychiatry, **47,** 260-268.

Tyler, L.K. (1985). Real-time comprehension processes in aggramatism: A case study. Brain and Language, **26,** 259-275.

Tyler, L.K. (1988). Spoken language comprehension in a fluent aphasic patient. Cognitive Neuropsychology, **5,** 375-400.

Tyler, L.K., Marslen-Wilson, W., Rentoul, J. & Hanney, P. Continuous and discontinuous acess in word recognition: The role of derivational prefixes. Journal of Memory and Language, **27,** 368-381.

Ulatowska, H.K., Freedman-Stern, R., Weiss Doyel, A. & Macluso-Haynes, S. (1983).

Production of narrative discourse in aphasia. Brain and Language, **19**, 317-334.

Ulatowska, H.A., North, A.J. & Macluso-Haynes, S. (1981). Production of narrative and procedural discourse in aphasia. Brain and Language, **13**, 345-371.

Uzzell, B.P. & Gross, Y. (Eds.). (1986). Clinical Neuropsychology of Intervention. Boston: Martinus Nijhoff Publishing.

Vygotsky, L.S. (1962). Thought and Language (trans. Haufmann, E. & Vakar, G.). Massachusett Institute of Technology, Cambridge, Massachusetts: The M.I.T.press.

Walsh, K.W. (1978). Neuropsychology: A Clinical Approach. Edinburgh: Churchill Livingston.

Walsh, K.W. (1986). Understanding Brain Damage: A Primer of Neuropsychological Evaluation. Edinburgh: Churchill Livingston.

Waltz, D.L. & Pollack, J.B. (1985). Massively parallel parsing: A strongly interactive model of natural language interpretation. Cognitive Science, **9**, 51-74.

Wapner,W., Hamby,S. & Gardner,H. (1981). The role of the right hemisphere in the apprehension of complex linguistic materials. Brain and Language, **14**, 15-32.

Warren, J.M. & Akert, K.(Eds.). (1964). The Frontal Granular Cortex and Behaviour. New York: McGraw Hill.

Wegner, M.L., Brookshire, R.H. & Nichols, L.E. (1984). Comprehension of main ideas and details in coherent and non coherent discourse by aphasic and non aphasic listeners. Brain and Language, **21**, 37-51.

Weinstein, E.A. (1971). Linguistic aspects of amnesia and confabulation. Journal of Psychiatric Research, **8**, 1-8.

Weinstein, E.A. & Kahn, R.C. (1955). Denial of Illness: Symbolic and Physiologic Aspects. Springfield I.L.: Thomas.

Weschler, A.F. (1973). The effect of organic brain disease on recall of emotionally charged versus neutral narrative texts. Neurology, **23**, 130-135.

Weylman, S.T., Brownell, H.H. & Gardner, H. (1988). "It's what you mean not what you say": Pragmatic language use in brain damaged patients. in. Plum,F. (Ed.). Language, Communication and the Brain. New York: Raven Press.

Weylman, S.T., Brownell, H.H., Roman, M. & Gardner, H. (1989). Appreciation of indirect requests by left and right damaged patients: The effects of verbal context and conventionality of wording. Brain and Language, **36**, 580-591.

Whitaker, H.A., & Slotnick, H.B. (1988). Comments on "The case for single patient studies": Is neuropsychology possible? Cognitive Neuropsychology, **5**, 529-533.

Whitaker, H. & Whitaker, H.A. (Eds.) (1976). Studies in Neurolinguistics. New York: Academic Press.

Wilcox, M.J., Davis,G.A. & Leonard, B.L. (1978). Aphasics comprehension of contextually conveyed meaning. Brain and Language, **6,** 362-377.

Winner, E. & Gardner, H. (1977). Comprehension of metaphor in brain damaged patients. Brain, **100**, 719-727.

Ylvisaker, M. & Szekeres, S.F. (1989) Metacognitive and executive impairments in head-injured children and adults. Topics in Language Disorders, **9,** 34-49.

Zurif, E.B., Gardner. H., & Brownell, H.H. (1989). The case against the case against group studies. Brain and Cognition, **10,** 237-255.

APPENDIX 1. SERIAL NEUROPSYCHOLOGICAL ASSESSMENTS AND DATA (ALL REFERENCE TO NORMATIVE DATA IS TAKEN FROM LEZAK (1983)).

A.S.: ASSESSMENT 4 MONTHS POST-TRAUMA

On interview he was noted to be extremely garrulous, unable to monitor and control his talking. His conversation leapt from one topic to another unless interrupted and directed. He was however able to apply himself to testing and was anxious to perform well.

A.S.'s performance yielded a variable profile on a standard intelligence test (WAIS). Overall however, indication was that premorbidly he had been well above average. He also demonstrated normal psychomotor speed. He was able to learn simple verbal and visuo-spatial material, provided this was structured for him. His major deficits were those attributable to frontal lobe dysfunction.

A.S. was unable to learn complex material of either a verbal or nonverbal nature. His approach was disorganised and fragmented and his recall was contaminated with intrusions from previous tasks. Performance on other problem solving tasks was similarly impaired. While he could often verbalise what was required of him he could not monitor his performance and would rush ahead without planning his responses. Rule breaking errors were therefore frequent due to poor impulse control.

At this stage A.S. was considered to have only limited insight into his disabilities or their likely consequences.

A.S.: NEUROPSYCHOLOGICAL TEST SCORES 4 MONTHS POST-TRAUMA

W.A.I.S.

Subtest	Scaled score
Information	7
Comprehension	13
Arithmetic	12
Digit Span	11
Digit Symbol	11
Picture Compl.	10
Block Design	9
Object Assembly	9

Weschler Memory Scale

Subtest	Raw Score
Information	5
Orientation	5
Mental Control	8
Prose Passages	8.5
Digit Span	12 (7/5)
Vis. Rep.	12 (3,4,2,3)
Ass. Learning	12.5 (5/0, 6/1, 6/3) (delay 6/2)

Verbal Fluency	F	A	S	
Words/minute	15	6	10	(50-54%)
"illegal" words	3	7	2	

Rey Auditory Verbal Learning

Trial	1	2	3	4	5	List B	A	Recog.
No. words	5	5	8	10	12	5	7	11
Intrusions	3	2	1	0	1	3	3	4

Rey-Osterrieth Complex Figure

Copy	31	(organisation reasonable but rushed and careless in execution)
Recall	23	(within the 50th percentile)

Trail Making Test

Trail	Time	Errors	Percentile
A	32 secs.	1	50
B	62 secs.	2	50-75

Porteus Mazes

Maze	VIII	IX	XI	XIV	Adult
No. trials	1	1	1	2	1

Austin (Milner) Maze

Trial	1	2	3	4	5	6	7	8	9	10
Errors	12	6	11	7	5	3	3	3	2	2

Trial	11	12	13	14	15	16	17	18	19	20
Errors	2	1	3	0	2	0	1	1	4	0

A.S.: ASSESSMENT 10 MONTHS POST TRAUMA

A.S.'s talkativeness remained a major feature of his presentation. On this occasion even complex visuospatial problem solving tasks were completed quickly and easily, demonstrating a major improvement in this regard. Qualitatively however, his approach remained disorganised and impulsivity and carelessness were still evident. These deficits impeded his ability to deliver an error free performance on a complex visuospatial learning task, despite indication that he was able to learn it quite quickly.

Despite modest quantitative improvement, his performance on verbal tasks remained poor. As before, he could learn and retain simple material with repetition but was unable to apply strategies with which to deal with complexity. His performance on a verbal association task indicated rapid generativity (well above average) but a failure to adhere to the rules.

A.S.: NEUROPSYCHOLOGICAL TESTS SCORES 10 MONTHS POST-TRAUMA.

W.A.I.S.

Subtest	Scaled Score
Block Design	14
Pic. Arrange.	7

Weschler Memory Scale

Subtest	Raw score
Prose passages	8.5

Verbal Fluency

	F	A	S
Words/minute	14	10	16
"illegal" words	2	5	0
	(80-84th.%)		

Colour Form Sort

successful and quick

Rey Auditory Verbal Learning

Trial	1	2	3	4	5	List B	A
No. words	4	9	9	10	13	8	8
Intrusions	3	1	1	0	1	2	2

Rey-Osterrieth Complex Figure

Copy	27	(organisation reasonable but rushed and careless in execution, missing 2 lines)
Recall	21	(within the 50th percentile)

Austin (Milner) Maze

Trial	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Errors	12	4	3	3	1	1	2	1	0	2

Trial	**11**	**12**	**13**	**14**
Errors	0	1	1	0

A.S.: ASSESSMENT 4 YEARS, 4 MONTHS POST-TRAUMA

Years later, A.S. had continued to make modest gains. His ability to form and shift between concepts was good, his visuospatial learning had improved further and he was better able to inhibit impulsive behaviour, although he remained abnormal in this regard. His verbal learning was still depressed and continued to be characterised by intrusions. His conversational style was unchanged.

A.S.: NEUROPSYCHOLOGICAL TEST SCORES 4 YEARS POST-TRAUMA

W.A.I.S.-R.

Subtest	**Scaled Score**
Vocabulary	10
Digit Span	8

Trail Making Test

Trail	**Time**	**Errors**	**%**
A	17 secs.	0	>90
B	50 secs.	0	>90

Rey-Osterrieth Complex Figure

Copy	29	(organisation reasonable but rushed and careless in execution)
Recall	24	(within the 50th percentile)

Written verbal Fluency	S (5 minutes)	C (4 minutes)
Number of words	37	9
Illegal words	0	0

Wisconsin Card Sorting Test

Category	**C**	**F**	**N**	**C**	**F**	**N**
No. Cards	11	23	11	13	12	11

Austin (Milner) Maze

Trial	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Errors	14	12	8	2	1	0	1	0	0	0

Selective Reminding Test

Trial	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Words	6	8	8	8	8	8	9	9	10	10
Intru.	2	2	2	0	0	0	0	1	0	0

Trial	**11**	**12**	**13**
Words	9	8	9
Intru.	0	0	1

A.S.: APHASIA EXAMINATION 4 YEARS, 4 MONTHS POST-TRAUMA

Western Aphasia Battery	Maximum possible	Obtained
Spontaneous Speech		
- information content	10	10
- fluency	10	9
Comprehension		
- Yes/No questions	60	57
- Auditory word recognition	60	60
- Sequential commands	80	75
Repetition	100	100
Naming		
- Object naming	60	60
- Word Fluency	20	18
- Sentence Completion	10	10
- Responsive naming	10	10

Aphasia Quotient = 96.8 (normal)

B.S.: ASSESSMENT 4 MONTHS POST TRAUMA

On interview, B.S. was a little restless and had some trouble maintaining his attention. His conversation wandered from topic to topic. He was orientated in person and place but was a lilltle confused regarding time. he was however cooperative and applied himself willingly to the tasks at hand.

Assessment revealed an intact immediate memory span, but B.S. had difficulty with the mental manipulation of even simple material. He also demonstrated a very slow speed of information processing.

He was able to learn very simple verbal and visuospatial information and could retain

this over time. With more complex material however, B.S. had significant difficulty. He was disorganised and ineffective in his approach and required external prompts to aid his recall. He did not however have intrusions in his recall.

Problem solving tasks were also performed poorly. B.S. was haphazard in his approach and he required the provision of an external structure to enable him to complete more complex tasks. His thinking was obviously slow and inefficient. He was concrete in his analysis of information and he had difficulty shifting flexibly between ideas. Perseveration of responses was a major feature. He also demonstrated an incapacity to operate within the rules set even although he could correctly verbalise the correct procedures. He showed a superficial monitoring of his performance, being unaware of making errors and occasional inappropriate responses to questions.

B.S.: NEUROPSYCHOLOGICAL TEST SCORES 4 MONTHS POST-TRAUMA

W.A.I.S.

Subtest	Scaled score
Information	12
Comprehension	-
Arithmetic	-
Similarities	8
Digit Span	9
Vocabulary	-
Digit Symbol	-
Picture Comp.	7
Block Design	5
Object Assembly	8

Weschler Memory Scale

Subtest	Raw Score
Information	6
Orientation	5
Mental Control	6
Prose Passages	10
Digit Span	9 (6/3)
Vis. Rep.	11
Assoc.Learn.	9.5 (4/0, 5/1, 6/1) (delay 6/1)

Verbal Fluency	F	A	S	Animals
Words/minute	6	5	5	-
"illegal" words	6	1	14	

Rey Auditory Verbal Learning

Trial	1	2	3	4	5	List B	A	Recog.
No. words	6	7	8	8	13	6	8	13
Intrusions	0	0	0	0	0	0	0	0

Rey-Osterrieth Complex Figure

Copy	35	(piecemeal organisation)
Recall	21	(within the 50th percentile)

Trail Making Test

Trail	Time	Errors	Percentile
A	92 secs.	0	<10%
B	240 secs	4	<10%

Porteus Mazes

Maze	VI	VII	VIII	IX	X	XI	XII	XIV	Adult
No.trials	1	1	1	1	1	1	1	2	1

Benton Visual Retention Test

	Obtained	Expected
Correct	7	9
Errors	6	2

B.S.: ASSESSMENT 12 MONTHS POST-TRAUMA

On this occasion B.S.'s conversation was considered over elaborate, although appropriate. Tangentiality was no longer apparent, at least in this assessment. He displayed rather shallow affect and poor eye contact.

B.S. had improved substantially in his capacity to retain even quite complex verbal and visuospatial material over time. He was also moderately improved in his capacity to manipulate information mentally. Other improvements were apparent although they were quantitative only.

While he was better able to inhibit incorrect and perseverative responses he was still deficient in this capacity. He continued to break rules despite being able to verbalise them. He also continued to have great difficulty monitoring his performances and learning from his mistakes. His approach to problem solving tasks remained slapdash and haphazard.

B.S.: NEUROPSYCHOLOGICAL TEST SCORES 12 MONTHS POST-TRAUMA.

W.A.I.S.

Subtest	Scaled score
Information	13
Comprehension	11
Arithmetic	9
Similarities	8
Digit Span	9
Vocabulary	12
Digit Symbol	-
Picture Compl.	7
Block Design	5
Object Assembly	8

Weschler Memory Scale

Subtest	Raw Score
Information	6
Orientation	5
Mental Control	7
Prose Passages	9.5
Digit Span	11 (7/4)
Vis. Rep.	11
Assoc.Learn.	14.5 (5/1, 6/2,6/3)

Verbal Fluency	C	F	L	Percentile	Animals
Words/minute	8	8	7	11-22	15
"illegal" words	2	1	1		

Rey Auditory Verbal Learning

Trial	1	2	3	4	5	List B	A	Recog.
No.words	5	8	11	11	13	5	11	14
Intrus.	0	0	0	0	0	0	0	0

Rey-Osterrieth Complex Figure

Copy	32 (piecemeal organisation)
Recall	28.5 (within the 50th percentile)

Trail Making Test

Trail	Time	Errors	Percentile
A	99 secs.	0	<10%
B	270 secs.	0	<10%

Benton Visual Retention Test

	Obtained	Expected
Correct	8	9
Errors	4	2

N.A.R.T.
32 errors

Austin (Milner) Maze

Trial	1	2	3	4	5	6	7	8	9	10
Errors	21	11	30	8	10	10	9	7	10	7

Trial	11	12	13	14	15	16	17
Errors	5	5	9	10	5	2	6

APPENDIX 2.1: TRANSCRIPTIONS OF THE ELEVEN TEXTS EXPLAINING THE DICE GAME.

The first section of each of the subjects explanations only, are displayed since it was this portion which was the subject of study. The transcriptions have been divided into clauses and have been coded in a number of ways to indicate the source of material for some of the analyses.

1. Rating scales

The transcriptions given out for rating were not divided into clauses or marked in any way. They were not displayed in that format here for reasons of space.

2. Cohesion analysis, stage 1 and analysis of type of lexicogrammatical tie.

Not all clauses were used in these analyses. Clauses which operated in simply a discursive manner (e.g. "what we've got to do") were excluded from the cohesion analysis. Substituted items including pronoun substitution used in the analyses are underlined. Ellipsis is indicated by underline and an asterix with the implied word in brackets.

3. Reference analysis.

Reference included substitution and ellipsis from the above analysis as well as personal possesive pronouns, all demonstratives including "the' and comparatives. When direct repetitions occurred, only the first reference was counted in the reference analysis. "There" used to introduce an element (e.g. "there are two cars") was not considered to have a true demonstrative function and when used as such was not part of the analysis.

4. Propositional analysis

Propositons contained in each clause are numbered on the right hand side. The proposition the number refers to can be found in Appendix 2.6. Repeated propositions were included in the propositional analysis. There was not a one to one correspondence between clause and proposition. On some ocassions one clause presented several propositions. On another, several clauses were involved in the unfolding of one proposition. Where there is a clause without a proposition number beside it, it can be taken that it belongs to a clause complex. The proposition that the complex proposes is then represented by a number beside the last clause in the complex.

NON BRAIN DAMAGED SUBJECTS

TRANSCRIPTION		PROPOSITION
1.DM		
1.	OK we've got two cars and a dice	4,6,
2.	which is coloured three colours red, yellow, green right	30,31,32,33,
3.	and there is one side of **the** dice	
4.	which is coloured black.	34
5.	Now **the** board consists of red,green and yellow spaces,	17
6.	going red,green,yellow then red, green yellow, red, green,yellow etc.	18
7.	and we start at one end of **this** series of red green yellow spaces	27
8.	and we progressively move down to **the** end of **the** board in one direction	28
9.	then we come back up **the** board along **the same** series of red green yellow spaces to **the** finish line.	29
10.	What we've got to do	8
11.	is throw **the** dice	38
12.	and if **the** red side of **the** dice lands face up	39
13.	you move **your** car along to **the** nearest **the** first red space	
14.	that **you** come to	40
15.	if it lands yellow side up	39
16.	you move it along to **the**first yellow space and so on.	40
17.	If **the** black side of **the** dice comes up	
18.	then you miss a turn	41
19.	you don't move along	41
20.	so then you keep throwing **the** dice alternately between you and **your** opposition	42
21.	till one of you ultimately gets to **the** finish line,	44
22.	* (you) throwing **the** dice,	
23.	* (you) moving along to **the** next of **those** coloured squares,	42
24.	get the idea?	
25.	now what does it look like	

Summary

Clauses relevent to cohesion = 22
Substitutions = 14
Ellipsis = 2

clauses relevent
to prop. analysis = 23
No. propositions = 23

Demonstratives, comparatives
and possessives = 38
I known exophoric reference
("we" clause 1.)
1 unknown exophoric reference
("the"clause 5)

TRANSCRIPTION		PROPOSITION
2.BK		
1.	right it's a board game	5
2.	which has two cars	4
3.	and they're to go up one side of the board and *(they go) down the other side of the board,	14.15
4.	they move from ah	
5.	they move up coloured squares	
6.	which are on the board	17
7.	and we determine the square	
8.	that the cars go on to,	
9.	by throwing a dice like object	6*,12,38
10.	which has colours on it's face	30
11.	so which ever colour faces upwards,	39
12.	You go to that space on the board	40
13.	except if black comes up on the toss	34*
14.	that means	
15.	you miss a turn	41
16.	and the ah.. colours of the cars are green and red	9,10
17.	so you have one *(car)	
18.	and I have one *(car)	11

Summary

Clauses relevent to cohesion = 18
Substitutions = 9,
Ellipsis = 3
Demonstratives, comparatives
and possessives = 25
I known exophoric reference
("we" clause 7.)
No unknown exophoric reference

Clauses relevent
to prop. analysis
=18
No. Propositions
=16

3.BN

TRANSCRIPTION		PROPOSITION
1.	OK Jen... what we have here	5
2.	is a rectangular piece of board	
	... right ..	20
3.	it's divided down **the** centre....	
	length ways...	
4.	and it's cut up in little tiny	
	sections of red green and yellow	
	red green yellow red green yellow.	18
5.	On **the** top of one side is **the** start ..	23
6.	on **the** opposite side **there's the** finish	24
7.	and what you have	
8.	is two little cars.	4
9.	one *(car)'s a red car	9
10.	and one *(car)'s a green car right...	10
11.	you're **the** green *(car)	12.
	and I'm **the** red *(car) ...	11
13.	and what we do ...	
14.	the idea is to	
15.	take **these** cars to **the** start ..	13
16.	take them down ... **the** rectangular	
	piece of board with all **the** little	
	colours on it ...	14
	and *(take them) up **the** other side	
	to **the** finish.	15
17.	how to get there	8
18.	we've got a little block ...	
	eight sided die ... we	6
19.	and it's got **the** colours on it	
20.	corresponding with **the** colours	
	on **the** board ..	30
	the green red yellow ...	31,32,33
21.	what ever (*colour) you throw on	
	that die	38,39
22.	**your** car moves to **that** position	40
23.	except on one side **there**'s a black	34
24.	and that means	
25.	you just stay where you are ...	41
26.	and **the** first one home wins	44

Summary

Clauses relevent to cohesion = 22
Substitutions = 17,
Ellipsis = 6,
Demonstratives, comparatives
and possessives = 24

Clauses
relevant to propositional
analysis = 26

No. propositions = 24

2 known exophoric reference
("we", "here") clause 1)
0 unknown exophoric reference

4.IS

TRANSCRIPTION		PROPOSITION
1.	right Jen, we're going to play **this** car game	4
2.	the idea is	
3.	to get from **the** start to **the** finish naturally, OK?	7
4.	and it's like a dice game	6
5.	and on **the** dice is a yellow a red and a green colours	31,32,33
6.	and on one side only **there**'s a black,	34
7.	if you throw **the** dice	38
8.	and **the** black comes up	
9.	you miss a turn	41
10.	because on **the** board **there**'s only red green and yellow stripes	5*,17*,18
11.	so when you throw **the** dice,	38
12.	whatever stripe comes up on **the** dice	39
13.	it corresponds with **the** board	
14.	that's **the** colour	
15.	you move to OK?	40
16.	If you throw a black colour	
17.	you relinquish **your** go	41
18.	because it's not on **the** board...	19
19.	OK is that understandable	

Summary

Clauses relevent to cohesion = 17
Substitutions = 11,
Ellipsis = 0,
Demonstratives, comparatives
and possessives = 15
2 known exophoric reference
("we, "this", clause 1.)
0 unknown exophoric reference

clauses relevent to
prop. analysis
=18
No. Propositions
=16

5.RF

TRANSCRIPTION		PROPOSITION
1.	OK **This** is a board game um...	5
2.	with two cars as **the** playing pieces	4
3.	and the idea is	

4.	you um you have to get your car to **the** finish line	
5.	before I do.	7
6.	OK **the** board is similiar .. to a monopoly board	
7.	I guess	48
8.	and you have to have it .. a die or a dice um and you	6
9.	except that rather than you.. rather than having **the** squares with **the** names on it like ParkLane and Mayfair	
10.	or whatever you have in **the** Australian version	
11.	I am only used to **the** England version	48
12.	you have coloured....various coloured squares	17
13.	and **the** die ...or **the** dice has um has has a colour	
14.	that's relevant to **the** colours on **the** board	30
15.	in other words **there** are three colours on **the** board, red, green, yellow	18
16.	and **there** are three colours on **the** dice, red, green and yellow	31,32,33
17.	and you...we take it in turns	
18.	to throw **the** dice um..	38
19.	if you you throw green	39
20.	you move **your** vehic..**your** your your playing piece or **your** car up to **the** green square or **the** next green square (cough)	40
21.	if you throw yellow	39
22.	you move **your** car up to **the** next yellow square ,	40
23.	if you throw red	39
24.	you move **your** car up to **the** next red square.	40
25.	you take it in turns	
26.	to throw **the** dice.	42
27.	you have to end...	
28.	**the** last colour on **the** board is red	26
29.	and you have to end with **the** red red throw	43
30.	or you have to throw **the** dice	
31.	so **the** red faces up ..	43
32.	um what else do I have to tell you ..	
33.	on ..**the** ..dice...**there** are two two yellow sides to **the** dice two red sides to **the** dice and one green side to **the** dice	31,32,33
34.	and **the** sixth side is actually black,	34
35.	which means	

36.	you lose a turn	
37.	if you throw a black	41
38.	or if **the** black lands..	
39.	**the** black face sits up..um...	41

Summary

Clauses relevent to cohesion = 38
Substitutions = 27,
Ellipsis = 0,
Demonstratives, comparatives
and possessives = 41
3 known exophoric reference
("this" clause 1,
"you" clause 4,"I", clause 5)
0 unknown exophoric reference

Clauses relevant
to prop. analysis
=39

No. propositions
=29

6.BM

TRANSCRIPTION		PROPOSITION
1.	right **the** game is a um	
2.	it's a board game ah so long board for um long	5
3.	and it's divided down **the** middle	20
4.	and **your** tors which in this case were two cars	4
5.	progress down one side and then	
*	*(progress) up **the other**... (6)...	
*	yeh * (progress) up **the other** side	14,15
6.	**the** means... (5)... means of progression is through a..	
7.	it's a block	12
8.	which is like a dice, six sided dice	6
9.	and it has different colours on it, red green yellow	31,32,33
10.	they're **the** three main colours,	
11.	**the** board itself now is divided up into **these** colours so	
12.	you've got coloured strips	17
13.	as you go down, red green yellow red green yellow red green yellow	18
14.	and it comes up **the** other side yellow green red yellow green red.. **same in reverse** order.	29
15.	now when you throw **the** dice	38
16.	**the** colour that comes up colour	39
17.	you move **your** car to **that** colour	40
18.	and then **the other** partner throws	
19.	and **their** colour they move **their** car	42
20.	and you continue down **the** board like that	36

*	and *(continue) up **the other** side.	37
21.	You.....	
22.	**the** last colour is a red	26
23.	and so in order to finish	
24.	you must throw a red	43
25.	to get there **the** finish	43
26.	the only other point is	
27.	that **there** is	
28.	one side of **this** block is a black side.	
29.	It's painted black	34
30.	and if that comes up	
31.	you miss a turn	41

Summary

Clauses relevent to cohesion = 33
(including 3 ellip.)
Substitutionss = 18,
Ellipsis = 3,
Demonstratives, comparatives and
possessives = 23
2 known exophoric reference
("the" cls 1, "your", cls 4)
1 unknown exophoric reference
(ambiguous "it" cls.14)

Clauses relevant
prop. analysis
= 31

No. Propositions
= 24

7.GL

TRANSCRIPTION		PROPOSITION
1.	OK Sally I'm going to explain to you **this** game	
2.	that **we've** just played	
3.	it's a very simple game	
4.	so it shouldn't take very much	
5.	to understand,	2
6.	firstly **the** parts of **the** game it consist	
*	of a board a long board with different coloured stripes across it	3,5,17
7.	and **the** stripes are red green and yellow ..	18
8.	on **this** board **there** are two toy motor cars	4
9.	move along in response to **the** colours	
10.	which show up on a dice	12
11.	there's also a dice	6
12.	which has red green and yellow sides as well as a black side	31,32,33,34

13.	now the way ..is that ..	
14.	that **the** game's played	8
15.	**the** cars are placed at **the** start on one end of **the** board,	35
16.	**the** person who goes first goes first	
17.	throws **the** dice	38
18.	and **the** colour which comes up on **the** dice	39
19.	they move **their** motor car **their** little toy car onto **the** next colour of **that**..**the** next square of **that** particular colour	40
20.	ah **the** other person then has a go	
21.	and does like wise ...	42
22.	if a black if black turns up	
23.	they don't move	41
24.	they stay up on the square	
25.	that they're on	41
26.	because **there** are no black squares on **the** board no black stripes on **the** board	19
27.	um that's basically it	
28.	but then they move down **the** board **the** board	36
29.	you could play it just as easily on a long board with **the** start and finish on opposite ends	49
30.	in **this** particular case **the** start and finish are on **the same** end	22
31.	but after having gone down **the** board	28
32.	they turn around and come back	29
33.	so that they end up at **the** same end	
34.	as they started at	22
35.	they come back on **the other** side of a black line down **the** middle of **the** board	20

Summary

Clauses relevent to cohesion = 35
Substitutions = 19,
Ellipsis = 0,
Demonstratives, comparatives and possessives = 35
2 known exophoric reference ("I","this",cl.1."we"cl.2)
0 unknown exophoric reference

Clauses relevent to prop.analysis = 35

No. propostions = 28

8.GW

TRANSCRIPTION		PROPOSITION
1.	you realise	
2.	I can cheat like mad here (Jen laughs)	
3.	alright Jen we've got a little game here	1
4.	which is...	
5.	involves two cars	4
6.	one *(car)'s green	10
7.	one *(car)'s red	9
8.	and we've got a board	5
9.	which represents ...	
10.	it's a rectangular shape	
11.	and it represents a race track	16
12.	I take it	
13.	we've got a start and a finish	21
14.	we go down **the** length of **the** board	28
15.	and then we turn around	
16.	and we come back up **the other** side.	29
17.	On **this** board we've got three colours	
	red green and yellow	17,18
18.	and we have a dice,	6
19.	on opposite sides of ah..one section of	
	the dice we have yellow	31
21.	on opposite sides of **the other** faces we	32
22.	and on **the** two remaining faces we have green	33
23.	and we have black.	34
24.	If you cast **the** dice	38
25.	and *(you) turn up black	
26.	you miss a turn,	41
27.	if you cast **the** dice	38
28.	whatever colour comes up	39
29.	you move **the** car on to **the** appropriate	40
30.	that's on **the** board	
31.	and the colours (noise)	
32.	I thought someone was coming in..	
33.	and **the** colours are um alternating	
	red green yellow red green yellow etc. OK?	18

Summary

Clauses relevent to cohesion = 27
Substitutions = 18,
Ellipsis = 3,
Demonstratives, comparatives and
Possessives = 13
1 known exophoric reference
("we" clause 3.)
0 unknown exophoric reference

Clauses relevant to
prop. analysis
= 29

No. propositions
= 22

9.SM

TRANSCRIPTION		PROPOSITION
1.	right OK right we've got **this** game here	1
2.	and we've got two small cars	4
3.	we've got a red car and a green car	9,10
4.	and we've got a start and a finish	21
5.	and we have a number of colours	
6.	painted on **the** board with a black line down **the** long centre of **the** board **the** long... ah rectangle	17,20
7.	now in **this** game we have a small block	6
8.	which has got um colours on it red yellow green and black now	31,32,33,34.
9.	we each have a turn	
10.	at throwing **the** block	38
11.	and each time um **the** um colour comes up	39
12.	you move move **the** car to **that** colour on **the** board	40
13.	or **the next** colour on **the** board that is **that** colour	40
14.	all except black because **there**'s no black	19,41*
15.	Once we get down to **the** end of **the** board on one side ah of **the** dividing line	36
16.	we have to turn around	
17.	and * (we) come back to **the** finish.	37
18.	**The** finish is on a red line	26
19.	which is in line with in line with **the** start,	22
20.	so we go right round **the** end of **the** board on one side	36
21.	* (we) turn around	
22.	and *(we) come right back to **the** finish	37
23.	using **this** block um and **the** two small two small cars	42

Summary

Clauses relevent to cohesion = 23
Substitutionss = 12,
Ellipsis = 3,
Demonstratives, comparatives and possessives = 25
I known exophoric reference ("we","this" clause 1)
0 unknown exophoric reference

Clauses relevent to prop. analysis = 23

No. propositions = 25

HEAD INJURED SUBJECTS

TRANSCRIPTION		PROPOSITION
1. A.S.		
1.	well you've got the cars	
2.	facing the wrong way for a start ..	50
3.	OK now we have a game here	1
4.	it's sort of 2 cars like the drivers	4?
5.	and you've got coloured coloured	
6.	like between the start and the finish	
	you	17*,21
	you've got 3 different colours	
7.	is that right 3 different colours	17*
8.	and on this dice here you've got three	
	dice here you	6*,30,34.
9.	and if you roll a black well	
10.	it means that	
11.	you don't move	41
12.	and it's just a matter of	
13.	* (you) roll the dice	38
14.	and * (you) move the car to to the colour	40
15.	that you roll	39
16.	which is nearest to the car...	
	in the forward motion not in a backward motion	51
17.	now how's that	

Summary

Clauses relevent to cohesion = 14
Substitutions = 11,
Ellipsis = 2,
Demonstratives, comparatives and possessives = 11
2 known exophoric reference ("you",cls.1"we",cls 3.)
4 unknown exophoric reference ("the",cls.1,2,and 3. "this" cls.8)

Clauses relevent to prop. analysis = 16

No. propositions = 14

2. P.B.

TRANSCRIPTION		PROPOSITION
1.	well Julie the game consists of	
	a a a race track	5,16
2.	that goes	
3.	um I don't know	

4.	what **the** road is	
5.	it goes **the** way	
	the building goes	
7.	it goes up and	
8.	it goes back over toward **33** over	45
	towards **33**	45
9.	**that** end of **the** game is **the**	
	race track ...	
10.	is **the** finish line	47
11.	there's two cars, a red car and	
	a green car and ah a little dice	4,9,10,6
12.	which has ah red green yellow and	
	black ...	31,32,33,34
13.	if you throw it	38
14.	and you land on a red line	39?
15.	ah *(you) throw it	38
16.	and **the** dice sort of shows red	39
17.	you move **your** car	40 (I)
18.	sorry sorry I should start	
19.	**the** race track is marked red green	
	and yellow ...	17,18
20.	red green and yellow lines across	
	it corresponding to **the** dice...	30
21.	if you throw **the** dice	38
22.	so it shows up red	39
23.	you move **your** car up to **the** red line	40
24.	if you throw it	38
25.	so it shows up green	39
26.	you you move **your** car up to **the** green	
	and so forth you ...	40
27.	every time you take it in turns	
28.	throwing **the** dice	
29.	and whatever colour shows up	
30.	you move **your** car up to **that** colour,	42
31.	except if **the** dice is black the dice	
32.	if it shows up black you	
33.	you don't move **your** car anywhere	41
34.	you just ...	
35.	you just miss a ...	
36.	well it's sort of like	
37.	missing a turn...	41
38.	you you just don't move **your** car	41
39.	you just	
40.	**your** car stays where it is	41
41.	and **the other** person gets **the** advantage	
42.	of having **the** next go....	41
43.	um you move all **the** way up to **the** up	
	to **the** end of **the** race track	36
44.	and then when you get to **the** end of	
	the race track	

45.	you turn **your** car around	
46.	and you go back down to **the** finish line...	37
47.	**the** race track is is about	
48.	I was going to say 12 inches or 30 centimetres long	46
49.	and it's divided into 2 halves	20
50.	and you go up one side you	28
51.	which is um going away from **33**	
52.	**there**'s a start a start at **33**	47
53.	and you go away from **33**	28
54.	and you go up um 300 centimetres or	
12	inches	28
55.	and you finish down at **33**	47
56.	and you've got 2 cars	5
57.	and **the** first one	44?
58.	and you take it in turns	
59.	of throwing **the** dice ...	42
60.	you got one car	
61.	and I've got 1 car	11
62.	and you take it in turns	
63.	throwing **the** dice	42
64.	and by * (you) throwing **the** dice	38
65.	and * (you) seeing what colour	39
66.	**it** comes up	
67.	**the** the race track has little coloured bars on it	17
68.	and you just move **your** car along	40
69.	and if you've got a lot of er **the** right amount of **the** throwing **the** dice	4?
70.	and you don't er get too many blacks well	41
71.	you could be **the** winner	44
72.	if you got all **the** blacks	
73.	well you wouldn't get very far	41

Summary

Clauses relevent to cohesion = 68

Substitutions = 49, ellipsis = 3

Demonstratives, comparatives and possessives = 47

3 known exophoric reference ("the", cls 1, "I', cls 3, "you", cls 13)

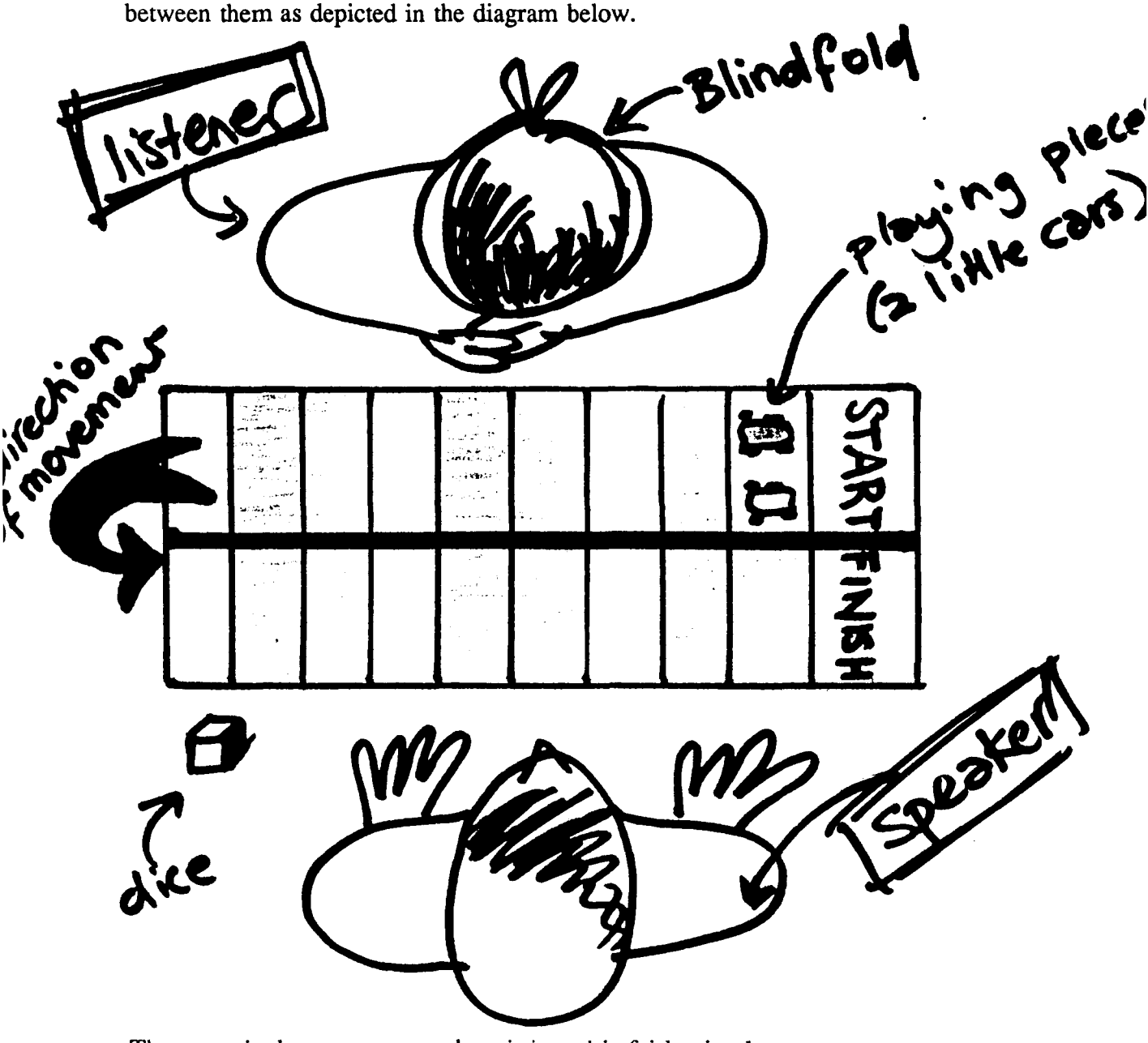
12 unknown exophoric reference ("the", cls 3, 6, "it", cls 5, 7, "that", cls 9, "a red line", cls.15, "33", cls.s. 8 (twice),51,52,53,55).

Clauses relevent to proposition analysis = 73

No. propositions = 53

APPENDIX 2.2: INSTRUCTIONS TO RATERS RATING DESCRIPTIONS OF THE DICE GAME

In the following pages there are transcripts of responses from 15 men, aged between 27 and 44. These men were asked to describe how to play a particular game to a third person, who was sitting in front of them, blindfolded. The game was on the table between them as depicted in the diagram below.



The game is drawn pretty much as it is and is fairly simple to play. The board as you see has stipes of three colours (red, yellow and green) alternating across it and is divided in two by a black line along it's length.

A dice with 2 red sides, 2 green, 1 yellow and 1 black is thrown and the player who's turn it is throws the dice and moves their playing piece (a little car, coloured either red or green) to the next stripe on the board which matches the upturned colour on the dice.

Start is the first red stripe after the word "**START**" and finish is the last red stripe before the word "**FINISH**". The cars go down one side of the board, turn around and traverse up the other.

Make sure you are completely clear about what the game looks like and how to play before you read on.

Now what I would like you to do is read the following 15 transcriptions in the order I have given them to you. When you have finished, start at the beginning again to commence rating them. In each transcript a red line seperates the first segment from the rest. The end of the first segment corresponds to the end of the speakers first attempt to explain the game. The first six rating scales refer to the **first section only**. Circle the number on each scale according to your opinion. Example scales and explanatory notes are set out below.

1. How was the first segment overall in it's effectiveness? (i.e. was the description made efficiently and clearly)

Effective						Ineffective
1	2	3	4	5	6	7

Note: this means how effective do **you** think the description was, not necassarily how the third person found it.

2. How organised was the first segment in the way it was given (i.e. does the person explain the most important things first or does he start talking about things in such a way that you can't be sure what he's referring to)?

Organised						Disorganised
1	2	3	4	5	6	7

3. Does the first segment contain unnecassary repetitions or redundancies (i.e. does the person say only as much as required about each piece of information or does he tend to go over the same information more than once)?

Not at all repetitive						Very repetitive
1	2	3	4	5	6	7

4. In the first segment, did the person give too little detail, enough, or too much?

Insufficient detail			Enough detail		Too much detail	
1	2	3	4	5	6	7

5. Was the way the person described the game in the first segment easy to follow or was it confusing?

Easy to follow						Confusing
1	2	3	4	5	6	7

6. In the first segment, what was the involvement of the third person? Were they completely silent, did they ask a few questions, or were they in fact in complete control of the verbel interchange?

Not interacting					In complete control	
1	2	3	4	5	6	7

APPENDIX 2.3. RAW SCORES ON FIVE SCALES GIVEN BY RATERS TO DICE GAME EXPLANATIONS.

Table A2.1 Raw scores on the **Repetitive Scale.** Values attributed to each of the nine control and two head injured subjects by nine raters (ranging from 1 "not at all repetitive" to 7, "very repetitive")

SUBJECT RATER	1	2	3	4	5	6	7	8	9	X
NBD subjects										
1. DM	3	2	1	2	3	2	1	1	2	1.9
2. BK	1	2	1	1	1	1	1	2	1	1.2
3. BN	1	4	1	2	1	5	1	2	3	2.2
4. IS	1	2	2	1	2	1	1	5	1	1.8
5. RF	2	4	5	5	2	5	2	3	3	3.4
6. BM	2	5	1	5	2	2	1	2	1	2.3
7. GL	4	4	4	2	3	5	1	1	1	2.8
8. GW	1	3	2	1	2	2	1	1	1	1.6
9. SM	2	4	5	3	2	3	1	1	1	2.4
CHI subjects										
1. A.S.	2	1	6	2	3	6	1	2	6	3.2
2. P.B.	6	6	7	7	7	5	5	3	7	5.9

Table A2.2 Raw scores assigned to the individual control and head injured subjects on the **Detail** scale by nine raters (ranging from 1, "too little detail" to 7, "too much detail")

SUBJECT RATER	1	2	3	4	5	6	7	8	9	X
NBD subjects										
1. DM	4	4	3	2	3	3	4	3	4	3.3
2. BK	3	2	2	3	2	2	4	2	4	2.7
3. BN	4	5	4	4	4	5	3	4	3	4.0
4. IS	3	2	2	4	2	3	4	5	3	3.1
5. RF	5	6	3	7	3	5	4	3	4	4.4
6. BM	5	5	4	5	3	5	4	4	4	4.3
7. GL	5	5	5	2	3	5	4	4	4	4.1
8. GW	3	4	4	2	3	4	4	4	4	4.1
9. SM	3	4	6	2	4	4	4	3	4	3.8
CHI Subjects										
1. A.S.	3	1	1	1	2	2	2	1	1	1.6
2. P.B.	6	7	7	6	3	6	4	2	2	4.8

Table A2.3 Raw scores assigned to individual control and head injured subjects on the **Organised** Scale by nine raters (ranging from 1, "very organised" to 7, "very disorganised")

SUBJECT RATER	1	2	3	4	5	6	7	8	9	X
NBD subjects										
1. DM	1	1	2	1	3	2	2	3	2	1.9
2. BK	1	4	3	1	2	1	1	4	1	2.0
3. BN	1	3	1	3	2	2	2	4	5	2.6
4. IS	2	6	4	1	6	2	1	5	3	3.3
5. RF	2	6	4	5	3	3	2	5	2	3.6
6. BM	2	4	2	6	2	2	1	3	1	2.6
7. GL	3	2	2	1	2	2	1	3	1	1.9
8. GW	3	2	2	1	4	2	1	2	1	2.0
9. SM	4	6	5	2	3	3	2	3	1	3.2
CHI subjects										
1. A.S.	4	7	6	7	6	6	2	2	7	5.2
2. P.B.	6	7	7	7	4	5	5	7	7	5.8

Table A2.4 Raw scores attributed to individual control and head injured subjects on the **Clarity** Scale by nine raters. (Ranging from 1, "easy to follow" to 7, "confusing")

SUBJECT RATER	1	2	3	4	5	6	7	8	9	X
NBD subjects										
1. DM	1	2	1	1	2	2	1	4	1	1.4
2. BK	1	6	6	1	3	2	1	6	1	3.0
3. BN	1	6	1	5	2	5	2	4	5	3.4
4. IS	2	5	5	1	2	3	1	6	3	3.1
5. RF	2	6	5	5	4	5	1	4	2	3.8
6. BM	3	4	1	5	2	3	1	4	1	2.8
7. GL	5	4	3	1	2	3	1	3	1	2.6
8. GW	3	2	4	1	2	3	1	2	1	2.1
9. SM	5	4	7	1	3	3	3	3	1	3.3
CHI subjects										
1. A.S.	5	7	7	5	5	6	3	7	7	5.8
2. P.B.	6	7	7	7	4	5	5	7	7	6.1

Table A2.5 Raw scores assigned to individual head injured and control subjects on the **Effectiveness** Scale by nine raters. (ranging from 1, "very effective" to 7, "ineffective")

SUBJECT RATER	1	2	3	4	5	6	7	8	9	X
NBD subjects										
1. DM	1	2	2	1	4	2	1	3	2	2.0
2. BK	1	4	6	1	6	2	1	5	1	3.0
3. BN	1	5	1	3	2	3	2	5	3	2.8
4. IS	2	6	5	1	6	2	2	6	3	3.7
5. RF	2	5	4	4	3	3	1	5	2	3.2
6. BM	2	4	2	7	2	2	1	4	1	2.8
7. GL	2	2	3	1	4	2	1	3	1	2.2
8. GW	3	2	3	1	2	1	1	2	1	1.8
9. SM	3	6	5	2	3	2	3	3	1	3.1
CHI subjects										
1. A.S.	5	7	7	7	7	6	4	7	7	6.3
2. P.B.	6	6	7	7	5	4	5	7	7	6.0

APPENDIX 2.4. COHESION ANALYSIS: THEORETICAL BACKGROUND

According to Halliday (1985) and Halliday and Hasan (1976, 1984, 1985) any text, spoken or written, long or short, has certain cohesive qualities which make it "hang together" as a coherent whole. Some of these qualities are structural, embodied within the organisation of the information in the individual clauses or clause complexes (e.g. the position of rheme and theme and given and new information in the clause). But there is also cohesion between individual messages in clauses distributed throughout the text. Halliday and Hasan have identified a variety of non structural, grammatical and lexical cohesive devices which they have argued, operate in a text to form links both within and between clauses. A summary of these is described below:

Grammatical Devices in Language which Produce Cohesion

A variety of grammatical devices can be used to signal that a source of reference for a particular message may be found elsewhere. The source may be elsewhere in the text (endophoric) either preceding the device (anaphoric) or following it (cataphoric). Alternatively it may be external to the text (exophoric).

1. REFERENCE The use of pronouns, definitive articles, demonstratives and comparatives establish cohesive links with information provided elsewhere.

a) Pronominals e.g. "we throw the dice and if <u>it</u> lands yellow side up..."; "it" refers to the noun in the preceding clause.

b) Definite Articles e.g. "There is a dice and two cars. <u>The</u> dice is thrown". "the" identifies the dice as being the same one referred to in the preceding clause.

c) Demonstratives e.g. "whatever you throw on the dice, you move your car to <u>that</u> position"; "that" specifies that the position (colour) being referred to is of the same

class as that described in the preceding clause.

d) Comparatives e.g. ..and it comes up the other side yellow, green, red, yellow green, red same in reverse order; "same" indicates the description is being compared to information in a preceding clause.

2. SUBSTITUTION: The substitution of another nominal or verbal group or part of a clause to replace the original.

a) Nominal: e.g. "you throw the dice and move accordingly. Your partner does the same thing ...." (throw the dice and move accordingly)

b) Verbal: e.g. "you have to get your car to the finish line before I do " (get my car to the finish line)

c) Clausal: e.g. "do you think Bob Hawke is the best man for the job? I think so" (Bob Hawke is the best man for the job)

3. ELLIPSIS: Ellipses refers to the omission of information, which can be inferred from the surrounding text.

a) Nominal: "you throw the dice and move your car" you throw the dice and you move your car).

b) Verbal: "go up one side of the board and down the other" (go up one side of the board and go down the other).

c) Clausal: "he has a go and then you" (he has a go and then you have a go).

Lexical Devices in Language which Produce Cohesion

The following cohesive devices are formed due to the relationships between particular lexical items. The relationships can either be general, based on knowledge of the

meaning of the english language or specific to the text.

1. GENERAL i.e. the relationship is based on an understanding of english

a) Repetition e.g. "the colours go red, green, yellow, red, green, yellow"

b) Synonymy e.g "...moving toward the finish line, and the first player to reach the end wins"

c) Antonymy e.g "that player wins and the other player loses"

d) Meronymy e.g. "the game has a dice and two players"

2. INSTANTIAL i.e. the relationship between two lexical items is specific to the text.

a) Equivalence e.g. "you are the red car and I am the green car"

b) Naming e.g. "the game is called the "dice game"

c) Semblence e.g. "the board is like a race track"

Organic Devices Which Achieve Coherence Between Messages

Both grammatical and lexical cohesive devices form links between individual components occurring both within clauses and between them (componential relations). There is another set of cohesive devices described by Hasan as "organic relations" which link whole messages.

1. COHESIVE CONJUNCTIONS

a) Additive (e.g. "and")

b) Adversative (e.g. "however")

c) Temporal (e.g. "then")

d) Relational (e.g. "which", "that")

2. ADJACENCY PAIRS (e.g. question followed by answer).

3. CONTINUATIVE (e.g. "still", "already", "so")

Cohesive Ties

Grammatical and lexical cohesive devices effectively establish a link between two items in a text. The link can be of three types:

1. CO-REFERENCE When two lexical items refer to the same entity the relationship between them is **co-reference** . The use of pronouns to replace a noun is a typical example of co-reference.

e.g. "you take the dice and throw it."

2. CO-CLASSIFICATION When two lexical items refer to different instances from the same class of meaning, the relationship between them is **co-classification.** For example in the two clauses "I throw the dice, then you do ", throwing the dice is common to both messages but the two messages are different instances of that class of meaning.

3. CO-EXTENSION A co-extensive tie is acheived when the two lexical items share a similiar field of meaning e.g. parrot and bird, arm and leg etc. These were defined more fully under lexical cohesive devices

According to Hasan different cohesive devices typically reflect particular relationships. Reference will usually form a co-reference relationship, (e.g. the pronoun substituted

and its referent are in fact the same thing). Substitution and ellipsis typically create relationships of co-classification and lexical cohesion may reflect either co-classification or co-extension. A summary table of the various devices is depicted in Figure A.1

Figure 2A.1. Summary of Cohesive Devices, taken from Halliday and Hasan (1985) (p.82)

NON STRUCTURAL COHESION		
COMPENENTIAL RELATIONS		**ORGANIC RELATIONS**
<u>Grammatical Cohesive Devices.</u>		**A. Conjunctives** e.g. causal tie ("because" etc)
DEVICE	TYPICAL TIE	
A. **Reference** 1. Pronominals 2. Demonstratives 3. Definitive article 4. Comparatives	co-reference	**B.Adjacency pairs** e.g. question and answer pairs
B. **Substitution & Ellipsis** 1. Nominal 2. Verbal 3. Clausal	co-classification	
<u>Lexical Grammatical Devices</u> A. **General** 1. Repetition 2. Synonymy 3. Antonymy 4. Meronymy	co-classification or co-extension	**Continuatives** e.g. "still", "already"
B. **Instantial** 1. Equivelance 2. Naming 3. Semblance	co-classification or co-extension	
STRUCTURAL COHESION A. **Parallelism** B. **Theme - Rheme Development** C. **Given - New Organisation**		

Lexical Cohesive Harmony

Hasan (1976, 1984, 1985) argued that the various cohesive devices could be identified in any text and that the identification of such devices could be used to obtain a measure of cohesion. In her 1984 1nd 1985 publications she was particularly concerned to establish a means to measure the lexicogrammatical cohesion of a text. (i.e. cohesion formed by lexical and grammatical cohesive devices, excluding organic and structural features). Hasan argued that by identifying all of the lexico- grammatical devices and the other textual elements they were related to, threads, or chains of semantic continuity could be discovered running through the text. The measure she developed depended fistly on exposing these semantic threads and secondly on taking account of the interaction of such semantic continuity with the more conventional grammatical relationships at the level of the clause.

1. Semantic Cohesion - Chains

According to Hasan's model, all lexical tokens implicit in any text can be recovered by interpreting pronominals, substitutions and ellipsis and then replacing these devices with their intended referent. Once this has been acheived all explicit and implicit lexical items can be extracted from the text and clustered into groups on the basis of their semantic relationships. Because the items within a cluster form a sequential semantic relationship from one clause to the next, the clusters are known as chains.

Chains can be of two types, **Similarity Chains** or **Identity Chains**. Identity chains are formed by a series of lexical tokens which all refer to the same entity (co-reference). Similarity chains are formed by lexical tokens which fall into the same class of meaning

(co-classification and co-extension). Tokens in a similarity chain must also be of the same grammatical category.

Hasan referred to tokens which entered chains as **Relevent Tokens.** There were also always a subset of tokens which did not share semantic meaning with any others and did not therefore fall into any chains. These she referred to as **Peripheral Tokens.**

2. Grammatical Cohesion - Chain Interaction

Initially Hasan (1976) believed that the formation of cohesive ties and chains within a text would be the factor which produced coherence. It became apparent however that this could not be the case since by this criteria meaningless lists of semantically similar words would be 100% coherent simply because all the members would be in chains.

In her later writings (1984,1985) she therefore introduced an additional requirement for her definition of coherence. This requirement was that in order for coherence to occur, some members of any one chain must share similar grammatical functions in their relationships with members of another chain. This she referred to as **chain interaction.**

Thus "chain interaction" was said to occur whenever **two** members of any one chain, had identical grammatical relationships to **two** members of another chain. Grammatical relationships could only occur within the clause i.e. any pair of relevent tokens related grammatically had to be found within the same clause. Any two or more tokens which were members of a similarity or identity chain and which also shared similar grammatical relations to members of another chain were referred to as **Central Tokens.**

The type of grammatical relationships tokens typically entered within a clause were actor-action, action-goal, action-location, attribute-attribuand.

Using these various definitions an estimate of the cohesive harmony could be calculated by calculating the percentage of central tokens as a subset of all the tokens in the text (total tokens). (Hasan, 1984; Armstrong, 1987)

For examples of the procedure to calculate an estimate of the cohesive harmony, the reader is referred to Appendix 2.5.

APPENDIX 2.5: PROCEDURE FOR LEXICAL COHESIVE HARMONY ANALYSIS

1. Transcription

The taped conversation was transcribed verbatim including all false starts, repetitions etc.

2. Clause Division

Clauses were separated using the procedure outlined by Hasan (1984) and adapted by Armstrong (1990) for use with analysing text produced by aphasic patients. The procedure was as follows:

All independent, incomplete and dependent clauses were separated on the basis of one verb per clause. False starts, repetitions etc. not containing a verb were grouped together until the verb appeared e.g.(1) "and you... we take it in turns"

The beginning of a new sub clause was defined by the presence of the beginning of the next verb complex, or its subject, by subordinate conjunctives (e.g. which, what, that, because, then, and, however, if, so, whether, now) or conversational fillers (e.g. right, OK, well.)

3. Lexical Rendering

All lexical tokens were extracted. Lexical tokens were defined as a content word which was either directly used in the text or whose presence was implied by the use of an implicit cohesive device.

A. Explicit Tokens

Explicit content words fell into the following grammatical classes:

1) Main Verbs and Their Particles.

All renditions of the verb "to be" were simply rewritten as "be" e.g "the dice is green" becomes "the dice be green".

Verbs and their related particles (e.g. come up, go home, put down, move along) were hyphenated and considered as one token. On the occasions where the verb and its particle were seperated in the text, these were reunited. (e.g. if the dice lands face up)

Tense was ignored as were auxillaries and the use of "to" in the infinitive. Verb complexes were reduced to the main event verb e.g. "keep on throwing" became "throwing"

2) Adverbs (with the exception of adverbs with an intensifying or moderating function as described below)

3) Nouns,

4) Adjectives (excluding numericals, comparatives and adjectives with a moderating or intensifying function)

B. Repetitions

During the process of lexically rendering the texts, repetitions were dealt with in the manner devised by Armstrong (1988) to analyse aphasic speech. When there was a direct repetition i.e. two or more identical lexical items were juxtaposed, only one of the items was counted in the cohesion analysis although the repetition was noted. If the

repetition was dispersed with another structure in between, the same item was counted twice. Whole clauses which were repeated were counted twice as were any whole or partial variants of a given clause.

C. Non Lexical Items Excluded From the Analysis

Types of non lexical items which were **excluded** from the analysis are defined below along with a list of actual exclusions in each category provided in brackets:

1. Determiners	definite articles ("the")
	indefinite articles ("a","an")
	demonstrative pronouns (e.g."those", "that", "there", "here")
2. Non Main Verbs	auxillary verbs (e.g."is running", "**have** got")
	infinitive (to) attatched to verb
3. Prepositions	(e.g. "in", "on", "at", "before", "towards", "across", "down", "up", "except", "like", "between", "to")
4. Negatives	(e.g. "not", "no")
5. Conjunctions	(e.g. "however", "which", "then", "that", "except", "when", "what", "how", "whatever")

6. Adjectives/Adverbs With an Intensifying or Moderating Function Only (e.g "very", "extremely", "only", "just", "all", "many", "at all", "too", "all the way")

7. Adjectives/Adverbs With a Comparative Function (e.g. "same", "opposite", "next", "nearest", "reverse", "last", "likewise")

8. Numericals (e.g. "one", "two", "first", "second")

9. Idiomatic Expressions

(e.g. "you know", "like that", "get the idea", "I take it", "is that right",)

9. Expressions Which Assist in Ordering the Text, But Do Not Contribute to Semantic Cohesion

(e.g. "firstly", "we OK to start", "for a start", "what we have here", "what we have to do is", "the only other point is", "in other words", "in order to", "it's just a matter of", "each time", "every time", "in this particular case", "the idea is", "it would be like", "what else do I have to tell you", "I was going to say", "that's basically it",)

Some of these expressions contained essential verbs and pronouns embedded in them which modified the meaning of the clause which followed. In such cases the following clause was simplified or modified to bear the basic message derived from the two clauses e.g. (2). "what we do is

(3). throw the dice" became (4). "we throw dice"

D. Implicit Tokens

Implicit tokens were derived by two processes:

1. Converting Substitutes (e.g pronouns, verbs) by replacing with their referents, the retrieved referent was underlined in the texts appearing in Appendix 2.1. e.g.

ORIGINAL	LEXICALLY RENDERED
(5) it is a board game	game be board game
(6) which has two cars	has two cars
(7) and they go up one side	cars go-up one side
(8) we have a dice	Jen Brian have dice
(9) and when you throw the dice	Jen throw dice
(10) if it lands red side up...	dice red side lands-up...
(11) you move your car to the red..	Jen move Jens car red
(12) you have to the end	Steve get end
(13) before I do	Sally get end

The original referent retrieved could be nominal or verbal or clausal. As well as single clause ellipsis, there were occasional demonstrative pronouns which substituted for a whole series of clauses as in the following example:

(14) "now when you throw the dice"

(15) "the colour that comes up"

(16) "you move your car to that colour"

(17) "and then the other partner throws"

(18) "and their colour they move their car"

(19) "and you continue down the board like that"

where "like that" refers to the entire procedure outlined in clauses 14 - 19. To reiterate the entire set of clauses would distort the cohesion ratio unrealistically. Such adverbial phrases were therefore dropped completely. In cases where the substitute was a verbal phrase (eg. the other person has a go and does likewise) it was simply retained as it was.

There were also several instances where a pronoun was used emphatically to anticipate the next clause e.g.

(20) "we take it in turns"

(21) "to throw the dice".

Lexical rendering of this would yield:

"we take throw dice turns throw dice"

which is obviously not sensible and therefore taken as an indication that in this context the pronoun is not operating as a cohesive device. In such instances the pronoun was simply removed i.e. "we take turns throw dice"

2. Identifying Ellipses and Inserting Implied Tokens.

The retrieved referent was underlined and accompanied by asterisks to indicate ellipsis. Ellipses were identified using the following criteria:

a) Nominal ellipsis. Nominal ellipsis was assumed when two or more contiguous clauses were present, each containing a different verb (predicate) but with the same

subject (actor) implied.The conjunctions for these were typically "and" and "or" as well as a comma when there were more than two clauses. On occasions where it was unclear as to whether an elliptical device was present, the implied token was inserted and the text re-read to determine whether it retained the grammatical and semantic "balance". e.g.

ORIGINAL	LEXICALLY RENDERED
(22) "you throw the dice"	"Jen throw dice"
(23) "and move your car"	"Jen ** move Jen's car"

b) Verbal ellipsis. The presence of a particle (or preposition assumed to be operating as a particle) was taken to indicate a verbal ellipsis. New clauses were formed on the basis of an identified verbal ellipsis to maintain the rule that only one verb appeared per clause e.g.

ORIGINAL	LEXICALLY RENDERED
(24)"you go up to one end of the track"	"Bill go-up one end track"
(25) "and down the other side"	"Bill **go-down side"

c) Situations in which ellipsis could not be assumed

Ellipsis was not assumed when two clauses were divided by a relational conjunction, e.g.

(26) "throw the dice which is coloured...".

e.g.

(26) "throw the dice which is coloured...".

Nor was it assumed in the presence of an embedded clause,

(27) "the board consists of a rectangle divided down the middle)".

Unlike nominal ellipsis, verbal ellipsis was not assumed when the subject (actor) and predicate (process) were followed by multiple objects (goals) e.g.

(28) "you have a green car and a red car"

(29) "I was going to say 12 inches or 30 centimetres"

4. Chain Formation

Tokens from the lexically rendered text were then extracted and placed in either identity chains (where each token referred to the same entity) or similarity chains (where the tokens shared similar but not identical meaning). Each token was identified by its clause number. Two was the minimum number of tokens required to form a chain. Tokens in a chain had to have the same grammatical function (verb, adjective etc). The number of **Relevent Tokens** was defined as all tokens entering chains. **Peripheral tokens** were all remaining tokens not in chains. An example of chains derived from a text is given on page 12.

5. Chain Interaction

Once the relevent tokens were listed in their various chains and identified by their clause number they could be used to determine the amount of chain interaction. This was done by calculating the percentage of relevent tokens which acted as **Central Tokens**. Central tokens were relevent tokens which entered into grammatical

relationships with other relevent tokens. The criteria used to identfy them was the presence of two members of one chain both of which had partners from their respective clauses operating as two members of a second chain. Thus central tokens could only exist if:

1. two members of one clause were both members of chains
2. two members of a second clause were also both members of the same chains.

Once such pairs of tokens were identified by reference to the chains, the equivelence of their actual grammatical relationships was confirmed by reference back to the original text. Grammatical relations considered legitimate for this analysis included the following:

actor- action (e.g. (30) you move your car along the board)

action- goal (e.g. (30) you move your car along the board)

action-location (e.g.(30) you move your car along the board)

attribut-attribuand (e.g.(30) you move your car along the board)

A. Dealing with Non-Symmetrical Relationships

There were numerous instances of non symetrical relationships, i.e. one token may be in a similar grammatical relationship with more than one other token. This happened particularly due to the subject reiterating a point for clarity e.g.

(31) "you move along the board, the red, green and yellow spaces".

In this case, "move-along" is in the same relationship to "board" as it is to "red",

"green" and "yellow spaces" and "red", "green" and "yellow" are three tokens in the same relation to "spaces". In such cases, provided that the tokens "move-along" and "spaces" have semantic pairs elsewhere in similar relations, all tokens in these relationships were considered to be central tokens.

B. Dealing with Incomplete Clauses and Repetitions

Hasan excluded falses starts and repetitions from her discourse analysis, arguing that they were not relevent to the cohesion of the text. Armstrong retained them in the chain formation but not in the chain interaction as a means to reflect the pathological nature of aphasic repetition. Because this analysis was not concerned with aphasic speech, the approach used by Hasan was adopted. All false starts and direct (adjacent) lexical repetitions were excluded from both analyses. Clausal repetition and paraphrasing was retained.

6. Calculating the Lexical Cohesive Harmony Index

The Lexical Cohesive Harmony Index is derived by expressing the number of central tokens (those tokens entering chains and also sharing grammatical relations with other members of chains) as a percentage of total tokens. An example of the process of analysing the lexical cohesive harmony is set out below.

7. Example of Lexical Harmony Analysis

Subject IS.

1. Original text

(32). right Jen, we're going to play this car game
(33). the idea is
(34) to get from the start to the finish naturally, OK?
(35). and it's like a dice game
(36). and on the dice is a yellow a red and a green colours
(37). and on one side only there's a black,
(38). if you throw the dice
(39). and the black comes up
(40). you miss a turn
(41). because on the board there's only red green and yellow stripes
(42). so when you throw the dice,
(43). whatever stripe comes up on the dice
(44). it corresponds with the board
(45). that's the colour
(46). you move to OK?
(47). If you throw a black colour
(48). you relinquish your go
(49). because it's not on the board...
(50). OK is that understandable

2. Lexically Rendered Text

(51). Mary Iven play car game
(52). get start finish
(53). car game be dice game
(54). dice be yellow red green colours
(55). side be black,
(56). Mary throw dice
(57). black comes-up
(58). Mary miss turn
(59). board be red green yellow stripes
(60). Mary throw dice,
(61). stripe comes-up dice
(62). stripe corresponds-with board
(63). stripe be colour
(64). Mary move-to
(65). Mary throw black colour
(66). Mary relinquish Marys go
(67). Black be-on board...

3. Chains

A) IDENTITY CHAINS

A	B	C	D
1. Mary	4. dice	9. stripes	9. board
6. Mary	6. dice	11.stripes	12. board
8. Mary	10.dice	12. stripe	17. board
10.Mary	11.dice	13. stripe	
14.Mary			
15.Mary			
16.Mary			
17.Mary			

B) SIMILARITY CHAINS

E	F	G	H
1. car game	4. yellow	4. colours	2. get
3. car game	4. green	7. black	14. move-to
3. dice game	4. red	13. colour	
	5. black	15. colour	
	9. red	17. black	
	9. green		
	9. yellow		
	15. black		

I	J	K	L
2. start	6. throw	7. comes up	8. miss
2. finish	10. throw	11. comes up	16. relinquish
	15. throw		

M	N
8. turn	3. be
16. go	5. be
	9. be
	13. be

C) PERIPHERAL TOKENS (NOT IN CHAINS)

"Iven", "your", "play", "side", "corresponds-with", "be-on"

Note that in the above text words refering to colour formed two different chains due to different grammatical functions (adjective versus noun)

Total Tokens = 58
Relevent Tokens = 52
Peripheral tokens = 6

4. Chain Interaction

N	F	G
4. be	4. yellow	4. colours
	4. green	
	4. red	
5. be	5. black	
9. be	9. red	
	9. green	
	9. yellow	
13.be	3. colour	
	15. black	15. colour

A	J	B	L	M
6. Mary	6. throw	6. dice		
8. Mary			8. miss	8. turn
10. Mary	10.throw	10. dice		
15. Mary	15. throw			
16. Mary			16. relinquish	16.go

Central Tokens = 30

5. Lexical Cohesive Harmony Index

Central Tokens as a percentage of Total tokens = 52%

APPENDIX 2.6: PROPOSITIONS UNDERLYING DICE GAME EXPLANATION

NUMBER	CONTENT OF PROPOSITION
A. Introductory remarks	
1.	this is a game
2.	game is simple
3.	there are several parts to the game
4.	game has two cars as playing pieces
5.	game has a board
6.	game has dice
7.	aim of the game is to get from start to finish
8.	the way that the game is played
B. Car details	
9.	one car is red
10.	and one car is green
11.	players have a car
12.	the cars move in response to a dice
*13.	the cars are put at the start of the board
*14.	they go down one side to the end of the board
*15.	when they get to the end they turn around and come back up to the finish
C. Board details	
16.	the board is like a race track
17.	board is painted across width in coloured stripes
18.	the stripes go red green yellow, red green yellow, red green yellow
19.	there is no black on the board
20.	board has black line painted lengthways down the centre
21.	there is a start and a finish
22.	the start and the finish are at the same end
23.	at one end of the board on one side of the black line, is the start
24.	on the other side of the black line
25.	the first stripe after the start is red
26.	the last stripe before the finish is red
*27.	we start at one end of the board
*28.	go down one side of the board
*29.	and up the other side to the finish
D. Dice details	
30.	dice has different colours on its sides which relate to the colours on the board
31.	there are two red sides
32.	there are two green sides
33.	there is one yellow side

34.	there is a black side

E. Procedural details

*35.	both players cars sit on the first red square after the start
*36.	they progress along the coloured stripes down the side of the board to the end
*37	when they get to the end of the board they turn around and come back up towards the finish line
38.	the first player throws the dice
39.	whatever colour the dice shows up
40.	his car is moved to the first stripe of that colour he comes to on the board
41.	if black shows up on the dice he misses a turn
42.	the two players alternate throwing the dice and moving their cars to the appropriate colour
43.	in order to get to the finish line a player must throw a red.
44.	first player to the finish line is the winner

E. Peripheral details

45.	the board is placed lengthways in front of you running from left to right
46.	the board is twelve inches long
47.	the start and finish are on your left
48.	board is like a monopoly board
49.	the board could have been one long track
50.	the cars are facing the wrong way
51.	the cars go in a forward motion

APPENDIX 3.1: STIMULUS ITEMS FOR POLITENESS DISCRIMINATION TASK

The following sixteen pairs of sentences represent alternative versions of speech acts. In each case, one member incorporates a particular politeness device as outlined in Brown and Levinson (1978). The type of device is described beneath each item.

1. Someone is waiting by the telephone, you say....

   a) I'll be finished soon

or b) I'll be finished in just a second

Polite mechanism: exaggeration, intensify interest to hearer (positive politeness)

2. The teacher says

   Now stop your chatter and get on with your work

or Now lets' stop our chatter and get on with our work

Polite mechanism: assert common ground, person centre shift (positive politeness)

3. You say to someone

   Come into my office

or Go into my office

Polite mechanism: assert common ground, minimise distance (positive politeness)

4. The mosquitoes are bad, the door is open

   Shut the door

or Have you shut the door?

Polite mechanism: indirect speech act (negative politeness)

5. You ask a stranger a favour, you begin..

Would you be so kind

or I wonder if you would be so kind

Polite mechanism: compound indirect speech act (attentive and pessimistic hedge) (negative politeness)

6. Someone you know well has bad breath

Your breath isn't so sweet

or I hate to say it but your breath isn't so sweet today

Polite mechanism: admit imposition (negative politeness)

7. Same topic as above....

Your breath isn't so sweet

or Your breath isn't so sweet today

Polite mechanism: minimise imposition, hedge (negative politeness)

8. You think there's been a mistake, you say..

Can you check your figures

or I know you're careful but can you check your figures

Polite mechanism: apologise for imposition (negative politeness)

9. In the same situation as above

You are probably busy, but can you check

or I know you must be busy, but can you check

Polite mechanism: admit imposition (negative politeness)

10. You have a disagreemnet, you say

This is the correct answer

or I tell you, this is the correct answer

Polite mechanism: impersonalise criticism (negative politeness)

11. You see an aquaintance rather drunk

Looks like someone has had too much to drink

or He's had too much to drink

Polite mechanism: impersonalise criticism (negative politeness)

12. The lawn needs mowing, you say

You must mow the lawn next weekend

or The lawn needs mowing this weekend

Polite mechanism: impersonalise request (negative politeness)

13. You need to know the time, you ask

What time is it

or Can you tell me the time

Politeness mechanism: indirect speech act (negative politeness)

14. Responding to the request "can you tell me the time"

It's about six

or Certainly it's about six

Politeness mechanism: attentiveness to hearer (positive politeness)

15. You are working in the dark, you say to your helper

Hold the lamp a bit higher

or Hold the lamp higher

Politeness mechanism: hedge (negative politeness)

16. Someone has started out as an actor, you say

You are in the play, I must go and watch

or You are in the play, I must come and watch

Politeness mechanism: assert common ground, mimimise distance (positive politeness)

APPENDIX 3.2: STIMULUS MATERIAL FOR PRODUCTION OF "POLITE" UTTERANCES

The requests which were analysed formally in Chapter 4 are typed in bold.

1. You ask the teller to change your large bag of coins ok? What would you say?

2. You're with a friend a male friend at the football and you want to offer him a can of soft drink what would you say?

3. The plumber has been working on a job at your home and when you get home the job is good and the bill is really good what would you say to him?

4. A friend usually catches the bus home from work but you've decided you can give them a lift tonight so you ring them up and you say ..

5. You're visiting your sister. You go around there and you want a cup of tea. What would you say to her?

6. You need to know the time so you stop someone in the street and what do you say to them?

7. You're in the queue at the supermarket with a lot of shopping and the person behind you only has a few things. You decide to let them go ahead of you, what would you say?

8. You're walking behind someone in the street and they drop their purse so you stop them and what do you say?

9. A friend rings up and asks you to go out for a meal with them on Thursday, you can't make it Thursday but you can on Friday, what would you say?

9. You're at home watching TV with your family and you want to change the channel what would you say?

10. You see someone's child drawing all over your book what do you say?

11. You'd like to ask a new friend if they'd like to go to the movies with you what do you say?

12. You're at a female friends place for dinner and the meal was great what would you say?

13. A policeman pulls you over and asks to see your license but you've left it at home what are you going to say to him?

14. You're on a public phone for sometime and you notice a man standing outside waiting and you decide you're going to say something to him. What do you say?

15. You want some soap powder in the milk bar but you can't find it, what do you say to the shop keeper?

16. You really need to borrow a car badly tonight and you decide to ask your sister for hers even though she was going to use it herself what would you say to her?

17. You ring up a friend called John Smith at work but someone else answers the phone, what do you say?

18. You're buying a hamburger but it hasn't got the onions you ordered so you take it back to the man behind the counter and what do you say to him?

19. You're at a friends house and you see a bowl of fruit and you decide you'd like an apple, what would you say?

20. You're at work in a room and it's cold. Someone else walks in and leaves the door open. What do you say?

21. You're talking on the phone and one of your family turns on the radio so you can't hear, you put down the phone walk over to them and what do you say?

22. You ring up your boss to say you're sick for the day what do you say?

23. You're on a long train journey and you're bored and the women sitting opposite has a very playful child on her lap and it's annoying her, you decide you'd like to hold him what do you say?

APPENDIX 4. RESPONSES TO HINTS; CHAPTER 4.

Details of responses offered to 8 request situations by 12 NBD control subjects and the two CHI subjects A.S. and B.S.

The 8 items are laid out in the following manner.

1. Background description

2. Table detailing:

A. Proposition underlying request

B. Modal rank of proposition in sequence of practical logic based on judgements by 11 raters

C. Frequency i.e. number of judges assigning that rank

D. Collapsed rank i.e. rank each proposition was assigned to in a scale of 1-5.

E. The total number of responses reflecting each proposition for the NBD group, A.S. and B.S. as well as the total (TOT).

3. Inter-rater agreement between raters ranking propositions as determined using the Kendell Coefficient of Concordance.

4. Inter-rater agreement between the two judges who assigned the actual utterances to their respective propositions expressed as percentage of items similarly assigned by both judges.

5. List of the actual responses offered along with

A. the **collapsed rank** that proposition related to

B. the **mean directness rating** i.e.how directly the response reflected the proposition ,based on the judgements of 13 judges.

ITEM 1.

Background: You're at the pub and you bought the last round and it's the person next to you's turn to shout but he's talking away and obviously hasn't noticed.How would you hint that it's his turn to go to the bar and buy you a drink

PROPOSITION	MODAL RANK (FREQ)	COLLAPSED RANK	ALL RESPONSES NBD	P.B.	A.S.	TOT
MY DRINK IS FINISHED	1(6)	1	2	0	0	2
I AM THIRSTY	2(7)	1	6	0	0	6
I WOULD LIKE A DRINK NOW	3(7)	2	0	0	0	0
I BOUGHT THE LAST ROUND	4(7)	3	1	0	0	1
IT'S YOUR TURN TO SHOUT	5(10)	4	3	1	5	9
GO TO THE BAR AND BUY ME A DRINK	6(11)	5	1	0	2	3

AGREEMENT BETWEEN 11 RATERS RANK ORDERING PROPOSITIONS (EXCLUDING LAST PREMISE WHICH WAS FIXED) : W = .803, P < .01. AGREEMENT BETWEEN TWO JUDGES CLASSIFYING PREMISES = 96% (19/21)

ITEMS		COLLAPSED RANK	MEAN DIRECTNESS
NBD subjects			
BK	1. Jeez I'm getting a bit thirsty.....	1	1.15
BN	2. Bit dry.....	1	1.92
DM	3. Have you ever heard the story of Burke and Wills?	1	4.15
GW	4.(knock over glass) Thank God that was empty	1	4.08
IS	5. Heh Bill Gee you've got long pockets	5	4.31
RF	6. Was my shout last time?	4	1.08
BM	7. It's a dry argument.....	1	4.07
CS	8. Anybody ... does anybody else um need a beer because mine's empty	1	2.15
GL	9. Gee that was nice I could do with another one of those.....	3	1.62
IN	10. Who's shout now?	4	2.85
MH	11. A man's not a camel.....	1	3.77
SM	12. Starting to get a bit dry.....	1	2.08
	13. Wonder who's round it is?.....	4	3.08
CHI subjects			
P.B.	14. It's your turn now.....	4	1.08
A.S.	15. It's your turn for a walk mate	5	2.39
	16. It's your shout	4	1.0
	17. It's your round.....	4	1.0
	18. Come on mate it's your go.....	4	1.08
	19. Your walk to the bar	5	1.85
	20. It's your go.....	4	1.08
	21. Go on your turn.....	4	1.15

ITEM 2

Background: You are at a friend's place and you would really like to borrow a record of their's, what sort of hint could you make ?

PROPOSITION RESPONSES	MODAL RANK (FREQ)	COLLAPSED RANK	ALL RESPONSES NBD	P.B.	A.S.	TOT
I REALLY LIKE THIS RECORD	1(6)	1	11	3	1	15
I DON'T HAVE THIS RECORD	2(5)	1	3	0	0	3
			(14	3	1	18)
I CAN'T GET THIS RECORD	3(6)	2	2	0	0	2
I WOULD LIKE TO HEAR THIS RECORD MORE	4(6)	3	2	0	0	2
I WOULD LIKE TO HEAR THIS RECORD AT MY PLACE	5(9)	4	3	0	0	3
CAN I BORROW THIS RECORD	6(11)	5	1	2	2	5

AGREEMENT BETWEEN 11 RATERS RANK ORDERING PROPOSITIONS (EXCLUDING LAST PREMISE WHICH WAS FIXED) : W = .42, P < .01. AGREEMENT BETWEEN TWO JUDGES CLASSIFYING ITEMS = 90% (27/30)

	ITEMS	COLLAPSED	MEAN DIRECTNESS
NBD subjects			
BK	1. I wouldn't mind having that at home to play for a while.....	4	1.15
BN	2. I haven't got that record at home	1	1.85
DM	3. Um gee this is a good record .. haven't seen this one before	1	1.77
	4. Can I borrow it?	5	1.08
GW	5. Gee I'd like I'd like ah to have a copy of that record	1	2.15
	6. But unfortunately they're unavailable	2	1.76
IS	7. Gee I really enjoyed that piece of music.....	1	2.15
	8. I'd love to hear how it would sound on my stereo.....	4	1.69
RF	9. Particularly nice song.....	1	2.23
	10. Particularly nice record.....	1	1.77
BM	11. Oh I like this record it sounds good.....	1	1.69
	12. Um pity I haven't got it.....	1	1.85
CS	13. (comment about) How good a record it is....	1	1.85
	14. I'd really like to hear it some more and..	3	1.39
GL	15. I really like that really like that record	1	1.69
	16. It's fantastic.....	1	1.85
	17. I wonder what it would sound like on my record player.....	4	2.46
IN	18. Yeh I really like to have that record	1	2.15
	19. But gee I can't afford to buy one myself um..	2	2.08
MH	20. I like your taste in music	1	2.92
SM	21. Um gee I really liked that record you played last week.....	1	2.23
	22. Um um.. I'd like to hear it again.....	3	1.54
CHI subjects			
P.B.	23. Oh this record's really great ..it's.....	1	1.85
	24. I really like this one .... it's ...um ....it's one of a kind and it's really...	1	1.61
	25. It's really.. it's great um.....	1	1.92

	26. Would you mind me trying it	5	1.39
	27. I'd like to try it for a while and then I'll give it back to you.....	5	1.15
A.S.	28. Look can I have a lend of it just... you know I won't scratch it I've got a good sound system like.....	5	1.08
	29. Do you think I could borrow it for a while to tape and then I'll have it myself because records are starting to get.....	5	1.08
#2	30. That's a good record	1	1.92

ITEM 3.

Background: Someone you know borrowed twenty dollars from you some time ago and you think they have forgotten, how would you hint to remind them that they owe you twenty dollars and they should return it?

PROPOSITION	MODAL RANK (FREQ)	COLLAPSED RANK	ALL RESPONSES NBD	P.B.	A.S.	TOT
YOU HAVE MONEY	1(7)	1	2	0	0	2
I AM SHORT OF MONEY	2(7)	2	6	0	0	6
I NEED $20	3(7)	3	1	0	0	1
I LENT YOU TWENTY DOLLARS/YOU OWE ME	4(9)	4	5	1	0	6
TWENTY DOLLARS			1	3	0	4
			(6	1	0	7)
RETURN MY $20	5(11)	5	2	0	2	4

RATERS RANK ORDERING PROPOSITIONS (EXCLUDING LAST PREMISE WHICH WAS FIXED) : W = .57, P < .01. AGREEMENT BETWEEN TWO JUDGES CLASSIFYING ITEMS = 82% (19/23)

	ITEMS	COLLAPSED RANK	MEAN DIRECTNESS
NBD subjects			
BK	1. Jeez I'm getting a bit short of cash.....	2	1.54
BN	2. I thought I had twenty dollars in my wallet but I haven't got it any more....	4	4.15
DM	3. Do I owe you any money?.....	4	3.85
GW	4. Gee um you couldn't see your way of giving me that twenty dollars back um I'm a little bit short this week	5	1.23
IS	5. John Bill whatever say how about lending me twenty dollars.....	4	3.46
RF	6. (Asking them) if they could give you a loan of twenty dollars.....	4	3.46
BM	7. (Indicate somehow that) I needed some money ....twenty dollars	3	2.69
	8. (Ask them) if they could loan me twenty dollars.....	4	3.46
	9. (Check out) if they've got any money on them	1	3.39
CS	10. (Ask them) if they needed a lend of another twenty dollars	4	2.15
GL	11. Look I'm really I'm really short of cash	2	1.46
	12. I'm short of cash right now and I want to go to the movies tonight.....	2	1.39
	13. I'm really short of cash and I would like to see that movie tonight.....	2	1.62

IN	14. When people borrow money um .. I really appreciate when they hand it back in due time...	5	2.23
MH	15. How's the finances going?	1	3.69
SM	16. Um gee I'm starting to get a little bit low on money um.....	2	1.62
	17. Yes I've found myself a bit short recently ..	2	2.08
CHI subjects			
P.B.	18. (Tell them a little story about) someone who loaned someone else some money	4	3.30
	19. And didn't pay it back on time.....	4	3.23
	20. And didn't pay it back	4	3.15
	21. They forgot all about it and didn't pay it back	4	3.0
A.S.	22. (Rub fingers together) you remember don't you?.....	5	2.46
	23. (Rub fingers gesture "20") remember?.....	5	2.08

ITEM 4:

Background: You are sitting across the dinner table from the person you drove there with. There are a few other people at the table and you want to hint to them that you'd like to go home now

PROPOSITION	MODAL RANK (FREQ)	COLLAPSED RANK	ALL RESPONSES NBD	P.B.	A.S	TOT.
I'M NOT FEELING WELL	2(5)	1	2	0	0	2
IT'S LATE	3	1	6	0	0	6
I'M GETTING TIRED	3(6)	1	5	0	0	5
			(13	0	0	13)
I HAVE TO GET UP EARLY	3/4(3)	2	2	0	0	2
SOON	4(4)	3	0	0	0	0
YOU HAVE TO LEAVE TOO	5(5)	4	2	0	0	2
NOW	6(11)	5	2	1	2	5

RATERS RANK ORDERING PROPOSITIONS (EXCLUDING LAST PREMISE WHICH WAS FIXED) : W = .235, P < .05. AGREEMENT BETWEEN TWO JUDGES CLASSIFYING ITEMS = 91% (20/22)

	ITEMS	COLLAPSED RANK	MEAN DIRECTNESS
NBD subjects			
BK	1. I'm feeling very tired.....	1	1.23
BN	2. I got an early.... I got an early I got an early morning tomorrow.....	2	1.69
DM	3. Gee the milkman will be coming soon ...	1	3.31
	4. We better go and let these people go to bed	5	1.54
	5. Um it's getting late.....	1	1.38
GW	6. Look we might have to hit the road shortly.....	5	1.77
IS	7. It's a bit smokey in here and a bit noisy, ...	1	4.08
	8. I'm not really feeling the best.....	1	1.69
RF	9. I'm rather tired.....	1	1.39
BM	10. It's getting a bit late.....	1	1.38
CS	11. (Ask them) how long they were thinking of staying.....	4	3.08
	12. (Ask them) how much longer they were		

	thinking of staying.....	4	2.85
GL	13. I'm feeling a bit tired.....	1	1.31
IN.	14. Oh darling I'm so...	1	3.77
	15. It's late.....	1	1.23
	16. It's late.....	1	1.23
MH	17. I gotta work tomorrow.....	2	2.77
SM	18. It's been a long night.....	1	2.85
	19. I'm starting to get starting to get a bit tired.....	1	1.6
CHI subjects			
P.B.	20. (Tell a third person to tell so and so that) you think you should go home now....	5	1.77
A.S.	21. (Whisper) let's go..time.....	5	1.08
	22. It's time to go.....	5	1.08

ITEM 5.

Background: you know that a friend has a party on this weekend and you want to go but he/she hasn't invited you yet. How would you hint that you'd like to come to the party?

PROPOSITION	MODAL RANK (FREQ)	COLLAPSED RANK	ALL RESPONSES NBD	P.B.	A.S.	TOT
I'D LIKE TO BE DOING SOMETHING THIS WEEKEND	1(7)	1	5	1	0	6
I HAVEN'T BEEN ASKED TO DO ANYTHING YET	2(8)	2	8	1	0	9
YOU HAVE A PARTY ON	3(8)	3	4	2	1	7
YOU HAVEN'T INVITED ME YET	4(11)	4	1	0	0	1
CAN I COME TO YOUR PARTY	5(11)	5	1	4	1	6

AGREEMENT BETWEEN 11 RATERS RANK ORDERING PROPOSITIONS (EXCLUDING LAST PREMISE WHICH WAS FIXED) : W = .692, P < .01. AGREEMENT BETWEEN TWO JUDGES CLASSIFYING PREMISES = 66% (19/29)

*NB ONLY 10 NBD SUBJECTS

	ITEMS	COLLAPSED RANK	MEAN DIRECTNESS
NBD subjects			
BK	1. Gee that party of yours sounds really good ..	3	2.0
	2. Be great to come to something like that....	5	2.15
BN	3. Jeez I haven't been to a good party for a long while.....	2	3.38
DM	4. It's going to be a boring weekend.....	1	3.31
	5. What are you guys doing.....	3	3.54
RF	6. I'm not doing anything on Saturday night either.....	2	1.77
BM	7. I got nothing to do this weekend.....	2	1.54
CS	8. (Tell them that) I didn't have anything on that weekend.....	2	1.62
	9. I haven't got anything on that weekend.....	2	1.62
	10. I'd really like to be doing something.....	1	2.0
	11. But I haven't got anything planned.....	2	1.78
	12. I'm free.....	2	1.92
GL	13. (I might sort of invite them to something)...	1	3.54
	14. (Ask them) if they're interested in a movie..	1	3.46
IN	15. I hear you have a party on this weekend.....	3	1.92

	16. Have you got all your guests coming?.....	4	3.23
MH	17. Well what's happening this weekend.....	3	3.54
SM	18. things have been pretty quiet lately.....	1	4.08
	19. I haven't got anything on this weekend	2	1.11
CHI subjects			
P.B.	20. (Tell them) you weren't doing anything on such and such a night.....	2	2.15
	21. (Tell them) are they doing anything that night.....	3	3.39
	22. Well is it an open party and is there any possibility of.....	5	2.0
	23. Is there any possibility of my going to it..	5	1.23
	24. (Ask whether) they were doing anything that night.....	3	3.0
	25. (Make up an excuse) to invite them down the pub.....	1	3.69
	26. Is it an open party.....	5	2.31
	27. Can I go to it too?.....	5	1.23
A.S.	28. What's happening this weekend?.....	3	3.39
	29. Is there anything special on this weekend that I could participate in.....	5	2.77

ITEM 6

Background: You want to be given a shirt of a particular kind for Christmas. How would you hint that to your friend or wife?

PROPOSTION	MODAL RANK (FREQ)	COLLAPSED RANK	ALL RESPONSES NBD	P.B.	A.S.	TOT
I LIKE THIS TYPE OF SHIRT	1(4)	1	16	0	3	19
I NEED A SHIRT	2(6)	2	2	4	0	6
I CAN'T AFFORD A SHIRT	3(6)	3	1	0	0	1
YOU WILL BUY ME A SHIRT	4(5)	4	0	0	0	0
BUY ME THIS SHIRT (FOR CHRITMAS)	5(11)	5	0	0	0	0

AGREEMENT BETWEEN 11 RATERS RANK ORDERING PROPOSITIONS (EXCLUDING LAST PREMISE WHICH WAS FIXED) : W = .117, N.S. AGREEMENT BETWEEN TWO JUDGES CLASSIFYING ITEMS = 96% (25/26)

ITEMS		COLLAPSED RANK	MEAN DIRECTNESS
NBD subjects			
BK	1. Um the shirts in that catelogue look really really good.....	1	2.23
BN	2. That shirt would probably suit me.....	1	1.85
DM	3. That was a nice shirt in the window in the usual .. local shop.....	1	2.0
GW	4. Gee I think stripes are in on shirts these days.....	1	3.31
IS	5. Gee I like that colour blue, the sky's nice and blue.....	1	3.46
	6. I haven't got enough money to buy it at the moment.....	3	1.31
	7. But gee I like that blue one there.....	1	1.77
RF	8. Gee that's a really nice shirt.....	1	1.46
BM	9. I've seen a nice shirt up in the shop.....	1	1.92

	10. Gee that's a really nice shirt.....	1	1.54
CS	11. It's a really nice looking shirt.....	1	1.69
GL	12. I really like this one.....	1	1.31
	13. I like this one.....	1	1.46
IN	14. I saw this really great shirt in Target and	1	1.85
	15. ...It's only eighteen dollars you know.....	1	3.31
MH	16. (Make it quite obvious that) I like HAINS shirts.....	1	1.38
SM	17. Ah some of those clothes in that um magazine last week were quite good.....	1	2.23
	18. I'm getting a bit low on shirts or or new shirts.....	2	1.54
	19. I could do with a with I could do with something new.....	2	1.85
CHI subjects			
P.B.	20. (Show her one of your old shirts) well the collar on this one's pretty shocking.....	2	3.0
	22. (Show her one of your old shirts) the cuffs are pretty shocking.....	2	3.08
	23. (Show her one of your old shirts) I don't like the... (tell her) you don't like the colour, you'd prefer a different colour ...	2	3.39
	24. (Show her one of your old shirts) the collar's no good.....	2	3.0
A.S.	25. They're not bad shirts them ones are they...	1	2.62
	26. I like that style of shirt.....	1	1.62
	27. What do you think of that style of shirt do you think it's Ok?.....	1	3.69

ITEM 7.

Background: You are eating a meal at a friend's place and you want some tomato sauce but there's none on the table, that you would like to have some tomato sauce?

PROPOSITION	MODAL RANK (FREQ)	COLLAPSED RANK	ALL RESPONSES NBD	P.B.	A.S.	TOT
THIS MEAL NEEDS SOMETHING	1(9)	1	4	0	2	6
I WANT SAUCE	2(6)	2	7	1	0	8
YOU HAVE SAUCE	3(6)	3	1	0	1	2
THERE IS NO SAUCE HERE	4(7)	4	0	0	0	0
CAN I HAVE SOME SAUCE	5(11)	5	0	1	0	1

AGREEMENT BETWEEN 11 RATERS RANK ORDERING PROPOSITIONS (EXCLUDING LAST PREMISE WHICH WAS FIXED) : W = .685, P < .01. AGREEMENT BETWEEN TWO JUDGES CLASSIFYING ITEMS = 94% (16/17)

ITEMS		COLLAPSED RANK	MEAN DIRECTNESS
NBD subjects			
BK	1. Some sauce would go well with this.....	2	1.69
BN	2. Tomato sauce goes nice with this one.....	2	1.62
DM	3. Gee tomato sauce would be nice with it... just finish it off nicely.....	2	1.54
GW	4. Would you happen to have any tomato sauce.....	3	1.31
IS	5. I wouldn't um mind something to just flavour up the pie.....	1	1.77
RF	6. Tomato sauce would be really nice		

	with this steak.....	2	1.46
BM	7. Have you got anything I might be able to add to this ... put on this meat.....	1	1.92
CS	8. I reckon tomato sauce would be good on this	2	1.46
GL	9. I reckon it would go well with tomato sauce .	2	1.46
IN	10. A bit of tomato sauce would go well with this dinner.....	2	1.39
MH	11. Have we got a bit of something with a bit of spice around?.....	1	3.23
SM	12. Um this meal is really nice but I think it's just just missing something on the on the meat.....	1	2.0
CHI subjects			
P.B.	13. I'd like some tomato sauce.....	2	1.15
	14. Pass me the tomato sauce please.....	5	1.0
A.S.	15. There's something missing.....	1	2.54
	16. There's something missing.....	1	2.54
	17. Got any tomato sauce by any chance.....	3	1.38

ITEM 8.

Background: You take turns to drive to social events with your friend/partner but they haven't had a turn for a while and you think they should drive tonight

PROPOSITION	MODAL RANK (FREQ)	COLLAPSED RANK	ALL RESPONSES NBD	P.B.	A.S.	TOT
I'VE DRIVEN A LOT LATELY	1(7)	1	1	0	1	2
WE TAKE TURNS DRIVING	2(4)	2	0	0	0	0
YOU HAVEN'T DRIVEN MUCH LATELY	3(5)	3	2	0	1	3
I DON'T WANT TO DRIVE TONIGHT	4(8)	4	14	3	0	17
YOU SHOULD DRIVE TONIGHT	5(11)	5	1	2	5	8

RATERS RANK ORDERING PROPOSITIONS (EXCLUDING LAST PREMISE WHICH WAS FIXED) : W = .283, P < .01. AGREEMENT BETWEEN TWO JUDGES CLASSIFYING ITEMS = 94% (28/30)

	ITEMS	COLLAPSED RANK	MEAN DIRECTNESS
NBD subjects			
BK	1. Gee I wish I didn't have to drive home I'll drive to the pub.....	4	1.46
BN	2. I seem to be driving all the time ... to parties.....	1	1.46
DM	3. who's birthday is it tonight (private joke,on birthday don't have to drive)	4	3.62
GW	4. I'd like a few drinks tonight	4	3.39
	5. would you mind driving.....	5	1.39
IS	6. I've just had a few drinks before I arrived I don't think I can drive this time.....	4	1.85
RF	7. My car's playing up a little.....	4	3.85
BM	8. when was the last time you drove.....	3	2.0
CS	9.(tell them that) your car isn't going properly.....	4	3.77
	10. (tell them that) you don't feel like driving	4	1.23
GL	11. Car's not going too well.....	4	3.69

	12. My car's playing up a bit tonight.....	4	3.61
IN	13. I'd appreciate it if um if I could um really relax and have a few drinks tonight...	4	2.69
MH	14. (I'd say) I was going to have a big night tonight	4	3.31
	15. (I'd say) I sort of felt like a big night tonight.....	4	3.39
SM.	16. I wouldn't mind sitting back and just relaxing on the way.....	4	2.77
	17. Gee you haven't driven for a while.....	3	1.28
	18. I wouldn't mind sitting back and viewing the scenery.....	4	2.69
CHI subjects			
P.B.	19. Well I'm too drunk to drive.....	4	2.0
	20. I think you'd better because otherwise if I get pulled over well I'll do my licence.	5	1.15
#2	21. Oh well I've felt too tired.....	4	2.0
	22. I felt too tired.....	4	2.0
	23. Will you drive	5	1.15
A.S.	24. You got drunk at the last party	3	4.08
	25. It's my turn (to get drunk).....	5	2.0
	26. You'll drive now.....	5	1.15
	27. It's your turn to drive.....	5	1.0
	28. It's it's your turn.....	5	1.15
	29. I've been sort of sober for the last few parties.....	1	3.54
	30. It's your turn.....	5	1.15

APPENDIX 5: CHARACTERISTICS OF VIDEO SEGMENTS USED IN CHAPTER 6

Some segments were attributed to more than one program type because thay had elements of each.

Program type	Description of program	Target word
1. News interview	Woman being interviewed	"street"
2. English lesson	Woman talking at camera	"guest"
3. Science/documentary	Film footage (solar system)	"solar system"
4. English lesson or soap opera	Enacted scene in art gallery	"art"
5. Gardening	Man demonstrating pruning	"cut"
6. English lesson or soap opera	Enacted scene in coffee shop	"31"
7. Science/documentary	Film footage (gymnast)	"muscle"
8. Soap opera	Enacted scene on a farm	"wellies" (wellingtons)
9. News/interview	Film footage (ceremony)	"years"
10. Gardening	Man digging in garden	"soil"
11. News/interview	Woman being interviewed	"slate"
12. English lesson/ News/interview or Science/documentary	Film footage (wealthy family)	"family"
13. Soap opera	Enacted greeting of guests	"wonderful"
14. English lesson or Science documentary	Enacted workers in council building	"complaint"
15. News/interview or Science/ documentary	Woman being interviewed and film footage (elderly)	"management"
16. Science/documentary	Man demonstrating light technology	"globe"
17. Panel discussion or News/interview	Woman responding to questions.	"holiday"
18. News/interview	Film footage (Irish demonstrators)	"outraged"
19. News/interview	Woman being interviewed and film footage (farm)	"farm"
20. Science/documentary	Man being interviewed	"fever"
21. Panel discussion or News/interview	Man responding to question	"mild"
22. Soap opera	Enactment in doctor's surgery	"couch"
23. News/interview	Film footage (grave diggers)	"death"
24. Panel discussion or News/interview	Man responding to question	"jury"
25. Science/ documentary	Man demonstrating light technology	"hand"
26. English lesson or Soap opera	Enacted scene at art gallery	"painting"

APPENDIX 6 : STIMULUS ITEMS USED IN THE FORCED CHOICE VIDEO OF DIRECT AND INDIRECT SPEECH ACTS

A. Direct Speech Acts (enacted while both actors seated in armchairs in living room)

Question:	**Response:**	
	Appropriate	**Inappropriate**
1. "Can you play tennis?"	"yes"	retrieve and wave tennis racquet
2. "Can you cook?"	"yes"	retrieve and stir saucepan
3. "Can you swim?"	"yes"	lie across arm chair and feign swimming
4. "Can you fish?"	"yes"	retrieve and feign use of fishing line
5. "Can you dance?"	"yes"	waltz around living room
6. "Can you paint?"	"yes"	retrieve paint box and brush and feign painting

B. Indirect Speech Acts (enacted while both actors engaged in relevant activity)

Question:	**Response:**	
	Appropriate	**Inappropriate**
1. "Can you pass the salt?"	pass salt	"yes"
2. "Can you hand me the lighter?"	pass lighter	"yes"
3. "Can you open the door?"	open door	"yes"
4. "Can you give me a hand?"	help lift object	"yes"
5. "Can you take this bag?"	take bag	"yes"
6. "Can you shut the window?"	shut window	"yes"
7. "Can you turn the TV up?"	turn up TV	"yes"

APPENDIX 7.1 : ITEMS USED IN THE SARCASM STUDY (CHAPTER 6)

A. LITERALLY CONSISTENT INTERCHANGES

1. COMMENT: What a horrible dress.
   RESPONSE: How rude
2. COMMENT: What a lovely dress
   RESPONSE: Why thanks
3. COMMENT: What a huge meal
   RESPONSE: You don't have to eat it all
4. COMMENT: What a tiny meal
   RESPONSE: Don't worry there's more to come
5. COMMENT: What a great football game
   RESPONSE: So you're glad I asked you
6. COMMENT: What a lousy football game
   RESPONSE: Sorry I made you come

B. LITERALLY INCONSISTENT INTERCHANGES

1. COMMENT: What a horrible dress
   RESPONSE: Why thanks
2. COMMENT: What a lovely dress
   RESPONSE: How rude
3. COMMENT: What a huge meal
   RESPONSE: Don't worry there's more to come
4. COMMENT: What a tiny meal
   RESPONSE: You don't have to eat it all
5. COMMENT: What a great football game
   RESPONSE: Sorry I made you come
6. COMMENT: What a lousy football game
   RESPONSE: So you're glad I asked you

APPENDIX 7.2: INSTRUCTIONS TO JUDGES RATING RESPONSES TO SARCASM STIMULI

I have been trying to investigate how people resolve conflict in language i.e. how they re-intepret the literal meaning of a pair of utterences, when the literal meaning doesn't make sense. For example if **A says "What a horrible dress" and B says "Why Thanks"** I would expect a fairly common way to reinterpret that would be to assume that either A or B was being sarcastic, saying the opposite to what they really meant. As you are about to find, the rest of the world doesn't necassarily agree with me!

The following transcriptions are responses from fourteen men aged 27-44, to twelve items, including the one above. Each item was a pair of sentences. Half, like the one above, were conflicting in their literal meanings and half were literally consistent with each other (e.g. **"A: What a horrible dress" B: "How rude"**) For each item the subject was asked to provide an explanation as to how the two sentences could make sense as being a statement from one person and a response from another. These are referred to as person A and person B. What I would like you to do is to read each response through carefully, then rate it according to two criteria:

1.Type of explanation offered i.e.:-

A. Adequate (straight forward) explanation.

B. Partial or incomplete explanation/s are given, related to one sentence only at a time (e.g.... for the example above, "well A really thinks it is a horrible dress and B is thankful that she thinks it is a horrible dress").

C. Person A and/or Person B are described as being sarcastic.

D. It is inferred that A or B is being sarcastic ("well A really doesn't mean it's a horrible dress, she means it's a nice dress and she's being funny).

E. An unusual situation is evoked as an explanation ("they're at a Halloween party where people are supposed to look horrible").

F. An extraordinary situation is evoked as an explanation (I can't give an example but more strange than E. above)

G. misinterpretation of sentence/s or instructions

H. could not offer explanation

On the recording sheet, write a letter A-H corresponding to the sort of explanation they gave on each item. If they offered more than one explanation, write down the appropriate letters in the sequence they occurred. If the person repeated the same explanation more than once, record the corresponding letter for each time the explanation was repeated with an * to indicate repeat.

2. Ability to offer explanation:

Quick and easy		Some trouble				Can't do
1	2	3	4	5	6	7

On the recording sheet there is a rating scale like the one above for each item. Circle the number which corresponds to your impression of the relative ease with which the person coped with the item

NOTES

* You will see that there is enormous variety between subjects in the amount of dialogue for each item, and the amount of questioning and needling from me. You can assume that shorter items usually reflect **my** decision that the explanation is

1. self evident despite (or because of) it's brevity or

2. that that is the best explanation I am going to get short of having the subject get up

and storm out in frustration.

* the conversations I had, have been transcribed **verbatim** so they are not simple to read, heaps of repetitions, false starts etc.

* if it seems to difficult to sort out, just give me your impression of the category of the subject's response and the amount of difficulty they had, don't worry too much about trying to delineate the number of explanations they gave. Sometimes this is very difficult to determine.

APPENDIX 7.3 : NUMBER OF RESPONSES TO SARCASM STIMULI IN DIFFERENT CATEGORIES

Table A7.1 Head injured and control subjects' responses to literally consistent and inconsistent sentence pairs as classified into two categories, based on ratings of 7 judges.

SUBJECT	CATEGORY OF RESPONSE			
	Literally Consistent Sentence Pairs (6 items)		**Literally Inconsistent Sentence Pairs (6 items)**	
	ADEQUATE	INADEQUATE	SARCASM	INADEQUATE
	(A)	(B+G+H)	(C+D)	(B+G+H)
NBD Subjects (N=12)				
BK	5.7	0.3	4.7	0.0
BM	4.9	0.9	5.0	0.0
CS	4.9	0.4	3.1	0.9
GL	4.9	1.0	4.6	0.1
IN	5.7	0.3	4.9	1.0
MH	4.7	0.1	3.9	0.4
SM	5.4	0.3	2.7	1.7
BN	4.0	1.6	2.6	2.3
DM	5.6	0.4	4.7	0.7
GW	4.1	1.9	3.7	1.1
IS	5.0	0.4	5.0	0.4
RF	4.4	1.6	5.4	0.3
X	**4.9**	**0.8**	**4.2**	**0.8**
CHI Subjects				
A.S.	3.1*	2.3*	0.3*	3.8*
P.B.	5.0	1.0	1.0*	4.0*
X	**4.1***	**1.6****	**0.7*****	**3.9*****

* p = .039 (1 tail) ** p = .011 (1 tail) *** p = .006 (1 tail)

APPENDIX 7.4. MEAN DIFFICULTY RATINGS GIVEN TO RESPONSES TO SARCASM STIMULI

Table A7.2. Mean difficulty ratings given to CHI and control subjects' responses to the literally consistent and inconsistent sentence pairs, based on the judgements of 7 raters.

SUBJECT	DIFFICULTY RATING	
	Literally Consistent Sentence Pairs (6 items)	**Literally Inconsistent Sentence Pairs (6 items)**
NBD subjects (N = 12)		
BK	1.6	1.2
BM	2.1	1.8
CS	2.1	2.9
GL	2.0	1.7
IN	1.5	3.5
MH	1.8	1.9
SM	2.0	3.7
BN	3.6	4.4
DM	1.8	3.4
GW	1.9	2.5
IS	1.9	3.1
RF	2.4	1.7
MEAN	**2.0**	**2.7**
CHI subjects		
AS	2.9	4.4
BS	2.2	4.6*
MEAN	**2.6**	**4.5****

* p = .03845 (1 tail)
** p = .011 (1 tail)
*** p = .006 (1 ail)