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**Understanding instruction: How severely brain injured pupils make meaning in the mainstream secondary classroom**

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# **Understanding instruction: how severely brain injured pupils make meaning in the mainstream secondary classroom.**

Siân Alison Rees

A thesis submitted for the degree of Doctor of Philosophy  
University of Bath  
Department of Education  
April 2007

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# Dedication

To my parents who apprenticed me into the craft of teaching  
To my sons who taught me about learning  
To my husband who encouraged me to start and complete this study.

With thanks for all your support

## Acknowledgements

I would like to thank all the young people, their parents and schools who have helped with this study. I have appreciated the comments of colleagues, which have helped me with my thinking, even when we approached the ideas from completely different angles. My thanks also go to the staff and students at Bath University who attend the Centre for Socio-Cultural Theory and Activity Research (CSAT) Reading Group for their inspirational discussions. I would particularly like to thank Dr David Skidmore for supervising this thesis and Dr Andrew Rees for proof reading and acting as a critical friend.

## *Abstract*

This naturalistic case study, within a socio-cultural framework, investigated how young people make meaning in a mainstream secondary classroom after a severe acquired brain injury (ABI). Seventeen pupils who had sustained brain injuries sometime in the previous 10 years were observed and contemporaneous fieldnotes made. The qualitative analysis took an interpretivist stance using iterative coding to develop inductive categories and identify analytical themes.

A number of common difficulties were seen in this group, but they varied with time since injury. Some common discourse structures were found to be particularly difficult. These pupils tend to operate with the rules of everyday language rather than schooled language, causing mis-communication. Ambiguity in school language confuses, as pupils seem unable to move from the initially-assigned meaning. Pupils experienced difficulties working in dyads or groups, but were able to cope when the discussion was guided by a teacher.

Forms of representation impact on the learning of these pupils; iconic representation proved easiest. Support for symbolic representation is necessary to engage in principled learning. Ideal type diagrams were developed to show how pupils' understanding is affected by contextual factors.

There is no one single answer for these pupils, but I am able to suggest strategies to try with pupils. The scaffolding metaphor was modified to account for the subtle needs of pupils with an ABI, and the concept of internally persuasive dialogue extended to include dialoguing with the self, using the commonly observed pupil strategy of 'thinking aloud'. A metaphor for a suitable classroom learning environment was developed, comparing and contrasting a polyphonic, layered, classroom with a classical, structured, form.

A consideration of the policy of personalised education from the viewpoint of pupils with ABI, led to recommendations for provision and classroom practice, placing the onus on the education system to respond to the particular needs of this group of pupils.

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## ***Abbreviations***

ABI: acquired brain injury:  
ADHD: attention deficit and hyperactivity disorder  
ASD: autistic spectrum disorder  
BBC: British Broadcasting Company  
CHI: closed head injury  
CT: computed topography  
DDA: Disability Discrimination Act  
DfE: Department for Education  
DfES: Department for Education and Skills  
DRC: Disability Rights Commission  
EAL: English as an additional language  
GCS: Glasgow Coma Score  
HES: Hospital Education Service  
IQ: intelligence quotient,  
IRE: initiation-response-evaluation  
IRF: initiation-response-feedback  
ITV: Independent Television  
KHIS: Kids Head Injury Study  
LD: Learning Disabilities  
LDD: Learning Difficulties and Disabilities  
MRI: Magnetic Resonance Image  
OED: Oxford English Dictionary  
PVS: persistent vegetative state  
PTA: post traumatic amnesia  
Q&A: Question and answer  
SEN: Special Educational Needs  
SHIPS: Supporting Head Injured Pupils in Schools  
SLT: Speech and Language Therapist  
TA: Teaching assistant  
TBI: traumatic brain injury  
THI: traumatic head injury  
UK: United Kingdom  
ZPD: zone of proximal development

# ***Chapter 1 - Introduction***

Advances in acute medical treatment technology have led to an increase in survival rates of children with an Acquired Brain Injury (ABI)<sup>1</sup>. But still brain injury is the most common cause of death and disability in children (Hawley *et al.* 2003). Much is known about the adult brain but not so much about children;

All these children return to school, yet there is little or no information available to help their teachers, their parents or other professionals, who are often ill-prepared to deal with the difficulties that are frequently faced. (HIRE Newsletter Spring 2002)

Much work has been done by medical researchers, especially in the USA, to isolate the manifestations of Acquired Brain Injury (ABI) (see chapter 3), but as yet educationalists have only briefly considered the teaching/learning implications. There is very little research looking at how ABI impacts on classroom learning and a couple of books about ABI aimed at educators (Savage & Wolcott 1995, Walker & Wicks 2005) and chapters about education, written by other professionals in half a dozen other books (e.g. Semrud-Clikemann 2001, Appleton & Baldwin 1998).

## **1.1 Motivation**

This study started from an interest in how children learn after ABI. I was based in a tertiary hospital in the South-West of England, teaching young people who had had severe brain injuries while the pupils were in hospital and then at home, monitoring and advising on reintegration to school as part of the hospital education service (HES). When my involvement with the HES ceased, pupils were transferred to the Supporting Head Injured Pupils in Schools (SHIPS) project, where I am employed as a specialist teacher. Medics with whom I worked were told by schools that children either could not learn once back at school or were very disruptive. The medics despaired at schools and teachers and asked why the teachers did not allow for the ABI.

But some pupils clearly did learn. These were among the young people who did not return time and again to the clinics seeking medical solutions. And naturally the question was 'how'? Medical reports, based on clinical assessments, did not necessarily predict which young people would manage in the classroom and which would not. I realised that my study would need to consider what was actually happening in the classroom as well as the teaching/learning implications of the medical and neurological consequences of ABI. I would need to observe the pupils in class with their teachers. Within this study 'teachers' refers to any person, whatever age, in the role of a teacher whether specifically trained, a teaching assistant (TA), parent helper or more competent peer. My professional experience has shown that pupils returning to primary or special schools have fewer difficulties than those returning to mainstream secondary education. The study therefore made close observations of the difficulties experienced by 17 secondary aged pupils after ABI in an attempt to uncover how these pupils make meaning in the classroom.

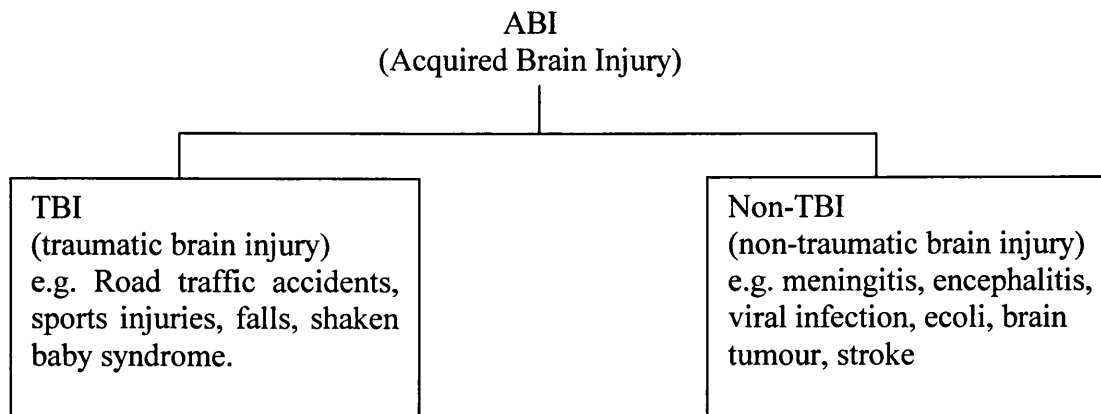
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<sup>1</sup> A list of abbreviations used is included on page x

Acquired brain injuries occur after birth as a result of illness or accident. They may be mild, moderate or severe, but this study only considers those in the severe category. The manifestations of childhood brain injury are different from injury sustained as an adult, as injury is overlain on a normally developing brain. Development is arrested, but then restarted. The pattern of recovery depends on the developmental age of the child at injury, the time since the injury and the age of the child or young person now. The resulting difficulties also depend on the site of the injury, whether focal or diffuse, although severe focal injuries often have secondary diffuse injury.

## 1.2 Acquired Brain Injury

There are two sub-categories of Acquired Brain Injury:



It is not easy to state the number of young people who are brain-injured in the UK. A number of researchers have attempted to gather such information (Sharples *et al.* 1990, Royal College of Surgeons 1999, Hawley *et al.* 2002, Hawley *et al.* 2003, Hawley *et al.* 2004b, Petit-Zeman 2001), the most recent suggesting that, every year, approximately 280 in every hundred thousand under-14-year-olds suffer a traumatic brain injury (TBI), in addition to the non-traumatic injuries, amounting to around 30 000 children per year gaining a new brain injury. In total, this amounts to between a quarter and half a million under 16 year olds in the UK with an ABI. Outcomes range from death and persistent vegetative states, to physical and cognitive disabilities and nearly always reflect the severity of the injury.

Most children survive but are left with long term ‘hidden’ problems such as learning, behavioural and emotional difficulties. It is held that it is better to deliver the necessary therapies in meaningful contexts for the child (e.g. Telzrow 1987, Semrud-Clikeman 2001), but once a child returns to school little assistance is available to them and their teachers and yet:

schools play a major role in the rehabilitation of head-injured children,  
(Ewing-Cobbs *et al.* 1986 p 63)

The difficulty for teachers is that the disability resulting from ABI frequently is invisible. Like dyslexia and mild autism, it is easy to forget about it in the hurly burly of classroom life and assume that the child is operating like the rest of the class. In addition, children with ABI may reach the same achievement level as their classmates and therefore are not flagged up as having Special Educational Needs. But they do not reach their potential. The Department for Education admitted:

Mainstream schools and, indeed, many educational psychologists are unlikely to be knowledgeable about the special problems involved in recovery from serious illness or injury... In particular, even the most skilled mainstream teacher who has had no previous experience of teaching a brain injured child will need advice on potential changes in a child's language, memory and organisational skill (which may be misunderstood or mishandled) (DfE May 1994 Paragraph 63)

TBI has two different effects on the brain. Focal injury, either fracture or contusion (bleed), results from the impact, both the knock (coup) and the rebound blow (countercoup) of the brain inside the skull. Diffuse injury results from sudden acceleration or deceleration of the brain causing axonal shearing. These are called primary effects and neither of these is present for a non-traumatic ABI, but the secondary effects in TBI may be present in non-traumatic ABI. These include swelling of the brain or around the brain, contusions, haematomas or haemorrhage (Semrud-Clikeman 2001). Most research has focussed on the effects of TBI rather than the more general ABI, this may be because TBI is seen as an amorphous group within ABI, while non-traumatic ABI may be divided into further groups by aetiology. Yet the injuries from blows to different parts of the brain can also be quite different especially those involving the frontal lobes as opposed to other areas. In the classroom there is sufficient similarity to group all pupils with ABI together, at least for this exploratory study.

### 1.2.1 Severity

Not all brain injuries are severe. Medical severity may be measured according to the following:

	Mild	Moderate	Severe	Very severe	Extremely severe
GCS	12-14	8-12	<8		
PTA	<1 hour	1 -24 hours	1-14 days	2-4 weeks	>4 weeks

GCS - Glasgow Coma Score

PTA - Post Traumatic Amnesia

However, severity measured by GCS and PTA is not a reliable indicator of consequences (Savage 1991, Blosser & DePompei 2003). Factors affecting severity of consequences are depth and duration of consciousness and age at onset (Anderson *et al.* 2005). Ponsford (1995) asserts that overstimulation while a child is still in PTA may lead to behaviour problems which otherwise would not have emerged, so it will be important to ask parents about the child's recovery.

### 1.3 Research problem

The research problem is an investigation into how pupils with a severe brain injury make meaning in the mainstream secondary classroom.

Clinical research suggests that the difficulties experienced by pupils with ABI will impede classroom communication. It is the interaction between recovery and normal development, along with the memory of pre-injury abilities and behaviour, which makes



ABI unique, and therefore demands separate research. So far, research into the impact of ABI on learning has been in clinical settings, mostly using quantitative methodologies. Although more research is now taking place into the classroom implications of ABI, no-one, as far as I know, has yet investigated how teachers may support the learning of these pupils in normal classroom conditions. With more children surviving ABI and being reintegrated into mainstream schools, it is important to investigate this topic using a naturalistic approach, as this promises to give greater insight into the realities of their experience of schooling than is possible using a controlled experimental approach.

### **1.3.1 Conceptual framework**

Psychological and functional research into ABI has been mostly conducted within a psycho-medical model (e.g. Ewing-Cobbs *et al*, Hawley *et al.*), within information processing, behaviourist (e.g. Barbara Wilson), or Piagetian (e.g. Ron Savage) frameworks. Only Mark Ylvisaker and his group have considered what a Vygotskian framework for enquiry may offer in this field. Socio-cultural theory offers a different viewpoint: that of each young person drawing on cultural tools which enable them to manipulate ideas and operate in a social world. Such tools are passed from one generation to another, both in schools and in society in general. Socio-cultural theory (or theories, as there are now a number of differing responses to the original work of Lev Vygotsky in the 1920s) the emphasis is on the place of signs and symbols, and, in particular, speech. As speech is the main medium for teaching in the classroom it would seem that socio-cultural theory may provide a key into understanding the experience of this group of pupils.

The theoretical framework for this thesis draws on the socio-cultural tradition of learning theory rooted in the work of Vygotsky and his followers (e.g. Daniels 2001, 2005, Tharp & Gallimore 1988, 1998, Wertsch & Stone 1985). This framework is more fully elaborated in Chapter 2. Vygotsky rejected the particular biological model of disability propounded by Pavlov and then popular in the Soviet Union, where the 'subnormal' were presumed to follow their own developmental model (Evans 1993). He argued that the laws of development were the same for all children and social aspects of learning were the means of improving pedagogical skills for all learners. Just as Vygotsky included biology as one level of analysis, arguing for a compensatory approach to 'defects' which looked at both the difficulty and the effectiveness of the pedagogic strategy used to help overcome the problem, I will consider both the effect of the impairment and the effectiveness of the teaching strategies employed to cope with the difficulties experienced by pupils with ABI.

### **1.4 View of disability**

A medical, or epidemiological (Söder 1989), model of disability emphasises the impairment or 'deficit' (Allan 1999) and views disability as the restrictions caused by the impairment. Rejecting this idea researchers have developed a social model of disability (Abberley 1987, Booth 1989, Mason 1992, Söder 1989). This draws attention to the ways in which the particular construction of society hampers or *disables* certain people, and attempts to remove any form of labelling by impairment. Proponents work towards the removal of barriers to participation in society (Mason 1992). Within an adaptability approach to disability (Mercer 1973, Soder 1989), social disadvantage is the result of the relationship between the individual and the environment. But these social models ignore the restrictions of organic impairments which would still cause

disadvantage (Rieser 1992) even if the social situation were changed. Young people who sustain an ABI will continue to experience limitations to their cognitive and possibly physical capabilities for the rest of their lives. These cannot be ignored. Shakespeare (2006) proposes an interactional approach to disability, which can encompass the physical, social and emotional implications of impairment, through examining both the consequences of impairment and the culturally-determined aspects of life. Both will be considered within this study.

But it is more than this. While ABI causes injuries to the brain which may be seen clearly on an MRI scan, the cause of impairment in ABI is also social and cultural (epidemiological); the way culture has developed gives birth to most 'accidents' and the manner in which we live, in close proximity to each other, means that viruses which cause brain injury are allowed to reproduce and spread. Relatively few injuries are caused by spontaneous cancers. Preventative measures lie in the hands of politicians and are socio-economically driven; society could develop ways to prevent injuries and in some places this has happened, but in other cases it is not considered economically viable to do so. Ameliorative techniques too are subject to economic scrutiny and socially determined by the treatment, therapies and assistance available within the local area. Currently the Kids Head Injury Study (KHIS) in Frenchay Hospital, Bristol, is seeking to expose the long-term costs of brain injury and the economic advantage, or otherwise, of early intervention.

'Disability' is relative to the demands of particular settings and can be reduced when changes are made to that setting (Rees 2007a).

If disabled people have equal moral worth to non-disabled people ....  
then justice demands social arrangement which compensate for both the  
natural lottery and socially caused injury. Creating a level playing field  
is not enough: redistribution is required to promote true social inclusion.  
(Shakespeare 2006 p67)

In the UK, people with ABI do fall into the legal definition of disability (DDA 2005) where you are disabled if you have a mental or physical impairment which has an adverse effect on your ability to carry out normal day-to-day activities. The adverse effect must be substantial and long-term, meaning that it has lasted for 12 months, or is likely to last for more than 12 months or for the rest of your life (DRC Website). This makes it illegal to discriminate against a person with ABI in the field of education. The loophole for schools is where provision is contrary to the efficient education of other children and the efficient use of resources (SEN and Disability Act 2001) and there is certainly no requirement to favour young learners with an ABI in order to promote social inclusion.

#### **1.4.1 Terms and labels**

According to the OED, a disability is a 'thing which incapacitates or disqualifies'. Disqualification assumes a standard which is not met and therefore bars or excludes the bearer from entry. In the case of ABI, it is the dis-ability to enter society or the culture of the UK. Part of this is the education system which is currently based around the written and spoken word. The ability to communicate well imparts an enormous advantage in the system, and success in the education system is, in most cases, the passport to employment, monetary reward and an easier life. Yet it is known that pupils

with ABI experience difficulties in the field of communication (e.g. Ewing-Cobbs *et al.* 1998), but very few get specific, differentiated help (Rees 2006a).

A consideration of 'ability' generally pertains to one area of life, as capability, talent, capacity, aptitude, skill, facility, gift or knack, yet 'disability' has become more of a general term, describing a person and not one area of their life. Young people with ABI retain some of their skills and may learn other specific skills. If they are labelled 'disabled', teachers and others may overlook these areas of skill, or seeing the areas of skill, dismiss the pupil as 'lazy'. A more specific term is required. We could say that a person is 'compromised' or that they have or experience difficulties. However, another use of the word 'compromise' is 'co-operation', meeting in the middle, giving up something you want for the good of another. Can we then say that abilities have been compromised?

Alternatively we may emphasise the specific difficulty. If a person *has* a difficulty it indicates the persistent nature of the problem, while *experiencing* the difficulty is more transitory, and labels only the current activity rather than the whole of life. Both focus the attention on the specific problem area and encourages all concerned with helping the young person to work to ameliorate the difficulty they are experiencing through restorative or compensatory means, reducing their level of disability.

#### **1.4.2 Results of labelling**

Soder (1989), however, asserts that labelling is 'categorisation through diagnoses, and labels underline the handicap and diminish opportunities for personal development.' The diagnosis becomes the person as the person conforms to the social label. Disability advocates, some of whom are professionals (e.g. Rieser 1992), have influenced front-line workers, e.g. teachers, therapists, nurses, social workers etc, to see that disability is not the defining characteristic but one of many personal characteristics. But by avoiding labels we do not change society, or life for those people with impairments which prevent or make access difficult to a particular social place or cultural tradition, it merely ignores the predicament of the individual. Society is the same and still excludes the disabled person.

Whether and how young people with an ABI are defined as 'disabled' is hotly contested among parents and the young people themselves; labelling brings financial and other advantages but emphasises the injury and changes which the family and/or young person may be unwilling to accept.

The label might, from the perspective of the labeller, be seen as a neutral, descriptive or scientific diagnosis.... in fact it is something much more. It puts the person in a category that is loaded with social meanings and preconceptions. (Soder 1989 p119)

In the classroom many pupils dislike having a Teaching Assistant (TA) assigned to them because of the stigma of need, and on returning to school pupils resist visiting the resource base or special needs centre 'because only thickos go there,' as one of my pupils put it.

Since the 1950s hospital admissions for ABI have been increasing (Middleton 1989), yet there is still a misunderstanding of the consequences of such an injury among the

general public. In film, literature and on television brain-injured characters frequently recover completely very quickly, e.g. recent episodes of *The Bill* (ITV) and *Waking the Dead* (BBC) (June 2006) or a second injury reverses the effects of the first, e.g. *The Hodgeheg* by Dick King-Smith, *The Curse of the Were-Rabbit* (Aardman Animations), although the recent BBC1 drama *Recovery* (February 2007) has gone some way to redress the balance. These have led to family members and teachers assuming that the pupil is 'nearly back to normal' when they are ready to return to school.

Pupils with ABI are frequently not noticed in the classroom without their label, as their difficulties are 'subtle', in that they are hard to analyse or define or apprehend. This adjective however also has its problems as subtle can mean that their differences/difficulties are thin or tenuous. The difficulties experienced by a pupil with an ABI are not obvious, it is frequently termed 'the invisible injury' (e.g. Walker & Wicks 2005); it is in this sense that they are subtle. One antonym for obvious is obscure – cannot be seen; the difficulties of ABI can be seen, but only if you look hard enough. Labelling seems to be necessary to afford each pupil with ABI the assistance they require to access the culture.

Within the Education Code of Practice (DfES 2001) the term 'disabilities' and 'learning difficulties' are separated in the Definition of Special Educational Needs (paragraph 1:3), and this separation seems to filter through to the busy classroom where neurological impairment which does not produce physical manifestations is not so easily seen and remembered. An ABI changes the way that a young person is able to access their thinking power, and is an impairment as it relates to what is expected in the UK education system, where attention, speeded thought processes, organisational skills and flexibility are seen as positive attributes of pupils. It becomes a disability when those around the young person do not understand the organic limitations due to the injury and dismiss the person, rather than try to compensate for the impairment in the teaching/learning relationship. I am aware that by conceptualising ABI in this way, I am at variance with the way ABI is generally seen in the neurological tradition. Medicine is generally concerned with the processes of the functioning body, and tends to seek symptoms and the reasons for their existence in an information-processing model. Hence the attitude to ABI is as a collection of deficits or impairments.

Impairment must be a bad thing in so far as it is an undesirable consequence of a distorted social development, at the same time as it is held to be a positive attribute of the individual. (Abberley 1987 p235)

What we need is an ambivalence to the impairment; the impairment is part of the person, it is not something to be rectified, but something around which we must work to ensure the person has access to the culture in which he/she lives and is not oppressed.

## **1.5 The Study**

This thesis is an attempt to look at how young people make meaning in the mainstream secondary classroom after a severe ABI. In Chapters 2 and 3 I will trace the understanding of learning from a socio-cultural perspective and research into ABI, before outlining the situation for pupils with ABI in English schools. Chapter 4 presents the methods of the study before Chapters 5 and 6 analyse the data, showing some of the mechanisms at work when pupils with ABI become confused in the classroom, making their own meaning and understandings from ideas presented to them. Chapter 7

examines the strategies used by pupils and teachers to assist meaning-making. The concluding chapter returns to the research questions and seeks to answer them in the light of the findings of the study.

## ***Chapter 2 - The social processes of learning***

### **2.1 Socio-cultural theory**

In this chapter I will outline the developments in understanding learning from a Vygotskian perspective, before examining how communication is used in the mainstream classroom.

Vygotsky was not well known in the west until the late 1970s and Piaget's theoretical viewpoint dominated psychological and educational literature. Within the area of research into ABI, almost all inquiries are conducted within frameworks originating within Western philosophy. The exception is the work emanating from the group in New York, led by Mark Ylvisaker. It would therefore seem helpful to examine how socio-cultural ideas may be helpful in exploring the experiences of young people with ABI in secondary classrooms. It would seem important also to consider how these ideas differ from the more usual theoretical frameworks adopted for studies into ABI.

The foundational theories of development in American and European psychology developed from different assumptions, reflecting the *Zeitgeist* where they originated. Behaviourist theories emphasise the outcomes of learning while the cognitivist model was heavily influenced by the developments in computer technology, especially in the U.S.. Information-processing sees cognition as computer-like and human activity in terms of skilful actions, focussing on memory and processing. Within this paradigm teaching may be seen as transmission.

Constructivists reject a concept of learning as transmission; new learning takes place through transformation as ideas are internalised. Piaget (1896-1980) followed a biological constructivist model, reflecting the rational thought of 19th and 20th century Western Europe with its emphasis on the individual and an all-powerful science. He held that development, being biological in origin, is universal, influenced by culture and opportunity, but not moulded by it (Phillips 1975). Mental growth, in his construct, is inseparable from physical growth. Yet a biological account was not absent from Vygotsky's (1896-1934) ideas and interests and learners who are 'defective' [sic] may also be encompassed within his theory as the process of socialisation intertwines with maturation of the individual (Daniels 2005).

Vygotsky's theory revolves around two important ideas: the Zone of Proximal development (ZPD) and his 'general genetic law of cultural development' (Daniels 2005 p6). Unlike Piaget's theory where the focus is on activity, Vygotsky theorises the importance of psychological tools in the development of concepts. Language and discourse become tools in the development of concepts and ideas.

### **2.2 ZPD**

Vygotsky (1978) put forward the notion that there are two levels of understanding, actual level and the potential level, between which teaching should occur, helping learners to grow into the intellectual life around them. Thus instruction and assessment are intertwined as the focus of teaching/learning is as much on the process as the product, but Vygotsky had not fully developed his ideas before his untimely death.

Tharp & Gallimore (1988, 1998) took up the challenge and delineate four stages of the ZPD; initially performance is assisted by more capable others, then the learner assists themselves through the process, before the process becomes automatised or fossilised. Sometimes learning is 'forgotten' and de-automatisation leads to recursion through the ZPD. However as Hedegaard (1996) points out it is only in the first of these stages that cognitive processes are exposed; at this point it can be used as an analytical tool within a process of dynamic assessment (Campione *et al.* 1984, Daniels 2005) (See Chapter 4 for its use in this study).

Class tuition in mainstream secondary schools assumes that pupils have experiences, skills and knowledge in common, and therefore share a ZPD. 'Instruction can build upon these common features if it takes into account that the children vary in their speed and form of learning' (Hedegaard 1996 p191). Whether after ABI, a pupil has the same ZPD as their class-mates may be an issue as pupils operate in the mainstream classroom.

How learning within the ZPD happens has been hotly argued over the last couple of decades; Wood *et al.* (1976) introduced the concept of scaffolding (discussed below) which has since been elaborated. Rogoff (1990), Lave and Wenger (2005) focus on increasing participation in social practice while others have developed Leontiev's ideas into activity theory (e.g. Davydov & Markova 1982) emphasising the unity of mind and activity. Piaget too asserts that learning takes place through action, but any action involves objects or ideas which are embedded in the culture. Yet Piaget ignores cultural influences. More recently neo-Piagetians, such as Case and Fischer (Gardner *et al.* 1996), have emphasised both context and content, claiming that a child may be at one stage of development in one context and at another when the context, or environment, is changed.

Piaget's child is an epistemologist - a seeker after his own understanding. A teacher facilitates discoveries, providing means by which cognitive inconsistencies may be illuminated. One set of cognitive structures develops into another as new information is accommodated and assimilated, producing a staged approach. But it is within the credence given to socially led development that the real difference lies. Vygotsky challenged Piaget's assumption that learning should be matched to developmental level declaring that

instruction is good only when it proceeds ahead of development, when it awakens and rouses to life those functions that are in the process of maturing or in the zone of proximal development. It is in this way that instruction plays an extremely important role in development (Vygotsky 1956 cited in Wertsch & Stone 1985 p165)

with the ultimate, often unrecognised, goal to gain consciousness and control, through mastering one's own action rather than being guided by someone else (Bruner 1981). It is in the pursuit of this that the concept of scaffolding has been introduced. This concept is discussed later.

### **2.3 Internalization of learning – the genetic law**

The assumption within Piaget's work is that a pupil constructs knowledge and symbolic representations from scratch as they accommodate and assimilate new ideas into

existing structures. The Soviets explored the concept of internalisation more extensively (Wertsch & Stone 1985). Vygotsky (1978) theorised that any cognitive function appears twice, or on two planes firstly at a social level as intermental and then on the psychological plane as intramental. But this is not a single once for all time event. Inner processes develop only as a result of a prolonged development. Consciousness and control appear at a late stage in the development of a concept or function, after it has been practised subconsciously and spontaneously (Bruner 1981). To be able to do it (to 'possess' it in Vygotsky's terms) is not enough, to have control over it the action needs to be beyond the subconscious. For example, when learning mother language, deictic shifters (non-specific referential words, whose meaning can only be understood from context e.g. we, then, there, now) can only be learned with a considerable amount of contingent communication with a more expert speaker of that language who had some pedagogical aims (Bruner 1981). The adult is socialising the child into cultural practices, passing on cultural knowledge in a deliberate and active manner.

### **2.3.1 Inner speech**

Piaget's concept of egocentric thought formed the stage between autistic play and directed (reality orientated) thought (Smith *et al.* 1998), only becoming realistic under social pressure. Intended only for the self it arises out of a solipsistic understanding of the world. Again rejecting dualism, Vygotsky argued that egocentric speech forms a bridge between external and internal; the child is not externalising his thoughts, but internalising his external verbal interactions. Emerson (1996) saw that such speech is presumed by the children to be understood by others, and increases when faced with a problem,

the child.....has few inhibitions about speaking aloud to express, amuse or direct himself when the urge arises, whether he is alone or in company. His speech is audible to himself and may be either clear or inaudible (or unintelligible) to others who are present as it is unconstrained by the transmission requirements of interactive talk. (Garvey 1984 p207)

Experiential, external activities are inextricably linked to internal (Leont'ev 1979, Wertsch & Stone 1985), with the process of transfer forming the internal plane of consciousness. Young children do not completely appreciate internal speech functions and temporarily use overt self-regulative speech, but, as it is mastered, audible speech disappears. It does not atrophy as Piaget has it, but it goes 'underground' (Wertsch & Stone 1985).

Egocentric speech is a functionally and structurally distinct form of speech. However while it is emerging it is not definitively separated from social speech from which it has all the while been developing.....Even if we could record inner speech on a phonograph it would be condensed, fragmentary, disconnected, unrecognisable, and incomprehensible in comparison to external speech. (Vygotsky 1956 in Wertsch & Stone 1985 p172-173)

Intelligence is not an 'accumulation of skills mastered' as in behaviourist theory, but a dialogue with the future and an address to the external world. It is how you seek help



and utilise the environment which shows true intelligence (Emerson 1996). Two things are fundamental to internal, or mental, activity: it is social, i.e. intermental and 'instrumental', i.e. tool-like (Leont'ev 1979).

This is then the contradiction – it is quasi social, but it is quite distinct in form; as I will show later, after ABI pupils use egocentric speech. Whether its use is the same as with much younger children needs to be investigated. The key feature is whether the utterance is part of an external social process or whether it is quasi-social, partially internalised, individual activity, a new tool with which to think.

### **2.3.2 Psychological tools**

While some in the Soviet school focused on activity, Vygotsky focussed on signs and symbols as mediational objects (Daniels 2001). He distinguished between psychological tools which direct mind and behaviour, and technical tools which form an intermediate link between human activity and an object (Vygotsky 1979). Leont'ev (1979) went further and rejected behaviourism as lacking activity on the part of the recipient. For 'it excludes the process that active subjects use to form real connections with the world of objects' (ibid p42). Instead he introduces the concept of 'objective activity' which stands between the stimulus and the response, and mediates the connections between the two. However this is not an individualistic response; activity has to have a motive and that motive is social, the object of activity is the mental image of the object and can be seen as it transforms the subject's activity. Such a mental image may be seen as a tool or a sign. Vygotsky did not elaborate on the format of such psychological tools; Bruner's (1996) elaboration of this resulted in the development of three different forms of representation, symbolic, iconic and enactive. Enactive representation involves learning instrumental structures, sets of actions appropriate for achieving a certain result. Iconic representations, in terms of images or graphics stand for the idea, while symbolic representation involves words or logical propositions. However it is never as clear-cut as this may seem; the active coding of modelled behaviour (iconic) into descriptions, or labels, increases learning and retention of complex skills (Tharp & Gallimore 1988), and such a coding involves language, the symbolic representation of ideas.

### **2.3.3 Concept Formation**

Concepts are not just enriched associations between internally joined groups – conceptual thinking is a powerful new intellectual mechanism which increases the capacity of working memory, thus assisting the process of 'thinking' (Skemp 1971).

Concepts cannot exist without words and thinking in concepts is not possible outside verbal thinking.... the new essential central feature which should basically be regarded as the primary cause responsible for concept development, is the specific use of words and the functional application of signs as a means for concept formation. (Vygotsky 1994 p213)

Concepts are defined by words. When a new word is learned the idea is not mastered, but only the beginning of the concept which it labels.

At the moment of initial acquisition, the new word is not at the end, but at the start of its development. At that stage it is always an undeveloped

word. The gradual internal development of its meaning also results in the maturing of the word itself. (Vygotsky 1994 p369)

Unlike Piaget, Vygotsky (1994) delineated between spontaneously developed and highly contextualised everyday concepts and systematised, organised and hierarchical academic concepts arising from formal education. Tharp & Gallimore (1988) termed the latter 'schooled' concepts, yet not all which is learned in school involves 'schooled' concepts. Children learn both at an everyday, empirical level, and theoretical, and therefore, conceptual (Hedegaard 1996). Teaching within the former consists of observation, comparison, categorisation and memory, while the latter requires teaching tasks that illuminate the contrasts found in a phenomenon's fundamental relations. The categories of everyday life are not always academic categories, and pupils have to use an unfamiliar category system as an alternative way of seeing the world.

Vygotsky proposes that academic concepts are not merely assimilated through memorisation, but arise and are formed with the help of the most extreme tension in the activity of thinking. There is a complex relationship between teaching and development.

The process of concept formation cannot be reduced to associations, attention, conception, judgement and determining tendencies, even though all these functions are indispensable in order for this synthesis to occur, which, in effect, amounts to the process of concept formation. (Vygotsky 1994 p212)

In this, Vygotsky challenges the predominant educational practices of the time, both in Russia and the West. Skemp (1971) isolated classifying as the key skill, bringing past experience to bear on present situation, to see if it corresponds, but left it to the learner to determine the sets. All too often teaching in schools becomes the transmission of isolated 'facts' which learners are presumed to organise for themselves. Tharp & Gallimore (1988) suggest teachers engage in cognitive structuring to provide explanatory and belief structures which organise and justify, for example theory in science, beliefs in RE and rules in games. These are unfamiliar categories and explanatory frames for children, and may negate those they take for granted in lives outside school. In this study I observed pupils to try to see if providing structures assists their learning.

The assumption in the west is that the general is developed from mastering the particular; concepts are formed by looking at different representations of the same 'thing' e.g. pine, oak and ash, and deducing what is the same about them, trees. Learners use words because of their physical affiliation, rather than because of their meaning, which arises from multiple usage and correction. Yet it has been found that, after ABI, young people do not easily attach markers to experiences (Ylvisaker *et al.* 1998c). If teachers assume that learners move from the particular to the general (using inductive reasoning) pupils with ABI will fail to conceptualise. This will be investigated as part of this study.

Vygotsky offers an alternative, suggesting that the general and abstract come before the specific and particular. A word is a generalisation which encompasses a number of as yet unseen objects and experiences; the particular is made visible through the general.

The child starts from the general e.g. animal, and moves to the specifics of individual names later. But if he learns 'duck' to represent animals, as my young son did, then all animals are ducks, at least for a while! The child makes guesses at the meaning from 'unorganised heaps' to 'complexes' then to 'concepts' via 'pseudoconcepts'. Applying this to the classroom, Hedegaard (1996) recommends that the teacher guides the learning from student's involvement with the general laws in the clearest possible form. Clearly, practical activities are an important part of teaching. However, 'these activities must .....contain the general laws in their most transparent form' (ibid. p191).

### 2.3.4 Talk

Concepts are the goal; meaningful discourse is the medium in which society creates minds and by which minds create society. (Tharp & Gallimore 1988 p93)

Talk is an important tool in the learning process as it is flexible and allows us to try out new ways of arranging what we know (Barnes 1992). It is through communication with teachers that children become aware of the special nature of educational knowledge as something distinct from everyday kinds of ideas and social practices (Mercer 1992, Renshaw 1992). This temporarily shared social world assumes a commonality of categorisation, and is necessarily only partially shared. It is tagged onto pre-established knowledge by means of fragile connections made by means of judgements and reasoning. Pre-established knowledge acquires novel dimensions in the light of the shared world as the student modifies their outlook, taking into account the point of view of the teacher. At times this cognitive conflict can be dramatic, at others the accommodation is easy, but among pupils with ABI change is difficult. How it affects learners in the classroom was noted in this study.

Vygotsky (1978) showed that speech not only accompanies practical activity but also plays a significant role in carrying it out. When young children are not allowed to speak then the task is not accomplished.

.....the most significant moment in the course of intellectual development which gives birth to the purely human forms of practical and abstract intelligence occurs when speech and practical activity, two previously completely independent lines of development converge. (ibid. p 24)

The ability to solve tasks with the aid of speech, as well as eyes and hands, is uniquely human. Vygotsky noted that children, instead of appealing to an adult, appeal to themselves and the intermental function of speech (socialisation) becomes intramental as it is used to organise their own behaviour. So the internalisation of speech is also the socialisation of children's practical intellect. Initially, speech accompanies action, but later it precedes action, so the words then shape the activity and speech becomes an organisational tool. Speech also gives the child access to a time field. Changes in the immediate field may be considered from the point of view of past activities and predictions of future ones. So the goal of an action may be in the future, while the tool is a memory of a past event (Vygotsky 1978).

Language is appropriated to form the intramental tools for higher mental functions (Renshaw 1992, Wertsch 1995). Signs interposed between the sensory system and the motor response allow a thought process, which is the beginning of higher cognitive functioning. The sign (be it a word or symbol) is primarily used to influence others and only secondarily to influence self (Wertsch & Stone 1985). Words have an inherently social function. Vygotsky argued that, by mastering the cultural sign system, human consciousness is formed in the individual, and even in the private sphere, humans are rooted in the social. However, internal and external processes are not copies of one another. Internalisation transforms the action itself, changing its structure and function to allow for intramental mastery.

## **2.4 Discourse**

### **2.4.1 Language as a psychological tool**

In all societies, culturally situated talk is the prime medium for sharing knowledge. Vygotsky asserted that the essence of cultural development is a collision between the mature cultural form for behaviour (schooled concepts) with the primitive forms which characterise a child's behaviour (everyday concepts). Discourse-rich curricula succeed because they make hidden thought processes public and shared, and therefore open to teaching. Barnes and Todd (1977) showed how talk enables learners to take a more active ownership of the learning in the context of education. When pupils have to present ideas clearly and explicitly, they will reason together and their reasoning is visible in talk (Mercer 1995). However, to facilitate this, partners have to talk to do the task in a spirit of co-operation rather than competition, with a shared understanding of the point and purpose of the task. Yet, in many classrooms, a competitive spirit dominates both between the teacher and pupils and among pupils themselves. But Gardiner (1992) found that young people are able to use words well, 'when they are invited to talk seriously about something that they feel is important to listeners who want to hear what they have to say and are prepared to value it as serious utterance, it is often surprising what linguistic resources they have at their command' (ibid. p 202).

Communication involves both verbal and non-verbal acts (Mackay 2000). Research indicates that the presence of a live conversational partner and feedback have a marked effect on the accessibility of language (Brown *et al.* 1989), despite possibly being more cryptic and incomplete (Rommetveit 1974). Overt messages, things actually said, are only a small part of the total communication (Edwards & Mercer 1987). Within spoken language much depends on guesswork and assumption. Through discourse and joint action, two or more people build a body of common knowledge which becomes the contextual basis for further communication. Within text, too, ideas are only intelligible within the framework of the shared imaginary world and the intersubjectivity established between author and reader. For school readers the context may be more than just the text. Beginning readers have to 'read' the picture as much as the text in order to make sense of the language, and many of them become so adept at this that they are able to predict the text without decoding the words. This 'taking the attitude of the other' constitutes an integral, basic, and thoroughly intuitively mastered component of communication under a great variety of situational conditions. Yet it is known that after ABI it is difficult to adopt the point of view of another (see chapter 3).

### **2.4.2 Conversational ground-rules**

Agreement about the conduct of a conversation makes it possible to converse without having to negotiate every aspect of the encounter. Within communication, partners

have to assume that what they say will be understood through a common language. This consists of a knowledge of vocabulary and grammatical structures (Bruner 1987), conventions about turn taking and conversational flow, (prosody, intonation, rate and volume) and guiding principles for non-verbal behaviour, (expression, eye contact and proximity to partner). These are frequently not voiced, but they exist. We often only realise that such ground rules exist when they are broken (Mercer 2000) and we are presented with behaviour which we did not expect.

In every social interaction the individual draws on a script or cognitive frame (Elkind 1979) which may be more or less appropriate to the context (Nelson 1981). These scripts are also a shared knowledge base within which interactions take place. Some negotiation may be necessary but, without shared scripts, every social act would need to be negotiated afresh. If a pupil with ABI either does not recall or choose the appropriate script for an event, there will either be a mismatch between communication partners or the pupil will expend additional mental energy to set up a framework for each situation, a very tiring process. Fatigue after ABI is discussed in Chapter 3.

Participation in classroom education clearly requires familiarity and competence in dealing with a variety of special sorts of discourse (Donahue & Lopez Reyna 1998), and the ability to shift between formats. Lack of flexibility after ABI has been reported in clinical situations and anecdotally, and may be observed in the classroom. This is discussed further in Chapter 3. Teachers tend to assume that the classroom ground-rules (Mercer 1992) are self-evident. They themselves probably succeeded at school and do not realise that language has a special nature in school. Students become used to hearing conversations they do not understand, and are not prompted to repair their understanding, especially where prolepsis is used.

Classroom expertise is communicated, demonstrated and assessed in ways that depend on shared rules of interpretation, ground-rules for mutual understanding that largely remain implicit. The problem is not one of intelligence or reasoning ability but of mutual understanding.

For pupils, the educational value of any kind of activities .....will almost certainly depend on the extent to which they are able to understand the ground-rules. I am not suggesting that children should be trained uncritically to accept these requirements of the educational system, but they do need to be helped to understand those requirements, as operated by their teacher, and to relate them to their own experience and their own ways of learning. This is itself part of the process of becoming educated, as much as is the acquisition of more specific kinds of curriculum knowledge. (Mercer 1992 p 223)

Ground rules determine what is relevant to a lesson. There are ground rules of different kinds for different subjects, and between different teachers. Different disciplines could be seen as different language games and successful learning partly a matter of gaining access to distinctive clusters of educational ground-rules. Some rules relate to how knowledge from outside school is to be used or ignored during lessons. Others determine the kind of thought patterns to be adopted, some of them very unlike the way people think and solve problems in everyday life. There are appropriate ways of talking and writing in different subject areas. Successful school learners learn what is expected

and ignore the rest. Schooling is a process of socialisation into what school expects (Sheeran & Barnes 1991).

The objective of classroom communications includes furthering the knowledge and understanding of children about topics which constitute the curriculum. School is not like everyday life, it has its own way of doing things (Tharp and Gallimore 1988), and questions are part of this (Mercer and Edwards 1981, Scribner and Cole 1981). School learners take part in didactic language, not the discourse of practice and the culture of the community. Subjects have their own form of educational discourse and flexibility is required to change from one set to another. Many assignments are presented in a 'classic' form in schools and have to be answered conventionally. In maths, in particular, stories embed simple arithmetic problems, where the learner is conditioned to look for specific information. In everyday situations other factors must be taken into account when solving similar problems. Typically there are questions concerning men digging a hole, or mixing paint colours in ratio to paint a large wall, which ignore the everyday logic and understanding workers would bring to these problems in real life. Scientific explanations are required to hinge on the exposition of basic principles rather than the practicalities of the activity in everyday context.

Many activities suspend common sense asking the pupil to inhabit a never-never land where ideas can be tried out. Children, however, expect that their activities have a direct and useful relevance to their present and future lives, and can experience difficulty with such activities. Likewise, teachers ask pupils to ignore everyday logic and knowledge to 'simplify' problems. Questions are answered according to the information in the text and not according to everyday knowledge, thereby causing great difficulties for those whose everyday knowledge conflicts with the way teachers expect the question to be answered.

Schooling thus faces pupils with the dilemma of intuiting what ground rules are being operated by a teacher at any particular moment. (Sheeran & Barnes 1991 p6)

It is taken for granted that children appreciate that there are different sets of ground rules and will be able to judge which are appropriate in a particular situation.

Interactions with teachers are different from those with friends. Chat is mundane rather than analytical. Conventions stop us probing too far into motives, behaviour and belief. Privacy is to be respected and a degree of ambiguity protects (Wood 1988). Everyday questions are often undemanding and an immediate answer is expected. Yet in the classroom questions are aimed at motivating, sustaining, and directing the thought processes of the pupil. Such responses take time to prepare but it has been found that teachers generally wait only one second before expecting a response (Wood 1992) as is the norm for everyday questions. However the quality of pupils' answers improved significantly with just a wait of 3 seconds. How pace in the classroom affects meaning making after ABI will be considered in this study. The purpose of talk in the classroom is unlike chat. School is about imparting knowledge, analysing, sharing, discussing and evaluating it. If pupils do not appreciate this difference their communication will be at odds with their partner and they will not be able to adjust the steps of the communication 'dance' (Anderson 2000 p24) to meet the needs of the other.

Some pupils are more successful than others in using groundrules. In order to show themselves as good pupils, or as intelligent, children have to perform acceptably in contexts controlled by teachers. The less successful are seen by their teachers as unintelligent, ill-mannered or un-cooperative (Sheeran & Barnes 1991). A large proportion of pupils with ABI in mainstream schools are seen as 'problem' pupils, their uncontrolled behaviour leading to suspension and often expulsion. However the converse also occurs where the pupil with ABI sits quietly in the class and is not noticed, as ABI polarises pre-injury characteristics. There seems to be no happy adjustment to the classroom. The point at which education fails may be the matter of incorrect assumptions about shared knowledge, values, meanings and interpretation. These groundrules, or taken-for-granted beliefs about how the world is and how teachers and pupils should behave, are largely implicit because teachers themselves are unaware of them having been learnt unconsciously through teachers' own schooling (Mercer 1995). These complex systems of tacit expectations influence how they interpret their pupils' behaviour. Unlike in everyday society, school communication is concerned with evaluation. Children learn quickly that teacher approval is not gained by revealing they don't know, so they muddle along. Whether this is also the case after ABI will be considered.

### **2.4.3 Gricean Maxims**

In order to understand a statement, Grice (1981) suggests that we need to apply four maxims

Maxim of quantity - the amount of information given will be sufficient

Maxim of relevance - what is said will be relevant

Maxim of quality - what is said will be based on what you believe to be truthful

Maxim of manner - it will be brief and clear (i.e. not deliberately ambiguous).

Faced with an apparent exception to the normal flow of conversation the listener assumes that Grice's Maxims hold and tries to make sense of it within those parameters. A reading is constructed that makes sense. Frequently, missing propositions have to be inserted to make the utterance make full sense. If we insert the one intended then we share meaning with the speaker, but if we insert a different proposition then our subsequent conversation may make no sense. Conversations depend on participants adopting or creating a common frame of reference, assuming that the speaker will make the communication as relevant as possible taking into account the context and the previous knowledge of the listener. In the classroom the speaker is usually the teacher and the listener, the pupils. Teachers set the context explicitly by referring to common experiences, or implicitly, by the setting (e.g. a science lesson). They assume that what has been taught has been learned or assimilated by the pupil and expect the students to understand the new material. Assumptions may have been made about the student's previous knowledge, their ability to make connections between the current context and previous learning, or the ability to insert missing propositions to make sense of a lesson, and thus to become an active learner. Chapter 4 will explain more fully how this will be investigated.

The same words may have several different meanings but using these maxims the listener is able to make sense of the utterance. Puns and other word play make the

intention less easy to infer. The typical listener searches for the communicative intention, e.g. 'today we are going to paint the rabbit', does not mean putting paint onto the classroom pet rabbit, and hypothesizes about the speaker's mental state using verbal and non-verbal communication. The speaker also monitors the listener's informational needs, to ascertain if the communication has been successful and faithfully reproduced in the listener. There has to be an underlying assumption that there is a common way in which language (syntax) is used.

#### **2.4.4 Repair**

Repair is necessary if one partner says something that confuses the other; the communication process halts until repair work has been done to re-establish common understanding (Mercer 2000). We have ways of asking for repairs in utterances in transactions with others, which depend on the premise that the utterance of another will make sense (Bruner 1987, Anderson 2000). Donahue (1985) showed that when messages did not provide enough information, atypical pupils were less likely than others to request repair. The children seemed to believe that the adult is omniscient and that they would not violate the Maxim of Quantity, but school has its own rules for talk and very rarely are these rules made explicit. Youngsters, not understanding these ground rules assumed that normal conversational maxims govern communications. Experience with ABI pupils has shown that frequently they interpret such figurative language literally and no requests for repairs are forthcoming. I will examine utterances which are not explicit to see if they are interpreted by the ABI student in the way the rest of the class understands them.

### **2.5 Where could difficulties occur in communication?**

#### **2.5.1 Pragmatics**

Communication may or may not achieve its purpose. Language difficulties may arise because of grammar, vocabulary or pragmatic difficulties. Foremost are impairments in pragmatics, or social communication, which unites linguistic form, communicative functions and context. It is the interface between social cognitive, linguistic and emotional development. Socially determined cues and strategies are used for comprehension (Baltaxe & Simmons 1992) but difficulties arise when the speaker does not know when to shift from one social register to another, or take the listener's perspective. Conversational partners need skills to maintain the communication (MacKay 2000). Although only one needs to initiate the interaction, both must be able to participate in joint attention and be able to maintain the interaction, taking turns as appropriate, neither cutting in on the other, or allowing the conversation to veer off track. Such skills of initiation and maintenance are sustained by executive functions (Ylvisaker *et al.* 1998a) (see Chapter 3), but conversation in its turn promotes the development of these higher functions. What is considered an appropriate response varies according to the conversational partner. Sometimes a question may be asked in such a manner as to annoy the listener and provoke a rebuke instead of a reply. However, the more skilled partner can and does make up for the other – this is readily seen in mother/baby dyads, but is not expected in teacher/secondary-age-pupil dyads, where a high level of language ability is assumed. The meaning and intention of any utterance depends on its context, what has just been said or will be said; judging the required response demands an ability to read the social clues of discourse, known as pragmatics, which seem to be difficult after ABI.

Wood notes that



children only employ economical, elliptical utterances after perfecting the unabridged versions from which these develop, even though the shorter forms are presumably more common in what they hear adults say (Wood 1988 p126)

The use of full forms e.g. 'that was in Banbury', rather than the elided form of 'in Banbury' is a younger phenomenon in language. The ability to use narrative develops with experience. Younger children fail to 'frame' what they are going to say by setting the scene and indicating who the characters are; this then causes problems in the use of pronouns. As children learn to handle language they go through a stage where they need to self-correct; they seem to know what sounds right but cannot always get there first time. After ABI, language is impaired (see chapter 3) and frequently the use of language in these respects reflects that of much less experienced/younger children. How that affects meaning making in the classroom needs to be investigated.

### **2.5.2 Word level**

Communication may break down at the level of the words, where the vocabulary used is not within the listener's lexicon. It may be possible to use the context to infer meaning, but where the word in question is a homonym, the received communication may be confused and undecipherable. Another obstacle to a pupil's understanding is the way that concepts are embedded in a minimal grammar which is handled as if it were the concept itself. Teachers make statements as if they need no empirical grounding, to be taken as fact (Hull 1985) or employ inappropriate metaphors which only encompass part of the concept (Skemp 1971). Because teachers do not return to the physical reality described by the terms used, they lose their meaning. What is required is a consistency of terms, rather than rote or formalistic use.

Referring develops over time between the ages of 4 and 10 (Wood 1988). Most 4-year-olds are not aware of the listener's need for information when ambiguity occurs and will blame the listener for the breakdown. A similar response is provoked in older pupils with ABI. Wood suggests that this is not a feature of 4-year-olds, but of their lack of experience. His work showed that those who appreciated the need for information had parents who were explicit in what they did not understand, saying 'that was not clear, I don't know if you want me to do  $x$  or  $y$ '. Teachers were able to replicate this and improve children's appreciation of listeners' needs. If we always give the benefit of the doubt to these children they will always expect to be understood, but if we explicitly tell them they are not giving enough information then learning takes place.

### **2.5.3 Ambiguity**

In a secondary classroom not all statements are explicit; implied meanings, including irony and metaphor must be inferred from the context and are therefore dependent on intersubjectivity. Such language abounds in teacher expositions, but also in text-books, literature and historical sources. Thinking together involves the active construction of shared understandings, finding common ground for teacher and learner to communicate successfully. Every utterance must be regarded primarily as a response to preceding utterances of the given sphere (Bakhtin 1986). Exchanges where partners in a dialogue are able to establish intersubjectivity (Bruner 1987, Rommetveit 1974) and create a common frame of reference are likely to be more successful than those where people are at cross-purposes (Jordan & Powell 1995). But sometimes there is a 'truth value gap',

the utterance is ambiguous and the listener cannot identify the subject. Seemingly factual statements may communicate opinion or an invitation to presume a context, and therefore share meaning with the speaker, by 'constructing some sort of a bridge between very different and previously separate social worlds' (Rommetveit 1974 p35).

Metaphors are part of our language, and our cultural history, and are one way of shaping common knowledge (Mercer 2000), including classroom knowledge, as labels for shared events. Their original meaning may be lost in the mists of time or be more obvious. Deeper meanings than even the metaphorical illusion, emotional or moral stances, may be invoked or the passive voice may indicate a speaker's viewpoint. Some work has looked at how they are handled in clinical situations after ABI (see Chapter 3), but not how they are handled in the classroom and how the teacher and pupil share the common ground of communication.

## **2.6 How discourse is used in the classroom**

But much of a teacher's working life is spent posing questions (Wood 1992); it is, according to Plato, the *sine qua non* of the teacher. It is the most characteristic means of assistance in formal learning (Tharp & Gallimore 1988). In one sense questions and instructions do the same job in the classroom, bringing about confusion between form and function (Young 1992). Both can assist cognitive performance, but with questions, teachers have a means of uncovering the subprocesses of cognition (Tharp & Gallimore 1988). However questions can also act as comments, hints or warnings. Instructions may be given in a number of ways which provoke different responses, e.g. you can either ask 'Would you like to march?' or you can instruct 'March'. One asks for a response in words and the other in action. A simple 'tell me' may be added to most questions to instruct a verbal response thereby making it explicit. Questions in school often violate normal conventions (Wood 1988), but for a legitimate reason, namely that of engendering learning.

### **2.6.1 Questions**

Questions may be used to assess or to assist the learner (Tharp & Gallimore 1988, Mercer 1992, Cazden 2001). Both are necessary; the former to see what the learner's level of knowledge is already, and the latter to build new knowledge and skills, assisting in mental operations that the pupil cannot or will not be able to do alone and involving metacognition (Cazden 2001). Ainley (1988) defines 4 styles of questions

1. pseudo questions e.g....., won't it? ....., don't we? Requiring only agreement
2. genuine questions, where the questioner does not know the answer
3. testing questions, where the questioner does know the answer
4. directing questions, where the questioner may or may not know the answer, but the listener thinks they do. These provoke the listener to think further about the problem and are subdivided into 3 categories: structuring questions (to activate the listeners existing knowledge and help to make connections), opening up questions (why do you think.....? What would happen if...?), checking questions (are you sure...? Do you agree....?)

Around 60% of classroom talk is questions and about 80% of classroom questions test for a rote or memorised answer (Young 1992). Testing questions (also called recitation or Guess-What-Teacher's-Thinking) are so common that there is a danger that pupils see all questions in this way. The answer has to be 'canonical' and pupils have to

provide the correct word, exactly as the teacher wants. Validity is judged by the teacher, on the basis on the closeness of fit of pupil answers to what the teacher thinks. If pupils do not answer the teacher will answer their own questions, they will also repeat or paraphrase answers to make them more correct (Young 1992). Ainley (1988) found that children nearly always interpreted questions as finding out if the pupils had got it right, while the teachers indicated they were pushing the pupils towards seeing a pattern, or they were getting the pupils involved in the lesson. But this is not the same as assisting the pupil to achieve conceptual understanding from which answers to similar questions may be gained later on. Even supposedly open questions, e.g. 'what are the causes of the Civil War?' actually require the pupil to recite the causes given in the text book, or written on the board in the previous lesson, and are closed. Hence a question may be 'open' in form but closed in function (Young 1992). Open questions require a higher level of thinking; 'what is this called?' is low level and closed in form and function, while 'why did this happen?' is higher and 'what do you think about...?' calls for analytical reasoning and informed judgement (Wood 1988). More demanding open-ended questions develop educability of children because they invite the pupil to distance themselves from the immediate short time consequences of their experience. They are encouraged to decentre, think about and reflect on their own activities and become more analytic, less impulsive and more in control of their own learning. The children then internalise the processes of control - including the ability to think analytically. Genuine, 'what-do-pupils-know' (Young 1992) or authentic questions (Skidmore 2000) provide more opportunities for pupil-to-pupil talk, answering one question with another, tell-me-more type questions or rephrasing to ask for clarity from the pupil. Those pupils who were asked open-ended questions speculate, hypothesise and discuss more, while children taught through specific questions tend to do better when tested for retention of factual information (Wood 1988).

Unless the questions are very rich there will be a number of students who manage to give all the right responses while having very different conceptions from those intended.

Students' naïve conceptions are not random aberrations, but the result of sophisticated and creative attempts by students to make sense of their experience. (William 1999 p18)

### **2.6.2 Instructional sequences**

Specialist discourses, such as school discourse suspend Gricean Maxims (Edwards & Mercer 1987). One such special discourse is the questioning structure called initiation-response-evaluation (IRE) (Mehan 1979). When a teacher knows more than his/her pupils, it would be expected that pupils should ask the questions. But within this rulebound classroom format the teacher does the asking. Because the teacher knows the answer, the third part of the interaction is bound to be evaluative, often simply 'yes' or 'no', and if the teacher repeats the question it is understood that the answer was not correct. Silence means that the previous question is still on the table. If a teacher ignores a question put by a pupil it means that the question has failed to be put on the agenda – the teacher controls the discourse. These rules are implicit, participants will usually not be aware of knowing these rules.

Wells (1992) offers a variation on the IRE structure - initiation-response-feedback (IRF). Feedback is far more flexible than simple evaluation and could encompass a comment, a consequent question, as well as a simple affirmation within questioning

sequences. Frequently IRF sequences are broken up by monologues giving direction or information (Young 1992). Pupils may be required to recite what they know, or to retell in their own words (Cazden 2001, Skidmore 2000) which support the educational functions of transmission and appropriation respectively. Feedback could also encompass hints, which push the learner along the path of producing the expected answer. These are commonly used by Teaching Assistants (TAs) in the secondary classroom and their effectiveness for pupils with ABI will be scrutinized.

One use of this discourse structure is to establish an agreed account of what the class did, or have seen or understand. The exchange as a whole is 'collaboratively constructed', with an in-built repair structure of the teacher being last to comment and therefore to correct erroneous information. The aim is for the teacher's knowledge to become 'common knowledge' (Edwards & Mercer 1987 p7). This safety net for knowledge is an advantage for children, such as those with ABI, who make inappropriate connections. However both forms incorporate a very different discourse structure from that encountered outside school and demand a flexibility of thinking not always available to pupils after ABI. In addition, questions and requests for opinions need to be dealt with an explicitness and formality not usually used in a normal conversation. Children who do not recognise or cannot use these implicit rules, including pupils with ABI, tend to be labelled unintelligent or backward.

### **2.6.3 Pupil discourse modes**

Within schools emphasis is placed on presentational talk, which requires organisational skills, to the detriment of exploratory discourse, where the learner is allowed to try out new ideas and ways of thinking (Barnes 1992). Children have much less opportunity to speak in school than at home and engage in shorter sentences with less syntactic complexity (Tharp & Gallimore 1988). It is the teachers who tend to make decisions about the structure of discussions and use a form of talk in which pupil initiations are largely eliminated (Hughes and Westgate 1997), restricting pupils to the role of responder. Such instructional discourse is designed to give children information about the goals of the curriculum, and teachers information about students' progress and

differs from other ways in which adults and children speak in both its structure and its content. (Cole 1990 p 47)

Pupils lacking flexibility, including those with ABI, may not notice this change.

Bakhtin (1981) makes a distinction between authoritative discourse (monologism), infused with power, characterised by debate and recitation, and dialogism which uses internally persuasive discourse. In this, ideas are freely developed by speakers and applied to new material (Barnes & Todd 1995, Skidmore 2000). Elements from one participant's perspective will influence and become part of what the other says when it is next his turn to speak.

Dialogic teaching harnesses the power of talk to engage children, stimulate and extend their thinking and advance their learning and understanding (Alexander 2004 p27)

It is collective (i.e. working together on tasks) reciprocal (listening to each other) supportive, cumulative and purposeful. However this requires a flexibility of

perspective not often seen after ABI and its effectiveness after ABI will need to be examined.

## **2.7 Scaffolding instruction**

However, although Vygotsky asserts that

Higher mental functions evolve through social interactions with adults: they are gradually internalised as the child becomes more and more proficient and needs less and less cuing and support from the adult (Vygotsky 1978)

his ideas lack the mechanism by which that support takes place. It was left to Wood, Bruner and Ross (1976) to suggest such a mechanism. Initially the metaphor of scaffolding was not linked to ZPD. Cazden (1979) was the first to make the link explicit, which has been acknowledged by the originators since then. Cazden also moved it to teacher-student relationship as well as the original parent-child. She argues that the question and answer sessions in classroom interaction scaffold learning, but it is difficult to see how all the elements of scaffolding as envisaged by Wood *et al.* can be realised in the classroom. Using the metaphor of scaffolding, Bruner (1978) suggested that teachers assist learners by a form of vicarious consciousness, seeking to reduce the possibility of failure by breaking tasks into chunks, directing attention, reducing degrees of freedom, marking critical features and demonstrating solutions. But this is contingent on the understanding of the learner, which is highly particularized. Essentially, the adult controls those elements of the task which are beyond learners, allowing them to complete only those elements which are within their range. Scaffolding involves simplifying the learner's role, not the task (Daniels 2001), but it is the task which is simplified in many classrooms in the name of differentiation.

Discourse plays a large role in this concept of scaffolding as the teacher rewords students' utterances to allow them to see a phenomenon in a new way through access to a new perspective (Cazden 2001). The teacher tends to gloss over the exact differences or errors in the learners' thinking and credits them with the kind of thinking he/she wants them to adopt. These reconceptualisations have to take place many times before it become part of the children's thinking. The learner's progress must be tracked to see if the teacher's goal is imported into the children's independent activity and hence appropriated in to their understandings (Cazden 2001). A reconceptualisation is much more positive than a correction. Hence scaffolding can be affective as well as cognitive, supporting the developing sense of self-worth. The mutual trust which develops between students and teachers is necessary in order that the students accept the support and guidance of the teacher (Cazden 2001, Stone 1993). However learners do not always follow the guidance and may choose to work within their own boundaries (Maybin *et al.* 1992)

### **2.7.1 Classroom scaffolds**

Scaffolding was first identified in out-of-school contexts, between parent and child and master and apprentice, where there is a large procedural element to learning. But school learning is frequently conceptual, with the application of that concept to different contexts (Askew, Bliss & Macrae 1996). Teachers may introduce tasks with the comment 'just have a go', expecting pupils to learn from their mistakes, but trial and error learning depends on markers being laid down to attach experience to consequences

which is difficult after ABI. Maybin *et al.* (1992) found that scaffolding in the classroom is different from the parent-child scaffolding where more time is available and there is more emotional intimacy.

Within the classroom teachers attempt to scaffold whole-class learning. This was not within the original conception and, in that it cannot be contingent on each individual learner, is not true to the authors' intention. Teachers may create a context by opening with, 'You remember what we were doing yesterday' or 'who has seen the display board' or similar phrases (Mercer 2000). Both require facilities which may be impaired after ABI. Pupils need to be able to transfer knowledge from contexts in which it was previously employed, through following the teacher's attempts to establish a common frame of reference, contingent on the assumed understanding of the whole class.

Stone (1998a) suggests that limitations in comprehension, memory, attention, pragmatics and/or self-reflection and self-control might interfere with the cognitive and communicational demands of scaffolded instruction. There are suggestions that a direct instructional approach is more helpful after ABI (Glang *et al.* 1992). But Day & Cordon (1993) suggest that because of the contingency of assistance, scaffolded instruction should not be affected much by individual differences, however teachers are not omnisciently aware of the communicational needs of pupils. Neither are they working at a one-to-one level but at intact classroom level, where they cannot be aware of all pupils. Even at small group level it is possible to overlook the differences in each child's comprehension of linguistic frames, readiness to infer meaning and motivation for cognitive or interpersonal engagement. Scaffolded instruction is harder to carry out in large groups and is less easy in inclusive classrooms especially where peer teaching is expected (Donahue & Lopez-Reyna 1998). The effectiveness of scaffolding in large groups is 'a serious concern if the learning-disabled field continues its unwise move away from specialised instructional activities for children with special needs' (Stone 1998a p360). It must be remembered that Wood (1986) asserts that effective instruction is contingent on the needs of the learner.

Teachers must also seek to understand what the child knows if they are to help develop, extend, clarify and integrate knowledge. (Wood 1986 p 170)

Stone (1998a) asserts that this has to be through a moment-by-moment 'online' diagnosis of the child's understanding, which he calls 'titration'. The more contingent the response of the teacher, the more the learner can do alone after instruction, but in schools it is difficult for a single teacher to be contingent on a whole class of individual pupils and mostly pupils are contingent on teachers, and the assistance they choose to provide. Whether learners can access whole-class scaffolded support after ABI will be considered.

Wood points out that the means of scaffolding changes with the maturity of the learner. Direct reminders and interventions are replaced by indirect suggestions aiming ultimately for spontaneous use by pupils of prompts, questions, heuristics and process-awareness that the teacher currently provides. Sensitively moderated, or titrated scaffolding procedures suspend Gricean Maxims.

When adults seem to ask questions whose answers are obvious or ask confusing or nonsensical questions, children rely on their default model of conversational co-operation and often give adults the benefit of the doubt. (Donahue & Lopez Reyna 1998 p399)

Pupils automatically change their answer if an adult asks the same question twice, believing their first answer to be wrong (ibid). How pupils with ABI understand prompts will be examined.

The most important part of scaffolding is its removal or 'fading' (Love and Mason 1995). Teachers prepare for the handover by warning pupils that they will be expected to complete the task on their own, thereby focusing the class on memorising important points (Edwards and Mercer 1987). Responsibility is transferred to the learner through glances, gestures and words, many of them redundant. Once the level is established the quantity of redundancy is diminished until the learner fails; when it increased to find a more appropriate, or contingent, level once more. Children actively participate in this, seeking extra help when they cannot complete the task alone. Handover however is not always successful. Recognising these warnings depends primarily on the familiarity with the ways of educational discourse and, without handover, pupils remain in ritual copying rather than understanding. They do what is required rather than working out a principled understanding of how and why certain actions, expressions and procedures are appropriate or correct. Whether pupils with ABI recognise handover warnings will be observed.

### **2.7.3 Extensions of scaffolding**

Most examinations of the metaphor of scaffolding presume that assistance will be given through speech. However, scaffolding can be more than this. It may also be understood as a set of environmental compensations that enable the child to complete a task effectively (Ylvisaker & Szekeres 1998). To get away from the idea that scaffolding looks the same whatever building is going up, Tharp and Gallimore (1988) emphasise many different kinds of assistance, embedded in on-going performance of a task which they term 'assisted performance'. Ylvisaker champions the metaphor of 'apprenticeship' (Lave 1977, Rogoff 1990) as eminently suitable for learning after ABI, but his work is mainly with adults and has not examined classroom discursive practices. Rogoff refines the notion of apprenticeship with her model of guided participation (termed *Adult Guidance* in Rogoff and Gardner 1984). Adult guidance may be a useful way to take into account the multiple frameworks experienced by these pupils. Donahue and Lopez-Reyna (1998) suggest that a 'flying-buttruss' metaphor may be more appropriate as the supports become part of the building as they are internalised by the learner. Good instruction, whether informal or formal, includes a balance of techniques including prolepsis, demonstration and explanation (Stone 1985).

### **2.7.4 Enriched Scaffolding - Prolepsis**

Proleptic instruction takes place ahead of competence (Daniels 2001) and is therefore in accordance with instruction in the ZPD. Initially learners do not understand the goal of the activity but there is a gradual shift of responsibility as they come to understand the objective (Stone 1998a). Foreshadowing challenges the listener to infer the referent for themselves, from the present or ensuing comments or actions, and creates a degree of cognitive tension.

The concept of prolepsis originated in literary analysis, as in ‘the about to be murdered prince...’ A discrepancy between message structure and temporal order makes for prolepsis, which leads to suspense and the ‘adventure of potential deceptive anticipatory comprehension’ (Rommetveit 1974 p 128). Within the short story genre, there is a ‘circle of understanding’ where initial comprehension is enriched and modified by successive reading, completing the hermeneutic circle. This circle starts with attention to a detail, as the author provides a clue to the twist which will emerge at the conclusion to the story, moves to the anticipation of a whole and then interpretation of the detail, as the anticipation is checked. It is also exploited by teachers, who use it to keep their pupils actively anticipating the next move in the lesson.

Within proleptic instruction the learner becomes an active participant in thinking. The pupil is treated as if they already understand concepts within their ZPD and then led to understand more fully. As the teacher continues expounding the topic of the lesson the meaning is confirmed and students build up their self-esteem as their guesses are proved correct. If such clues are carefully placed, pupils with ABI will be able to keep up with their peers. The teacher may for example start to talk about tectonic plates and, without defining them, talk about volcanoes, earthquakes and the earth’s crust, eventually dropping into the monologue that the plates float on magma. Finally the teacher may refer to a diagram showing the relationship between all the elements. As part of their work pupils may be asked to define the term. In subsequent lessons the teacher may assume that pupils can recall the definition and provide fewer, or less explicit, clues. For the pupil with ABI the lesson has become unintentionally proleptic. The teacher has not set it up in this way (it is unintentional) but for the pupil with ABI the lesson becomes proleptic because of the difficulty with remembering terms (see Chapter 3). After ABI it is harder to understand less explicit utterances and the pupil may become ‘lost’, until the teacher emphasises the learning content or skill at the end of the session. The opportunity to build up self-esteem may disappear as the ABI pupil has not been able to anticipate the path of the lesson.

Prolepsis works because it is based on nesting. One utterance is understandable because we know that its premises are based on another. Kirkegaard said ‘life is lived forward but understood backward’. In understanding proleptic utterances we anticipate meaning, but truly understand only when we reflect. To use proleptic instruction

the child must possess certain minimal levels of communicational competence and inferential skills if such instruction is to proceed. (Stone 1985 p142)

Proleptic teaching plays a crucial rôle in the child’s development of strategic activities, metacognitive or executive skills (Stone 1985). Proleptic communication involves the ability to understand hints and social clues, prompts and implied information based on a shared social reality. The mutual trust thus formed makes it more likely that the listener will adopt the position of the speaker (Rommetveit 1974, Stone 1993).

But temporal incongruity causes difficulties for some learners. Rommetveit (1974) suggests that the seriously mentally retarded [sic] child may require isomorphy between message structure and temporal structure in order to comprehend the message, including the passive voice. This may also be true of learners with ABI as sequencing in time is a common difficulty. A strictly step-wise progressive expansion of a restricted perceptual



and social reality allows for cumulative decoding as the premises have been provided at every stage and the listener is not forced to engage in prolepsis, but this is not realistic in the classroom.

Donahue (1985) found that some students with learning disabilities may hold beliefs about conversational rules that limit the benefits they derive from proleptic instruction. Instead, hearing new words or concepts for the first time may set off a cycle of communicational anxiety and misunderstanding, as they are less likely to request the repair of a communicative breakdown, assuming that the teacher had given the minimum necessary information. Yet many aspects of teacher talk violate the normal expectations of how to interpret an utterance. For example teacher's questions often violate the principle that sincere speakers do not ask for information already available to them.

## **2.8 Metacognition**

Butler (1998) feels that the scaffolding metaphor has outlived its usefulness, giving a false impression of the relationship between the adult and child, implying that the learner is passive as the adult is the architect. She seeks self-regulated learning. The size and shape of students' knowledge structures depend on prior knowledge, students' interpretation of new information and the ways in which students process information. Through social interaction adults influence the cognitive and metacognitive tools which a child uses, through establishing a joint task definition and engaging in collaborative problem solving to shape students' approach to tasks.

Piaget held that strategic learning was part of the normal, natural development of a human, while Thorndike and the associationists felt that development only happened as a result of instruction. But in socio-cognitive theory, development and instruction are both necessary and neither cannot be reduced to the other. Instruction leads and transforms the path of development (Stone 1985). Hence metacognition is a product of culture and needs teaching to bring it about (Donaldson 1978). In interactions between the adult and the child in the ZPD, the adult leads the child to adopt an approach inaccessible on their own. Thus the child is led to learn strategies which may be applied at a later date (Rogoff 1991).

In the schooling model 'learning and learning to learn are not the same' (Hoogsteder *et al.* 1996 p 193). Younger, or inexperienced, children are less able to control their activities; simply asking a young child to attend, concentrate or remember are unlikely to bear fruit (Wood 1988b). However older children can concentrate and remember because they have learned strategies to do so which this makes them appear less impulsive. They know when they have exhausted all the possibilities, they organise material for learning and rehearse for memorisation. While young children tend to engage in field-independent perception, where objects in the field have their own meaning (Wood 1988), those who have learned metacognitive strategies will seek meaning from the wider field. In theory, mature pupils, who have had their learning supported in earlier years, are able to use remembered prompts and self-checking devices heuristically and guide themselves to new learning.

As mature learners we may "scaffold" ourselves through difficult tasks in an internal dialogue about our performance as our teachers once scaffolded our earlier attempts. (Meadows 1995 p 22)

Within schools there are two learning modes: content and metacognitive skills, called higher cognitive or psychological skills in Vygotsky's theory. In neurological literature, metacognition is an exemplar of executive functions (Ewing-Cobbs *et al.* 1998), which are significantly damaged in severe TBI (see chapter 3). Flavell (1979) asserts that monitoring of cognitive enterprises occurs in 4 classes of phenomena; metacognitive knowledge (beliefs about what you can do), metacognitive experience (what you experience about this task), goals and strategies. If the language of education is to be an invitation to reflection and culture-creation it must leave place for reflection, for metacognition. It is this that permits one to reach higher ground (Bruner 1986). This reflectiveness is principled rather than procedural. It is not abstract, or disembedded, knowledge but transcendent, applicable to many contexts and problems. It leads to self-awareness and metacognition.

## **2.9 School as a social place**

Piaget sought evidence of cognitive conflict in peer interaction, ignoring other factors (Forman and Cazden 1985). Using Piaget's work, Vygotsky showed that children are able to achieve things in groups which they only later achieve on their own. But he was interested in teaching-and-learning rather than collaborative learning (Mercer 1995). It has been left to later researchers to apply Vygotsky's ideas to peer-collaborative situations. Explaining ideas to others encourages a more explicit and organised understanding (Fletcher 1985, Hoyles *et al.* 1990 cited in Mercer 1995) as learners organise themselves into specific roles within a partnership (Forman and Cazden 1985), integrating their conflicting task perceptions into a mutual plan through using social-regulation. Intramental regulation develops from this intermental dialogue as learning is internalised.

The scaffolding metaphor may be taken beyond one-to-one discourse to include the structuring of activities. Cazden (2001) asserts that 'fortunately for busy teachers, most children can also learn from well-designed but less individually tuned group instruction' (*ibid.* p66). It is suggested that peers provide more varied models and feedback, as they scaffold each other (Mercer 1995), which may compensate for the impossibility of teacher fine-tuning. The process of having to explain oneself to others encourages a more explicit and organised understanding. Research suggests that joint decision-making leads to greater cognitive gains (Rogoff 1990, Azmitia 1997, Mercer 1995). However I have observed that pupils with ABI sometimes seem unable to participate in such groups. Within this study I hope to observe group and paired work and to suggest reasons for these observed difficulties.

The classroom itself has a special etiquette involving bids for the floor, asking for help and taking turns in peer interaction. It has also been found that the learning disabled children tended to be excessively polite, as they adopt a deferential posture to avoid conflict. The polite request may be easier to ignore than the direct request (Donahue 1985). Similar features of social interactions may be noticed with some children with ABI especially when parents have had to re-teach social customs after a severe injury. They do not seem to be able to distinguish the social niceties which are appropriate when talking to elderly relatives from those that are appropriate when talking to their peers. How this impacts on classroom understanding will be investigated.

## **2.10 Why meaning-making in the classroom can fail**

The clash between everyday and schooled understandings can be problematic (Vygotsky 1994). Even non-brain-injured learners familiar with certain words from home or other contexts, do not realise that teachers have a different meaning, e.g. they conclude that liquid has to be viscous because Fairy Liquid is, evaporation means thickening milk, yet such students are still able to produce perfectly acceptable secondary level science assignments as educational 'ground rules define not correct answers, but appropriate ones' (Mercer & Edwards 1981 p33). The root of many misunderstandings at school is that the child's alternative meanings contrast with the 'public' meanings given by the teacher, the language definer (Barnes and Sheeran 1992). Difficulties for both teachers and learners often stem from the teacher's limited appreciation of the special nature of language in school, of the relation between school language and children's out-of-school experience, and of the justification for promoting certain kinds of language activities (Mercer & Edwards 1981 p40). The school is foreign territory, different from life at home or on the street and the child has to engage in 'repair' work to create shared meanings. Some children seem to be unable to take on the public meanings of the subject and continue to use meanings shared within one of their other cultural groups. The ground-rules approach to understanding classroom communication leads to different conclusions about a learner's abilities. Rather than equate failure to understand with a lack of intelligence, it is suggested that mutual understanding is missing and learning failed at the point where incorrect assumptions are made, either by the speaker or the listener (Mercer & Edwards 1981).

Communication patterns in the classroom are also at odds with 'normal' conversational practices, they form part of the groundrules of schooling (Mercer 1992, Mehan 1997). Access to the floor is governed by rules, sometimes a pupil can reply directly but other times has to get permission to speak or permission to reply. Variation occurs within a lesson, between lessons and across lessons.

To be a competent member of the classroom community, students must not only master academic subject matter; they must also learn the normative demands of classrooms. (Mehan 1997 p237)

The rules for normative classroom behaviour are not communicated directly to the pupils, they are tacit and pupils must infer the rules from contextually provided information. Though in everyday life an immediate response is expected to questions, Cazden (2001) has found that waiting time before teachers' questions are answered is important to allow pupils to think. The slowed response time after ABI makes this an important feature to allow the brain injured youngster to take part in classroom communication. Without it, the pace can be too fast to allow active participation.

The classroom is particularly intolerant of individual differences in discourse styles (Donahue 1985). Written language is the system of schooled thoughts. It is more precise than spoken language because it does not rely on tone of voice and gesture. The job of the school is to teach the development of reading and writing of schooled language and the constant conjunction of these systems with everyday systems (Tharp & Gallimore 1988). There are a large variety of rules for different situations in school and children who fail to conform to these norms for participation run the risk of being devalued by teachers and classmates. Teachers judge children on the appropriateness of

their communication in the classroom. Failure to adapt to classroom rules may also contribute to some children's difficulty in academic learning.

As children age, the gap between high achievers and low achievers continues to widen; this is due in part to the fact that children who are skilled at mastering rules of classroom discourse are thereby afforded access to rich learning experiences through peer and teacher dialogues. (Donahue 1985 p98)

Within a socio-cognitive framework, strategic learning emerges from cultural interaction mediated by the linguistic sign system. Knowledge is build up from active engagement with the culture, understanding and appreciating the ground rules for the particular context. Communication in the classroom is complex and has many opportunities to fail. Pupils need to be able to infer and use other higher order linguistic skills to follow classroom discourse. They need to be able to negotiate their access to the teacher and the floor and be socially aware to repair communication and resolve conflict. Students must take into account the point of view of another, whether the teacher, pupils or unknown others in literature or tasks, including being able to understand the passive voice. Children need to have the flexibility to shift between different scripts or frames, to know what is expected in terms of what is relevant, to know when to initiate and use their own ideas and when to keep strictly to the teachers instructions. They must be able to make links with previous knowledge, and know when to use and when to ignore everyday knowledge

The general assumption is that educational failure is because of innate ability. But teachers retain social control over what is done, said and understood. The separation of formal education from everyday life and the implicit basis of classroom activity and discourse means that for some children the classroom becomes a confusing place where they are used to not understanding and unfortunately

there are virtually no studies that examine the implications of learning disabled children's linguistic and social deficits for their acquisition of discourse rules in the classroom. (Donahue 1985 p99)

and even fewer studies of how pupils make meaning in the classroom after ABI, as will be discussed next in Chapter 3.

## ***Chapter 3 – Acquired Brain Injury in Schools***

This chapter looks at what is known about recovery from ABI and the likely impairments which follow, including those affecting discourse, before looking at the educational context for young people recovering from ABI in England.

### **3.1 Recovery**

Schools play a major role in the rehabilitation of head-injured children.  
(Ewing-Cobbs *et al.* 1986 p63)

After ABI, no two children are the same; they were not the same before their accident and the damage which results from a brain injury depends on the type and extent of the lesion, anatomical location, age of the child and the static or progressive nature of the damage (Begali 1992, Obrzut & Hynd 1987). Outcome is also determined by the environment of the child, their home background and support they receive (Taylor & Alden 1997), including educational support. Periods of dramatic change occur immediately after injury (acute phase) (Clark 1996), or within one year of injury (middle phase). After this point the rate of recovery slows down, but does not stop for up to 10 years, and the young person enters the chronic phase. However recovery is usually incomplete. Hawley *et al.* (2004) uncovered a large group of children with residual symptoms 6 years post injury including changed personality. Language deficits have been found more than 9 years post injury (Jordan & Murdoch 1990, Dennis & Barnes 1990, Ewing-Cobbs *et al.* 1998a). There are improvements, and pupils further from injury are more likely to have localised rather than global deficits (Middleton 2001). This is important for schools as secondary aged pupils may be 6 years or more post-injury.

Most young people make a rapid physical recovery, which then creates expectations in parents and schools for adequate cognitive and behavioural functioning, but a normal physical appearance can mask underlying cognitive deficits (Lord-Maes & Obrzut 1996, Johnson 1992). It is not just that older children with ABI act like the younger controls (Dennis *et al.* 1996, 1998), and Johnson (1992) states that there is no evidence that the further development of the brain proceeds normally after injury. Teachers cannot assume that, by approaching a learner with ABI as they would a younger pupil, learning will proceed without hindrance.

#### **3.1.1 Functional recovery**

As there is usually no outward sign of injury, changes in the pupil may be put down to other factors, but there are specific difficulties arising from damage to the brain (Lord-Maes & Obrzut 1996). It is widely held that after ABI children can access all the learning which they had acquired prior to the injury, but it is extremely difficult to add to this learning (Hebb 1949, Adamovich *et al.* 1985, Kinsella *et al.* 1995, Semrud-Clikeman 2001). However the reasons for this are couched in terms of brain function. This study examines how the consequences of injury impact in the context of the classroom.

Earlier ideas of brain plasticity (e.g. Kennard 1936, 1940) have generally been superseded by concern about the damage done to a developing brain and skull (Ponsford 1995, Anderson *et al.* 2005 Mateer *et al.* 1996). Difficulties not seen immediately, may emerge later (Walker & Wicks 2005, Johnson *et al.* 1998), which is important for this study as children may have acquired their injury several years before taking part. Hebb (1985) proposed a secondary degeneration in adolescence, while Middleton (1989) feels that this is due to the cumulative affects of subtle defects, resulting in delays. Failure to acquire certain skills (Ponsford 1995, Telzrow 1987) may also be due to damage to neural systems responsible for skill acquisition (Obrzut and Hynd 1987, Taylor & Alden 1997, Ylvisaker *et al.* 1998a). This is only seen as the damaged areas are needed to subserve a later developing function (Ewing-Cobbs *et al.* 1986). Until the complexity of the demands of schooling reaches that crucial level where the youngster overloads, the pupil may feel comfortable in the classroom (D'Amato & Rothlisberg 1996). But

the needs of students with TBI can be expected to change not only as a function of the interaction between recovery and maturational processes, but also in relation to the school demands that are placed on the children at a particular time. (Lazar & Menaldino 1995 p 58-59)

A belief that more therapy and extra tuition can help the young person catch up and achieve a full recovery puts the child under great stress and can lead to psychological difficulties (Johnson 1992, Middleton 2001).

With severe head injury there is a considerably increased risk of behavioural disturbance in the injured child to a level of severity likely to impact on home and school. (Brooks 1991 p180)

### **3.1.2 Social and behavioural recovery**

Behavioural and emotional problems frequently follow a head injury regardless of age at injury (Lazar & Menaldino 1995). Families rate behavioural change as the most difficult to handle following injury (Clark 1996). Frequently the children are more aggressive, show poor anger control and tend to hyperactivity. There is also the possibility of depression, anxiety and poor social skills, leading to social withdrawal. Social functioning is a serious obstacle to adequate adjustments after severe injury because of the social nature of schooling, hence behavioural sequelae have educational implications (Ewing-Cobbs *et al.* 1986).

An inability to process social clues (Pettersen 1991) often leads to social fearlessness and dysinhibition, which can lead to social and sexual exploitation (Brooks 1991). Young people after TBI may know the rules, rôles and routines that apply to social situations yet behave inappropriately. They know what to do but cannot suppress intervening impulses, are distracted, fail to interpret the situation correctly or fail to select the correct schema for the task (Ylvisaker *et al.* 1998a). One of the difficulties is that the sequelae of ABI may result in what appears to be naughtiness or misconduct, but in actual fact occurs through misunderstandings on the part of the pupil and misinterpretation by peers or staff (Ylvisaker *et al.* 1995).

Health problems occur, especially fatigue and headaches, but also seizures, and vision and hearing deficits. These impact on the classroom functioning of the pupil. Pupils who are tired are less likely to concentrate, link ideas or follow instructions. In my

experience, after ABI pupils are unlikely to be able to attend school for a full week or even a full term for several years. Hence, after leaving hospital, children with ABI often spend several months being taught at home by teachers of the hospital education service. Then there is a phased return to the classroom, starting with one hour per week and gradually building up either in their previous school or in a new school, while still being taught at home. It is at this point, when their learning can no longer be individually tailored, that the difficulties of the child with ABI are compounded. The pupil may sit quietly in the classroom, appearing to act like the 'average' child but underneath there are great problems and teachers have to work hard to maximise their learning potential.

## **3.2 Impairments of ABI**

### **3.2.1 Attention**

Attention and concentration problems are frequently seen in children with TBI (Begali 1992, Mateer *et al.* 1996, Semrud-Clikeman 2001, Ylvisaker & Szekeres 1998). Poor attention and concentration may be mis-interpreted as attention-seeking behaviour (Middleton 2001). Group seating in a classroom is therefore presumed inappropriate for many youngsters after a severe brain injury, and a programme of gradual re-entry to school is usually advised to avoid attentional overload (Telzrow 1987). Medics single out busy worksheets as problematic, as they may distract from the main idea, but none of this has been examined in context.

### **3.2.2 Memory and new learning**

Clinical assessments of memory and new learning show that these difficulties are the most frequently seen, persistent and problematic following ABI (Begali 1992, Telzrow 1987, Mateer *et al.* 1996, Ewing-Cobbs *et al.* 1998b, Semrud-Clikeman 2001). Visual memory tasks do not show as much deficit as verbal tasks. Ewing-Cobbs *et al.* (1998b) suggest this could be due to developmental factors as visual memory develops much earlier and therefore may be retained after injury. Donders (reported in Kinsella *et al.* 1995) found that pre-morbid overlearned and automatized skills show little disruption after head injury, while Begali (1992) found difficulties with categorisation and generalisation, essential for concept formation (Donaldson 1978, Green *et al.* 1995). Learning, involving encoding, storage and retrieval of information, relies heavily on memory. At the encoding stage a number of factors determine what and how much is encoded, including attention, the depth to which the new knowledge is assimilated into existing knowledge, the significance of the event in social, emotional or intellectual terms and the extent of deliberate elaboration at the time of encoding. However the manner in which this operates within the everyday context of the classroom has not yet been examined.

### **3.2.3 Executive functions**

Executive functions are so-called as they control the planning, monitoring, goal-setting processes, strategic problem-solving and inhibition of unwanted behaviours which may be directed by an executive (Pennington *et al.* 1997, Temple 1997, Ylvisaker *et al.* 1998a). Metacognition, the knowledge of one's own cognitive abilities, is an exemplar of self-regulation (Dennis *et al.* 1996). After an injury, parents and carers, including TAs and support workers in schools, tend to take over responsibility for executive functions.

The combination of very natural parental overprotection and post traumatic behavioural and cognitive change in the injured child tends to inhibit normal maturational development and social experiences. (Brooks 1991 p180)

In order for rehabilitation to take place effectively Ylvisaker *et al.* (1998a) suggest they need to be persuaded to release control back to the injured child.

Disruption of executive skills, which are particularly vulnerable in TBI (Ozonoff 1995, Ylvisaker *et al.* 1998a), could affect many aspects of classroom behaviour. It may involve irrelevant distraction by extraneous stimuli and therefore inability to maintain attention on task. It could also lead to perseveration, failure to initiate appropriate activity, inhibition of impulsive responses, failure to maintain effort over time and failure to use feedback. Difficulties in thinking divergently mean that the young person may have problems in thinking creatively. It may depend on the way the task is communicated and I noted such differences where observed. Executive functions also intersect with other functions, such as memory. Memories organised before storage are retrieved much more easily and memory strategies, such as asking a young person to 'remember' something, may be counter-productive in those with frontal lobe injuries, as effort involved in trying to remember interferes with involuntary memory and learning. Cognitive flexibility, frequently absent after a severe brain injury (Ewing-Cobbs *et al.* 1998b), has implications for classroom functioning, especially in the secondary school, where different teachers have different requirements and there are frequent changes of setting throughout the day.

The emphasis on language as a tool for problem-solving within the classroom, has brought executive functions into play as the most common language difficulties after ABI are those associated with executive functions, (Ylvisaker & Gioia 1998). In clinical studies it has been found that reduced initiation results in a paucity of communication, while socially inappropriate comments, volatility and perseveration have been attributed to poor inhibition (Ewing-Cobbs *et al.* 1998b, Ylvisaker *et al.* 1998a). In adolescence, figurative language, particularly sarcasm, is widely experienced in classroom discourse and may form a barrier to meaning-making for pupils with ABI as

The deficit in understanding of deceptive emotions... is likely to be connected to ....problems in the development of executive functions through inability to use metacognition and non-routine schemas to interpret events and deploy non-routine executive operations. (Dennis *et al.* 1998 p470)

In an attempt to explore metacognition after ABI, Mateer *et al.* (1996) report two means of metacognitive training used with pupils with ADHD: a mechanical approach and an elaborative approach. Some studies report positive effects with these methods, but there is no general consensus that it is a successful strategy. Their suggestion is that the student has to be aware of learning outcomes to use learning strategies effectively and monitoring of strategy effectiveness and learning outcome is a complex metacognitive activity which involves directed attention and reasoning which are often disrupted in ABI. Dennis *et al.* (1996) points out that after ABI it seems to be difficult to inhibit behaviour long enough for metacognition to be initiated. In their study the researchers



found that young age at injury predisposes children to metacognitive difficulties. Faced with semantically or grammatically anomalous statements or management tasks involving direction, poor performance is associated with younger age at test and head injury. Young children could detect but not repair these anomalies, while brain-injured children could do neither; they did not know that they had not understood correctly. This would seem to have enormous implications for the classroom where meaning-making may depend on a deeper search for meaning once the pupil appreciates that their previous understanding of the topic is not enough to encompass the new situation. However the authors stop short of applying their findings to the classroom. They note that, after ABI, children operate in the same manner as their age-related peers when statements are unambiguous. Comprehension difficulties are not therefore not related to a poor knowledge base, but appear to arise from poor monitoring skills. An alternative explanation which is not considered, is that the children fail to switch reference sets for a testing situation, assume that Gricean maxims hold and that the speaker has provided enough information. The children then blame themselves for the breakdown in communication and have learned that in such circumstances it is better not to 'make a fuss'. It will be important in the classroom to observe whether ABI pupils realise when communication has broken down and whether they ask for repair.

### **3.3 Discourse and ABI**

#### **3.3.1 Impairments**

A growth in interest in how discourse is affected post-ABI has led to a number of studies (Ylvisaker *et al.* 1995, Blosser & DePompei 2003, Jordan *et al.* 1988, Jordan & Murdoch 1990, Dennis & Barnes 1990, Chapman *et al.* 1992, Ylvisaker *et al.* 1995, Ewing-Cobbs *et al.* 1998a, Dennis & Barnes 1990, Bond Chapman *et al.* 1995) which have shown that discourse measures are a better measure of communicative competence than more traditional measures of lexical or grammatical abilities, which may be evidence for normal performance.

Chapman *et al.* 1998 suggest that the stimulation of being at school has a positive affect on linguistic ability after ABI. But this conclusion was reached without examining what happens in the classroom. The same authors (Chapman *et al.* 1992) and others (Ewing-Cobbs *et al.*, 1998a Jordan *et al.* 1988) found that discourse is altered post-ABI in terms of quantity of speech, the amount of information conveyed, naming and alterations in the structure of narratives. Word retrieval difficulties cause breakdowns in conversation, resulting in social stress, which causes further word retrieval problems. This study investigates how this impacts in classrooms.

#### **3.3.2 Organisation**

Organisation of language is important in the classroom to communicate meaning. Chapman *et al.* (1998) found that, after ABI, younger pupils showed greater difficulty than adolescents on written tasks regardless of severity of injury. Disorganised language is most easily observed in expressive tasks, either speaking or writing, but organisational difficulty also depresses reading comprehension (Lord-Maes & Obrzut 1996). Inflexibility leads to difficulty in interpreting ambiguous words, in finding alternative ways to express a thought and in maintaining a conversation over topic shifts (Ylvisaker & Gioia 1998). Ewing-Cobbs *et al.* (1987) showed that the expressive and graphic functions of language were most likely to be disturbed in areas such as description of object function, repeating sentences, word fluency, writing to dictation

and copying sentences. However Jordan & Murdoch's (1990) study failed to support these findings, except for word fluency. Word fluency measures deteriorated slightly over the 12-month period because of failure to acquire new skills. Gains in other areas were not over-and-above those made by controls, and attributed to maturation rather than recovery.

Tangential speech is common after ABI and belies difficulties with organisation. Cohesion is produced by markers, which link together the ideas of the narrative or other discourse, using pronouns and sequential markers. Ewing-Cobbs *et al.* (1998a) found that the types and use of cohesive markers is no different from typical learners, but the use of referential markers is different. Local coherence is maintained, but global coherence is lost, especially demonstrative and personal pronouns conjoining meaning across sentences. After severe TBI, students produce fewer complete referential and lexical ties, more referential errors and avoid the use of prepositional material. The use of pronouns needs understanding of both semantic and structural, or syntactical, context (Lovett *et al.* 1986). Eventually most of these children learn to use pronouns and develop a diverse lexicon, but discourse is still impaired (Ewing-Cobbs *et al.* 1998a).

Impaired social communication may be the most pronounced consequence of ABI, and is presumed to affect the young person in and out of the classroom. Reduced social perception leads to socially awkward interactions and pragmatic difficulties. Pettersen (1991) found a significant negative relationship between the length of coma and the ability to respond to hints or indirect clues in conversation. Her research, the first in this area, employed a wide age range of respondents and was exploratory, but they did find evidence that intervention aimed at improving sensitivity to non-verbal clues, improves social competence. Uniquely, within this study classroom discourse post-ABI is examined.

### **3.3.3 Narrative**

Narrative has been the most widely researched area of discourse so far (Chapman *et al.* 1992, Ewing-Cobbs *et al.* 1998a, Bond Chapman *et al.* 1995, Jordan *et al.* 1991). Narrative in the classroom includes written and other accounts of events, whether reports, stories or even a mathematical 'explanation'. Bond Chapman *et al.* 1995 suggest that narrative disruption is associated with injury to the frontal lobes, possibly due to the organisational role of the executive functions, and is related to academic success. In clinical studies Jordan *et al.* (1991) found that, up to age 13, pupils with ABI perform no differently from controls on spontaneous story production; they had the same measures of story grammar and of cohesion. Ewing-Cobbs *et al.* (1998a), looking at younger children 3 years post injury, found differences. It may be that the main disruption is in skills which are developing at the time of injury. Established skills are preserved and Ewing-Cobbs' study involved a greater proportion of children who were younger at injury. It is in the macrostructure, story grammar and gist recall, that more differences have been found, including a loss of core information resulting in impoverished narratives, particularly in adolescence when most young people develop metacognition. It may be that injury to significant parts of the brain means that the structures needed for mature narrative do not develop in the same way. This finding is significant, as the main assessment tool in classrooms is the telling of narratives, whether orally or in writing.

### 3.3.4 Understanding Ambiguity

Dennis & Barnes (1990) found that ability in literal comprehension is not related to ability in understanding metaphor after ABI. Interpreting ambiguous sentences and metaphors, drawing inferences and developing sentences from words is harder after ABI (Dennis and Barnes 1990, Ewing-Cobbs *et al.* 1998a). General verbal domain knowledge, however, is related to understanding metaphor, as the listener has to understand the idea in its context, or to have prior knowledge of that to which the component pertains. The researchers also tested the ability to make inferences involving the use of a script, or routine of interaction, to explain the reasons for a second action. While this task appears to require knowledge of a social domain, it has a greater dependency on an intact working memory as

working memory capacity limited the ability to make inferential bridges in over learned and stereotyped event chains. (ibid p 443)

This would have great significance in a classroom which utilises figurative language either in discourse or text. My study collected responses in such classrooms and those using more literal discourse styles.

Understanding metaphor depends on finding an intersection between two classes, which appear not to intersect at all, requiring a knowledge of vocabulary and the verbal domain to which the topic of the metaphor belongs. In humour the punchline resolves the ambiguity.

To understand humour the listener must disregard the literal interpretation of an utterance and go beyond it to derive meaning from what is not explicitly stated. (Docking *et al.* 2000 p91)

In order to develop a resolution you have to realise that the utterance may be understood on two levels, one which does not make sense and the other which does – the literal interpretation makes the humour. Mismatch is also involved in sarcasm, this time between spoken message and tone of voice or facial expression, and requires attention to two elements at the same time. This could be missed if the focus is on the spoken word alone. This study examined the response of pupils with ABI to humour and sarcasm in the classroom.

Docking *et al.* (2000) found that after ABI adolescents have significantly poorer ability in interpreting humour than matched peers. However the response was not homogeneous, with marked differences between individuals. They also found that humour assists interaction in social and educational environments, enhancing the quality of life and suggest that

Impairment in humour skills has a negative impact on social acceptance. (Docking *et al.* 2000 p97)

The study recommends that young people are taught to dissect a joke and understand it in parts. However the authors note that context is important in humour and that results may have been different if conducted in spontaneous situations, rather than clinically as was the case.

Despite their injuries, children with TBI will probably view themselves as they were before the injury (Clark 1996, Telzrow 1987), hence

It is particularly important for curricular decisions to be made for the individual child – trying to fit the child into an existing curriculum generally causes frustration and failure. (Semrud-Clikeman 2001 p134)

Verger *et al.* (2000) found that the younger the child at injury the less likely they were to remain independent which could be due to the late onset of difficulties widely observed in ABI pupils.

### **3.4 Methods of teaching**

A number of specialised instructional techniques have been suggested for use with students post-ABI (Mateer *et al.* 1996). Some have only been used with TBI adults, others only with children with developmental difficulties, but all have only been evaluated in clinical settings. The very different context of the classroom has not yet been tried. Ewing-Cobbs *et al.* in 1986 noted that there was often an attempt to teach children with ABI as if they were learning disabled (MLD) and called for research to address the development of intervention programmes for the TBI child. More recently Ylvisaker & Szekeres (1998) recommended that new learning is applied to real life through an apprenticeship approach to teaching and learning. However much of the work was undertaken with young adults in learning situations other than classrooms. My study considered how far this was possible in a mainstream secondary classroom. Other authors have recommended other approaches.

Compensatory training is advised for those who deny their deficits and whose strengths and weaknesses are easy to identify (Begali 1992). Spared functions compensate for deficits; pupils may be taught to use self-instructional talk, visual scanning, auditory rehearsal and external aids. Internal compensation approaches may involve checklists or memory systems. This is aimed at better functioning through use of a device, rather than improvement of the learner's cognitive ability. However, 'it is not enough to provide a child with an assignment sheet and assume this will be sufficient for remediating problems in remembering class assignments' (Mateer *et al.* 1996 p 627). These techniques tend to be behavioural in origin, with rewards and motivators and require a commitment to adhere to the strategy by all concerned. While these techniques can be accessed by some adults after ABI, they have not been evaluated in children and not much is known about the development, in children, of aspects of memory utilised by this approach.

In 'direct instruction' communications are presented logically and unambiguously using behavioural techniques such as modelling, shaping, reinforcement and continuous assessment (feedback), and requires over-learning for mastery. All component parts are pretaught, with consistent instructional wording, and there is a cumulative review of all new skills with previously learned material. In three case studies of young people with TBI, receiving one-to-one direct instruction on a variety of topics, both academic and behavioural, Glang *et al.* (1992) show that direct instruction can be successful with TBI pupils, but the authors do not know if it is transferable. However, techniques effective only in a clinical setting cannot be considered an 'effective treatment' (Glang *et al.*,

1992, Mateer *et al.* 1996 p628), as the classroom is the main place for schooling a young person after ABI.

The 'method of vanishing cues' (Mateer *et al.* 1996) spawned from direct instruction has so far only been evaluated with adults. Using implicit memory, skills are taught with cues. Gradually the cues are removed and the skill used, but the means by which it was learned is not remembered, neither is it possible to transfer the constituent parts to different contexts.

Errorless learning (Baddeley *et al.* reported in Mateer *et al.* 1996) was developed as people with poor memories cannot cope with error in the learning phases of vanishing cues. Learners are not allowed to guess, or work out answers for themselves. It counteracts the high level of failure through being 'unable to meet the demands of the environment...with detrimental intellectual and affective consequences' (Hogg & Mittler 1980 p13), creating a situation where only the correct stimulus is presented at first and then incorrect ones brought in later. In trial and error learning, both stimuli are presented and the pupil learns which is correct by the positive feedback received when responding to the correct one. Delaying reinforcement assists with maintenance of desirable behaviours, but after ABI pupils need immediate reinforcers. It is also hard to generalise from errorless learning (Porter 1986, 2005), and it is most useful in training/procedural learning situations. This can be profitable with ABI children learning to read, but unless they are allowed to decode unknown words within their ability they have no means to tackle new words. However in a busy classroom, teachers are not aware of exactly what each pupil knows and it is difficult to manage this approach.

Cognitive remediation (CR) involves either restorative or compensatory training. Dead tissue cannot be taught to learn; constant bashing at certain skills is futile, compensatory strategies need to be put in place (D'Amato & Rothlisberg 1996). A compensatory approach provides patients with well-rehearsed techniques (mental prostheses) to circumvent impairments. However it requires a level of flexibility which is shown to be less good after ABI in terms of refraining from the repetition of an ineffective procedure or shifting to a more effective procedure. Ben-Yishay & Diller (1993) found that restorative training to ameliorate the effects of core impairments, has a limited direct impact on enhancement of functional activities. Cognitive remediation also requires an awareness of self; those who are not aware of need are not able to learn. The most effective interventions were when CR training was combined with interpersonal skills. It may be that interpersonal skills improve the linguistic ability and the ability to use language as a tool.

A developmental view of outcome and planning involves educational services because the short stays now common in hospital (Lazar & Menaldino 1995), mean that children are placed in the hands of schools and home-teaching services much earlier in the recovery process than previously. 'The point that children are not small adults must be re-emphasized continuously' (Lazar & Menaldino 1995 p 56), as recovery from injury is superimposed on developmental changes. The factor here is not age, but what age represents – a dynamic factor of behavioural change over time. Developmental analysis includes an examination of the rate and sequence of the acquisition of skills. Lazar & Menaldino (1995) propose that skills developing at the time of injury determines outcome. Age is not a good measure of these as every child is different. This gives rise

to differences in research findings due to non-availability of pre-morbid levels and reliance on global, non-functional testing rather than specific measures. Developmental peaks for brain activity are observed at different ages for different functions. Savage (1999) proposes that specific assistance is matched to functions at these ages. However, functions may develop at particular times because of cultural practice rather than genetic disposition.

### **3.5 Educational context and climate for severely brain injured pupils**

#### **3.5.1 Prevalence & Provision**

Between a quarter and half a million under 16-year olds with TBI will be in our schools in the UK, in addition to the smaller number of non-traumatic injuries sustained. The long recovery time and persistence of the consequences of injury mean that in any one mainstream secondary school, there will probably be at least two injured pupils. We cannot be more definite than this as there are no reliable national or regional statistics to guide us, and different injuries are recorded differently.

Studies into school re-entry have found that not all children return to school successfully. Pre-requisites for successful re-entry are suggested as the ability to attend to classroom interaction, understand and retain information, reason, solve problems and express ideas, plan and monitor one's performance, and self-control (Semrud-Clikeman 2001, Telzrow 1987). Verger *et al.* (2000) found that the three most potent predictors of reintegration were intactness of the verbal intellectual ability, speed of processing and age. In most cases the child is required to adapt to the classroom (Hawley 2002) rather than the classroom being differentiated for the pupil (Ponsford 1995, Clark 1996, Brooks 1991, Kinsella *et al.* 1995).

The large scale retrospective postal study by Hawley *et al.* (2002), found that only 20% of schools made any special provision for children returning after a brain injury, and only half of those suffering severe TBI had any special assistance – this is the same situation as that highlighted by Jones & Johnson (1994). This is a cause for concern given the persistent nature of cognitive and behavioural problems which follow a brain injury and is exacerbated when hospital staff tell parents that the child will make a full recovery. Parents are then surprised by the difficulties their child encounters in successive years. By then the history of injury has been lost from the school records.

Studies in the UK have found that few schools were aware that pupils had suffered a brain injury (Johnson *et al.* 1998, Hawley *et al.* 2004). Even when the head teachers were aware of a pupil with a brain injury, they had not necessarily associated the difficulties experienced by the pupil, with the head injury (Jones & Johnson 1994, Hawley 2004).

Whilst it may be possible for a teacher to keep in mind the problems that a newly head-injured child is likely to exhibit, especially if there has been good communication with the hospital and parents, it is easy to see that as time goes on the appearance of other behavioural or cognitive problems may not be related to the head-injury, especially if a change of school has been made. (Jones & Johnson 1994 p115)

Poor hospital/school liaison means that teachers have little information on how to handle the learning needs of a pupil with ABI. Some of the children see an educational psychologist, but a third of the teachers were not aware of the recommendations, though most parents were cognisant of the content of reports (Jones & Johnson 1994). However a third of teachers felt their pupils with ABI were behind in all subjects (Jones & Johnson 1994). The perception of special educational needs was markedly higher in parents than in teachers, 'either the parents were overestimating the extra help needed or the children's requirements in the classroom were not being recognised by the teachers' (Jones & Johnson 1994 p116).

### **3.5.2 Assessments**

When pupils return to school they take with them a number of assessments from medical professionals. Among these are formal psychological assessments. If, as is usual, a request for a statutory assessment is made, educational testing follows. Psychological assessment typically measures academic achievement, learning style and school performance in comparison with norm group (Carney 1995), tapping into preserved knowledge, and 'administered in a highly controlled setting, they may overestimate a TBI individual's actual level of functioning in the classroom, where demands and distraction are greater' (Telzrow 1987 p 537, supported by Begali 1992, Clark 1996, D'Amato & Rothlisberg 1996, Telzrow 1991, Ylvisaker *et al.* 1995). Cognitive ability is less of a diagnostic aid in ABI and more of an indicator of the severity of injury as 'research has repeatedly demonstrated that children with TBI, even those more seriously injured, may fall in the 'normal' range when their test scores are compared to those of the standardization group; however the way in which they earned their score is apt to be quite different' (Clark 1996 p557). Differences are accessible only if qualitative investigations are combined with quantitative tests. Verbal skills measured in these tests tend to remain intact, while discourse skills are not measured. Standard testing requires a consistent, well-defined task being presented and information is meted out in small units in a one-to-one situation. This masks the most critical aspects of ABI to making meaning in the classroom: ability to select key aspects of a learning situation, plan a method of response and integrate new information with previous knowledge. The classroom situation is uncontrolled and students with ABI frequently quickly overload on information and lose the capacity to choose strategies to remedy their difficulties (D'Amato & Rothlisberg 1996). 'Success in the classroom requires the student to integrate and to retain lengthy amounts of information and to shift attention away from surrounding distractions' (Milton *et al.* 1991 p 35).

Informal assessments can provide important information about the child's functioning in natural settings, which are less structured, more distracting and require more self-initiation (Carney 1995, Telzrow 1991, Blosser & DePompei 2003, Milton *et al.* 1991). Ylvisaker *et al.* (1995) support dynamic testing after ABI; this also addresses the responsiveness of the child to instruction and potentially effective interventions (Lunt 1993). Dynamic assessment is a fundamental part of the Supporting Head Injured Pupils in School (SHIPS) project, from which pupils were taken for this study.

### **3.5.4 ABI and the practice of inclusion**

The move towards inclusive education in the 1990s coincided with an increase in the survival rates after ABI and a reduction in secondary damage due to new intensive-care regimes. Increasing numbers of young people are returning to mainstream schools after

a major life-changing event, but they are not necessarily met with an approach to teaching and learning which is inclusive.

The consequences of ABI can include physical, cognitive, emotional and behavioural difficulties. Teachers, generally, are happier to accept medical and physical disabilities into the classroom than Emotional and Behavioural Difficulties (EBD) (Avramidis *et al.* 2000). ABI presents as a medical problem but teachers quickly discover the behavioural problems, either internalising or externalising, both of which cause their own difficulties to the teacher in charge. Jones & Johnson (1994) found that teachers generally agreed that more information on the educational implications of children's head injuries would be useful with INSET the preferred medium for its dissemination. This accords with the more general research by Avramidis *et al.* (2000) of teachers' attitudes to pupils with special educational needs.

Allan (1999) holds that the marketplace of competition and choice has affected pupils with SEN by generally undermining justice and equality, making winners and losers and increasing the impetus for exclusion and segregation. Pupils returning to school with ABI have a medical label, but the disability is seen as intrinsic to the child and not schools and teaching methods. The practice of providing needy pupils with a Statement of Educational Need brought in by the Education Act 1993 and revised in 2001 (DfES 2001), was designed to make sure that pupils with needs different from those of their peers were met, but the outworking of the policy has meant that not all pupils with medical needs are given the legal protection of a statement. Even when a statement is made Allan (*ibid*) questions its value as in many cases it does nothing more than document needs.

What most affects teachers' attitudes is the level and nature of the support they receive, in terms of staffing and support services (Avramidis *et al.* 2000). In a survey concerning provision for children with Special Educational Needs (SEN), more than half of the teachers in the survey of one LEA in the South West of England reported that they needed more support in teaching classes that included students with significant difficulties, and ABI is a significant disability. A significant number felt they needed material resources, particularly for differentiation. Some felt that their class size should be below 20 if students with significant disabilities were to be included. Jones & Johnson (1994) found that only half the teachers questioned believed that they had received sufficient educational information to help the children, while the majority would have liked more information on prognosis in order to plan ahead. But there is an inherent uncertainty about the effects of the damage which can make planning difficult. American statistics cited by Telzrow (1987) show academic difficulties and grade failure for more than half the children with ABI, with an adverse effect on educational adjustment for the majority of children with head injuries. Many, she argues, require different provision. Even those in 'regular' classrooms encounter significant problems, such as repeating a grade. We do not have this practice in the UK and while self-esteem is protected it means that young person is faced with increased learning demands they cannot necessarily meet when the teaching/learning experience is not differentiated. But differentiation depends on understanding the needs of the individual pupil, while not disabling the pupil with that knowledge (Allan 1999). The challenge is to understand, thence to support the learner to develop independence and not to engender a spirit of 'I can't, I'm injured'. In the case of ABI that knowledge is not always easy to come by; schools rely on parents to inform them about the child's injury and are



unlikely to have any information on the consequences of such an injury (Jones & Johnson 1994, Hawley *et al.* 2002, 2003). There is a dearth of written material for teachers about ABI but this is improving, with the efforts of charities such as Acquire, Encephalitis Society, Brain & Spine, Children's Brain Injury Trust (Cbit) and the publication of the first book about ABI written specifically for UK schools (Walker & Wicks 2005). KHIS and the Brain Tumour (BT) Study based in Frenchay Hospital, Bristol, currently in progress, are the first large scale prospective investigation of children with TBI and BT respectively in the UK. Having 200 subjects and 200 controls, drawn from across the South West of England and South Wales. It is hoped that this too will provide insights into the educational needs of this group.

Part of the difficulty facing teachers is the different paradigms at work. The needs of pupils with ABI, may be viewed within a psycho-medical, sociological or organisational paradigm (Skidmore 2004), as deficits originating in the pupil, in society or in the institution respectively. Both Allan (1999) and Skidmore (2004) argue for a change in the way that teachers see themselves, not as the holders of power, but as co-learners responding to the learning needs of every single pupil, within shared learning experiences. However voices from within the ABI community (e.g. Savage 1997, Walker & Wicks 2005), focus not on power, but on provision with the cry that 'reintegration is an on-going process' (Walker & Wicks 2005, Ylvisaker 1998). Even when special needs due to an ABI are identified, finance does not follow in all cases. Visible injuries tend to be provided for but not invisible ones, although brain tumours seem always to garner sympathy and extra financial assistance. But relatively few brain injuries lead to visible physical impairments.

### **3.5.5 Need for more research**

Although various sources make recommendations for the way pupils with ABI may be assisted in their learning (Semrud-Clikeman 2001, Ylvisaker *et al.* 1998a, Skezeres & Meserve 1998), research on the efficacy of educational techniques has not been forthcoming, making it difficult to determine the success of these techniques (Miller 1984, Semrud-Clikeman 2001). Ewing-Cobbs *et al.* (1986, 1997) call for research to address the development of intervention programmes for pupils with ABI and the impact on executive functions, while Donders & Strom (1997) are concerned about the effects of mild ABI on learning disabled children as these children form a large proportion of children sustaining ABI. But there is also a dearth of research into the ability of children and young people post-ABI to engage in classroom learning, which this study set out to address.

Practitioners are left to assume that sound teaching practices adapted to the learner, and delivered with an appreciation for the possible sequelae of head injury, have the same chance for success as they do when applied knowingly to other disabled learners (Begali 1992). But the consequences of brain injury may interfere with the skills used in the classroom to understand the teacher's instructions. Mutual understanding within a clear goal-oriented context, emphasised by Flear (in Stone 1998a), is made more problematic where the learner has difficulty paying attention, understanding social clues, or difficulties with receptive language and higher order communication skills. Organisational difficulties and other problems with executive functions may interfere with the implementation of teacher instructions. Proleptic instruction, where the learner has to make connections and leaps of intuition, establishing and maintaining a context (coherence) for learning (Stone 1993) requires an ability to understand social

transactions, to comprehend hints, to think flexibly and to understand prepositions and deictic markers (Stone 1993). It also requires an active theory of mind, which allows the learner to engage in intersubjectivity, and be persuaded to assume the thoughts of the teacher and an ability to reason and use set inclusion, holding and manipulating ideas in working memory.

Both Bawden *et al.* (1985) and Ponsford (1995) suggest that the poor performance of severely brain-injured children in school is due to slowed processing as the brain-injured pupil cannot keep up with the instructions which the teacher provides. While processing speed is certainly slower, this does not account for all of the difficulties observed in these young people. Teaching occurs through action, whether bookwork, discussion, question and answer sessions or educational activities. If a young person does not understand what it is they are expected to do, then their learning will be hampered. 'Must try Harder' (Acquire undated) is a common comment in the reports of pupils with ABI, and teachers commented that although keen, one pupil was 'often not in complete compliance with task requirements' (Hawley 2005 p7). Clinical (laboratory tasks) studies show all kinds of deficits which are not necessarily evident in naturalistic studies (Porter 2005); what is missing is research to assess the effects of these clinical findings in the mainstream classroom. Chapter 4 outlines the methods for such a study.

## ***Chapter 4 - Methods***

This chapter outlines the methods adopted for my study. I will start by setting out the aims and research questions before considering why the particular methods used were chosen. The influence of the pilot study on methods of gathering data is discussed next, followed by an examination of the data analysis procedures. Finally I lay out my procedural concerns and how they were met.

### **4.1 Aims**

The initial emphasis of this project was a description of the difficulties of ABI children as they operate in the classroom, trying to understand the world of the school through the eyes of pupils with ABI. Key stages 3 and 4 seem to be the most difficult time for this group, so it seemed best to look at what was happening at this stage of education initially, with the hope that observations at this problematic time may also throw light on what happens at other stages of education. In the teenage years, all young people go through physical changes which affect how they see themselves; they draw away from their parental support systems and develop independence. The demands on pupils are greater and different – now they have to organise themselves, monitor actions, evaluate what they have done and there are clear difficulties at this time. There is also a change in the way education is organised, with separate teachers for each subject and a rigid timetable. These changes seem to emphasise the difficulties faced by young people with ABI in the education system.

This study aims to examine how young people of secondary school age who have suffered a severe brain injury, make meaning in the secondary classroom. Experience in classrooms shows that pupils after ABI do not always know what their teachers expect. Understanding how they decide what is required will help teachers and hospital tutors to prepare severely brain injured pupils for their return to school and classroom teachers to assist such pupils in their classes. The overriding research question is therefore:

- How does a severely brain-injured pupil make meaning in the classroom?

Following from this:

- What strategies can classroom teachers adopt to support ABI pupils' learning?

In order to do this I must answer other questions:

- How does the kind of impaired discourse functioning which occurs after ABI impact in the classroom?
- What are the barriers to understanding classroom communication for ABI pupils?
- What strategies do ABI pupils use to decide what to do in the classroom?

#### **4.1.1 Defining the problem**

These questions developed as I observed in classrooms. Initially I started with the question 'How do pupils learn after ABI?' Taking an inductive approach I refined the enquiry to look at the barriers to learning post-ABI. It became clear that there were assumptions made by teachers in general and by the school system which this group did not seem to be able to pick up. I focused on these for a while before refining my search

again to look at transition points in the lessons. However, the difficulties experienced by these pupils occurred within a number of different communication fields. Making meaning post-ABI became the focus of my project, including understanding the effects of injury impairments. In the course of study the questions became progressively focussed through an iterative approach.

## **4.2 Choice of method**

### **4.2.1 Quantitative**

Quantitative research is suited to give a definitive answer to a particular question, where factors may be quantified or counted. It is best suited to clinical situations where variables may be controlled. In experimental studies a comparison is generally made between experimental and control groups. The control group is assumed to be matched in every way except the experimental variable, but life interferes with research and other factors may impinge on the experimental conditions.

Supporting an engineering model, quantitative research helps to determine how best to teach, not what to teach, why we should teach it or how young people come to understand what is being taught. It is very useful in studies of efficiency, as it assumes cause and effect. Once a curriculum has been determined, quantitative research may assist in finding the best method of teaching, as long as the learned material itself is testable. But in this study I wanted to look at how pupils with ABI make meaning in the classroom.

Although data collected in quantitative research on children's thinking looks similar to that in research into objects, the basis on which it is collected is not the same. It is one thing to measure the growth of a plant or the expansion of a strip of metal and quite another to 'measure' the understanding of a child or group of children. Variables may be manipulated to isolate one feature, but within complex social interactions, such as those which occur in a classroom, there may be a variety of reasons for one action and explanations for one outcome. Human behaviour is phenomenological; perspectives and actions are shaped by worldview, the fundamental belief system of the individual. The worldview of a child and an adult operating in the same culture may be different. Children do not always interpret activities in the way that the experimenter intends. Asked about animals which fly, those who are familiar with the film *Dumbo*, may offer 'elephant' as a response (Mehan 1973). Without sharing the culture of the child even for a moment, a researcher may question their reasoning or language skills. Pilot research can eliminate some areas of conflict and produce well-constructed tests which measure the aspect of the situation relevant to the research question.

While this methodology may lead to insights into the neurological consequences of ABI, empirical data collected in this way led Bronfenbrenner to describe the methodology as studying 'children in strange situations with strange adults for the briefest possible periods of time' (Schaffer 1996 p 4). It cannot provide a picture of how young people operate in the real world where a large number of variables interact with each other to provide support or distraction for the particular feature under investigation. This study requires research into the interpretive and interactional processes of learning, which cannot easily be measured.

The diversity of perspectives of the experimenter and the subjects means that experiments, couched in language and a social context, are open to different

interpretations. Material is never totally disembedded; surveys may be skewed by complex social interactions, including the personal experience of the individual, and experiments may be culturally loaded. Contextually provided information can add to ability. Piaget's famous experiments on set inclusion in young children were shown by Donaldson and McGarrigle to give an inaccurate picture of the child's thinking. When the context was something familiar to the child (teddy and his steps), the researchers showed that children were able to reason (Donaldson 1978). Likewise the changing of Piaget's three mountains task into one where a doll has to hide from a policeman, changes the context and the understanding of the child seems to change. It is not Piaget's results which are in question. It is his explanations of why children gave those results. The experiment did not measure the variables which the researcher set out to test, and hence theoretical inferences may be questioned. In order to examine how pupils learn after ABI, pupils need to be observed in their normal setting (the school classroom) in pursuit of customary activities, within the cultural domain of all UK teenagers.

Knowing does not just result from measuring and counting (Schön 1983); stylistic conventions are used to describe, theoretical knowledge guides situational thinking and conceptualisation, while appreciative systems are used to judge conduct. On-the-spot knowledge of a particular situation, termed 'knowing-in-action' is an instinctive knowledge based on tacit knowledge. Such knowledge cannot be measured or counted, but is part of a teacher's art. When visiting pupils as part of the SHIPS project I have asked teachers with whom a pupil is successfully learning what it is that they are doing. So far, none have been able to tell me. Their knowledge is knowledge-in-action. This requires qualitative study to uncover what practices are helpful.

#### **4.2.2 Qualitative**

Qualitative researchers argue that causes cannot be identified solely by the physical or statistical manipulation of variables, which fail to take account of the nature of human social life. Life and learning involve complex processes of interpretation and negotiation which do not have determinate outcomes. People create their own social realities through social activities which have meaning for them. This naturalistic research strives to remain true to the nature of the phenomenon which it studies. It is not judgemental (Bryman 1988).

Qualitative research emphasises process, a focus on natural settings and an interest in meanings, perspectives and understandings. Research is conducted from the perspective of those being studied, and gives respondents a voice. It maintains a capacity to penetrate individual frames of meaning and point of view (Bryman 1988). This was important in my study, as the pupils observed cannot be viewed as a homogeneous group. Every pupil is different due to different premorbid (pre-injury) learning and experience and differences in the site and extent of injury. However most ethnographers do not just act as sponges, but know what they are looking for in broad terms. What they are looking at is not necessarily something which would interest the respondent or what the respondent would feel was important; it is questionable to what extent the research would reflect their point of view (Bryman 1988).

Theories of the social world cannot be derived independently of our preconceptions nor do 'the facts speak for themselves'. They are coloured by our own worldview, and many researchers therefore try to make their hypotheses and theories explicit. Deviant

data serves as the basis for further research (May 1993), as happened in this study where noticing a particular feature of classroom behaviour in one classroom, alerted me to look for similar situations to see if the pupils reaction or style of meaning-making varied according to the input by the teacher or was personal.

Qualitative methodology tends to be associated with particular modes of data gathering or its non-numerical content, but it is more than this. Research takes place within a broader understanding of what constitutes legitimate enquiry. Experimental, hypothetical-deductive or positivist research is concerned with looking for causal relationships, and from this the verification or falsification of prior theories (Henwood & Pidgeon 1993). Qualitative research focuses on exploring the nature of phenomena, rather than testing pre-defined hypotheses and employs an ethnographic, participant, observational approach. It is concerned with description and attention to detail, but also to analyse the environment under study. The mapping of the context is very important for the understanding of respondents' interpretations of the situation which presupposes flexibility and lack of structure, with an open research strategy. Such enquiry is often opportunistic; theories and concepts are avoided at the beginning of the research. The data which is gathered is generally unstructured, that is, not coded at the point of collection. Case study and qualitative study have come to be synonymous in many instances. This seemed to suit the purpose of my enquiry as I did not set out to test a hypothesis, but to develop a theory, and because there are a relatively small number of pupils with ABI in mainstream secondary schools. Hence a case study approach was adopted; a small number of cases were studied in depth and analysed for the meaning behind actions and discourse.

#### **4.2.3 Requirements**

The distinction between qualitative and quantitative methods is more in their suitability to answer the particular research question (Bryman 1988, Mercer 1991). In this study, an in-depth, naturalistic participatory observation was needed to ascertain strategies which are used to assist pupils with ABI to participate successfully in the classroom and strategies which cause barriers. It required an ethnographic study.

Ethnography is dependent on the social skills and self-awareness of the researcher, as the situation and data collection process is affected by the rapport developed between researcher and respondents (Ball 1990). Engagement is used to advantage as ethnographers draw on their own experiences to explain their observations (May 1993). It is important that the relationship between researcher and participant is discovered and explained. The epistemological position of naturalistic, contextual or interpretive enquiry demands that the world should be studied in its natural state, undisturbed by the researcher. Life is viewed as a process rather than static; it is about interconnection and change and is suited to the study of ABI in schools where pupils are developing and changing. However observations are made in time and are therefore static, and not changing; they are a snapshot in time.

Participant observation does not make assumptions about what is important, instead researchers immerse themselves in the everyday life of those they are attempting to understand. By being in the classroom I participated in the lesson whether I wanted to or not. Role is crucial in defining participation. It can range from complete detachment to complete involvement. Each position has its advantages and risks (Bryman 2001). I have a role in the school as an advisory teacher by virtue of my work for SHIPS, and

provide reports for statutory assessment or reviews. This involves being semi-involved; an observer first and participant second.

An action research approach, looking for and evaluating strategies which may be used to teach this group of pupils, would have changed the nature of the study. I am employed by the Hospital Education Service (HES) to teach pupils with acquired brain injuries and other neurological difficulties in their home when they are unable to attend school for medical reasons, and by SHIPS as a teacher-advisor helping schools manage the learning of young people who have sustained an ABI. Action research would focus on this aspect of my job rather than pupil experience, which is the aim of the present study. While this would be a valid and helpful area for research, I am currently interested in investigating how these pupils make meaning in the classroom itself. My findings will make a difference to the way I advise teachers and to the approach I take in preparing pupils for their return to school, but I hope it will also inform the community of professionals working with these young people. Although the study is not action research, I was aware that I would need to become the subject of the research as much as the other participants, and need to be aware of my own bias (Oakley 2000), my personal view of disability, special needs and the individual's place in the world.

#### **4.2.4 Trustworthiness**

Fundamental to the idea of science is that it is valid, usually meaning objective, generalisable and explanatory (May 1993). Early social research derived its assumed objectivity from the scientific method on which it was originally based (May 1993). The researcher was thought to stand detached from the data and the results may be generalised to the population as a whole. Claims of objectivity assumed that personal prejudices and values did not enter the research, but social science research examines society itself and should be questioned whether researchers can stand outside something so fundamental.

The generalisability of studies can be compromised because of the sample choice. Tizard and Hughes (1991) were aware that, by restricting their sample to girls, to make the project manageable in the time, they may have lost an important variable for comparison. Pragmatic and practical considerations also meant that data was collected in fairly affluent areas and they did not include the most disadvantaged children. Likewise in my study the sample had to be limited and was not ideal, as it had to include a variety of aetiologies, both traumatic and non-traumatic. But it is a realistic sample. In any one school, teachers may encounter pupils with different kinds of injuries all with the label of ABI and the aim of the study was to examine in detail how pupils with ABI make meaning and to suggest strategies which teachers may try in their own classroom. However, theoretical generalisability may be possible where empirical generalisability is not.

More than one researcher examining a number of close cases brings to bear the insights of more than one researcher on cases which are assumed to have factors in common (Bryman 1988). Unfortunately, there are very few specialist ABI teachers. However the hospital brain injury team, including psychologists and Speech and Language Therapists, discuss the needs of individual children; their insights guarded against too narrow a focus. Triangulation may be used to enhance validity by gathering data from a number of different perspectives. But my study was not designed to provide a definitive account of the experience of all pupils with ABI.

Reliability is not a good term for qualitative research, as replication of qualitative research is mostly not possible because it is an in-depth study of a particular social situation (Bryman 2001). Hammersley (1992) proposes that validity is an important criterion but reformulates it somewhat. He feels it must be plausible, credible and relevant. However most qualitative researchers feel that no single absolute account of social reality is possible. In qualitative research, where the development of new concepts is sought rather than the testing of hypotheses, it may be better to consider trustworthiness. In this account I examined the particular social world of young people who generally operate as individuals within mainstream classrooms. Therefore it should be possible to provide an account of their particular world.

Bryman (2001) suggests that instead of trying to match the measures of objectivity, it may be better to consider parallel concepts. Credibility parallels internal validity. As no single absolute account of social reality is possible, it is the credibility of the account that is important. Respondent validation (confirmation by the members of the social world under investigation) may be used as a measure of credibility. But how much the research may be validated in this way is questionable, as theses and papers are written for social science peers, not the respondents – ‘can’t understand a bloody word it says’ is quoted of one respondent reader of a thesis. Within qualitative research transferability parallels notions of external validity. It is not usually possible to replicate qualitative research, and it certainly would not be possible to do so in the case of this study. Instead I aim to help readers to see how far the situation or context of the pupils I discuss matches that of others. As qualitative study is in depth rather than breadth, thick description (Geertz 1973) is essential to allow readers to understand the unique context of these respondents (Bryman 2001). Ideas of reliability are matched by dependability, in terms of transparent record keeping, allowing peers to examine to process by which conclusions have been reached. However this is time consuming for auditors and has not been generally adopted. Confirmability parallels objectivity. Although complete objectivity is not possible, the researcher has to act ‘in good faith’, not allowing personal values or theoretical leanings to sway the conduct of the research. Guba & Lincoln (1994) also suggest a measure of authenticity, ie fairness, representing different viewpoints among members of the social setting, authenticity in a number of areas, helping members arrive at a better understanding of their social milieu, perspectives of others, impetus to change their social setting, empowering others. I needed to be aware of variation in the behaviour and attitude of teachers and pupils over the period of observation, taking into account adjustments to teaching style to cater for the difficulties of the ABI child, home circumstances and health.

### **4.3 Pilot data gathering**

A pilot study was undertaken to try out different methods of data collection, including both qualitative and some quantitative methods, as preferred in medical circles, using free fieldnotes, a handheld tape-recorder and a systematic observation sheet. I also experimented with different positions from which to observe, to see which gave best access to helpful data.

#### **4.3.1 Recording observations**

Various methods of recording observations are available. Although audio/video equipment records the detailed behaviour of participants, it cannot record accurately the interactions between large numbers of subjects (Foster 1996). In this case only the



interaction of two participants was needed in most settings. Occasionally the pupil being observed was part of a small group. Cameras disrupt proceedings and teachers who are watched will be more nervous and self-conscious than usual, which may affect the trustworthiness of the data. Where children are self-conscious, as children post-ABI frequently are, it would not be appropriate to video-record. Audiotape transcription takes a long time, but it can bring new insights as it records most of the discourse and allows consideration of the detail of the verbal exchanges. As part of the pilot study I audio recorded two of Jade's lessons (pupil details are provided later in this chapter). Recording her science lesson was very helpful, as it exposed the subtleties of Jade's understanding of vocabulary, but in the recording of the maths lesson much was irrelevant and my simultaneous notes were easier to use. I sat next to Jade, but not all her comments are clear, while the teacher's remarks may be heard clearly. But audiotapes do not record non-verbal language and the context of the discourse, so I supplemented it with fieldnotes, which gave a very full account of her fast-paced maths lesson. Fieldnotes were helpful in deciding which extracts to transcribe. Within Jade's context, permission to record was relatively easy as the class membership was small and stable for every lesson, but in a larger context pupils are frequently grouped differently for different subjects and I could anticipate that gaining informed consent to record was going to be extremely time consuming and potentially problematic. The disadvantages heavily outweighed the advantages and this method of recording was abandoned.

#### **4.3.2 Observational positions**

I also experimented with positions from which to observe. When I arrived Simon's teacher introduced me to the class; they were aware that a stranger was visiting. Taking my cue from King (1978), I had decided that day to be as unobtrusive as possible but sitting behind the bookcase only sparked the class's curiosity, and it prevented me hearing the details of conversations. I managed to creep into Jade's French lesson and sat behind the coat rack hidden to the class but in full view of the teacher, who ignored me. While this had advantages in terms of observing the behaviour of the pupils, it raised ethical concerns about whether I should observe covertly, even if the class knew that I would visit at some point. Subsequent observations of both pupils were made sitting about 2 metres away and next to the pupil. Both pupils were asked their views on the process of observation. Jade was comfortable with either position, while Simon was not really comfortable being the focus of attention. After discussion, he was prepared for SHIPS to continue to 'help' him in school. Later, pupils were mostly comfortable with the process of observation; Louise, Owen and William were positively excited by their involvement in research, while Nasser and Darren wanted to see what I was writing, and wanted to know what use I would make of the notes, but seemed reassured after discussion.

#### **4.3.3 Systematic observation**

Studies which employ systematic observation techniques do not usually record every instance of a particular behaviour (Foster 1996). Continuous recording locates behaviours in time and sequence, recording frequency and duration. Point or time sampling shows a percentage of the behaviour of interest to the research and is helpful in studies where comparison is a chief aim. Systematic observation of the interactions is possible if researchers know exactly what they are seeking, possibly through a pilot study with the particular behaviour operationalized, and types of behaviour clearly allocated to categories. Once these are fixed the system is inflexible; the categories cannot be refined once observation has started. If categories are too tightly defined

there may be difficulty in assigning a response to a category. Tizard and Hughes (1991) met this difficulty in coding children's talk. They felt that the

codes were insufficiently sensitive to bring out the relationship which [they] felt existed between the kind of activity and the quality of talk. (Tizard and Hughes 1991 p30)

In an attempt to categorize every behavioural instance, events may be forced into inadequate preset categories. A decision must be made as to whether a systematic record is made for frequency or duration of events. Duration is recorded using continuous recording systems frequency by a tally, which could be point or time sampled. Very briefly I attempted systematic coding on my first foray into observation by looking at what Jade was doing every five minutes. I quickly realised that this would miss most of the interesting behaviour and that the interactions occurred in spurts rather than at regular intervals or continuously. This method may be suitable for recording the proportion of different types of behaviour, but is not helpful in understanding how pupils make meaning. Systematic observation generally omits contextual and cultural information, which will be important in understanding the nature of the observed behaviour. In this study the focus is a description of the difficulties encountered by the ABI pupil and therefore systematic observation was not suitable. I later tried to record the general context through the development of an observation sheet, including location, people present, and curriculum content of the lesson and teaching style, but recording these details at the start of fieldnotes seemed sufficient.

#### **4.3.4 Live coding**

The number of different types of teaching situations I encountered made the design of an observation sheet for live coding difficult, and the one I used had several limitations (Appendix A). There were too many categories to choose between in a fast moving lesson. Decisions had to be made very quickly and on several occasions I spent too long making up my mind and missed the next interaction. It showed me the number of interactions and examples of each sort, but did not record discourse, a rather important factor in making meaning. Occurrence rather than frequency is important to this study, as it is looking at understanding but even when the whole discourse is available it is still not always possible to know what each contributor intends (Scarth & Hammersley 1986).

All live coding has its difficulties (Scarth & Hammersley 1986), as the complete data does not remain available to either the researcher or impartial analysts for checking later. In addition, it is difficult to maintain the same definitions for coding across a number of researchers. This was not a problem in my study as there was only one researcher, but it could be a problem over time as observations were spread out over six years, because of the availability of the pupils, and as theory develops a single action may be explained in a different way, thus theory could influence what is observed and coded differently, leading to a lack of reliability.

I did not want to look at the minutiae of what is happening, but as this is essentially an explorative study with the aim of building theory in a new field, I wanted to take an overview of classroom life for the ABI pupil. I required rich data gathered as accurately as possible and written up quickly so that notes could be elaborated without being contaminated.

### **4.3.5 Orienting questions**

The use of routine orienting questions (May 1993) posed to the observed situation was also piloted (Appendix B). A sheet was used to prompt observations in these categories, and to record the teaching style employed, the content or skill being taught, the distraction level, the immediacy of task completion and the atmosphere. The questions were found to be important, but limiting. The questions were almost as restricting as the observation sheet which preceded them. It was found to be better to write down everything which was seen without trying to analyse at the time.

### **4.3.6 Fieldnotes**

Fieldnotes require emotional attachment which results in commitment to the project. They are flexible and less obtrusive than audio/video recording, as it is usually acceptable to write while observing in a classroom or in a meeting (Foster 1996). However they can still be threatening, especially to other teachers. In all observation there is a trade-off between keeping records in depth or in breadth – the more detailed a record the narrower the range of behaviours one can record (Foster 1996). Observations were heavily focussed on one pupil including interactions with others, so in-depth annotations were required, while trying not to miss vital information by over-focussing on one pupil.

In order to examine the pupil's ability to build knowledge I made a record of all discourse between my subject and others in the classroom and noted their activities when not involved in discourse. Context within the fieldnotes was provided by recording the teaching situation, participants, subject focus and more general style adopted by the teacher. A compromise had to be made between the amount of material collected and the time spent in doing the collection. After analysis of the pilot study I felt that I had collected enough material to give me a good picture of Jade's classroom activities, but not Simon's. There was much less interaction between the teacher and pupil in a larger class lesson, even when it was an active lesson. Some lessons are more profitable than others to observe – it doesn't equate to the amount written, nor could I predict which would be the more profitable.

Post-session fieldnotes after participant observation were rather sparse, with no verbatim conversations recorded, which precluded any analysis of the discourse. I had to judge whether the particular incident was worth remembering for later recording purposes. In comparison, fieldnotes during non-participant observation recorded most of the interactions verbatim. There were not many interactions between the teacher and Simon, and it was easy to write them down. Jade had many more interactions with her teacher, but fieldnotes were sufficient in most lessons.

### **4.3.7 Interviews**

I decided that, as well as classroom observations, data for my study would be gathered using unstructured interviews, which are 'conversations with a purpose', among parents, teachers and pupils. I felt these were particularly suitable for this study due to their ability to uncover the point of view of the respondent. From interviews I wanted to find out how much I would have to lead the discussion in order to gain access to the information I wanted. I also wanted to experiment with the effect of recording interviews on a small hand-held recorder and to consider the best places and times to conduct interviews.

However they did not provide the quality of evidence I had anticipated. The teachers had widely varied experiences of teaching and of teaching the 'hard to teach'. Teachers inexperienced with ABI wanted advice on how to manage the learning of the pupil rather than give me their opinions or observations. Hence interview data reflected the teacher's familiarity with ABI, more than the pupil's classroom experience. My questions were frequently answered in an unexpected manner, and although this in itself says much about the experience of the pupil in the classroom, it was not what I wanted to research. On a revisit, I also tried asking the teacher about strategies which had been successful. But reports outlining strategies had not been seen and I started to carry copies to give out and then asked if teachers thought these would be helpful.

I found that interviews need time and space; snatched moments at break were not ideal as teachers had little time to talk because of time-consuming annual events taking place in the schools. Teachers did not want to book a specific appointments, and it was better to approach them informally. During these snatched moments it did not seem appropriate to bring out the tape recorder and I took brief notes, which were filled out as soon as possible. It may have been helpful to send the transcripts to participants for their comments (Nias 1991), but time constraints prevented this.

After reflection I realised that the formal interviews were not providing the insights I needed. Teachers and parents were not aware which interventions were successful. Many felt at insecure about supporting the learning of a young person with ABI and were looking for my approval, or my advice, and the interviews became sessions where teachers told me of the difficulties so that I could suggest possible strategies. Returning to schools later I was able to ask if these were successful, but interviews as a formal research strategy were abandoned.

#### **4.3.8 Homework sheets**

Homework is reported by parents to be problematic after ABI. I hypothesised that young people learn better through some lesson styles and attempted to test the retention of learning over time through questionnaires. When I observed a homework task being set in class I sent a sheet home asking the parent to evaluate the pupil's memory and understanding of the task (Appendix C).

The questionnaire was posted first class so that it arrived the following morning to overcome the probability that the pupil would forget to give it to the parent. I also felt that the parent being aware of the task could alter the outcome, as the questionnaire itself may act as a memory aid to the pupil and upset the naturalistic conditions I wanted to observe. I intended to discard the data if it was compromised. The way the questionnaires were phrased may have limited the feedback from parents. The questionnaires asked closed questions in the main, although they provided space for comments, and parents just ticked the boxes which did not provide full answers to my questions or add value to the data collected in other ways. The quantitative methodology sat uneasily within what was developing into a qualitative study and it was abandoned. However, homework remains an area of concern, and is worthy of further investigation.

### **4.3.9 Pilot study conclusions**

The emphasis on quantitative studies within the medical context in which I was working made me try initially to encompass quantitative methods, and I tried using an observation schedule, semi-structured interviews with parents and teachers, and parent questionnaires. However none of these produced the evidence I needed. It is tempting to believe that multi-strategy research is inevitably a good thing (Bryman 2001), but is it not a universal panacea.

The quantitative methodology limited the observations and there was a possibility that I would ignore the unexpected. I had to change my strategy. I abandoned the intention of undertaking broad and balanced sampling, in favour of trying to observe a representative cross-section of situations. An attempt to triangulate was replaced by an attempt to penetrate layers of meaning and uncover the learning relationships which develop through 'thick description' (Geertz 1973).

I wanted to develop rather than disprove a hypothesis. I decided that a qualitative analysis of naturalistic observations in the classroom would provide a clearer picture of how these young people make and convey meaning. The main research tool became qualitative, non-participant observation of classroom discourse, trying to 'make the familiar strange'. I felt that such a study could add to the understanding of how young people make meaning in the classroom after an ABI.

## **4.4 Research strategy**

### **4.4.1 ABI research**

Many studies have considered the cognitive abilities of young people after brain injury (Bawden *et al.* 1985, Chadwick *et al.* 1981, Donders & Strom 1997, Ewing-Cobbs *et al.* 1986, 1997, 1998, Kinsella *et al.* 1995,) but in a clinical setting. However clinical (laboratory tasks) studies show all kinds of deficits which are not necessarily evident in naturalistic studies (Porter 2005). Brain injured children have difficulty in sorting and prioritising stimuli (Telzrow 1987), to assist in planning and ordering tasks (Ewing-Cobbs *et al.* 1998). In a testing situation the assessor takes this role, but in the natural setting of a classroom the young person has to manage these executive functions as well as the task presented by the teacher. Discourse ability after ABI has been studied (e.g. Chapman *et al.* 1995), but this was in a clinical setting and restricted to narrative discourse. It is important to study what actually goes on in classrooms

(as Desforges, 1985, has pointed out), too many psychologists have pontificated about teaching and learning without studying what actually goes on in classrooms. (Mercer 1991 p 42)

Making meaning in the classroom has to take place without the organisational support of a clinician, although the task and a TA may assist with this. Explanations of classroom difficulties are currently extrapolated from performance in clinical situations, usually as part of quantitative research in a medical paradigm. In this study I aimed to observe natural behaviour as far as possible, to see not just what is missing after ABI, but also how it is that these young people make meaning from what is around them.

The relatively limited but increasingly available literature on educational programming for children with brain injury reflects the

historical neglect of these important issues. (Ylvisaker *et al.* 1991 p10)

#### 4.4.2 Data collection

Tools for research, like tools for any craft, are suited to purpose. From the pilot study I found that the most appropriate tool for this study was classroom observation using free fieldnotes from an observer/participant role. Evidence has been presented by recording detailed fieldnotes, including verbatim quotations where possible, transcribed for verbal content within 24 hours, to support the focus of the enquiry into making meaning, and also to make it accessible to a wider readership, e.g. classroom teachers (Mercer 1995). One advantage of participant observation is its flexibility. Fieldwork is a continual process of reflection and alteration of the focus of observations.

Researchers cannot stand outside the situation and merely observe. This is especially so in the classroom where curious pupils want to know who you are and what you are doing there. Assisting re-integration is a normal part of my job with HES, giving a reason for my being in the classroom and alleviating the stress which my presence could cause (Dockerell 1988), but I tried to keep in mind that the process of observation, of having another adult in the room who does not have a specific role, changes the behaviour of the parties who are being observed (Hawthorne effect). Rather than engaging in futile attempt to eliminate the effects of the researcher, I tried to understand them (Hammersley & Atkinson 1983, May 1993). I made comments about the classroom dynamics when I wrote up observations which then assisted in the analysis. The Hawthorne effect, is similar to Heisenberg's uncertainty principle in physics, which asserts that the act of measuring a property changes it. The knowledge that you have been chosen for special observation or treatment itself can boost confidence, motivation and achievement. In this study my interest in the pupil could have influenced classroom interactions and pupil esteem, and simply by being in the classroom I make the teacher aware that there is a pupil with ABI in the class, but the presence of a TA could also engender awareness of the injury. However this is helpful for the study as teachers are then more likely to try to impress me by showing me the tactics that they have found to work for the particular pupil. All observations were written up and elaborated within 24 hours so that details not noted were still in my mind (Appendix D). I found that the most useful observations occur in the ZPD when the pupil is struggling with new ideas. At this point their thinking is more accessible, especially as the young people tend to think aloud (see chapter 7).

While observing I sat close enough to hear the pupil's comments, but far enough away so that (s)he did not feel they had to include me in their reasoning, especially if I knew the pupil well from having taught them at home. However, if a pupil became stuck and could not find a way out of their dilemma, I intervened in the form of dynamic assessment. Minick (in Lunt 1993) suggests that dynamic assessment should include measures of the child's potential for learning, information on processes that lead to the child's success or failure at cognitive tasks, and information on what might be done to facilitate the child's education and development. The focus is on the process rather than the product. This seemed eminently suitable for my purpose, to uncover the processes whereby pupils post-ABI deal with the ideas/communication in the classroom, and whether these lead to success or failure to make meaning. Dynamic assessment derives from Vygotsky (Lunt 1993). It could be called interactive assessment as it deals with both the test situation and the nature of what is being measured. It is an assessment of

the ZPD, of the measure of the difference between the child's static ability and ability in assisted performance (Campioni *et al.* 1984).

There are a number of approaches to dynamic assessment, but all look for process and for potential in terms of focus and interaction between tester and child. This interaction can vary on a continuum from standardised and structured, to flexible and unstructured. In my study I offered assistance to the pupil, and then assessed whether it was successful or not. If it was not, I was on hand to assist further. From my point of view I was able to test out theories of what would be helpful in particular circumstances and, from the pupils point of view, they were able to learn in a situation where otherwise they would not have. It would not have been ethical to allow the pupils to fail completely in these circumstances.

#### **4.4.3 Sampling**

Observations cannot include everything, and a sample of possible occurrences/events has to be examined. Quantitative research may be able to use probability to sample, but this is not possible in my study as there are so few young people with ABI. An opportunistic convenience sample had to be taken. This has its limitations. It may be that the young people I observed were not typical of the majority of young people who have sustained an ABI. But qualitative studies are designed to look in depth at a social situation, rather than broadly for the purposes of generalisation, it looks to build theory. At the start of the study I had no idea who would become part of the study, or how many young people would be available. In the end the analysis was undertaken with 14 participants and checked out with a further three. Of the original number, only 5 are still part of the SHIPS project and in a mainstream school. Three have moved on to college where they are still being monitored, but the context for learning in college is very different from that of school; some of their difficulties have disappeared and new ones have arisen. It is another context worthy of research. Three others are now in employment, having previously attended college. The remaining three have moved away.

Ball (1990) suggests that observations should be representative of the social situation of the participants, i.e. the school life of the pupil in this case, and data samples should be taken across the board as evenly as possible. The times of the school year/day affect behaviour as well as different lesson style, teachers and subjects. The more the time spent observing a group, the greater the adequacy of the data, while data may be different when collected at different times in the yearly cycle of a school. Physical setting may also influence interactions and different places should be chosen for observations, while the language used and the intimacy of the researcher with the group, may also affect the validity of the data (May 1993). I intended to observe pupils on different days, with different subjects and different teachers. In this way I hoped to observe a broad and balanced sample of lessons. In practice it was found that some teachers were uncomfortable with an observer in the classroom and some lessons were inaccessible because of the constraints of the timetable. Once initial analysis started I also realised that it was more important to follow up theoretical trails to discover categories and develop theory. Strauss & Corbin (1990) call this theoretical sampling. However I still tried to observe a cross-section of lessons, partly as the study accessed the schools through the SHIPS project and I needed to fulfil their criteria for intervention. This additional constraint was helpful, as it led to new theoretical ideas emerging and engendered a broader picture of how young people make meaning after

ABI. Ideally, data collection should continue until there is theoretical saturation of categories, coding of instances until no new examples of variation are found (Strauss & Corbin 1990, Henwood & Pidgeon 1993), but realistically there is a limit on the time spent in data collection. SHIPS has a recommendation of 12 hours observation per pupil, but the amount of time is also determined by the stage of education of the young person, e.g. students in Y11 may reach the end of their school career. The data used in this study was not evenly collected across the pupils. Some pupils were visited for only 5 hours, others for around 24 hours over 3 academic years, as illustrated in table 1.

Observations	R	N	C	A	S	I	V	O	B	D	J	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	L3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	U3	U3	4	4	U3	4	4	4
<b>Class lessons</b>																	
Maths	1	5	1	2	1	2	2	1	3	1	2	3	X	3	3	1	6
English	1	4	1	3	1	2	5	1		1		3	1	1			1
Science	1	4	1	3	2	2	2		1	1	1	5	1	1	1	1	4
MFL	2	2	1	4	1	-	-	-	-	-	1	2		4	-	1	1
Humanities	1	3	1	3	3	4	1	2				3		2	-	-	3
Citizenship/PHSE	1	1		1										1	-	-	
IT		2		3											-	-	1
Technology		3	1		2								1		-	-	-
Music		1		1	1		2								-	-	-
Drama			1	1	1										-	1	-
Art		1	1	1	1	1					1	1	1	1	2		
PE		1				1									1		
<b>Other</b>																	
Private study	-	1	-	-	-	2	-	1	-	3	-	-	1	-	2	2	-
Piano lessons	2	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
<b>Comments</b>																	
parent	2	0	1	2	8	1	1	1	1	1	1	1	2	1	3	2	5
Teacher	1	12	2	7	2	1	3	2	0	1	5	4	3	1	3	1	4
Other professionals	-	0	-	2	2	3	2	0	-	3	0	0	0	-	3	4	2
College interview	-	-	-	-	-	-	-	-	-	-	-	1	-	-	-	-	1
Number of school years	1	3	1	3	2	2	2	1	1	1	1	2	1	1	1	1	2

#### Key

X permission was not obtained to observe in this class

- not applicable to this pupil

Where cells are shaded, in this matrix and others, there were no observations

Table 1: Breadth of observations

Additional data concerning the type of injury and path of recovery was collected from medical reports, KHIS and parents using the application form for inclusion in the SHIPS project (Appendix E).

#### 4.4.4 Pursuing trustworthiness

I shared some of the tentative findings in training sessions for teachers and TAs and asked for comments to assess the credibility of the findings. In this way I was also able to confirm that what I had noticed was happening at other times when I was not present. By reporting anecdotally the behaviour of pupil A to the teachers of pupil B (anonymously) I was also able to judge if my findings were transferable. During the study I was also invited to speak to a number of groups including groups of hospital teachers from around the country, classroom teachers, and groups of teachers and



therapists who deal with young people who have sustained an ABI, who did not have any connection with the study, including some in Australia. As I reported tentative findings many would nod, and when I invited comments, they confirmed that they too had noticed similar behaviour, confirming transferability at least in these cases.

During the study I kept a reflective diary (Appendix F) to allow me to engage in self-analysis during the project (Burgess 1984). This was intermittent, as it was accessed when there was something to note. As well as helping with an audit trail, this has been very helpful in developing the project and has enabled me to see how ideas developed, and to return to previous ideas when I had followed leads which were not fruitful. It has helped to acknowledge where I was influenced by ideas from outside the data.

## **4.5 Data Analysis**

### **4.5.1 Sociocultural framework**

Different frameworks for understanding enable different insights into problems. I have chosen to use a socio-cognitive framework, as it has been little-used to investigate the experience of pupils with ABI in the classroom and may afford new insights. Within socio-cultural theory the unit of analysis is taken as an event, which leads to a close empirical study of symbolic interactions in naturally occurring microsocial situations (Sawyer 2002), although it is also possible to look at agency and the use of cultural tools (Wertsch 2000). Tharp & Gallimore (1988, 1998) suggest that performance when in ZPD and assisted by others, may be used as an analytical tool together with the use of externalising of inner speech.

Discourse is suggested as a good way of looking at ABI functioning (Chapman *et al.* 1992, 1995, Ylvisaker & Szekeres 1998) as it

..provides a more revealing assessment tool than traditional language measures in pediatric [sic] TBI because it involves a complex interplay of linguistic, cognitive and information processing abilities..... (Blosser & DePompei 2003 p117).

and tangential discourse is indicative of organizational difficulties (Ewing-Cobbs *et al.* 1998). A high correlation between ability on discourse measures and academic performance has been found.

### **4.5.2 Analytical methods**

A number of different styles of analysis are available. Systematic observation would lead to interaction analysis. Discourse analysis deals with the structure of discourse, why people say what they say and what they are trying to do by saying it, but does not deal with the content of discourse which will be important in a study which considers how pupils with ABI understand teachers and tasks in the classroom.

Inductive analysis may lead to the elaboration and application of a theory prior to, or at, an early stage of a qualitative study which may condition the researcher to see what they expect to see (Bryman 1988). Grounded theory is more forgiving in that the relatively late incursion of theoretical considerations in a study is consistent with the inclination to defer the conceptual elaboration of data (Bryman 1988). The researcher is faced with a large amount of unstructured data, which is then sorted into an array of concepts and categories, seeking common ideas (Nias 1991). This is very different from the practice

of content, analysis where the task is to allocate instances to a set of mutually exclusive categories. As analysis proceeds, a set of categories is built up, each referenced to one or more instances in the data, as it is subjected to a process of refining and subdividing the categories, and a search for contradictions and negative instances, using 'constant comparative method' (Glaser and Strauss 1967). Linked categories emerge to inform the study (Foster 1996), thus developing theory which is grounded, conceptually dense and well integrated (Strauss & Corbin 1990).

Most qualitative research methods stress the collection of all data before analysis takes place. With grounded theory the emerging analytical categories shape the data collection process. Sampling decisions were made according to interests identified in the data. A commitment to begin the observation process with a relatively open mind and a minimum of prestructuring was designed to minimize preconceptions and allow ideas to emerge from the data (Nias 1991), rather than test the data against a preconceived theory. In my study, this led to a cumulative spiral of data collection, analysis and theory development (Foster 1996). The analysis took an interpretivist stance rather than being content or discourse analysis per se. Having identified specific difficulties experienced by children with ABI, a search was made within the data to identify the conditions under which a child with ABI is able to participate in classroom instructions, and an attempt made to make recommendations for teaching during the rehabilitation period in order to facilitate this skill in such children.

When analysing the pilot study, I found that I was heavily influenced by the topics raised by therapists and psychologists during the weekly team meetings of KHIS. However, having admitted this influence, I found myself at greater liberty to look for other themes which emerged directly from the data. At this point my job changed to only teaching pupils who had been discharged and I no longer attended the meeting. It may have been helpful to work within a team, which could have acted as a check and balance to the work (Measor & Woods 1991), but this was not possible during most of the study, although I was able to talk with the speech therapist and neuropsychologist from the team on a number of occasions.

#### **4.5.3 Sensitivity**

Building theory is a creative process. Theoretical sensitivity (Glaser 1978) is a personal quality of a researcher, incorporating awareness of the subtleties of the meaning of data (Strauss & Corbin 1990). Insight develops through reading and professional experience. My theoretical sensitivity has been gained from working as a practitioner in the field of education for over 20 years in various roles and with various age groups. In particular I worked with children and young people who are said to have specific learning difficulties for several years before moving to work in the hospital education service where I encountered young people who had sustained brain injuries. My interests in this area encouraged me to attend conferences, obtain and read books and become involved in a charity, Acquire, which aimed to increase awareness of the educational needs of children, young people and adults with an ABI, and work for improved educational provision for them.

But too much reading of literature can lead to thinking within the limitations of others' ideas. This may be counteracted by the rigour of the analytical process, as posing questions and dealing with the material increases sensitivity (Strauss & Corbin 1990). One insight sparks another which gives meaning to previously inexplicable

observations. This is both a creative and scientific process, and the creativity of developing theory needs to be constantly checked against the reality of the data. There is a need to step back, periodically, and look again, maintaining a sceptical attitude, and following research procedures. This helps to break through on assumptions. Alternating the collection and analysis of data allows sampling on the basis of concepts emerging as relevant to the research situation, while regarding all explanations as provisional and alterable.

#### **4.5.4 Coding**

Coding is systematic and precise and not at the whim of the researcher. It is there to build theory, not test it, to give it rigor and explain what is observed, thereby reflecting reality (Strauss & Corbin 1990). In order to assist with making comparisons I chose to organise the analysis according to phenomena, and not according to the pupil. I had to be aware that differences may occur for neurological reasons and I valued the reports provided by the neurologist and neuropsychologists.

I looked for patterns by the use of key words which I assigned to certain behaviours. Patterns of behaviour emerged which are different from those exhibited by children without ABI, particularly in the areas of attention, initiation, concept formation and recall. I also noticed strategies used by pupils and teachers to surmount the barriers to communication.

#### **4.5.5 Using CAQDAS: computer assisted qualitative data analysis software**

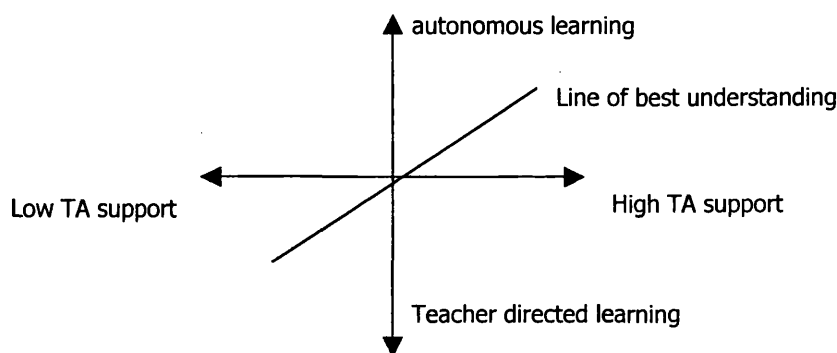
All the analysis for the pilot was achieved through the multiple photocopying of notes, cutting and grouping by hand. It was a laborious process. I saw the possibilities of working with Nvivo in a similar, but much more efficient way, first labelling anything which looked interesting, then comparing with data from other observations, grouping and sorting the data into many categories which could then be refined. Some needed to be merged, others redefined and renamed as commonalities emerged. Thus my open coding (Strauss & Corbin 1990) led to 'axial coding'. I began to make notes on what I saw, insights, hunches, puzzles that the analysis revealed and developed a research diary. From this I was able to return to the raw data and look at it from different perspectives.

The analysis went through several forms combining the codes in different ways to try to explain how young people make meaning in the classroom after a severe ABI. Each time I thought I had an explanation I engaged in further observations and data analysis to see if my hunches held true in other situations. Hence there developed a cycle of analysis and observation (Strauss & Corbin 1990).

As this developed I became involved in selective coding, trying to identify top level or core categories, which would organise and explain my observations and develop theories. One advantage of using Nvivo was the ability to code material in more than one category. The coding stripes could then be used to look at overlap between categories. I could also have used the Boolean search facility, but I did not. It is suggested that it is possible to use Word to code and retrieve, using the 'find' facility, but the advantage of Nvivo is in comparing and combining categories and in the development of trees which helped to see the connections between larger groupings of categories (Bryman 2001). The danger with using Nvivo is that material is divorced

from its context, including its narrative flow. However extracts may be viewed within the surrounding paragraph or section, which helps to avoid decontextualisation.

As part of the selective coding procedure the title of the thesis changed several times, before I was happy that meaning making was the core category for this study. Gradually, through being constantly compared (Glaser & Strauss 1967) the categories were related to each other developed into a tree (Appendix G). I initially identified a number of areas, including understanding classroom assumptions (Edwards & Mercer 1987) post-ABI, how damaged facets of attention impinge on classroom interactions and strategies used by teachers to connect with pupils who have sustained an ABI. Each of the categories was dimensionalised (Strauss & Corbin 1990) in an attempt to locate the conditions for the explanations which were developing. To do this I had to identify the properties for each category which I tackled through posing questions to each category (Appendix H). Dimensionalising continued by considering the extremes for each category and the position of observations within the continuum. This helped me to make statements such as ‘the more autonomous the learning expected the more TA support is required’ and to develop ideal type diagrams (Max Weber) such as



Matrices (Miles & Huberman 1984) were developed to explore how wide was the incidence of the behaviour under consideration. These were initially organised alphabetically, but later by age at injury, as that seemed to be relevant to several categories.

However, the lines between each type of coding were artificial; as I was engaged in selective coding so I had to return to axial coding to define my parameters more tightly and this meant combining and dividing categories as new explanations were explored and developed. Eventually I was able to develop a story, albeit a complex one, about how young people with a severe brain injury make meaning in a mainstream secondary classroom. But the complexity of the story meant that I had to focus on only part of it in my study, that of the use and understanding of language, and a more detailed tree of that part of the analysis was made (Appendix I). Other findings, picking up the themes of attending and focussing and making sense of the game of school, will be published at a later date.

All lower level categories were also dimensionalised in terms of their conditions, context, strategies and consequences again by posing questions to tease out subtle meanings. Writing helped me to validate my theory against the data, thus completing the grounding. As I wrote so I checked what I was saying against the original data, something which was easier using Nvivo than it had been with the pilot study. I could also check the context by viewing the material within its enclosing section.

#### **4.5.6 Limits to analysis**

Any analysis is limited by its methodology and by the limits of the data collected. Here much of the context was lost, as only what struck me at the time was recorded and I did not have the luxury of considering the subtleties of body language and facial expression. By using Nvivo the data tended to become fragmented but I was not looking at narrative flow per se, although responses within a long dialogue did become important. The codes I used were broadly thematic. Some coding was in terms of words used, as I tried to ascertain whether particular grammatical structures or words caused difficulties. However, this analysis was kept within a thematic node and was done for a specific purpose. Over the period of observation I saw shared understandings and common frames of reference develop (Stone 1993) and some relationships break down, especially between pupils and TAs as they worked together. Although some note of changing relationships and understandings between the participants was made through dating and attaching contextual notes, the process of coding divorced data from the contextual notes and such insights had to be remembered.

Pre-existing ideas and the values of the researcher influence decisions about data collection and the research questions, without which the research would have no focus (Foster 1996). The analysis was naturally limited by my own knowledge, ideas and values, but the rigour of grounded theory helps to overcome this, as well as judging their impact on the phenomenon studied.

By adopting the cyclical approach, with analysis informing later data collection, the danger is that issues not appearing in early sessions may be lost, or that the focus of the study will become too narrow, selectively perceptive and thereby ignore relevant material which may challenge the line of enquiry. I maintained a wide line of enquiry by not prejudging observations when in the field, but recording all interactions, leaving the analysis until after the data was written up. Only the choice of which lessons to observe was guided by the analysis.

### **4.6 Procedural concerns**

#### **4.6.1 Ethics**

In developing a methodology for this study I was mindful of my responsibility to the pupils, their schools and families (BERA 2004); I was aware that as pupils with ABI are few and far between, they could be easily identified in any reports. While names of participants have been changed and geographical locations not mentioned, it will be difficult to ensure complete anonymity as there are comparatively few young people with ABI. Teachers reading papers and reports resulting from the study may be able to identify the school and the pupil, even with fictional names (Dockerell 1988). This was brought to the attention of parents and schools when I sought consent. However there has been no need to disclose sensitive medical or other information. Only parents who want the school to know about the severity and consequences of the child's injury sign up to the SHIPS project. Reports from the KHIS team are already sent to schools directly and the ward teachers send a letter to the schools of all patients admitted with a brain injury.

Within this study there was no need to deceive participants (BERA 2004); their comments were valued hence informed consent was sought from all participants including pupils where parents felt they were mature enough to understand according to

the BERA guidelines (2004); all participants received an information sheet about the project (Appendix J). This gave them the right to withdraw from the study at any time, and assured them that I have had a CRB (police) check and have public liability cover. It was important to point out to parents that that this research may not benefit their children directly, although all families and schools were provided with a report on the child's learning style and strengths, as part of the SHIPS project. Schools and parents were encouraged to comment on the findings of the research (BERA 2004) through training, which is one product of this study, and on the reports provided to parents and schools after each series of visits (Dockerell 1988). Where parents have asked for copies of reports held by the study they have been provided. Parents and schools are invited to use the SHIPS helpline between visits, and some have done so. SHIPS also produces a Newsletter, and articles about the research have been published in *The Acquirer*. Thus I tried to open up the work to the scrutiny of teaching practitioners and others involved with ABI (Dockerell 1988, Foster 1996). The only comments that have been made are that the report is helpful or that the language in the report has been pitched incorrectly for the reader. The observations themselves did not attract comment.

As the young people who take part in the study will be part of the SHIPS project they, their parents and teachers will have access to information and expertise about ABI by means of the links with Children's Brain Injury Trust (Cbit), Head Injury Re-Education (HIRE) (now Acquire) and Kids Head Injury Study (KHIS) all of which are partner organisations of SHIPS. Currently grants are available to offer this service to young people, but it is hoped that longer term funding may be found. As part of SHIPS I refer young people to the rehabilitation team at the specialist hospital if I am uncertain about any aspect of their welfare.

#### **4.6.2 Access**

The young people, their families and schools were contacted through the agency of several groups who act as the primary 'gatekeepers' (Burgess 1984). It was important to identify the immediate gatekeepers, those who have the power to grant or withhold access to people and situations for the purposes of research. There is usually not just one but several gatekeepers, whose attitude is determined by their view of research and researchers (Foster 1996, Burgess 1984). Some children were recruited through ward teachers who appoint me as home-teacher within the local Hospital Education Service (HES), and others living further away were given a leaflet asking if they would welcome the involvement of SHIPS. Parents contacting SHIPS were then asked if they and their child would be prepared to be involved in the study. KHIS and other medical personnel also acted as gatekeepers, introducing pupils to SHIPS and providing information about recovery and ongoing development.

My positions with the HES and SHIPS provided natural entry to a school, but entry does not guarantee access (Ball 1990). Gaining permission to research does not necessarily mean that access is gained to the insights and opinions of the participants. The means of access constrains the relationships and therefore the data collected and 'the failure to appreciate how you are perceived and identified may inhibit, distort or channel your perception of event.' (Ball 1990 p34). The researcher is never fly-on-the-wall, but part of the social fabric which is being researched. I had to be sensitive about the introduction of the idea of research to maintain a collegial relationship with teachers

in order to access their insights. I was aware that this relationship with teachers could be compromised as I act as an advocate for the children with the schools and LEAs.

Teachers may consider me to be 'expert' in working with ABI children and as a threat to them in their classrooms. I tried always to be sympathetic to the situation in the class, and found a positive comment about every situation I encountered. I offered something back, such as materials or in-class support at difficult times, and only provided constructive criticism (positive and negative) if invited to do so. Building a non-threatening relationship became very important to access the perceptions of the staff; opening questions for discussion had to be judicious, and I frequently used 'How's (s)he getting on?' to open conversations. I was aware that I may be perceived as wanting to put the ABI pupil's needs above those of other pupils, so I constantly emphasised that I appreciated that my pupil was only one of 25 or so in the class. HES monthly reports on the pupils' learning are sent to schools, so from the start of my involvement school staff have had access to my observations about the way the pupil with ABI learns.

Some of the research relationships closed down, because of difficulties in contacting schools, staff moving to other jobs and families moving away or moving schools. Some of these were able to be restarted, sometimes through parents or school staff taking the initiative to seek help from SHIPS. Being aware of the power relations in any social grouping and being accepted by participants at one level, may not mean you are accepted by people at another level of the organisation (May 1993). In some schools I have been accepted and welcomed by the SENCo and other teachers with special needs training, but not by other teachers. Acceptance as 'part of the furniture' is the ideal, but difficult to achieve. It is possible to invent a function in the classroom for the sake of the pupils but in most classrooms I remained a stranger. In different classrooms, I was required to take a variety of roles; sometimes I could sit and observe, other times I was expected to support the pupil with ABI, and occasionally I was asked to help more generally. School cultures vary enormously. In some schools I was provided with a timetable and allowed free access to lessons, in others I had to 'book-in' to lessons in advance and in a few I was told what I could, or could not, observe.

#### **4.6.3 School ethos**

Rutter *et al.* (1979) found that school ethos does make a difference to children's learning when organisational structure, teacher-pupil relationships and climate are taken into account. Within a socio-cultural framework, differences between schools are recognised in the content, structure and function of interpersonal communication. Wicks (2004) lists features of a 'good' school, from her point of view as an educational consultant for pupils with ABI, as

- willingness to listen and change,
- willingness to plan individually and innovatively,
- willingness to differentiate curriculum, environment, teaching methods, expectations, assessment and social/behavioural support system
- readiness to accept training.

The SEN Code of Practice (DfES 2001) suggests that schools should put flexible teaching arrangements in place, make physical adaptations to acoustics, lighting and access to rooms, be prepared to use alternative methods of communication and seek

specialist support. Not all schools make such adaptations; pupils in my study had a variety of experiences, as shown in Table 1, below.

School of	Information transfer	INSET	Flexible teaching arrangements	Alternative communication & assessment	Plan innovately, differentiate curriculum & methods	Social & behavioural support
Ruth	Poor	X	X	X	X	X
Nasser	Poor	X	X	X	X	X
Carl	Poor	✓	X	X	X	X
Adam	Poor	✓	X	✓	X	X
Simon	Good	✓	X	X	X	✓
Ian	Poor	✓	X	✓	X	✓
Vicky	Poor	X	X	X	X	✓
Owen	Excellent	✓	✓	✓	✓	✓
Ben	Good	✓	X	X	X	X
Louise	Poor	X	X	X	X	X
George	Good	X	X	✓	X	X
Darren	Good	✓	✓	✓	✓	✓
Jade	Excellent	X	✓	X	✓	✓
Harry	Good	X	✓	✓	X	X
Evan	Good	X	✓	X	X	✓
Mike	Good	✓	✓	✓	✓	✓
William	Poor	X	✓	X	X	X

**Table 2:** School ethos

**Key**

- ✓ showed evidence of
- X showed no evidence of

A table such as this limits the data to quantitative features. It also does not say if interventions were effective or appropriate, or how many were tried. In some schools a pupil was withdrawn for 1 lesson a week for extra literacy support, while in others a completely new timetable was written, accessing only mainstream lessons which were suitable, but both counted as flexible teaching arrangements in Table 1. There is much more to a school: most schools have been welcoming, but only a few put into practice all the recommendations in the SHIPS report. Some teachers are more willing to do this than others, but in many classrooms, the presence of a TA has meant that all differentiation is left to the TA. As many schools only have one, or at most two pupils, with an ABI out of around a thousand pupils, the individual needs of that pupil can become lost. Some schools are able to communicate the needs of individuals to supply teachers, but in many cases the motivation for this comes from parents or SHIPS, and whether the schools are prepared to use these systems is a indication of their willingness to assist. SHIPS provides reports and recommendations for staff. In only a few schools are these seen by all the teachers involved with a particular pupil. SHIPS also offers free training sessions at two levels; introduction to ABI and a four hour training course which may be delivered in twilight sessions.

**4.6.4 Details of pupils**

Thankfully ABI is relatively rare, but this meant the pupils to whom I had access were in different schools and different year groups. Most of the pupils in this study sustained a severe brain injury through a road traffic accident. For some of them I am unable to obtain hospital reports as they were hospitalised out of county and parents do not



remember details of coma scores. Tests for post-traumatic amnesia may not have been done.

Adam and Ian are in the same year in a large comprehensive school with a unit for physically disabled youngsters attached. Adam, aged 10, was playing on his bicycle when he was hit by a car. He was hospital for nearly 10 weeks, in intensive care for the first two. He remained in PTA in excess of 4 weeks. I was asked to teach him. He returned to his junior school very quickly and reintegrated well. I became involved again when he transferred to the local secondary school six months later. Adam has a right hemiplaegia and consequently has difficulty writing and walking. For a lad who had been a prize-winning footballer this became a significant problem to him. Ian, another footballer, had a brain tumour aged 10 and was out of school for approximately 18 months, having both chemo- and radio-therapy, during which time I taught him at home when he became well enough. He suffered serious complications and has been left with a right hemiplaegia, high frequency hearing loss, for which he now has a hearing aid, and double vision. He gradually re-integrated into school in Year 7 and attended school full-time in Year 8. His physical abilities were still impaired, but he could walk unaided. Their school put on a one-hour introduction to ABI in a lunch hour before Adam joined the school. Only one teacher attended, although most of the TAs came. Subsequently SHIPS has been omitted from the invitation list for statement reviews, the reason being that it is now a long way from the injury. Although I am made welcome when I visit, my phone calls and emails are frequently not returned and it is difficult to access the school.

Jade was knocked over by a bus outside her school when in Year 9. There was some indication that she may have deliberately stepped out in front of the bus. She was in a coma for four weeks. I taught her at home for a year before she joined a mixed ability class for young people with medical needs. Along with the rest of the group she only attended for half the day, which was suitable for her fatigue levels. Within the group she managed without a TA, but was taught at all times by teachers who, although not conversant with ABI, were aware of the need to differentiate the curriculum for every pupil as many had missed large amounts of schooling due to their illness. Hence any groups that were formed had to be flexible and depended on the level of understanding in the topic on which they were working, rather than the subject as a whole.

Owen, aged 8, was in a car being driven by his grandmother, when they were involved in an accident. He was sent to a rehabilitation centre for many months and has been left with a left sided hemiplaegia. He returned to school with a full-time TA and half time teacher, whose responsibility was to differentiate the curriculum for him and liase with teachers about the best ways to teach him. This was paid for through a legal settlement. I observed him in Year 9. Owen was in the best situation in school. His school has a unit attached for young people with special educational needs, some of whom have all or some lessons in the mainstream school. His support teacher has worked hard to ensure that other staff in the school understood Owen's particular needs. Her work in the area of Maths is typical.

After much explanation/ discussion with the teacher, he models everything on the board to the whole class. He breaks it down into small steps on the board. He gives worked-through examples on the board. So the pace is slower, my pupil can listen and watch while his

TA writes down the clear instructions and off we go! Also the teacher keeps a close eye on my pupil and if he hasn't quite grasped something he gives him more of the same, even if the rest of the class need to move on.

The difference is that she is employed on a 0.5 contract by the LEA as a teacher in the school, and the rest of the time by the trust which looks after Owen's needs, funded by a legal settlement. She is also overseen by an educational consultant who specialises in paediatric ABI. She has the knowledge, legal backup and the time to devote to differentiating the curriculum, by training teachers in suitable educational strategies for Owen. Hence differentiation is not left to an untrained TA as it is in most other schools.

Mike suffered a hypoxic brain injury, aged 13, as the result of an accidental hanging when he fell on the stairs rushing down to watch an important football match. He was admitted to hospital and spent 5 days in paediatric intensive care, returned to the ward and then was readmitted to intensive care for a further 9 days. He was hospitalised for 10 weeks. I taught him on discharge and for the subsequent year. He returned to school in the summer of year 10, but was set back by the death of his father in Year 11. He obtained one GCSE, in art. Mike's school made an enormous effort to meet his requirements, dedicating a teacher to his needs, and developing a timetable and curriculum which suited him. This meant that he attended only a few class lessons with a TA, and worked on his own or with a small group of children at other times. This suited his need for a calmer situation and lower level of distraction. He never returned full time to school, because of his heightened levels of fatigue.

Simon and Ben were in the same school, a high achieving comprehensive. Simon was on holiday with his family at the age of 9 when he stepped out into the road and was hit by a van. He had a GCS of 6 and required 4 days in intensive care. He had at least 3 weeks PTA. He had poor motor control and left inattention, but over the years these have resolved to a certain extent. He was in Y7/8 when I observed him. Ben fell off his bike while racing down a hill in the local park at the age of 9. I worked with him some 6 years later. He initially came to the attention of the hospital education service through a sleep disorder, not uncommon after a brain injury. Both were able students and hence were not supported by TAs, but when aspects of their injury became obvious the school had no mechanism beyond referring them for 'a chat' with their head of house. However Simon's mother had provided a poster about him for the staffroom (Appendix K), which alerted at least one supply teacher to his needs. However, the supply teacher, who was an extremely experienced teacher, admitted to me that he was relieved that I was in the class as he would not know how to deal with Simon's difficulties. Both boys found it impossible to cope with school and ended up in the care of the hospital education service, one in the class for young people with medical needs which Jade had attended.

Ruth was the victim of child abuse, under the age of one year, sustaining an injury to the left temporal lobe, and put up for adoption as a result. There are few records for her. She is now in a loving family with opportunities to explore all kinds of activities. She loves animals. She has general organisational difficulties despite being an able pupil. Ruth's school is not provided with any extra financial resources for her. She has a TA in some classes, but the TA adopts the same style of support which would be provided for other pupils with a label of dyslexia or specific learning difficulties. Reports had not be seen

by TAs or teachers involved with Ruth. It is a large school, and they have refused the training offered, although one member of staff attended a day course provided by the local hospital.

Vicky sustained a traumatic injury, aged 10, when she lost control of a quad bike. She was in PTA for approximately 14 days. She was taught at home before being re-integrated into a mainstream class in KS2. SHIPS was asked to assist in the transition to KS3 for both these girls. Vicky's school felt that they were hampered by a low level of provision indicated on her statement of needs. They provided a TA in some lessons, but not in others, and did not avail themselves of training. After visiting Vicky in Year 7 I discovered through KHIS that there is another pupil in year 10 with an ABI. He is not causing the school any difficulties, and hence Vicky's difficulties are being put down to her home background and character. However it is not known whether the older pupil is able to learn to his full potential or not. Subsequently both Vicky and Ruth have experienced some difficulty in adjusting to secondary education and I currently take lessons with both girls individually on a fortnightly basis covering brain injury awareness and learning strategies.

Nasser has recently come to this country from a North African state. It is not clear how or when he suffered his injury, but he has clearly had at least one brain injury. As an infant, the place where he and others were sleeping collapsed around them and from that time he had a limp. In addition, as a junior, a raid on his village took the lives of his parents and injured those who survived. He came with no medical notes and his carers did not inform school of his needs. School quickly became aware that he had special educational needs and asked me to prepare a report. English is not his first language, and he is supported to learn English as an additional language in school. I first observed him less than one year from entering this country and starting to learn English. Nasser has a right hemiplegia and consequently writes with his left, non-dominant hand and has difficulty walking. Nasser and William were both in the same school at the time of the observations. Their school was unable to arrange INSET as there were more pressing needs in the school at the time. When I turned up to observe Nasser in Year 8, I was questioned why I was watching him as the teacher thought I was interested in brain injury. She had taught Nasser for 6 months at this point, and had clearly not seen his IEP or the SHIPS report. Nasser had TA support in many, though not all his lessons and was withdrawn with a group for additional language sessions with a specialist literacy teacher, who told me she felt inadequate to meet his needs due to the ABI. However she was willing to consider new ways of teaching and subsequently changed her approach for the whole group.

William sustained a non-traumatic brain injury through a viral infection when he was aged 15. He had a bone flap removed which was replaced three months later and subsequently wore a hat to hide his scar, which made him very visible in school. I taught him from his discharge from hospital and accompanied him back to school in year 11. He attended most lessons but returned home on Wednesday afternoons when I helped him to catch up with the coursework he missed in Year 10. William was considered too able to require support and struggled for 18 months to keep up with the class. However, he did not follow a full timetable. The local hospital education service allowed me to attend key lessons and oversee coursework and revision in preparation for his GCSEs.

Louise was 13 when she was knocked down by a van on a main road. I did not teach her on discharge and there are no readily available records. She was brought to the attention of SHIPS by her Speech and Language Therapist. She was observed in Years 10 & 11. Louise's school was struggling and during the period of observation was placed in special measures. Within this school some excellent teachers differentiated within their subjects to meet her needs and the needs of others in the class, but there were some inexperienced teachers who were at the beginning of learning their craft. In this school the SHIPS report which was (at least at this time) aimed at the SENCo was given directly to the TA who worked with Louise for part of the time. The TA commented that she did not understand the technical language. This school also had a very large number of cover lessons. The high level of cover lessons was an issue common to nearly all schools, except Owen's and Evan's schools. Supply teachers did not know any of the class, let alone any who had invisible needs and impairments such as follow ABI. Frequently pupils would have as many as 3 cover lessons out of 5 in one day.

Evan discovered his tumour early in Year 9, but despite having chemo- and radio-therapy managed to return to school within 6 months. However he then had serious problems with eating and I provided home tuition for several months, before returning full time to school in Year 10. He has been left with double vision for which he has a prism in his glasses. Evan's school had a group for those who found school difficult, run by a very caring TA. Evan was attached to this group and allowed to bring his work there if he felt he could not cope at any time. This was an excellent way for him to feel in control of his situation. He was allowed to leave a class if the particular activity became too much, and he was not alone in this. Yet the situation was carefully monitored by the TA who would talk to class teachers, and act as an intermediary for Evan at times, explaining his feelings where he felt he could not. It helped that Evan's mother also worked at the school and all teachers were able to report to her any concerns in an informal way without difficulties building up. He is now in school full time without support.

The three young people who were all recruited later into the project all sustained TBIs through falling. Harry fell from a tree and became profoundly deaf as a consequence. His school were very reluctant to readmit him because of his difficulties, and his mother called on SHIPS to assist. Darren fell 20ft from a roof onto concrete while trespassing on a derelict site. He was in ITU for 7 days and PTA for more than 2 weeks. His family situation was such that it was decided he should return to school immediately, instead of the normal period of tutoring at home. I was asked to tutor him at school. Prior to his injury Darren was part of a special group in school because of high levels of anxiety, but he attended normal lessons. Carl fell from a wall in the playground. His primary school refused any help and felt he did not require statutory assessment, but he was referred to SHIPS from KHIS when he transferred to the same secondary school as Darren, and was seen to be experiencing difficulties. Darren and Carl's school has put on the longer training course for all its staff, but only one teacher, apart from the SENCo turned up, although most of the TAs attended. Although Carl's parents had told the school about his ABI sustained four years earlier, the school had not passed the information onto his teachers.

Parental concerns can also affect the way the pupil sees him/herself in school. SHIPS was approached by a number of parents who were concerned that the school was not, or

may not be, teaching appropriately. Simon and George were among these, and were themselves anxious at school. George was age 12 when he was hit, and spent 3½ weeks in hospital, 2½ of those in a coma. His lowest GCS is recorded as 5. He had no specialist help once he left hospital, and only became known to the KHIS team and SHIPS through parental persistence. I observed him two years later in Year 10. George's school was welcoming, and felt that his parents were over anxious. As in most schools, the SHIPS report highlighted some areas where appropriate strategies were being used and others where recommendations could be made. Subsequently his parents felt that things had improved at school. Although in some classes differentiation was assumed by teachers, because of the presence of a TA. Details of the pupils are gathered in Table 2.

Name	Age (KS) at injury	Age (KS) at observation	Type of injury	Cause	GCS	PTA (wks)	Physical impairments
Ruth	5mths(Pre)	11 (KS3)	TBI	Non-accidental	U/K	U/K	no
Nasser	2 (Pre)	11/12 (KS3)	TBI	Falling masonry	U/K	U/K	Hemiplaegia
Carl	7 (KS2)	11 (KS3)	TBI	Fall			no
Adam	10 (KS2)	11 (KS3)	TBI	RTA		4	Hemiplaegia
Simon	9 (KS2)	11/12 (KS3)	TBI	RTA	6	3	Mild hemiplaegia
Ian	11(KS2)	11 (KS3)	Non-TBI	Tumour		N/A	Hemiplaegia, deafness and double vision
Vicky	10 (KS2)	11 (KS3)	TBI	Quad-bike		2	Facial scaring
Owen	9 (KS2)	14 (KS3)	TBI	RTA			Hemiplaegia
Ben	9 (KS2)	16 (KS4)	TBI	Bike	U/K	U/K	No
Louise	13 (KS3)	15/16(KS4)	TBI	RTA			No
George	12 (KS3)	15 (KS4)	TBI	RTA	5	U/K	No
Darren	13 (KS3)	14 (KS3)	TBI	Fall		2	No
Evan	13 (KS3)	14 (KS3)	Non-TBI	Tumour		N/A	No
Jade	14 (KS3)	15/16(KS4)	TBI	RTA			No
Harry	14 (KS3)	15 (KS4)	TBI	Fall	3	4	Profoundly deaf
Mike	14 (KS3)	15/16 (KS4)	Non-TBI	Hanging		N/A	No
William	15 (KS4)	15/16 (KS4)	Non-TBI	Viral infection		N/A	No

**Table 3:** Pupil details

**Key**

U/K – unknown

N/A – Not applicable

GCS – Glasgow Coma Score (lowest score where available)

PTA – Length of Post traumatic Amnesia (only applicable in traumatic injuries)

**4.6.5 On-going contact**

As well as through the SHIPS project I have on-going contact with parents and young people through FUN Club and Frenchay CBIT, clubs for families and parents of young people with ABI respectively. When parents or schools are aware of difficulties, SHIPS tries to be an intermediary and, through observing the behaviour of the pupil in the

classroom, advises both parents and teachers on the best way to intervene. Some of this study's observations have been provoked by such requests.

It is hoped that this qualitative analysis will give a voice to those living with the consequences of ABI. It is an exploratory study, aiming to open up new territory for investigation. Caution must be exercised in generalising from such a small sample, but it is hoped that the study will uncover some areas which may benefit from further investigation and will begin a more general argument which could be used in further studies.

The next chapters set out the analysis of the data collected for this study. Chapter 5 examines the language used in a secondary classroom and how this is received by pupils with ABI. Chapter 6 considers the ambiguous nature of some of the language encountered while chapter 7 scrutinizes the way pupils with ABI deal with concepts, both when thinking ideas through and when expressing ideas to others.

## Chapter 5 – Understanding Classroom Language

This chapter analyses the data gathered on classroom discourse structures, looking at how teachers explain, instruct and question their pupils and how the pupil with ABI responds to each of these.

Discourse structures used in the secondary classroom, are not clearcut. Explanations are frequently broken up with questions, or initiation-response-feedback (IRF) sequences are punctuated by monologues giving direction or information. Questions can provoke very different reactions in pupils after an ABI from those expected from the rest of the class. They may replace a command, and seem more gentle, or may act as a comment, hint or warning, bringing about confusion between form and function (Young 1992), thereby demanding a high level of inferential skill from the pupil. Analysis may probe the form of individual utterances, or consider the function of sequences of instructions and questions, which are frequently mixed. Each approach yields different insights into the way meaning is made by pupils after an ABI. While teacher/ pupil interaction can look the same on the surface by taking the same form, they may be different in educational function and it is important to consider such function in the analysis.

### 5.1 Explanations

Pupils with ABI seem to have the most problems when teachers ‘talk’ to the class, giving explanations of ideas, linking the lesson to previous ones and generally introducing the topic. Exposition of new topics frequently left Louise struggling to work out what to do, and created a barrier to communication. Theoretical explanations frequently involve terms which are new to the pupils. Teachers whom the pupils describe as easier to understand, will define new terms in many ways, orally, with a written definition and possibly also with a demonstration, as Louise’s art teacher did.

GCSE Art Lesson, introduction to a project on abstract art

*The teacher spoke at length about the work of Mondrian and John Piper. He focused on the idea of abstraction, which was defined orally several times, in different ways, and attention was also drawn to a definition written on the board. There was plenty of repetition of the definition of ‘abstract’ in terms of art. Louise looked ahead of her or to her lap throughout most of this. The class were then asked to find examples in different pictures using a series of questions written on a sheet. One question asked ‘Why does the painting look like this?’*

L<sup>1</sup>: Because it is an abstract painting?

SR: What does it mean ‘abstract’?

*Louise read on the sheet then looked at me*

*I pointed at the definition on the board*

SR: Can you write about that?

*Louise copied exactly what was on the board which meant that the grammar was now incorrect.*

SR: Hang on, does that make sense?

*She looked at me and was unable to rephrase it in her own words.*

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<sup>1</sup> In extracts pupils are referred to by their initial, SR is the researcher, T is a teacher, TA is the teaching assistant and other pupils are P1, P2 etc

She had not grasped the concept of abstraction, which had been presented during teacher exposition, even though the teacher had carefully laid out the definition with many examples. It is generally held that with repetition, pupils with ABI can learn (Begali 1992, Blosser & De Pompei 1991, Walker & Wicks 2005), but this does not seem to be the answer here. The teacher had not included question and answer in his presentation of the material, but used monologue, and Louise, who had been sitting at the back of the room had spent much of the time looking at the desk in front of her, rather than at him. This is common behaviour among pupils with an ABI. During teacher monologues they start by looking at the teacher but after a while look away, or sometimes start to fiddle with items on their table. This could indicate that their attention has been diverted or that they have lost interest in what is being said, as it does not make sense. However, abstraction is also an advanced concept; it is a form of metaphor, and demands liberation from concrete ideas. Louise did know that she was expected to write something and was happy to copy what was on the board to satisfy the requirements of the task. But she was unable to read, comprehend and rephrase the definition to fit grammatically with her writing; the task seemed to be beyond her personal ZPD (Vygotsky 1978). Pupils with ABI are held to have an uneven profile of skills (Walker & Wicks 2005, Ylvisaker & Feeney 1998, Begali 1992) and what they cope with in one area may not reflect what is achievable in another. This inability to rephrase could reflect either the rigidity of her thinking, or that she has not really understood what it is that the teacher is trying to communicate to the class. The rest of the class completed this task quickly and moved onto the next part of the lesson.

However teachers do not always engage in lengthy theoretical explanations, neither do they necessarily provide definitions in different representative modes (i.e. symbolic, iconic and enactive, which are discussed further in Chapter 7). They may give instructions of how to engage with a task; the task becomes the explanation. But after an ABI it is rarely easy for pupils to distil a definition for themselves.

Nasser was in a Food technology class

T: We call it recipe engineering where you change or improve it, OK?

Class: Yes (*Nasser did not join in*)

T: What could we do to change this?

*Nasser is looking behind*

P1: Add pineapple

T: If you add pineapple what would it do?

P2: Nutrition

*Nasser is still not attending, the TA nudges him to do so*

T: Nasser can you think of anything?

N: Nutrition

Nasser was not attending to the teacher. This could have been a difficulty with attention, but there was no obvious focus to his distraction. When the teacher directed a question at him he copied the previous answer, so he had been listening at least on one level, but it appears more that he does not follow the explanation. The teacher carefully used words at two different levels to describe recipe engineering and then extended the definition by asking the class to engage in a task which illustrated the principle. They were required to become active learners, linking in the new term with previous knowledge. The rest of the class followed in a kind of choral recitation establishing



common knowledge (Edwards & Mercer 1987) as she invited them to reply (Mehan 1979); they were able to engage with her in IRF and later engage with the task of recipe engineering. Nasser was unable to do either of these. It could have been that the words she used were the problem, or it could be that the idea of changing or improving was the difficulty. Certainly here, where he is not just being asked to recall information, but to manipulate ideas he finds it very difficult to make meaning. The teacher is trying to help the class to construct new ideas around the new term, and Nasser seems unable to follow. She did not write the new term on the board, as Louise's art teacher had done, neither did she give examples, but asked the pupils to provide the examples, which Nasser could not do. Neither exposition nor IRF seems to be enough on its own. It may be that these pupils need a much more intersubjective explanation guiding the construction of knowledge in small steps.

### 5.1.1 Using technical terms

Technical terms introduced in previous lessons are also assumed to be understood.

Geography lesson, the pupils have been given 3 tasks from a book the page numbers are on the board.

*The teacher reads out the passage they are supposed to read as part of task 2 and expounds on it. It is full of technical words and is spoken quickly. The TA reads out the question.*

Q1: Explain how tectonic plates lead to earthquakes and volcanoes

TA: Tectonic, look here it is, they float. *(She pointed to the word tectonic in the text-book)*

L: Shall I write that?

TA: Yes

L: What about the plates bit?

TA: Here *(she pointed to the passage about plates)*

The TA leads Louise to find the meanings in the textbook, and Louise writes out the meanings, reciting rather than retelling (Emerson 1996, Skidmore *et al.* 2003). There has been no opportunity for Louise to engage with the learning actively. Although the teacher had used the terms *tectonic* and *plates* in her exposition, it was clear from subsequent behaviour that Louise did not understand them. Other pupils too can experience difficulties with new vocabulary, but it does not seem to happen as frequently as with this set of pupils. These terms had been used in a series of lessons previously and the teacher seems to presume knowledge; for Louise the dialogue has unintentionally become proleptic.

Deliberately used, proleptic instruction (Daniels 2005, Rommetweit 1974, 1985, Stone 1998a) gives many opportunities for the pupils to be active learners as they make and judge associations and rework for themselves the knowledge they are receiving. Where teachers intentionally use proleptic instruction to encourage active thinking, they will deliberately drop hints to assist the pupils along the way and push them into developing a fuller understanding

Science lesson about forces. Previously Louise's class had been considering stopping distances

T: Next lesson we are going to investigate air brakes. Look at this

*He gets out a piece of apparatus and allows a weight to drop on a string attached to a rubber bung. He then attaches a wing to the bung and allows the weight to fall again.*

T: What is happening?

P1: It goes slower the second time

T: Why?

P2 answers.

T: What could I do to make it slower?

L: Put on more wings

T: What could I do to this one wing?

L: Make it stronger

Brakes had been part of the previous discussion, but the term airbrakes was a new idea. The teacher built up the tension by delaying the explanation and requiring the class to work out what he meant by looking at the example he provided. The pupils needed to realise that the term airbrakes had meaning in itself and that it was related to the previous topic of discussion in order to give the answer that the speed is reduced. When knowledge has to be reworked in this way it leads to learner activity. It is generally held that if children are active learners and work something out for themselves then they are more likely to retain that knowledge.

However the pupil with ABI also faces prolepsis where it is not specifically intended, when the teacher assumes that the class understands the terms being used. They then have to try to make sense of the communication without the guidance of an adult, and at a time when further information is being imparted. Thus the task instruction became unintentionally proleptic.

Simon was in a history class comparing architecture of different eras

T: Windows often tell us about the age of a building. Sketch the shape of the window

*Simon drew a careful picture of his window. The rest of the class did rough sketches.*

The teacher assumed that her pupils would understand the concept of 'sketching' as opposed to 'drawing', but Simon did not. This could be indicative of Simon's need to be precise and to look at the detail; on other occasions he drew scientific diagrams starting with the detail first. But it is more likely that he did not understand the word sketch and had no way of deducing its specific meaning from the context. He saw others using a pencil from which he understood drawing was needed. While the rest of the class produced generalised sketches, Simon created a detailed drawing of a particular window; the task which assisted the rest of the class in abstracting their knowledge was of no educational benefit to Simon. He was left behind as others moved to the next task. Frequently, after ABI, pupils are described as slow workers, but if they have to work hard to make meaning from teachers' instructions then it is no wonder they are slow. Curran (2005) holds that pupils have to work five times harder post injury than they would have done prior to ABI to achieve the same.

### **5.1.2 Use of other media**

Teachers may use video presentations to explain new ideas and learning. Ian, Nasser and Evan frequently took part in lessons which involved making notes from a video.

Here the TV presenter gave a monologue and the pupils were required to watch pictures and take notes at the same time. It could be anticipated that the pictures would assist with the understanding as visual memory is more likely to remain intact than verbal (Ewing-Cobbs *et al.* 1998b), but the requirement to take notes would impede comprehension because of the necessity to shift attention and dual task (Semrud-Clikeman 2001) both of which are difficult after an ABI.

Evan's Geography lesson was taking notes from a video. The questions for the notes were provided on an A5 sheet

T: Read the first 5 questions so that you know what is coming up.

*Evan read the questions silently, but much more slowly than others in the class. As the video progressed he answered the questions and also moved his body to the background music*

Q2 Where does the investment for Brazilian industry come from?

Evan wrote Belo Horizonte

*Teacher stopped the video and checked the answers to 1 & 2 by asking the class to raise their hands to answer. Evan was not chosen. The other pupil's answer was accepted and he corrected his answer. The video was started again.*

Q3 How many new jobs has the car factory created?

Evan immediately wrote 10000

.....

*Teacher stopped the video again to check the next answers.*

Q5 What kind of materials are the homes near the car factory made from?

*Evan raised his hand and was chosen*

E: Bits of land

T: Yes on bits of land...P2

P2: Bricks and wood

Evan was able to answer the questions using a straight-forward grammar, very easily, but when expressed in the passive voice he gives a different answer. Instead of answering where the investment comes from he answers the question 'where is the investment going?' Both questions were clearly answered on the video. Later he answered the question 'where are the new homes built?' rather than 'what are they made from?' It seems that he is able to answer direct questions while watching at the same time, but not ones which are expressed in a more complex manner. The rest of the class seemed to find the questions very easy to answer and as an able student, (predicted Level 6/7 at KS3 SATs pre-injury), the teacher also expected him to be able to answer correctly. When he did not, the teacher looked questioningly at me.

Keywords may assist with recall. Ian was not able to answer any questions about videos he watched in RE, until the TA wrote keywords alongside. He was able to use these to form sentences and write about what he had seen in answer to the question 'What do you know about Jesus as a boy?' The keywords seemed to be sufficient to help Ian recall the main points of the video. On this occasion, they were written on a piece of plain paper but subsequently I have tried the same strategy using post-it notes, which then means the pupil can order the main ideas to assist with planning their account. Keywords are preferable to sentences or phrases as they allow more freedom

in retelling the story, allowing the pupil to engage in internally persuasive dialogue rather than merely reciting.

While the addition of a visual element may have assisted, it was not enough to be able to make meaning later, and it appears from Evan and Nasser that note-taking while watching can be a confusing experience; it certainly requires the skill of divided attention which is difficult after ABI (Mateer *et al.* 1996). This matrix shows the experiences of pupils with ABI with exposition.

Exposition	R	N	C	A	S	I	V	O	B	D	J	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	L3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	U3	U3	4	4	U3	4	4	4
Follows live exposition	✓	x	P	x	✓	x	x	(✓)	x	x	x	P	P	P	x	x	✓
Follows video exposition		x				x								P			

Key

✓ can follow, with assistance if in brackets

x has great difficulty

P – partly follows

Matrix I

Those pupils who can partly follow exposition remember some of the ideas, but need further assistance to fully understand what to do, or what the essence of the idea is about. Simon, Carl, Ruth and William, who can follow exposition, were probably the most able of these pupils pre-injury. They may not follow all of the nuances, but follow a sufficient number to complete tasks which follow. For George and Louise, particular teachers always checked their grasp of the ideas and offered one-to-one assistance, scaffolding their understanding where necessary. These were the teachers whom Louise described as ‘easy to understand’. Owen’s teacher has devised ways to assist him with following teacher exposition; his TA draws Mind Maps of explanations as the teacher speaks, or, if instructions are being given, Owen acts out the instructions as they are spoken aloud by the class teacher.

### 5.1.3 Interruptions

If explanations are interrupted, it may be anticipated that this would afford the time and space needed to process the ideas. Interruptions may come from disciplinary matters, or backtracking to encourage the pupils to make links with other work.

Science lesson, biology. Louise is at the back of the class

T: Books out.

*No book was given to Louise. She sat waiting and eventually one arrived.*

T: Last lesson we talked about food chains. *The teacher continued with his monologue about the content of the last lesson.*

T: We will talk about expectations. *The teacher continued by talking about his expectations about behaviour of the pupils in his class.*

T: What we did last lesson was food chains. In real life they don't exist. In real life they have a choice. Do you remember I gave you the analogy of someone who only eats one type of cereal?

*Some murmurings from pupils, some yes, some no.*

T: Right I want you to look at this sheet.

*Louise looks at the sheet and reads it. The teacher also reads from the sheet, adding comments to the reading. A couple of questions are asked signalled by 'It's a what?' Louise does not join in the answering.*

The teacher interrupted his explanation of food chains by a long aside about classroom rules. This teacher also uses rhetorical questions, (this was not the only example) and analogies. Louise was not the only pupil to answer what was essentially rhetorical here. The teacher then assumes that, having reminded the pupils, they will remember his analogy from the previous lesson, just as they will remember his train of thought before the interruption. Having introduced food chains, he then states to the class that they do not exist. This reference to theoretical versus practical environmental conditions requires an enormous leap of understanding. The point is not made explicit and explained only by reference to an analogy. In addition, he uses two pronouns in this utterance ('they' in both cases), which do not agree. The teacher signals the points when he wants the class to respond, which they do as a group, assuring him that the class is following his train of thought, but Louise does not join in, probably because she is not. Later however, she showed that she was well able to complete the work, which did not require the pupils to have understood the teachers' introduction. Louise has requested that she should have a dedicated TA in biology and geography, as she feels she does not cope well in these lessons. Both these subjects are largely taught through exposition. Whether explicitly or implicitly, Louise seems to know that this is a difficult mode of teaching/learning for her. Likewise William rejected Business Studies, but in his case he stated that it was because of the way it was taught. These two older pupils are certainly aware of teaching styles which they find difficult. Louise described this teacher's lessons as 'going in one ear and out the other'. It could be that they need space and time to reflect or organise concepts which the constant flow of exposition does not afford.

Interruptions can be the reason some lessons are seen as 'difficult'. While we were walking to a maths class, Louise told me

SR: What is difficult in maths?

L: The teacher is in the middle of explaining and then he has to go off and then another time you are asking for help and he spends ages with P1 or P2

SR: And when he does give you help, then are you ok?

L: Sometimes it's confusing

It could be that Louise is just complaining here that she does not get the teacher's full attention, especially as she seems to be saying that he spends ages with other pupils, but in this class she expressed irritation when explanations to her were interrupted by disciplinary matters, even at times when he stayed near her. It appears that other members of the class can cope with interruptions, but ABI pupils do not seem to be able to, as shown in this matrix.

Interruptions	R	N	C	A	S	I	V	O	B	D	J	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	L3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	U3	U3	4	4	U3	4	4	4
Discipline		x		x		x	x	x		x		x					
Linking back		x		x		x					x	x	x	x	x		x

**Key**

✓ maintained ideas

x did not maintain ideas

Matrix II

Some pupils did not experience interruptions, either because they were part of a compliant class and/or the teacher's style was such that they presented material in a logical order. This seemed to be preferable for the pupils. Although interruptions could give time to process what has already been said, they could also hinder as they break the train of thought, introduce new ideas, and require pupils to switch attention, which is held to be difficult after ABI (Begali 1992, Semrud-Clikeman 2001, Ylvisaker & Szekeres 1998).

### 5.2 Instructions

Instructions form a large part of classroom communications and may be expressed as statements or questions. The way they are phrased seems crucial to classroom meaning-making post-ABI.

Introduction to Adam's maths lesson, part of a unit on area.

T: Today we are going to do an investigation, using the dotty paper you had before. I want you to draw shapes which have an area of 12 cm<sup>2</sup> and then work out the perimeter. Remember perimeter is the line you would draw around the edge. If they are straight lines you can count them, but if they are diagonal then you will need to measure.

*Paper was given out and Adam looked at it for a moment. He starts to draw a rectangle around 12 squares.*

TA: Do you want to draw the lines in? (*i.e. dividing up the 12 squares*)

*He draws them*

A: What's perimeter?

TA: Around the edge, the outside

*He starts counting*

The teacher did not model the task and Adam only followed part of it, though he was able to make a start by drawing a rectangle. He had not followed the explanation of perimeter, but the teacher was referring to it in passing rather than specifically teaching the concept of perimeter. She assumed that they all knew and would only need a quick reminder. I was not aware of any other member of the class who needed further explanation of the word perimeter, although I know it is a term which is easily forgotten. For the rest of the class, however, her simple reminder was sufficient. Adam however realised that he would need to know the meaning of this word and his strategy was to ask for help; without the TA to ask he may have been lost. It was assumed the class knew what dotty paper was from 'before' – this is an example of unintentional prolepsis. Adam was then given the paper and he looked at it with a little surprise; I don't think he had understood the reference to dotty paper, but here this did not matter as the meaning was established when the paper was given out.

Difficulties with memory can interfere with following instructions

William's comments after an ICT lesson

SR: How did you find that lesson?

W: He explained it OK and then he left. I wondered if I would remember it all. I felt a bit on my own.

The teacher did not demonstrate the task and no written instructions were left. Owen's TA makes a point of writing out any instructions given by the teacher for Owen to refer to when completing the task, and he seems more able to complete activities alone. Generally ABI does limit the memory, both working memory and longer term (Begali 1992), but the answer is not necessarily just to write instructions down.

Teacher comments after William's ICT lesson

T: In the mocks he did not completely answer the whole question. He sort of answered the first bit and not the last, especially where it was a two-part question. Is that to do with the illness?

SR: Yes

T: It was similar in the English too. He didn't cover all the question. It was a shame. He could have done a lot better.

In exams, all instructions are given in written form and, like many other pupils after an ABI, William only answered the first part of the task. The teacher recognised that this was not typical of the pre-injury William and comments that he could have obtained a better mark. Subsequently, I taught William the strategy of touching each part of the task written down and checking he had covered it in his answer. I do not know if under exam conditions he was able to use the strategy, but he certainly could when working through practice papers.

### 5.2.1 Written Instructions

Louise, too, experiences difficulties with the way in which assessment takes place for GCSE, in particular, the use of implied/subject specific meanings of certain phrases.

Maths lesson, talking through her mock calculator paper as additional work once she had completed the set task. Question 2 had been done through a non-calculator method, with errors as they were more difficult numbers to compute.

SR: Did you have a calculator?

L: Yes

SR: But you didn't use it

L: It said show your workings out and you might get more marks, so I thought you couldn't use the calculator.

*I showed her what to write to show workings*

The phrase 'You **must** show all your working' frequently appears on GCSE maths papers, and means that you must show what computations you have made in order to achieve your solution. This is perfectly possible on the calculator as you record the whole equation and not just the answer. The phrase acts as shorthand, but Louise took it literally, as 'you must show how you worked out the answer' and felt that use of the

calculator would preclude this. She was additionally hampered because she was using an older calculator which did not display both the input and output at the same time. I was able to recommend that she should have access to such an instrument both to practise and to sit the exams.

Another such 'shorthand' instructional phrase is 'trial and improvement' which denotes a particular method to be used in solving a problem. However in this question the method was illustrated as well as labelled.

Maths cover lesson, sheet of sample GCSE questions is set.

*Question 3: One positive number is 2 more than another. When the two numbers are multiplied together the answer is 40.*

*Ingo wants to find these two numbers by trial and improvement. He tries  $5 \times 7 = 35$  too small  $6 \times 8 = 48$  too large*

*Continue with the method until you have found the numbers correct to one decimal place*

*Louise sat and looked at it*

SR: What do you have to do?

L: Don't know

SR: What do you understand from the question?

L: It's confusing

SR: One positive number. Tell me a positive number

L: 4?

SR: Yes.. is two bigger than ....

L: 2?

SR: Yes, multiply together

L: Is that times?

SR: Yes

L: 8

SR: We've got to find two like that only their answer is 40

*She tried  $6 \times 4$  and others, eventually finding the solution*

Louise was unable to start and I tried to prompt her by asking her to talk herself through what she had to do, but this time other linguistic difficulties stopped her. The question was 'confusing' yet the sentences were very simple. Certainly the example was modelled in whole numbers, but the answer required accuracy to one decimal place. However the immediate problem was with the two specialist terms, positive and multiply. It was not that they were unknown, she offered examples or alternative words for each, but she was unable to do that for herself. It was as if she were only able to 'unpack' the question when it was broken down phrase by phrase, and she could then respond to each bit in turn without having to hold it all in her mind at once; the amount of material was too great. Luria (1973) developed a similar strategy with his patient LZ where he would pose questions to himself for each phrase he read. For him the grammar, which shows the relationships between the named objects, proved to be problematic, as he focussed on the meaning of the individual words. Here too it could be that Louise, in searching for the meaning of the two discipline specific words she found difficult (and which were only understood after a space of time), missed the detail



of the grammar which gives the sentence its 'sense'. Equally some sentences cause difficulties because of the implicit nature of the utterance.

Louise's Maths teacher had written a question from the exam paper on the board

Q: From the above table what is the probability that a person is male?

Louise wrote 10/23

SR: It's the probability that any person in the test centre is male

L: Oh 23/40

SR: Why?

*Louise shrugged*

Her response was immediate and, having seen other examples too, her difficulty is not with the mathematical concepts, but with the way the question is phrased. The question implied, but did not state explicitly, that it was a person in the test centre. Once she had been given this information explicitly, she realised that the probability was from all the people there and not just all the males. She seems to be using the words as a formula; the bottom number is the largest group mentioned in the question. This is a good strategy as long as the question is explicit. It is possible however, that she just gave the first answer she thought of, and then when I prompted she was able to take the time to consider her answer, or it could be that she understands that she was wrong first time and then has another guess and this time gets it right – the probability against this is rather high. I changed a question into a statement in my rephrasing; 'It's the probability....' But it is also noticeable that in my rephrasing I added the missing words 'in the test centre'. I made the question less ambiguous. I asked her to explain her thoughts (unfortunately with one word) but she could not; had I put in the inferred words she may have explained.

Mike too was faced with having to think beyond the literal in a maths class, something he too finds very difficult and seems common among pupils with an ABI.

Mike was faced with warm ups on the board, written as

Warm Ups

3, 12, 21, 29, 36

- a. Prime
- b. Square
- c. Multiples of 3
- d. Factors of 36

He did not know what to do. I read it to him as 'from this list of numbers find all the prime numbers, all the square numbers, all the multiples of 3 and all the factors of 36'. Although he then knew what to do, unfortunately he could not remember what a prime number was, but was able to find the square numbers and multiples of 3. In both these cases the pupil only understood because a supporter interpreted the question. The SENCO in Mike's school felt that this was the purpose of a TA, but this does not assist the pupil with understanding written language or participating fully in the learning. If support is present, it is possible for the teacher to leave the explanations to the TA and carry on in the normal way, knowing that the TA will ensure the task is completed (Ainscow 2000). This does not ensure that the pupil understands the learning objective

behind the task and can leave the pupil frustrated in their learning. In her college interview Louise commented

L: At school my TA did everything for me and if I asked her not to she got annoyed and said I wouldn't get very good marks. If someone did that here I'd get a bread knife and tell them to go away.

The strength of her feeling is evident, even though she expresses it in an inappropriate manner. A TA however can help the pupil to maintain their attention, although in observations this is not usually the role chosen by the TA. Frequently, pupils with ABI start to attend to teachers' talk and then do something else, perhaps play with a calculator (Louise, Nasser), or chat (William, Ruth) or just look around the room (George, Nasser, Evan, Owen). When instructions have finished it is clear that these pupils then do not know what to do next. They then have to find a way around this impasse. The table below shows the strategies used.

Strategies when stuck	R	N	C	A	S	I	V	O	B	D	J	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	L3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	U3	U3	4	4	U3	4	4	4
TA	no	P	no	P	no	F	P	F	no	P	no	P	P	no	F	F	no
Waits for individual instruction	X	X✓	X	X	X	✓	✓	✓	X	✓	✓	X	✓	X	✓	✓	X
Asks the teacher or TA	✓	✓	X	✓	X	X	X	✓	✓	✓	X	✓	✓	X	X	X	X
Regularly copies others	X	✓	✓	✓	✓	X	✓	X		✓	✓	X	✓	✓	X	X	✓

**Key**

✓ uses this strategy

X does not use

F Full-time TA

P Part-time TA

no - no TA

Matrix III

There seems to be a link between those who have a TA and those who passively wait for assistance, but it has to be remembered that the reason they have an TA is because they cannot manage the learning on their own – although in some cases it is more to do with safety issues, than learning. However if TAs immediately offer assistance it does engender dependence. George seems to employ a number of strategies depending on the lesson, and the art teacher, at least, is aware of his need to copy others and commented

George is better in the more disciplined lessons. I put him between 2 pupils and he can copy what they are doing. In freer lessons like this I try to get him in a group who are doing the same thing. After we have done this for a couple of weeks we'll have to have a lesson where we all do the same - a more disciplined lesson and then they are better again.

It is also notable that the teacher comments that George is better in 'more disciplined' lessons; by this I assume he means lessons which have a clear structure. These seem easier to follow for most pupils with an ABI. However in the lesson I observed George also asked the teacher for a private explanation

Teacher demonstrated 'roughing it up' on another pupil's work. George looks, copies and then carries on with his own, not looking

G: Sir can you show me how to do it?

T: Yes

*He then had one to one tuition almost identical to that given to the group.*

It may be that he wants the teacher to start him off, or do some of the work for him but he does not seem to be able to apply the technique to his own work.

### **5.2.2 Demonstration**

Some teachers support explanations or instructions with demonstration.

Owen was in an English lesson in the computer room

T: Hush everyone. Hands off keyboards and look this way. This is a tidy up lesson. On the board there is a checklist of what you have to do. Number 1 I would like you to finish the film review, put your name on the top when you print it, or it might get lost. Please don't use the print icon on the top, some of these are set up and will print out 20 copies at a time. We should look after the environment and avoid waste, so don't use the print icon, you might use it at home, here you're on a network. Please use file then print

*She demonstrated using an interactive whiteboard. Owen followed what she was doing with his mouse.*

Owen has to make the movements himself with the mouse as the teacher speaks. Other pupils too seem to find this helpful, even though Begali states 'simultaneous sensory bombardment is inappropriate for most THI youngsters' (1992 p143). Pupils seem to be able to follow even quite complex instructions when they are able to join in with them immediately. Other pupils were limited by the details of the demonstration.

Louise was learning about forces in science. The teacher wrote on the board 'thinking time' and 'stopping distance' and asked the class think and write down factors affecting the two. He gave two examples for thinking time.

*Louise wrote down lots of factors for the thinking time but did not do the stopping distance.*

SR: What about this one?

*Louise looked at me puzzled.*

She had not realised that she was supposed to complete the factors for both; she had followed the demonstration given by the teacher to the letter, a strategy she often adopted. How helpful the different pupils find demonstration is given in the matrix below.

Following demonstration	R	N	C	A	S	I	V	O	D	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	L3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	U3	4	4	U3	4	4	4
Explanation alone	✓	x		x ✓	x	x		x		x	x	x ✓	x		✓
Demonstration with explanation		✓		✓	✓	✓	✓	✓		✓	x ✓	✓	x	✓	✓
Demonstration without explanation	x ✓	✓		✓		x		✓					✓		✓

### Key

✓ can follow

x cannot follow

Matrix IV

Sometimes teachers demonstrate without verbalising; for Mike this seems to be preferable. It may be that the need to search for the meanings of words confuse and take up brain processing effort, but without verbalisation he can concentrate on the visual. Demonstrations without explanations seem to occur mostly in practical classes, e.g. art, PE, music, and as such require a physical response. Ruth however did not manage this for some musical tasks, nor when reported speech was demonstrated without explanation. Explanations in Maths and Science are accompanied by demonstrations but tend to involve remembering and sequencing moves, and pupils' inability to join in the task may be a function of memory or sequencing rather than whether demonstrations have a verbal commentary or not. Evan and Adam managed explanations without demonstrations where there was only one element to the explanation; more complicated explanations could not be followed. As with LZ (Luria 1973), it seems that the most successful way to 'teach' pupils with ABI what to do is to show them, in much the way an apprentice would learn (Rogoff 1990). Wood, Bruner and Ross (1976) found that, for 3 year olds, showing alone was the most successful strategy, while for 5 year olds, tell and show was more successful. It seems that the words get in the way of task memorisation with the younger, or less-developed, learner. However, this does not mean that the pupil has understood the theory behind the task. Ruth needed further verbal input, when given a more theoretical language task, and the success of others indicates that show and tell may be preferable for these activities.

### 5.3 Lesson style

Teachers dominate classroom talk (Alexander 2004) and more open dialogue was only seen occasionally when I observed classes. William did not take part in the history class discussion about a medical hall of fame, but was able to use some of the points made in the follow up task, making a case for one man to be in the hall of fame. He seems to have been able to follow this lesson, however he was also able to follow exposition and IRF as well. Louise was able to interject her ideas in a class discussing the prologue to Romeo and Juliet where everyone just offered their ideas freely without putting a hand up. The teacher kept control by prompting discussion with questions, and Louise's comment after the lesson was that she enjoyed lessons with this teacher, finding them 'easy to understand' but that she could not cope with Shakespeare. George was also able to take part and make valuable contributions in a class discussion where the teacher gave over control of the class to one of the pupils for about 10 minutes.

Nasser's English teacher asked the class to think around a problem, by trying to keep her questions as open as possible.

Nasser's English class had been reading the novel Skellig

T: OK we're going to stop a moment and think about the man in the garage. Who is he?

*Class suggest a wino, dosser, drunk, and other such words. The teacher turned these into more acceptable words and starts writing on the board as she accepts and comments on the responses. She wrote an objective on the board and then bullet points of the suggestions.*

T: I want you to write the date in your book and the objective then write down other ideas of who he could be

*The class shouted out various contributions*

T: Do you think angels hang out in garages?

N: *(shouting out)* No

Throughout this the teacher responded to the suggestions, writing each one on the board and putting forward ideas based on their suggestions. She made the links from the story explicit and exposed the hints given by the author. But Nasser was focused on copying what was on the board - when asked, he had difficulty reading it. His contribution was emphatic when it came, and may reflect the deep religious beliefs held by his family, rather than his response to a piece of literature. However, as he was asked 'Do you think...?' he was able to answer, when he has normally has difficulty responding to teachers' questions.

Peer group dialogue is also under-represented in my observations, relative to what is usually considered the norm in schools, with only seven examples (two each for Ruth and Evan). Simon and his group were required to design an advertising campaign for a new drink.

English lesson, developing an advertising campaign for a new drink. Working on advertising campaign in groups. Cover teacher introduced lesson by talking about teamwork and eliciting qualities of teamwork. Sat in groups of four, four activities per team. They looked at the sheet provided by the teacher

P1: What do you want to do?

S: [very quick response] I'll do a questionnaire

*Simon started to work on it. P2 and P1 discussed the shape of the bottle, the other two were silent. A few minutes later P1 tried to get Simon's opinion*

P1: Do you think that would be right for the design of the bottle?

*He pushed his book towards Simon. Simon ignored him and carried on with his questionnaire*

P1: Simon

*Simon looked quickly then said yes*

Simon produced six questions on his own without having any involvement in the group decision-making. At one point Simon looked over at P3's work, making no comment. Others did elicit opinions but Simon chose not to be included in this. P1 tried to include Simon, but his overtures were rejected. Simon gave the impression that he felt the work

should be done in silence and that the others were 'breaking the rules' by talking, despite the introduction to teamwork. Very few lessons employed teamwork and Simon was clearly not used to it. It may be that group work broke one of his personal rules, but it is more likely that he was unable to cope with it and so avoided it. His school had optional activities on Wednesday afternoons, such as team games, drama, dance or other co-operative activities, but Simon chose to go home, as he explained, 'to be with my mum.' Like Simon, Adam found it difficult to refer to his group and initially did everything, but later when others took part as well he was prepared for them to do all the work. However Evan became the focus of the attention in his group (it was the first tutor group he had attended after his absence), but he was unable to pick up on points made by others and interrupted their contributions. This is suggestive of difficulties with social interactions inhibiting the participation of the young person in this type of classroom learning technique, but with so few examples it is difficult to draw firm conclusions. However, later he showed he could work with others, as in this example.

Evan was in a French lesson

P1: How do you say I went?

SR: Je suis allée...

P1: Je suis allée au centre commerciale. J'ai achetée les pantalons noirs

E: C'était ennuyer

SR: ..parce que..

E: How do you say I don't like?

SR: Je n'aime pas

P1: le shopping

It could be interpreted that Evan interrupted because he was unable to allow his friend to have the limelight, on the other hand this could have been part of a genuine collaboration. The session continued in a similar fashion, with gradually less and less input from me as they created joint utterances. This then became a paired scaffolded session, as my props were gradually removed and the two pupils took over more and more of the responsibility for composing the French phrases. However the social pressures here were less as he was only working with one other. Teachers frequently asked pupils to 'talk about it with your partner', and while the rest of the class chatted to their neighbour, pupils with ABI tended to sit silently, as if the talk was too vague to know where to start. This was particularly so when the topic was new to them. Even when the task was more concrete partners did not always speak as when Ruth and her partner were working together in Maths

Ruth's Maths class was asked to pair up with a calculator between them.

T: I want you to find how you could get 0.5

*Ruth took over the calculator from her partner, placing her body between the calculator and her partner.*

Ruth became dominant in the relationship and the other girl was frozen out of the activity. There was a buzz of conversation in the room, as the rest of the class approached the task as a joint problem, making suggestions and taking it in turns to try out ideas. However when an activity only asked the pairs to practise a skill, rather than involving them in problem solving or developing their ideas, Adam was able to take the initiative and involve his partner.

The whole class copied the teacher counting to 20 in French for pronunciation

T: OK now I want you to try with your partner

*Adam and his partner did so. Adam kept his place with his finger. He then suggested they should close their books and try from memory, which they did. The teacher came along and said they did not have to do it without their books.*

The matrix below shows which pupils experienced the different forms of interaction in the classroom and their reactions to it.

Participation	R	N	A	C	S	I	V	O	D	J	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	L3	L3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	U3	U3	4	4	U3	4	4	4
Teacher led Q&A	✓	x	✓	✓	✓	x	✓	✓	✓	✓	✓	✓	✓	x	✓	✓
Open class discussion		✓									✓	✓				✓
Group discussion	x	x	x		x	x					✓x		x			x
Dyadic discussion	x (✓)	x	✓	x	x								✓			

Key

✓ coped well, after tuition in working together if in brackets

x did not cope

Matrix V

This table seems to indicate that the most difficult arena for the pupil with an ABI is collaborative paired or group work, although there is limited evidence for this. Researchers note that social skills are difficult post ABI (Ewing-Cobbs *et al.* 1998) and this may be the area in which these difficulties are most clearly seen in the classroom. It may be that the presence of the teacher in class discussion gives confidence that the point of view of the pupil with ABI will be heard, and in peer groups the pupils have to be more concerned with how to interject their ideas and how to listen to others. Louise at times could defer to others in her group, but at other points was unable to take part as the rest of the class did. However, she was several years post injury, unlike most of the others in this situation, and may have learned the necessary skills to be able to do this. If so, then this may be an area to discuss with pupils before returning to school, or for tutors to keep in mind once the young people have returned. Ruth's ability to take part in dyadic discussion improved after specific teaching to help. It may be appropriate to teach group/paired work skills specifically as part of the reintegration programme. Another interpretation may be that the loss of authority and structure when the class is broken down into smaller groups, affects the pupil with ABI because of their requirement for structure (Begali 1992, Blosser & Pearson 1997, Semrud-Clikeman 2001, Blosser & DePompei 2003), as group discussion is by its nature less structured than teacher led Question & Answer (Q&A) sessions. None of the groups I observed were 'led' by the teacher, although this is often the practice in primary classes where a pupil has an ABI, and it could be a strategy in secondary schools too. It may have been better had roles in the groups been allocated, and this may be an area where further research would be helpful. Dyadic work seems to be determined by the resultant character of the young person with ABI. Ruth is bubbly and rather dysinhibited and

takes total control of the task, while Simon, who is withdrawn, contributes nothing and, when his partner runs out of ideas, the pair sit in silence. After ABI, the pupils who are confident can handle less structured situations, while the insecure ones find it almost impossible. This insecurity may have a number of roots, one of which could be their acceptance of their new situation.

## 5.4 Questions

Teachers ask questions to find out what the pupil understands, their opinion or information. Most of the enquiries are task orientated, which is not surprising as most conversations in the classroom focus on learning tasks, but have different functions.

### 5.4.1 Recitation

In many secondary classrooms the emphasis is on passing examinations, and recitation is used to inculcate the necessary facts and responses, through posing questions, orally or via text, to which the teacher assumes at least some pupils will know the answer. Pupils with ABI, however, often do not follow this

Louise was at the start of a biology lesson dealing with food chains

T: What does the arrow show?

P1: Answers

T: Where the energy flows, where the energy flows, from the lettuce to the slug to the hedgehog.

T: Next one

L (shouts out): carnivores

*No comment is made on her answer. The class continues with general shouting out. Louise leans on the bench and closes her eyes.*

Louise has clearly not followed the argument, but adds her own word. It would seem that the difference between an invitation to bid for the floor and an invitation to reply (Mehan 1979) may be difficult to distinguish post-ABI. She cannot cope with the freedom of shouting out, as she is usually able to respond in question and answer recitation sessions, especially where the material is being revised, as in the following.

Louise was in a science lesson

T: Last lesson we had a look at the sheets; we looked at this. Girls, you must behave in the lessons...(comment on the behaviour continues).....Reactions happen when particles collide. The force with which they collide determines the rate of the reaction. Can you copy this please? Girls (another comment on the behaviour of the girls)

*He wrote on the board and Louise copied it. Then he wrote 'We can increase the number of successful collisions by'*

T: And we can do this in many ways, by the following things. How can we make more successful collisions?

L: Decrease the water

T: What happens if we decrease the water?

P1: Gets weaker

L: Stronger

*Teacher wrote concentration on the board. Louise put her hand up*

T: Yes

L: Raise the temperature



T: Yes, we'll come to that later  
T: Concentration - more particles in a given area (written on board and copied) Louise you gave us one  
L: Heat up the solution so that you give the particles more energy so they are more likely to collide  
T: What else could you do?  
L: Vary the amount of energy  
T: Energy - that's heat  
L: Power  
T: No  
*Teacher writes 'surface area or size of particles' on the board. It is copied.*  
T: The smaller the particles the more surfaces are available for reactions. A catalyst speeds up a reaction, how many textbooks, I am going to get more textbooks.

Louise knows the form and, when the teacher wants to elaborate on the ideas she does not give him time. The teacher fished for the answers he wanted, trying to get them to remember the ideas provided in the previous lesson. He does not cue the elicitation, giving heavy hints to the information required, as Nasser's science teacher did.

Science lesson on classification. Nasser is sitting at the front of the class. He has an TA with him. His book is open on his desk.

T: Tell me one thing all living things have in common..... You came up with the answers yesterday

N: Move

*Teacher approval. Other members of the class came up with the others very quickly, Nasser mouthed the words with the others.*

T: There's one more....

N: Evaporate

T: You are looking for a word beginning with E

N: Excretion

T: Good

*Lots of repetitive vocabulary work followed, going over the terms met yesterday and which were written in his book, placed in front of him.*

T: Can anyone remember the 5 groups of vertebrates?

*Nasser was the first up with his hand*

N: Mammals

TA (mouthed at me): This is good

What is noticeable about this extract is that the teacher initiated the sequence with a command 'tell me...', and continued in the same vein. Only later on did she use a question and by this time Nasser was well into the pattern and had gained teacher approval. The TA noted to me how unusual this response was for Nasser. It is interesting to note Nasser mistakes 'excretion' and 'evaporation', both of which start with the same letter. This was probably a word substitution (see Chapter 7).

The sequence in which Louise was involved started with a statement, about reactions, rather than a question. It could be that this gave Louise time to focus in on the area of learning before she was asked to respond to a question. Certainly, in other lessons

where she responded to this form of interaction, they all started with a statement or something to copy from the board. This enabled her to switch her attention into the topic to be studied. This matrix shows the prevalence of this behaviour.

Switching in	R	N	A	C	S	I	V	O	D	L	G	E	M	W
Keystage at injury	Pre	1	2	2	2	2	2	2	L3	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	U3	4	4	U3	4	4
Response to initial question	x	x	x	x	x	x	x	x	x	x	x	x	x	✓x
Responds to 2 <sup>nd</sup> question/after command or statement	✓	✓	✓x	✓	x	x (✓)	✓	✓	✓	✓	✓	✓	x	✓

**Key**

✓ responds, later in recovery if in brackets  
 x does not respond

Matrix VI

It appears that many of these pupils need to have time to adjust to the IRF format and respond only to the second or subsequent utterances. In the early days of William's return to school he did not respond. I asked why he had not, even when he knew the answers. He responded 'but she knows that already!' I spoke with him about teachers asking questions even when they know the answers, and their aim to help pupils put ideas together, and on my next visit to school I found that he was able to take part. Nasser, in particular, seems to experience difficulties with this mode of teaching and rarely joins in. The example given above is an exception, as confirmed by the TA's comment. This may be because he does not follow the exchanges or because he does not understand that teachers pose such questions to extend the understanding of the pupils. Equally it could be because he has learned that he does not need to, but neither does he respond when questions are posed directly to him.

**5.4.2 Teaching questions**

Here the TA poses questions which allow Nasser to reveal what he knows already and engages him in an internally persuasive dialogue which will help Nasser to extend his concepts.

Food Technology, Nasser is involved in a task designed to help him find his way around the kitchen. The class have been given a 'list' of pictures of kitchen utensils to find, name, and write down where they are kept.

TA: Do you know what its called?.... colander c-o-l-a-n-d-e-r it's a colander.....OK what else did you see that's on our list?

*Nasser picks up a grater*

TA: Do you know what that's called?.....a grater...what's it used for?

*Nasser mimes eating a carrot*

TA: Yes, you can grate carrot

A teaching question 'what's it used for?' is posed, to which the TA knows the answer, but unusually Nasser accepts this question and responds. The TA accepts a mimed answer (carrot) and provides the new vocabulary at the same time. This exchange is helpful to the ABI pupil. Likewise in lessons where the style is requesting the pupils to act, e.g. French where the instruction is to 'count to 20' or 'tell me where you live',

even if phrased as a question, and the activity is clearly seen as practising a skill, Nasser joins in with no problem. However other exchanges with a different TA, produce a different reaction in Nasser.

Food Technology, Nasser is making a pasta salad

TA: Have you had pasta before? At home?

*Nasser sulks*

TA: It doesn't matter, I just wanted to tell you it puffs up so you don't want too much

N: I know

Nasser has recently arrived from Somalia, so this is a genuine question on the part of the TA but it is almost as if Nasser is offended that the TA thinks he may not have eaten pasta. I later found out that they eat pasta as frequently as rice within British Somali culture; he may feel patronised. This misunderstanding may have arisen because Nasser is unable to put himself in the shoes of the TA and appreciate that she does not understand British-Somali homes. He sees the world rigidly from his own point of view, but likewise the TA does not know about the culture of her pupil. Nasser reacts to this question with irritation, as he does to the hint questions which this TA also frequently uses. It appears that some ABI pupils are able to differentiate between genuine, or authentic, questions (Skidmore 2000), to which there are several answers depending on the view of the pupil, recitation where a teacher is looking for a particular answer, or hints where the teacher uses a question to control class behaviour, whether learning behaviour or social. Nasser seemed to be particularly sensitive to the different kinds of questions. This shows a sophisticated understanding of the ground rules of schooling, but not an acceptance of them, as he is prepared to answer authentic questions, but shows irritation when faced with hint questions. Teachers' hint questions became a barrier to his learning. Nasser would be assisted by a different form of words, but also may be assisted by an explanation of what teachers are trying to do when they cue responses in this way. Other pupils seem to be able to accept this, but after ABI it seems to be difficult for some pupils to appreciate what others are attempting to do. Under pressure, pupils with ABI tend to condense their utterances (see chapter 7). It could be that Nasser feels his teacher is also under pressure, or becoming cross with him, which he cannot understand, which provokes a similar emotional expression in him. In this case, teachers could be advised to use longer utterances, which would benefit the pupil by avoiding the connection between condensed language and pressure. This would also provide more information, and therefore fewer opportunities for inferences to be misapplied. Louise accepted both authentic and teaching questions, which seemed to be beneficial to her learning.

It is notable that most of the examples of authentic questions involve Owen or my questioning. Other teachers and TAs are much more likely to prompt the pupil into action rather than ask the pupil's opinion.

Owen was working on the computer in the resource base, on his RE task set in the previous lesson

TA: Have you checked it?

O: Yes

TA: Let's go through it then.

*She read the questions and answers aloud. His numbering of questions was not consistent. She asked him to reorganise his work. He continued numbering past the point where it was necessary.*

TA: Can I take this off here?

*Owen nodded*

TA: Let's look at the end

*She read his answer aloud*

TA: This is still part of number 10

*She drew it all in to one paragraph.*

Owen, like other young people with ABI, works much more slowly than his peers; he has a reduced timetable and spends time in the resource base completing work set in the lesson. His TA had given him time to work on his own and then asked her question. He had previously been taught the importance of checking work, and now instead of prompting him, her question assumes he is a responsible young man, and she asks genuinely if he has done so. The relationship between the two was such that if he had not I am sure he would have said so! She honours him as a thinking person who makes choices and not someone who needs to be trained into a certain pattern of action. Later in the same session, it can be seen how his TA and support teacher have the same attitude and it supports honesty from Owen.

TA: What question are you doing?

O: Eleven

*The TA looks for answer in the sheet and has great difficulty. Owen mutters further about his chair being uncomfortable. His support teacher comes over. The TA went to look for further reading matter for the task.*

T: Can't you find it?

O: I haven't found it because I haven't been looking

T: I've been watching. You need to focus to get it done. If I gave you a highlighter would that help?

*She does not wait for an answer. Owen gets on and answers the question without a highlighter. Teacher returns with a highlighter*

T: Have you finished?

O: Yes

T: What next?

O: Number 12

*TA returns*

TA: How are you getting on?

O: I don't know

The teacher's intervention was as a result of Owen's on-going complaints about his chair and she distracts him by asking a genuine question about the task. Although his response may look cheeky, his facial expression showed that this was an honest answer when he admitted he has not been looking. This honesty is common among young people with ABI. The highlighter, which she suggests, is a strategy which he sometimes finds helpful, but in this case he did not need it. When she approaches him again, she continues with her authentic questions. Owen is one of the few young people who have an awareness of the difficulties he has as a consequence of his injury and of strategies which he can use. It may be that this authentic form of conversation has allowed him to develop a genuine relationship with his teachers and therefore form an

honest assessment of his abilities. At the end of this extract Owen responds with 'I don't know'. This is a common response after ABI (see Chapter 7). The TA's question could be interpreted as genuine or possibly rhetorical. Owen interprets it as the former, as do most pupils after an ABI.

### 5.4.3 Rhetorical questions

Louise misunderstands the rhetorical nature of some questions and responds, either physically or verbally, when a response is not required.

Maths lesson after a demonstration

T: All happy about fractions to decimals to percentages?

L: Yes I understand it now.

*No one else answers*

P4: She's shouting out again

She was the only one to respond and other members of the class recognised that this was a normal action for her; in a French class she annoyed her peers sufficiently for a pupil to complain to the teacher that Louise was shouting out when she answered a rhetorical question. Vicky too answered rhetorical questions; it is very noticeable when they are disciplinary questions about the class being quiet, as in this case

Vicky was in an English lesson, with a rather excitable class

T: Year 7, do we have to come back after school to do this poem?

V: No

On the other hand Evan did not answer what was a genuine question on the part of the teacher, presumably interpreting it as rhetorical, and Simon was unable to follow a rhetorical question which the teacher herself answered, but Louise did manage this.

Science practical lesson

T: Gas is on.... Should you wear safety glasses? Yes

*Louise went to get safety glasses.*

In this case the teacher's 'question equivalent to a statement' (OED), i.e. one which requires no answer, was aimed to produce an action. The teacher posed and answered his own question, cuing a physical response, perhaps as the familiar action required was able to be complied with immediately. As may be seen from the following matrix most pupils are not able to respond appropriately to rhetorical questions.

Response to rhetorical questions	R	N	C	A	S	I	V	O	D	B	L	G	E	M	W
Keystage at injury	Pre	1	2	2	2	2	2	2	U3	2	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	L3	4	4	4	U3	4	4
Requiring understanding		X		X					X		X		✓		
Requiring action		X			X						✓		X		X
Disciplining	X	X					X	X			✓				

Key

X - inappropriate response

✓ - appropriate response

Matrix VII

After ABI, pupils seem to find rhetorical questions confusing. They do not respond to questions requiring action, but respond verbally, or with a nod, to rhetorical questions about understanding or disciplinary asides, treating them as authentic questions. But here form does not match function. These questions act as directions to be obeyed rather than to be answered.

## **5.5 Understanding classroom language**

In this chapter I have explored how pupils with ABI can misunderstand, or fail to follow, classroom discourse structures.

Most lessons observed adopted a monologic style, where the teacher provided information or instructions within an expositional format. It seems that pupils after ABI find monologues very difficult, possibly because of the speed at which they are required to process this information. Teachers make assumptions about what is known by the class, but difficulties with word-finding which occur as a consequence of ABI, lead to situations where unintentional prolepsis occurs, and the pupils are left searching for the meaning of the language. This impedes the capacity to think about the ideas being expounded, or perhaps to notice the relationships between the objects indicated by the grammar (Luria 1973). To overcome this, some pupils are trying to keep a glossary of terms for each topic and subject, and have it in front of them while the teacher is talking. Definitions and icons are recorded for each term as an aide memoire. However, this takes effort and is not always remembered in a busy class.

Sometimes explanations or instructions are interrupted by other class business. It may be anticipated that this could either assist the pupils with ABI as it would give them time to process the language, or it would confuse and hinder the pupil whose train of thought would be broken. While pupils will forgive teachers whom they usually find easier to understand, they complain bitterly about some teachers and how they interrupt their explanations. For some pupils with ABI this is given as the reason why they find the subject difficult, but all the pupils observed needed additional assistance where the introduction to the lesson had been interrupted. The need to focus on what they are learning seems to be very important for a pupil with ABI.

Demonstrations may profitably support explanations, but pupil participation is more advantageous. Unfortunately, discussion is rarely seen as a task in itself (Young 1992), and hence was not observed in the classroom. For these pupils, discussion, or internally persuasive dialogue (Skidmore *et al.* 2003), where the pupil is encouraged to talk themselves through a problem, could be a strategy to assist both with developing their command of language as a communication tool, but also to support thinking and learning. Where pupils were allowed to contribute, this was within IRF sequences forming pedagogical dialogue (Skidmore *et al.* 2003). Teachers maintained control of the form of the language, providing instruction to pupils who were ignorant of it, albeit through Q&A. The older pupils and those longer post-ABI seem to accept that the teacher will pose questions to which he/she knows the answer as part of the 'game of school', but others have difficulties when presented with such 'teaching questions'. However all the pupils observed were able to respond thoughtfully to genuine questions phrased as 'what do you think...?' or similar. Teachers also use rhetorical questions to provoke the pupils to think about the topic being studied, but pupils with an ABI do not seem able to distinguish rhetorical questions and either provide answers if they are

vocal, or don't if they are withdrawn in character. Pupils in the former category are then seen as 'unusual' by their peer group and become open to teasing or other comment.

Q&A sessions slow the pace, as the teacher has to wait for the response, and then an evaluation before moving onto the next idea in their exposition of the teaching idea. Response at speed is held to be difficult for pupils post-ABI (Bawden *et al.* 1985, Ponsford 1995) and it is notable that more of the pupils, though not all, can respond in question and answer lessons and thence complete the follow up task. It could also be that the pupils, in question and answer, are able to both rehearse their thoughts (see Chapter 7) and dialogue at least in a small way with others. The type of questions posed make a difference; authentic questions being preferable to teaching questions. However, when teachers allow genuine or authentic dialogue to take place in a classroom, pupils with ABI are able to take part in a meaningful way and to complete the follow up task with fewer difficulties than if it were set after exposition, instructions or some IRF sessions. But peer groups and dyadic pairs seem more difficult to manage for pupils with ABI. This is more likely to be because of social difficulties rather than linguistic ones, as the difficulties seem to revolve around turn- and initiative-taking.

The difference between spoken and written language is related to complexity. It may be supposed that it would be easier to deal with written language as it endures; the memory is not taxed and the pupil is able to take their time in considering the task, re-reading as many times as necessary. However, written language presents difficulties not encountered in the spoken form; it lacks immediate situational context clues, and often utilises a much more complex grammar, including the passive voice, which involves the reorganisation of ideas. Pupils tend not to complete written tasks, although with teaching this may be overcome. Pupils may be taught to pose questions as they read, breaking down the passage into shorter phrases. While written language has the advantage of enduring, it tends to be comprised of more complex structures. The less complex spoken language proves to be as difficult, if not more so, possibly because the speaker includes too much information in one utterance, articulates it at speed and adds in asides. Within both spoken and written language, words and phrases are used which may be interpreted in a number of ways. The next chapter examines the ambiguity which each pupil faces in the mainstream secondary classroom.

## Chapter 6 - Making meaning despite ambiguity

Ambiguous language abounds in secondary classrooms both unintentionally and deliberately; teachers assume that pupils have the maturity to understand beyond the literal. In this chapter I look at how pupils with ABI understand ambiguity, before examining how breakdowns in communication are repaired.

### 6.1 Hints & Prompts

After the general introduction/explanation has taken place, teachers try to hand over the responsibility for the task to their pupils. Without handover, understanding remains on a procedural level. So instead of telling, teachers hint in a manner similar to cued elicitation in questioning sequences (Edwards & Mercer 1987). Cues aimed at pushing the pupil into a new area of learning, or into using their capabilities to the full are often expressed in an imprecise way in order to seem less dictatorial, hoping that the young people are more likely to acquiesce. It is assumed that young people will infer meaning from very brief, ambiguous, and sometimes obscure, utterances. If pupils do not know that teachers intentionally hint towards expected behaviour, such utterances are likely to be misinterpreted.

When William was completing his science coursework, the teacher told me I could hint to him while supervising the work. I was also acting as his scribe, as usually the work would have been done in pairs. She was in the same room marking coursework which had already been completed.

The investigation was about the resistance of different thicknesses of wire. He had done one trial of each of the three sizes

SR: Now what?..... Are you happy with the results?

*William looked at the table where I had been writing them down*

W: They seem about right

SR: Yes. Is that enough?..... Could you check them?

W: I could do them all again

SR: How many times should you do them?

W: Two, then I can take an average

SR: Then do you know they are both right..... what if one is very different?

W: *Long pause...* I suppose I should do three

SR: Then if one is different.....

W: I know which one!

William ignores my cue to do more ('what now?') and then the stronger 'is it enough?' which I had expected would push him into doing more. He picks up on 'could you check them?' He then makes a valid link with average but has forgotten, or not understood, the reasoning which says you need three, but he is able to finish my sentence (see later).

*He finished his three trials of each and stopped*

SR: OK? You happy with that? What next?

*William shrugged*



SR: Have you got enough evidence?

W: Yes

William perseverated on needing three, so as well as three trials he has only three thicknesses. Later the teacher told me she would have directly told William that he needed to do three trials of each and to find 5 gauges. William here did not seem to understand that the Gricean maxim of quantity has been suspended and that teachers make hints for your own good in terms of learning at school.

Teachers use a variety of wordings in their cues; some seem to be more easily understood than others. In this lengthy extract, where Adam was involved in a maths investigation, a number of different constructions may be seen. His TA was looking after another pupil in addition to Adam. (The beginning of this extract appeared in Chapter 5 to illustrate how Adam understands instructions)

The objective was to find the shape with the largest perimeter for a given area of 12 square centimetres

*Adam and the TA draw it between them, he says down, across etc and she moves the ruler to match*

TA What's the perimeter?

*He counts*

This is a very explicit question and he reacts appropriately; the utterance has prompted him to explore the next part of the problem.

*Adam starts to draw a rectangle around 12 squares. The TA holds the ruler and he draws.*

TA Do you want to draw the lines in? (i.e. dividing up the 12 squares)

*He draws them*

A: What's perimeter?

TA: Around the edge, the outside. You know what that is.

*He starts counting*

Adam responds as expected to the question 'do you want to', but later he asks the TA the question she earlier asked him – what's the perimeter? It could be that he has forgotten or that he is copying her example, thereby expecting her to find the perimeter. A TA would not expect to do the 'work' for a pupil and she gives him a definition of the perimeter, adding 'you know that...'. He then works it out, but needs a further prompt to include all the measurements

A: 12, 24

TA: Don't forget the ones on the end

A: 26

'Don't forget' elicits an appropriate response. There follows a short exploration of different shapes by Adam, while the TA deals with her other pupil. Adam stops working so the TA prompts him.

TA: The only way you get more is to put a hole in the middle and then you'll have the inside too

*Adam does nothing*

Here she has given him one solution to the problem and the reason why it works, but Adam ignores it. He does not seem to understand what she has said, but it is a phrase with five parts. The TA makes her instruction a little more explicit, reducing her instruction to four parts

TA: You need a box with a hole in the middle

*Adam picks up a pencil and draws an H-shape again*

A: Same

TA: It's the same as that one

*Adam rubs it out and then draws a N-shape and extends the legs until he counts 12. He starts to count the perimeter*

A: I don't know what I am doing

*The TA does nothing. Adam counts again*

TA: You need to get a hole in the middle

*The TA points and alters the drawing and they count*

A: No bigger

TA: No bigger. What if we.....

At this point he gets up and asks the teacher if he can go to the toilet. He does not notice that the TA is in the middle of a sentence. During this extract she has tried twice to hint that he needs to change his shape to 'get a hole in the middle', yet he seems unable to follow this at all. Adam has realised that he is stuck and declares 'I don't know what I am doing'. This gives a wonderful opportunity, which unfortunately was missed, to ask him to say what he does understand about the task and to dialogue with himself about this investigation. It is possible that he is uncomfortable with the idea of mathematical exploration and is expecting to find an 'answer', rather than to find out what he can. In my notes, I have written that in the middle of this he looks very tired – it is just before lunch and he is diabetic. It could be that he is too tired to understand the hint. However in hinting she uses the phrase 'the only way' and in making it explicit she uses the phrase 'you need to'. These multiple part utterances do not seem to be understood by other ABI pupils either. When Adam gets back from the toilet the TA tries again

TA: How about an O a square O

*The TA draws it a vague shape with a hole in the middle*

A: What's that?

TA: I'm seeing how many squares

*Adam is very distracted*

TA: Boys turn around

*She is ignored*

TA: Adam

*He ignores her*

TA counts to 12. See what the perimeter is

*Adam counts then he fiddles again*

TA: Try the square with the hole

A: I don't want to

She does try to hint by drawing something, but it is not close enough to what is needed and Adam does not follow it. He asks for help in understanding but it is not forthcoming. The other pupil the TA was supporting took her hints and developed his thinking with her help. Eventually she pushes Adam into exploring a way she knows will give a larger perimeter, using an explicit instruction 'try the....' and finally he says he does not want to! The hint now has 3 parts which is a lot to process with an impaired working memory (Walker & Wicks 2005), or possibly by this time he has become frustrated by the number of times he has not fully comprehended the prompts and gives up on the activity. Nasser reacts similarly in his food technology lesson, walking away and tutting after a series of unsuccessful prompts (see later). Both boys have had to work hard to make meaning in the classroom and meet expectations.

Use of the passive voice also seems to be difficult. It is a more complex syntactical structure. Louise became stuck while doing some bookwork in a science class.

A foodweb was written in words. The task was 'Give the longest chain and give the shortest chain.' She tried hard but could not, just saying very staccato the names of some of the animals, including 'the minnows eat the perch' (a reversal). I suggested she should draw it to make it clearer. She did this easily, which gave her the longest chain. She could not find the shortest chain.

L: (hand up) sir

*Teacher came over*

L: What's the shortest chain?

T: Well, the minnows eat the algae, not all were eaten

L: If 50% were eating algae what would the rest eat?

T: Plankton and its other food sources

The teacher employs a hint with words missing- not all the minnows were eaten, so therefore some are left alive - this then is the answer, the shortest chain, algae-minnows. She takes it as not all the minnows eat the algae. The difficulty here could be the understanding of the passive voice, 'were eaten', or that she does not infer the missing words 'not all (of the minnows) were eaten.' It could also be that the word all acts as a pronoun and she could have chosen the unintended agreement (algae) and then not been flexible enough to also consider the alternative meaning. It is notable that the strategy which worked used an iconic representation of the ideas. This is discussed further in the next chapter.

Other phrases used by teachers include 'have you finished'? This phrase can mean different things depending on the tone of voice. In this example Nasser did not pick up the meaning in my tone of voice, and answers as if it were a genuine question, rather than a hint that he had not finished.

Nasser was writing a poem. He read it again and stopped

SR: Have you finished?

N: Yes

SR: What do you have to do now?

*Nasser looked blankly*

I tried a second time with another question, which again did not provoke the desired response. It could have been that he did not know what to do at this point, or it may have been that he was focussed on the detail of the task rather than the big picture and so did not know how to move from one to the other, or it could have been that again I used a vague question which was not sufficient to prompt the next action. 'Have you got', which is a more direct question, however does seem to be understood.

Nasser was leaving early from a science lesson

T: Nasser, have you got all your things?

*He picked up his planner and disappeared*

Perhaps because it asks the pupil to check a physical attribute, something which is tangible, rather than 'finishing' which is an abstract concept, and was used ironically. Similarly I used the phrase 'is it enough?' to William to hint that he should conduct further trials in the science experiment discussed earlier. He did not pick it up, perhaps because of the abstract nature of the hint and I used a conditional phrase, which he did understand in part. It was only when I asked a direct 'how many' question that my intention was fully understood.

Matrix VIII gathers together the phrases used by teachers and the responses by pupils with an ABI.

Hint phrases	R	N	C	A	S	I	V	O	D	L	G	E	M	H	W
Keystage at injury	Pre	1	L2	2	2	2	2	2	L3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	U3	4	4	U3	4	4	4
<b>Commands</b>															
Try the.../make sure			✓	x		✓					✓	✓			✓
Lets..		✓		✓			✓	✓		✓		✓	x		
Direct commands	✓		✓	✓	✓	x	✓	✓	✓	✓	✓		✓	✓	
Don't/don't forget	x	✓		✓				✓							
<b>Questions</b>															
Have you ? Are you...?		✓	✓	✓	x	✓				✓x		✓	x		x
What /where?	✓	✓		✓	✓	x	x					✓	x		x
Is it..?		✓			x										x
Do you think?				✓											
<b>Statements</b>															
The only way you'll...				x	x										
First person, (e.g. I want you to...)	x	✓	x	x	✓		x	✓	x	✓x					✓
You need to ....		x	x	x	✓			✓	✓	✓	✓	x		x	✓

Key

- x literal, inappropriate or no response
- ✓ appropriate response
- ✓ x both are observed

Matrix VIII

It seems as if no clear conclusions about vocabulary use may be drawn from the limited number of observations in this study. The response depends on much more than the

words used; context, mood and relationship seem also to have an effect on the ability to comprehend and respond to teacher cues, for as Skidmore (2006 p513) says 'there is no cognition without affect'. However, it may be noted that certain phrases seem more likely to cause difficulties. Negative comments are frequently ignored, although 'don't forget' is sometimes successful. Another is 'need', either as 'you need to' or as 'I need you to'. These much used phrases are expressed as statements which themselves seem to be more difficult. Cues for action may be expressed in commands (pick up the red one), questions (which is next?) or statements (you need a red one). It would seem that these three increase in difficulty, possibly because a command implicitly requires action, while questions seem to be more successful than statements, possibly because a question makes it more obvious that a response is required. A directive statement has to be understood as a command. It is two steps away and as such appears to be more difficult. Where commands are not understood they are frequently, though not always, couched in phrases with more than one part

Vicky was looking at a poem

T: Let's make a prediction, what it is about, from what we can see.

*Vicky ignored it*

Here the command, 'let's make' is qualified by 'what it is about' and 'from what we can see'. Some of the vocabulary in Matrix VIII may be difficult, not because of the words used, but because its use necessitates a longer utterance. After ABI working memory is generally shortened (e.g. Walker & Wicks 2005) and it may be that these pupils cannot make sense of multiple part instructions. Instead they cause confusion, as may be seen from Matrix IX.

Cue length	R	N	C	A	S	I	V	O	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	U3	4	4	4
One part cues	✓	✓	✓	✓	✓	✓X	✓	✓	✓	✓X		✓	✓	✓
Two part cues		✓	X	X	✓	✓X	✓	✓	✓	✓	✓	X	X	✓
Three or more part cues	X	X		X	X	X	X		X	X	✓X			✓X

Key

X literal, inappropriate or no response

✓ appropriate response

Matrix IX

Single part cues are mostly successful but once cues have 3 or more parts, these become problematic. This may reflect clinically observed difficulties with attention and speed of processing (Mateer *et al.* 1996). George ignored a one-part directive, but this could have been because he was in focussed attention (Rees 2007b). It is notable that William and Evan were able to understand multiple part questions later in recovery, but not early on. It may be thought that the extra information in multiple part directives would make the utterance less ambiguous, but it appears that there is a nice balance between clarity and memory to be achieved.

### 6.1.1 Projection

Sentence completion helps to overcome the ambiguity. Teachers project the construction of knowledge forward by assisting pupils to express themselves. As illustrated earlier, I started and William finished the sentence 'Then if one is

different..... I know which one!’ Regardless of how recently the pupils had received their injuries they seem to be able to understand and respond appropriately under all conditions. It is also notable the enthusiasm with which the pupils join in these exchanges. It may be because they are more flexible.

Adam was in a science class where a circus of activities had been set up.

SR: You’ve just done

A: Station 6

SR: so..... is station

A: 7

Adam did not complete the phrase on the first attempt, I added the word ‘so’, which again was not quite enough. My next utterance omits words, but the keyword ‘station’ is sufficient to prompt him on. I was able to continue with hints until the utterance was understood, without seeming to insult the pupil. In this form of words teacher and pupil are jointly constructing the meaning and Adam was enthusiastic with his response. However, in class communication, pupils with ABI frequently do not join in class responses

Adam in science, the teacher then went around each station, explaining what was there, she expected them to remember, they were not in order, or in the same place as yesterday.

T: The pestle and mortar are not.....

*Lots of hands up, but not Adam*

P1: for pounding

*Later Adam was using the pestle and mortar. He slopped some acetone in and started pounding in the exactly the way the teacher said not to!*

Adam’s hand was almost the only one not to go up in response to the teacher’s cued elicitation here. However it is phrased as a negative, which could make it harder to understand. The use of projection required recall of her instructions the previous day. This is typical of teacher use of projection when communicating with the whole class, and seems harder than responding to projection within current activities.

### 6.1.2 Form & function

Words such as ‘should’, ‘would’ or ‘could’ are polite imperatives in function but not in form. Syntactical form is replaced by practical function (Young 1992), which seems to be particularly problematic for most pupils with ABI.

In the previous lesson Adam had been passed a note to see the physiotherapist at 10.40. He did not have a watch. At the beginning of the lesson when the class were lining up he asked the time.

A: What’s the time?

SR: Perhaps you should tell the teacher you have to leave at 10.40 and why. That would be polite

*He shrugged and did not.*

I meant “Tell the teacher....”, but it was a statement and in more than 2 parts. He was clearly aware of the need to check on the time and remembered, perhaps over-

compensating for his memory difficulties. The teacher later commented that she felt I should have told him to speak to her. However I wanted him to be responsible. Adam has recently been put on report because of unacceptable behaviour. He has not picked up what is acceptable behaviour in school. I have offered to take sessions on ABI awareness, to see if focussed teaching will help.

'If ...then', 'might', 'ought' and 'supposed' also include the idea of conditionality:

William's class was in a science lesson. There was a diagram of a leaf on the board and each pupil also had their own.

T: Look at the diagram ..... You might want to add this to remind you.....

*She wrote on the board as she spoke. William did not add anything to his diagram*

Here is another example of a heavy hint, in multiple parts, which William ignores, but this hint is expressed in a tentative manner; not that the pupils 'had to' or even 'should' add this, but 'might' want to. It also uses the word 'add', in an unfamiliar way. Even the action of writing on her diagram did not induce him to copy it out, but the rest of the class did. Louise had difficulties each time the word 'supposed' was introduced. The phrase 'Are you supposed.....?' is met with a literal response rather than treated as a hint, as are negative phrases such as 'why don't you...?'. Both of these are complex utterances demanding an ability to deal with two ideas at once; the action itself and the cognitive action of the listener. Pupils either ignore such phrases or treat them literally, producing a response which verges on being cheeky. Likewise Simon ignored my hint 'it looks like shredded straw', aimed at getting him to look for some straw, until I specifically told him to look for straw. But again this is statement and he responded to the command. The ability to make meaning from conditional phrases is shown in the matrix below:

Use of Conditional	R	N	A	S	I	V	O	D	L	G	E	M	W
Keystage at injury	Pre	1	2	2	2	2	2	L3	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	L3	U3	L3	4	4	U3	4	4
Could	✓	x	x				✓		✓	✓	✓		✓
Would	✓	x	x	x		✓			✓	✓			
Should			x	x								x	x
Ought			✓								✓		
Might			x				x	x	✓	x	✓		x
Supposed		x							x				
If...then		✓	x				✓						x

Key

x literal, inappropriate or no response

✓ appropriate response

Matrix X

From this matrix it seems that 'could' and 'would' are more readily understood, and more frequently used, than 'should'. Adam, Simon and Nasser seem particularly poor at understanding such utterances and only when they are supported by gesture are they able to make an appropriate response. Ian, Vicky and Mike's teachers rarely use this language with them, which could reflect their (possibly subconscious) appreciation of language difficulties. It does seem that the more mature pupils deal with conditional

language more appropriately; Ruth is a long time post injury and has had linguistic support at home which may explain her inclusion in this group.

The comment from a teacher 'Your homework is on the board' sends most of the class diving for their planners, but not Louise, except in one case where the direction 'Now homework' was accompanied by the teacher actually writing it on the board. This is an example of functionally equivalent language where a statement is acting as an instruction. Action seems to support her understanding of what she is expected to do. However in classes where the teacher says 'Your homework is on the board. Put it in your planners,' she is one of the first to start writing it in. It is a discursive norm which is less than explicit, and pupils with ABI do not always understand it.

At times pupils with ABI take the teacher's functional equivalence literally, including Adam

Adam was unable to complete the written exercise so the teacher had given him a book to read

T: Put pens down (said both in French and English several times)

*Adam looked around the class and eventually puts the book down.*

He had no pen in his hand and he acted as if the command does not refer to him, as confirmed by his facial expression. Eventually he complied, but only after he had seen the rest of the class paying attention to her. His understanding was based on the actions of others, using situational cues.

Teachers have a set of words which act as keywords in the classroom, which form an oral shorthand. They represent a much longer direction, and unspoken words need to be inferred. One of these is the word 'right'. 'Right' brings the attention of the class and indicates that the teacher is serious about what he is going to say. All light-hearted discussion and preambles are now over, now the business of the lesson is to begin. Nasser does not appear to understand the functionally equivalent meaning of 'right':

In a Food Technology class

T: Right, now we need a dressing

*TA and N were spelling out a word, he did not look*

TA: Come on. Face the front.

N: Why?

TA: You need to listen

*Nasser yawns*

Here the word 'right' acts to draw the attention of the pupils, while the word 'now' emphasises that she wants attention now; both words act as a short hand instruction, from which the pupils have to infer what they are expected to do. Nasser does not pick this up, and questions the TA's explicit direction 'face the front' showing his complete ignorance of the original teacher direction. Nasser understands the phrase 'right now' on a literal level,

Nasser's IT teacher wanted to show the pupils how to construct a web page, using her interactive whiteboard. The class had been instructed to turn off their screens and look at the board, which they all did.



T: Right, now you need to click on this button here  
*She demonstrated what she needed them to do on her whiteboard.*  
*Nasser turned around, turned on the screen again and clicked the button*

Here the teacher intended that this would be done later, but she did not express herself in the future tense and included the word 'now'. Nasser did as he was told, but not as she meant. He had missed the vocal intonation of 'right, now', understanding the phrase as 'right now' and that he was to follow her instructions immediately.

'Remember' is another word which teachers use as a shorthand to draw attention to something which has previously been taught

Adam and two other boys were composing a short piece  
 TA: Remember what you learned before about using your fingers  
*The other two started using more than one finger. Adam did not.*

It seems here as though Adam either did not remember or did not recognise that he was supposed to apply the learning from a previous lesson. However it was a multiple part directive. But George was able to respond appropriately, albeit hesitantly, when the teacher asked his class to 'remind' her of the grammar rules. He may have been hesitant as he was not sure what to do. When told 'don't forget' Adam is able to respond appropriately. This may be because the phrase includes what has to be remembered and no demands are made on the memory.

The use of key words depends on the style of the teacher. Some of these pupils never seem to come across these words, while others seem to be bombarded by them. This table shows the spread of understanding of keywords for those pupils who encounter them.

Keywords	R	N	C	A	I	V	O	D	L	G	E	H	W
Keystage at injury	pre	1	L2	U2	U2	U2	2	L3	L3	L3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	U3	4	4	4	U3	4	4
Remember/remind		X		X	X					✓			
Right	X	X					✓		✓				✓ X
Now		X		X					✓	✓ X			✓
Stop		X		X			✓			✓			
Listen		X				X	✓	X	✓		✓		
Pens down				X			✓		✓	X			
OK		X	✓					X				✓	

Key

X literal, inappropriate or no response

✓ appropriate response

Matrix XI

It seems that the understanding of these keywords depend on the length of time back in the classroom; those who have been back in school the longest are most responsive, while those who have only returned recently to school have little understanding of what is expected. Keywords are an essential part of making meaning in school. They could be reintroduced to pupils before reintegration. Unfortunately teachers do not always realise how ambiguous their utterances may be. When asked, Simon's English teacher asserted that he would not come across ambiguity until Year 9, but all the pupils observed experienced levels of ambiguity incidentally and accidentally from a variety of causes.

Nasser was making pasta salad in a Food Technology lesson

T: What must you all do now?

P1: Wash your hands

T: Good. Now if Mr P has been around this morning you will all have soap on your sinks.

*The class all go to wash, Nasser does not pick up the cue*

TA: You need to wash your hands

*Nasser went to wash*

T: Now you all need aprons, they are in the corner here

*She indicated where they were. Nasser was close to them and one of the first to get one on.*

The teacher intended her pupils to think about the necessity to wash their hands and pupil P1 had given the correct response to her, but she had not explicitly confirmed it, although she did say 'good'. Instead she added further information, not strictly necessary, which communicated a moral attitude of gratitude to other staff. The form of her words was information, while their function was as a direction; Nasser did not pick up that he needed to wash and his TA had to tell him. As discussed in Chapter 5, Nasser has difficulties in understanding IRF as a teaching form and may not have understood 'good' as a confirmation of the appropriate response, or he may have ignored it simply because it was from a pupil and not the teacher. The second instruction was possibly less clear than the first, in that the teacher said 'you all need aprons' but it was accompanied by a gesture and I suggest that this was what was followed, not the hint. The ambiguous nature of many of these directives militates against making meaning for pupils after a severe ABI, but an additional gesture may assist with communication. But gesture may also invite a response which is not intended

In Adam's science class the teacher called the class together. She walked to get something and as she went she said

T: I'm going to show you a Eureka can

*Adam follows her. The rest of the class stood still.*

Adam understood this transaction in a different way from the rest of the class. Adam's usual way of making sense in the classroom is to copy what other people do. It may be that the teacher's phrase 'I'm going to show you...' triggered him into copying whatever she did. The phrase acted as a keyword for him when it was not intended that way.

The food technology lesson continued

TA: We must get ourselves organised. What have you got?

*They look together and name all the ingredients*

TA: Can you remember what Miss said?

N: I remember

The opening to this sequence is very ambiguous, but supported by the TA picking up Nasser's bag. He understood the implication and was able to name all the ingredients with her help. But instead of asking if he knows what to do, she asks if Nasser can remember and Nasser, in common with many young people after ABI, believes he does,

when clearly he does not remember everything the teacher has instructed the class to do, as shown in the next extract.

*Nasser takes the saucepan to the tap*

TA: Is it getting heavy? Is that enough? What did Miss R say?

N: Two

TA: No, just over half full

*The TA pours some out*

The TA produces three ambiguous utterances one after another. The word 'it' could refer to a number of items, (initially the saucepan), but the next pronoun refers to the water. Nasser's response, 'two' (or could it be too?) perhaps refers to two bowlsful, or twice as much water as pasta. The TA does not question which; she takes control of the situation and pours water out. Next she asks

TA: What number shall we put it on and for how long?

'It' here means the ring on the hob. Nasser is completely baffled

*He starts moving around the kitchen area*

TA: Listen (*firmly spoken*) we must know how long to cook it

*She looks at the packet to find out and Nasser follows her and finds it himself with her indicating in a general manner where to look.*

N: 13 minutes

The pronoun 'it' now refers to the pasta. Nasser only picks up her reference when she indicates by her example what she wants him to do. At this point he finds the information quickly and without any fuss. The pasta is put on and the time noted. Nasser works out for himself what time it has to be taken off the heat. But by this time Nasser is thoroughly annoyed/frustrated, he walks around the kitchen tutting and muttering to himself. The TA has been bombarding him with questions and directions, giving him no space to think, which have been misunderstood or partially understood. He has had to work very hard to make sense of what he is expected to do.

TA: Could I make a suggestion? It's three o'clock

N: Oh yes

*He walks immediately to the cooker and grabs the pan. The TA moves to rescue him from a dangerous situation.*

Unfortunately here Nasser did not think about his safety, but he understands the implication of the TA's hint. Although there is a pronoun involved, the phrase 'it's 3 o'clock' is a very familiar one and the meaning is evident. Instead the TA should have phrased her utterances more carefully, using nouns, and then giving a thinking space after each one for Nasser to consider what to do.

### **6.1.3 Homonyms**

Nasser's difficulty lay with the understanding of pronouns but teachers can produce particular confusion when they introduce homonyms.

Maths lesson, Mike was working from the textbook. Revision section on time.

SR (*reading*): In 30 minutes what would the time be?

M: B, where is time B?

SR: What is the time in 30 minutes?

Mike did not realise that the question referred to the clock face he had previously used and looked for one labelled B. This is quite reasonable as maths questions are frequently labelled with letters, but he had obviously not seen the word 'be' within the question. It may be that he cannot handle conditional utterances. I rephrased the question. With a minimum amount of stimulation normal adults usually jump to highly predictable conclusions (Bruner 1966) and when pupils give wrong answers it may be because they are answering a different question. But, a previous question had shown two clock faces labelled 'time A' and 'time B', so it could also be that once an interpretation is chosen Mike perseverates on it, being unable to switch between meanings (Walker & Wicks 2005). This also seems to be the experience of Louise switching between Maths and Biology

Biology lesson

T: Right, what I want you to do for 10 minutes is to have a go at the questions

Q1: 'What is the difference between a primary and a secondary consumer'.

L: That's a primary and that's a secondary consumer. I don't know the difference.....

In the previous maths lesson I had been talking to her about range - a new concept - as the difference between the largest and the smallest variable! The introduction of one word with diverse meanings was bewildering for Louise; she did not seem to realise that there was a mismatch between her understanding and what was wanted. It may be that she is unable to compartmentalise her learning as other young people are able to, or that she is unable to understand that there are different language rules in different contexts. Certainly she seemed unable to hold together the two alternative uses and judge between them, she seems to have plumped for the recently used meaning. This word difference caused problems for Mike too:

Mike was tackling a Certificate of Achievement paper in maths.

Name of village	Number of people
Aber	2080
Cross Keys	3162
Llan	2895
Big Tor	3006

Q3 What is the difference between the number of people living at Llan and the number of people living at Aber?

Mike wrote 'Llan has got the hundreds'

SR: It means the number difference

M: Oh 815

Mike looked for a 'difference' as a 'point of unlikeness'(OED), rather than the mathematical sense. He used an everyday meaning of the word. The association can be within an educational context and still be inappropriate.

Ben was tackling GCSE Maths practice questions. One question had 'class interval' in the table

B: What's that? I don't understand.

SR: A class interval? .....from 5 to 10..... all the weights which are between 5 and ten.....a group... sometimes its called grouped intervals.....

B: I was thinking of a school class and wondering what that had to do with it.

Ben realised he had not made meaning and asked for clarification. I gave him a variety for him to choose from as I was not sure what had caused the breakdown in communication and he was able to choose. It transpired that it was not that he did not understand the term, but that he has become stuck in one way of thinking. Flexibility to switch reference set was missing. Other pupils are able to change their reference set. Such misunderstandings compound the difficulties in following classroom activities. Vygotsky (1994) points out the difference between academic and everyday concepts. Unfortunately these sometimes are labelled by the same or similar words and pupils with ABI seem unable to hold both in their mind and choose between the two, instead they select one or other at random. Ben made it explicit that that he understood the more familiar use of the word 'class'. His difficulty arose from the distinction between everyday and specialist use of a term. However he realised that his interpretation did not make sense and was able to ask for help

Another strategy, used when faced with ambiguity, is to understand it literally or precisely

In science lesson, the class was asked to get into groups of 3 or 4 to conduct an experiment to show the effects of concentration on the rate of reaction. William stood around with another lad.

P1: I'm a female. I'll organize them. P2, 10cm of Thiosulphate, William, 3 cm water.

*William placed a 3 cm trickle of water on the bench. I talked about it with the group and the need for centimetres cubed or cubic centimetres not just cm.*

It may be thought that William was using sarcasm to point out the error made by P1, but he was very serious about getting 3cm of water as requested, instead of the 3 cubic centimetres, which was on the sheet, but not read out by P1.

Later in the same lesson

SR: Now we've got to wait until the cross disappears

W: Cross disappear? How? It's the other side of the glass, it can't disappear

SR: What do you mean?

W: It's under the glass, it can't disappear. It'll still be there.

*He lifted the flask to show me that it was still there.*

P1: No William, it's going to go cloudy and then you won't see it.

*He seemed satisfied*

It may have been that word recall difficulties (discussed in Chapter 7) meant that William muddled the ideas of disappearing and dissolving, but he certainly thought that I meant the cross would not be there any more. Quite correctly, he pointed out that it would be. He seems to latch onto the idea of something vanishing, not being there at all when it disappears, beloved of magicians and conjurors, not just that it 'passes out of sight' (OED). However when another pupil provided an explanation, he readily accepted it. But it is also possible that the colloquial, and less precise use of the word 'disappear' led to his confusion.

After ABI, pupils have a tendency to interpret utterances on a literal level. Teachers are sometime deliberately obtuse in order to make their pupils think around the ideas, aiming towards the pupil owning the learning and engaging with new ideas. But this group seem more sensitive to Grice's conversational maxims, which lead the listener to believe the speaker will give sufficient information, be truthful, relevant and not deliberately ambiguous. Hence they interpret utterances literally even though the classroom is one place where they are suspended (Donahue & Lopez-Reyna 1998).

Pupils with an ABI have various strategies to deal with ambiguity posed by words which have a number of meanings. This matrix shows how these strategies are used by the various pupils.

<b>Dealing with ambiguity</b>	R	N	A	C	S	I	V	O	B	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	U3	4	4	4
Everyday meaning	✓	✓	✓			✓		✓	✓	✓	✓	✓	✓	✓	✓
Literal interpretation	✓	✓	✓	✓	✓	✓	✓	✓		✓	✓				✓
Don't know/ignore it	✓		✓		✓	✓				✓					
Previous meaning			✓							✓			✓		
Find keyword & copy		✓		✓			✓			✓					
Ask what it means			✓						✓						

**Key**

✓ Uses this strategy

Matrix XII

The most common strategy when faced with ambiguity is to assign an everyday meaning, or interpret the utterance literally, ignoring the school/academic context. But some pupils are able to solve their problem by asking or by finding the word in text, or by assuming it has the same meaning wherever it is met in the school context. Teachers could make the precise meaning explicit, but if this is continued well into recovery then there is a danger that the pupil may rely on adult assistance and not learn a strategy for themselves. Once the teacher is sure that the pupil knows the alternative meaning it

may be advisable, having explained the procedure, to prompt the learner to ‘think further’ or some other mutually agreed phrase, and then support the finding of the appropriate meaning through scaffolded instruction (Wood, Bruner & Ross 1976).

#### 6.1.4 Links

Pupils with ABI have a tendency to skip from one idea/topic to another in conversation, engaging in rambling, tangential speech (Walker & Wicks 2005). One reason for this may be that the use of a homonym pushes them to think of a different situation or idea,

Ruth was in a piano lesson, I had just identified a feature of the music as a suspension and asked her to play from a certain place.

R: Do you want the bridge?

SR: Yes

*Later*

R: That’s another bridge

SR: Pardon?

R: A suspension bridge

In this case, and many similar ones, it is the word itself which prompts the link and not its meaning. Unfortunately for our mutual understanding, a bridge is also a technical term in music and I had asked Ruth to play from the bridge passage, which included a suspension. It was only later when she correctly identified another suspension as a ‘bridge’ that I realised her error. But on other occasions events can also trigger links, as happened in William’s science coursework practical.

William’s coursework was on resistance. He had to set up a circuit and place different thicknesses of wire in the circuit and measure the current. I was supervising, but the teacher was in the room, marking. The lab technician arrived with the equipment.

W: Last week we had all this out. We were making fuses. They had to melt.

T: William should be good at this, he was doing this last week. You will need a board as the tables burn easily

*William then set up the circuit as he had planned at home, first drawing it as he had not brought the correct planning sheets. This took 20 minutes. He was then ready to start the experiment. He placed the first wire in position.*

W: What voltage shall I have it on?

SR: You will have to try it out until you find something that works and gives good readings.

W: I’ll have to heat it up until it melts

SR: We’re not making fuses today! Think what you need

W: If I increase it then it will melt

SR: Yes it will, but we don’t want it to melt

W: So I’ll find out when it melts

SR: We need to find the resistance of the wires remember

W: Oh yes

William’s difficulties with organisation meant his time was curtailed, and if he had been in class this would have been awkward for his partner as well as himself. The link he

made was not through the words being the same, but that the same equipment was set out. William's first reference to fuses occurs after he has set out the equipment even though the teacher also made the link, at the beginning of the lesson. It seems to be triggered by the iconic representation rather than the symbolic (teacher's words) (Bruner 1996). He then becomes fixed on the idea of fuses, something he has done previously. But symbolic links may also be made.

Louise's science group was considering the melting and boiling points of various elements.

T: Which of these two would boil first?

*P2 gave a wrong answer and the teacher extended the question*

Louise shouted out 'gas'

Although Louise knew she should raise her hand she does not seem to be able to control the urge to answer immediately. I suggest she was talking to herself, rehearsing her answer. The link made again involves meaning; boiling does turn a liquid to gas, but it is not the answer to the question 'Which would boil first?' She has made a symbolic connection between boiling and gases, but it has not been put through a checking process to determine if it is an appropriate answer to the question. It is an impulsive suggestion. William too made some very odd links at times, including this one in a Maths lesson

The teacher was asking the class if their parents were coming to parents' evening

T: Are your parents coming?

W: I've got an extra large T-shirt

T: Does that mean yes or no?

W: I haven't asked yet

What the connection was will never be known. I asked William what T-shirts he meant, he looked puzzled and shook his head. It could be that he did not want to tell me, but he is not usually shy about telling me things. It seems that the link made was not understandable to him either, and typical of some tangential speech.

After an ABI pupils make links with other experiences or knowledge, which are unexpected. The breadth of these are shown in this matrix.

Links	R	N	A	S	I	V	O	B	L	G	E	M	W
Keystage at injury	Pre	1	2	2	2	2	2	2	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	L3	U3	4	4	4	U3	4	4
Word association	✓	✓M	✓	M	M			✓	M	✓	✓	✓M	✓
Link to event	✓					✓	✓	✓	✓	✓	✓		✓
Link through meaning	✓								✓	✓	✓		✓

**Key**

✓ makes links

M misunderstands communication through use of links

Matrix XIII

Pupils who make unexpected links through homonyms do so to a more familiar context. Most frequently links are made through word associations then through events, and lastly through the meanings, with only the more mature, and furthest post-injury pupils being able to make links through meanings. This may be a reflection of the clinical



finding that, after ABI, pupils have difficulties with abstract ideas (Begali 1992, Ponsford 1995, Semrud-Clikeman 2001). These were unexpected links, but humour relies on links and homonyms to draw attention to an amusing relationship, and failure to appreciate such links in poetry denies its richness. Louise was not at all comfortable with the content of Act 1 Scene 1 of Romeo and Juliet; while the rest of the class were giggling at the smutty verbal humour, she could not see any humour in it at all even when I tried to explain how the words could have two meanings. She did not seem to understand the concept of puns and double entendres, understanding only the literal level of Shakespeare's communication.

## 6.2 Deliberate ambiguity

### 6.2.1 Humour

Teachers use humour to try to draw attention to features of the lesson.

Mike had been to a science lesson in school that morning and when I arrived to teach him, as usual, I asked him what he had done in the lesson. He showed me his diagram of a blast furnace all correctly labelled.

SR: Lovely diagram, so in the top you put limestone, coke and iron ore  
*(I pointed to each in turn)*

M: Is that coca cola or cocaine?

SR: Neither, coke is a type of coal which has had its impurities burned off. It is pure carbon. Like charcoal.

Mike realised that his concept of 'coke' did not fit with the coke in science. It bothered him enough to remember later (when prompted by my interest in his diagram) and ask. I checked with the support teacher in the lesson, who assured me that this was explained in class and a joke had been made of the three words. Mike however had only remembered the two which were already familiar to him. Coke in this case was being presented as a disembodied name for an object not seen, as an abstract example of a category, carbon. The joke may have been intended to establish the difference between the multiple meanings of the word, but in Mike's case it only served to intrigue, which allowed him to remember long enough to ask a question about it later. This is a topic for which it is difficult to provide practical work, you cannot set up a blast furnace in a science lab, and even smelting iron with charcoal takes more resources than are usually available, but it would have been preferable to show examples, or pictures, of each to establish the difference, rather than relying on semantics. A few days later when we were talking around the same topic, Mike had remembered charcoal as the carbon which was used. Again he latched onto the familiar and concrete, as he uses charcoal in his artwork.

Mike has difficulty understanding many kinds of humour, but laughed at a 'joke' during rugby where the teacher was using humour to support his teaching point

In a rugby lesson the group had stopped for a scrum.

T: Mike, mark Mike

*Both Mikes laughed*

Mike here has the benefit of a non-verbal gesture and a concrete situation to which it applies. This visual joke involves alliteration, but I have no way of knowing whether he

understood it at that level or just at the level of their being two lads of the same name on opposing teams. Teachers also use humour to discipline.

A pupil was chewing gum in George's English lesson.

T: P3 get rid of the gum. I remember being told I looked like a cow chewing the cud when I was in school. I never did it again  
*George laughed*

George understands the verbal picture painted by the teacher and laughs at the situation. Others in the class did not. Presumably he is using his imagination and the idea of a teacher as a cow strikes him as funny, a literal understanding. The teacher is using self-deprecating humour.

Adam was left out of a verbal joke among friends

Adam was in a French class taken by a supply teacher.

P1: What did the shark say when he swam into a wall?.....Dam....

Adam's face did not move

P1: Get it?...A dam is a wall and he said "Damn"

*Adam did not make any indication of having understood. They both got back to work*

When this happens the pupil is left out and it is possible that his friends think less of him. Humour is very important to 'grease the wheels' of social interaction and not being able to participate can be very isolating, as well as identifying the individual as 'odd'.

Humour is used by teachers both for control and explanation, but Docking *et al.* (2000) found that ABI teenagers find humour difficult to explain in clinical situations. The pace of the lesson may also be a factor. In a fast-paced class discussing Romeo and Juliet, Louise was attentive for the whole lesson. Louise commented that she likes this teacher, but she did not laugh at the teacher's jokes. The pace of this lesson is much faster than in George's English lesson and it may be that she has to spend her energy keeping up rather than relaxing into the jokes. Using humour seems harder than appreciating it but after ABI pupils are able to introduce their own humour.

In a geography lesson Owen had to find the capitals of European countries. He and his TA were looking at a political map of Europe, but Switzerland was too small to include the capital.

TA: (*to me*) Do you know the capital of Switzerland?

SR: Is it Bern, or Lucerne?

TA: Perhaps it's Zurich

O: Do you know the capital of Switzerland? Its S!

This 'joke', using a pun on the word 'capital' is common among KS3 pupils and is probably not of his own creation, but it was appropriately used. However, in this case the pupil controlled the joke. He therefore controlled the ambiguity, rather than have to interpret someone else's elliptical language. However he persisted with the joke to the point of boredom throughout lunch. Piaget holds that the child masters syntax of speech

before the syntax of thought, so evidence of using jokes may not necessarily mean that the pupil can interpret jokes in the way the teacher intends.

Nasser's class were reading a novel.

Reader: 'I'm Mina she replied. You're Mina he said I'm sick to death.'

*Nasser laughed out loud*

Nasser found this amusing. It seems he infers the word 'called' and appreciates it on a literal level, that the man is giving his name as 'Sick to Death'. Adults make errors such as this many times but they do not cause a breakdown in communication as it has done here. Subconsciously, we consider alternative interpretations and understand the utterance as it was intended, but this does not seem to be the case after ABI. This matrix shows the forms of humour understood and used by this set of pupils.

Humour	R	N	A	C	S	I	V	O	B	D	L	G	E	M	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	4	U3	4	4
Understands crude humour			✓	✓			✓	✓		✓					
Uses crude humour			✓			H	✓	✓	H	H					H
Understands visual										✓		✓	✓	✓	✓
Uses visual															
Understands verbal		x	x	✓	✓			x			x			x	x
Uses verbal	✓			✓	(H)			✓					✓		
Reported sense of humour			G	G		G			G			G	G	G	G

**Key**

✓ - Understands

x - Does not understand

H - Used at home

G - Good

If reported by teachers/parents but not observed by me it is in brackets ( )

Matrix XIV

It appears that it is easier to use forms of humour than to understand them. This could be to do with controlling the context, but it is also notable that the pupils seem to find smutty and visual humour much easier to manage than verbal humour. This concurs with the developmental order of the emergence of types of humour (McGhee 1979). The first to appear is 'smutty' humour, which is generally understood and used by young people after ABI, much to their parents' embarrassment as there seem to be no mechanism to judge when and where to engage in such. Next to appear is an appreciation of visual or situational humour, appreciated by both William and Mike in examples above, and last to appear is verbal humour, which appears to be very difficult post-ABI.

**6.2.2 Sarcasm and irony**

Irony is much employed among adolescents and adults; sometimes its pointed nature turns it into sarcasm. Teenagers learning to use irony overuse the form, but generally it is not heard in the speech of pupils after an ABI. Mike was able to understand irony. In previous lessons he had been practising using both hands to type

SR: I see you have only one hand again today

*Mike grinned at me and used two hands to type*

This occurred more than a year post injury and while he was relaxed. He clearly understood my irony. But the sarcastic comments of Nasser's TA, e.g. Now the fun really starts,' as she indicated the need to wash up, served only to annoy Nasser. It could be that Mike and Nasser were able to pick up the spirit in which the comments were made, and the difference between irony and sarcasm. If so, this shows a degree of linguistic awareness rarely attributed to young people after ABI. Occasionally a young person is also able to control the ambiguity of irony

William was chatting in a history lesson

W: I'm getting a £300 phone

P1: Bring it to school

W: Yes and get it stolen!

*Rest of the table talks, William is working.....*

P1: Have a party

W: I am having one at my Mum's.

P1: Where does she live?

P2: Up in the hills

W: Up in the hills, far, far away, where the witches live

William grinned while delivering both utterances and I believe he knew that these were jokes typical of his social group. William has managed to keep his friends and make new friends since his injury, something not all the young people have managed to do. However his friends have to be very understanding, as he will spread confidences without realising the implications. Simon is now almost completely isolated and he is the one who is almost totally unable to deal with humour. He rarely smiles when in public, and any form of word play is almost always unkind and directed towards his older sister. Humour is one means of marking social identity and it would seem an important focus of tuition before reintegration.

### 6.2.3 Metaphors and Similes

Metaphors are used extensively in education; in many cases it is very difficult to judge how they have been comprehended by any of the pupils, including those with a severe ABI. Generally they are used to try to make concepts easier to understand through equating them with more familiar situations. Sometimes, the word 'like' is used to signal a simile.

Louise was completing bookwork about catalysts in science.

*At this point I looked at her book and a written answer: A catalyst lowers the collision of a successful reaction*

SR: Um, it does not lower it, but .....

T: Look at page 110. On page 110 it talks about catalysts and enzymes. Enzymes are very similar to catalysts, they are *(he is distracted by boys mucking around at the back and walks off)*

L: *(to me)* Look it lowers it *(she is pointing to two graphs of activation energy needed)*

SR: That's the activation energy. The amount of energy needed to start the reaction.

In the middle of this extract the teacher draws attention to the similarities between enzymes and catalysts, but unfortunately he is distracted by the boys and does not return

to the subject. There is also a confusion over the pronoun 'it', not clarified by the teacher when he tries to sort out the misunderstanding, and Louise reiterates her belief. The teacher returned to talk individually to Louise, and introduces another metaphor:

*The teacher walked over to look at her work.*

T: It lowers the activation energy, like when you start a fire you have to strike a match and add some energy. Go on.

*Louise sat still, looking glum*

Now the metaphor is that of striking a match, though it is introduced as a simile with the indicator 'like'. About five minutes later he tries again with another metaphor, that of walkers climbing a mountain. This metaphor is supported by an illustration in the textbook.

*The teacher came over to check what Louise was doing.*

T: How a catalyst does this is it's like taking a short cut (*pointing at the metaphorical pictures*). These can't get over the mountain its too steep, but then the catalyst comes along and it's a short cut.

*Louise looks perplexed*

T: Look these here (*still pointing at the picture*) don't have to go up the hill. They don't have to use as much energy because the catalyst provides a short cut. You don't need as much activation energy.

Louise was completely baffled by this. In both these examples the indicator 'like' is used but Louise is not able to use the similes to assist with understanding the concept of catalysts, but copied out a suitable answer by identifying a key word, thereby getting around her difficulties and satisfying the requirements of the teacher. However, Louise is able to introduce similes for herself,

Science lesson about atomic structure

T: How do we arrange the atoms?

*Different pupils answer. Louise is still writing and makes no indication of having heard. Once she finishes she joins in the answers with the rest. They are talking about ionic bonding and Louise is giving all correct answers very quickly*

L: And that becomes Sodium Chloride. It's like a north and south... on a magnet. Do we have to draw them?

The teacher may have used this in a previous class, or this may be a very familiar concept. But she can make meaning with metaphors when she controls the use. Idioms too embody ambiguity.

In a science class the pupils were preparing to undertake an investigation.

T: Let's list all the factors you could change on this.

*Lots of ideas were thrown out by the class, including thickness by Louise*

T: There are lots of ideas but some are red herrings, so I want you to choose from these (*he writes them on the board*).

L: Thickness of the wings.

T: That's maybe, but I'm not sure how we would investigate that.

*The class write it down and the end of the lesson arrives.*

The teacher was trying to guide the class to investigate aspects of the problem which would produce viable results for GCSE coursework. Louise appears not to understand what a red herring is, or if she does she does not equate this with her suggestion, but it was the only one in that category. Yet the very obscure phrase

At the end of a DT lesson.

T: Gentlemen we are hurtling towards quarter past

was understood immediately by George. He was almost first to respond and clear up. This phrase contains an unusual word in this context, but it could be a favourite phrase of the teacher and familiarity may be the reason for George's quick response.

Louise was also able to respond to another pupil's utterance, turning it into a common metaphor

Art lesson: Louise and her friend were squabbling over who would get the pictures they needed.

P1: She's from another planet. She's from Mars

L: Venus

SR: Oh men are from Mars and women are from Venus.

*Louise smiled*

I was the one left behind in this conversation! Louise immediately recognised that use of this common phrase but did not want to be labelled as male and hence changed the metaphor. I don't think P1 intended to use the men/women analogy, just that aliens come from Mars, it was Louise who changed it. She also used the phrase 'buried the grudge' when writing about the prologue to Romeo and Juliet, without prompting. It seems that she can use metaphors when she controls their use. This matrix shows how these pupils respond to formal ambiguity.

<b>Formal ambiguity</b>	R	N	A	C	S	I	V	O	B	D	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	U3	4	4	U3	4	4	4
Sarcasm/irony Teacher use		✓	x	✓	x	x		✓			x	(✓)		✓		x
Sarcasm/irony Pupil use	✓	x	x	✓				✓							✓	✓
Metaphor/simile Teacher use	x	x		x		x	x	x	(✓)	x	x	(✓) x				x
Metaphor/simile Pupil use											✓	✓				

Matrix XV

Key

✓ - Understands/uses

x - Does not understand/use

If reported by teachers/parents but not observed by me it is in brackets ( )

It seems that, like humour, it is easier to engage in formal ambiguity than to understand it. In one case it was reported that the pupil understood metaphors used in the classroom, but when one was used, he did not understand it. Parents and teachers may have been reflecting pre-injury behaviour or making the assumption that because the pupil is in the class and is able to complete the task, that they understand explanatory metaphors, which is not necessarily the case. In order to understand formal ambiguity pupils need to appreciate that the speaker is not speaking on a literal level, but it also requires a level of abstraction to pick out the key ideas in the real and metaphorical situation and link them together. Making such links may need assistance (see Chapter 7).

#### 6.2.4 Role-play

Role-play is frequently used to draw parallels between ideas in the classroom, however pupils with an ABI seem to understand the task on a different level. The assumption is that the presentation of the task in a 'real-life' situation makes the idea 'concrete' and therefore more accessible in a Piagetian framework. For pupils post-ABI, the situational presentation actually seems to make it more difficult, possibly because the role-play becomes a metaphor. The temporary suspension of reality means that the young person has to hold more than one idea in mind at the same time, a form of dual tasking, which seems to be accessible only where the situation is familiar. Louise's Geography teacher set up a trading game to illustrate the problems besetting world trade. The different groups had to role-play countries of the world, some of which had more resources than others. They had only simple rules, on a card and were told the aim was to get as much money as possible by selling paper shapes to the bank.

The trading game was set up and the class asked to get into groups of 5 maximum. Louise refused to get into a group. The teacher put her in a group. The instructions were on a card. P1 read the card out to the group. At the beginning Louise did not take part in discussions. Then P1 realised they would need a ruler.

L: Shall I see if I can trade a ruler for the paper?

*She traded a ruler and a scissors for 2 sheets of paper (a poor trade)*

Louise was uncomfortable being asked to get into a group; this could have reflected her social difficulties or she could not judge which would be the best group as the teacher had not outlined the task. If so, this shows a greater social awareness than usually presumed of young people after an ABI.

*The group got working. Louise was not part of the decision making in terms of what to make, and just did as she was told - measure this, cut that.*

P2: Anyone want to trade paper for a pencil?

L: Do we need this pencil?

Group: No

*Louise went to trade, but returned as the offer was to buy paper not a pencil! The group then asked me if I was a teacher and if I knew good ways to cut out the shapes and I became involved.*

Louise wanted to be involved with the task. She deferred to the group when making decisions. She took her part in selling the 'goods' manufactured to the bank, but when asked what country she was, to put the earned money in the account, she was unable to

answer. I was close enough to hear and said 'Ghana'. Even at this late stage in the game she had not adopted the identity of the country. No other pupils had difficulty with this. Everyone else had become very nationalistic towards their adopted country.

Next day:

SR: How did you get on with the Geography? The trading game?

L: OK

SR: What did you learn?

L: Don't know really....nothing.... To share and how countries buy and sell from each other

SR: Which country had the advantage?

L: USA, because they are richer, bigger, powerfuller (sic) and have more money resources

SR: Where does Ghana come?

L: We came third

SR: Do you think we were supposed to come third?

L: We did

SR: Yes but we cheated a bit, didn't we?..... We had an expert, an international adviser, who knew how to get the shapes without having all the necessary resources

L: Well, we did come third

After initially asserting that she learned nothing, possibly to gain space to think (see Chapter 7), Louise showed she had gained understanding of how the more powerful nations (the teacher deliberately made the dominant group in the class into the USA) have the advantage, but Ghana should not have come third in the world. In retrospect I realise that I should not have become involved, but the group were keen to involve me and I introduced myself as an international adviser, another metaphor. The group accepted this at the time, including Louise, but the following day she could not divorce reality (we came third) from the metaphor (the game). She had learned something of the inequalities of world trade, but not the value of international advisers, a complex idea for any 15 year old. Louise joined in the activity without understanding the significance of it, while Nasser and Simon could not complete the role-play tasks they were given. However Mathematical tasks are frequently placed in an imaginary 'real-life' context especially in SATs and GCSE exams.

William was learning about solving equations in Maths.

SR: Let's think, 5 T-shirts cost 4 pounds. How much does one cost?

W: *(Long silence.....)* divide it by 5

SR: Try writing it down....as a fraction

*He could not so I did it. We did the next one together and he could write it down. The next question produced*

*$2x = 15$  William wrote  $x=2.5$*

SR: Hang on, put it into real things....2 T-shirts cost £15

W: *(very quickly)* One costs £7.50

SR: Write it

W: Is that it?

SR: Yes



This use of 'real-life' context was well within William's experience. It was not so much role-play as a limited the use of imagination, using an iconic representation of experience to be able to manipulate ideas within the mind. But this is not automatic, and William only learned to use this strategy after much practice.

### 6.2.5 Using imagination

In another class Louise had missed the practical lesson, as she had attended an interview at college but was present for the write up.

Science follow-up lesson about forces.

*Louise started the write up and did well for two or three sentences*

L: I didn't do this, Sir, Sir, can I do this? It would make it easier

T: OK

*He gets the apparatus and the rest of the lesson was taken up with the experiment.*

Others in the class, who were in a similar position, were able to imagine what they would have done, how they would have set up the apparatus and what would have happened, from the information on the board. Louise could not, but she was aware of what would make the task easier and was able to articulate it, showing a level of self-awareness not usually accorded to young people after ABI (e.g. Glang *et al.* 1992, Walker & Wicks 2005). Scale drawing and sketching too involves a similar suspension of reality.

Mike was trying to find areas of complex shapes. I had already given it a context of trying to find out how many slabs you need for a patio of this shape and size. as he was unable to deal with the concept of area as an abstract concept.

*He drew the shape in his squared exercise book by counting the squares and worked out the areas. I deliberately drew the next one not to scale.*

M: 3 by 4, 12

SR: That's not 3 by 4 it says 5 and 6

*Mike sat still*

SR: Don't look at the squares, its not to scale. Perhaps we'd be better on plain paper

*Mike went to draw the diagram on the plain paper. He wanted a set square to get the corners at right angles.*

SR: It's only a rough sketch, as if you were on a building site and drawing a quick diagram to take to the builders' merchants.

*He completed a very large drawing and worked out the area. I drew the next one deliberately out of scale on plain paper. Mike put in a line to split it into two rectangles. He then had to find the length of various unmarked lines*

M: 2

SR: Why?

M: It looks like half of that

SR: It does, but remember that this is a rough sketch. Look at that, and that. So it's.... (*pointing*)

M: 3

SR: Good

Mike focused on the reality of the squares in his book, when they were removed he still needed the realism of measuring out the dimensions. I then introduced an imaginary context with a conditional 'as if' but he did not pick up that hint. My next move was to assert that 'this is a rough sketch'; we were no longer pretending, I also accompanied this with semi-completed sentence and he was able to finish it off. It was as if he could not work in an imaginary situation, but once it became 'real' he could use his reasoning skills to work it out. His difficulty seems to be with abstracting from the concrete situation, to the imaginary one.

When work is given from the text-book, pupils post-ABI need to have the book open in front of them. They are unable to imagine what a teacher means when they describe how to copy diagrams, or how to fill in a table without having the item to focus on at the same time. This again makes the situation real, but it also brings an additional sense into play; now the pupils have visual as well as auditory input, each backing up the other. They do not have to rely on their imagination. Sometimes even looking is not enough, and kinaesthetic input is also needed. William followed his biology teacher by tracing the diagram of the leaf she was describing with his finger, while Owen moved the mouse to emphasise the instructions given by the teacher. Despite Begali's assertion

simultaneous sensory bombardment is inappropriate for most THI youngsters (Begali 1992 p143)

these pupils seem to need to underpin symbolic representation of ideas with iconic images (see Chapter 7).

Most pupils with ABI do not choose to take courses in drama. It seems that the imaginative demands are too great and they choose to avoid this subject. Imagination is the mental faculty forming images of objects not present, or the creative faculty of the mind (OED); this is important in a study of making meaning because pupils are anticipated to understand what imagination is and be able to use it by the time of secondary education, but it is clear that pupils with an ABI find difficulty when required to use their imagination. This matrix shows the responses to imaginative demands.

Dealing with ideas	R	N	C	A	S	I	V	O	B	D	L	G	E	M	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	3	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	4	U3	4	4
Concrete 'here and now' context	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Put in real-life, experienced context		✓							✓	✓	✓		✓	✓	✓
Asked to imagine a situation/empathise	✓	x	✓	x	x	x	x	x	✓	x	x	x	✓	x	✓
Uses abstract ideas		x		x	x		x		x	x	x	x		x	x

Key

✓ can understand and use

x cannot understand and use

The ability to move from the here and now towards a more abstract understanding appears to be problematic for these pupils. Many are able to put ideas into real-life, experienced context, but fewer can imagine a situation or empathise with the situation of another. This has huge consequences for the study of English and humanities. Of

Matrix XVI

the pupils who have sat GCSE none have achieved above Grade D in these subjects, although they have in others. The problem with abstract thinking seems occur with all pupils. There are different levels of abstraction, but it seems that, after ABI, thinking has to be contextualised, practical and applicable.

### 6.3 Repair

A breakdown in communicative intention is a normal part of conversation which is generally repaired with little notice on either part. However where a pupil has suffered an ABI, breakdown is more obvious. Pupils then have a number of strategies for repair.

#### 6.3.1 Copying

If pupils are not sure what to do, they may see what others are doing and take a cue from them.

Nasser was in a French lesson, learning to count.

T: Ecrivez numero quatre

T: Montrez moi

*Nasser does nothing, but then looks at others holding up their boards and writes 4 on his*

T: Huit

*Nasser looks at his neighbour's board, copies and holds it up when requested*

T: Douze

*Nasser writes 11 and holds it up without waiting to be asked. When he realises it is wrong he rubs it out and writes 12 before holding it up again.*

T: Dix-neuf

*Nasser looks around and then copies what others have. Next the teacher asks them to divide their boards (in French). He looks confused and then looks at others and copies what they do.*

Nasser started to learn French at the same time as his peers. This is his third language and mostly he shows a command of the language at least as good as that of his classmates, answering questions and following instructions given by the teacher in the target language at the same time or even before the rest of the class. His teacher commented that he has a good accent and frequently joined in. However on this occasion he is clearly lost. He is aware that others have raised their boards, he looks and makes his say the same. This does not prompt him to listen for the next instruction, but having found a strategy that works he continues to copy. On the third occasion he does rely on his own decisions, gets it wrong and reverts to copying. He knows what is expected, but has not necessarily understood. Perhaps Nasser is not secure enough in himself to make his own decisions. He relies on others and copies their behaviour. Teachers do not reprimand the pupil for copying, leaving the pupil to follow this strategy without knowing that it is not beneficial to learning, although at times it may be the 'right' answer and accepted as such by the class. Frequently the pupil with ABI picks on one friend to copy

Science lesson soon after returning to school.

SR: I think you need to write this down

W: P1 isn't doing it. I've done it anyway

SR: Everyone else is improving their own

William takes his cue from P1, not the rest of the class. P1, however, is not a good model, as he frequently chooses not to take part in classes and tasks, and by choosing to follow P1, William is missing out on developing his understanding of the topic. He also states that he has already completed the task. This is an example of poor monitoring, as he has not fully completed it. The rest of the class add more information to their diagrams; they have understood that this was what the teacher expected. George's art teacher commented that he makes sure George is seated with those who will be good models. A skilled TA is able to intervene when pupils copy an unsupportive model, but William was considered too able to warrant a TA.

### 6.3.2 Following a pattern

In other lessons pupils continue to follow a pattern of behaviour beyond its usefulness. It frequently leads to errors in mixed mathematical exercises, where the pupil applies the successful pattern of solving one problem to the next one without checking if it applies. It also affects how the pupil reacts to less explicit communications.

Biology lesson

TA: Now lets think of our own food chain

*Louise looked on the sheet*

TA: Not on here, in your head

Louise looked on the sheet again even though the TA had suggested thinking of 'our own' food chain. This phrase may be interpreted in two ways. If we understand 'our own' as referring to humans, then the chain may have been on the sheet, however both the TA and I understood it as meaning an example of a food chain not one provided by the text. Louise presumably interpreted it as the former, assuming that the intention of the communication was to follow the pattern of previous tasks. Sometimes this strategy can be very helpful

Maths lesson, converting fractions into percentages.

T: If you've finished that go onto the next two

*Louise wrote  $2/10=1/5$  used a calculator to find 0.2 and then did 20% without a calculator*

*She came to a halt over the next one*

SR: Look at that  $2/10$  became 20%. Now that's  $3/10$  so what would that be

*Louise thought a bit and then wrote 30%*

*She checked on the calculator without me prompting her. In the next question she did  $1/10$  becomes 10 % without any prompting.*

Following the pattern which she had learned, meant that she could bypass the stage of turning the fraction into a decimal, but she had retained it within her pattern and later used the two stage process to tackle a slightly different problem

Later in the same class.

*Q5 Give 12.5% percentage as a fraction in its lowest terms.*

*She wrote*

<i>Fraction</i>	<i>Decimal</i>	<i>Percentage</i>
$50/100$	$0.5$	$50$
$12.5/100$	$0.125$	$12.5\%$

L: That doesn't work does it? I thought if I did it backwards it would

Louise notices her own error. She is very comfortable 'doing it backwards' as she showed in algebraic problems and chose to combine this and following a pattern here. Unfortunately it did not produce the required solution. In fact she had already chosen a fraction not in its lowest terms ( $50/100$ ) as her starting point, if she had chosen  $\frac{1}{2}$  then she may have seen her way around the problem, but the previous questions had all dealt with fractions involving 10, and she seems to have remained in this pattern. It is almost as if the phrase 'in its lowest terms' has been ignored and the focus of her thinking is on 'fraction' and 'percentage', which is what she was tackling earlier. The key words seem to have triggered a misunderstanding.

She had practised this technique, of 'undoing' a problem, in the previous lesson, but it was not helpful in this case. However she did have an idea of how she might start, and initiated action. What was missing was an idea of what it would produce in the end, a planning problem (Walker & Wicks 2005). She was then unable to think her way around the problem and needed significant amounts of assistance.

Continuing Q5

SR: Well we know its  $12.5/100$ . That's a fraction, but it's not in its lowest terms. How do we do that?

*No reply*

SR: Can you deal with the point?

*No reply*

SR: We could multiply the top and the bottom by .....

*She placed her pen on the decimal point and started to 'move the point'*

L: 3?

SR: Do you mean 3 places?

*Blank look*

SR: Actually you have to multiply it by 10 and move the numbers 1 place, so we get  $125/1000$

L: 1000? How?

SR: You've made the top bigger so you must do the same to the bottom.

Now we must cancel?

L: Cancel?

*I demonstrated but I don't think she understood*

There were a number of difficulties with this exchange. I knew from previous questions that Louise could find fractions in their lowest terms, but here she seemed to be fixed in a different way of thinking and unable to change her reference set. We then appeared to be using different terminology to describe what happens when a number is multiplied by 10 and also when talking about equivalent fractions. This shows how important it is to maintain a consistent set of terms. She seemed unable to appreciate that although the technique may have a different name, it essentially does the same thing. Similarly she

finds it difficult to find links between facts and concepts. It may be that other pupils find that their way of thinking can be extended to account for new situations they encounter, but not for Louise. But GCSE questions in many subjects require the application of knowledge and techniques to new situations, hence this kind of practice is essential in preparation for exams, and the need to apply knowledge made explicit. It is also notable that in this example and others the pupils are required to hold many ideas in their mind at the same time. Most of these pupils will start an activity while the teacher is still talking about it, or immediately the teacher has given the instruction, even if the instruction was a warning of something happening later. It is as if they know they need to start the task so that they do not forget, a strategy to make sure they do what the teacher wants, rather than have to hold it in their mind. Many professionals interpret this as impulsive behaviour, an inability to wait (e.g. Glang *et al.* 1997, Walker & Wicks 2005), but I suggest that this behaviour may be a deliberate strategy to avoid mental overload. Ben described feeling as if his ‘mind was racing’, even when his body was tired. For him this resulted in sleep problems, but most of the pupils seem very active in the classroom and eager to please, but fatigued when they get home. The need to make quick judgements is necessary for another strategy used by pupils with an ABI.

### 6.3.3 Trial and improvement

When faced with a computer many pupils click wildly on icons. Ruth does a similar thing when in front of the piano; without a gap she will play another note or chord, wildly stabbing at any key in her reach. One solution, which works in both circumstances, is to say ‘Stop, think!’ or for Ruth, as when she perseverates, ‘hands in lap’. This strategy is one of trial and improvement – a technique taught in Mathematics, which may seem to give it credence as a legitimate strategy to use, but these pupils do not seem to register what it is that brings success, if it does come, and they do not often learn for the future. Ylvisaker & Feeney (1998) point out that, after ABI, young people do not put down somatic markers for memory; it may be that these markers are missing for other kinds of learning too. However this can be an excellent strategy if pupils, with an ABI, are taught to slow down and notice what they are doing. Likewise, if they are unsure when tackling problems with a calculator in maths or physics, they may try a number of calculations, dismissing most answers as unreasonable. When they eventually find a solution with which they are satisfied, they cannot remember the calculation which produced it. The solution is to provide the pupil with a calculator (e.g. Casio fx-85WA), which retains the calculation while displaying the result. The exception to this is in practical lessons where this strategy may be dangerous.

### 6.3.4 Asking

Asking is a natural way to get assistance if you realise you are stuck. Requests come in several forms.

Science Lesson, note-taking from a video. I was sitting at the back of the room, behind Nasser.

*The group enlist the teacher as an information point, asking her about other acids and alkalis they had missed - Nasser is still copying the others. He has now stopped looking at his notes completely and is only copying what the others have written. A few minutes later Nasser looks at me (I am sitting behind him). This was the first time he had looked at me during the lesson.*

N: Help please

*I walked over to talk to him about his work. He could not read any of the acids or alkalis which he had copied, some were in the wrong place and the table was all over the place. There were only a few of the acids and alkalis mentioned on the video*

SR: What have you written?

N: Don't know

*We went through each one - I could read most, but one floored me too!*

SR: What do you want to write next?

*Nasser shrugged.*

Nasser had realised that he was not keeping up with the amount the rest of his group had written in their tables. He had taken up most of the available time with drawing the table, which is a very laborious task for someone who can only use one hand. The copying was also taking a long time as he was copying one letter at a time. He was unaware of English spelling patterns at this point, but it is also common for ABI pupils to copy one letter at a time. He felt he could ask for my help, but it was not help with the spelling which he wanted, but help in what to write next. When he had been watching the video, he had been so engrossed in trying to copy what the others were writing, that he had not been able to concentrate on the content of the video and once he had exhausted what he had written he did not know how to add more. Despite sitting close to the teacher and having recently been involved in a group which enlisted her help, Nasser turned to me for assistance. This was a very positive response in the face of an inappropriate activity for him. But his request was very concise, possibly showing the pressure he felt (see Chapter 7).

Assistance may also be requested non-verbally, possibly by raising a hand, which is what is expected in many classrooms, but also by looking at someone who may be able to help. This only works if the recipient recognises the look.

Nasser was off task in a maths lesson and was playing with the calculator. He puts in 7 and then + and it showed 7.0000000000

N: I don't want lots of noughts

*Another boy tries it too and gets the same. Nasser looked at me. I move towards them to look at what they have got*

SR: Yes the noughts are after the point. It's still a 7. It just says 7 and no more

*They did not look convinced, but a third pupil told them they needed to look at the board*

I recognised that Nasser was asking for help, this was something he uses on many occasions with teachers and teaching assistants, but my explanation did not convince them. Unfortunately I could not explain further without undermining the teacher by showing that I approved of their activity. However theirs was a very genuine question about place value and if I could have spent time on it would have been worthwhile.

Comments may also take the place of a request:

As Owen typed, the automatic feature put something in.

O: I didn't type that

*He looked at the TA*

TA: No, it was the computer

His comment here acted as a request for an explanation when he did not understand what had happened. Together with his non-verbal signal, the TA gave reassurance, if not a complete explanation of the automatic features of the word processor which was on the networked computer, but not on his personal computer which he usually used.

### 6.3.5 Stopping

Other times the pupil with ABI seems to stop working, perhaps completing one section of a task and not moving on to the next section.

Food technology lesson, Simon and his class were preparing to make bread.

*He set to work immediately when told to, but was then disturbed by others, and stopped.*

TA: What are you going to do here?

Here Simon had clearly been distracted by others and had no means of bringing himself back on task. The TA's question was enough to get him back on track. It was not a hint, but a proleptic question, engaging Simon in thinking about the task he has been asked to do. This technique works well for other ABI pupils as well, but if the pupil has a limited understanding of the task, it is sometimes not sufficient.

English lesson, writing poems.

N: Can I do the monster one?

*He reads it out and stops*

SR: What do you have to do?

N: Copy it out

SR: No. Do you remember what she said?

N: No

SR: You use it as a model for your own

*I then went on to demonstrate how he could do this.*

The title 'monster' is Nasser's own title for it, based on the picture on the opposite page which he feels looks like a monster. The poem is called 'You'. He is able to start the task and choose a poem, but then cannot move on. He does not ask for help and does not seem to know there is anything else to do. When asked, he suggests that he should copy it out which he has previously done with poems. There was no clear reason for stopping here, he was certainly not distracted by others. It seems more likely that he stopped because he did not know what to do next. In his original question he used a non-specific verb, 'do', as if even, at this stage, he was not sure what he had to 'do' to the poem.

Stopping can also occur in practical lessons. The reasons that a pupil stops are not always clear. Sometimes a distraction in the classroom causes a break in their task, other times it is an unexpected result from an action they have made, such as when Adam put a value into a spreadsheet cell and received the message 'invalid#####'. At other times pupils seem paralysed by choice as Louise was when given a choice of paintings to copy in art. However it is not always clear when the pupil is thinking or when he is stuck



Adam was in an ICT lesson, part of a series about using a spreadsheet. He sat back in his chair.

SR: Now what?

*He pointed to the paper which said 'Design two more what if questions'  
He then clicked on the clip art, clicked all around, clicked on one picture and then put in another then stopped.*

SR: What's next?... what if.....

A: DJ costs more..no double

Adam could have been thinking about the next task as he sat back in his chair, but I interpreted it as having become stuck and tried to prompt him on. His non-verbal indication now makes me think that he was thinking about it. However he then was distracted from this and he put in some clip-art, using the trial and improvement strategy described earlier. After this he stopped again and this time needed more than my 'What's next?' prompt to remind him of the task. I used what I have termed projection to elicit what he was thinking, but in an open enough way to give him the freedom to express himself rather than be limited by my suggestion. Some professionals feel that the pupils are distracted by their own thoughts (Walker & Wicks 2005), but they could just experience overload of ideas connected with the task, and be unable to choose between them. If the difficulty is with choosing between ideas, then asking them to verbalise may assist with focusing on one idea and making a judgement about that, without reference to the others. The following matrix gives some of the reasons for stopping to occur.

Reasons for stopping	R	N	C	A	S	I	V	O	D	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	U3	4	4	4
Distraction		✓			✓	✓	✓							✓*	
Do next?		✓		✓	✓	✓	✓		✓*	✓		✓*		✓*	✓*
Unexpected				✓	✓			✓		✓					
Choice		✓			✓	✓	✓			✓			✓		
Language difficulties			✓	✓		✓				✓	✓	✓			✓

Key

\* within six months of return to school

✓ reason for stopping

Matrix XVII

Among younger pupils, and older ones just returning to school, stopping seems to occur because they do not know what to do next, but can occur for other reasons as well, including unexpected outcomes of the current activity. Surprisingly, in view of the literature (e.g. Begali 1992, Kehle *et al.* 1996, Walker & Wicks 2005) it does not occur so frequently due to distractions in the classroom, and when it does it is again among the younger pupils. In a naturalistic setting older pupils seem either to be able to ignore distractions, or return to their task. It is also notable that Ruth does not stop in the way others do. This may be because she is further away from the time of injury, has had a supportive background, and has developed strategies to deal with times when she is

stuck. Ruth is very verbal and tends to ask when she does not understand, even if it is inappropriate to ask at the time.

French lesson, Ruth's neighbour had forgotten his text-book.

T: Thanks you for being a good study buddy and letting him share but it will be hard for the first section

R: Will it? (*she looked very puzzled*)

The teacher was warning her to be extra considerate towards her neighbour in the first section, but was not explicit. Quite typically she has to ask, but the teacher was talking to the class and did not choose to expand on his comment.

Not all pupils with an ABI have the same experience with breakdown of communication. Pupil strategies used when they notice a communicative breakdown are given in this matrix

Repair strategies	R	N	C	A	S	I	V	O	B	D	L	G	E	M	H	W
Keystage at injury	Pre	1	L2	2	2	2	2	2	2	3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	4	U3	4	4	4
Copies	x	✓	✓	✓	✓		✓	x		✓	x	✓	✓	✓		✓
Follows pattern	✓	✓							✓		✓		✓			
Trial & Improvement	✓	✓	✓	✓					✓		✓	✓	✓			✓
Stops	x	✓	x	✓	✓	✓		✓		✓	✓	✓	✓	✓	✓	✓
Verbal request	✓	✓		✓*			✓*	✓			✓	✓	✓	✓		✓*
Non-verbal request		✓		✓												
Comment								✓	✓							

**Key**

\* later in recovery (18 months post injury)

✓ uses to repair

Matrix XVIII

It is possible that the pupil who does experience a break in their task, or who is unable to initiate a task, has been distracted, but this is not clear in the observations and many times there is no obvious distraction. The pupils may be distracted by inner thoughts, but again this is not clear. It appears from this matrix that, while older pupils can make requests from their return to school, younger pupils are able to make verbal requests for assistance later in the recovery period. Only those whom I observed at least 18 months post injury were able to do this, but not all of these could. Simon made no verbal or non-verbal requests for assistance. However he experiences significant psychological difficulties adjusting after his injury, and his social adjustment may contribute to his non-ability to ask.

Louise does not copy others, but she is very independent and socially isolated. It is as if she does not realise the presence of other pupils. Simon on the other hand, who also has social difficulties, is highly aware of others and of what they think of him. He copies others frequently. Owen has appropriate support from a well-trained and experienced TA and a support teacher employed exclusively for him, and when he is stuck he is able

to get the assistance he needs from them, so he has no need to copy. But in the time I observed him he also did not try out ideas or follow patterns he had established for himself. This could have been that I did not observe him for long enough, but he may have learned to rely on his TA, even though the school has a policy of switching the TAs around.

Repair methods seem to depend on the modes of action available at the time. These matrices only show which strategies are used in each type of lesson not the proportion of each.

<b>Language</b>	R	N	C	A	S	I	V	O	B	L	G	E	M	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	U3	4	4
Asks	✓	✓		✓						✓	✓	✓		
Stops		✓				✓		✓		✓	✓			
Trial and improvement				✓								✓		
Copies		✓	✓				✓				✓	✓		
Follows a pattern	✓	✓												

Matrix XIX

<b>Practical</b>	R	N	C	A	S	I	V	O	B	L	G	E	M	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	U3	4	4
Asks		✓		✓			✓	✓	✓	✓	✓	✓	✓	✓
Stops				✓	✓			✓		✓		✓	✓	✓
Trial and improvement	✓	✓	✓	✓					✓	✓				✓
Copies		✓		✓	✓		✓			✓	✓	✓	✓	✓
Follows a pattern		✓				✓			✓	✓		✓		

Matrix XX

<b>Theoretical</b>	R	N	A	S	I	V	O	B	D	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	U3	4	4	4	4	U3	4	4	4
Asks		✓	✓							✓					✓
Stops				✓				✓		✓	✓			✓	
Trial and improvement										✓					
Copies		✓													
Follows a pattern										✓					

**Key**

✓ uses this strategy

Matrix XXI

Most pupils are able to use a range of strategies in all types of lessons, but if the mode is linguistic, the pupils will tend to ask for help, or for the meaning of a word. Opportunities to try out here are verbal. In a practical lesson, including maths, practical science, ICT, art, music and technology, with equipment, be it a computer or calculator, opportunities to try out tend to be physical. This may have safety consequences in science and technology practicals, as happened with Nasser, and TAs report concerns about safety for many of these pupils, because of their 'impulsive behaviour'. However, if this is the way in which young people after an ABI learn best in practical lessons, TAs could intervene to slow down the action, rather than stop it altogether.

Theoretical lessons include the explanatory part of most subjects, including the grammar of languages and music, and seem to have a much more limited range of

strategies. The abstract thinking required may inhibit the freedom of the pupil to utilise otherwise successful strategies, but it should be noted that fewer theoretical lessons were observed. This in turn could mean that the pupils are less familiar with such formats and therefore have not had the opportunity to develop strategies. After ABI, pupils do not tend to choose subjects which are taught with a high proportion of theory for GCSE, and, where choice is guided, they are steered towards practical courses. This could be tacit acknowledgement that these pupils have more strategies open to them to operate independently in practical lessons. It does appear that, under conducive conditions, pupils have a number of strategies from which to choose and later in recovery make good use of these. According to Vygotsky (Emerson 1996) intelligence is not so much 'an accumulation of already mastered skills' but how one is able to use the environment to solve problems; it seems that these pupils are able to utilise their social situation to engage with tasks.

#### 6.4 Adult repairs

Sometimes, a breakdown is noticed by the pupil, but more often TAs are in a position to notice them and offer the means for repair. Breakdowns are rarely noticed by teachers, perhaps because they have to spread their attention thinly among the pupils. TAs tend to provide short prompts and hints for the pupil, similar to the directives discussed earlier,

Adam was in a science class and had completed one task. Instead of moving onto the next task, he stopped.

SR: What do you have to do now?

Adam shrugged

SR: Was it on the overhead? Over there?

*I pointed. Adam looked*

The rest of the class were able to move smoothly from one activity to the next, but Adam could not make that move on his own. Initially I tried to move him on with a proleptic question which assumed that he knew what to do, but that was unsuccessful, so I tried a hint to look at the overhead on which the next task was written; he did not turn his head, so I emphasised it further with words, but it was only when I use an action (pointing) that he looked, read and moved to the next activity. I had to make my instruction explicit through an action for it to have the desired effect. Nasser's response to direct instructions was frequently to question them. In each case communication had broken down to such an extent that he did not understand the necessity. Adults in the classroom commonly use this strategy to try to assist pupils with an ABI when they are unable to move on by themselves, but it is rarely, if ever, successful. However scaffolded assistance (Wood, Bruner & Ross 1976) can provide the necessary support for the pupil to become actively involved.

Science lesson, properties of ionic bonds.

*Louise is sitting at the front of the room, the teacher at this point is speaking to another pupil at the back of the room.*

L (shouting out): Sir, how do I know if it's soluble in water?

*He had told them to put a bit of water in the tube.*

SR: Think

*The teacher walked over to her.*

T: What does soluble mean?

L: Melt  
 T: Well  
 L: Dissolve  
 T: So how will you do that?  
 L: Put water on it

*She went to put water on the salt and he walked away.*

The teacher led Louise to understand the meaning of the word 'soluble' so that she could then find her own answer to her original question, through first recruiting her interest in the area, limiting her freedom, by indicating she was in the correct area, and finally drawing her attention to a critical feature of the problem. However, I saw very few teachers who employed this strategy with the pupils. Another option open to teachers is to pose an authentic question (Ainley 1988, Skidmore 2000, Young 1992):

Evan had been working at his art project. He was well behind the others. The teacher introduced the lesson with a reminder of the way the project was structured and Evan continued where he had left off in the last session. He then stopped working.

SR: What next?

E: I think you have to do Alice

SR: Do you draw it yourself or get a print?

E: Don't know

SR: How could you find out?

E: Ask sir

*He was not in the room at this point. Evan did nothing*

SR: Could you look at someone else's?

*Evan went to look at his cousin's again and saw that he had to do another sheet with the main picture which he proceeded to draw.*

Having again attempted a proleptic question, I tried hinting by giving two options from my observations of what other pupils were doing at the time. This too was unsuccessful, so I asked a genuine or authentic question, one to which I did not know the answer, 'how could you find out?'. This would have been successful had the teacher not been called from the room at this point. My next move was a further hint, to copy someone in the room, and this time the hint was understood. Evan seemed to need the authentic question in order to be able to put the hint in context. Different pupils respond in different ways to these strategies as shown in this matrix:

Attempts at repair	R	N	C	A	S	I	V	O	B	D	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	4	U3	4	4	4
Hirts		X		X	X	X	X			X	X			X		X
Direct commands		✓X	✓	X		✓				✓	✓		✓		✓	
Authentic question		✓		✓							✓			✓		
Scaffolded				✓				✓			✓		✓			✓
Prleptic		X		X	✓X						✓		✓			X

Matrix XXII

### Key

✓ successful

x fails to repair

Where scaffolded assistance or authentic questions are used they are successful in repairing the breakdown, but they are rarely used. Many of the examples above were introduced by me, either deliberately to see what would happen, or incidentally, as this is a strategy I naturally use and pupils I know well are used to it. However there were several examples from two other teachers, all of which were also successful. Owen's teaching assistant was also instructed by the support teacher to use elements of scaffolded instruction in her support, including reducing the degrees of freedom when required to choose. Proleptic utterances to repair breakdown, seem only to be successful with some older pupils. This may reflect the age of these pupils at injury as well as their current age, although the oldest at injury and at observation was unable to repair a breakdown with the help of a proleptic utterance.

## **6.5 Making meaning despite ambiguity**

In this chapter I have examined pupils' response to ambiguity and how breakdowns in communication are repaired. When pupils notice a breakdown they may ask an adult for help verbally or non-verbally, but will copy other pupils, rather than ask. Older pupils are more likely to be able to verbalise their need for repair from the time of their return to school, while younger pupils and Year 7s will copy, perhaps due to an unfamiliar environment. Pupils may also try to follow a pattern they have used previously, or use a strategy of trial and improvement. Too often, the pupils stop what they are doing and sit still. This may be provoked by not understanding a hint, or not knowing what to do next, or it could be triggered by mental overload as the pupil tries to choose one from a number of options. It seems to happen less frequently as recovery progresses, and more with some pupils than with others, but with the long recovery period of ABI, this will be a feature of the classroom behaviour of most pupils post-ABI. At this point it is vital for someone to be able to move the pupil on. Most TAs use a prompt, a hint, to move pupils on but this tends to be unsuccessful, possibly because of the implicit nature.

Authentic questions, asking about the pupil's knowledge of the task, rather than content, are much more successful in that they require a personal response which can be made by no one else. Some of these questions may be proleptic, making an assumption that the pupil has relevant knowledge. These utterances are mostly successful, but not in all cases. Another strategy is to give a direct command, which are mostly obeyed. Where a pupil experiences a major breakdown in communication, scaffolding instruction seems to be extremely successful. It involves collaboration between the pupil and the teacher in the joint construction of knowledge which is contingent on the pupil. This kind of intervention is not witnessed much in the mainstream secondary classroom, but could be used to great effect by skilled teachers and TAs.

Communication is rarely wholly explicit. It relies on all kinds of assumptions, about context, experience, skills and thinking speed. Pupils after an ABI may no longer have immediate access to some of these skills, e.g. perception, or they may only have access to a limited skill in this area, which may be further restored as the brain recovers. This may limit perception to only part of the information provided, or it may only allow focus on the detail and not the whole picture, which can then interfere with the monitoring process. Touching the additional information as it is mentioned in the text

may help, as may linking ideas and concepts. Other reasons for a breakdown may involve memory.

Homonyms are frequently used in classroom discourse. Alternative understandings are appreciated when they are pointed out. Sometimes pupils choose the appropriate meaning in the context, but at other times there seems to be no mechanism to suggest that they should look for an alternative and asked to find the two meanings for themselves, they encounter difficulties. Where phrases appear frequently – e.g. a favourite phrase of the teacher – the pupil can learn the context specific meaning. Mostly the pupil chooses the meaning they hear most often, around the home or outside school.

Jokes, too, can be understood and explained when forewarned of the linguistic technique being used. I worked with explaining puns, metaphors and jokes before some of the pupils returned to school, but they are still not recognised in context. It seems that the pupil, having made one interpretation of the word, is unable to discard this and look for another, more appropriate, one. After ABI, pupils can join in with visual or social jokes, but not when they involve word play. Some utterances can be funny when taken on a literal level, but are intended and understood by others in the class at a metaphorical level. The pupil with ABI is then isolated as the only one laughing. The use of smutty remarks often depends on linguistic ambiguity. As a home tutor I comment on their appropriateness when they arise in lessons, and as a result those I taught at home do not use such remarks at school, at least not when I am listening. This shows a level of control which is generally not acknowledged for this group of pupils, who are generally regarded as impulsive (e.g. Glang *et al.* 1992, Walker & Wicks 2005).

Literal interpretation is the fallback position for pupils post-ABI, which may be why jokes and puns may have to be explained, and metaphors and allegories do not necessarily explain concepts. In many cases pupils appear bored or fidget when a metaphor is introduced, which is probably a sign that they do not understand the communication. Pupils overcome their difficulties in using metaphors in a number of ways. In written work they isolate a key word (which could be metaphorical) and then find the appropriate word in the text and copy out the relevant sentence. This does not work in class discussion or exposition. In that case they opt out, or ignore it. It may be thought that a simile would be more readily comprehended than a metaphor, but despite the presence of the indicator 'like' this does not appear to be the case.

However, where the pupils control the context themselves, they are able to use these formal devices. Surprisingly, evidence from this set of pupils shows that irony may be both used and understood, by pupils who are relaxed and have a cheerful personality. There is medical evidence to show that chemicals in the brain, which are released when relaxed, help to stimulate connections between cells (Curran & Turner 2006). However while the possibility of sarcasm is appreciated, its use can be misunderstood. It may be that aspects of non-verbal communication are ignored (Miller *et al.* 2006).

When control rests with the pupils they are able to use imagination to make meaning after an ABI. Imagining something described by another appears to be particularly difficult, while role-play is understood as a task to be completed but not as a metaphor. The suspension of reality appears to be generally difficult for pupils after ABI and

extremely problematic for some pupils. The degree of difficulty seems to increase with younger age at injury.

At times, Gricean maxims of conversation are suspended in classrooms, which is not always understood after ABI. Those who have been back in school for a longer time are more likely to realise that teachers hint to assist engagement with a learning task. This may mean that this would be an area worth discussing with pupils in preparation for their return to school. Teachers use such hints to scaffold learning but also to discipline (get a class moving, wash hands, wear safety goggles, report to teacher). Prompts tend to be rather short ambiguous utterances, employed to encourage the learner to think actively. When words are omitted pupils post-ABI seem to misunderstand communicative intention. Gesture or example increases the likelihood that the prompt will be understood in the way intended. Cues involving concrete actions are more likely to elicit an appropriate response than those involving abstract ideas such as 'finishing work'. Those provided as commands seem to be more readily understood than questions, and questions more readily than statements, but any containing three or more parts seems not to be understood by any of these pupils at this stage in their recovery. Teachers also employ key words or phrases to indicate that they require certain behaviours, e.g. 'right', 'now', 'remember'. The young person with ABI seems not to be aware of the special place these words have in classroom communication.

Non-alignment of form and function causes communicative difficulties. 'Should', for example, would normally indicate to a pupil that the teacher is hinting, but this is not the case with the ABI pupil, who tends to understand literally. Phrases with two parts, one to do with the action and the other to do with the cognitive action of the pupil, seem to be particularly difficult for the ABI pupil. The phrase 'you need to' seems to be especially difficult to understand. However when the young person is required to predict the end of a phrase or sentence they are more successful, this may be because the speaker is able to continue to add clues until it is understood, while a question or statement is finished and can only be added to by another separate phrase. Multiple hints in this way can irritate, as they emphasise the lack of understanding and seem to point out the 'disability' of the injured young person.

On considering the findings of both Chapters 5 and 6, it seems that different types of teacher communication provoke different levels of response in pupils post-ABI as illustrated in this matrix.

Teaching Strategies	R	N	C	A	S	I	V	O	D	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	U3	4	4	4
Recitation	C	C		C	X	X	C	C	X	C	C	C	X	X	C
Rhetorical questions	X	X		X	X		X	X	X	C		X			X
Directives/hints	C	C	C	C	C	C	C	C	C	C	C	C	C	C	C
Explanation	C	C	C	C	C	X	C	C	X	C	C	C	X	C	C
Authentic questions	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓		✓
Scaffolded assistance				✓				✓	✓	✓					✓
Humour		X	✓	X	✓			X	X		X		X		X
Role-play/imagination	✓	C	✓	X	X	X	X	X		C	X	✓	C		✓

Matrix XXIII



### Key

sss✓ takes part appropriately

X does not take part/inappropriate response

C can take part under certain circumstances

Pupils who were further on in their development when they sustained their injury are more likely to take part in teachers' questioning sequences. However, they do not necessarily gain any understanding from them; like explanations, pupils may still not understand concepts despite participation. Rhetorical questions are rarely understood. The one understood by Louise was used as a cue for action, and although she did not respond verbally, she did so appropriately with action. Authentic questions, where teachers are finding out either what pupils know or what they have done, are always appropriately handled, and scaffolded assistance is successful where it is used. It may be that both of these are heavily dependant on intersubjectivity and are therefore designed for the individual pupil. It seems that a tailored approach is necessary.

The next chapter looks at the way pupils with ABI form concepts and express their ideas.

## Chapter 7 – Forming and using concepts

The formation and use of concepts is a fundamental part of school life; this chapter examines the strategies and processes used by pupils with ABI.

### 7.1 Thinking Aloud

Vygotsky (1979) proposed that, as a young person matures, external speech becomes internalised through the use of an 'inner voice', as interpersonal interactions become intrapersonal. But, for the pupil with an ABI, voicing thoughts externally, or thinking aloud seems to be a necessity.

Louise was tackling a GCSE Maths past paper. She read:

L: A box of chocolates contains 4 hard centres 6 soft centres and 2 foil wrapped chocolates. What is the probability of picking out (a) a soft centre? 4 and 6 and 2, 12. 6 out of 12, a half.

*She wrote  $\frac{1}{5}$*

Even though she is 16 years old Louise normally reads questions aloud. Here she thinks herself through the solution in a very concise way. Despite saying the correct answer, she wrote down an incorrect one. This is not the only example of this, and it becomes quite frustrating. This phenomenon in dyslexic pupils is usually attributed to a poor memory for symbols, especially as a 5 and a 2 could be said to be similar in shape when rotated. She could also have been confusing  $\frac{1}{5}$  and 0.5. It is clear, here, that she is commenting to herself, but it is not always so clear.

Nasser was in ICT learning to build a web page

N: What do I do now?

SR: Look at the list

*He didn't*

N: Write welcome

*He did*

N: Now .....

*I pointed to the list. He read*

N: /c/

SR: Centre it

N: How do I do that?

*I showed him the buttons at the top and let him choose the right one*

N: What do I do?

*I pointed again*

N: Change font

*He did nothing so I showed him how to change the font.*

When Nasser asked 'what do I do now?' I took it to be a question and gave him the answer, but he answered the question himself. I now believe he was thinking aloud, rehearsing his answers. He then prompted himself with 'now' which again I took to be a request for assistance. This time it was given in gesture (pointed) and he accepted it, but could not read the word. The next and subsequent questions were directed at me. Instead of 'now' he then said 'What do I do?', a much fuller question. But it seems as

though I had upset his method of prompting himself, as when he got stuck he was unable to move on in the way he had done previously. Most thinking aloud is grammatically complete and sounds like intermental communication. Such 'thinking aloud' does not appear immediately after injury, but generally once the young person has returned home and started lessons possibly because they need the experience of having the language of learning modelled for them by the teacher. Mike used questions to guide his behaviour and his mother commented that she had to learn to keep quiet and let him answer for himself. Vygotsky pointed out that although this 'inner speech' is fully understandable when used by 3 and 4 year olds, it becomes inscrutable by the time the children are aged 9 years. Piaget argues that such language is 'egocentric thought', and, after ABI, young people do have continuing difficulties with empathy, which may lead us to think that complete utterances would also continue. However condensed utterances appear several years after ABI and, later in recovery, young people appear to allow their thoughts to 'go underground', perhaps as the young people retrace the stages of their development.

Thinking aloud	R	N	B	O	C	S	L	G	A	I	V	M	D	W	H	E
Keystage at injury	Pre	1	2	2	2	2	L3	L3	2	2	2	U3	3	4	4	U3
Current keystage	L3	L3	4	U3	L3	L3	4	4	L3	L3	L3	4	4	4	4	U3
Years from injury	10	9	8	5	4	3/4	3/4	2	1/2	1/2	1/2	1/2	1/2	1/2	1	1
Complete utterances	✓	✓	✓	✓	✓	(✓)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Condensed utterances		✓	✓	✓	✓	(✓)	✓		✓							

Key

Matrix XXIV

✓ shows evidence of, in brackets where reported but not witnessed by me

This matrix is organised by time since injury and shows that the pupils further away from injury use more concise utterances, at least at times. Thinking aloud seems to be a cognitive tool. Even though Simon does not seem to use thinking aloud at all in school, he does so at home, as his mother commented

Mother: I can't always understand what Simon says..... He doesn't expect us to notice.

Without thinking aloud, pupils may fall into inappropriate previously learned procedures.

During a cover lesson for Maths the task was a sheet of mixed questions taken from exam papers.

*Question 4 had a diagram showing a number of playing cards and coins.*

L: probability

*She worked out the various probabilities of getting single cards and single coins without writing them down. She then read the question silently. It said If the card shows '2' and the coin shows 'heads', the outcome can be written as (2,H) (a) List the possible outcomes.*

L: How can I do that? The card is  $\frac{1}{4}$  and the coin is  $\frac{1}{2}$ .

SR: You are asked to do outcomes

L: But we only know the card and the coin. What does it mean 2 H? I can't do that. I know the card is  $\frac{1}{4}$  and the coin is  $\frac{1}{2}$ .

SR: We're not asked about the probability yet, that'll come later, first we have to list the outcomes, what it is possible to get

L: But 2H what's that?

SR: You could get a 2 on the cards and a head on the coins

L: Oh

*She wrote out the whole answer systematically and very quickly*

Louise did not read the question out loud and therefore then did not register that she needed to find outcomes. She immediately fell into the routine practised in class for finding probabilities, without checking completely what she was being asked to do. She classified the question as probability, possibly as the graphics were in large format and dominated the text. After this she perseverated on the idea of probability. She also misunderstood the symbolic notation, 2H, yet she had tackled problems with similar notation previously. It was as if her mind was not clear to access this information; when the notation was clarified, she tackled the problem in a very logical manner.

Thinking aloud seems to help organise ideas, before making them public. Louise did not look at me when she asked the first question. At the time she was looking intently at the worksheet. Although other ABI pupils have poor eye-contact, Louise is very sociable, particularly with adults who are helping her. If what you are saying is not helpful she will look away. At the time I interpreted the second comment as a request for assistance, but I now feel that it was a voiced thought, as it has four distinct ideas, one on top of another. By her third utterance she was looking at me while speaking and the question is much more clearly directed outwards. It also repeats the same information as if I were not supposed to hear the previous utterance. According to Vygotsky, first she should talk to me then to herself, as she takes the ideas underground, and external support fades away but with these pupils it seems to work the other way around. Evan found for himself he needed to address his ideas outwards.

E: When you say it in your head it doesn't sound like the right words but when you tell someone you get the right words

### **7.1.1 Function of thinking aloud**

Thinking aloud fulfils a number of functions. Having been distracted, pupils learn how to get back on task quickly and efficiently. However pupils with an ABI do not always find this easy. George brought himself back on task by thinking aloud,

The class had been asked to write down two school rules that they would keep. There is then a general discussion in class and George is distracted.

G: Two rules I'd keep

T: Have you written two down?

G: Yes I'm thinking

T: George, you can do one, you don't need 2 just do one

The teacher responds to George's voiced thought as if it were a question to her. Although George replies 'yes', he had not written two down, the 'yes' acknowledges

the teacher. It is worth noting here that differentiation of the task is for George to do less work than the others, rather than to make the task more accessible.

Pupils post-ABI frequently think aloud to initiate actions, as in the previous example. Both Adam and Mike have asked me if they can read the questions aloud, having first read them to themselves and not known what to do. Nasser always reads aloud, but his teachers put this down to his poor reading ability. I suggest that this may be a partial explanation. In a normal classroom there is usually a murmur of noise and therefore the space for the ABI pupil to talk themselves through the problem, but not in exams.

I had given Louise a sheet of maths questions to revise some work she had had difficulty with in a previous lesson.

*Louise read out every question aloud. I asked if it helped. She replied in the affirmative.*

SR: What about in exams?

L: You just mutter under your breath

Even in the silent exam hall Louise knows that she will need to ‘voice’ the instructions she is given, and just does it as quietly as possible. She is far more aware of her needs and strategies to fulfil them than many authorities on ABI would credit her (e.g. Glang *et al.* 1992, Walker & Wicks 2005).

### **7.1.2 Form of thinking aloud**

Possibly teachers could vicariously act as the inner voice, but thinking aloud seems to need to be done by the individual pupil.

In art, the task was to choose a painting and write about it. She had written several lines, struggling over some of it and I had helped her.

L: Is that it?

*I read the framework written on the board.*

SR: Have you included all that?

*Louise nodded, but she had not*

It was not enough that the instructions were read out. It may have been better to ask Louise to read aloud the framework and check that she had completed the task, so that she would have had to deal with the information herself. It is difficult to make meaning with multiple part instructions after ABI (Chapter 5) and it may be that by reading aloud the material is automatically chunked and more understandable. Alternatively, she may have been saying that she had had enough of that task and wanted to move on.

But thinking aloud can assist monitoring

In Louise’s maths class a problem had been set which involved a cumulative frequency graph but the class were clearly not managing it. The teacher converted the lesson to bar charts.

L: (Hand up and shouted out) Sir do I put the frequency up the side?

*The teacher moved to the board and explained what he wanted, answering her question to the whole class.*

L: (*muttered*) I think I’ll go 1, 3, 4, 5, 7, 7, 9

SR: Hang on, look at the board, he’s included a 2 and left it empty

*She then wrote the numbers horizontally*

Louise's utterance allowed me to monitor what she was thinking, but it was only later I realised that she was reading out the grouped frequencies, but then wrote them where the class intervals would usually be placed, having asked if she should write them 'up the side'. It seems that she has perhaps muddled terms, or orientations or both. But she was clearly at the limit of her ability here (her ZPD) although the teacher, in presenting the work, felt that it was appropriate for the class. Her intention however was not to let me monitor - but to monitor her own actions. Thinking aloud can also organise ideas.

Geography cover lesson. Questions set from the textbook. Louise had to read the information and answer the questions.

The next questions were about the Everglades. The first two questions were straight-forward factual questions, which she rehearsed before writing.

After an ABI, it appears that pupils need to rehearse what they will write as a whole and then scribe it. However this technique puts pressure on their damaged memory system, and is possibly not a sensible strategy. TAs could act as a vicarious memory or a Dictaphone could be used to store and replay ideas. Non-injured pupils start to write a sentence and then stop to decide what to write next. They may be prompted to start writing by being given the first few words. This does not help pupils with ABI.

Evan had partially done his homework. The task had asked 'Describe at least four things that you think are good about Brazil. Write a paragraph'.

*Evan had written a list and the teacher had pointed out that a paragraph was required. He did nothing.*

SR: Start with 'In Brazil...'

*He did nothing*

SR: Think about what you want to say.

*Evan said, then wrote: Brazil has some great beaches and hotels which is great for tourism.*

*Then without having to hear it aloud, he wrote: They can make some good money.*

*The next task was a cloze passage. He read it out and inserted all the missing words with no problems.*

It may have been that Evan was already thinking about his response, but he did not tell me so, and he usually did if I interrupted his thoughts. However, modelling a start to the sentence did not help, he seemed to need to gather the whole phrase together and hear it. The second sentence then appeared without being spoken aloud first. It seems that once he had focused on the task he was able to plan internally. My suggestion was authoritative and did not give space for Evan to bring in his own ideas. However, where the pupils are able to find a sentence in the text to copy out, they can complete such question and answer tasks very quickly.

Nasser was in a geography lesson, doing bookwork about measurements of climate.

*The first question asked how temperature was measured. He clearly pointed to the picture of the thermometer and then found a sentence to copy out*

*letter by letter. There were a mixture of pictures and icons on the page and when I asked how temperature is measured he pointed to the icon.*

N: Number 4

SR: These first? (*pointing at questions 2 and 3*)

N: w-i-n-d-s-t-r-e-n-g-t-h (*letter names*)

*Again he found the relevant sentence and copied it without change.*

*For the other two this was not possible, as the sentence started with 'it' and he stopped*

SR: Let's make a sentence, what could you put instead of 'it'?

*No reply. I pointed and said*

SR: Wind direction is measured.....

*Nasser hesitated, I pointed at the sentence and then Nasser started to write what I had said, following it up with the rest of the sentence. He had similar difficulties with the following answer and needed the same assistance.*

Nasser was able to find appropriate sentences to copy. They were already verbalised and organised as part of the text, but he still read them aloud. When the sentence had to be rearranged he was unable to do so without a prompt and my indication that he should follow it up with the rest of the sentence. He was then unable to apply what he had done in the first case to the second. This could have been a difficulty with the use of pronouns (Chapter 6) as much as the ability to rephrase or form a whole sentence before writing, but he certainly did not want to write before he had found the complete sentence. In Evan's case the information had been in the form of diagrams and tables and there were no sentences to copy. Unlike Nasser, Evan was not comfortable with my suggestion of a start to the sentence. It did not prompt him on, but he eventually found his own complete phrasing to use. However, when presented with gaps in a passage he is able to find appropriate words very quickly. In this case he is able to engage with someone else's thinking; it is much more complete and does not involve so much implied thought.

Louise is able to rephrase answers.

Louise has been asked to read a page about catalysts and make notes.  
She appeared not to know what to do.

SR: What do you understand from that?

L: That (*she pointed to the words activation energy*)

SR: What's that?

*She read the sentence, no rephrasing*

L: I can't copy all that

SR: Write what a catalyst is and what it does

*She started writing and wrote well, borrowing some bits and rephrasing others*

Here I did not suggest a beginning of a sentence, but broke down the task into two parts (i) write what a catalyst is and (ii) write what it does. This suggestion is also in the form of an explicit instruction. This seemed to have been more helpful. She could then form her own sentences and write fluently. As with Evan, there seems to have been a development in method for organising thought, as she became more focussed (Rees & Skidmore 2007c). Initially she read the text silently, then read out loud, voicing what she would do, then she was able to copy without voicing first, offering the sentence as

in the text, and finally she could rephrase and write without thinking aloud. When asked to write more generally about catalysts she wrote 'Activation energy is the amount of energy to get a reaction started.' I felt that there was a word missing (needed) but she was unable to find it. When speaking in English we miss out such words but written language usually includes them, which Louise does not seem to understand.

However where the young person is prevented from thinking aloud to organise, as when they are required to raise their hand and answer in front of the class, they are not always able to form a complete utterance

Adam had been learning to give his birthday in French and had done so successfully several times to his neighbour and the TA.

T: Who can tell me their birthday?

Adam is first to volunteer again

A: Mon anniversaire...

T: C'est

A: C'est le 20 juin (*very quietly*)

He could start his sentence but then needed prompting to continue. He spoke very quietly at the end and looked down. He seemed aware that he had not been 'successful' in his answer and had needed support. On other occasions the teacher's question does not allow her to support his response and he is left high and dry

Adam's class has been learning about counting in French.

T: What do you notice the numbers 21 to 31 (*Adam's hand was up but she continued*) specifically 21 and 31?

A: They .... Don't know

T: You must have been thinking about something

A: They all start with the same number

T: Yes, now look at 21 and 31

Adam knows what he wants to say and raises his hand. He starts his utterance with 'they..' but cannot get any further at this point. The teacher also does not appreciate his difficulties and has no idea what he may be thinking and so cannot assist him. His ideas have not been organised and he needs time to think. When this happens time and time again, it can lower self-esteem and lead the young person to opt out of school learning. When George had an opportunity to think aloud he was able to:

At the start of an English Class George's teacher wrote on board 'I could of done that'.

T: What's wrong with that?

P2: Could

T: No

*General hubub of its ok, nothing wrong*

G: Could

T: Hands up if you think it is wrong

*George put his hand up*

T: George, why?

*George put his hand down*

T: Changed your mind?



*More general discussion followed during which George was muttering*

G: Miss is the word could wrong?

T: No

Hawley (2005) noted that a pupil in her study also raised his hand and then could not answer. It could be that George and Adam do not know what raising their hand in class means. They may be unaware of the particular social rules of the classroom, but given time, and the opportunity to mutter, George is able to add his contribution. It is more likely that he needs time to rehearse. Muttering could have allowed him to vocalise and therefore rehearse his response. Therapists warn teachers that pupils with an ABI need time to think, but they also need time to organise and possibly to rehearse their response. Barnes (1992) suggests that exploratory talk should precede class talk. But difficulties encountered when working in groups or dyads (Chapter 5) does not necessarily mean that asking the pupil to discuss ideas with a friend before sharing with the class would be beneficial. This may be an area where a sympathetic TA may be able to support learning by allowing the pupil to rehearse their answer aloud (as if to the adult) without seeming 'immature' and losing face with peers. However a one-word answer to a very direct question needs no organisation and no rehearsal:

It is the end of lesson, the class have packed up, but 2 minutes are left so the teacher gets out a dictionary.

T: Give me a letter

P1: A

T: Right A. It's a performer, on a st (*she does not even finish the word*)

George: Actor

*A sweet is thrown and he catches it*

### 7.1.3 Action

Pupils also use action as a mode of thinking, to reinforce understanding,

Louise was in a maths class completing practice GCSE Maths papers.

*Q5 Louise read the question aloud and touched the diagram as she read about each line*

L: This angle is equal to that because they are opposite

SR: Yes they are equal, but the word is alternate not opposite. These two are opposite.

*I pointed to two opposite angles. She had identified two of the unknown angles as the same.*

L: y add 2 equals 180. All of them equal 180.  $90 - 48$  then I will take that from 180. That's 42.  $180 - 42 = 138$  so it is 138

Touching the diagram to emphasise the information given as part of the question possibly performs the same function as speaking aloud, externalising a thought. She then managed to recall the correct concept of equality of angles between parallel lines, but gave it a label which refers to other geometric ideas. One might expect that my demonstration of opposite angles would interfere with the information held in working memory, but it did not seem to do this. However, she did not follow through her thinking on this, instead she examined a different unknown angle. 'Y add 2 equals 180' does not make mathematical sense, but if we insert 'the two others' instead of '2' then it makes complete sense. She seems to use a shorthand for thinking, much more concise

than any other vocalised utterances I have recorded. Yet the next part of the vocalisation is again complete, using the words 'I will'. The known angles in the triangle were  $90^\circ$  and  $48^\circ$ . She should have added these two and then subtracted the sum from 180. She seems to recall the wrong operation (subtraction instead of addition) but has no checking protocol to be able to determine that the answer cannot be  $138^\circ$ .

The widespread use made of thinking aloud pupils post-ABI is given in this matrix

Use of thinking aloud	R	N	C	A	S	I	V	O	B	J	D	L	G	E	M	H	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	U3	4	4	4	U3	4	4	4
Reading aloud		✓	✓	✓		✓	✓		✓	✓	✓	✓	✓	✓	✓	✓	✓
As rehearsal	✓	✓	✓	✓	(✓)	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Action to support								✓				✓		✓		✓	✓

Key

✓ - needs to use, at least at times, in brackets if reported but not witnessed

Matrix XXV

Rehearsal seems a very important strategy employed by all the pupils with ABI I have met. Only Simon appeared not to use thinking aloud at school, although he did at home. Older pupils seem to use this technique for a wider number of reasons, perhaps because they are presented with a wider variety of tasks, more responsibility for learning or because they are more aware of their metacognitive strategies.

#### 7.1.4 Permission

It also appears that thinking aloud is used to give permission

Mike was in an art class.

M: Miss can I get some oh....paper you see through

*He did not wait for permission, just got up and found some*

Mike starts to ask a question but does not follow it through. The rest of the class get up to find things on their own, without permission. It may be that Mike did not understand the routine of this particular class, but he did he not wait for an answer. It is more likely that he was thinking aloud. He seems to be giving himself permission to get something, through invoking the name of the teacher. Louise explains this as 'using her imagination'

English cover lesson. The task was to write essay plans for a number of possible exam topics to do with Of Mice and Men.

L: (shouted to teacher) What are essay plans?

T: You have points, you don't write it all out. I'm a science teacher and if I were writing about science I would do an introduction and then a paragraph and then another.....

*The teacher drifted away*

L: I don't do that

SR: When you are in exams do you do a plan?

L: No

SR: How do you write then?

L: I just do it. In my mock maths I pictured myself at the back of the class and tried to listen to what Mr H was saying, but I couldn't hear him. I use my imagination a lot.

She wants to 'hear' what the teacher is saying, but the words don't come. It may be that her normal practice of thinking aloud, which is internally persuasive, has not worked and she falls back on the authoritative discourse of the teacher. But if this had worked, she would have produced an internal dialogue, through casting one voice in a character. Permission again has to come from outside; Louise is more aware of the processes involved, so she calls it 'using her imagination', and in doing so shows she has insight in to her metacognitive strategies. She does not consciously plan her answers, but listening to an imaginary teacher is still planning for yourself, but crediting someone else. It could be that Louise does not want to believe in her own ability to solve the problem and when she is unable to solve it, it is preferable to blame Mr H rather than herself. This is a particular problem with homework and coursework

Discussion with history teacher about William.

SR: What about his coursework?

T: He has not given me any

His teacher put this down to memory and lack of organisation. But William was convinced he had given it in. On several occasions, with different pupils, I have enquired about homework, to be told that it has been done, but when I ask, it cannot be produced. The young person genuinely believes that they have completed the work and searches high and low on the computer and among their books, but it cannot be found. I do not think they are 'having me on' as it happened too frequently and with several pupils. The answer for William, at least, was to involve his father to witness and sign when he had seen the homework. It seems that the thought has become the reality. After ABI, pupils believe homework has been 'done' once it has been considered, and by thinking about asking the teacher, then the teacher has given permission. This has implications for behaviour, both in school and in the outside world. It is known that young people with ABI lack the facility to make appropriate judgements (Deaton *et al.* 1995), and are more likely than others to become involved in antisocial or offending behaviour. A high proportion of young people with an ABI are excluded from schools because of their actions. I suggest that this confusion between the world of the imagination and the real world may be at least part of the reason that this happens.

Only a few of the pupils I observed made a link between thoughts and the real world, as shown in this matrix; those who coped with role-play, (see Chapter 6) are also shown.

<b>Imaginary links</b>	R	N	C	A	S	I	V	O	B	L	G	E	M	W
Keystage at injury	Pre	1	L2	2	2	2	2	2	2	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	U3	4	4
Real/ Thought	✓		✓						✓	✓		✓		✓
Role play	✓		✓						✓	✓		✓		✓

**Key**

✓ made links

Matrix XXVI

Those who get into difficulties because they make links between the real and thought world are mostly those who are able to cope with role-play conditions. It is as if they cannot tell where the real begins and the imaginary ends - other pupils ignore the imaginary totally and therefore do not get into such a muddle.

## **7.2 Representing ideas**

Thinking aloud externalises intramental behaviour, but in order to communicate and make meaning, pupils also have to express themselves to others. Words are the symbols used for both intramental and intermental actions, but expressing ideas to others necessitates an intersubjectivity not required in intramental behaviour.

### **7.2.1 Cohesion**

Cohesion, where consistency of meaning is maintained across possibly ambiguous utterances, seems to be particularly difficult after an ABI, through the use and understanding of pronouns (see chapter 6), conjunctions and consistency of idea. Louise assigns a meaning to a pronoun without informing her listener, indicative of a difficulty with empathy or Theory of Mind (Happe & Frith 1995).

Louise and I were chatting while walking between lessons.

SR: How's it going?

L: I don't like it

SR: What's that?

L: The new timetable, I don't like it, it's difficult. Last year you could follow it better

I had meant my question in a general sense. Louise assigned a specific meaning, but did not inform me of it. In this case it did not matter as my question repaired the breakdown, but Simon's misinterpretation was more problematic. His history teacher had been discussing two pictures of buildings in his town. When he was asked to 'have a look at them' he was unaware that he had to look at the two pictures on the page. This then meant that he was unable to complete the task of comparing old and modern architecture and his writing only commented on the older building.

Although inconsistency of topic in expressive language (tangential speech) is well documented in the clinical literature (e.g. Walker & Wicks 2005), and may be witnessed in non-classroom conversations, this does not seem to effect classroom oral language seriously. It may be that the pupils are aware that they need to focus in class. However inconsistency, i.e. moving between ideas, topics or subjects, may be seen in written work. William initially described John Pinney's house as an 'average sized Georgian house', but only a couple of sentences later declared that John Pinney was 'an important man so it is quite large'. When writing, attention must be sustained over the length of the piece, and the process of writing, as opposed to speaking, requires control over a number of different processes. Inconsistencies could result from inattention, or the need to divide attention (Rees & Skidmore 2007c). Another piece of written work shows a number of difficulties:

William wrote,

The Shakespeare pub was of hospitality and an office before it was established as a bar. It was also originally joined to the building next to it as

it has been separated now. The pub is of two original Georgian houses, but the third is separated and is now used for personal use.

The word 'of' in the first sentence it best read as 'used for', while in the second sentence the wrong conjunction has been used ('as' for 'but'). In the third sentence the verb should read 'consists'. These errors seem badly out of place in a piece of writing which uses mature language in other phrases. The piece does not cohere and the reader has to work hard to understand what he meant. Written work is frequently repetitive:

William was starting his ICT GCSE Coursework. He had been given a framework to follow. The first task was to analyse the problem and write it up in Word. He wrote three sentences.

'I am creating a database on houses. I need information about houses. I will find information about houses.'

All three sentences said the same thing, but he could not see it. On the other hand William also omitted words when writing,

William was writing about John Pinney's house for history coursework.

Pinney used his house meetings, gatherings and living of course.

William told me he had checked it, and when I asked him to read it he could not find the missed words, a common difficulty. Here he has included the key words but missed the word 'for', a functional word rather than one imbued with meaning. In spoken language, there are many examples of functional words being omitted.

In an art lesson the teacher approached with the mask Mike had been working on. He looked at it and touched one area.

M: Missing

SR: Could you get another piece?..... How is it stuck down?

M: Glue

SR: Yes, what sort?

M: PVA

I understood his first utterance to be 'there is a piece missing'. He did not respond when I asked 'could you', which could be due to the difficulties with understanding the conditional (Chapter 5) and I asked a much more direct question. His answer misses words, other pupils would probably have said 'with glue', but the answer to 'what sort' is reasonable as one word. Difficulties with conjunctions appear in written work rather than spoken, where they are generally avoided.

Vicky chose to write an account of her injury, which is reproduced as she wrote it.

We all had a go on Lee's motornime with him and affer a hour callams quad so then I put on the cash hemmet and i dive of and the after a little go I cashed into a steal gate I badly hurt one side of my face that is the left side.

This was written fairly soon after her injury and illustrates some of the difficulties she was experiencing at the time with controlling written language. She seemed unable to delay writing long enough to check the spelling. It appears that she starts to add

information to the sentence with the word 'and', follows it with 'the' and then starts a new sentence with 'after'. She told me at the time she had 'proof-read' the piece, as we were working on that skill at the time. She was unable to see any of the difficulties a reader may encounter. Of the pupils I have observed, nearly all show some lack of cohesion in their expressive use of language, as shown in Matrix XXVII which is organised to show diminishing time since injury

<b>Cohesive difficulties</b>	R	N	B	O	C	S	L	G	A	I	V	D	W	M	H	E
Keystage at injury	Pre	1	2	2	L2	2	L3	L3	2	2	2	3	4	U3	4	U3
Current keystage	L3	L3	4	U3	L3	L3	4	4	L3	L3	L3	4	4	4	4	U3
Years from injury	10	9	8	5	4	3/4	3/4	2	1/2	1/2	1/2	1/2	1/2	1/2	1	1
Pronouns		✓			✓	✓	✓	✓		✓	✓	✓	✓			✓
Conjunctions											✓	✓	✓			✓
Repetition									✓				✓			
Consistency of idea	✓		✓	✓					✓		✓		✓			
Functional words omitted-spoken							✓								✓	
Functional words omitted-written											✓		✓			

**Key**

✓ shows evidence of difficulties with

Matrix XXVII

It appears that as the pupil recovers the difficulties in this area decline. Nasser's difficulty with pronouns may stem from English being an additional language (EAL).

**7.2.2 Condensed language**

Like Mike, Nasser provides one-word answers, but it seems that the reason may be different:

The teacher was setting up an improvised drama putting Frankenstein on trial.

T: We need lawyers, witness and the author

TA: What were you?

*Nasser pays attention to the TA and not the teacher*

TA: Don't let me keep having to tell you to listen

*Nasser raised his hand*

N: Defence

T: That's coming

TA: What were you?

N: Defence

TA: What does defence mean?

N: Court

T: Lawyers, as Nasser has said, you can defend and you can prosecute.

Think about questions to ask and to answer. What we will do is have the two sides here and when the witnesses come up they will stand here.

Nasser's responses at this point in the lesson have become very terse. He is under a lot of pressure in a noisy classroom, dealing with concepts he does not understand. Later the TA asked 'Do you know what a defence lawyer is?' Nasser clearly did not, yet earlier in the lesson his contribution 'court' had been taken to mean that he understood and further explanations were then based on this. When the young person becomes 'overloaded' their expressive language becomes condensed. Yet, at this point, they need to express themselves fully, so that those around them can pick up the root of their confusion and explain the situation or concept. Under stress, their language becomes terse, condensed and almost monosyllabic. They do not try out ideas for themselves, and think their way around problems using dialogue with another to support their thinking. Just as they are working on the cusp of new ideas, as they develop their concepts, these pupils seem unable to take their part in persuasive dialogue. Moving from the specific to the general seems particularly difficult.

Owen was writing a story based on a film they had seen.

T: Who are your characters?

O: Simon's sister and Joe's brother

T: What personality is Simon's sister?

*Owen muttered*

T: If you think a bit about it brothers and sisters are often different

*Owen did not answer*

T: Do you think brothers and sisters are often similar?

O: Yes

T: Is your brother like you?

O: Yes

*He then gave several examples, spoken quickly*

When concrete examples were required Owen was able to find the words and spoke clearly in complete utterances. But the teacher was asking about generalities. Owen was unable to express himself well. Despite muttering, he was unable to offer a coherent idea. In several examples pupils mutter when they are unable to express their opinion or when something is too hard, possibly to rehearse ideas, but here Owen comes up with nothing. George's written work shows a similar difficulty, in distinguishing between the specific and the general.

George maths GCSE coursework

'I have spotted that the 3 step that it go's [sic] up in 6 and I wonder what will happened [sic] if you change the step and if the nth term[sic] will change The nth term [sic] for 3 step is  $6n+44$  and here [sic] is the proof

45

35      36

25      26      27

194

$6n+44$   $\longrightarrow$

$25 \times 6 + 44$

$=194$

This is very difficult to follow unless the reader is very familiar with the investigation, but it clearly means something to George. However, George certainly does not

understand the concept of mathematical proof and its generality. This is not uncommon among young people in Year 10, but George's teacher expected that he would be able to, with the standard of Maths he achieves in other areas.

Simon is not very forthcoming at the best of times, but when he is stuck he becomes monosyllabic. Simon is a very academic pupil, from a family with high expectations and more recently he has become clinically depressed as it has become obvious to him that he is unable to function as others do. On the other hand, I did not record any condensed spoken language from William who has not suffered from depression since his injury. The manner of use of expressive language after ABI may be an indicator of mental health and a simple classroom-based early warning of the need for intervention.

Yet at times pupils with ABI are able to provide a very full explanation, or question. All the pupils I have observed have been able to do this.

At the end of a maths lesson,

T: Make up your Rags

SR: What's that?

M: You have to draw a traffic lights and then make red for 'didn't understand at all', amber for 'could do with some more help' and green for 'that was easy'

*He marked red.*

Mike's injury has severely compromised his memory, yet, in this case, he is able to produce a full explanation of something which had been explained to him at least 3 days earlier, as this was after a weekend. However my question was a genuine request for information which he had and I did not. It also required him to report factual information that he fully understands. When pupils with an ABI ask a question of a teacher, or express an opinion, they are always fully expressed. Pupils also move from one form to the other in quite short spaces of time.

Mike was in an art class, painting his mask.

SR: What about the holes?

M: (*shouted*) Miss, have you got a thin brush?

*She got one and came over*

T: We want to be delicate do we?

*She painted some little bits*

M: holes..... It's the holes

*The teacher look quizzically at me*

SR: He was thinking of getting it in these holes

T: You've got a big fat brush you can go around with it

Mike here started with a complete utterance but the teacher, unexpectedly to Mike, did not seem to understand what he wanted. As he became agitated, his language became condensed and then once more expanded to 'it's the holes'. This was still not enough to explain why he wanted the small brush and I explained. The ability to expand language shows that they are aware of how much the listener understands, however the young people then tend to get stuck in one way of expressing themselves and though they expand the number of words, they do not alter the words they use. Situations when condensed language occurs are given in this matrix.



Use of condensed language	R	N	A	S	I	V	O	L	G	E	M	W
Keystage at injury	Pre	1	2	2	2	2	2	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	L3	U3	4	4	U3	4	4
Faced with the unexpected		✓						✓			✓	
For concepts		✓	✓	✓	✓	✓		✓	✓		✓	
When asked to empathise		✓					✓					
When asked to generalise									✓			
Expands								✓	✓		✓	

Key

✓ uses

Matrix XXVIII

It is known that highly stressed pupils do not concentrate or learn as well and think less flexibly (Turner & Curran 2006). Condensed language seems to emerge when under pressure, rather than when comfortable with an idea which Vygotsky suggests, although Adam's expressive language does become condensed when he is focussed on his maths problem involving area and perimeter. Pressure may arise when faced with the unexpected, and when dealing with concepts/ideas, especially when generalising. It tends to occur just at the point when it is necessary to develop and expand understanding, possibly through dialogue, but this is not accessible without particular awareness on the part of the teacher. It is reported that, after ABI, it is difficult to add to new learning; this may be one source of the difficulty.

Expansion occurs only with the older pupils and when they initiate the exchange. If the condensed language arises from trying to handle new concepts, or when teachers are asking questions, pupils usually do not expand. However, George did so when asked what was wrong with 'could of'. He was answering a question posed to the class, and, from his facial expression, I could tell he was fairly convinced he had the correct answer. It could have been this certainty which induced him to expand his answer.

Those pupils who did not become stressed, did not show condensed language. Ruth, Evan and William have 'happy-go-lucky' characters, and are in emotionally and psychologically supportive situations with parents and support teachers working closely together. Owen, who also had very appropriate support from a TA who understood about ABI, only showed one example of condensed language.

### 7.2.3 Moving from iconic to symbolic

Ideas may be represented in a variety of ways in communication, both by the communicator and by the recipient. Clinicians generally recommend visual representation (Blosser & DePompei 2003, Walker & Wicks 2005) for young people who have suffered an ABI, and an iconic representation is usually understood with ease. After ABI, pupils seem to be much more alert to visual cues than to auditory ones, which engage symbolic representation. This group of pupils were able to use diagrams and charts around the classroom to assist them with tasks when other pupils in the same situation were unable to complete the task.

Louise was in a French lesson. This was the second activity.

T: OK. You bet

*This is a game the class plays frequently. One pupil chooses a card with topics on and the others had to suggest vocabulary associated with it which is then written on the board. Louise quickly found that the vocabulary was written on the wall behind her and read it out, contributing most of the words.*

No-one else in the class seemed to realise that the relevant vocabulary was displayed in the room. Likewise Simon found the answers to his Geography test on the classroom display, which no-one else seemed to realise; his head kept bobbing up and down as he copied the information, everyone else kept their head down. He had full marks, nobody else did! It could have been that they were keeping to the rules of the classroom, that a test is to see what you know, while Simon just saw it as something to be endured.

The three modes of representation, through action, imagery and symbols, capture experience and hence learning (Bruner 1966). Enactive representation guides activity within instrumental structures. It is a means-end mode full of procedures and typified by what happens in a court of law. In schools there are many procedures, including an appreciation of 'what is done' in class or relationships, and therefore is at the root of how a young person interacts with the game of school, which is found difficult after ABI. But one of the most pervasive is the algorithmic approach to maths teaching, as in this example from a year 10 class.

#### Maths lesson

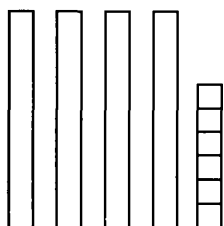
T: Today we will do percentage increase and decrease

*She then took the register*

T: Percentage change comes up a lot and you are supposed to be able to do it. You work out both the same way (*she was writing on the board as she spoke*) And if you could copy this please

If a learner wants to apply the mathematical ideas that they have learned they need to establish the general idea behind any algorithms they learn. Yet, in most classes, the teaching stops at procedures; teachers do not guide their pupils into turning the skills into concepts or principled learning (Mercer 1995). The result of this lesson was that William had no idea how to work out percentage increase and decrease. It seems that the aim in this class is to pass the exam, which is reflected in the method of teaching/learning. The pupils copy and practise an algorithmic approach to percentage change. Mike too could follow a procedure and only showed his lack of understanding later.

Maths lesson looking at the idea of decimals as an extension of hundreds tens and units. Mike had previously measured length using parts of centimetres. Diagrams were given in the textbook which he had to express as a number.



M: 4 sixths

SR: How?

M: There are 4 of those and then 6

Mike had formed a schema (Skemp 1971, 1989) of how to handle fractions, which we had studied previously, involving counting, and transferred the technique to decimals. He had developed a procedure but not understood the principle behind it. Both the work on fractions and this particular decimals task were presented with visual imagery, and it seems that he had seen a link between them. It shows an understanding that fractions and decimals both involve parts of numbers, but he has not differentiated between the two ideas. While the last few lessons had presented tasks involving, and designed to demonstrate, different aspects of decimals, Mike had been able to complete the tasks without developing principled understanding. These young people seem to need more than just well designed tasks to extend their concepts.

Skemp (1971) asserts that in building schema it is important to ask 'How did you do it?' Verbalising is important. Thinking aloud has already been shown to be of great advantage to young people post-ABI. It is suggested that TAs could ask such pupils to explain what they have learned in their own words after teachers have explained the task or if they get stuck. Thus their dialogue with the material to be understood would become internally persuasive. TAs are in an ideal situation to do this as they are not the teacher, and many of them do not fully understand the subject which they are supporting.

William was part of a group experimenting with sodium thiosulphate and hydrochloric acid to find out how concentration affects rate of reaction

P1: It's 40 cm<sup>3</sup> water

W: I can't get that, it only goes to 25 cm<sup>3</sup>

SR: OK so how..

W: ..Two 20s

William was able to find the solution to his problem, but his immediate response was that he could not get it. The temptation for a TA is to tell him how to measure the 40 cm<sup>3</sup>, but in solving his own problem he moves a step nearer to forming adult concepts. However the pupil may need some assistance to make the move. Frequently I have asked ABI pupils about homework, only to be told that they 'got stuck' and have found that it was simply an incorrect assumption on their part. Once an assumption is made, in this case that the water has to be measured in one step, pupils stick rigidly to that idea and it takes an outsider to push them on. When alone, this does not happen and the pupil cannot make progress. It can be helpful to provide a framework, which pushes the pupil move onto subsequent sections of the task, even if they cannot manage the immediate one. Here William had assistance from an iconic representation of the problem, the measuring cylinder.

An iconic representation deals with imagery, including imagination, which serve as prototypes for classes of events (Bruner 1996). It forms a pre-conceptual structure by

which we can compare instances and form classes, and eventually concepts. However care must be taken about the form of icon chosen.

The teacher had involved the class in a demonstration of how salt only conducts electricity in its molten [sic] form.<sup>1</sup>

T: The question is why? It is because it has a crystal structure. We need to look at how the atoms and ions are arranged. For example Sodium<sup>+</sup>, Chlorine-

*He wrote on the board*

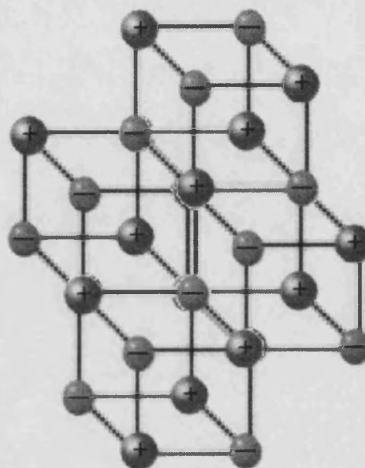
Na<sup>+</sup> \_\_\_\_\_ Cl<sup>-</sup>

T: It is a very strong bond

L: (shouting out) Only because it is opposite to opposite

T: That's right, opposites attract. Not only these two, but others are attracted

*He drew a grid of ions on the board and then continued with it into 3-D*



L: But aren't they supposed to be circles not squares?

T: These are atoms, but they join together to make big crystals

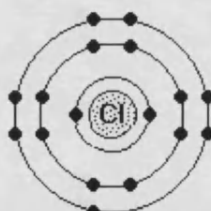
SR: Are you happy about that?

L: Yes

In the last few lessons the class had been exploring the iconic representation of an atom, e.g.



Na (11) 2.8.1



Cl (17) 2.8.7

And suddenly the lines, which had been circles, formed squares, without an explanation that the lines now represent attractive forces, rather than spherical shells around which the electrons move randomly. Louise had not followed the change although the rest of the class seemed comfortable with the transformation. She then answered that she was happy with the teacher's explanation, but she did not look convinced. Perhaps she was being over-polite. In a later lesson she was unable to answer a question about giant structures satisfactorily.

<sup>1</sup> I am aware that the teacher should have used the term dissolved not molten, as salt melts at 800°C

In schools, symbolic reigns supreme (Gardner *et al.* 1996). Words are preferred over images in both teaching and in testing. When provided with iconic representations, the pupils are sometimes able to move to the symbolic for themselves.

Ruth's teacher had just asked for volunteers to talk about how their school visit had made them more independent. Her group were chatting while the teacher prepared the activity.

R: Independent means when you were abseiling, you have to go down on your own

P1: Its... You are away from Mum and Dad... you're away from home

R: Independent means doing an activity on your own

Ruth initially relates the concept of independence, introduced and labelled by the teacher, to a specific incident in her own experience, that of abseiling, of which she has an image. Her friend elaborates from her experiences of being away from her parents, but it is Ruth who is able to generalise these into a symbolic, and therefore transferable, representation. Ruth is many years post injury, but early in recovery this seems to be very difficult.

Although Bruner (1996) in his later writings asserts that enactive, iconic and symbolic modes of representation should not be seen as developmental, many schemes of work are set up with this in mind. While other pupils can make the move from iconic to symbolic representation, it seems to be slower after an ABI. Ian, when presented with symbols in algebra, referred to them as the concrete meanings much longer than his peer group.

Maths lesson in a series introducing the idea of algebra through role play of taking orders in a café. Initially questions were presented as concrete items, then questions were posed in symbolic form e.g.  $t + c =$

I: Tea and cake

Ian seemed not to want to make the jump to refer to the items as symbols. Later in the exercise the symbols changed to  $v + w =$ , much more difficult to associate with objects, and he stopped, although he had managed to handle the maths when it had been associated with concrete objects. It seems that Ian needed to be able to represent the symbols as concrete objects in order to manipulate the ideas. In some ways giving an object a label, 'stand' or 'TV' is just as symbolic as  $w + v$ .

Having tackled several mixed addition and subtraction 'sums' the next task was to solve a problem expressed in words and pictures. Nasser could not read the problem. I read it to him pointing at the words.

Q: The TV and the stand together are 77.9 cm high. The stand is 32.6 cm high. How high is the TV?

N: 77.9

SR: That's the TV and the stand

*I pointed out the picture.*

N: 32.6

SR: You can use the calculator for this.....What's the TV and stand together?

*No response. I pointed at the picture*

SR: 77.9? And the stand on its own?

*No response*

SR: 32.6? So what do we have to do to get the TV on its own?

*No response*

SR: What sort of sum would we have to do?

*The bell went and he joyfully left the class!*

The diagram which accompanied Nasser's task did not help him to work out what to do to find the height of the TV. Though he can add and subtract, Nasser's concept of addition and subtraction seems to be limited to the algorithm. Nasser's initial response was to repeat one of the numbers in the question. I pointed to the picture to try to relate the problem to a meaningful context, but it was no help and he chose another number given in the question. He seemed firmly wedded to the algorithm. He seemed to have no idea of subtraction beyond process or a procedural skill to be used in certain limited circumstances. Nasser had learned addition and subtraction algorithmically and did not have an iconic representation of these concepts. If maths is taught as a series of facts or skills which never mesh together, or are applied to practical problems, any pupil will be very limited in their understanding. Subtraction is usually taught in a very practical way initially, but by Year 6, when Nasser entered the UK education system, only implicit examples of the use of algorithms are given, so although he has had opportunities to build the concept of subtraction, he will not have been explicitly guided into such an understanding and he has not been able to develop the concept unaided.

Generally, iconic representation, even in the imagination, seems to make the task easier.

William was tackling two stage equations in maths. Previous questions all had had whole number answers. He had followed the technique given by the teacher and solved each one alone. For this one he got to  $5x=4$ .

SR: Let's think, 5 T-shirts cost 4 pounds. How much does one cost?

W: Long silence.....divide it by 5

SR: Try writing it down....as a fraction

He could not so I did it. We did the next one and he could write it down

OK. Then on the next one he got  $2x=15$

W:  $x=2.5$

SR: Hang on, put it into real things....2 T-shirts cost £15

W: (*very quickly*) One costs £7.50

SR: Write it

W: Is that it?

SR: Yes

Initially I made it explicit that he needed to find out what one T-shirt cost. He had previously tackled this stage of the procedure on his own, so I do not think that this was the problem. It was more likely to be that in this question he had to focus on the mathematical operation, which he was able to label as division. However he could not tackle this symbolically, even when I named the symbolic representation needed as a fraction. This may be because his understanding of fractions does not incorporate division; it is procedural rather than principled (Edwards & Mercer 1987, Mercer 1995). He could then follow my demonstration, procedurally for the next one, but made an

arithmetic error on the following one. When prompted he corrected this, but the surprise in his voice when he realised it was correct, showed that he still did not really understand what he was doing, despite the iconic representation. His understanding of equations remained procedural. The style of the lesson also provides supports to develop ideas.

English lesson, studying the Prologue to Romeo and Juliet.

T: Now I've talked enough. You have sheets. I want you to underline the 5 most important lines in the prologue and jot down why.

*Louise stops and looked at me*

SR: What have you got to do?

L: Underline the five most important lines and jot down why

*She underlined the one given as the example and the reason discussed by the teacher. She then stopped and looked at me.*

SR: Lets start at the top and see if they are important

*She did this and got as far as line 3, then the teacher arrived*

T: Line 3 is important see if you can work out why

*Gradually she chose five lines and wrote about them with a lot of help and discussion. On two occasions she reminded me we needed 5 lines.*

The teacher here wanted his pupils to 'discover' for themselves that every line in the prologue is important in setting up the story. He instructs the class, in symbolic mode, he models what he wants, but not explicitly, and uses an inexplicit phrase 'jot down', to tell them what to do. This presentation is difficult for Louise on a number of levels and she cannot make meaning with it. Louise realised that she did not know what to do next, and used a non-verbal appeal for a prompt. Her TA tends to instruct before Louise gets stuck, while I wait and prompt. This allows the pupil to develop independent thinking strategies, but is against the generally advised practice of errorless learning (Baddeley & Wilson 1994).

Errorless learning is held to assist with learning where memory is impaired, as is often the case after ABI. Errors made by the individual are stored as episodic/iconic memories which are more easily recalled than the instruction/ correction presented symbolically. However the technique is limited to domain-specific knowledge. The advantage of errorless learning for procedural material does not carry over into reasoning tasks. Behavioural techniques, such as errorless learning, are criticised for failure to produce learning which is maintained over time and generalised (Porter 1986). Instructing too early denies independence and autonomy in learning. After ABI, young people are held to be suggestible; if we do not give them the tools for thinking then they will only be able to be followers and not leaders. The use of a non-verbal sign could also be interpreted as lack of confidence, but this seems unlikely in view of Louise's confidence in attracting teacher attention, although it could be lack of confidence in her ability to remember what was said. However, on other occasions, she was able to start on her own. Another interpretation could be that, once again, she needs to verbalise the instruction which the teacher has given; that her 'inner speech' has failed to support her learning. She is well able to repeat the teacher's instruction word for word, just as she had remembered the science teacher's demonstration of the expansion of gases experiment. This was not a case of not remembering. She knew exactly what to do once she was prompted. That prompt had to come from outside and she seemed unable to give herself that prompt on this occasion.

Louise was very reluctant to move outside the framework of five lines presented by the teacher, she constantly sought the 'right' lines, yet he was looking for the class to support their chosen line and he concluded this part of the lesson by accepting every line suggested as important. Support in the lesson may be garnered from a number of different layers of meaning all of which interact to produce the style of the lesson: the teacher's instruction, the text, previous class open discussion, and dyadic dialogue (which Louise refused). Louise described this lesson as 'confusing', although she attributed it to the Shakespearean language. I suggest it could equally have been due to the layered nature of the lesson format and the requirement for inductive logic. However she was able to use some figurative language in her contributions and was able to empathise with the characters, showing some flexibility in thinking.

#### 7.2.4 Words as labels

Word finding is a major source of errors in the making of meaning. Pupils are required both to understand the language of others (receptive facility) and to express their own ideas (productive facility). Words label concepts and provide a shorthand for talking about concepts with others, but the young people with an ABI cannot always recall the labels, even when they can recall the concept. If the symbol, which labels the concept, cannot be recalled, it cannot be used to think. Each word we know is part of a vital world linked by thousands of associations, each opening a myriad of graphic and emotional memories. When we need a word we have to choose from a number of possibilities but generally only one fits the situation precisely (Luria 1973). Mike does not recognise the label but the concept is intact:

Mike was answering questions about passing time from a text-book.

Q: The train leaves Plockton at 2015. The journey takes 20 minutes. What time does it arrive?

M: 25 to 9

SR: What's that in 24h clock?

*Mike sat and looked at it*

SR: (pointing to the 2015 in the question) Like this?

M: 2035

By showing an example I circumvented the need to understand the label. Pupils are required to memorise facts, using semantic memory, which did not have meaning in their everyday life and the pure symbol (the word) was not recognised. If there had been a meaningful representation to be able to encode in memory (as episodic memory) it is possible that this would have been more readily recalled. Most pupils also experienced difficulties in finding a suitable word; language is punctuated with 'um', 'thingy' and sometimes pupils explicitly ask for help

Evan was tackling a comprehension question.

E: In the Simpsons they kept it in that thing, in the front of the car, where you keep things securely, I can't remember the word

SR: Glove compartment?

E: That's it

After an ABI it is clear that pupils can deal with symbolic representation, but that words, as symbols, seem harder to commit to memory than images and are at risk of



errors in retrieval. The most reliable memory in the classroom seems to be for events in which the pupils have taken part, e.g. science experiments, for which they will have an image, and the least reliable for what the teacher has told them. As Confucius is reported to have said:

I hear and I forget  
 I see and I remember  
 I do and I understand

although doing does not necessarily lead to understanding. Reports written by Speech and Language Therapists (SLT) frequently recommend cuing forgotten words, but this does not necessarily lead to learning in a true sense – only the ability to recall parrot-fashion. Thinking time could also be increased, but in the cases observed this may have led to further frustration. When talking has been well linked in with other information, it is much more easily remembered (Ylvisaker *et al.* 1998c), as William said

Casual chat with William.

SR: How are you finding history?

W: OK. I like it when she talks. She always goes over what we did in the last lesson and then says things lots of times. I learn a lot then.

It is almost as if the teacher deliberately establishes images of what happened in the last lesson through recapitulation of material, as well as images for historical events. Most pupils post-ABI experience significant difficulty using word labels, as may be seen here:

Difficulties in using labels	R	N	C	A	S	I	V	O	B	D	L	G	E	M	H	W
Keystage at injury	Pre	1	L2	2	2	2	2	2	2	3	L3	L3	U3	U3	4	4
Current keystage	L3	L3	L3	L3	L3	L3	L3	U3	4	4	4	4	U3	4	4	4
expressive facility	(✓)	✓		✓		✓	✓			✓	✓	✓	✓	✓	✓	✓
receptive facility	✓	✓	✓	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓	✓	✓

Key

✓ experiences difficulties

□ no evidence of difficulties

Matrix XXIX

Nasser's difficulties could again have been due to EAL difficulties, but as most of the others experience difficulties, any EAL difficulties could be exacerbated by his ABI. Owen, however, showed no evidence of difficulties with labels during the time in which I observed him. He is well-supported, by both a part-time teacher and a full-time TA, paid for by his legal settlement, and he seems very happy at school. His teacher negotiates with subject teachers over how lessons are presented, and work is fully differentiated to meet his needs. Within that it seems that he is able to learn and recall labels for concepts. Ruth's one difficulty in expression involved a pronunciation error, rather than inability to find the required label. Simon, Carl and Ben, however, had difficulties with understanding technical terms used by others, but could always find a way of expressing themselves appropriately. This may be because they were all more able pupils who were further away from injury. The employment of the metacognitive

strategy of talking around the topic, which scaffolds the learning through internally persuasive dialogue, seems a positive strategy to deal with this.

Sometimes word-finding difficulties mean pupils with ABI find an alternative word which gives insight into their thinking process, as in Louise's science lesson about air brakes (see p74). Asked what she could do to make the movement slower, Louise answers 'Make it stronger'. She may have genuinely meant stronger here, but it is more likely that she could not find the word larger, although she could have confused stronger and larger, as later in her written work she muddled the words weights/wings (alliterative) and more/less (antonym), saying one but writing the other. Concepts distil the attributes common to a class of things. They are committed to memory as part of learning. Concepts, however, are labelled by words, a symbolic representation of the idea:

At the moment of initial acquisition, the new word is not at the end, but at the start of its development. At that stage it is always an undeveloped word. The gradual internal development of its meaning also results in the maturing of the word itself. (Vygotsky 1994b p369)

It is not that the concept is understood as soon as the word is known. Child (1986) asserts that there is a possibility that youngsters will learn verbal labels without sufficient exposure to the class attributes in order to construct the concept; they can give the appearance of knowledge without a firm basis, as Nasser did when completing addition and subtraction algorithms.

The teacher used a classical IRF sequence to correct Louise's mistake, allowing another pupil to give the correct term. However he did not explicitly tell Louise that her term was incorrect, she was left to surmise that another pupil had been asked because hers did not fit. Word-finding is considered a great difficulty after ABI (Clark 1996), but Louise does not make this obvious. When speaking she does not hesitate, or indicate that she has not found the word she wants. Instead she substitutes another word, leaving the listener unaware that she has word-finding difficulties. Under clinical test situations the SLT reports that she has severe difficulty with word-finding; teachers are left to assume that Louise uses language less well than others, or that she is less intelligent than she really is.

Vygotsky (1994) asserts that during adolescence young people move from thinking in complexes to thinking in concepts. Pupils learn the specific meaning from multiple usage and correction. Teachers who insist on correct terms help pupils to develop and organise their thinking.

Evan was in an art class, producing a scene through a window

E: I will do a ledge like on the top of the wall (*He gestured*)

SR: Crenellations?

E: No, like you get overlapping the bricks

SR: Coping stones?

*Evan drew it on his picture*

E: There's the coping stones - is that right?

Evan first tries the word ledge, which could mean any long architectural feature which protrudes. His second attempt 'overlapping bricks' is still general in that it could refer to several of the common bonding patterns in bricklaying. He was using a more abstract word, but one which was imprecise in terms of its meaning. By suggesting alternative words I was trying to provoke a new level of precision in Evan's thinking.

Frequently, pupils who have suffered ABI substitute one word for another from the same area of learning, as William substituted 'reliable' for 'fair' in this discussion about science:

William had missed the opportunity to complete his science coursework practical session with his class because of his injury. I was asked to supervise him.

SR: Yes, but what measurements will you take?

W: I need to make it reliable

SR: Good, how will you do that?

W: They will all be 10 cm

SR: OK, but reliable?

*William looked at me*

SR: Why have we got this and this? (pointing to the ammeter and voltmeter)

W: Oh the current and the voltage

SR: And how many will you do?

W: Three, a small one, a middle-sized one and a big one

SR: Fine, and how many of each?

W: Just three

It subsequently became evident that he did not mean he would conduct three experiments at each point, but three in total. Although he understood the concept of a fair test, it had assumed the label of reliability, and he had no concept of reliability, even though I had talked about both concepts in preparation for the practical session. He also did this when writing up, putting comments about the fair test in the reliability section. I had only corrected him rather than explicitly taught him. While this is sufficient to remind other pupils of earlier teaching, it is not enough after an ABI, and I should have taken the time to reteach. Substituted words occasionally rhyme as in this case

Louise was learning about food in French. The teacher started writing the words of categories on another board and as the class finished they looked at her.

T: Right what do these words mean (*said in French and English*)

Boisson

L: Fish

Fish in French is poisson. Non-injured pupils also make this kind of error and it may not indicate a particular feature of learning after ABI. However with alliterative/rhyming substitutions, it may suggest that words are associated by sound rather than by meaning. This matrix shows the kind of substitutions made:

<b>Substitutions</b>	R	N	C	A	S	I	V	O	B	L	G	E	M	W
Keystage at injury	Pre	1	2	2	2	2	2	2	2	L3	L3	U3	U3	4
Current keystage	L3	L3	L3	L3	L3	3	L3	U3	4	4	4	U3	4	4
Alliterative		✓								✓	✓	✓		✓
Rhyming										✓				✓
From same topic area			✓							✓		✓	✓	✓
Antonyms				✓						✓				
More inclusive						✓				✓		✓	✓	✓

**Key**

✓ shows evidence for

Matrix XXX

It is noticeable that substitutions tend to be more prevalent for pupils injured later in development, possibly as their linguistic development is more advanced and they have a wider range of known words to confuse. The most frequent substitution seems to be from the same topic area. If more than one new word is introduced at the same time, as I did with William, then there is a tendency to assign the label of one to the other. In addition I introduced them symbolically, without action to support my words, assuming that this was a reminder of work learned before the injury. This was clearly not sufficient.

Written work shows up the substitutions much more than oral work, where the communicative intention is much less demanding. However, it is interesting to note that written work from younger pupils does not include such substitutions. This could be because older pupils are dealing with more complex ideas, or that they have more freedom in the way in which they express themselves in preparation for GCSE. Most of the substitutions are for more inclusive words, within the same conceptual group; they are words linked through meaning, but less precise.

### 7.2.5 Reasoning

In order to form a concept from a complex, a learner needs to be able to hold thoughts simultaneously, to organise and classify. Skemp (1971) calls this forming schema. Frequently teachers expect individual 'facts' to be combined into generalisations which form concepts. In order to form concepts from isolated facts, inductive reasoning skills are needed to be able to generalise from the particular. As pupils bring observations together through a process of trial and improvement they move towards an idea. Textbooks rely on inductive logic

Mike was finding the areas of rectangles where the squares were drawn in for the first few and then were gradually removed to encourage the abstraction of area as base multiplied by height.

M: 15

SR: Yes, how did you know that?

M: Don't know

SR: Try the next one

*Mike sat there*

SR: Like this one

*Mike completed it correctly. This happened 4 times, then he did the other 12 well, and on his own. The next one went wrong*

M: Uh? Oh gone the wrong way

*He sat there*

SR: Look at the pattern

*Mike completed the exercise correctly.*

Although I attempted to get Mike to enter into a dialogue with himself about what he had done, he was unable to do so. It may have been that his difficulties with recalling labels prevented him voicing his thoughts in order to make a generalisation, that these were the same type of questions. Perhaps I should have pushed beyond his initial 'don't know' as he may have been playing for time. Without this, he has to approach each one on its own, thinking it through. I did point out the similarity between the first and the second but I did not lead him into noticing the similarity for himself and my authoritative intervention was not internally persuasive. It helped him to follow the pattern until all that was left was small marks to indicate the length and width of the rectangle. At this point he needed a prompt to continue in pattern. This ensured that he completed the exercise correctly, but not necessarily that his concept of area was extended and developed. It seems that these pupils need a balance of structure in the task and outside assistance to support learning. Or perhaps a deductive approach may be preferable. If the notion of school is to bring together the everyday knowledge of the child with abstract scientific ideas (Vygotsky 1979), the manner of introduction of concepts may be deductive. Deductive reasoning, moving from the general to the particular, seems to be easier after ABI. But in both, there is a problem which has to be solved:

Concepts are always formed during a process of finding a solution to some problem facing the adolescent's thinking process. The creation of a concept is dependent on a solution to this problem being found.  
(Vygotsky 1994 p257-8)

When faced with a coursework task requiring him to generalise ideas about Georgian architecture in his city, William struggled. He had missed the preparation lessons through not being in school, and was unable to pick up the concepts for the architectural ideas. He needed to generalise the particular architectural features, label and discuss them. It was necessary to hold several ideas in his mind and manipulate them, using these labels in discussion and for sorting. He had to move from the specific to the general using inductive reasoning and he found the task extremely difficult. He worked very slowly and did not complete the task. In addition the word labels for the features were completely new to him and were defined symbolically. He had great difficulty remembering them. When we returned to this piece of work some six months later he had forgotten all the ideas completely, but at this later stage of recovery he was able to handle the ideas and skills much better, although he still referred to 'sash' windows as 'hash' windows. It seems that this incorrect label had been committed to permanent memory and then it was very difficult to update it. If a constructivist viewpoint is accepted, then concepts are not transmitted, but formed by the learner, communicated through examples containing concepts which must be already known by the learner. It would have been better to have worked with pictures of these architectural features in a wide range of buildings, from which we could have learned the general terms, before isolating the commonalities amongst Georgian buildings, working from labelling a complex towards establishing a concept. In Piaget's theory ideas are constructed by the individual as he/she interacts with the world, in which case teaching is seen as providing appropriate experiences, while in socio-constructivism (Vygotsky and the Russian school), teachers mediate the world and experiences to the learner through discourse. Both Piaget and Vygotsky agree that concepts are only partially formed initially, usually

symbolically labelled. Related examples extend the concept as it is altered to take account of new situations; slowly a general idea of the concept is formed. Davydov (cited in Renshaw 1992) takes Vygotsky's work one step further, asserting that it is not through appropriating cultural tools, but through appropriating more general thinking tools that growth in thinking occurs. It would seem that, after ABI, careful linguistic mediation of experiences is essential for learning within a framework which moves from the general to the particular. Simply providing extra information is not enough.

Science lesson for William combining sodium thiosulphate and acid at different temperatures.

T: Today we will do some practical work. You have it on the sheet. It is very simple and it is to look at the rates of reactions. Right, what do you do? You look on the sheet and it tells you.  
*She reads out the sheet.*

This was all the introduction the class had. The sheet showed a diagram of how to set up the experiment, what quantities to use and what measurements to take. The group did the experiment and the teacher called the class together:

The teacher then gave an explanation of the theory behind the results with some Q&A but William did not join in.

T: What I need you to do now is to write an explanation in your book.  
*William got out his book and sat and looked at it. A few minutes later*

T: I will write it on the board.  
*William copied it down.*

Later when I used this work to tackle a sample exam question, William could not answer the question and could not remember the theory, although he remembered doing the experiment. The answer to this lies in the careful guidance into new ideas supporting and scaffolding understanding, not just completing the task and memorising. The pupil needs to be persuaded internally of new ideas. For these pupils, with their poor memories, reciting to pass exams is not sufficient.

### **7.2.6 Scaffolding emerging concepts**

Teachers often ask their classes to recall earlier work at the beginning of a lesson, to link new concepts to previous knowledge. This can be very beneficial to other pupils, but can be rather difficult after ABI, unless there is a visual stimulus for the memory.

Ruth was in a History lesson about medieval England.

T: Can anyone remind me of what you were doing last lesson? Have a look in your books.

*Ruth did nothing. She was playing with a pen. Her TA came and sat by her.*

TA: Do you remember last time? Get out your book

*Ruth got out her book. Her planner and pen were taken away*

T: What is the feudal system? You might have to look at your book

*Ruth ignored it. TA finds relevant place and pointed to it. Ruth talked animatedly to her TA about the feudal system and added to her diagram. She did not appear to be listening to the teacher.*

Ruth appeared here not to know what had been studied in the previous lesson. The pen may have distracted her, or her memory may have let her down. Even though the teacher suggested the class should look in their books, she did not have her book out and was not able to use this suggestion. At this point her TA came and sat with her and gave her a direct instruction to get out her book. She was then able to tell the TA about everything she had learned previously about the feudal system. Ruth had understood the previous lesson, but could not demonstrate her knowledge possibly because of the demands on her poor verbal memory, difficulties with planning (the need to get out the book was not realised), difficulties understanding the conditional, 'might' (see Chapter 6), or understanding that the TA's suggestion that she 'might' look at the book, was a command. Only the demonstration of what was required, and the visual rescued her. Using visual representations as well as verbal descriptions is preferable.

Maths class. Owen's teacher was introducing the next topic the class would study.

T: How many flat, 2D, shapes could you find the area of? Discuss this on your tables.

*The rest of the table discuss. Owen shouts across others 'triangle'.*

*The group then have an off topic discussion. Owen looks away.*

TA: What can you think of? What else can you find?

T: OK P1 give me 2 shapes you could find.....

P1: Square, rectangle

*The teacher went around the tables asking. Owen put his hand up, with 2 others*

T: Owen

O: Decagon

*All the offers were listed on the board. Teacher wrote 3 arrows next to decagon, octagon and hexagon*

T: The 3 arrows are by ones that you may or may not be able to do, you may not have enough information. The others you have enough maths to be able to do.

*He went through them including find the area of a triangle by halving the surrounding rectangle.*

T: What's the difference between a rhombus and a parallelogram?

P3: A rhombus has all sides the same length

T: A kite is a kind of triangle. If I cut the kite up and rearrange it, what would I make?

*The teacher drew a kite on the board. Owen's was the first hand up*

T: Owen

O: A rectangle

The teacher encourages the class to discuss what they already know with their groups. Owen appears to struggle a little with this; he does not seem to be able to take turns in group discussion, although he can when the teacher controls the discussion and he is able to contribute. His contribution of a decagon did not really fulfil the teacher's purpose as it is unlikely that at this stage the class could have found the area of a decagon, but later Owen was very quick to rearrange the kite into a rectangle of the same area. The teacher had prefaced his question by pointing out that a kite is a kind of triangle and it may be that Owen was able to link together the technique for finding the area of a triangle with the shape of the kite. The teacher also provided a visual

representation of the shape, which may also have helped. Altogether the combination of class and group discussion, teacher statements, iconic representation and class question and answer allowed Owen to take a full part in this construction of knowledge. In scaffolded teaching questions are posed to lead the thinking on, whether in a one-to-one or a class context. Skills and ideas are demonstrated, giving the pupil an iconic representation of the task or concept, with access to reminders (generally on the board) about that demonstration while the task is attempted. This worked extremely well in Louise's French lesson

French lesson, there are sentences in French and English written on the board in different orders.

T: You are going to jot down the English (*pointing to the board*) and find the matching French one

*An example was done*

T: You can write the French and copy the English underneath or you can do it in this order (*pointing*)

L: I'll do it in that order

The teacher completed an example, explaining her reasons as she went. She then left her example on the board and Louise was helped to start by being given a choice of how to set it out, even though, as usual, she chose the last mentioned. The fact that a choice was given meant that the teacher modelled how she wanted it laid out. Later in the lesson the teacher modelled what she wanted again.

T: What I would like you to do now is give your opinion. You use..

*She pointed to the French phrases she had written on the board and the class read them out. She demonstrated some examples.*

T: For each of these (*pointing to the French phrases about adolescents*) write.... (*pointed*) I need you to write it in full to learn it

*Louise read the English translations but answered in French.*

Interestingly this teacher left many of her phrases unfinished, using what was written on the board to complete them. This was probably to avoid too much speaking in French, which this class clearly felt was more difficult than reading French, from their discomfort when she did introduce the spoken language. Yet this moving from one mode of language to another did not disturb Louise in the way that moving from diagrams to text does in other subjects.

During the lesson the teacher had loudly answered questions from all pupils giving reasons for her responses. Frequently this was because the word was a cognate.

The title was *Où travaille-t-on?*

T: Do you know what this means?

P1: Go

T: It's not a cognate

L: To go, to work

T: Good, work, where do they work?

*Later*

SR: What are you looking for?

L: Moody



SR: Which phrase do you think it might be?  
*Louise pointed to the correct one*  
 SR: Yes, *humeur* is mood, *changer* is change, they change mood. It's a cognate. Do you know what a cognate is?  
 L: I know but I can't explain  
 SR: OK If I say that this work (*autorité*) is a cognate what would you do with it?  
*She thought for a bit*  
 L: authority?  
 SR: Yes, it is a similar meaning in English  
 Louise (pointing at *individualité*): Individuality?  
 SR: Yes  
*At the end of the lesson I asked*  
 SR: How did you find that?  
 L: Easy  
 SR: Why?  
 L: I know some of the words are like the English

Louise knew that she had to use the dictionary if she got stuck, but once she had looked up the word (*moody*) could not use the information given in it to solve her problem. She actually had an idea of which phrase was the translation, but when this was not confirmed did not know what to do next. I asked Louise to verbalise her understanding of the concept of cognate and when she was unable to do so I guided her into finding an understanding by using the skill of finding cognates, which she had been doing for most of the lesson. This reduced her degrees of freedom and asked her to do something practical to focus her thinking. It may be that just as it is necessary to assist the ABI pupil to focus their attention in class in order to concentrate, it may be also be necessary to help them on the finer scale of focusing thoughts by reducing degrees of freedom. Louise's response at the end of the class showed that she had appropriated the understanding and was now able to put it into her own words.

It may have been that Louise had set herself a rule that she could not guess, although the teacher throughout the lesson was modelling the strategy, by identifying cognates among the French vocabulary the class were using. This word however, was not explained to the class during this session and when I commented to the teacher how useful this strategy was for Louise the teacher remarked 'Did I use a lot of cognates? I suppose I did'. This appeared to be part of her style of teaching rather than a deliberate attempt to scaffold learning. This teacher said that she did nothing special for Louise, but that Louise was getting on very well and was at the top, if not the top of the class. Her lessons clearly suited Louise's learning style; she commented:

I like those lessons. Miss explains it all properly so it is understandable.

Owen's support teacher realised how much he gained from modelled examples in maths:

Emailed comments about Maths classes.

Year 9 has been fab because after much explanation/discussion with the teacher he models everything on the board to the whole class. He breaks it

down into small steps on the board. He gives worked through examples on the board.

I suspect that while the teacher writes out the small steps he also talks about it, illustrating both how and why it is done, marking the critical features of the task. Owen's support teacher and TA take this further, using concept maps in almost every lesson to show him how ideas fit together. This seems to be successful in that he is able to remember new terms and ideas from one lesson to another.

Frameworks can also scaffold the work of pupils who have organisational difficulties (Ylvisaker *et al.* 1998c), but after ABI it cannot be assumed that pupils know how to use them. Writing-frameworks in secondary schools usually follow one of two formats: the first is a series of questions and/or instructions to guide pupils to think around certain areas, while the second looks like a cloze passage, but expects a paragraph to be written in the space of the gaps. It was this latter type which confused Louise; she did not know what was expected:

Geography lesson, setting homework.

*The teacher then read out the task waving the sheet in front of the pupils.*

*She clearly turned it back and forward in her hand - miming looking at both sides.*

She made a gesture of looking at both sides of the sheet, but this was not enough for Louise who told me the following day that she could not do the work

Discussion the next day

SR: How was geography yesterday?

L: The lesson was confusing. I don't know how to do the homework.

*I got out my sheet*

SR: Did you read the article?

L: No

*There was surprise in her voice*

SR: When you have, then you can use the framework here.

L: But she said we had to write in detail.

SR: Yes, you can still use the framework and then put in the detail from the article.

*I went through part of it as an example*

SR: Do you think you can do that?

L: Yes

Despite the teacher waving the article in front of the class during the lesson, Louise had not picked up that the information in the article, on the reverse of the sheet, was necessary to complete the task. She knew that a detailed answer was expected but did not understand how to use the sheet which was meant to help her. Because of this the sheet became a hindrance to her starting the task. Louise did not understand that the framework presented as:

Monserret [sic] is an island in the.....

It is located on the edge of...

These plates... to form...

At this type of margin you find volcanic....  
In 1995 a volcanic eruption on .... caused by.....  
This resulted in ....

could have more than a one word insertion into each space. The teacher had attempted a non-verbal communication of the importance of both sides of the sheet by waving it. She did not model reading it, and the only image Louise had of what to do was of a teacher waving the sheet. The framework itself did not make it clear what to do. The instruction needed to be made explicit. Louise's understanding could possibly have been transferred from cloze work, which frequently occurs in science. The teacher asked her to write 'in detail' about the events and she could not see how one word in each space could provide a detailed account. The teacher had told the class to use the framework, although on the sheet it is offered 'as a little help if you are stuck', so Louise could have chosen to write freely about the topic instead. However, she became focussed on the teacher's instructions which had been clearly remembered. A simple demonstration of what was expected was sufficient to clear up the communication difficulty and as a result Louise was able to do the homework on her own. Her mother reported that she seemed to know what to do, but needed encouragement to stick with the task.

William's history coursework included frameworks in two formats; the first as a series of ideas which could be included in the final argument, some presented as questions and others as source material to read (symbolic representation). He worked through all the exercises for the first but had great difficulty drawing it together into continuous prose to form his argument. The second framework was a grid on which to collect ideas under different headings, and was much more graphic in format which allowed him to collect the ideas quickly and write clearly.

Owen's supporters used concept maps, either handwritten or software supported. These helped plan his written tasks, as well as to understand links between ideas, through visual representations. In writing, pupils are able to hold an internally persuasive dialogue with themselves thus establishing the concepts they are learning. A word-processing package, e.g. Word, may also be used for planning written tasks, but it cannot show the connections between ideas, instead it has a much more sequential form, and necessitates the mental holding of ideas. But paragraphs, or even single sentences, may be moved from place to place if they have been poorly sequenced. William found he was able to focus his attention much more easily on the screen, rather than a piece of paper. Like many of the young people in the study, William has lost some of his fine motor control and disliked his handwriting. All ABI pupils who have had access to a computer have found it easier to word-process their written work. Word processing packages have an advantage for teachers too in that they show up trial and improvement behaviour, when the pupil starts clicking on every button instead of thinking and then clicking on one. The need to think first may be clearly demonstrated to the pupil. The need to monitor the layout may also be shown when work is being prepared for presentation.

### **7.3 Development of Ideas**

In this chapter I have considered strategies which are effective to assist pupils to form and use ideas post-ABI. Symbolic representation of ideas can be problematic for some pupils, especially early in recovery. Iconic representation of ideas is much more readily

achieved and ideas are frequently successfully manipulated in this form. However, the icons and actions need to be within the experience of the pupil concerned. Words as symbolic representations of ideas are not always accurately recalled, either receptively or expressively; at times the concept is used without the correct label. Word substitutions tend to be for a more general word, indicating that the pupil may be thinking in a 'heap' (Vygotsky 1978) rather than an adult concept. However, where an effort has been made to link in the concepts, e.g. through talking, modelling and/or mind-mapping, the ideas and their labels are recalled and used. Where incorrect usage of words is explicitly corrected, rather than implicitly through noting what his/her peers are doing, the pupil is more likely to remember it next time. Finding their own solution to their own problem through supported space to think is vital. Engaging in internally persuasive dialogue through writing is enhanced through the use of mind-maps, which also help explore links between ideas.

Many young people post-ABI have difficulties with planning, initiating, organising, and monitoring tasks. This tends to emerge more at Key Stage 4, especially when tackling coursework where longer tasks are required to be completed independently. Support is needed for organisation, possibly through the use of concept maps. When the teacher is naturally less involved, e.g. in a homework or coursework task, frameworks can be helpful, but can also be a hindrance if not explained properly. Not all frameworks are easily understood by pupils post-ABI, especially when they look similar to other tasks, e.g. cloze tasks, which the pupil may have met previously and for which a different response is required. Pointers should be phrased in questions or instructions, rather than as statements for the pupil to rewrite, which then becomes an almost impossible task for pupils who are rigid thinkers. Frameworks where pupils are required to fill in tables to guide their writing may be helpful, as arguments for and against may be collected in adjacent boxes. The organisation of material is frequently more successful on the computer, where the pupil may write down their thoughts and then be helped to organise them later. It may also be used to plan, and the plan or framework remains in front of the pupil as they expand it. A computer depends on icons, and the pupil does not have to recall the correct label for an action; if they are taught to use the mouse, point and click is all they need. The proximity of the computer screen also helps to focus the attention of many ABI pupils (Rees 2007b), but care needs to be taken to ensure that the framework does not result in an algorithmic approach.

Apart from those in supportive situations, young people with ABI speak to others using a condensed form of language when they are under pressure in some way. The expansion of condensed language means that, sometimes, the young person is aware that their listener has not understood. But the use of non-referenced pronouns means that, while they know exactly what they mean by the pronoun, it is not clear to others, and the young person is not aware of this. Written work often omits functional words, contains repetitions and misused conjunctions. There seems to be little awareness of audience and style, but this improves where it is taught prior to the return to school.

Early in the recovery process all reading needs to be vocalised, and instructions need to be repeated by the individual pupil, even when spoken aloud by another. When teachers try to prompt an answer by giving the first couple of words, it is rarely successful – although in conversation it usually is (see Chapter 6). Once the pupil is engrossed in the task then they may be able to rely on inner speech to plan what they will write. Action may be used to back up vocalisation, but I have not found evidence

of action alone. Young people with ABI think aloud to initiate, to monitor understanding in discussion, to organise ideas both for problem solving and for writing, to get back on track after a disruption, and to give permission. These different purposes are not marked by a difference in the type of language used, but, as recovery from the injury progresses, more concise utterances may emerge. Thinking aloud generally makes complete sense and can elicit unexpected responses from those around. Parents and teachers have to learn to let the young person answer their own questions. However the pupils also seem to feel that thought represents reality, both in terms of obtaining permission and in terms of completing tasks. This can have unfortunate consequences: homework may be left unfinished, or pupils may become involved in anti-social or offending behaviour.

In the final chapter I will examine how far my research has enabled me to answer the questions posed at the start.

## ***Chapter 8 – Making meaning in the classroom***

It would seem that a socio-cultural framework fits pupils with ABI. Scaffolding within the ZPD supports and guides learning, while the process of rehearsal, to change intramental to intermental is widely used by this group.

### **8.1 Finding answers**

In order to make meaning pupils have to both understand what others are communicating and make themselves understood. This study found that, after an ABI, pupils act differently from others in both these areas. Their patchy, changing profiles single them out from others. They can do things you would not expect and cannot do things you would expect. The most common difficulties are not exclusive to ABI, but the way they are manifest and their combinations are unique. However I found a level of awareness not usually accorded to pupils post-ABI. I will now consider the research questions in the light of the data, starting with the more specific questions, then considering how severely brain injured pupils make meaning and lastly the strategies which may be adopted by pupils and teachers to support learning.

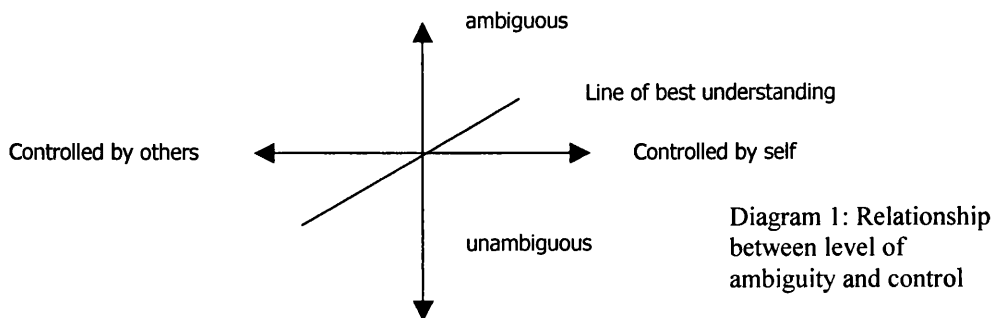
#### **8.1.1 How does the kind of impaired discourse functioning which occurs after ABI impact in the classroom?**

Language is rarely completely explicit in its meaning and pupils need to choose between a number of possible meanings and interpretations. Other pupils seem to be able to cope with this more readily than those who have sustained an ABI. This may again be because their shortened working memory (Begali 1992, Blosser & DePompei 2003, Semrud-Clikeman 2001, Walker & Wicks 2005) prevents them holding ideas together to judge between them. Teachers need to make the language directed at pupils with ABI much more explicit. Word play, jokes and the like depend for their humour on multiple meanings for words. Teachers often draw attention to possible pitfalls through humour, but this can leave pupils with ABI more confused and less likely to remember the teaching. It is better if the language used is explicit. A well-chosen metaphor or analogy may help to elucidate the point under discussion but, if it cannot stretch to encompass other linked ideas, it may not be so helpful after all.

Elliptical language is more risky in terms of communication. This study has shown that ambiguous language tends to be interpreted literally by pupils after ABI, which upholds clinical findings (Dennis & Barnes 1990, Ewing-Cobbs *et al.* 1998). In the early years post injury, it is probable that, given several interpretations of an utterance, they will not adopt the appropriate one and the communication will break down. Metaphor, figurative phrases, functional equivalence and homonyms all cause difficulties, and while other pupils may be able to realise that there may be alternative understandings, pupils with ABI tends to become stuck in one mode of thinking and perseverate. In the highly pressured classroom, where there is frequently not time to repeat ideas, this is inefficient to say the least, and is confusing for pupils with ABI. Further research is needed to identify specific conditions for understanding elliptical language.

However, pupils several years post injury are deliberately able to introduce ambiguity into their own expressive language and use formal structures such as metaphor and

simile. The relationship between level of ambiguity and where control lies may be iconically captured thus:

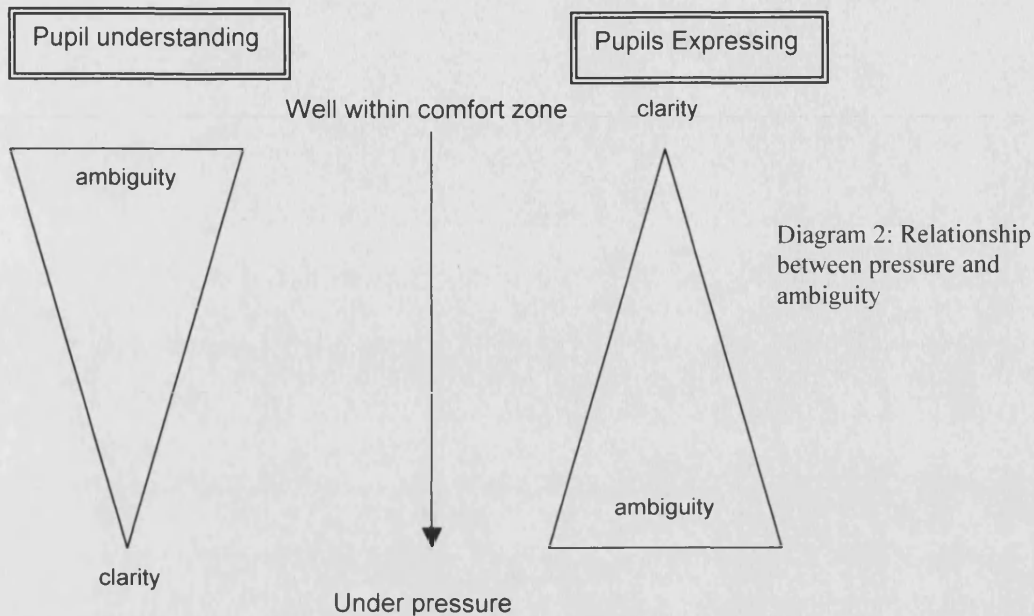


Such diagrams, as used here, are not statistically based. Each interaction may be represented by a pair of co-ordinates consisting of ambiguity and a unit of control. The line, which is not at an exact angle, is the locus of the optimum set of co-ordinates. Where pupils control the ambiguity themselves they are able to tell jokes and stories, use metaphor and other elliptical language. However some of the jokes are not considered funny by their peer group, as they seem to work at a less mature level.

It is widely recognised that word finding is difficult post ABI (Clark 1996), but this study has shown that such pupils do not make this obvious in the classroom. They do not hesitate or indicate that they cannot find the word. Instead another word is substituted, leaving the listener unaware that there are word-finding difficulties, and that the pupil has not fully communicated their understanding. This additionally means that the pupil, having not attached the correct label to an object, is inhibited in their ability to manipulate ideas and solve problems. Words substituted tend to be more general words, and the specifics of the problem are lost, impacting on concept formation.

Word finding problems lead to unintentionally proleptic situations. The teacher assumes all the pupils understand the technical or other vocabulary being used. Where teachers intentionally use proleptic speech to get the class thinking, they will deliberately drop hints to assist the pupils along the way and push them into developing a fuller understanding, but after a while the teacher assumes that the class now know this word and cease to support it in their discourse. It is at this point that pupils with ABI have to work very hard to piece together the meaning from what is being said. This is particularly so when teachers engage in lengthy expositions.

It has been shown (Sharples, personal communication) that, after ABI, young people are more likely to become anxious and depressed. When under pressure the ability to express themselves clearly is reduced, pupils resort to copying and use a condensed form of language. This finding has helped to uncover why pupils post ABI become agitated in the classroom when teachers hint using very short phrases. It is probable that the pupils interpret this as the teacher becoming angry or frustrated with them, when it is nothing of the kind. A simple explanation to the pupil about how school discourse is conducted and the intention of hints has been enough to put right this misunderstanding. The following diagram shows the relationship between the two:



After ABI, the more pressured the situation, the more explicit the communication has to be. However, when expressing themselves under pressure, pupils' communication becomes less clear. It would seem that reducing the academic and social pressure on a pupil with an ABI would allow them to express themselves more clearly, handle ideas with more ease and make the pupil more comfortable in the classroom. This is therefore more likely to engender learning; neurochemistry indicates similar findings (Curran 2006).

It has also been shown that homonyms can provoke a change of direction in conversation or writing. Tangential speech is common after ABI, but this study has increased the understanding of how this affects classroom meaning-making, particularly in written work. Further work may investigate whether this is due to difficulties with word finding, ambiguity or literal interpretations of discourse.

Complex grammatical structures seem to present difficulties in comprehending written language for pupils with ABI. It may be that while the grammar of simple structures is preserved, more complex structures are more difficult as there are indications that some narrative structures are lost (Ewing-Cobbs *et al.* 1998a) and script grammars cause some difficulties. This is an area worthy of further investigation. The present study has also indicated that it may be the phrasing of comments and hints which makes them problematic, but this needs further investigation to determine the extent of this. Belief in Gricean Maxims leads pupils with ABI to interpret utterances literally and within a framework of everyday groundrules. I have suggested that tone of voice may not be observed accurately by pupils post-ABI. However there is not enough evidence to reach a firm conclusion. Further research would be useful in this area.

### 8.1.2 What are the barriers to understanding classroom communication for ABI pupils?

This study has shown that pupils with ABI struggle with some of the common discourse structures used in the classroom. In particular it has been found that they find it very difficult to follow instruction presented as exposition. It is probable that clinically observed memory difficulties (Begali 1992, Blosser & DePompei 2003, Semrud-



Clikeman 2001, Walker & Wicks 2005) prevent the pupils following long explanations, but it may also be that, while pupils who have not suffered an ABI are able to deal with ideas as they are presented, the slowed thinking after ABI (Bawden *et al.* 1985, Ponsford 1995) prevents this happening and the pupils quickly become lost. Alternatively, it may be a result of difficulties with symbolic representation, widely used in academic learning, and shown in this study to be difficult post ABI. IRF structures slow down the speed of the information being presented, but some types of questions also prove a barrier to understanding. After ABI pupils do not seem to be able to identify rhetorical questions and they are treated as if a verbal response were demanded. Teaching questions (pseudo questions) and hints only serve to emphasise the control structure within the classroom, using knowledge and forms of language as a means of control (or manipulation). Some pupils with ABI react against this, but the study has found they respond well to authentic questions asking what is understood. It was observed that the repetition of instructions does not necessarily assist the pupil. However many hints and prompts were understood; the effect of context on Pettersen's (1991) findings that the more severely a young person is injured the less able they are to participate in conversation smoothly and respond to hints or indirect clues in conversation, may need to be investigated. Hints were understood when they did not put a strain on working memory (by being in multiple parts), were not couched in conditional terms, and where the pupil had been back in school for a significant length of time. But, after ABI, pupils do not seem to cope with discourse where form and function (Young 1992) do not match.

Although it may seem that interruptions in the flow of ideas from a teacher, whether as exposition or as IRF, would give the pupil time to handle the ideas already presented, they seem only to confuse and frustrate. This may reflect the difficulty in thinking flexibly and switching between one mode of thinking and another (e.g. Walker & Wicks 2005). The problems encountered by pupils with ABI in understanding the rules which govern conversations may have a similar basis. Gricean maxims, which rule all other discourse, do not necessarily hold in the classroom where teachers aim to engender thinking in their pupils. Managing discourse in the classroom requires a flexibility to switch between different rule sets, which seems particularly difficult after ABI.

It was found that role-play as a metaphor for understanding, in maths for example, can leave the pupil more confused; instead of joining in the pretence, they adopt a literal interpretation of the situation. While ABI pupils can use their imagination, the need to do so has to be made explicit, and the imaginary situation has to be something which makes sense. Drawing an imaginary line to deal with positive and negative numbers is possible and links an abstract task with reality, but using role-play to introduce algebra is confusing. While many pupils can 'write up' an experiment in which they have not taken part, this is well nigh impossible for pupils with ABI; for them, it is neither genuine nor true. They cannot imagine what might have happened and then sequence it.

### **8.1.3 How does the severely brain-injured pupil make meaning in the classroom?**

This study has shown that, after ABI, pupils more often than not repeat instructions they have just been given or reread the question, particularly in the first 3 years after recovery. Further research is needed to address the question of why this strategy ceases, although it is possible that, after this time, the thoughts are able to go underground (Wertsch & Stone 1985). Likewise pupils employ the strategy of 'thinking aloud' or

‘dialoguing with self’ to help them understand. After an ABI, pupils seem to experience difficulty in using their inner voice to regulate behaviour as other pupils would. Spontaneously they voice their thoughts to direct their behaviour when faced with obstacles. Space needs to be provided for this to happen without embarrassment, as this is more frequently seen in young children. At times pupils with ABI voice their thoughts as questions and I have observed adults, including parents, taking these questions as inquiries and providing information. If the young people are left to think, they provide their own answers and do their own thinking. Their thinking pattern is not disturbed and they are more likely to focus on their learning.

Severely brain-injured pupils make meaning most comfortably through visual means, using iconic representation as their preferred method. Such icons may be on a computer screen, in printed or written material or through having a mental picture of an action. Any enactive representation, in terms of learning skills, needs many more repetitions than with other pupils, and it is suggested that errorless learning (McCourt 2005) may be a helpful strategy for this. It was found that pupils post ABI spontaneously touch to notice items, which may be assisted by teachers providing supporting materials which may be touched as they explain new ideas. Without such materials pupils are left without understanding what is being explained.

#### **8.1.4 What strategies do ABI pupils use to decide what to do in the classroom?**

This study has shown that pupils use a range of strategies after ABI to decide what to do when faced with a classroom task. Frequently they will copy someone else to get started in the classroom, but this may be counterproductive if the pupil copied starts off on the wrong track. Other times it can be successful; teachers need to seat pupils advantageously. On other occasions pupils with ABI follow a previously successful method, or remain with an idea used previously. This may be a result of perseveration (Walker & Wicks 2005) or of the judgement that this is a useful method or strategy; further investigation could be usefully be made here. Other strategies to initiate action are to repeat a previously successful behaviour, or to ask for help. All too often, however, pupils after ABI freeze. It is as if they assume themselves to be at fault and prefer not to point out their weakness. Later in recovery pupils will ask to clarify instructions or to move on when stuck, but this strategy does not appear to be available early in recovery. Pupils will also set off on the wrong track not realising they have misunderstood instruction, with the tell-tale comment “Oh I didn’t realise....” when the error is pointed out.

This study has helped to address the reasons why pupils post-ABI find it so difficult to add to their learning. The study has shown that, when pupils are presented with comprehension tasks, usually in humanities subjects, the strategy is to identify a keyword and copy out the phrase or sentence around it. This overcomes the difficulties with comprehending written material and frequently satisfies the teacher, but does not add to learning.

#### **8.1.5 What strategies can classroom teachers adopt to support ABI pupils’ learning?**

There is no ‘magic formula’ for teachers of young people with ABI. Every pupil is different and teachers will require different strategies at times to adjust to the needs of the individual. The barriers to making meaning experienced by pupils with ABI in the classroom are surmountable where there is the will to do it. After an ABI, not all pupils

experience the same difficulties - it is necessary to observe the individual pupil and find solutions which match their needs.

The study has been able to identify a number of strategies which teachers could adopt which would assist the understanding of this group of pupils. Engaging the class in IRF rather than exposition slows down the pace of ideas being presented, allows for repetition, encourages pupils to explore ideas for themselves, retelling rather than reciting (Skidmore 2000) and gives space for the pupils with ABI to rehearse an answer before presenting it. It was found that the easiest prompts for the pupils to understand were commands, then questions and last statements, but a command removes the responsibility for thinking from the pupil. Asking the pupil what they have been told to do requires the pupil to verbalise the instructions for themselves and this is usually successful. Starting a phrase and allowing the pupil to complete it was also found to be a successful strategy. It can be useful for the pupil to be able to distinguish between reciting, when they can imagine the teacher speaking and try to recall what they said, and retelling, when the young person works out for themselves what they would do or say. Reciting may then be used to recall methods which have been taught when the pupil is not in class, while retelling allows them to rework ideas and concepts to establish them and formulate a possible solution. Another strategy is to unpack written instructions phrase by phrase, possibly touching to emphasise each part. Many of these strategies may be modelled and taught to pupils using authentic questions and scaffolded assistance, so that they can take them over for themselves.

Problematic structures within the mainstream secondary classroom include role-play, rhetorical questions and humour. Hints, explanations and recitation may be problematical for some pupils. If a pupil has problems with memory, and cannot therefore copy from the board, notes may be provided in revision guides and sheets, or other pupils' notebooks may be photocopied. Pupils will probably also need to use memory aids, which could be as simple as paper and pencil to write down stages in solving a problem, or fingers to remember how far they have got in counting. Metacognitive strategies may be used to assist pupils with word finding difficulties. Pupils can then adopt such strategies for themselves to talk around the unknown word, thinking aloud and dialoguing with themselves to trigger vocabulary

In order to assist in developing concepts and ideas, teachers could define technical words more frequently, or ask their pupils to develop their own glossary of terms. Iconic representation of ideas was found to support the acquisition of concepts. Mind-maps may be used with icons in addition to words; pictures to accompany explanations were seen to be very supportive. Demonstrations also provide an iconic representation, and pupil participation is even more advantageous. Concept maps were also found to assist with linking ideas together. Further research is needed to ascertain whether they also assist with word finding skills. The study hinted that the deliberate correction of terms may be helpful to some young people with ABI when trying to establish new concepts, but further research is needed to ascertain if this is helpful to all.

The study showed that deductive reasoning in the classroom is generally much more successful than inductive. A deductive approach in teaching would be preferable, examining the general before moving to particular cases. This would help to avoid the tendency to narrow understanding to the introductory idea, with its label. Because of this tendency to become stuck with previous experience, it is recommended that

teachers should pre-empt need, trying to anticipate what the pupil will need in the way of assistance before they become stuck. This is called direct instruction in some local authority statements, but should not be confused with the US educational method of the same name (Glang *et al.* 1992, Lindsay 2006, Mateer *et al.* 1996), where it refers to a rigorously developed, highly scripted method for teaching that is fast-paced and provides constant interaction between students and the teacher. This would not be suitable for pupils post-ABI because of the high level of drilling and content which relies on memorisation rather than understanding to establish ideas.

The study showed that, while frameworks are helpful to plan and organise work, their use has to be explicitly explained to young people with ABI. Frameworks which pose questions were shown to be more helpful than ones with statements. Likewise the computer was seen to help to organise ideas and focus attention, but difficulties with monitoring meant that it was also easy to lose work. Specific teaching in the use of frameworks and/or managing IT software before the pupil engages with the task, could take place to overcome these problems.

The study has also helped to address how some of the needs of this group of pupils change as they move further from the time of the injury. During the first year back at school the difficulties encountered are different from those occurring later on. The ability to find the required word seems to be much harder than later on, leading to frequent incidences of unintentional prolepsis, and very odd links are made in conversation, though these are not usually made in front of the whole class. This may be because pupils are much less willing to volunteer to answer questions. Any teaching hints are almost always totally ignored in the first year, and there is more of a tendency to answer the wrong question.

Most of the socially unwise behaviour, e.g. talking loudly about forbidden classroom behaviour, also occurs in the first year. However, when I observe such behaviour, it becomes a subject for teaching and the pupil learns. Those whom I have not met until later in recovery do sometimes engage in such actions later on. It seems that teaching is necessary to assist the young person to regain the knowledge they had prior to the injury.

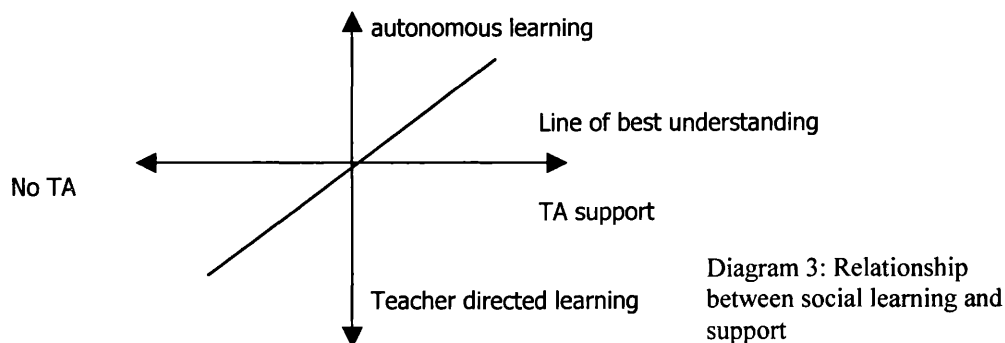
## **8.2 Theoretical implications**

This study has helped to address how findings within clinical research impact on classroom behaviour. Clinical findings ignore the functional context, in order to examine how skills are affected by brain injury. For adolescents, school is the context for much of their time and is where thinking skills are developed and used. This study has shown that contextual supports determine outcome to a large extent; performance varies according to the appropriateness of assistance.

### **8.2.1 Learning through discourse**

Subtle pragmatic difficulties make classroom interactions problematic for the pupil who has suffered an ABI. Hence any form of group learning presents an additional layer of interactions with which to cope in the learning situation. A TA can be a great support in this situation, standing as an intermediary in social interactions, and is able to explain and encourage without taking over the group. Difficulties may also occur where a pupil is required to learn from the evidence around them without the support of a teacher. This may be from books, tasks or observations. Such learning is frequently assumed to

happen and, when a pupil shows from their actions that they have not learned from experience in this way, surprise is expressed. In both these situations the pupil is responsible for their own learning; they are expected to learn from society and cultural artefacts around them. It is autonomous learning. This diagram illustrates that the more the pupil is expected to learn socially the greater is the need for TA support.

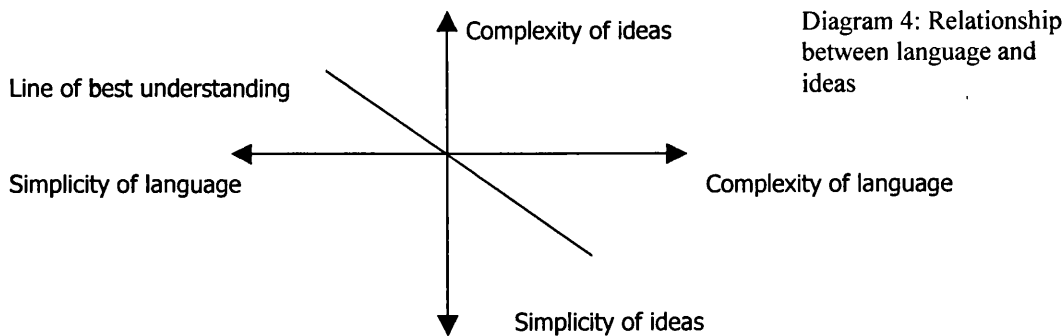


The converse of this is where the teacher retains the direction for learning and teaches in a non-social context, ie one-to-one, possibly in a resource base. This situation sometimes occurs when the pupil first returns to school if it is deemed that they are not ready to join a class (e.g. Ian and Darren). This location remains culturally determined, but the teacher's interventions, marking the important features of activities and controlling the degrees of freedom within tasks, are crucial. However, there is a financial implication to this, as it requires an extra adult in the school. Most of this group of pupils are currently awarded extra support through the statementing system, or otherwise, but not all. If they are to play their part in society as adults it is important to put in resources at this point, so that they may learn the skills for adult life.

Young people post-ABI find the pragmatics of language difficult to control (Clark 1996, Ylvisaker & Gioia 1998). Their difficulties are, however, very subtle, and it has been shown that listeners are not necessarily aware of the problem in schools, the pupil just seems 'odd' (quaint). Over-politeness can interfere with intersubjectivity, as partners in communication receive messages of agreement or understanding which do not concur with the true state. On the other hand blatant honesty can offend and break trust and communication. Within a classroom, teachers manipulate situations subtly to get their pupils to engage with learning, and good pupils know how to manipulate situations to their advantage. After an ABI young people lose that subtle control and their efforts at manipulation become obvious; teachers and other pupils become very aware of the attempts and are offended by them, breaking the communication cycle and often leading to reports of rudeness and disciplinary action.

### 8.2.2 Concepts

When ideas are linked into meaningful structures (Tharp & Gallimore 1988) they are more useful, more easily recalled, and are available for problem solving. If links are inappropriately made, it is difficult to access the relevant information. Most of us can hold, judge and link together several ideas, but with a reduced working memory, as is common after ABI this is difficult, and if the wrong connections are made they can be recalled in preference to appropriate links. While it may be *preferable* for other pupils, simple and clear language is *necessary* for the brain-injured pupil to be able to make meaning, if complex ideas are to be explored as illustrated in Diagram 4.



Discourse is the means by which ideas are taught and learned. Internally persuasive dialogue (Skidmore 2000) has a positive contribution to learning for this group of pupils, as for others. The involvement of pupils in constructing their own concepts by guiding their learning means that they are active and are able to try out links in safety before they are established as a structure. This may be developed through involvement in group-discussion, making links and associations with pre-existing knowledge. However, previous knowledge or experience may not be assumed, as memory difficulties after ABI mean that pupils may not recall previous learning.

### 8.2.3 Thinking

The way ideas are represented makes a real difference to the learning of these pupils. Iconic learning was found to be much easier than learning in a symbolic or enactive mode. Skills (enactive learning) needed more repetition than is normally given in order to learn them, while symbols should be given meaning by turning them into icons (meaningful visual representations). Any way that a concept or knowledge may be turned into an action, which may be remembered as an iconic experience (e.g. experimental work in science, construction in Technology, or even holding the real object), was seen to be preferable, with the appropriate language being introduced alongside the action to code the images into symbolic representation. This increases learning and retention of complex skills (Tharp & Gallimore 1988).

The provision of structures which organise and justify ideas (Tharp & Gallimore 1988) was found to assist the learning of pupils with ABI. Icons to look at, perhaps in a concept map which shows the organisation of ideas, were shown to help to encode concepts before committing them to memory. Topic maps are best drawn at the time; the presentation of a completed topic web on a sheet could be confusing for a young person with perception and sequencing difficulties. Concept maps may be drawn by a TA, or the teacher could present the icons on the board for the whole class. Pupils may make notes using specially designed mapping software (e.g. Inspiration). It is generally much easier to choose from a number of suitable icons, rather than to imagine and draw. Such icons help with the recall of new or technical vocabulary. It is suggested that the requirement for a precise use of technical terms helps to develop more finely tuned concepts. Alternative symbolic labels may be offered to help the pupil refine their ideas as they distinguish between them.

Help with organising ideas may also be given through a scaffolded lesson where a deliberate effort is made to link in new ideas with past knowledge and through frameworks for written work. 'Scaffolded dialogue' (Alexander 2004) helps support

learning, but the precise form of this needs to be considered carefully with a pupil who has sustained an ABI. Requiring the individual to explain their thinking to the class may put pressure on the pupil and their language may become condensed, at a time when they need to present ideas clearly.

### 8.2.4 Development of the concept of scaffolding for this group

The notion of scaffolding introduced by Wood *et al.* (1976) has been much elaborated and refined (Stone 1998a,b, Butler 1998 and others). The concept of a ‘flying buttress’ (Donahue & Lopez-Reyna 1998) may be more helpful post-ABI, when pupils do not just need support to learn and automatize ideas, but need to build the strategies into their learning behaviour. However a further refinement is required to meet the particular needs of pupils with ABI. I would like to suggest the acronym PEDER as helpful when thinking about supporting the learning of pupils who have ABI (Rees & Skidmore 2007b):

	<b>Similarity with scaffolding metaphor</b>	<b>ABI specific</b>
<b>Point out</b>	Recruitment / reduction in degrees of freedom	Helps with attention to appropriate features and reduces choice
<b>Explain</b>	Marking critical features	Emphasis on labelling the processes and constituent parts, providing links to previous knowledge
<b>Demonstrate</b>	Demonstration	Provision of iconic representation
<b>Encourage</b>	Frustration control	Avoiding the downward spiral to depression
<b>Repeat</b>		Establishing routines and memories

Diagram 5: PEDER acronym

Such support provides a rock<sup>1</sup> or secure foundation for learning. After an ABI pupils do not necessarily notice for themselves, they do not learn by ‘osmosis’ (O’Loughlin 2006) and significant features need to be marked or *pointed out*. Attention control is different post ABI (Rees & Skidmore 2007a) and reduction of the elements of choice can be helpful to focus ideas and learning in the classroom. It is then important to *explain* in order to label features, make connections between ideas and give the pupil the tools to be able to manipulate ideas for themselves. This assists with word finding difficulties and provides explicit links with previous knowledge. *Demonstration* or modelling provides a visual, or iconic, representation of the idea, but the study has shown that ‘show and tell’ is more helpful than pure demonstration. *Encouragement* is extremely important for young people who have experienced such a significant injury. Coming to terms with the new personality and learning style is not easy and causes many pupils to become anxious. It is known that highly stressed pupils do not concentrate or learn as well and think less flexibly (Turner & Curran 2006). However once is never enough and instructions will need to be *repeated* in order for the routines and memories to be established; in neuroscience the saying goes ‘neurons which fire together, wire together’ (Hebb 1949). However this may also mean changing the presentation of learning tasks for the whole class.

<sup>1</sup> Peder is the Danish/Norwegian equivalent of Peter/Pierre which means ‘rock’

### **8.2.5 A distinctive educational experience?**

Norwich & Lewis (2005) suggest in general there is a difference in the ‘intensity, attention and deliberateness’ in teaching needed for pupils with SEN, equating to ‘pointing out’ within the PEDER acronym. They also point out the need for a difference at the level of concrete programmes, materials and perhaps settings, not in curriculum design and pedagogic strategy. Many of the changes needed to use the PEDER acronym may also help other pupils, but if the approach to teaching/learning made use of PEDER then other pupils would lose out on learning opportunities provided by other teaching styles.

Allan (2003) identified three main barriers to inclusion: (i) a rigid SEN paradigm, (ii) teachers professional understanding of the issues and (iii) educational policy. All of these may be at work with the inclusion of pupils with ABI. ‘Later emerging difficulties’ (e.g. Walker & Wicks 2005) and the long recovery period combine to make this group very difficult to predict. The ‘Swiss Cheese Effect’, a metaphor for the unexpected gaps in knowledge and skills typical of this group of pupils, and the impulsive nature of pupils post ABI, means the pupils can act unpredictably. Adults who support learning in any way need to be aware of the possibilities through specific training. Government policy of ‘personalised education’ (Charles Clarke Nov 2003, Jan 2004, David Milliband Jan 2004) may be one way to serve this group. However, there are many definitions of personalised learning (TES Friday 26-03-04), but all agree it is not ‘individualised learning’ where pupils are placed in front of a computer terminal to learn alone, or are left to their own devices. Pupils with ABI currently receive some elements of a personalised education (Rees 2007c). Certainly when first reintegrating into school the tutor, SENCo and often the hospital tutor are all intimately involved in making personal contact with the pupil at least on a weekly basis. The pupil will probably attend school for only part of each day and at GCSE level one or more subjects has usually been dropped from the timetable. However as the pupil moves further away from the time of injury, or even moved schools, it is more common that they are attempting to follow a full timetable with no assistance, probably because no-one at the school realises that such assistance is necessary. While a consideration of learning style, and personal interest in their learning will help young people who have sustained an ABI, that is not usually sufficient to meet all their needs. Smith (2004) suggests that such young people require a ‘bespoke education’.

In one or two cases what may be termed a bespoke educational package is arranged (Rees 2007d). It is bespoke in that it is individually tailored to fit, but still looks much like that of other pupils. This is more frequently done in cases where it is clear that the young person will not be able to cope in a mainstream or special school. Within schools this flexibility is not often available although, with the advent of the 14-19 review, it may be possible to arrange a more bespoke programme for those who need it. Likewise, if a young person sustains an injury in Year 9 or Year 10, it will probably be better if they do not attempt coursework tasks during Year 10, and are put in for the linear exams. This has financial implications for the school and the Hospital Education Service, who will need to continue to support the young person when they have returned to school in order to complete coursework tasks.

There is a flexibility for all pupils in KS4 not often seen in KS3. Pupils are able to take fewer courses to manage their fatigue levels and slowed rate of working. William dropped business studies and Mike dropped DT and Italian, while George opted for 8



subjects, rather than 9, to give him extra time with the support staff at school. However the way pupils with ABI learn often conflicts with the way curriculum content is presented, particularly in Years 10 & 11. Although GCSE courses try to include authentic activities in most areas of learning, there is still much to be committed to memory, and where such learning is not embedded in concept maps and structures, recall can be very difficult. Multiple-choice factual answers required by modular science courses can prove almost impossible for some, and a linear course may be more advantageous.

It is evident from teachers' comments in training sessions that other young people show the same or similar difficulties, from different organic sources, but ABI is unique in the combination of these and it was seen in this study that pedagogies which assist ABI, will assist others too. Having changed teaching style to accommodate Owen's needs his Maths teacher found that the rest of the class had made more progress than was usually expected. It seemed that, at least in this case, by considering the needs of the pupil with ABI the unspoken needs of others were also met. Further research is required to ascertain whether all changes made to benefit the pupils with ABI suit other pupils or whether a different group would then be disadvantaged.

### **8.2.6 Oppression**

Disadvantage can lead to oppression as one group is subjugated by another (Abberley 1987). Normality is seen as preferable, such that a child must be able to stand and walk, even if that causes pain and suffering and is only possible with unwieldy gadgets. The oppression of disability means that people try their best not to be 'disabled' and try to belittle the effects of impairments. Young people often do not want to access the 'Special Needs' centre at school, whatever it may be called, or specific courses teaching independence skills. Part of empowering young people with ABI, is helping them reach a level of awareness of their personal strengths and impairments, so that they can access whatever help they require to play a part in society.

Disability is historically specific. In many cases those who now are labelled 'disabled', whether through ABI or otherwise, would not have had the opportunity to enjoy life only 20 years ago; society is willing to find the resources to push medical knowledge and practice further but not necessarily to cope with the implications of the recovery from injury. It is once the young person with ABI leaves the hospital that many of the implications of the injury are seen for the first time. Their life will now be more demanding in terms of time, organisation, emotional pressures and as a consequence, money. Social justice does not equate with monetary compensation, but in the absence of oppression; this implies that the provision of care for the individual, rather than the more general needs of society in education and medicine should predominate. However, individuals also have a duty to society; it is the responsibility of the individual pupil to respond to teaching positively, to take part in society and extend a culture which has stewardship at its heart.

### **8.3 Recommendations for provision and classroom practice**

Relatively few teachers in mainstream schools have any experience of teaching pupils who have an ABI. Their disability may be invisible (Rees 2006b) and their difficulties subtle, but specific to their injury. Teachers need to be knowledgeable about changes in brain function and how this effects learning. A training course has been developed and piloted as part of this study. It is delivered through SHIPS (Appendix L).

### **8.3.1 Education as Rehabilitation**

From the findings of this study it has become obvious that there are certain things which need to be taught/discussed before returning to school (Rees 2006c). Initially these ideas may be introduced out of context, to point out and explain the ideas, but it is also necessary for the teacher to show their use in the classroom context as well. In preparation for the return the young person needs to be reminded of the ways in which teachers expect pupils to offer ideas or 'bid for the floor', and to ask teachers questions. The ways teachers use questions need to be explained, especially to older pupils. Because of the difficulties experienced with knowing how to act politely in the classroom, general classroom rules and boundaries will need to be re-established together with the different ways to talk to adults and peers. However it is important to stress the need to judge others' actions and not follow blindly, although in the heat of the moment it is more likely that the pupils will follow. At this point, if the teacher is still present, the pupil may be reminded about the previous teaching and encouraged to use whichever judgement strategy (e.g. stop and think) has been chosen.

This study briefly examined the difficulties pupils with ABI encounter when working in groups, but only a limited number of groups were observed and there was not sufficient evidence to draw clear conclusions. However it would seem that it would be helpful to teach group-work skills in preparation for the return to school. The establishment of new strategies is an important role for the home tutor/re-integrating teacher. Such strategies may involve use of visualisation, thinking aloud, and naming or labelling objects to be remembered. Monitoring the completion of tasks and the use of the variety of frameworks offered by teachers needs to be taught.

Before returning to school it is important to make sure that all the underlying skills for learning have returned. Such skills include noticing, classifying and reasoning, planning, organising, sequencing, monitoring, empathy, orientation and spatial awareness. Many of these contribute to the language skills essential for participation in the classroom, e.g. the use and understanding of conjunctions presupposes an understanding of cause and effect. The two skills may be taught simultaneously as one relies on the other. Hence much of the teaching at this stage will focus on language and communication.

The Hospital Education Service offers a service to children and young people who cannot attend school on medical grounds. In some areas there is a move towards teaching such young people in group settings but I would argue that the particular needs of young people who have sustained an ABI require one-to-one tuition at this time. It is important to re-establish previous learning, but also to teach the particular skills they will need on return to school. This means that such pupils should not be expected to complete work set by school, as would be normal practice with other sick pupils. On reintegration pupils will generally be able to operate in the classroom without excessive fatigue, but they will still need substantial assistance to make meaning, particularly during the first year after their return and they should have a dedicated TA as a matter of course. The TA would give the pupil confidence that someone is on hand to assist, but they could also check for understanding and be an advocate eliciting additional support from the teacher where necessary. The TA could also help to establish routines, and remind the pupil of the ground rules in the classroom and the strategies taught by the home tutor. Difficulties with attention and choice could also be assisted by the TA,

but the most important job of the TA is probably to help the pupil adjust to changes in their learning style and personality, which are a result of the injury.

The particular pattern of needs will vary from one pupil with ABI to another. Strategies should be contingent on the particular needs of the individual pupil. However there is enough correspondence to be able to make suggestions of strategies which may be widely applied; they may be arranged in the acronym ACQUIRED (Appendix M) which has been developed for training. Many of these strategies assist in more than one area and may be added onto normal classroom practice. However

it is important to identify useful and promising strategies. However I believe that it is erroneous to assume that the systematic replication of particular methods will necessarily generate successful learning. (Ainscow 2000 p108)

The qualities of the individual teacher become part of the 'method' they use and success is not guaranteed if another teacher adopts the same 'method'.

### **8.3.2 Placement**

Professional experience has shown that special school placement is best for some pupils with ABI. Pupils have tried to return to a mainstream school only to find that they become increasingly confused and unhappy. One teenager, who sustained an injury at age 5, operates with the maturity and achievements of a 5 year old. She tried to return to a mainstream primary school, but her frustration at not understanding what was happening around her, and her confusion when faced with a large busy classroom, led to physical violence. After having been excluded and then reinstated, when medical evidence indicated she was not responsible for her actions, a more suitable placement was found for her in a special school with a class of eight pupils, which has a teacher and a TA. The work is also pitched at a level with which she (and the rest of the class) can cope, and she is no longer the 'odd one out'.

Class size and therefore 'busyness' is a major factor for this group of pupils. In a mainstream secondary school, pupils change both class and teacher every hour. A teacher may see this group only once a fortnight and if this is missed for INSET, illness or other reason, then it may be a month before the teacher meets the pupils with ABI again. If there were fewer pupils in a class, the teacher would have more time to speak to each one as an individual, and while it still may be a fortnight before they meet again, the space would be there to develop a relationship. Smaller groups would also reduce the distractions from other pupils, keep noise levels down and allow teachers to include a larger proportion of pupils in discussion, which this study shows would be beneficial to the pupil with ABI. However, the study did find some skilled practitioners teaching in highly structured environments which were conducive to the learning of pupils with ABI. One such I have termed 'the classical classroom'.

### **8.3.3 The classical classroom**

When comparing the primary-aged pedagogy of five nations, Alexander (2000) draws a parallel between musical and classroom structure and form, not as an alternative to a more traditional analysis, but as a complementary metaphor for classroom practices, which he feels is rooted in history and culture. He uncovers many different approaches and features of lessons which may be conceptualised by terms more frequently found in

musical analysis. Likewise I suggest that a 'classical' structure suits the learning patterns and style of pupils who have sustained an ABI and is mapped in Appendix N

The antithesis to the classical classroom could be styled 'polyphonic' (Rees 2005, Rees & Skidmore 2007b) a term also applied to Dostoevsky's novels.

The plurality of independent and unmerged voices and consciousnesses, and the genuine polyphony of full-valued voices are in fact characteristics of Dostoevsky's novels. (Bakhtin 1973 p 4)

A polyphonic classroom is characterised by different layers of meaning; teachers interaction with pupils (communicative intention), classroom ground-rules and routine, peer group interaction, interaction with the task, interaction with self (metacognition) and interaction with the concept. Pupils can succeed at one, ignoring another, they can complete a task without understanding why, or contribute to their learning in terms of building concepts. Ideally, there should be an awareness of all of these layers at the same time, without isolating the lines, producing a multilayered understanding. However, after an ABI this appears very difficult and pupils attempt to switch attention from one layer to another. But this too is not easy (Rees 2007b) and there is a tendency to focus more intently on just one layer, often the task, to the detriment of all other layers of meaning, and the pupil misses the additional help given, homework being set or even the bell for the next lesson.

In the polyphonic classroom the lesson moves forward seamlessly, but this gives no clear indication of transition points where the pupil has to switch attention. Long flowing lines in a polyphonic structure require a high level of attentiveness to be able to link the beginning idea with the end, as in teachers' expositions of the theory behind the focus of study. Frequently these consist of long sentences, using technical words, which pupils after an ABI find difficult to follow, either finding their attention wandering or describing those lessons as 'difficult'.

Interest in polyphonic music is created through a feeling of discomfort, as the listener, expecting harmony, hears discord. Tension is then resolved, bringing security once more. Likewise ambiguous language, including hints and prolepsis, which push the pupils on to developing a new and expanded understanding of the topic, may keep the pupils intrigued, actively thinking as they anticipate the next revelation. Teachers make the assumption that pupils understand and talk on that basis, building up a picture of what they want the pupils to learn, which is full of ambiguity until at last it all comes clear. By this point a pupil who has sustained an ABI, has often given up as most cannot cope with such uncertainty.

Support in the polyphonic classroom is an implicit feature of the layers of meaning, depending on pupils being able to garner support from the interactions going on around them, the metacognitive strategies they have learned thus far and the design of the task. However for the pupil who has sustained an ABI this may not be enough. Without the security of explicit support any ambiguity questions the stability for a moment. Just as musical suspensions create a sense of tension in the listener, as he/she awaits the resolution, ambiguity may generate a high level of stress in the pupil with an ABI which is never resolved, as they understand language literally, which will not resonate with the figurative usage by the teacher.

Polyphony relies on the intricacy of the detail, but for pupils with an ABI too much detail overloads. Choice, or even a list of instructions, can confuse or even paralyse a pupil after an ABI because of the difficulties of holding ideas in working memory. Confusion leads to the pupil strategy of taking language literally, rather than search for deeper figurative meanings, and of considering diagrams as exact representations. A search for security in the face of such confusion means that the pupil sticks rigidly to what they know, perseverating on single ideas, paying too much attention to one thing and being unable to integrate new ideas into their understanding.

Bakhtin contrasts Dostoevsky's polyphonic approach with the monologic (homophonic) European novel. A homophonic approach to music culminating in Mozart's sonatas, sought to give music an almost tangible architectural shape, hence the epithet 'Classical'. Classical structure and texture is quite different from polyphony and would better describe a more suitable educational setting for pupils after an ABI. Here, one line takes pre-eminence and all the others support it. Focus can legitimately be on the main theme of the lesson, it does not need to be divided and there are no distracting layers, as all are supporting the one. The firm bass-line of previous experience provides a foundation for the new learning and explicit support is provided, by teachers, task or equipment to fill the gap between previous and new learning as the harmonic filling supports both the melody and the bass.

The classical melodic statement is shorter and more memorable, with a clear structure and breathing time. Question and answer sessions provide shorter utterances, with space between each, as a pupil is nominated to answer and the teacher then evaluates the answer, in the typical initiation-response-feedback cycle. The classical melodic line no longer relies on suspensions for its interest, but such notes which are not within the harmonic framework are now used as passing notes from one secure chord to another. The ambiguity of figurative language may be used in a similar way, to add to the understanding of an utterance, but not to replace it completely. Teachers can introduce ambiguity but ensure that enough is said to guarantee its full understanding. Once a teaching theme is well established a second theme (countermelody) may be introduced to emphasise the points of the main theme through contrast just as links and contrasts may be made in the classroom to assist with concept building.

The form of a classical piece is of utmost importance, with the main theme repeated then developed and recapitulated. Such repetition is very important for the pupil who has sustained an ABI in order to establish new learning. The development of the main idea, possibly through demonstration or illustration, allows for concept building, practice of skills and opportunities to develop metacognitive awareness. It also allows for different perspectives to be explored moving pupils towards greater levels of abstraction (Renshaw 1992, Skemp 1971). At the end the main theme is recapitulated as in the plenary, which is now often seen within the structure of lessons. However, because of the over-focusing typical of pupils with an ABI, within an essentially polyphonic classroom, these pupils often miss what should be a vital part of the lesson. However, a stricter structure, following classical lines, would ensure that this is an essential part of the lesson, and not just tacked on because it is recommended. A structured lesson also models organisation to pupils whose organisational abilities have been scrambled. Pupils may anticipate the script of a well-structured lesson in the same way that players begin to anticipate the entries and shape of classical music. This

brings security to the pupil after an ABI who lacks the flexibility to react quickly to unscripted learning opportunities.

But probably the most important part of this analogy is the harmony; that solid foundation above which the melody soars. It is the clear harmonic and melodic rules which make the sonata predictable, just as explicit ground rules for each task mean the pupils know what is expected of them. Within that they can learn about themselves. Things happen often enough in the classroom in a predictable way for them to come to know what works for them, a metacognitive understanding. A logical key structure in the sonata provides clear expectations of where it is going. Interest comes from small surprises, which divert from the main path for a moment and then return. Similarly in the classical classroom, pupils have a good idea of the structure of the lesson, not because they have copied the aim from the board at the start of the lesson, but because the lesson itself is structured with tasks that build on each other. Clear transitional points may be anticipated, usually through the teacher providing an accurate timing for each section, just as cadences may be anticipated in the sonata from the conventional chordal structure preceding them. Such cadence points also provide time and space to reflect and prepare for the next part of the lesson.

In the classical classroom TA support is the harmony, providing the infill between the bass line of what pupils know and the new learning of the melody. In the early days after an ABI, a TA is a very important person, assisting the young person to come to terms with the new self, learning new metacognitive strategies and providing support, both academic and social. Yet many TAs are unsure of their role. Darren's TA felt hers was to ensure he was happy and relaxed in school, while Louise's TA felt she had to get the work into Louise's book so that Louise could 'learn' it. Supporting a young person with an ABI is a skilled job and requires particular training, but few of the TAs had received any training at all. SHIPS offers training and there is an annual Training Day for TAs, teachers, educational psychologists and others involved in education, run by the local centre of excellence for paediatric neurology (including SHIPS) to which I encouraged schools to send representatives.

However,

The constant presence of an assistant may well, of course, be socially reassuring for a student.....On the other hand, however, we see many instances where the assistants' actions acted as a barrier between particular students and their classmates. (Ainscow 2000 p110)

It was noted that sometimes the teacher carried less responsibility for the pupil with ABI when a TA was present. The lesson carried on in the normal way with the assistant dealing with the student and ensuring that they complete the tasks set, rather than considering the learning which is intended to take place through the activity. Daniels (2006, personal communication) considers that these young people are engaged in the ZPI (zone of proximal instruction) which is all about completing tasks and not development itself. Just having a TA may preclude a consideration of how practice may be changed to facilitate the participation of these students.

The provision of additional resources to pupils – such as support from teaching assistants – did not ensure good quality intervention or adequate progress by pupils (Ofsted 2006 p2)

Instead they call for the involvement of a specialist teacher, good assessment, tailored, challenging work and commitment from school leaders. Yet such provision of specialist teachers is not available in many areas of the UK for pupils with ABI.

Music in the classical style requires a great deal of sensitivity on the part of the players; they must listen intently to each other to match their style in terms of note lengths and attack. In a classroom situation, teaching a pupil with ABI requires intersubjectivity; their abilities are typically ‘patchy’ and teachers need to be aware of exactly how the young person is approaching the current learning task.

Too often a pupil who has an ABI can access only part of the lesson, part of the classroom meaning-making, as the consequences of the ABI do not allow them to attend to the whole lesson. Slowing down the pace of the lesson and providing a clear structure with breathing spaces means that these pupils are able to take a greater part in the lesson. After all it is the pupil’s interpretation of the lesson ‘score’ which matters, as it is their learning which is to be enhanced. Each pupil has to bring part of themselves to the lesson, just as a player contributes to the musical offering; but every pupil and player is different. What is learned, understood or developed in each lesson depends on the unique combination of participants, including the teacher, (the conductor), together with the structure, or form, of the lesson.

#### **8.4 Limitations and suggestions for further research**

My study was an initial study into making meaning in the classroom and looked at the experience of pupils with ABI in mainstream secondary schools only. This was chosen deliberately because it is where difficulties occur most often, but the way that pupils make meaning at young or older ages than the 11-16 age-range considered, may be different and warrants study. Professional experience in other types of school (primary, special and private) and colleges leads me to believe that their distinct context and ethos provides a very different experience of education in those settings, with different contextual supports, different groundrules and different expectations of pupils. Future research could investigate these settings. Learning in the work place is also an issue for many pupils because of the length of recovery and the long lasting implications of the injury.

Although the aim in this study was to take the pupils’ views into account, it would be instructive to look at the school experiences of pupils with ABI, within a Foucaudian framework as explored by Allan (1997, 1999); the experience of this group as they try to establish a new identity may be instructive to those of us who try to help.

The wide levels of experience, pre-morbid school achievement and times post injury in this study can only paint a broad picture of how pupils make meaning in the classroom after an ABI. A closer sample of pupils may be able to discover individual characteristics of the learning of particular groups. However this may lead to teachers making assumptions about learners and not treating them as individual young people with a unique pattern of needs. My study found that more difficulties are encountered in some school years than others. When a pupil is ready to return to school they frequently

feel that normal life has returned; all around them breathe a huge sigh of relief, only to find after a few weeks that, although physically they may be ready for school, cognitively their recovery has a long way to go. There are different demands on young people at different ages. A child may seem to have made a full recovery in Year 6 only to find that in Year 7 or 8 they face major problems as the demands of schooling change. There is a further change of demands in Key Stage 4 as pupils prepare for GCSE. Further research could focus on this pattern and look at ways to help pupils with ABI through their difficulties.

I also considered all ABIs as a single group, but differing aetiologies affect the brain in distinct ways and further work will be necessary to tease out the differences. It may be that the lack of focal injury in non-traumatic injuries leads to different kinds of classroom behaviour, or that pupils who have frontal injuries react differently from those without. Further research may be able to isolate features of meaning-making in pupils with one type of injury or at particular stages in recovery.

My sample size was small, thus generalising from this can only be tentative, but it was a strong sample for a qualitative, in depth, case study approach. This method was chosen for practical reasons and it also enhances the ongoing Kids' Head Injury Study and Brain Tumour Study which are population studies. There is an argument for extending these two studies to examine the classroom experiences of the young people as well as measuring the consequences of injury using clinical tests.

In this study the researcher was a visitor in the classroom and a stranger to some of the young people, but well known to others. It may have been that those I know well were more forthcoming with their comments or that I had more insight into their way of making meaning. Further research could be undertaken by classroom teachers who would get to know each pupil well and could monitor the pupil over much longer periods, mapping their progress more accurately. It may also be possible to conduct a longitudinal study with a small number of pupils watching how meaning making changes as recovery progresses.

A nationally-funded representative study may be able to test whether a classical classroom is more suitable than a polyphonic one for all pupils with an ABI. If it were designed as collaborative action research it may be possible to clarify the kind of structure which is essential for learning and others which may assist but are not critical.

It has been suggested above that software packages could be used for pupils and teachers to take notes, develop frameworks and topic maps. Professional experience indicates that some are more effective than others for pupils with ABI. Further research could evaluate these and develop new tools. The difficulties encountered when interviewing teachers point toward another area for research, that of teachers' perception and knowledge of ABI. Problems encountered with homework were not adequately addressed in the current study and remain an issue.

The regional setting of this study in the South West of the UK is important and also a limitation. The tertiary hospital for neurology may have very different practices from other tertiary hospitals, and the presence of the research studies for TBI and BT already provide a point of contact for parents, and a point of referral to SHIPS which does not exist in other areas. The impetus for SHIPS came from a realisation that some of these



pupils were finding school very difficult; staff at the hospital have tried to inform their community counterparts of the kind of difficulties experienced, but the further from the hospital the less contact there is and the less informal training. Formal training of educational professionals takes place each year, in the form of the Bristol Training Day. Staff from many of the schools involved in my study have attended one of these days and contacts further afield have also taken advantage of them. No other hospital in the UK sponsors training days for educationalists. However there are also drawbacks. Few of the LEAs recognise the implications of ABI and support through statutory assessment is not always available. This is particularly so when a pupil shows no outward sign of their injury and/or their clinical scores are 'average'. This study has shown however, that despite 'average' scores classroom functioning may be affected strongly.

Clinical research is being undertaken in University of Exeter into the development of socio-emotional and executive functioning in children aged 10 to 15 years who have sustained an ABI. My study has indicated that these elements may affect the ability to make meaning in the classroom and future research could follow up the issues raised in a classroom context.

### **8.5 Contribution to knowledge**

This study has been able to consider the conditions learning in a classroom context for young people with ABI. The requirement for a totally different educational package is not overwhelming, although special school provision is appropriate for some. However this group of pupils do require a greater level of differentiation of approach within the mainstream classroom than they are often accorded. Improved monitoring of the progress of individual pupils, TA support and training of teachers and TAs is essential and more resources need to be found.

Classroom discourse practices, based on nationally recommended theories of teaching, have been shown to throw up barriers to learning, but, with small changes, could support learning. The optimal conditions for learning were seen to be affected by at least two dimensions; an attempt was made to illustrate these diagrammatically. Young people can engage in complex ideas when language is simple, or complex language when they control it, extending and refining the findings of clinical research into discourse after ABI.

The study has also revealed the place of thinking aloud in meaning making for this group. The egocentric speech used by pupils after ABI seems to be a dialogue with self which disappears underground once more, many years post injury. Using this feature of learning behaviour, pupils may be taught a modification of Alexander's theory of dialogic teaching (Alexander 2004) so that they may talk themselves through difficulties; thus the concept of internally persuasive dialogue was extended to include dialoguing with self. Provision of space and time needed to utilise this strategy could make a big difference to learning outcomes.

The scaffolding metaphor was refined to suit pupils who have sustained an ABI. Several teachers have piloted the PEDER acronym, with its built-in bias towards iconic representation and deliberateness, and found it helpful. Alexander's musical metaphor for classroom interactions was developed to compare Classical and Polyphonic styles. The idea of the Classical classroom requires alterations to practice; not all pupils with

ABI are provided with TA support, and changing teaching style requires a great commitment. But this may go some way to explain why some pupils post ABI do well with some teachers, and not with others.

My thesis is that;

- ◇ These pupils are limited in the ways they make meaning and use a variety of strategies, some not used by other pupils.
- ◇ This causes difficulties in the classroom; it is teachers' responsibility to adjust their communication .
- ◇ However teachers have probably never taught a pupil with ABI and cannot be expected to know the particular ways to structure learning without assistance.
- ◇ Therefore specialist teachers should be employed to;
  - a. advise teaching staff of the specific learning style of the individual pupil and how this is affected by the ABI.
  - b. facilitate training for staff and parents.
  - c. monitor pupils' progress.

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## ***Glossary***

- accommodation:** in Piagetian theory; it involves modifying behaviour to fit the environment, changing a schema to apply it to the new learning. Must be used with assimilation for cognitive development to take place
- acquired brain injury (ABI):** An injury to the brain which is not genetic
- acute phase:** phase of recovery which usually takes place while in hospital
- aetiology:** origin or cause of a disease
- algorithm:** rule or procedure, generally in maths
- antiphony:** alternate or responsive singing/playing by a choir/instrumental group in two divisions.
- aphasia:** loss of ability to express oneself and/or understand language
- appropriation:** Rogoff's term for the way children learn from social interaction. Similar to internalisation, it emphasises that children acquire a changed understanding as they participate in activities
- assimilation:** incorporating environment into existing schemas. Works with accommodation to promote learning.
- attention:** ability to focus on a given task for an appropriate amount of time
- autistic:** pervasive developmental disorder of children, characterized by impaired communication, excessive rigidity, and emotional detachment. Tendency to view life in terms of one's own needs and desires
- axons:** long extensions of nerve cells that conduct impulses within the brain
- axonal shearing:** tearing of the axons
- behaviourism:** approach to psychology concerned only with observable behaviour. Term coined by Watson and associated with Skinner, operant conditioning and associations
- bridge passage:** leads from first subject to second in Sonata Form
- cadence:** melodic or harmonic progression which is associated with the ending of a section of music
- case study:** in-depth study of an individual or few individuals
- chronic phase:** last phase of recovery, generally from 2 years post injury onwards when recovery is much slower
- closed head injury (CHI):** as TBI but where the skull is maintained
- coda:** passage added to a composition to give stronger sense of finality
- code switching:** ability to modify an utterance to the needs of the listener
- cognitive conflict:** discrepancy between what a learner believes and what (s)he is experiencing
- coma:** state of profound unconsciousness Glasgow Coma Score (GCS) 8 or less
- compensatory approach:** therapeutic approach which aims to develop new skills to compensate for lost skills
- computed topography (CT):** scan of the brain, or other part of the body, involving a series of images taken at different levels.
- constructionism/constructivism:** An approach to human development which proposes that models of reality are constructed through an active interaction between innate capacity and the environment, included the social environment
- contusion:** vascular injury resulting in bruising, swelling and haemorrhage of capillaries
- confabulation:** fabrication of experiences recounted to fill in and cover up gaps in memory
- cortex:** the outer convoluted surface of the brain composed of nerve cell bodies and synaptic connections

**contra-lateral:** pertaining to the side of the body opposite the reference point, usually the site of injury

**countercoup:** area opposite initial impact which is injured as a result of acceleration/deceleration

**counterpoint/contrapuntal:** combination of simultaneous parts or voices each having significance in itself, which blend together in a coherent whole

**coup:** area of initial impact in a traumatic injury

**cultural tools:** internalised models of symbol systems which organise and categorise knowledge in a particular culture acquired by an individual and necessary for operating within that culture.

**decentration:** increasing ability to move freely from one point of view to another in Piagetian theory

**developmental niche:** relationships between child and their environment, social setting and culture

**development(music):** middle section of Sonata Form where the two linked subjects are explored

**developmental theory:**

**diffuse:** effects many regions, opposite to focal,

**dynamic (music):** range of volume of musical sound

**dysfunction:** malfunction of a part of the body

**dysinhibition:** Loss of inhibition, unrestrained behaviour resulting from a lessening or loss of inhibitions or a disregard of cultural constraints.

**EAL:** English as an additional language

**eidetic approach:** using the recall of visual images

**ellipsis:** omission of words which would clarify the utterance

**enactive:** representation of the world through skilled activity

**encephalitis:** inflammation of the brain

**epistemology:** theory of knowledge

**ethnography:** study of ethnic groups, here refers to the study of groups of people in school society, and an attempt to take into account their perspective in description

**executive functions:** planning, prioritising, sequencing, self-monitoring, inhibiting, initiating, or altering behaviour, also known as 'higher level functions'.

**exposition (classroom):** part of a class lesson when the teacher speaks to the class expounding ideas and concepts

**exposition(music):** the initial statement of the subjects, usually two, in Sonata Form

**figurative language:** involving a figure of speech

**fine motor skills:** small physical actions eg finger movements

**focal:** restricted to one region

**frontal lobe:** front part of the brain, frequently the site of injury in TBI

**Glasgow Coma Score (GCS):** a quick, practical and standardised system for assessing degree of conscious impairment; often used to predict outcome after brain injury. A score of 13-15 is considered a mild injury, a score of 9-12 is a moderate injury, a score of 3-8 is a severe injury.

**ground rules:** special ways of behaving in a particular situation

**haematoma:** collection of escaped blood trapped within the brain

**haemorrhage:** loss of a large quantity of blood in a short period of time

**hemiparesis:** muscular weakness affecting one side of the body

**hemiplegia:** paralysis of one side of the body

**homophony/homophonic:** music in which the parts move in step



**hypoxic:** inadequate reduced tension of arterial oxygen which results in increased heart and respiratory rates. In severe cases this leads to breathing failure and coma

**iconic:** representation of the world through imagery

**information processing:** theory of learning which holds that the brain functions in a similar way to an information processor (computer)

**initiation:** the ability to start a task

**inner speech:** mentally talking oneself through a task. Vygotsky felt that this was essential for thinking about action and profiting from social interaction

**intermental:** related to speech and language and ways of communicating with others

**internalisation:** process by which children gain knowledge and understanding from social interaction

**intersubjectivity:** shared knowledge between communicants where both take part in the interactions, fitting their own understanding to the assumed understanding of the other

**intramental:** internalised inner use of speech to regulate thought. Refers to cognitive self-regulation

**IQ:** intelligence quotient, a measure of intellectual ability base of psychometric tests

**IRE:** initiation-response-evaluation; a script for question and answer in a classroom

**IRF:** initiation-response-feedback; a script for question and answer in a classroom

**Kids Head Injury Study (KHIS):** large-scale study in a tertiary hospital into effects of TBI on various aspects of quality of life

**Learning Disabilities (LD):** US term equating to the UK term SpLD (Specific Learning Difficulties)

**Learning Difficulties and Disabilities (LDD):** UK government term used to describe pupils with special educational needs (SEN)

**lesion:** any visible local abnormality of the tissues of the body; damage to the nervous system

**melisma/melismatic:** originally a passage where one syllable has many notes, latter applied to highly ornate instrumental music

**metacognition:** a group of skills which allow one to reflect on ones own cognitive processes, including predicting the outcome of an action, monitoring activity, co-ordinating attempts to learn and modify behaviours, strengths and weaknesses: Thinking about ones own mental states or thought processes

**middle phase:** between the acute and chronic phases of recovery

**morbidity:** abnormal condition or quality

**MRI:** magnetic resonance imager, tool used by radiographers to examine the brain non-invasively

**non-traumatic brain injury:** injury to the brain not caused by a knock or collision eg through infection, near drowning or near hanging

**ontogenesis:** onto, essence of being (knowing) genesis, beginning

**ontogenetics:** science of ontogenesis

**ontology:** a branch of philosophy which deals with the nature of existence

**open head injury:** acquired brain injury caused by a trauma which penetrates the skull

**ornaments (music):** melodic decorations

**passing note:** a connecting note in the melody which does not form part of one of the chords

**penetrating injury:** acquired brain injury caused by a trauma which penetrates the skull

**perseveration:** inappropriate persistence of a response in a current task Perseverations maybe motor or verbal.

**persistent vegetative state (PVS):** a condition in which the person makes no response which is meaningful

**perception:** the act of apprehending by means of the senses or of the mind

**phenomenology:** study of consciousness by introspection and subjective inspection of mental events as they occur in an experience

**plenary:** short session at the end of a lesson when the teacher requires the class to sum up what they have learned

**plasticity:** the ability of cellular or tissue structures and functions to be influenced by an ongoing activity

**polyphony:** music of many voices which do not move in step; opposite of homophonic

**post traumatic amnesia(PTA):** a period of hours, days or weeks following injury during which the person is confused, with a loss of day-to-day memory. The person is unable to store new information and has a decreased ability to learn.

**pragmatics:** communication in context

**premorbid:** as it was before the injury or illness

**prefrontal:** associated areas of the frontal lobes

**prolepsis:** communication where the listener has to construct new understandings of the speaker's intended meanings. For this to work it has to be assumed that the speaker is sincere and that they have some information not yet communicated to the listener.

**repair:** the act of seeking clarification of an utterance which is not understood

**recapitulation(music):** repetition of the subject material in the exposition

**rehabilitation:** to restore to good health or useful life, through therapy and education

**restorative approach:** therapeutic approach which aims to restore lost skills

**rote learning:** learning 'by heart'

**scaffolding:** supportive role adult plays to support child's activities, enabling child to achieve beyond their ability alone. Progressively the support is reduced to allow the child to act alone.

**schema/schematic:** in Piagetian theory, a concept developed by action on the environment through processes of accommodation and assimilation. A schema is not fixed, but constantly changing

**script:** organised structure of knowledge in memory, built up from past experience

**semiotics:** the study of signs and symbols and their meaning

**SEN:** special educational needs

**sequelae:** pathological consequences or manifestations of the injury

**short-term memory:** the temporary store of memories which decay in minutes

**situated cognition:** social constructivist view that cognition is typically situated in social and physical contexts and rarely decontextualised

**social constructivism:** theoretical position which emphasises the way knowledge is constructed in social and cultural contexts. Suggests that child is active agent in construction of personal identity, but social context is active in the way in which the child's learning always takes place through social relationships.

**suspension:** holding over the note of one chord into another forming a dischord which is then resolved by a change of chord

**symbolic:** representation of the world through symbols

**theory:** any statement that claims to explain something. It gives explanations for observed behaviour and leads to the development of hypotheses and suggestions for practical applications.

**theory of mind:** ability to take the perspective of another and understand their mental state

**traumatic brain injury (TBI):** adventitious brain injury sustained after a blow or collision to the head

**traumatic head injury (THI):** as TBI

**working memory:** temporary store of a limited amount of information which decays in seconds

**zone of proximal development (ZPD):** in Vygotsky's theory the gap between the actual developmental level as shown by independent problem solving and the potential level as shown when under adult guidance

## Appendix A – observation sheet

Name \_\_\_\_\_ Date \_\_\_\_\_ Lesson \_\_\_\_\_ Adults in  
room \_\_\_\_\_

Plan of room \_\_\_\_\_

Teaching style: \_\_\_\_\_

Skill or content?

Distraction level

Immediacy of task completion  
atmosphere

Activity number 1      2      3      4      HW

**BRIDGING**

Teacher language:

Linguistic devices used

**INTRODUCTION**

What does pupil do? Bid for floor?

Teacher language:

Linguistic Devices used

**HANDOVER**

What does pupil do?

Teacher language:

Linguistic Devices

Ground rules for an activity communicated?

Are they explicit or implied/assumed?

Transferred knowledge is assumed?

What other strategies are used?

**ACTIVITY**

Notice a breakdown?

Request assistance?

From whom?

Signalling their need for clarification

How can teachers tell they need help?

One-to-one assistance given?

What? Modelling / talking/ hints/ other

What does pupil do?

Who assists?

Linguistic devices

Are they successful?

A-typical behaviours:

Planning

Goal setting

Dysinhibition

Perseveration/lack of flexibility to change problem solving sets or scripts

Poor working memory

Metacognitive behaviour

Attention

Pragmatic difficulties

Initiation and decision making

## **Appendix B - Orienting questions**

What strategies do ABI pupil use to follow activity changes?

What do they do while being taught as a class?

How do “teachers” (ie those who teach, whether LSAs, teachers or other pupils) assist one-to-one? Are they successful?

How does the teacher communicate what to do?

What figurative language is used by teachers to communicate skills and concepts?

How are the ground rules for an activity communicated?

Are they explicit or implied/assumed?

What transferred knowledge is assumed?

What other strategies are used? Are there any allowances for this particular pupil?

When an activity changes does the ABI pupil know what is expected?

Does the ABI pupil notice a breakdown in communication?

How do they request assistance?

From whom do they request assistance?

How do they signal their need for clarification if they do not explicitly ask? Or how can teachers tell they need help?

What other atypical behaviours may be impeding the ABI pupil’s ability to join in with classroom activities?

Planning

Goal setting

Dysinhibition

Perseveration/lack of flexibility to change problem solving sets or scripts

Ability to shift attention

Poor working memory

Error checking protocols/ evaluating/ metacognitive behaviour

Attention

Initiation and decision making

Pragmatic difficulties

Linguistic difficulties/ word finding/rambling speech

## Appendix C – Homework questionnaire

**Homework monitoring sheet** Parents, please complete by ticking the boxes

Date \_\_\_\_\_ Date due \_\_\_\_\_

Subject \_\_\_\_\_ Task \_\_\_\_\_

1. Getting started COMMENTS (optional)

- Got started on his/her own \_\_\_\_\_
- Needed reminding to do the homework \_\_\_\_\_
- Needed lots of reminders to do the homework \_\_\_\_\_

2. How did your child know what the task was?

- Had it in his/her planner \_\_\_\_\_
- Had it in his/her head \_\_\_\_\_
- Had a handout from the teacher \_\_\_\_\_
- Had it on a scrap of paper or on his/her hand \_\_\_\_\_
- Called a classmate \_\_\_\_\_
- I had to instruct him/her to call a classmate \_\_\_\_\_

3. Finding the books/equipment \_\_\_\_\_

- Knew exactly where it was \_\_\_\_\_
- Had to look through a lot of books to find it \_\_\_\_\_
- Needed help to find it \_\_\_\_\_
- Didn't find it \_\_\_\_\_

4. Working on the task \_\_\_\_\_

- Seemed to understand what to do \_\_\_\_\_
- Had a few questions about how to do it \_\_\_\_\_
- Needed me to stay and give help occasionally \_\_\_\_\_
- Was unable to do any of the task independently \_\_\_\_\_

5. Completing the work \_\_\_\_\_

- Stuck with the task until it was completed \_\_\_\_\_
- Had one or two breaks \_\_\_\_\_
- Needed encouragement to stick with the task \_\_\_\_\_
- Needed a lot of support to finish the task \_\_\_\_\_
- Was unable to complete the task How long did your child take on this piece? \_\_\_\_\_

6. Putting the homework away \_\_\_\_\_

- Put it away where it could be found and given in easily \_\_\_\_\_
- Needed a reminder to put it away \_\_\_\_\_
- Needed repeated prompts to put it away \_\_\_\_\_
- Left it out or put it somewhere where it would be hard to find \_\_\_\_\_
- N/A – homework was to revise for a test \_\_\_\_\_

Thank you

## Appendix D - Example of Fieldnotes

### Louise - Probability

Maths lesson following up the mock papers. Probability is written on the board and starter under which is a number of fractions. The teacher gives out calculators

T: You need calculators for this

L:( to the world in general) How do you do fractions on this?

SR: I'll tell you in a minute, just listen

T: When you have a fraction how do you make a decimal?

L: Divide, the line means divide

T: So what is  $\frac{1}{4}$  as a decimal

L: 0.25

T: How do you turn a decimal into a percentage?

P1: 25%

P2: Take off the 0

T: So what are you doing?

P3: times by 100

Louise is playing with the calculator and does not appear to be listening

T: Right now repeat these for all these

Louise goes straight down doing each one, writing out the layout first and then filling in with the answers as in the example .

The teacher starts asking the group who are not working to give him the answers, Louise and the rest of the girls continue working alone.

T: Louise what is 2 divided by 5

L: Not looking up: 0.4

She continues working

SR: You're very quick at these

L: They're not hard

T: You must remember the bar between the top and the bottom number means divide

Louise is writing at this point

L: 0.66666666. What do I write?

SR: We say that the number is recurring and you put a dot over the number

T: All happy about fractions to decimals to percentages?

L: Yes I understand it now.

No one else answers

P4: She's shouting out again

T: Now lets look at probability. You had this on the mocks and you all got it wrong so..... page 261 question 3

What is the probability of getting an even number on a dice?

(The lesson continued)

## Appendix E – SHIPS top sheet



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Name of pupil.....DOB.....  
Parent/carer.....  
Address.....  
Phone..... Mobile.....  
School Name.....Address.....  
Year.....School phone.....  
Contact person.....email.....  
Class teacher/tutor.....Head teacher.....  
SENCO..... HOY.....  
Does the pupil have a statement of educational need? Yes/ No or an IEP? Yes/No

### Details of brain injury

Hospital..... Consultant..... Date of injury.....  
Type of injury TBI/non-TBI Cause.....GCS.....PTA.....  
Position of injury in TBI.....  
Other details.....  
Length of stay in ICU..... Hospital..... Home Tuition.....

### Which other professionals assist your child?

Name	Organisation	Phone and/or address
.....	.....	.....
.....	.....	.....
.....	.....	.....
.....	.....	.....

Who referred? KHIS/HES/Parent/School/ Other (please state).....

### Where did you hear about SHIPS?

Web / HIRE / Cbit / Leaflet / Other, please specify.....

Have you seen the SHIPS leaflet? Yes/No

Have you seen the website Yes / No

On the reverse of this sheet please indicate

Why you think your child needs the support of SHIPS.

What are their specific difficulties at school?

What do you hope SHIPS can do to help your child?

For office use: Parent pack Teacher pack Training Parental permission School permission Evaluation
--



## **Appendix F – One page from reflective diary**

05/01/2003 12:46

We know that recognition is intact in TBI. This is an elementary psychological skill. Is it that the higher ones do not develop (medical literature) or is it that the skills to learn them, ie communication skills, are missing or unavailable, or what? Or could we as teachers do something to encourage them?

We say that TBI children cannot learn, do we mean learn content or strategic learning?

06/01/2003 07:51

Are we developing higher order cognitive skills when we are teaching, or are we using them when we teach which is why the TBI child has difficulty in learning?

We want active learners, active in using prolepsis and able to make the links etc

What if something prevents you from being active?

There are a number of terms being used and I am not sure which are equivalent or how they are different

- metacognition
- higher order cognitive/mental/psychological functions
- executive functions
- active learning
- proleptic teaching/instruction
- strategic learning

Can I put tables and diagrams in the Lit Review to explain?

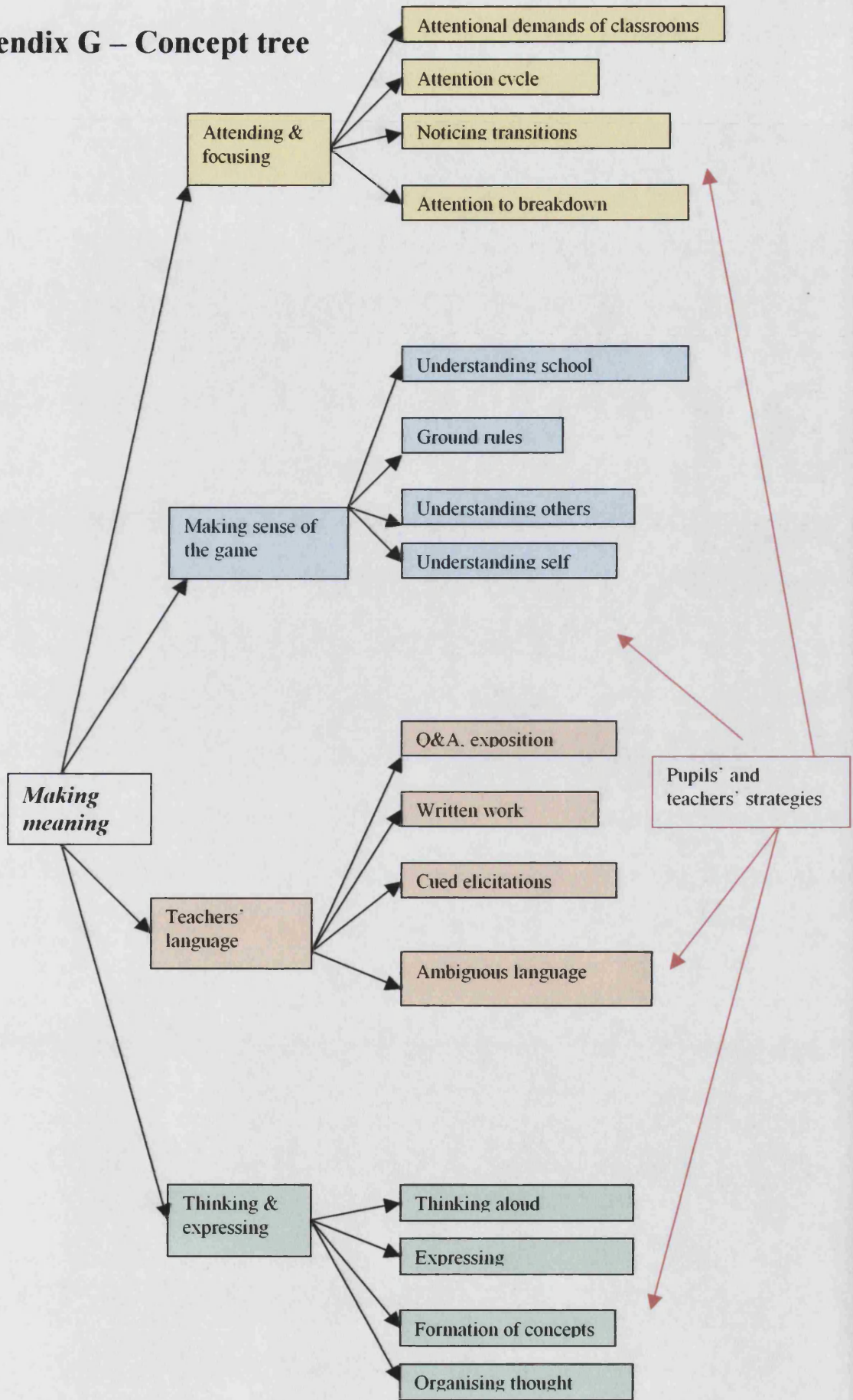
06/01/2003 12:09

In response to Stone 1985, I wonder if parents have found that the children do not understand when the parents use prolepsis and parents instead follow their children's lead and accept their incorrect responses in order to build self-esteem

22/01/2003 13:22

Fleer found that new conceptual understanding is fostered by the establishment of mutual understanding between teacher and students within a clear goal-oriented context. This seems important if the TBI child is not oriented towards others and has an impaired theory of mind and also is not goal oriented. This is in Stone 1998.

# Appendix G – Concept tree



## **Appendix H – Dimensionalising**

### **Forming concepts**

*Do the young people choose associated words or similar sounding words? What are the associations?*

*How are the ideas connected? Physical connections, or temporal, or conceptual, or collections, factual or logical one?*

*How do you get them to understand when they have a wrong word? Do you use a more specific one, a more general one or something else?*

*How does the representation of the idea assist with learning?*

*Is there a sequence from procedural to principled?*

*Is there a difference in the way ABI pupils respond to learning skills, knowledge or ideas?*

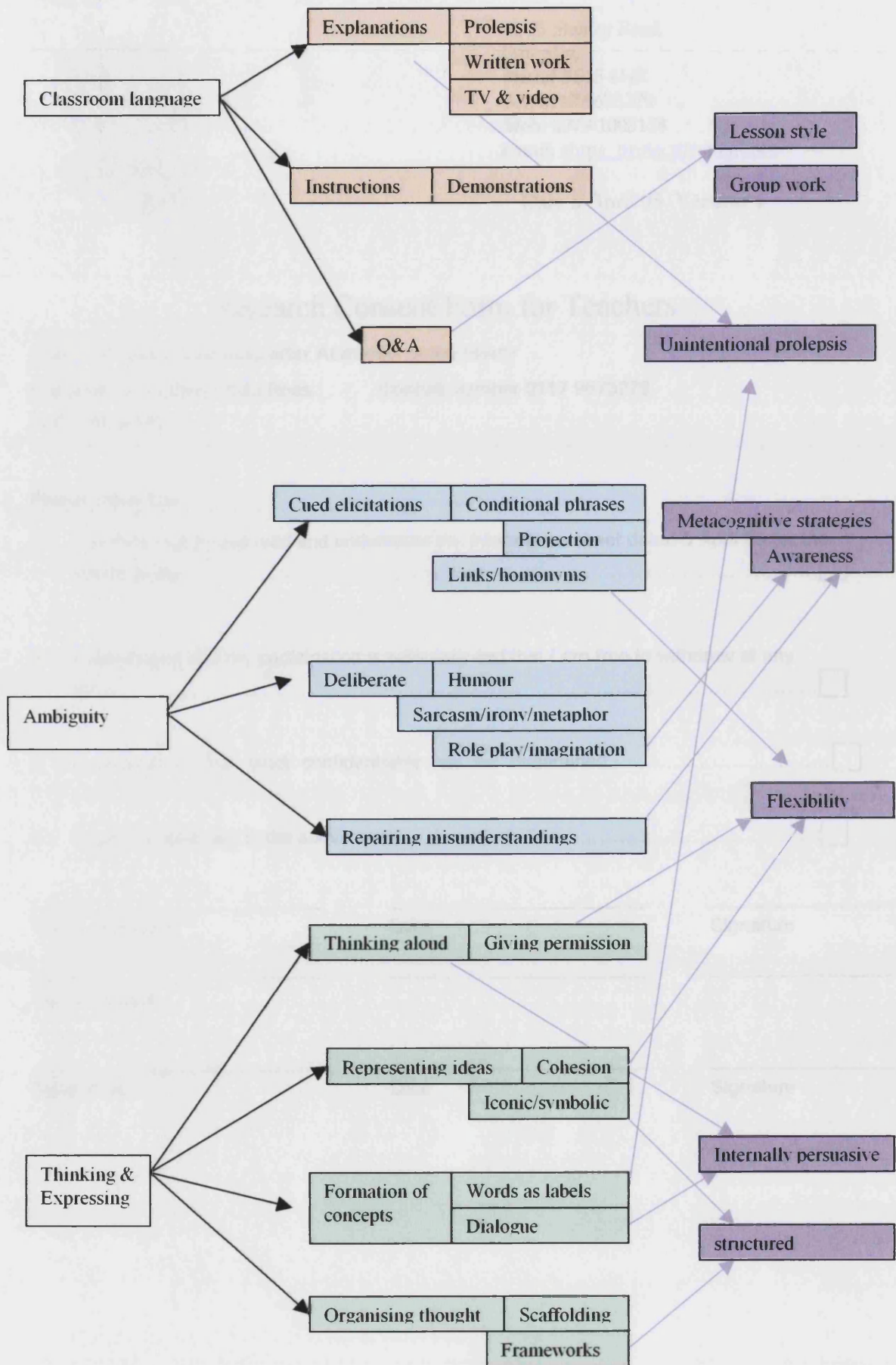
*Is it true that ABI pupils have difficulty abstracting? Or is the difficulty with finding the specific concrete example?*

*Are words corrected? How do they find out that it is incorrect usage?*

*Do they find a solution to their problem? (this is the point at which concepts are formed according to Vygotsky)*

*How does speech/language in the classroom assist with the formation of concepts?*

# Appendix I – Concept Tree for making meaning



## Appendix J – Consent Form and information sheet



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Date 5 April 05 Version 4

### Research Consent Form for Teachers

**Title of Project: Learning after Acquired Brain Injury**

Name of Researcher: Siân Rees  
Bath University

Contact number 0117 9673279

Please initial box

1. I confirm that I have read and understand the information sheet dated 5 April 05 for the above study.....
2. I understand that my participation is voluntary and that I am free to withdraw at any time.....
3. I understand that strict confidentiality will be maintained.....
4. I agree to take part in the above study.....

\_\_\_\_\_  
Name of teacher

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature

\_\_\_\_\_  
Name of pupil

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_  
Researcher

\_\_\_\_\_  
Date

\_\_\_\_\_  
Signature



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Date 5 April 05 Version 4

## Research Consent Form

**Title of Project: Learning after Acquired Brain Injury**

Name of Researcher: Siân Rees      Contact number 0117 9673279  
 Bath University

Please initial box

1. I confirm that I have read and understand the information sheet dated 5 April 05 for the above study.....
  
2. I understand that my participation is voluntary and that I am free to withdraw at any time without my care or legal rights being affected.....
  
3. I am willing to allow access to my medical records but understand that strict confidentiality will be maintained. The purpose of this is to check that the study is being carried out correctly.....
  
4. I agree to take part in the above study.....

Name of patient/pupil	Date	Signature
Name of person giving consent	Date	Signature
Relationship to patient		
Researcher	Date	Signature



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Date 5 April 05 Version 4

## TAKING PART IN RESEARCH

### Study Title: Learning after Acquired Brain Injury

You are being invited to take part in a research project. Here is some information to help you decide whether or not to take part. Please take time to read the following information carefully and discuss it with friends and relatives if you wish. Ask us if there is anything you do not understand or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.

1. You may or may not receive any direct benefit from taking part in the study. However, information obtained during the course of the study may help us to understand better how children learn after Acquired Brain Injury. It may also help us in selecting learning programmes for future patients.
2. I am trying to find out how children learn after a severe brain injury and how teachers should teach during the rehabilitation period in order to prepare children for reintegration into school.
3. This study will involve observation only, though it may take place while I am employed to teach your child.
4. All the information collected about you/your child during the course of the research will be kept strictly confidential. Details from medical records will not be given to others. Names and places will be changed in reports
5. It is up to you to decide whether to take part or not. If you do decide to take part you will be given an information sheet and consent form. Even if you do decide to take part, you are free to withdraw at any time and without giving a reason.
6. Consumers for Ethics in Research (CERES) publish leaflets which give more information about research and looks at some questions you may want to ask. A copy may be obtained from CERES, PO Box 1365, London N16 0BW.



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Date 5 April 05 Version 4

## Learning after Acquired Brain Injury

### INFORMATION FOR PATIENTS AND THEIR CARERS ABOUT THE STUDY

The aim of the study is to look at the needs of children when they return to school after Brain Injury. Many children find that their preferred way of learning changes after brain injury and teachers want to know the best way to prepare children for their return to school and the best way to teach them once they return. There are relatively few children who have a brain injury, so it is necessary to observe as many of these children as possible.

This study will take place alongside the normal observations for the SHIPS project. A report will be prepared in the same way and recommendations made. The study will use the observations made for the SHIPS project and look at them in more detail to ascertain how the pupil is making meaning in the classroom situation. Your child will be observed as they go about their normal school studies. After the lesson they will be asked about the lesson, what was easy to understand and what they found more difficult. Your child's teachers have given permission for observation to take place in their classes. You will be invited to discuss what has been observed about the learning of your child at the end of the study. There will be no extra visits at home or to the hospital involved in this research

This study will contribute to a PhD qualification with Bath University. It is being conducted by Siân Rees who is a fully qualified teacher (DfES no 80/64385) of many years experience, who is additionally employed by two local LEAs as part of the Hospital Education Service, as a specialist teacher for brain injured pupils, and has therefore has police clearance to work with children and young people.

All information which is collected about you and your child during the course of the research will be kept strictly confidential. Any information about you which leaves the hospital will be anonymised but you need to be aware that as there are so few children who suffer Brain Injury it will be difficult to ensure complete confidentiality. You may contact me, Siân Rees, on 0117 9673279 during the study for further information.

Thank you for taking part in this study





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**Date 5 April 05 Version 4**

## **Learning after Acquired Brain Injury**

### **INFORMATION FOR TEACHERS ABOUT THE STUDY**

The aim of this study is to look at the needs of children when they return to school after Acquired Brain Injury. Many children find that their preferred way of learning changes after TBI and the rehabilitation team want to know the best way to prepare children for their return to school. There are relatively few children who have a acquired brain injury, so it is necessary to observe as many of these children in their classes as possible.

This study will take place alongside the normal observations for the SHIPS project. A report will be prepared in the same way and recommendations made. The study will use the observations made for the SHIPS project and look at them in more detail to ascertain how the pupil is making meaning in the classroom situation. The pupil will be observed as they go about their normal school studies, to gather evidence of children's learning behaviour after acquired brain injury. After the lesson they will be asked about the lesson, what was easy to understand and what they found more difficult. I would also like to know from your point of view how you felt the child was getting on. At the end of the study you will be given an opportunity to comment on the report.

All information which is collected about you and your pupils during the course of the research will be kept strictly confidential. Any information about you will be anonymised, but you need to be aware that as there are so few children who suffer Acquired Brain Injury it will be difficult to ensure complete confidentiality. Permission is also being sought from pupils and their parents/carers.

This study will contribute to a PhD qualification with Bath University. It is being conducted by Siân Rees who is a fully qualified teacher (DfES no 80/64385) of many years experience, who is additionally employed by two local LEAs as part of the Hospital Education Service, as a specialist teacher for brain injured pupils, and has therefore had a police check.

You may contact me, Siân Rees, on 0117 9673279 during the study for further information.

Thank you for taking part in this study

## Appendix K – Staffroom poster

A poster in the staffroom can be an effective way of alerting teachers to the needs of an ABI pupil, especially in secondary school where pupils have many different teachers and supply teachers are more common. It will not work for all, but has been shown to work in some cases. It should be A4 size. You will need to adapt it to fit your child's particular circumstances. SHIPS or teachers at Frenchay would be happy to help you do this.

### **{Name of child} {Form}**

Photo of child

{name of child} has returned to school part-time. He/she is studying the following subjects:

Maths  
Science  
English  
Drama  
Art

He/she has permission to spend other time in the library

{name of child} has specific problems but experience suggests the following solutions

<b>Problem</b>	<b>Solution</b>
Tires easily Concentration	Breaks between lessons
Occasional immature behaviour Lack of confidence Easily upset	These problems are linked. The best approach is to be firm – but do not shout or show anger. He/she responds to humour which will defuse most situations.

Miss Smith has a booklet – Head Injury: Some consequences for injured school children and schools. Reading this may help you understand {name of child} needs.

## Appendix L – Training Course



# **Acquired Brain Injury: What can I expect, how can I help?**

ABI is among the most common causes of admission of children to A&E departments. The effects can be significant in all aspects of the children's lives, despite the fact that they appear 'normal'.

Siân Rees will talk about Acquired Brain Injury and its implications for learning, over four sessions:

23 November - What is ABI?

30 November - What is acquired with an ABI?

7 December - Learning after ABI

14 December - Challenges & Strategies for learning after ABI

***St Martin's School, Spring Hill, Worle,  
Weston-super-Mare  
3.30pm to 4.30pm***

You are welcome to attend as many or as few sessions as you are able. Please phone 0117 9673279 or email [ships\\_project@fsmail.net](mailto:ships_project@fsmail.net) to book your place

## Appendix M

<b>ACQUIRED</b>	<b>Typical Behaviour</b>	<b>Strategy</b>
<b>Attention</b>	Different attention cycle from rest of class	TA to assist with movement in and out of focused attention
	Does not notice additional information	Teach pupil to touch each part of the task as it is mentioned, TA helps to judge whether a disruption is worth attention
<b>Communication</b>	Pragmatics	Reteach polite behaviour, check if pupil is over-polite, watch their eyes
	Unknown new technical terms	Keep a glossary, take care when using prolepsis
	Group work	TA acts as intermediary
	Breakdown	TA helps to establish strategies to deal with breakdown of communication
	Literal understanding	Define any homonyms, avoid or explain humour
	Concise expression	Release pressure
<b>Quaintness<sup>1</sup></b>	Patchy understanding	Check all underlying concepts, do not assume knowledge
	Inflexible	Establish routines
	Unaware of others' point of view	Teach cohesion of pronouns, TA states what the other person needs to know or feels, monitor friendships
	Unaware of self	Help pupil come to awareness of new style of learning and personality. Be aware of depressive tendencies
	Difficulties with role play	Make role play explicit
<b>Understanding School</b>	Unexpected classroom behaviour	Make classroom expectations clear, display expectations clearly
	Priorities in classroom are not beneficial	Set out clear rules for classroom behaviour, talk through appropriate individual priorities
	Need for structure	Use a planner, with a timetable, keep a record of words learned, use frameworks to structure tasks, provide a cognitive structure of ideas as concept maps
<b>Ideas</b>	Word finding difficulties	Keep a glossary, provide iconic representations
	Linking ideas together	Concept maps
<b>Rehearsal</b>	Thinking aloud	Space to speak out ideas, time to answer questions, private room for assessment
<b>Effort</b>	Slowed rate of thinking	Reduced timetable
	Fatigue	Reduced timetable, less homework
<b>Decisions</b>	Poor at choices	Write out the options
	Poor at planning	Frameworks
	Poor judgement	Mentor to assist and talk through

<sup>1</sup> Quaint means 'unusual or different' (Merriam on-line dictionary) or 'daintily odd' (OED)

## Appendix N – music/pedagogy analogy

<b>Polyphonic music</b>	<b>'Polyphonic' Pedagogy</b>	<b>'Classical' Pedagogy</b>	<b>Classical music</b>
Polyphony	Layers of meaning	Structured	Homophony
Suspensions including ornaments as suspensions	Ambiguity essential to main teaching point	Ambiguity as incidental to main teaching point	Passing notes, ornaments as extra to tune
Contrapuntal lines	Support from layers of meaning	Support from TA	Melody and bass with harmonic infill
Infrequent cadences	Flowing lesson	Clear transition points to rejoin lesson if lost	Frequent cadences
Interwoven texture	Previous knowledge interwoven into task	Clearly building on known ideas	Firm bass line
Fluid layered form	Multi-layered learning tasks eg project work	Framework/organisation	structure
Imitative entries	Gradual introduction of many aspects of teaching/learning	Setting the scene	introduction
Long flowing melody	Long engagement with teacher or audio-visual exposition, or with text in books or ICT	IRF/ Q&A, Repetition built in	Shorter melodic statement, possibly using mirroring, texture, dynamic or rhythmic changes
Concurrent theme	Contrasting ideas	Contrasting ideas and illustrations	More lyrical 2 <sup>nd</sup> theme
Contrasting theme	New ideas introduced	Expansion of main ideas of the lesson	Development
Antiphony	Different groups of pupils explaining their work to the rest	Repetition of main ideas	Recapitulation section
Melismatic coda	End of lesson used to outline developments of work	Plenary used to bring out the key points of the lesson	Coda
Second theme emerges as a counterpoint to the first	Pupils are actively engaged in making their own links between ideas	Links the first idea of the lesson to the second, making clear the relationship between the two	Bridge passage