

**THE CONCEPTUALISATION OF DREAMS BY ADULTS
WITH LEARNING DISABILITIES: ITS RELATIONSHIP
WITH THEORY OF MIND ABILITIES AND THE
DIAGNOSIS OF PSYCHOSIS**

A thesis submitted to the University of Manchester for the
degree of Doctor of Clinical Psychology in the Faculty Medical
and Human Sciences

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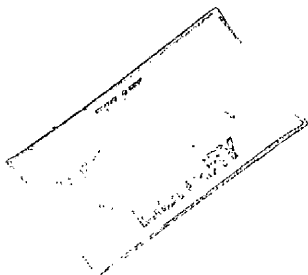
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LIST OF CONTENTS

ABSTRACT	6
DECLARATION	7
COPYRIGHT	7
STATEMENT OF CANDIDATE'S ACADEMIC TRAINING	8
ACKNOWLEDGEMENTS	8
GLOSSARY	9
1. INTRODUCTION	11
1.1 Overview of chapter 1	11
1.2 Consciousness and inner experience	12
1.2.1 Inner experience	13
1.2.2 Distinguishing internal and external experiences	14
1.2.3 Disorders involving the inability to distinguish internal and external events	16
1.2.4 ToM ability and psychotic symptoms	18
1.3 Dreaming	19
1.3.1 Definitions of dreaming	19
1.3.2 Development of dream experience	20
1.3.3 Comparisons of dreaming and waking consciousness	22
1.3.3.1 Perception	22
1.3.3.2 Cognition	23
1.3.3.3 Affective	24
1.3.4 The realistic nature of dreams	25
1.3.5 The similarities between dreaming experience and psychotic experiences	25
1.4 The development of individual understanding concerning conscious experience	26
1.4.1 Piaget's stages of development and the ability to distinguish internal and external phenomena	27
1.4.1.1 Sensorimotor stage	27
1.4.1.2 Pre-operational stage	28
1.4.1.3 Concrete operational stage	29
1.4.2 Children's developing conceptualisation of dreams	31
1.4.2.1 Piaget's (1927) findings regarding dream conceptualisation	31
1.4.2.2 Replication studies	32
1.4.3 The development of ToM	35
1.4.4 First order ToM	37
1.4.5 The importance of ToM	38
1.5 Learning Disabilities	39
1.5.1 Classification	40
1.5.2 Epidemiology	42
1.5.3 Associated conditions	43
1.5.4 Aetiology	43
1.6 LD, consciousness and inner experience	44
1.6.1 The importance of exploring inner experience in people with LD	44
1.6.2 The application of Piaget's stage of development model to individuals with LD	45
1.6.3 Difficulties obtaining reports of inner experiences in individuals with LD	48
1.6.4 Research on emotion in individuals with LD	49
1.6.5 Understanding thoughts	51
1.6.6 The understanding of death in individuals with LD	52
1.6.7 The experience of dreams in people with LD	53
1.6.8 The therapeutic use of dreams with people with LD	54
1.6.9 The conceptualisation of dreams in people with LD	54
1.6.9.1 Comparative studies	56
1.6.10 Development of ToM in individuals with LD	59
1.7 Implications of ability to conceptualise dreams	60
1.7.1 Psychological difficulties in people with LD	62
1.7.2 Epidemiological studies	62
1.7.3 Diagnostic issues	63
1.7.4 The diagnosis of psychosis in people with LD	64

1.7.5	Psychopathology and behaviour problems in people with LD.....	66
1.7.6	Medication use.....	67
1.7.7	Conclusions from LD research.....	67
1.8	Rationale for research.....	68
1.8.1	Hypotheses.....	68
2.	METHOD.....	73
2.1	Overview of chapter 2.....	73
2.2	Study design.....	73
2.2.1	Sample size and power calculation.....	73
2.3	Participants.....	74
2.3.1	Inclusion criteria.....	74
2.3.2	Exclusion criteria.....	74
2.3.3	Recruitment methods.....	75
2.3.4	Research sample.....	76
2.4	Measures Used.....	77
2.4.1	Dream Interview Schedule (Stenfort Kroese et al., 1998).....	77
2.4.2	British Picture Vocabulary Scale II (BPVS-II, Dunn et al., 1997).....	78
2.4.3	Learning Disability Casemix Scale (Pendaries, 1997).....	79
2.4.4	Modified version of the Sally-Ann test (Wimmer & Perner, 1983).....	80
2.4.5	Background information.....	81
2.5	Ethical approval.....	82
2.6	Issue of consent.....	83
2.7	Procedure.....	83
2.8	Confidentiality.....	86
2.9	Data analysis.....	86
2.10	Planned statistical analysis.....	86
3.	RESULTS.....	89
3.1	Overview of Chapter 3.....	89
3.2	Distribution of data.....	89
3.3	Participant characteristics.....	92
3.3.1	Chronological age and receptive language ability.....	92
3.3.2	Gender, ethnicity and severity of LD.....	93
3.3.3	Aetiology of LD.....	93
3.3.4	Epilepsy, psychosis and medication.....	94
3.3.5	Severity of challenging behaviour.....	94
3.4	Testing hypotheses.....	95
3.4.1	Hypothesis 1.....	95
3.4.1.1	Total percentage of correct responses.....	95
3.4.1.2	Perceptually public/private and physical/non-physical properties of real objects, objects in photographs and objects in dreams.....	97
3.4.2	Hypothesis 2.....	103
3.4.3	Hypothesis 3.....	103
3.4.4	Hypothesis 4.....	106
3.4.5	Hypothesis 5.....	111
3.4.6	Hypothesis 6.....	112
3.4.7	Hypothesis 7.....	113
3.4.8	Hypothesis 8.....	113
3.5	Dream content.....	116
3.5.1	Participants reports of dreams.....	116
3.5.2	Participants responses to open-ended questions.....	116
3.5.3	Participants responses to questions about their difficulties.....	117
4.	DISCUSSION.....	119
4.1	Overview of Chapter 4.....	119
4.2	Discussion of results in relation to the hypotheses.....	119
4.2.1	Hypothesis 1.....	119
4.2.1.1	Total percentage of correct responses.....	120
4.2.1.2	Perceptually public/private dimension.....	120
4.2.1.3	Physical/non-physical dimension.....	121
4.2.2	Hypothesis 2.....	123
4.2.3	Hypothesis 3.....	123

4.2.3.1	Total percentage of correct responses	124
4.2.3.2	Ability to think about fictional entities	124
4.2.3.3	Ability to dream about fictional entities	125
4.2.4	Hypothesis 4	126
4.2.4.1	Total percentage of correct responses	126
4.2.4.2	Perceptually private dimension	127
4.2.4.3	Non-physical dimension	127
4.2.4.4	Individuated dimension	128
4.2.4.5	Potentially fictional dimension	128
4.2.5	Hypothesis 5	130
4.2.6	Hypothesis 6	130
4.2.7	Hypothesis 7	131
4.2.8	Hypothesis 8	132
4.2.8.1	Total percentage of correct responses	132
4.2.8.2	Perceptually private dimension	132
4.2.8.3	Non-physical dimension	133
4.2.8.4	Individuated dimension	133
4.2.8.5	Potentially fictional dimension	133
4.3	Discussion of responses to open-ended questions	134
4.4	Discussion of dream content	134
4.5	Limitations of the study	137
4.5.1	Sample of participants	137
4.5.2	Use of measures	138
4.5.2.1	The Dream Interview Schedule	138
4.5.2.2	The BPVS-II	142
4.5.2.3	The Learning Disability Casemix Scale	142
4.5.2.4	The Modified version of the Sally-Ann test	143
4.5.2.5	Background information	143
4.6	Strengths of the study	143
4.6.1	Inclusion and exclusion criteria	143
4.6.2	Consent process	144
4.7	Implications for theory	145
4.7.1	Conceptualisation of dreams in adults with LD	145
4.7.2	Cognitive correlates of dream conceptualisation	148
4.7.2.1	ToM ability	148
4.7.2.2	Receptive language ability	150
4.7.3	Impact of inaccurate conceptualisation of dreams	152
4.7.3.1	Likelihood of obtaining a diagnosis of psychosis	152
4.7.3.2	Likelihood of receiving psychotropic medication	153
4.7.3.3	Likelihood of displaying challenging behaviour	153
4.8	Implications for clinical practice	155
4.8.1	Conceptualisation of dreams by adults with LD	155
4.8.2	Implications of ToM ability	157
4.9	Suggestions for future research	159
4.9.1	Changes to the interview schedule	159
4.9.2	Investigation of the importance of ToM ability in dream conceptualisation	160
4.9.3	Investigation of association of dream conceptualisation with the likelihood of receiving a diagnosis of psychosis	161
4.9.4	Exploration of distress in relation to dream experiences	161
4.9.5	Exploration of the effects of social desirability on responding	161
4.10	Conclusions	162
	REFERENCES	163
APPENDIX 1.	Information for services	181
APPENDIX 2.	Participant information sheet	183
APPENDIX 3.	Consent form	186
APPENDIX 4.	Letters to families/carers	187
APPENDIX 5.	Family/Carer information sheet	188
APPENDIX 6.	Open question interview schedule (Stenfert Kroese et al., 1998)	191
APPENDIX 7.	Closed question interview schedule (Stenfert Kroese et al., 1998)	192
APPENDIX 8.	Learning Disability Casemix Scale (Pendaries, 1997)	196

APPENDIX 9. False belief test (based on Wimmer & Perner, 1983).....	202
APPENDIX 10. Background information sheet	205

LIST OF TABLES

Table 1. Distribution of the data – dreams, photos and objects	90
Table 2. Distribution of data – real and fictional objects and BPVS-II age equivalent scores	91
Table 3. Age and receptive language ability of participants	92
Table 4. Frequencies for gender, ethnicity and severity of LD	93
Table 5. Frequencies of aetiology of LD	94
Table 6. Frequencies of epilepsy, diagnosis of psychosis and prescription for psychotropic medication for participants	94
Table 7. Frequency of the different severities of challenging behaviour	95
Table 8. Median and range of percentage of correct responses:	96
Table 9. Test statistics:	96
Table 10. Wilcoxon tests comparing total percentage of correct responses in the three groups of objects	97
Table 11. Median and range of percentage correct responses	99
Table 12. Test statistics	99
Table 13. Wilcoxon tests comparing percentage of correct responses (perceptually public/private) in the three groups of objects	100
Table 14. Medians and ranges of percentages of correct responses	101
Table 15. Test statistics	101
Table 16. Wilcoxon tests comparing percentage of correct responses (physical/non-physical) in the three groups of objects	102
Table 17. Wilcoxon tests comparing percentage of correct responses for real and fictional objects	105
Table 18. First order ToM abilities	108
Table 19. Kruskal Wallis test comparing within group differences in first order ToM ability.	108
Table 20. Correlations between percentage of correct answers regarding dreams and receptive language ability	115

LIST OF FIGURES

Figure 1. AAMR 1992 Definition of 'Mental Retardation'(MR) (cited in Hatton, 1998)	40
Figure 2. ICD-10 classification (cited in Hatton, 1998)	41
Figure 3. Procedure	85
Figure 4. Response pattern illustrating a perfect understanding of the perceptually private/public and physical/non-physical properties of real objects, objects in photographs and objects in dreams	98
Figure 5. Observed response pattern for participants regarding the perceptually private/public and physical/non-physical properties of real objects, objects in photographs and objects in dreams	98
Figure 6. Response pattern illustrating a perfect understanding of thoughts and dreams as mental events that can include both real and fictional content	104
Figure 7. Response pattern illustrating observed pattern of responses for participants in the present study regarding the understanding of thoughts and dreams as mental events that can include both real and fictional content.	104

ABSTRACT

There is empirical evidence to suggest that individuals with learning disabilities (LD) have difficulties with the conceptualisation of dreams as perceptually private, non-physical, individuated and potentially fictional entities (Edwards, 1999; Stenfert Kroese, Cushway & Hubbard, 1998). Edwards (1999) also examined dream conceptualisation by adults with 'schizophrenia' (and no LD), finding that a proportion of these participants also had difficulties with the conceptualisation of dreams.

The aim of the current study was to replicate the results found by Stenfert Kroese et al. (1998) using a comparative sample size (Edwards, 1999 study was under-powered) and to examine possible cognitive correlates of accurate dream conceptualisation e.g. receptive language ability and first order theory of mind (ToM). First order ToM was particularly relevant in view of the difficulties of some adults with 'schizophrenia' (and no LD) with dream conceptualisation (Edwards, 1999). The current study also examined the impact of difficulties with dream conceptualisation on the life experiences of people with LD e.g. the likelihood of receiving a diagnosis of psychosis (e.g. Edwards, 1999; Slade & Bentall, 1988), of receiving psychotropic medication and of developing challenging behaviour (e.g. Glick & Zigler, 1995).

Participants' understanding of the perceptually private, non-physical, individuated and potentially fictional nature of dreams was assessed with a structured closed-question dream interview schedule (Stenfert Kroese et al., 1998). Participants' understanding of the properties of both real objects and objects in photographs was also assessed and compared. Receptive language abilities were assessed with the British Picture Vocabulary Scale II (BPVS-II, Dunn, Dunn, Whetton & Burley, 1997). First order ToM ability was assessed with a false belief test (e.g. Wimmer & Perner, 1983). Information regarding diagnoses and medication was obtained. Challenging behaviour was assessed with the LD Casemix Scale (Pendaries, 1997).

Findings from the current study replicated those of previous research (Edwards, 1999; Stenfert Kroese et al., 1998), i.e. that many adults with mild to moderate LD are vulnerable to believing that their dreams are taking place around them; can be witnessed by other people; can be touched and manipulated; can be shared by others asleep in the same room and are generally about real events. The ability to accurately conceptualise dreams was found to increase along with receptive language ability (c.f. Edwards, 1999) and there was some association of first order ToM ability and the ability to understand that dreams can be potentially fictional entities. There was no empirical support for evidence of an association between the ability to accurately conceptualise dreams and the likelihood of receiving a diagnosis of psychosis, receiving a prescription of psychotropic medication or of developing challenging behaviour. In light of the recognised limitations of the study, some caution was exercised in interpreting the findings. Possible implications of the findings for theory and clinical practice were discussed and suggestions for future research were made.

DECLARATION

No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or institute of learning.

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GLOSSARY

The following terms have been abbreviated throughout the thesis:

AAMR	American Association on Mental Retardation
APA	American Psychiatric Association
ASD	Autistic Spectrum Disorders
BPVS	British Picture Vocabulary Scale
BPVS-II	British Picture Vocabulary Scale, second edition
DD	Dual Diagnosis
DoH	Department of Health
ICD-10	International Classification of Diseases, tenth edition
IQ	Intelligence Quotient
LD	Learning Disabilities
LDO	Learning Disabilities Only
LREC	Local Research and Ethics Committee
MA	Mental Age
MR	Mental Retardation
NATS	Negative Automatic Thoughts
PAS-ADD	Psychiatric Assessment Schedule for Adults with Developmental Disability
REM	Rapid Eye Movement
SO	Schizophrenia Only
ToM	Theory of Mind
VMA	Verbal Mental Age
WAIS-III	Weschler Adult Intelligence Scale, third edition
WHO	World Health Organisation

CHAPTER ONE

INTRODUCTION

1. INTRODUCTION

1.1 Overview of chapter 1

This study has two main sections. Part one investigates the ability of adults with learning disabilities (LD)¹ to accurately conceptualise dream experiences and aims to determine possible cognitive correlates of this ability, with particular reference to receptive language and first order theory of mind (ToM) abilities. Part two investigates the possible impact of the ability to accurately conceptualise dream experiences on the life experiences of people with LD, with particular reference to the likelihood of obtaining a diagnosis of psychosis², of being prescribed psychotropic medication or of developing challenging behaviour.

This introduction will begin with a discussion of conscious experience and will go on to:

- explore the literature concerning the development of knowledge regarding conscious experience, including children's developing conceptualisation of dreams;
- summarise the literature regarding the development of children's understanding of mental states, concept of ToM and development of the experience of dreams; and
- examine the association between dreaming and waking conscious experience.

This will be followed by a discussion of:

- the aetiology, diagnostic criteria and prevalence rates of LD;
- the literature regarding the development of knowledge regarding conscious experience in people with LD;

¹ The term 'learning disabilities' is used predominantly throughout, although the author is aware that a variety of terms including 'intellectual disabilities' and 'mental retardation' are often used in the literature.

² Due to current debate regarding the diagnostic systems of psychiatric conditions, the term 'psychosis' is used predominantly throughout, referring to a variety of symptoms (including hallucinations, delusions and paranoia) with functional relationships (see Bentall, 2003 for a detailed discussion of diagnostic issues).

- the experience of dreams in people with LD, their understanding of mental states and first order ToM abilities; and
- the research literature regarding the conceptualisation of dreams in people with LD.

The second section will consider:

- the aetiology and prevalence rates of psychological difficulties within the LD population;
- the validity of applying a psychiatric diagnostic approach to individuals with LD, with particular reference to the diagnosis of psychosis and the possibility that dream experiences may add further complications to this controversial situation;
- the association between psychopathology and challenging behaviour in individuals with LD;
- the prescription of psychotropic medication in individuals with LD.

1.2 Consciousness and inner experience

'The contents of consciousness encompass all that we are conscious of, are aware of, or experience' (Velmans, 2000 p.6). This includes inner experiences such as thoughts, feelings, visual images and dreams, but also includes our experiences of the three dimensional world ('the phenomenal world', Velmans, 2000, p.6), such as the perception of an object. Whilst there are ongoing philosophical discussions about the actual nature of these experiences, the reality of these experiences are recognisable and understandable to the majority of people. On the whole, individuals are able to recognise experiences such as thoughts and emotions and know that these experiences come from within themselves, for example, they can recognise a thought of a banana as distinct from the actual banana. Similarly, individuals are able to recognise experiences as coming from the outside world. For example, seeing a banana in the fruit bowl, or holding the banana, although exceptions to this will be discussed.

1.2.1 Inner experience

The emphasis of this review will be on the understanding of inner experiences. The underpinning assumption is that the understanding of inner experiences will develop in parallel to the understanding of external experiences (i.e. the phenomenal world).

An overview of the variety of inner experience available to individuals was provided by Hulburt (1990, 1993). This research used a descriptive experience sampling method to access reports of inner experiences (this involved recording the details of inner experience every time a beep sounded). Whilst the sample size was small, Hulburt found four major categories of inner experience: verbal thinking, visual images, unsymbolised thinking and feelings. Verbal thinking occurred in between 7-80 per cent of samples and was described as 'well-formed inner words and sentences i.e. inner speech' (Hurlburt, Happé & U. Frith, 1994, p.386). This was reported to be the same as the experience of external speaking, with the equivalent characteristics of rate of production and tone of voice. Verbal thinking was generally experienced in the individual's own voice, but at times was experienced as the voice of another. Visual images occurred in up to 50 per cent of samples and was 'much the same as external perception' (Hurlburt et al., 1994, p.386). Visual images were previously seen images or completely novel. Many visual images were accompanied by emotions. Unsymbolised thinking occurred in up to 50 per cent of reports and seemed harder for individuals to explain, often being referred to as 'pure thought', without words or images available to awareness. Feelings were again experienced in up to 50 per cent of reports and occurred within the body, the chest usually suggested as the location, although providing a precise location for feelings was difficult.

As the sample size was small, the assumption that the categories would be the same for the whole population needs caution. However, the technique had been successfully applied to individuals without any clinical disorder, individuals with Asperger syndrome (Hulburt et al., 1994) and to individuals with a range of clinical disorders including anxiety, depression, eating

disorders and psychosis (Hulburt 1990, 1993). The descriptions also fit with other research on inner experience, for example Hamilton's (1983) description of auditory hallucinations (see 1.2.3) and research suggesting visual images are experienced in the same way as external perception (Podgorny & Shepard, 1978, 1983, see 1.2.2).

1.2.2 Distinguishing internal and external experiences

Whilst the majority of people successfully distinguish internal and external experiences, determining the source of these based on the perceptual experience can be problematic. This could be inferred from Hulburt's (1990, 1993) work, where verbal thinking and visual images were experienced in much the same way as if they had occurred externally.

In a discussion of psychotic experiences, Bentall (2000) suggested that the process of discrimination between the external and the internal, which he referred to as *source monitoring*, should not be assumed to be privileged knowledge possessed by everyone, i.e. people are not pre-programmed to inherently recognise events as internal or external. 'Discriminating between self-generated (internal "imaginary") events and externally generated ("real") events is best thought of as a skill' (Bentall, 2000 p.102).

This assertion was based on the research of Johnson and colleagues (Johnson, Hashtroudi & Lindsay, 1993; Johnson & Magaro, 1987), which demonstrated that the discrimination of internal events relied on the use of a range of cues. These included:

- contextual information e.g. time and location of the event;
- sensory qualities e.g. vividness, detail and complexity;
- memories of the cognitive operations involved e.g. effort associated with generating the thought; and
- coherence and plausibility of the memory trace e.g. if individuals recall themselves performing acts that are in conflict with what they know about themselves they are likely to recognise that this is a memory of a fantasy or dream (see Bentall, 2000 for a review).

One of the cues used to distinguish internal and external phenomena was the sensory quality of the phenomena (e.g. vividness, detail and complexity, Johnson et al., 1993; Johnson & Magaro, 1987). In a discussion of the experience of both internal and external phenomena, Velmans (2000), suggested that the 'fact that seen objects are experienced as being different from visual images does not alter the fact that both objects and images are experienced and that their phenomenology results from mental modelling in the mind/brain' (p.230). There is a reflexive pattern where an initiating stimulus results in perceptual/cognitive processing, leading to the experience of the stimulus by the individual (Velmans, 2000). Whether a perceived event or stimuli is conceptualised as internal or external, it will result in the *same* perceptual/cognitive processing. Velmans (2000) described the phenomenological differences between external events (such as perceived objects) and images (such as imagined images) as not always clear (e.g. Spanos, Ham & Barber, 1973).

Velmans (2000) was not the first to suggest similarities between the perception of external and internal phenomena. Shepard (1984), in an article re-examining J.J. Gibson's ecological approach to perception (see Gibson, 1961, 1979), discussed the phenomena of perception, imagination, thinking and dreaming. Shepard (1984) suggested that imagined events and external events (perceived objects) were both experienced in the same way, despite imagined objects being absent or non-existent. This was supported by Podgorny and Shepard's (1978, 1983) experiments in which participants were asked to indicate the location of a dot in a figure presented on a grid. In the two conditions (one where the dot was actually present and one where the subject was required to imagine the location of the dot), reaction times were virtually the same. This was interpreted as the figure being internally represented in the same way whether imagined or actually perceived.

Shepard (1984) utilised J.J Gibson's (1966) view of perception as akin to the physical phenomenon of resonance (see Gibson, 1966 for a review). Shepard (1984) proposed that organisms, or in the case of this review, individuals, would respond to stimuli they found relevant or important.

However, the resonance referred to by Shepard (1984) was not a resonance to energy (as proposed by Gibson, 1966), but a resonance to information. Shepard (1984) suggested a hierarchy of resonant modes, from the most abstract and conceptual (imagining, remembering and thinking) to the most concrete and sensory (having sensations). The primary source of the excitation of the resonant system could be external (sensations, perception) or internal (dreaming, hallucinating, imagining, remembering, thinking). Perception of meaningful external objects and events arose when resonant activity was induced (by external excitation) at all levels of the system. Similarly, dreams and hallucinations arose when resonant activity was induced (by internal excitation) at all levels of the system.

Subjective and neurophysiological evidence (e.g. Penfeld, 1958; West, 1962) demonstrated that during rapid eye movement (REM) sleep, or even in hallucinatory states, the lowest level resonances became entrained by activity at the top of the hierarchy (abstract and conceptual). This resulted in what appeared to be a realistic perceptual experience (Shepard, 1978a, 1978b). Shepard (1984) described perception as 'externally guided hallucination' (p.436) and dreaming and hallucination as 'internally simulated perception' (p.436). Imagery and some forms of thinking were more abstract and should, therefore, be less easily confused with external experiences.

This suggested the potential for confusion to arise between perception and internal states, particularly hallucination and dreaming. Bentall (2000), however, in his research on psychosis argued that the more "abstract" simulations (Shepard, 1984) of thinking (using inner speech) and visual imagery could also be confused with external experiences. As a skill requiring a number of cognitive operations, the ability to source monitor is likely to become disrupted under certain circumstances (Bentall, 2000).

1.2.3 Disorders involving the inability to distinguish internal and external events

The disruption of source monitoring is demonstrated in psychotic disorders, where individuals can experience hallucinations and delusions. Slade and

Bentall (1988) defined hallucinations as 'Any percept-like experience which a) occurs in the absence of the appropriate stimulus, b) has the full force or impact of the corresponding actual (real) perception, and c) is not amenable to the direct voluntary control of the experiencer' (p.23). Hallucinations can consist of the following:

- auditory hallucinations;
 - a voice speaking out loud an individual's thoughts;
 - a running commentary on the persons behaviour;
 - a number of voices who appear to be discussing the individual;
 - voices giving out instructions; and
- visual hallucinations e.g. seeing a person when no one is present (Hamilton, 1983; Launay & Slade, 1981).

The current consensus regarding auditory hallucinations is that they occur when an individual misattributes their inner speech (i.e. internal dialogue used to control behaviour, Vygotsky, 1962) to an external source (e.g. Bentall, 1990; C. Frith, 1992; Hoffman, 1986; Thomas, 1997). Inner speech has been shown to be accompanied by subvocalisation or activation of the speech muscles (McGuigan, 1978) and the content of auditory hallucinations have been shown to match recordings of the individual's subvocalisation (Green & Preston, 1981).

Auditory hallucinations have also been found to coincide with activation of the areas of the brain responsible for the production and perception of speech (e.g. McGuire, Shah & Murray, 1993; Stevens & Livermore, 1982). For example, Silbersweig et al. (1995) demonstrated that a patient who experienced both auditory and visual hallucinations had associated activations in both the visual association cortex and auditory association cortex in the left hemisphere.

Auditory and visual hallucinations are also often found in individuals experiencing bereavement. Research has shown that up to 70 per cent of recently bereaved people experience visual images of, or hear the voice of,

the deceased (Grimby, 1993; Reese, 1971). Bentall (2000) discussed the association of hallucinations with different medical conditions, including sensory loss, fever, focal brain lesions, delirium and alcoholic states (e.g. Asaad & Shapiro, 1986; Slade & Bentall, 1988). This suggests that changes in brain function can disrupt the process of source monitoring.

1.2.4 ToM ability and psychotic symptoms

An impairment in the ability of people with psychosis to represent their own or other people's mental states e.g. ToM ability, has been found across a number of studies (e.g. Drury, Robinson & Birchwood, 1998; C. Frith, 1992; C. Frith & Corcoran, 1996; Pickup & C. Frith, 2001; Sarfati, Hardy-Bayle, Brunet & Widlocher, 1999). These generally found that ToM was impaired in symptomatic individuals, however, precise association of impaired ToM with a particular psychotic symptom proved difficult to establish (Bentall, 2003). Some ability to represent mental states was retained, but errors were made in the process (Pickup & C. Frith, 2001).

C. Frith and Corcoran (1996) found an association between impaired ToM and paranoia. An initial association with negative symptoms was invalidated by the strong correlation between ToM and scores of intelligence quotients (IQ), suggesting poor performance was probably caused by general cognitive deficits. Drury et al. (1998) found ToM deficits in individuals suffering from multiple positive and negative symptoms.

In summary, the ability to determine whether perceptual experiences are internal or external is not as simple as it might appear. There are a host of factors that make this skill possible (as reviewed by Bentall, 2000, discussed above) and these can be disrupted under a number of circumstances. Of most relevance to the present study is the perceptual experience of dreaming, which will be discussed in the next section.

1.3 Dreaming

As this study is concentrating on the ability of individuals to conceptualise dream experiences, it is important to define what is meant by dreaming. Also, as the study examines the possible cognitive correlates of this ability, there will be a discussion of the progressive development of dream experience. There will also be an examination of the perceptual experience of dreaming.

1.3.1 Definitions of dreaming

Dreaming has been defined as 'mental activity occurring in sleep' (Hobson, 2002, p.7). However, the simplicity of this statement is contrasted by the many different kinds of mental activity that can be experienced during sleep. Hobson (2002) described three different kinds of mental activity, which he used his own experiences to define. These were as follows:

1. 'as soon as I fell asleep, I could *feel* myself moving just in the way the sea moved our boat when I was out fishing today' (p.7). This contains an internal percept (the rhythmic movement) and is typical of sleep-onset dreams. The experience is hallucinatory, brief, has narrow scope, lacks other individuals and has no emotional impact.
2. 'I kept thinking about my upcoming exam...I didn't sleep well and was inevitably pulled back to the same ruminations...' (p.7). This is limited to thinking/cognition (although is non-progressive), has no perceptual structure and no hallucinatory experience, although there is emotion.
3. 'I am perched on a steep mountain top...I am suddenly on a bicycle, which I steer through the group of climbers...' (p.8). This is a typical REM sleep report. It is animated, complex, bizarre, hallucinatory and long (Hobson, 2002).

The most discussed and researched dream experience, is Hobson's (2002) third kind of mental activity e.g. REM sleep reports. However, Foulkes, Hollifield, Sullivan, Bradley & Terry (1990), cite research with children (Foulkes, 1982) and adults (Snyder, 1970), to suggest that REM dreaming is not as bizarre and fantastic as Hobson (2002) claimed and is often mundane

and realistic. Foulkes' (1982) research was considered "gold standard", in that participants were awakened during REM sleep in sleep laboratories.

1.3.2 Development of dream experience

Ability to accurately conceptualise dreams as internal events (as opposed to occurring externally) probably depends on experience of these phenomena. This is suggested by Piaget's stage model (see 1.4) with development from realism to objectivity through the development of experience, self-understanding and symbolic thought.

Foulkes (1993) stated that children's dreaming had a key role to play in informing the understanding of the 'inner experiential dimension of mental development' (p.115). He viewed the ability to dream (i.e. to create conscious imaginary worlds in the mind, independent of external stimuli) as analogous to the ability to consciously reflect upon, remember and anticipate waking perceptions and actions. Similarly, the absence of, or limitations in, dreaming ability would suggest the possibility that the experience of such waking conscious states would also be limited or absent (Foulkes, 1993).

Data from empirical dream research has suggested that dreaming employed the same systems of mental representation and mental processing as occurred for waking experiences (Cavallero & Foulkes, 1993). Evidence suggested that REM dreaming and waking cognition shared many similarities in terms of structural properties (e.g. Farah, 1984). Foulkes (1993) has suggested that cognitive development is responsible for the ability to dream and he placed particular emphasis on visual spatial skills. Foulkes (1982, 1985) conducted longitudinal sleep laboratory studies with children. From the age of three to seven years dreams were seldom reported (about a quarter to a third of the time) on REM awakenings, and it was only around the age of seven to nine years that recall moved towards typically adult levels. Dreams became progressively longer and more narratively complex with age. They developed from simple images with a momentary static quality ('like a description of viewing a slide', p.124) between the ages three to five, to those including the self as an active participant between the

ages seven to nine. The rates of dream recall and the inclusion of newly emerging properties were relatively well predicted by cognitive variables, in particular visual spatial analytic skills. Foulkes (1993), therefore, suggested that cognitive development was responsible for the ability to dream and that as cognitive skills develop dreams became more elaborate.

Similarly, in a cross-sectional study, Foulkes et al. (1990) found that waking visual spatial skills predicted dream recall rates. Verbal skills were not generally found to be predictive, although there was some predictive value found in relation to children's narrative abilities (the ability to develop, structure and tell a story). The incorporation of the active participant role at age eight was also predicted by visual spatial skills.

Hunt (1989), however, disagreed with Foulkes' (1982, 1985) findings on less developed dreams in childhood. He cited anecdotal clinical evidence of complex and bizarre dreams and disturbing nightmares and anxiety dreams in children aged two to three years [see Hunt 1989 for a review of the differences between this work and that of Foulkes]. However, this emphasis on bizarre reporting could be an artefact of the data collection method (e.g. evidence that dreams recalled at home are those that are more bizarre and attention grabbing, Kerr, 1993). Hunt also disagreed with Foulkes' primary emphasis on visual spatial skills as the basis for dream experience, suggesting that dreams could be primarily determined by either visual imagery or narrative form (Foulkes et al., 1990 also found some predictive validity of narrative skills).

Therefore, it could be suggested that both visual spatial skills and verbal language ability might both be implicated in the ability of individuals to experience complex dreams. However, verbal ability may have the significant effect of limiting an individual's ability to report dream experiences (Edwards, 1999).

One characteristic on which adults vary widely is the number of dreams recalled on awakening at home. Research suggests that home recall, rather

than in the sleep laboratory, results in reports of dreams that are especially attention grabbing because of their vividness, bizarreness, emotional intensity and other unusual qualities (Kerr, 1993). A significant correlation has been found between visual imagery vividness and frequency of dream recall (e.g. Hiscock & Cohen, 1973; Richardson, 1979).

The evidence suggests that cognitive skills are implicated in the ability to generate and/or to remember dream experiences. Therefore, individuals who have impaired or limited cognitive abilities may have different dream experiences to the general population, perhaps more similar to those seen at earlier developmental stages.

1.3.3 Comparisons of dreaming and waking consciousness

The similarities between dreaming and waking consciousness in terms of the way these are experienced by individuals is particularly relevant to the ability to determine the experience as internal or external. This relates to Shepard's (1984) description of dreaming as internally simulated perception. Hobson (2002) proposed that the most scientifically useful way to define and measure dreaming was by focussing on the perceptual, cognitive and emotional qualities of dreaming (i.e. a procedural approach), rather than the descriptions of the dreams themselves (i.e. phenomenological approach, as studied by Foulkes). This review will take the stance that both procedural and phenomenological aspects are relevant to the ability to distinguish these experiences as internal and to the ability of individuals to accurately conceptualise dreams.

Hobson (2002) provides a framework through which the characteristics of dreaming that are shared with, or differ from waking consciousness could be explored. These are as follows:

1.3.3.1 Perception

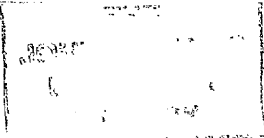
The problematic nature of distinguishing internal and external experiences based on the perceptual experience has been discussed (e.g. Bentall, 2000; Hurlburt, 1990, 1993; Shepard, 1984; Velmans, 2000). Dreaming is an

example of an inner experience where the perceptual experience is very similar to that of perception of the external (phenomenal) world (Shepard, 1984). Kerr (1993) also discussed these similarities, defining perception as the way that characteristics of the environment are recorded and imagery as the way the characteristics are recreated. Imagery that is experienced during dreams shares many similarities with perception (c.f. Shepard, 1984), in that the visual, auditory and other sensory qualities have a hallucinatory quality and are assumed by the person dreaming to represent reality (Kerr, 1993). Rechtschaffen and Buchignani (1992) designed an experiment that allowed relatively direct comparison of dreaming experience and perception, concluding that visual imagery in dreaming bore a close resemblance to visual perception during waking. The absence of colour in 20 per cent of dreams was the most common difference.

However, perceptual experience in dreams does not only consist of visual experiences. Dreaming involves all the senses that are used in waking perception in apparently similar degrees (Meier, 1993). Visual and auditory perceptions predominate, with smaller percentages of touch, taste or smell. Speech as auditory perception is represented, with verbal activity accounting for a third of all dream activities. There is a high incidence of hearing, which occurs in four out of five dreams. However, auditory perception has been described as less vivid and less differentiated than visual perception (Strauch & Meier, 1992, cited in Meier, 1993). These similarities in the perceptual experiences of waking and dreaming may make the process of source monitoring difficult.

1.3.3.2 Cognition

Hobson (2002) saw the 'cardinal' cognitive features of dreaming as loss of awareness of self (self-reflective awareness), loss of orientational stability, loss of directed thought, reduction in logical reasoning abilities, diminished reality testing and poor memory both during and after the dream. Interestingly, all are similar to possible deficits in LD. In particular, the lack of directed thought would make it difficult to determine the perceptual source of the experience.



Some researchers (e.g. Meier, 1993) have suggested that dreamers have a greater degree of reflection, deliberation, consideration and inferential intention, than suggested by Hobson (2002). Meier (1993) suggested an 'inner evaluation of the dreamer in reference to the 'external' perceptual dream world' (p.63), although he maintained that dream thinking had typically less complexity and endurance and lacked a critical stance and self-evaluation. However, this does not necessarily contradict Hobson's hypothesis concerning the realistic nature of the dream experience. Sharing a greater range of cognitive processes with waking experiences may add to the effect of realism.

Cohen (1979) suggested that the dreaming mind usually follows lower level structures of thought (referring specifically to Piaget's stages). He suggested that the dreaming mind generally functions at the concrete operational level, but may also operate at the sensorimotor level and very infrequently may operate at the formal operational stage. This would suggest that whilst asleep, the dreamer would not possess the cognitive skills necessary to determine internal from external experiences and that the dreaming mind would function at what Piaget would term a realistic level (see 1.4).

1.3.3.3 Affective

Internally generated emotions are sometimes regarded as core features of dream experience, often experienced as more intense than those of waking experience (Hobson, 2002). This appears to be explained by the activation of structures of the limbic system (the amygdala) during sleep (Hobson, 2002).

Hobson (2002) suggested that dreaming is experienced as reality *at the time it is occurring* due to the strength of the perceptions and emotions that are generated, in combination with the lack of logical reasoning that occurs throughout. Foulkes (1993) also agreed that *at the time it is occurring*, dreaming is experienced as reality. The question is how this realistic experience effects conceptualisation upon awakening. This would seem to

depend on individual skill in relation to source monitoring (e.g. Bentall, 2000). However, the aspects of dreams discussed above make this task harder.

1.3.4 The realistic nature of dreams

Dreams in general, have been found to be neither purely fantastic nor purely realistic, but instead they are considered to demonstrate an elaboration on realistic experience (Strauch & Meier, 1992, cited in Meier, 1993). Strauch & Meier (1992, cited in Meier, 1993) found that 28.6 per cent of occurrences in dreams were appropriately realistic and 53.4 per cent combined realistic events in an unusual manner, creating realistic but unfamiliar events. Kemp, Burt and Sheen (2003) investigated the confusion between dream experiences and real events and the perceived and remembered qualities of these experiences. They found that many people reported occasional confusion between dreams and reality. Also, working from diary descriptions of dreamt and actual experiences over a three-month period, independent raters sometimes had difficulty distinguishing the two classes of experience based on the descriptions. Although this is only one study, it demonstrates the potential for confusion between dreaming and reality, by individuals experiencing the phenomena and by those receiving descriptions of it.

1.3.5 The similarities between dreaming experience and psychotic experiences

There has been a long-standing interest in the similarity of dream experiences and psychotic phenomena (e.g. Arsenian & Semrad, 1966; Hobson, 1997, 2002; Sullivan, 1962). Hobson (1997) has argued that 'dreaming is not a *model* of psychosis. It is a psychosis' (p.126, emphasis as in original). Hobson (2002) suggested that the cardinal cognitive features of dreaming (loss of awareness of self etc.) combined with the visual experience, or hallucinatory experience as he termed it, of dreaming, simulates the mental illness of delirium.

This would suggest the possibility for confusion between dream experiences and psychotic phenomena based on perceptual experience. The potential for confusion may be greater when descriptions, rather than direct experience,

are being considered, particularly so in view of Kemp et al.'s (2003) findings regarding confusion between descriptions of dreams and real events.

Continuing from the initial discussion of the nature and understanding of perceptual experiences, particularly dreaming, an examination of the child development literature allows for exploration of how the ability to distinguish external and internal experience develops. As suggested by Bentall (2000), it is not an innate ability. The following section will explore the development of knowledge concerning consciousness and will focus particularly on the development of the ability to distinguish dream experiences as internal phenomena.

1.4 The development of individual understanding concerning conscious experience

The main focus in this section will be on Piaget's contribution to the child development literature, which has formed the basis on which much subsequent work has been carried out. Piaget conceptualised development of knowledge concerning conscious experience as continuous. His view was summarised by Smith and Cowie (1991) who stated that 'the individual is always in the process of reconstructing reality: the only way in which we come to have knowledge of our world is through the process of continual construction of it' (p. 317).

Piaget proposed a series of stages in the development of thinking, with each stage corresponding to a broad change in the structure of cognitive ability (Smith & Cowie, 1991). Whilst progression to the next stage was suggestive of significant cognitive re-organisation, there were no discrete steps and the process gradual and continuous (Donaldson, 1978). The stages occurred in fixed order of:

- sensorimotor (0-2 years);
- pre-operational (2-7 years);
- concrete operational (7-12 years); and
- formal operational (12 years onwards).

The skills achieved in one stage were necessary to achieve the skills of the next (Donaldson, 1978). However, the age of achievement could vary widely (Smith & Cowie, 1991). The ages stated by Piaget were intended as averages (Donaldson, 1978).

1.4.1 Piaget's stages of development and the ability to distinguish internal and external phenomena

The stages can be related to changes in an individual's understanding of the phenomenal world, by the development of internal models (e.g. symbolic thought). The first three stages are the most important in terms of the ability to determine internal and external experiences, and are summarised as follows:

1.4.1.1 Sensorimotor stage

At the sensorimotor level, children confuse their own activity with that of the external world. This stage begins with simple reflex activity, made up of reflexes or motor responses with no differentiation between the self and the outside world. Both are compounded into one single reality and both contribute to reality to the same extent. The initial lack of differentiation results in confusion regarding what is internal and external, subjective and objective, physical and mental (Laurendeau & Pinard, 1963). There is no ability to distinguish internal and external experiences, as all are considered the same.

The sensorimotor level ends with *internal representation*, the ability to use images, words or actions to represent objects (Smith & Cowie, 1991). Differentiation occurs when structure begins to be applied to the external world, which is achieved by developing an awareness of the self

(Laurendeau & Pinard, 1963). The focus changes to objects, rather than own body, and there is realisation by children that they are agents of change (Smith & Cowie, 1991). There are similarities with the skills needed for source monitoring (reviewed by Bentall, 2000), where the recognition of own effort on the production of experiences is required. Now the world depends upon the development of internal representations.

1.4.1.2 Pre-operational stage

Symbolic thought is expressed through the rapid growth of language ability, the use of imaginative play, deferred imitation and engagement in activities with an end goal (Smith & Cowie, 1991). This kind of internalised imitation is viewed as the source of mental imagery, the general ability to represent reality to oneself (Donaldson, 1978). The child gradually moves from the state of *realism* to the state of *objectivity*, which occurs when an individual is able to distinguish what comes from themselves and what is part of the external reality as can be observed by everybody (Piaget, 1929, cited in Wellman & Estes, 1986).

However, whilst there will always be fragments of internal experience still viewed as external, their importance and intensity decreases as cognition develops (Piaget, 1927, cited in Laurendeau & Pinard, 1963). The difficulty in distinguishing the mental (internal) and the real (external) has two consequences:

- attribution of motives and psychological causes to physical phenomena [*animism*]; and
- attribution of physical properties to mental phenomena [*realism*] (Piaget, 1929, cited in Wellman & Estes, 1986).

There may still be confusion in distinguishing between imagined (i.e. internal) events and reality. For example, nightmares may be responded to as if they had actually happened (Smith & Cowie, 1991). There is also a lack of understanding that other people can look at things differently, or that another

person's thoughts, feelings or understanding of a situation can be different from one's own.

Piaget (1954, cited in Flavell, 1963) termed this *egocentrism*, but it could also be considered to relate to what is now termed ToM ability (Premack & Woodruff, 1978), which is associated with psychotic disorders (e.g. C. Frith, 1992) and is the core impairment in autistic spectrum disorders³ (ASD, Baron-Cohen, Leslie & Frith, 1985). Individuals with ASD, who tend to lack ToM ability, have difficulty distinguishing mental from physical entities, do not recognise mental function of the brain and cannot take account of their own mental states (Baron-Cohen, 1989).

1.4.1.3 Concrete operational stage

At the concrete operational stage egocentrism decreases and the child gains the ability to simultaneously co-ordinate two aspects of a situation, including co-ordination of their own perspective with that of someone else (Smith & Cowie, 1991). Piaget believed that the ability to flexibly move from one point of view to another, and back again, was key to developing an objective view of reality (Donaldson, 1978). This suggests that ToM is necessary for a fully developed ability to determine external from internal experiences.

At the sensorimotor level focus is on practical solutions, actions performed on real objects and is limited in thought over time, concentrating on the here and now. The concrete operational level allows explanation, understanding and consideration of events over a much wider time period (Donaldson, 1978).

With a view of reality limited to the here and now, source monitoring would necessarily prove difficult. It is a skill requiring the ability to judge the current experience against previous experiences, to judge behaviour against stable aspects of the self and to recognise the effort put into generating the thought

³ The term 'autistic spectrum disorder' describes a condition with core impairments in three areas: reciprocal communication, social reciprocity and imagination. The clinical picture varies across and even within individuals (Happé, 1994).

(c.f. Bentall, 2000). If these factors cannot be reflected upon there will be difficulties establishing what is internal or external. However, children are unlikely to be overtly distressed by these experiences, as this lack of ability is not a change from the normal state of affairs. In individuals with psychosis this inability to distinguish the external and internal can cause distress due to the change from how the world was previously experienced.

Piaget's theories, however, do not pass without critique, although most refer to his conclusions regarding the age that children acquired skills, rather than a disagreement with the skills that were acquired (see Donaldson, 1978 for a review). The relevant criticisms were as follows:

- The ability to consider another's viewpoint occurred earlier than Piaget had claimed (see Hughes, 1975 experiment, cited in Donaldson, 1978) and whilst needing some understanding of the spatial relations also required the ability to understand feelings and intentions.
- The sensorimotor child showed a greater ability to differentiate between the self and the environment than suggested by Piaget (see Bower & Wiseheart's, 1972 experiment). Whilst the child continued to have the difficulties described by Piaget, they were related to the child's undeveloped knowledge concerning spatial relations (Donaldson, 1978).

Whilst Piaget may have wrongly estimated the age at which knowledge is achieved, and therefore have seen children as egocentric for longer than is actually the case, the fact that these difficulties exist is not disputed. Piaget's theories remain relevant to explanation of the development of understanding regarding consciousness, however, the possibility of the development of knowledge occurring earlier, or more rapidly, needs consideration.

The conceptualisation of dreams has tended to be used as a measure of an individual's ability to distinguish between internal and external experiences and the examination of these studies allows further consideration of the process of the development of this ability.

1.4.2 Children's developing conceptualisation of dreams

The concept of dream, an entirely subjective phenomenon, was used by Piaget to specifically study the notion of realism, the lack of discrimination between what is subjective (internal/mental) and objective (external/physical) (Laurendeau & Pinard, 1963). However, the subjectivity of dreams is often far from obvious. Dreams are an example of an internal phenomena very similar in perceptual experience to external events (e.g. Shepard, 1984), but also in terms of emotional impact on individuals (e.g. Laurendeau & Pinard, 1963).

1.4.2.1 Piaget's (1927) findings regarding dream conceptualisation

Piaget's (1927, cited in Laurendeau & Pinard, 1963) questions focussed on the origin, the location, the way the dream was experienced and the individuated nature of dreams. Children's conceptualisation was as follows:

- The origin was vague, but external.
- The location was in the room.
- The eyes and ears produced the experience.
- Other people could see their dreams if they were in the room at the right moment.

This would suggest a *realistic* view, i.e. that the children had attributed physical properties to the dream. Piaget (1929, cited in Wellman & Estes, 1986), however, clarified his findings to suggest a less extreme view of realism. Children were described as confusing dream phenomena with their corresponding real objects, but the objects were seen as less tangible and immediate. The images produced during dreaming were described as 'pictures (images) we see!' (Piaget, 1929, p.94, cited in Wellman & Estes, 1986). Therefore, children would be aware that the images produced by dreams were not actually real (for example, there was not a real monster in the room), but would believe that the dream itself was tangible and real, existing as a picture in the room, or in front of the eyes. Others, therefore, would be able to see it.

An initial understanding of dreams and other mental states was considered by Piaget to begin at approximately six to seven years of age, with a full understanding of their subjective nature by the age of twelve (Piaget, 1927, cited in Laurendeau & Pinard, 1963). Children's understanding of thoughts and imagined mental images were viewed in the same way as dreams (Piaget, 1929, cited in Wellman & Estes, 1986).

Piaget also viewed children as unable to differentiate between the process of dreaming and thinking from the activity of doing, for example, 'children believe that thinking is just talking and that you think with your mouth' (Wellman & Estes, 1986, p.911). Piaget (1929, cited in Wellman & Estes, 1986) discussed different levels of realism, suggesting a progression from stronger to weaker held notions.

1.4.2.2 Replication studies

Laurendeau and Pinard (1963) replicated Piaget's studies on the development of objectivity and symbolic thinking. They suggested three different levels of realism found in children's understanding of dreams. They were as follows:

- *Integral realism* i.e. dreams occurred externally to the dreamer (e.g. in the bedroom, on the wall) and originated from external sources (e.g. the night, the bed). This was present shortly after the age of four years.
- *Mitigated realism* i.e. alternative suggestion of internal and external origins for dreams, without arrival at any clear conclusion.
- *Integral subjectivism* i.e. dream as internal (in the head, the mind, the imagination) and as personal and invisible. The eyes were still often considered able to see the dream. However, Laurendeau and Pinard (1963) suggested that rather than reflecting realistic thinking this referred to the visual quality of the dream. This was present at the age of six and a half years.

Laurendeau and Pinard's (1963) findings went some way towards replicating Piaget. However, as with other criticisms, the children achieved objectivity at

a much earlier age (six and a half years as opposed to twelve years). Wellman and Estes (1986) critically re-examined Piaget's notion of childhood realism. They referred to Keil's (1979) research suggesting that young children believed all things, including thoughts and dreams, to be physical and to Piaget's findings that children believe that 'you think with your mouth' (Wellman & Estes, 1986, p.911). They distinguished between two types of mental phenomena, these being:

- *mental activities* (e.g. thinking and dreaming);
- the *products or contents of such activities* (e.g. a thought about a dog).

Both aspects have the potential to be confused with real physical activities or objects (Wellman & Estes, 1986). However, they focussed on the second aspect, namely the child's ability to distinguish, for example, a real dog from the thought or imagined image of a dog. They investigated this notion of realism using three of the criteria on which real physical objects could be distinguished from mental images/ entities:

- behavioural-sensory qualities i.e. could it be seen, touched and physically acted upon;
- public nature i.e. could other people also experience it; and
- consistent existence i.e. was the phenomena present over an extended period of time.

In contrast to Piaget's findings, they found that even three-year-olds could distinguish real and mental entities on the basis of these criteria, contradicting even Piaget's (1929, cited in Wellman & Estes, 1986) weaker view of realism (children believing thoughts and dreams to be external images). Thoughts or dreams were not seen to exist in any kind of publicly perceptual sense.

Wellman and Estes (1986) explained the contradictions in terms of the difference in questioning, with Piaget asking children about *mental activities*, whilst their study asked about the *contents of mental activities*. However, they suggested that the children's responses implied a more developed

understanding of mental activities also. As with previous criticisms, it may be that the age of attaining this understanding was simply overestimated by Piaget and that children younger than three years may have realistic misconceptions of mental entities (Wellman & Estes, 1986).

Woolley and Wellman (1992) also studied childrens' developing conceptualisation of dreams, their findings contrasting with both Piaget (1927, cited in Laurendeau & Pinard, 1963) and Laurendeau and Pinard (1963). Woolley and Wellman (1992) examined the understanding of children aged three and four years old in relation to the notions that dreams were:

- nonphysical (not made of anything);
- perceptually private (not available to public perception);
- individuated (not directly shared with others); and
- potentially fictional (in content).

Childrens' understanding of these properties in relation to objects and photographs was also examined. Woolley and Wellman (1992) determined that in order to identify whether mental phenomena were confused with physical phenomena, it was necessary to ask them about both and compare their responses. All the children judged dream entities, photographs and physical objects to be appropriately different in terms of physical versus non-physical and perceptually public versus perceptually private status. There was no confusion regarding the fictional nature of dreams. In terms of individuation, whilst most four year olds appropriately described this, many three year olds believed that their dreams were directly shared with others (although still not the majority). Their beliefs reflected the idea that dreams were shared between sleeping minds, not through public perception, as they understood that dreams were not external, physical events. Cross-cultural support is provided by the earlier work of Shweder and Levine (1975), who also found that young children in Nigeria believed that dreams were shared by others sleeping in the same room.

The finding that at three to four years of age children were no longer realistic in their understanding of dreams contrasted with the previous finding of twelve years (Piaget, 1927, cited in Laurendeau & Pinard, 1963) and six and a half years (Laurendeau & Pinard, 1963). It was felt to reflect the evolution of the methods used to study this area e.g. use of a structured interview schedule and closed questions about both mental and physical phenomena. Woolley and Wellman (1992) concluded that any error in conception of dreams, which were few, took place 'against a coherent mentalistic understanding of the mind generally, and of dreams specially as one sort of mental state among others' (Woolley & Wellman, 1992, p.379).

1.4.3 The development of ToM

In their discussions of children's largely mentalistic view of the mind Woolley and Wellman (1992) referred to the research regarding thoughts and mental images (e.g. Estes, Wellman & Woolley, 1989; Wellman & Estes, 1986), knowledge (e.g. Pillow, 1989; Wimmer, Hogrefe & Perner, 1988), beliefs and desires (e.g. Wellman & Bartsch, 1988; Wimmer & Perner, 1983) and pretence (e.g. Leslie, 1987, 1988). All of these factors are incorporated in the development of ToM and require the deployment of metarepresentations. Leslie (1987) distinguished between *primary representations*, the representation of the world in an accurate and literal way (the direct representation of an object, state of affairs or situation) and *metarepresentations*. A metarepresentational context allows the creation of pretense, it is a second order context that gives 'a report or quotation of the first-order expression...Its reference, truth, and existence relations are suspended while it appears in this context' (Leslie, 1987, p.417). This is seen as a *decoupled representation* (Leslie, 1987). It allows for pretense and manipulation of a situation, for example it allows for a banana to be treated as *if* the 'banana is a telephone' (Leslie, 1987). Leslie (1987) proposed that the emergence of *decoupled representation* was necessary for the development of the basic representational structures for ToM (see Leslie, 1987, for a detailed review of the development and nature of metarepresentational abilities).

ToM is particularly relevant to the development of knowledge concerning conscious experience, particularly in light of the association of disrupted ToM ability in individuals with psychosis. Piaget proposed that until an individual could flexibly move from one point of view to another, and back again, he could not develop an objective view of reality. This involved not only the understanding of spatial relations and the perceptual experiences of another, but also the ability to understand another's feelings and intentions (Donaldson, 1978).

Premack and Woodruff first defined ToM in their 1978 studies of chimpanzee behaviour and cognitive processing. The term described the ability to attribute mental states to oneself and to others in order to explain and predict behaviour (Happé, 1994). This definition inherently presumes an ability to understand one's own and another's feelings and intentions. According to Wellman (1994), ToM ability involves two components:

- ontological component, i.e. the ability to distinguish between the real (physical) world and the mental (inner) world; and
- causal component, i.e. the ability to understand that there are apparent mutual causal relationships between mental states and the physical world. The assumption being that mental states can affect the way an individual acts, and responds to the world, just as the physical world can affect the thoughts or feelings that a person has.

The ontological component refers primarily to the ability to source monitor. Rather than seeing ToM as categorical, as present or absent, it may be better to think in terms of severity of impairment (e.g. Yirmiya, Erel, Shaked & Solomonica-Levi, 1998). ToM ability is generally conceptualised in terms of progression in its development (cf. Bentall's 2000 notion of the development of source monitoring ability as a skill).

It is possible to identify factors that suggest the progression in the development of ToM ability, as follows:

- Precursors of ToM ability are apparent at 18 months with the appearance of symbolic play (identified by Piaget as suggesting the development of objectivity).
- The appearance of language related to wants, beliefs and emotions e.g. Bretherton and Beeghly (1982) who found that at the age of two and a half years, most children spontaneously used vocabulary regarding perception, volition, major emotions and knowledge, and that they did so equally with reference to themselves and others.
- Three to five year olds have been found to correctly distinguish between intended acts and unintended behaviour e.g. mistakes, reflexes and passive movement (Shultz, Wells & Sarda, 1980).

1.4.4 First order ToM

To reflect true ToM ability, an individual must be able to attribute mental states that are 'independent both of the real world state of affairs (because people can believe things which are not true), and independent of the mental states other people have (because you and I can believe, want, and pretend different things from one another)' (Happé, 1994, p.40). Both of these abilities require a *decoupled representation* (Leslie, 1987).

Wimmer and Perner (1983) were the first investigators to study the developmental ability of children to represent another person's false belief, which they viewed as vital to the ability to interpret or anticipate another person's actions.

They developed a story where a character 'Maxi' put chocolate into a cupboard (x) and left the room. Whilst he was out his mother moved the chocolate to a different location (y). The participants had to indicate where Maxi would look for the chocolate on his return. Only when they were able to represent Maxi's false belief (chocolate is in x) as different from what they as observers knew (as a *decoupled representation*, chocolate is in y) would they be able to correctly point to location x.

The results demonstrated a strong age trend (which seemed to correspond well with Piaget's stages of development), with the majority of four to five year olds incorrectly pointing to location y, but almost all six to nine year olds correctly identifying location x. This has been termed 'first order ToM' and is the ability to identify that people can have different thoughts about the same situation and that people may act in accordance with their false belief (e.g. Baron-Cohen, 2000).

A review of the child development literature (Wellman & Lagattuta, 2000) demonstrates that first order ToM ability develops rapidly during the pre-school years, with most children attaining this skill by the age of four. There is a general shift in children's concept of mind between the ages of three and four years, with the appearance of the ability to understand false beliefs, an initial understanding of the distinction between appearance and reality, the ability to understand that individuals possess desires and intentions and that different individuals have different beliefs and sources of belief (Yirmiya et al., 1998). This provides further evidence for claims that children as young as four no longer have a realistic view of the world (Woolley & Wellman, 1992; Wellman & Estes, 1986).

1.4.5 The importance of ToM

ToM ability has been suggested as a necessary precondition for moral responsibility, self-consciousness and social interaction (e.g. Dennett, 1978). Absent or impaired ToM ability, has been postulated to account for the core difficulties of ASD, namely, lack of appropriate social reciprocity, reciprocal communication and pretend play (Baron-Cohen et al., 1985). There tends to be an absence of mental state terms in the language of people with ASD (Tager-Flusberg, 1989, cited in Tager-Flusberg, Calkins, Nolin & Baumberger, 1990). Temporarily impaired ToM has also been found to be associated with psychotic symptoms (e.g. C. Frith, 1992; Pickup & C. Frith, 2001). Permanently absent, or underdeveloped ToM, would make the understanding of conscious experience difficult and would suggest significant problems for the ability to source monitor. Baron-Cohen (1989) described

difficulties for people with ASD in distinguishing between mental and physical entities.

Hurlburt et al. (1994) investigated the hypothesis that people who fail ToM tasks should be poor at introspecting about their thoughts, with three adults with Asperger syndrome⁴ using the descriptive sampling method (Hurlburt, 1990, 1993). All reported inner experiences to some degree. However, the individual who passed only the very simplest false belief tasks (assessing first order ToM) was the least able to report on his inner experience. They suggested the possibility that 'the ability to attribute mental states in experimental ToM tests and the ability to introspect on one's own thoughts in the experience sampling task are strongly linked' (p.394). Whilst they are cautious of inferences made from such a small sample, the findings lend further credence to the association of ToM and the ability to think about or report internal events.

The initial sections of this literature review have focussed on the nature and development of conscious experience, particular the ability to distinguish internal from external experiences, within the population of individuals without LD. The remainder of the discussion will focus on the relevance of this literature to individuals with LD and also specifically on the research regarding the nature and development of conscious experience in this population. Again the focus will be on the ability to distinguish internal from external experiences. The initial discussion will focus on the definitions, prevalence rates and aetiologies of LD.

1.5 Learning Disabilities

Hatton (1998) provided a comprehensive review of the classification, epidemiology and aetiology of LD, referring to its socially constructed nature,

⁴ Diagnostic criteria for Asperger syndrome include marked impairments in social interaction and restricted, repetitive or stereotyped patterns of behaviour. These are associated with a clinically significant impairment in social functioning, but in the absence of any clinically significant general delay in language or cognitive development (DSM-IV, American Psychiatric Association, APA, 1994).

which has resulted in changing definitions, measurements and inclusion in the statistics over time (Trent, 1995; Wright & Digby, 1996). However, throughout the twentieth century the conceptualisation of LD as a deficit in intellectual ability (or intelligence) has been the predominant view (Wright & Digby, 1996).

The implications of this for a review of the literature are that all papers discussed during the twentieth century should refer to the same, or very similar, constructs based on the definition of deficit in intellectual ability. Definitions of LD do, however, vary across countries (Fernald, 1995). This is related to factors, including ideology, political viewpoints, economic issues and culture (Fryers, 1993). This may have implications for the examination of research conducted in different countries.

1.5.1 Classification

The American Association on Mental Retardation's (AAMR, Luckasson, et al., 1992) definition and classification system is the most comprehensive and widely accepted (Hatton, 1998) (figure 1).

Figure 1. AAMR 1992 Definition of 'Mental Retardation'(MR) (cited in Hatton, 1998)

MR refers to substantial limitations in present functioning. It is characterised by significantly sub-average intellectual functioning, existing concurrently with related limitations in two or more of the following adaptive skill areas;

- Communication
 - Self-care
 - Home living
 - Social skills
 - Community use
 - Self-direction
 - Health and safety
 - Functional academics
 - Leisure
 - Work
- 'MR' manifests before age 18.

'Significantly sub-average intellectual functioning' refers to an intelligent quotient (IQ) score of 70-75 or below (two standard deviations below the mean) on individually administered assessments of general intelligence (Hatton, 1998). There needs to be an additional significant limitation in adaptive skills needed to carry out the daily tasks of living (appropriate for the age of the individual) (Hatton, 1998). The disability must have manifested before adulthood.

Professionals consistently refer to individuals with LD in terms of degree of severity (Hatton, 1998). A widely used classification tool is the International Classification of Diseases, tenth edition (ICD-10, World Health Organisation, WHO, 1993) (figure 2).

Figure 2. ICD-10 classification (cited in Hatton, 1998)

	IQ Score
Mild	50-70
Moderate	35-49
Severe	20-34
Profound	<20

There is a tendency, particularly in epidemiological data to refer to all individuals with an IQ score below 50 as having severe LD (Hatton, 1998). Some professionals believe that LD is not necessarily a life-long condition (e.g. Hatton, 1998; Sinason, 1992), as the functioning of individuals with milder LD can fluctuate depending on life circumstances.

However, clinical services often do not carry out eligibility assessments in as much detail as suggested by the AAMR or ICD classifications. This means that there will be individuals receiving services who would not necessarily meet criteria, also that there are likely to be many people who would meet criteria who do not receive services (Hatton, 1998). Therefore the research literature is likely to contain individuals who may not meet full criteria for LD,

and is also likely to miss individuals who do meet criteria. As a group, individuals with LD are diverse, with a wide range of characteristics and needs (Hatton, 1998).

1.5.2 Epidemiology

The social construction of LD (Hatton, 1998) also produces difficulties in obtaining definitive epidemiological data. This review will refer to the prevalence (the number of cases, old and new, that exist in the population at a particular point in time over a specified time period, Richardson & Koller, 1985), as incidence studies have generally not been carried out (Hatton, 1998).

European and North American prevalence studies investigating mild LD (across all age ranges) report prevalence rates of 3.7 to 5.9 per 1000 (see Fryers, 1993; McLaren & Bryson, 1987; Richardson & Koller, 1985). The UK Government white paper *Valuing People* (Department of Health, DoH, 2001), however, put the prevalence rate of mild LD at 25-30 per 1000 population where entire populations were screened and at less than 10 per 1000 where studies included those known to services only. Studies suggest a higher proportion of males than females with mild LD, with a ratio of 1.6:1 (Hatton, 1998). However, Hatton does raise a number of problems related to the validity of studies (see Hatton, 1998).

European and North American prevalence studies investigating severe LD (across all age ranges) report prevalence rates of 3 to 4 per 1000 (see Fryers, 1993; McLaren & Bryson, 1987; Richardson & Koller, 1985; Roeleveld, Zielhuis & Gabreels, 1997). Again prevalence rates are higher with total population studies (e.g. 6.3 per 1000, Hatton, 1998). With regards to the ratio of males and females, this varies across studies (Hatton, 1998), although *Valuing People* puts it at 1.2 males: 1 female (DoH, 2001). The classification of severe LD is clearer, meaning prevalence studies are likely to have greater validity than for mild populations (Hatton, 1998).

There has been little research investigating prevalence rates for LD in different ethnic groups. However, research in America and Britain has found tentative evidence suggesting higher prevalence rates amongst minority ethnic groups (DoH, 2001).

1.5.3 Associated conditions

In Hatton's (1998) review, the most common conditions associated with LD (figures refer to percentage of population) were:

- epilepsy (15-30 per cent e.g. McLaren & Bryson, 1987);
- cerebral palsy or other motor impairments (20-30 per cent e.g. McLaren & Bryson, 1987);
- sensory impairments (10-33 per cent, e.g. Hatton & Emerson, 1995; McLaren & Bryson, 1987);
- challenging behaviour (6-14 per cent; e.g. Emerson, 1995; McLaren & Bryson, 1987); and
- psychiatric disorders (10-71 per cent e.g. Borthwick & Duffy, 1994; McLaren & Bryson, 1987). Psychiatric disorders will be discussed in more detail later.

1.5.4 Aetiology

Determining aetiology in LD, as with classification and epidemiology, is at best difficult (Hatton, 1998). It is estimated that aetiology is unknown in 20-40 per cent of cases of severe LD and in 45-62 per cent of cases of mild LD (e.g. Matilainen, Airaksinen, Mononen, Launiala & Kaariainen, 1995; McLaren & Bryson, 1987; Wellesley, Hockey & Stanley, 1991). For the majority of individuals, LD will result from a complex interaction of biomedical, social, behavioural and environmental factors (see Hatton for review).

From examination of the literature it is clear that the term LD refers to a wide and varied population. A discussion of people with LD does not refer to a homogenous group, however, nor does a discussion of the population of

people without LD. Research should bear this in mind, but should not be deterred by it.

1.6 LD, consciousness and inner experience

A review of the literature has demonstrated that the majority of adults and children without LD are able to distinguish internal and external events. Whilst there are notable exceptions (e.g. individuals with psychosis), individuals possess an ability to recognise experiences such as thoughts and emotions (both within themselves and within others) and to know that these experiences are internal and subjective. Similarly, individuals are able to differentiate experiences as coming from the outside world. However, it is unclear whether the same *assumed* understanding could be applied to the LD population as there is a paucity of research available examining the conscious experience of individuals with LD, particularly their inner experiences.

1.6.1 The importance of exploring inner experience in people with LD

It is possible that individuals with LD may have (and understand) experiences using qualitatively different processes to many other people (Barrett & Jones, 1996). They may have difficulties classifying experiences according to different types of phenomena (Morgan, 1986) and have limited communication through which to describe them to others (e.g. Hurley, 1996; James, Murkherjee & Smith, 1996). This makes the sharing of these inner worlds and the understanding of them a difficult task to accomplish. However, such an understanding is critical to practitioners working with people with LD. Without this it is not possible to understand and respond to the psychological difficulties of this client group nor to tailor therapeutic interventions to them (Stenfert Kroese, Cushway & Hubbard, 1998).

The research that is available suggests that individuals with LD have difficulties understanding a number of areas of conscious inner experience, for example in understanding emotions (e.g. Reed, 1997), reporting thoughts

(Dagnan & Chadwick, 1997) and understanding dreams (Edwards, 1999; Stenfert Kroese et al., 1998). They also have impaired metarepresentational abilities e.g. impairment in ToM (e.g. Yirmiya et al., 1998). Research has also investigated the concept of death in individuals with LD, which is related to Piaget's stage model (Harper & Wadsworth, 1993; McEvoy, 1989).

1.6.2 The application of Piaget's stage of development model to individuals with LD

Before discussing the ability of people with LD to distinguish internal and external experiences, it is necessary to discuss the relevance of Piaget's work to people with LD. The implication is not that individuals with LD function in the same way as children, or are indeed like 'adult children', rather that individuals with LD, by definition, have impaired cognitive development. A developmental perspective seems best placed as an initial framework for understanding. In fact it has been noted that 'Piaget...is a student of the development of thinking more than he is a student of children' (Kessen, 1962, p.77). The discussion of the application of traditional developmental approaches to LD should not be confined only to those researchers interested in developmental theory. Its conclusions hold importance for all kinds of intervention (Hodapp, 1990), particularly as the interventions informing clinical work with individuals with LD are often developed with individuals without LD.

In summary, Piaget's view was that each individual passes through a number of stages, gaining further knowledge of the world at each, in order to develop an objective view of reality. The individual develops the ability to represent experiences in terms of signs and symbols, and can link one event with a similar class of events under different circumstances.

This discussion involves the distinction between conceptualisation of LD as a result of 'delayed' or of 'defective' [from now on the term 'difference' will be used] development (Baumeister, 1987). The first formal developmental approach (LD as resulting from delayed development) was introduced by Zigler, who suggested that Piaget's stage model applied to individuals with

LD (Weisz & Zigler, 1979; Zigler, 1969). The only difference was the rate at which the individual passed through each stage of development and the ceiling stage reached (Morgan, 1986). To date a number of studies have demonstrated that individuals with mild LD progress through the same stages, but at a slower pace and halt development at an earlier stage than individuals without LD (e.g. Inhelder, 1968; Stephens & McLaughlin, 1974; Woodward, 1961, 1962). Individuals with severe and profound LD have been found to remain at early stages of development, with cognitive skills suggestive of the sensorimotor stage (e.g. Kahn, 1976, 1979; Woodward, 1959).

There has, however, been contention regarding whether the model can be applied to all individuals with LD. In a critical review of the research (involving three longitudinal and twenty-eight cross-sectional studies), Weisz and Zigler (1979) concluded that individuals with LD did progress through Piagetian stages of development, with the exception of individuals with clear electroencephalographic (EEG) abnormalities.

This progression through the stages is relevant to the ability of individuals with LD to distinguish between internal and external experiences. Using Piaget's stage model, the individual is unable to gain an objective view of the world until the concrete operational stage. At this point internal and external events should be reliably distinguished.

Information is experienced through a number of channels, including auditory, visual, olfactory, tactile and kinesthetic. These experiences can be internal or external, but the source of the perceptual experience can be difficult to distinguish (e.g. Bentall, 2000; Shepard, 1984; Velmans, 2000). The information is then processed to a number of levels: those of 'raw experience (it feels...); basic categorisation (it's like...); extraction of symbolic meaning to a range of conceptual levels' (Clements, 1997, p.163). Therefore, delayed progression through the stages of development would suggest difficulties for individuals with LD in terms of the ability to extract symbolic meaning and to classify phenomena according to different

experiences. Thus, individuals with LD would have difficulties classifying phenomena as thoughts, emotions, dreams and also in determining classes of experience as internal or external. Their understanding of the world would remain somewhat *realistic* (Piaget, 1929, cited in Wellman & Estes, 1986).

There has been debate over whether ASD should be considered as an exception to the similar sequence hypothesis (see Morgan, 1986 for a detailed review). In summary, Morgan (1986) proposed that, on the whole, individuals with ASD do adhere to the similar sequence hypothesis. However, in terms of operative skills (the incorporation of specific signs and symbols into a general conceptual structure), many fail to progress beyond the sensorimotor stage. This would make it difficult for an individual to generalise knowledge from specific instances or events to a more general schema. Therefore, one dream experience may never be associated with another to form the basis of an overall understanding of dreams. This may also make the task of source monitoring difficult, as each experience may be interpreted as novel, not applied to a class of external events or internal events.

On the other hand, those who view LD from a 'difference' model of development would suggest that all individuals with LD have one or several specific 'defects', either biological or cognitive and which would result in qualitatively different development. This is felt to exclude them from an understanding applied within traditional developmental perspectives (e.g. Ellis, 1963). Weisz (1990) summarised the difference perspective as suggesting a 'more heterogeneous array of cognitive processes that are difficult to encompass within a single cognitive theory' (p.140). Difference theorists would suggest that these cognitive differences result in qualitatively different ways of making sense of the world (Barrett & Jones, 1996) or possibly, qualitatively different experiences.

Mundy and Kasari (1990) have suggested a point of reconciliation between the developmental and difference models, based on a review of studies utilising a wide range of Piagetian tasks (see Weisz & Zigler, 1979). These

found that individuals with LD with no known organic impairments performed at identical levels as "mental age" (MA) (as opposed to chronological age) matched children without LD on Piagetian tasks, but at lower levels on tasks involving information processing skills. Children with known organic impairments and LD often performed at lower levels on both tasks than children matched for "MA".

Mundy and Kasari (1990) argued that the level of cognitive skill achieved by individuals with LD was associated with the structural features of cognitive problem solving measured by Piagetian tasks, but that the rate at which cognitive skills were achieved is indexed by performance on some information processing tasks (see Weir, 1967).

1.6.3 Difficulties obtaining reports of inner experiences in individuals with LD

Of importance to researching the ability of individuals with LD to distinguish internal and external phenomena are the self-reports of people with LD, which have previously been considered to be of limited validity (e.g. Balla & Zigler, 1979). The reasons given included the likelihood of socially desirable responding (due to factors including acquiescence and dependency), difficulties with memory (not remembering enough to self-report), recency effects (stating or remembering the most recent event or question), anxiety and incomprehension (Stenfert Kroese, 1997).

Stenfert Kroese (1997) reviewed the literature on self-report in people with LD and found reports of valid and reliable data e.g. Jahoda, Markova and Cattermole (1988) who found consistent patterns of responding regarding stigma and self concept. Also, Lindsay, Michie, Baty, Smith and Miller (1994) and Lindsay, Neilson and Lawrenson (1997) who found a high degree of convergent validity in self-reports regarding emotion.

Examples questioning self-reports of individuals with LD refer to studies of negative events or traits for individuals with LD, including adaptive and maladaptive behaviour and ratings of anger and depression (e.g. Benson &

Ivins, 1992; Voelker et al., 1990). Voelker et al. (1990) found that whilst individuals with LD reliably reported adaptive behaviours there was a bias to self-report maladaptive behaviours in a socially desirable direction (as measured against carer reports of the same behaviours). However, earlier studies have found that staff under-report emotions in people with LD and focus more on challenging behaviours (Harper & Wadsworth, 1993). Benson and Ivins (1992) did conclude in favour of reliable self-reporting of people with LD, however, when slightly modified techniques were used.

1.6.4 Research on emotion in individuals with LD

An area of conscious experience that has been explored with individuals with LD is that of emotional expression. Lindsay et al. (1994) have, however, commented on the paucity of research in this area. Nevertheless, recognising and expressing emotions has been described as an area of difficulty for people with LD (e.g. Reed, 1997). Clinical observations have suggested a restricted range of emotions, difficulties distinguishing between emotions, a small emotional vocabulary and problems with the appropriate expression of negative emotions (Bates, 1992).

The increase of research in the area of emotional expression, however, generally suggested that people with LD can and do self-report their own emotions. Lindsay et al. (1994) found that people with LD had a degree of insight into their emotions and could describe them given measure on which to do so, and could do so consistently across different measures. This seemed to reflect a 'stable and reliable cognitive system related to emotion' (Stenfert Kroese, 1997, p.7). Similarly, a study on grief in adults with LD found that individuals tended to refer to their grief in emotional terms, including loneliness, anxiety, sadness, depression, dislike of new residential placements and worries (Harper & Wadsworth, 1993).

Differences have been suggested in the phenomenology of emotional expression and disturbance across the different severities of LD (e.g. Sovner & Hurley, 1983). Glick and Zigler (1995), in line with the stage theory of development, have suggested that there is a developmental progression in

the expression of emotional disturbance. Individuals with severe LD were hypothesised to be more likely to demonstrate emotional disturbance through actions (showing symptoms of turning against others rather than against themselves), whilst individuals with milder LD more likely to show emotional disturbance through their cognitions. Their research, however, focussed on comparing non-LD psychiatric inpatients with inpatients with mild LD. Individuals with LD were more likely to show symptoms of temper outbursts, physical assaults and fewer somatic complaints or depressed cognitions. Whilst this demonstrated a difference between the emotional expression of individuals with LD compared with non-LD individuals, it did *not* support the view that emotional expression would change dependent on severity of LD. In fact, it suggested that even individuals with mild LD were less likely to express emotional disturbance through cognitive symptoms.

It could be hypothesised that the difference in reactions may be related to a difference in the understanding, possibly conceptualisation, of the phenomena. For example, if emotions are not understood as normal, subjective reactions to particular situations the feeling and intensity of the phenomena in itself could be disturbing. Further research in this area may prove useful in examining Glick and Zigler's (1995) theory across different severities of LD. Research specifically examining the conceptualisation of emotions as a subjective phenomena may also prove fruitful.

Interestingly, Reed and Clements (1989) found that whilst emotional understanding was associated with overall cognitive ability, individuals with LD demonstrated emotional deficits that were not in line with their level of cognitive development. The similar finding of Rojahn, Rabold and Schneider (1995) supported this, with emotional deficit greater than would be expected. This is interesting in view of the findings suggesting ToM deficits in individuals with LD also (e.g. Yirmiya et al., 1998), which will be discussed later in more detail (see 1.6.10). Emotional vocabulary is often taken as evidence of development of ToM (e.g. Bretherton & Beeghly, 1982).

1.6.5 Understanding thoughts

Little research is available that directly examines the ability of people with LD to reflect on their thoughts, to describe the ways in which thoughts are experienced or to identify thoughts. In the context of investigating the applicability of cognitive-behaviour therapy to people with LD, Dagnan and Chadwick (1997) attempted to elicit cognitions by focussing on a specific emotional event. They found that over 20 per cent of a sample of people with mild to moderate LD could identify an appropriate mediating cognition (or belief) for scenarios involving sadness and anger. Lindsay and Kasprovicz (1987) and Lindsay (1991) also investigated the ability of individuals with LD to report negative automatic thoughts (NATS), and suggested this could be achieved through the use of role-play and re-enactment of previous difficult life events.

Lindsay et al. (1997) utilised these techniques, finding that some individuals with LD could report a wide range of thoughts during role-play. They also found it was possible to elicit NATS during clinical interview in some individuals, although others would be unable to report any specific NATS. However, whilst the research suggested that some individuals with LD were able to *identify* thoughts, it does not shed any light on how these thoughts are *experienced* (as in Hurlburt's 1990, 1993 work with non-LD individuals), or whether individuals with LD view them as internal, private cognitive events (the culturally normative conceptualisation of a thought).

The research regarding emotions and thoughts suggested that these areas of conscious experience could be remembered, referred to and reflected upon by some individuals with LD. However, there were some individuals for whom this was harder. There were suggestions of abilities following the similar-sequence hypothesis and also areas of discrepancy in terms of abilities (suggesting support for the 'difference' theorists), for example, emotional deficits above overall level of cognitive ability. The understanding of death in individuals with LD is another area where developmental research has been applied and is particularly relevant in terms of the

potential effects of a lack of understanding of this concept on the quality of life and experiences of individuals with LD.

1.6.6 The understanding of death in individuals with LD

It has been suggested that confusion regarding the cognitive understanding of death might cause difficulties with the grieving process (Harper & Wadsworth, 1993) and may lead to a prolonged grief reaction (Stenfert Kroese, 1997). The literature suggested that adults with LD are functioning at an earlier stage of development in this ability (e.g. Harper & Wadsworth, 1993; McEvoy, 1989).

McEvoy (1989) studied the cognitive understanding of death in 38 adults with LD. He cited research suggesting that many people with LD were reluctant to talk about the death of a relative due to beliefs that the discussion may disturb the dead and result in them returning to haunt them, as his rationale for his study. His research focussed on the most widely accepted features of a mature concept of death (as discussed in the child development literature). These were:

- irreversibility - once dead something could not return to life;
 - nonfunctionality - all life defining functions stop after death; and
 - universality - all living entities would die
- (Kane, 1979; Speece & Brent, 1984).

Of the participants 26 per cent believed that once dead you could come back to life (11 per cent were unsure), 71 per cent believed that everyone will die (although only 42 per cent said that they would die) and 26 per cent of participants believed that it remained possible to see, hear and breath after death (8 per cent were unsure). More mature concepts of irreversibility and non-functionality were associated with better communication abilities, self-care and community skills. This may suggest an association with developmental progression (e.g. in line with Piaget's stage model). Harper and Wadsworth (1993) also found that the cognitive understanding of death

was lacking in one fifth of their 37 adult respondents with moderate to severe LD.

Difficulties with grief may be expected given such confusion regarding the concept of death, e.g. individuals may be waiting for the deceased to return, or may have feelings of anger if they feel that death was optional and that they were deliberately deserted (Stenfert Kroese, 1997). Another possible concern is staff reactions to the grief experienced by individuals who do not have a mature concept of death. It seems possible that individuals who talk about the return of their deceased relatives, or their belief that their relative may still be able to see or breathe, may result in misinterpretation as signs of mental health difficulties rather than beliefs resulting from a lack of knowledge.

Piagetian research has been applied to the understanding of dreams in individuals with LD. Again, confusion regarding the experience of dreams have been hypothesised to result in serious consequences for individuals with LD in terms of quality of life and experiences (e.g. Edwards, 1999; Stenfert Kroese et al., 1998). Before describing research on the conceptualisation of dreams in individuals with LD, the research on experience of dreams will be considered.

1.6.7 The experience of dreams in people with LD

The experience of dreams is associated with cognitive skill (Foulkes, 1993), which may subsequently be associated with ability to accurately conceptualise these phenomena (Marcel, 1988). For this reason, it is important to examine the literature on the reports of dreams by individuals with LD. However, very little is known about the experience of dreams in this population.

Six studies have suggested that people with LD are able to report their dreams (Bradshaw, 1991; Edwards, 1999; Hilakivi, 1987; Morris, 1994; Stenfert Kroese et al., 1998; Turner & Graffam, 1987). Hilakivi (1987) compared the dream content of 10 boys with LD (aged 13-14 years) with 8

'normal' classmates. The boys with LD reported less bizarre dreams compared to controls and used fewer words to describe them. This is interesting in view of Foulkes (1982, 1985) research suggesting an association between cognitive skill and dream content. However, there were no details of content reported in the study.

Turner and Graffam (1987) collected 154 dream reports over a ten-year period from 60 employees of a sheltered workshop. Deceased family members or friends often featured in dreams and these often elicited salient emotional reactions e.g. chronic sleep disturbance, emotional distress and chronic crying spells. Such emotional reactions have been hypothesised to make dream experiences more realistic (e.g. Hobson, 2002). Turner and Graffam (1987) concluded that adults with LD have rich and diverse dream experiences.

Stenfert Kroese et al. (1998) in a sample of 54 adults with LD found no dream content in 11 participants, whilst the remaining 43 reported dreams and nightmares with a variety of topics. No further details of the content of the dreams were reported.

1.6.8 The therapeutic use of dreams with people with LD

The dream reports of people with LD have been found to be relevant to, and reflective of, significant life events and current psychological state (e.g. Turner & Graffam, 1987). Moreover, there is a small amount of research (two studies) that demonstrates that it has been possible to work positively with such individuals using their dream experiences. Morris (1994) incorporated dream work with a woman with mild LD. Bradshaw (1991) described the use of a 'successful cognitive manipulation' with a man with Down's syndrome who suffered from recurrent post-traumatic stress nightmares.

1.6.9 The conceptualisation of dreams in people with LD

Stenfert, Kroese et al. (1998) used a modified version of the paradigm employed by Woolley and Wellman (1992) to investigate the conceptualisation of dreams in adults with LD, in terms of their non-physical,

perceptually private, individuated and potentially fictional nature. Findings demonstrated the following:

- approximately 40 per cent of questions about dreams were answered incorrectly, indicating substantial confusion regarding the non-physical, perceptually private nature of dreams;
- less than a third of participants (n=16) were confident that dreams were individuated. Of the participants 14 consistently believed that two people sleeping in the same room would share the same dream, whilst 24 participants were inconsistent in their responses (suggesting a phase similar to that of 'mitigated realism' e.g. Laurendeau & Pinard, 1963);
- answers given to the questions regarding physical objects and photographs indicated a good understanding of the behavioural and sensory properties of these items (e.g. Woolley & Wellman, 1992);
- there was some confusion regarding the ability to 'act on' objects in a photograph;
- a substantial proportion of participants did not believe that it was possible to dream about (or think about) fictional entities.

The authors believed participants' ratings of dreams as non-fictional could possibly be due to under-developed imagination skills. Difficulties in imagination skills of individuals with LD have been observed in a study by Scott and Baron-Cohen (1996), who investigated the ability of children with ASD, LD and those 'developing normally' to produce 'unreal' changes to their representations of people and houses. Participants were required to draw houses and people that could not actually exist. Children with ASD demonstrated the most difficulty with the task, however, children with LD also demonstrated greater difficulty than 'normally developing' children. The performance of participants with ASD was considered to fit with Leslie's (1987) proposal regarding metarepresentation. All the children demonstrated the ability to produce *primary* representations of what they perceived, but those with ASD (in particular) and also those with LD (to some extent), had difficulty producing a *decoupled* representation that could be changed and manipulated independent of reality (Scott & Baron-Cohen, 1996).

However, the alternative explanation that participants' responses to questions regarding the fictional nature of dreams were influenced by a desire to be seen as normal (social desirability factors), making them unwilling to admit to unusual/bizarre thoughts or dreams, was believed by Stenfert Kroese et al. (1998) to be more likely.

The authors concluded that the results confirmed the observation made by Beail (1989) that *some* individuals with LD are unable to distinguish between fantasy, dreams and reality. This would suggest that *some* individuals with LD have not developed an objective sense of the world (Piaget, 1927, cited in Laurendeau & Pinard, 1963), resulting in difficulty distinguishing between internal and external experiences.

1.6.9.1 Comparative studies

Edwards (1999) completed a modified version of the study by Stenfert Kroese et al. (1998), examining dream conceptualisation in adults with LD only (LDO), adults with a dual diagnosis of LD and 'schizophrenia' (DD) and adults with a diagnosis of schizophrenia only (SO). There were 14 participants only in each group, suggesting caution when generalising the findings. The findings demonstrated the following:

- participants in the LDO group answered 29 per cent of questions incorrectly regarding the perceptually private, non-physical nature of dreams;
- participants in the DD group answered 38 per cent of questions incorrectly regarding the perceptually private non-physical nature of dreams;
- there were significant differences in both the LDO group and the DD group between the number of correct responses to questions regarding the perceptually public/private nature of real objects and objects in photographs, compared to objects in dreams;
- there were significant differences in the DD group between the number of correct responses to questions regarding the physical/non-physical nature

of real objects and objects in photographs, compared to objects in dreams. However, no such differences were found in the LDO group;

- participants in the LDO group answered 42.86 per cent of questions incorrectly regarding the individuated nature of dreams, whilst in the DD group the figure was 32.14 per cent;
- participants in both the LDO and DD group were confused about the potential for dreaming and thinking about fictional entities.

The results of the DD group more closely replicated the findings of Stenfort Kroese et al. (1998). Edwards (1999) suggested that the smaller percentage of questions answered incorrectly by the LDO group regarding dreams (compared to the findings of Stenfort Kroese et al., 1998) could be accounted for by her sample of participants (all inpatients in residential services offering cognitive behavioural therapeutic programmes). They may have had more experience in differentiating and discussing their thoughts, emotions and behaviours. This seems to fit with the suggestion that the ability to source monitor is a skill that can be enhanced or impaired under certain conditions (c.f. Bentall 2000).

Of particular interest is the finding that a number of the SO group did not have a clear conceptualisation of dreams, with particular difficulties with the perceptually public and non-physical nature. A minority of participants in this group were also confused about the ability to dream and think about the possibility of fictional events. Edwards (1999) speculated that the difficulties of the SO group may have been partially due to ToM deficits (c.f. C. Frith, 1992) (which may be likely given the findings of Scott & Baron-Cohen, 1996), whilst the difficulties experienced by the participants with LD may have reflected a lack of comprehension. However, there is evidence to suggest that individuals with LD also have difficulties with ToM tasks (e.g. Scott & Baron-Cohen, 1996; Yirmiya et al., 1998). This would support Piaget's notion that a reduction in egocentrism is necessary for the development of an objective view of reality and would fit with the research literature investigating ToM impairment in individuals with psychosis (e.g. C. Frith, 1992).

No association was found between the tendency to state that it was impossible to think or dream about fictional entities and social desirability measures (although the effect sizes suggested this might be a fruitful line of investigation). Also worth noting is the finding that whilst people with a diagnosis of SO were no more likely to report experiencing dreams, they tended to provide more detailed and complex narratives than those in the LDO group. This may fit with the findings of Foulkes (1982, 1985) and the findings of Foulkes et al. (1990) that dream experiences become more complex as cognitive skills become more sophisticated.

The findings of these two studies suggest that some people with LD have a *realistic* (Piaget, 1927, cited in Laurendeau & Pinard, 1963) understanding of dreams. Two of the misconceptions apparent in the participants with LD's conceptualisation of dreams (e.g. that dreams can be perceptually public and physical entities) were not found in Woolley and Wellman's (1992) study of three to four year old children. This suggests that some individuals with LD may not be simply functioning at an earlier developmental stage (unless it is earlier than three years of age). They may have unique ways of attempting to understand the mind. However, the conceptualisation of dreams as perceptually public and physical entities was found in children in earlier studies using different methodology (e.g. Laurendeau & Pinard, 1963; Piaget, 1927, cited in Laurendeau & Pinard, 1963). What is clear is that a proportion of adults with LD appear to have a much more *realistic* view of the world than the children in Woolley and Wellman's (1992) research.

An area relevant for the ability to distinguish internal and external events, with its basis in developmental theory, is ToM. ToM has been found to be associated with disorders in which individuals have difficulties determining the source of experiences based on perceptual information e.g. psychosis and ASD. Given the difficulties demonstrated by some individuals with LD in the conceptualisation of dreams as private, non-physical entities, it is important to examine this ability in individuals with LD.

1.6.10 Development of ToM in individuals with LD

Individuals with LD have generally formed the comparison groups in research into ToM (e.g. researching ToM as core deficit of ASD). Happé (1995) conducted an empirical summary of ToM abilities of participants with ASD, LD and normal development (70 ASD, 34 LD and 70 normally developing children). She found a significantly lower pass rate on false belief tasks in the ASD group (20 per cent) compared with the LD (58 per cent) and normally developing (56 per cent) groups, which were comparable. ToM ability was related to verbal mental age (VMA) in the ASD and normal group, but not in the LD group.

Other research, however, has demonstrated significant group differences between individuals with LD and normally developing children (e.g. Benson, Abbeduto, Short, Bibler-Nuccio & Maas, 1993; Yirmiya, Solomonica-Levi & Shulman, 1996; Yirmiya, Solomonica-Levi, Shulman & Pliowsky, 1996; Zelazo, Burack, Benedetto & Frye, 1996). A meta-analysis (including individuals with ASD, LD and normally developing individuals), using 40 research papers, by Yirmiya et al. (1998) suggested additional mediating factors for ToM ability in individuals with LD. The possible importance of specific aetiologies and diagnoses of the individuals with LD were highlighted.

Research, therefore, suggests that individuals with LD are not significantly better at passing ToM tasks than individuals with ASD, but rather that individuals with Down syndrome (who have often formed the comparison groups e.g. Baron-Cohen et al., 1995) have significant skills in terms of ToM ability. This is believed to be due to greater empathic abilities and social skills (e.g. Beeghly, Weiss-Perry & Chicchetti, 1990; Kasari, Mundy, Yirmiya & Sigman, 1990). This hypothesis was examined in the meta-analysis (Yirmiya et al., 1988) and found that individuals with ASD performed significantly less well than individuals with LD, regardless of aetiology (with a large effect size found). However, the difference was greater (in terms of effect size) when individuals with ASD were compared with individuals with

Down syndrome only. Individuals with Down syndrome demonstrated better ToM ability than individuals with LD of unspecified aetiology.

In relation to normally developing individuals, however, all individuals with LD performed significantly less well (the effect size was considered to be medium). ToM abilities were associated with performance and VMA in individuals with LD, which seems to reflect an association with cognitive abilities. They concluded that individuals with ASD and individuals with LD demonstrated impaired ToM when compared with normally developing children, but that the impairment is more severe in those with ASD. Individuals who fail ToM tasks would be expected to have difficulty understanding, or introspecting about, what comes from within themselves and what is external, as experienced by everybody (e.g. Hulburt et al., 1994).

1.7 Implications of ability to conceptualise dreams

The second part of this study concerns the implications of the ability to conceptualise dreams. Stenfert Kroese et al. (1998) suggested that the implications of confusion regarding the nature of dreams were profound and that people who believed that dreams were actual events may experience an increase in negative emotions due to the belief that what happened in their dreams was real. This fits with the evidence found by Belicki (1992), who studied the relationships between nightmares, psychopathology and cognitive style. Nightmare distress was found to relate to obsessive preoccupation with memories of the nightmare, which may be more likely if an individual believed it to have been an actual event. Distress was related to dysfunctional beliefs about the nightmare, which may include believing it was real.

Distress was also related to dysfunctional beliefs about ability to cope with the experience. Perceived coping ability could be hypothesised to be lower if the experience was actually deemed to have happened. Nightmare distress was also found to be associated with psychopathology (Belicki, 1992). This

may have implications for the diagnosis of psychosis in individuals with LD, as confusion regarding dreams may cause people to respond in ways that are likely to be interpreted as signs of psychopathology.

However, it is unclear from the research in conceptualisation of dreams in LD to what extent individuals believed dreams to be real. Piaget has been interpreted as having two viewpoints on the degree of realism in relation to dreams (e.g. Wellman & Estes, 1986). The belief of some individuals that dreams were perceptually public and physical (e.g. they could be acted upon) (Edwards, 1999; Stenfert Kroese et al., 1998) could be taken to reflect Piaget's 'stronger' version of realism e.g. whereby individuals would not be able to distinguish between the dream entity and the actual corresponding real entity.

The strength of realism may have implications for the impact of the ability to conceptualise dreams. If an individual believes the event to have actually happened then this may result in the reactions suggested by Belicki (1992). However, if the individual simply views the dream as an image, the impact on the individual may not be as extreme. Also, as discussed in the review of the child development literature, this inability to source monitor may not be as disturbing to individuals with LD, who never had this skill, as it is to individuals with psychosis who used to have this ability.

The implications of this may be in the reactions of staff, or health professionals, to the reports of individuals with LD. For example, comments such as 'I saw two monsters fighting under my bed' could be interpreted by professionals as evidence of delusional ideation and visual hallucinations, therefore, as suggesting a psychotic disorder (Edwards, 1999). Given the findings of Kemp et al. (2003) that independent raters sometimes could not distinguish diary descriptions of dreams from actual experience in adults without LD, this would suggest the potential for confusion of staff working with individuals with LD, especially given the inherent communication difficulties.

Although an individual may know that the event was an image, the perception that it occurred in front of the individual and that others should have been able to see it, might result in individuals responding emotionally, or insisting that others should know about the experience, which again could be interpreted as signs of psychopathology. Glick and Zigler's (1995) research demonstrating that even individuals with mild LD demonstrate emotional distress through behaviour may suggest that disturbance relating to dreams may be displayed through challenging behaviour.

1.7.1 Psychological difficulties in people with LD

In order to examine the possibility of mistaken diagnosis of psychosis in greater detail it is necessary to examine the literature on the diagnosis, and experience of, psychological difficulties in individuals with LD. As in people without LD, mental health problems can result in serious consequences for people with LD (Caine & Hatton, 1998; Szymanski, 1994).

1.7.2 Epidemiological studies

Epidemiological studies of psychiatric conditions in the LD population have varied enormously (Fraser & Nolan, 1994), depending upon methodological considerations e.g. definitions of disorders, methods of identifying cases and characteristics of the population studies (Borthwick-Duffy, 1994; Campbell & Malone, 1991). Most estimates of prevalence of psychiatric disorders such as psychoses and personality disorder range from 8-15 per cent, if anxiety disorders and depression are included the estimates rise to over 50 per cent (Fraser & Nolan, 1994). Shoumitro, Thomas and Bright (2001) carried out a study with a community based population aged between 16 and 64 years. They found 14.4 per cent had a psychiatric diagnosis according to ICD criteria; 4.4 per cent had a diagnosis of schizophrenia, 2.2 per cent depressive disorder, 2.2 per cent generalised anxiety disorder, 4.4 per cent phobic disorder and 1 per cent had a diagnosis of delusional disorder.

Taylor, Hatton, Dixon and Douglas (2004) completed the Psychiatric Assessment Schedule for Adults with Developmental Disability (PAS-ADD, Moss et al., 1998) checklist on 1155 adults with LD living in community,

residential care and hospital settings. This found an overall prevalence of 20.1 per cent of mental health problems; with affective/neurotic, organic and psychotic disorders 14 per cent, 3.9 per cent and 10.2 per cent respectively (lower than Fraser & Nolan's, 1994 estimate). Significant differences were found in rates of particular disorders across gender, age and residence type, which may explain the substantially lower prevalence of 'schizophrenia' in the previous study using a community sample only. Taylor et al. (2004) state that rates of psychiatric disorders in their study were consistent with previous studies of people with LD using over-inclusive screening instruments.

1.7.3 Diagnostic issues

It is difficult to establish conclusions regarding the prevalence of psychiatric disorders without consensus about diagnostic categories and validation of diagnostic criteria (Weisblatt, 1994). This is not a dissimilar problem to that found in the study of psychiatric disorders, particular the psychoses, in the general population (e.g. Bentall, 2003). However, whilst debate concerning the efficacy and validity of diagnoses such as 'schizophrenia' continue in populations of individuals without LD, there are standardised classification systems e.g. DSM-IV (APA, 1994) and the ICD-10 (WHO, 1993) available, which have increased reliability of diagnoses.

The picture in the LD population remains more problematic. Sturmey, Reed and Corbett (1991) reported that no reliable and valid instrument to assess 'schizophrenia' could be found for the LD population. Moss et al. (1998) concluded that the PAS-ADD checklist (developed in the UK for people with LD) was a satisfactory measure to assess mental health problems in this population. However, concerns have been raised regarding to its psychometric properties e.g. poor internal consistency for psychosis and poor inter-rater reliability (Stenfert Kroese, Dewhurst & Holmes, 2001).

Caine and Hatton (1998) identified three factors making the application of standardised psychiatric diagnosis to people with LD problematic. These were as follows:

- often an insufficient range of symptoms to meet standard criteria for a diagnosis of 'schizophrenia' are displayed (Moss, Prosser & Goldberg, 1996);
- mental health problems may be expressed differently e.g. through behavioural problems (Moss, 1995); and
- potential difficulties in the accurate communication of experiences or mental state (Moss, 1995; Sturmey et al., 1991).

Stenfert Kroese et al. (2001) have questioned the appropriateness of applying any kind of psychiatric diagnostic model to the psychological problems of people with LD. They referred to difficulties in providing accurate self reports; difficulties of practitioners in understanding idiosyncratic methods of expression; possible acquiescence due to the perceived power imbalance in the clinical interview (e.g. Sigelman, Budd, Winer, Schoenrock & Martin, 1982); the likelihood of recency effects in repetition of parts of the clinical interview (e.g. Glanzer & Cunitz, 1966); and possible difficulties in ability to comprehend, attend to, appropriately formulate and express responses to the many questions asked during a diagnostic interview.

Third party reports have been used to compensate for these difficulties. However, these frequently differ from self reports e.g. Moss, Prosser, Ibbotson and Goldberg (1996) found significant differences in the achievement of diagnostic criteria for psychiatric disorder when interviews were held with individuals with LD as opposed to interviews with carers.

1.7.4 The diagnosis of psychosis in people with LD

As a result of difficulties in the diagnostic process, the possibility of over diagnosis, or mistaken diagnosis of 'schizophrenia' in people with LD has been raised (e.g. Slade & Bentall, 1988; Weisblatt, 1994). This is the opposite of the tendency for 'diagnostic overshadowing' that is often referred to (the tendency to overlook symptoms of mental health problems and attribute them to being part of having a learning disability, e.g. Mason & Scior, 2004; Reiss, Levitan & Szyszko, 1982; Reiss & Szyszko, 1983).

There are difficulties in diagnosing psychotic symptoms in individuals with LD, as a result of the inherent difficulties in attempting to diagnose 'breaks' in reality testing in individuals who have difficulty communicating their view of reality (Weisblatt, 1994). Similarly, 'it would seem likely that verbally unsophisticated [sic] people are sometimes mistakenly diagnosed as hallucinating' (Slade & Bentall, p.94). Stenfort Kroese et al. (2001) discussed a clinical case where a man with LD was believed to be suffering from psychosis after he complained that he had 'bats flying around inside him'. It was later identified that he was trying to explain that he had 'butterflies in his stomach'. People who have difficulties with, or who lack experience of, understanding and discussing abstract concepts may describe these phenomena using idiosyncratic, external explanations. These are prone to misinterpretation by health professionals.

Often a diagnosis of psychosis is made in individuals with limited speech, or with no speech, on the basis of inadequate data, whereas a diagnosis of psychosis should be made with caution and only in the presence of definitive signs (Weisblatt, 1994).

Slade and Bentall (1988) refer to the additional complicating factor that 'equally it is possible that verbally unsophisticated [sic] people are vulnerable to believing their imaginings are real' (p.94). This is supported by the findings of studies on the conceptualisation of dreams (e.g. Edwards, 1999; Stenfort Kroese et al., 1998) and regarding the concept of death in people with LD (Harper & Wadsworth, 1993; McEvoy, 1989). These highlight the importance of not assuming that the individual with LD has the same view of reality as the clinician.

In the case of dreams some individuals with LD clearly believe that others would see, share and be able to touch their dreams. This would seem to imply that when discussing such phenomena, individuals would be likely to expect that others may already know about them, or have experienced them themselves. This conviction could be taken to imply a strong delusional

belief. In people without LD, an inappropriate belief is not diagnosed as psychotic if it results from a lack of knowledge (Weisblatt, 1994) or is culturally normative (see Bentall, 2003). Bicknell (1994) referred to the possibility that individuals with LD may sometimes fill the gaps in their social knowledge with paranoid fantasy. She described a clinical case where a man, who lacked an understanding of banking, believed that when he gave his money to staff the head of the residential service used it for himself. This resulted in anger and disruptive behaviour, which it was possible to diffuse with repeated explanations. However, the risk is that this interpretation of reality could have been considered psychotic and could have resulted in the prescription of medication (Bicknell, 1994).

1.7.5 Psychopathology and behaviour problems in people with LD

A related issue in the potential for misdiagnosis of psychosis in individuals with LD is the potential for emotional distress to be displayed in behavioural symptoms, turned outwards towards others (e.g. Glick and Zigler, 1995).

There is confusion regarding the conditions under which behavioural problems should be considered to indicate a mental illness (Caine & Hatton, 1998; Moss, 1995). Theoretically, some aggressive behaviour in people with LD will be associated with psychiatric disorder (Reiss, 1992, 1994; Reiss & Rojahn, 1992, cited in Reiss, 1994). In particular, aggression may be associated with depression, paranoid ideas, personality disorder or psychosis (Reiss, 1994). Rojahn, Matson, Naglieri and Mayville (2004) found individuals with self-injurious, stereotyped or aggressive/destructive behaviour had generally higher psychopathology scores than individuals without. The presence of behaviour problems increased the likelihood of almost all psychiatric conditions by up to three-fold.

However, behavioural disturbances are frequently mislabelled as symptoms of psychosis. This highlights the importance of consideration of the causes of such behaviour and recognition of the possibility of affective symptoms (Weisblatt, 1994). Reiss & Rojahn (1992, cited in Reiss, 1994) investigated

the relationship between aggression and depression in 528 adults, adolescents and children with LD, finding that criterion levels of depression were met in four times as many aggressive as non-aggressive problems. Levitas and French Gilson (1994) suggested that when the affective signs of distress are ignored, misread or misattributed, aggression, destruction or self-injury may result. They postulated that this occurred due to the lack of incomplete internalisation of self-regulation in some individuals with LD. Negative life events (such as sudden loss, or the need to adapt to novelty) may result in catastrophic reactions, which risk being mistaken for psychosis and may result in the prescription of psychotropic medication (Levitas & French Gilson, 1994).

1.7.6 Medication use

The use of psychotropic medication amongst the LD population is a widespread phenomenon and they account for one of the most medicated groups in society (Nottestad & Linaker, 2003). However, a diagnosis of psychosis is not required for a prescription to be given. A substantial number of individuals are taking medications that appear inappropriate for their diagnosis, the main reason seemingly for the treatment of challenging behaviour (e.g. Fleming, Caine, Ahmed & Smith, 1996; Kiernan, Reeves & Alborz, 1995; Nottestad & Linaker, 2003).

1.7.7 Conclusions from LD research

Dreams seem to be phenomena of particular significance when considering whether the self-reports of individuals with LD may result in a mistaken diagnosis of psychosis. It seems likely that the description of a dream event by an individual with limited communication skills could easily be misinterpreted by health professionals as the description of a psychotic experience. It would also seem likely that individuals who have particular difficulties in differentiating these experiences from reality (e.g. Edwards, 1999; Stenfert Kroese et al., 1998) may become distressed by them (e.g. Turner & Graffam, 1987) and that clinicians may misinterpret this distress (which may be displayed behaviourally e.g. Glick & Zigler, 1995) as further evidence of psychopathology (e.g. Belicki, 1992) and prescribe medication.

1.8 Rationale for research

The current study is in two parts:

1. Research evidence suggests that some people with LD have difficulties with the conceptualisation of dreams as perceptually private, non-physical, individuated entities (Edwards, 1999; Stenfert-Kroese et al., 1998). The initial study by Stenfert Kroese et al. (1998) did not attempt to identify the cognitive correlates of this ability, whilst the subsequent under-powered study by Edwards (1999) only examined the association between conceptualisation of dreams and receptive language ability. This study aims to extend this research to investigate the association of receptive language ability and first order ToM skills as possible cognitive correlates.
2. Edwards (1999) compared dream conceptualisation in people with LD to that of individuals with schizophrenia (without LD) and a dual diagnosis group. She also examined the relationship between accurate conceptualisation of dreams and nightmare distress, in view of the possible links with psychopathology (e.g. Belicki, 1992). This study investigates the possible impact of the ability to accurately conceptualise dream experiences on the life experiences of people with LD, with particular reference to the likelihood of obtaining a diagnosis of psychosis, of being prescribed psychotropic medication or of developing 'challenging behaviour' (e.g. Glick and Zigler, 1995).

1.8.1 Hypotheses

1. (a) Participants will produce a significantly greater total percentage of correct responses to questions relating to real objects and objects seen in photographs as compared to objects in dreams.
(b) Participants will produce a significantly greater percentage of correct responses to questions relating to the perceptually public/private nature of real objects and objects seen in photographs as compared to objects in dreams.

- (c) Participants will produce a significantly greater percentage of correct responses to questions relating to the physical/non-physical nature of real objects and objects in photographs as compared to objects in dreams.
2. Participants will produce a significantly greater percentage of responses suggesting that dreams are entities that are shared with others than responses suggesting that dreams are individuated entities.
 3. (a) Participants will give a significantly greater percentage of correct responses to questions relating to real objects as opposed to fictional objects.
(b) Participants will give a significantly greater percentage of correct responses to questions relating to the ability to dream about or think about real as opposed to fictional objects.

The percentages of correct responses in hypotheses 1-3 are measured by the closed-question section of the dream interview schedule (Stenfert Kroese et al., 1998).

4. (a) Participants who pass the modified version of the Sally-Ann task (Wimmer & Perner, 1983) will answer a greater total percentage of questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who fail the modified version of the Sally-Ann task.
(b) Participants who pass the modified version of the Sally-Ann task will answer a greater percentage of questions correctly about the perceptually private nature of dreams (as measured by the closed-question section of the dream interview schedule), than participants who fail the modified version of the Sally-Ann task.
(c) Participants who pass the modified version of the Sally-Ann task will answer a greater percentage of questions correctly about the non-physical nature of dreams (as measured by the closed-question section

of the dream interview schedule), than participants who fail the modified version of the Sally-Ann task.

(d) Participants who pass the modified version of the Sally-Ann task will answer a greater percentage of questions correctly about the individuated nature of dreams (as measured by the closed-question section of the dream interview schedule), than participants who fail the modified version of the Sally-Ann task.

(e) Participants who pass the modified version of the Sally-Ann task will answer a greater percentage of questions correctly about the potentially fictional nature of dreams (as measured by the closed-question section of the dream interview schedule), than participants who fail the modified version of the Sally-Ann task.

5. Participants who have received a diagnosis of psychosis (as determined by their background information) will answer fewer questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who have not received a diagnosis of psychosis.
6. Participants who receive psychotropic medication (as determined by their background information) will answer fewer questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who do not receive psychotropic medication.
7. Participants who display challenging behaviour (as measured by a score of above 7 on the LD Casemix Scale, Pendaries, 1997) will answer fewer questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who do not display challenging behaviour (as measured by a score of below 7 on the LD Casemix Scale).
8. (a) There will be a significant positive correlation between receptive language ability (as measured by the British Picture Vocabulary Scale II,

Dunn, Dunn, Whetton & Burley, 1997) and the total percentage of questions answered correctly regarding dreams (as measured by the closed-question section of the dream interview schedule).

(b) There will be a significant positive correlation between receptive language ability (as measured by the British Picture Vocabulary Scale II) and the percentage of questions answered correctly regarding the perceptually private nature dreams (as measured by the closed-question section of the dream interview schedule).

(c) There will be a significant positive correlation between receptive language ability (as measured by the British Picture Vocabulary Scale II) and the percentage of questions answered correctly regarding the non-physical nature dreams (as measured by the closed-question section of the dream interview schedule).

(d) There will be a significant positive correlation between receptive language ability (as measured by the British Picture Vocabulary Scale II) and the percentage of questions answered correctly regarding the individuated nature dreams (as measured by the closed-question section of the dream interview schedule).

(e) There will be a significant positive correlation between receptive language ability (as measured by the British Picture Vocabulary Scale II) and the percentage of questions answered correctly regarding the potentially fictional nature dreams (as measured by the closed-question section of the dream interview schedule).

CHAPTER TWO

METHOD

2. METHOD

2.1 Overview of chapter 2

This chapter provides details of the experimental design employed in the study; including the recruitment procedure, measures and experimental procedures. The study was designed to be both accessible and non-threatening to individuals with LD. There was careful consideration of the ethical issues involved when conducting research with individuals with LD and these are discussed in relation to gaining ethical approval and obtaining consent.

2.2 Study design

A 'within groups' design was used to assess whether adults with LD could successfully conceptualise objects in dreams as perceptually private, non-physical, potentially fictional entities that are individual to the dreamer. The ability to successfully conceptualise real (physical) objects and objects in photographs was also assessed and compared. The dependent variable was the ability to conceptualise dreams. Receptive language ability (as measured by the British Picture Vocabulary Scale II, BPVS-II; Dunn, Dunn, Whetton & Burley, 1997) and ToM ability (as measured by the modified version of the Sally-Ann test, Wimmer & Perner, 1983) were the independent variables. Associations were examined between the ability to conceptualise dreams and diagnosis of psychosis, prescription of psychotropic medication and severity of challenging behaviour (as measured by the LD Casemix Scale, Pendaries, 1997).

2.2.1 Sample size and power calculation

With one participant group a target sample size of 52 participants was identified prior to the study. Using power = 0.8, it was calculated that an effect size of 0.20 could be detected if 52 participants were recruited. The effect size was determined with reference to the previous study of a similar design (Stenfert Kroese et al., 1998).

2.3 Participants

2.3.1 Inclusion criteria

All participants were required to:

- be over the age of 18 years;
- receive LD services; and
- obtain an age equivalent of four years on the BPVS-II, as required receptive language ability (if the confidence intervals included four years individuals were included in the study).

In Woolley and Wellman's (1992) research, children of four years of age could comprehend the questions and respond appropriately. Whilst not inferring that a BPVS-II age equivalent of four years suggested that participants were functioning at this 'MA', measures of receptive language ability have been found to correlate positively with measures of general intelligence (e.g. Elliot, 1983). It could be assumed that participants with receptive language abilities of this level would have been able to understand and attempt to answer the questions.

2.3.2 Exclusion criteria

Participants were excluded if they had:

- insufficient receptive language ability to be able to understand the interview questions (an age equivalent of under four years on the BPVS-II);
- visual impairment and/or history of head injury, as both have been associated with a loss of dreaming (see Farah, 1984 for a review); or
- limited, or no verbal communication (for example, sole reliance on gestural or pictorial communication systems).

With regards to visual impairment and head injury, additional neurological damage could have affected the interpretation of results. For example,

whether lack of dream experience or difficulty conceptualising dreams was associated with LD or additional neurological impairments.

2.3.3 Recruitment methods

All participants were recruited through attendance at three social service run day centres in and around a north west satellite town. The day services served ethnically diverse areas and were representative of the local population, serving individuals with LD across the range of severity, e.g. from mild to severe. Two additional services were approached whose populations were mainly made up of individuals with ASD, both declined to participate. One was suffering managerial and organisational difficulties and the other attempted to identify potential participants, but unfortunately the individuals with ASD did not comprehend the term dream or could not identify any such experience and, therefore, did not see any reason for taking part.

The following recruitment procedures were used:

1. Day centres/services were approached regarding their willingness to facilitate the research. Meetings took place with the managers of the services, where the aims and procedures of the research were explained. A copy of the information sheet given to services is presented in appendix 1. Once services had agreed to take part managers either explained the research to staff, or meetings were arranged where the researcher could do this.
2. Initial contact with potential participants was made in two ways:
 - a. by a member of the service staff explaining the study and obtaining agreement from individuals for the researcher to approach them; or
 - b. by the researcher talking to groups at services and individuals identifying themselves as interested. A copy of the information sheet given to participants is presented in appendix 2.
3. Once individuals had been identified as potential participants they were then seen individually in order for the study to be explained and for the consent process to begin. The procedure was as follows:

- a. Each individual received a verbal explanation of the information presented on the participant information sheet. The information was presented with the use of simple words and sentences and was paced to allow individuals enough time to formulate their thoughts and communicative responses. These procedures were in line with good practice in LD research (e.g. Dye, 2001).
 - b. Individuals were then asked to indicate whether they were interested, but were assured that they would be given at least a week to consider taking part in the study. They were encouraged to talk to staff and relatives, if they wished to, before signing a consent form (see appendix 3).
 - c. If interest was indicated, permission was asked to inform their families/carers of the research. If this was given letters (appendix 4) and information sheets (appendix 5) were distributed. Some individuals lived alone and others indicated that they did not wish their families to be informed. However, as all individuals were approached through services there was always someone who was aware that the individual was taking part. Families/cares were not asked for consent on behalf of individuals. Information was provided in the interest of transparency with stakeholders in the care of individuals with LD.
4. At the subsequent research meeting (at least a week later) individual's were asked whether they remained interested and their understanding of the research was re-examined by a number of simple questions. Written consent was then obtained (see section 2.7).

2.3.4 Research sample

In total 73 individuals indicated interest in the study. Of these:

- five had decided they did not wish to take part at the second meeting; and
- two were consistently absent from day services when research visits were arranged.

Of the remaining 66 interested individuals, four did not fulfil the initial inclusion criteria. The reasons for this were as follows:

- three obtained an age-equivalent score of under four years on the BPVS-II; and
- for one, although the BPVS-II confidence intervals included an age equivalent of four years, the interview had to be stopped due to incomprehension.

In total, therefore, 62 individuals met initial inclusion criteria for the study.

2.4 Measures Used

2.4.1 Dream Interview Schedule (Stenfert Kroese et al., 1998)

The interview schedule was originally designed and used by Stenfert Kroese et al. (1998) in their research 'The Conceptualisation of Dreams by People with Intellectual Disabilities' and has also been used by Edwards (1999) in her research on 'The Conceptualisation of Dreams in people with Intellectual Disabilities and Schizophrenia'. The interview consisted of two sections. First a set of open-ended questions and second a set of closed questions.

The open-ended questions required participants to report the content of their dreams and probed their understanding of the nature of dreams. There were three open-ended questions, as follows:

- a. 'Do you have dreams?' Prompts of 'tell me a bit about your dreams' or 'can you give me an example?' were used;
- b. 'What is a dream?' Prompts of 'When do they happen?', 'Where do they happen?', 'How do they happen?'; and
- c. 'What do dreams make you feel like?', with prompts of 'happy, sad, scared, upset' etc.

The open interview schedule is presented in appendix 6.

There were 44 closed questions, which were asked using the verbal presentation of eight short stories. The questions assessed participants' conceptualisation of physical objects, objects in photographs and objects in dreams according to four dimensions:

- a. perceptually public (i.e. could be seen by more than one person) versus perceptually private (i.e. could only be seen by one person);
- b. physical (i.e. object was physically present, something you could touch) versus non-physical (i.e. object was not physically present, could not be touched);
- c. shared (i.e. whether two people could have the dream experience at the same time) versus individuated (i.e. only one person could have the dream experience at that time); and
- d. potentially fictional. This used a series of questions describing real objects (e.g. a red tomato) and fictional objects (e.g. a flying cow), which asked participants whether they had seen these entities, whether they existed and whether they could be thought or dreamt about.

All questions were repeated using different scenarios to provide a measure of reliability. The closed interview schedule is presented in appendix 7.

Stenfert Kroese et al. (1998) had adapted the interview schedule, which they used with 54 adults with mild-moderate LD, from a paradigm originally developed by Woolley and Wellman (1992) to investigate children's developing conceptualisation of dreams. Edwards (1999) also used this paradigm in her study with adults with 'schizophrenia' only, adults with LD only and adults with a dual diagnosis. The descriptions used by Woolley and Wellman (1992) had been adapted by Stenfert Kroese et al. (1998) to be more age and culturally appropriate.

2.4.2 British Picture Vocabulary Scale II (BPVS-II, Dunn et al., 1997)

The BPVS-II is a standardised, wide-range test of vocabulary (hearing) for Standard English. It can be viewed as a test of receptive language ability, verbal ability or verbal intelligence. Measures of vocabulary correlate positively with measures of general intelligence (e.g. Elliott, 1983) and have been among the most important contributors to comprehensive tests of intelligence (e.g. Elliott, 1983, 1990). The BPVS-II has sound psychometric properties of reliability and validity (Dunn et al., 1997). However, it is

important to consider that cultural factors, such as language deprivation or stimulation (which may be of particular importance to people with LD) may result in significant changes to vocabulary score (Dunn et al., 1997).

The BPVS-II is an updated revision of the earlier British Picture Vocabulary Scale (BPVS, Dunn, Dunn & Whetton, 1982), which has been used widely in both clinical practice and research with individuals with LD and ASD. Each item consists of four separate illustrations to one page. The researcher verbally presents the target word and the participant is asked to point to the picture which best illustrates the word. Items become progressively more difficult throughout the test. The scale is of particular value with individuals with LD, as it does not require the ability to read or write. It is noted to be useful in research as the wide-range nature of the test reduces the possibility of floor or ceiling effects (Dunn et al., 1997). Assessment is stopped after eight failures in a particular section, meaning that individuals do not become anxious regarding failure.

Some studies have compared the BPVS raw scores of adult participants with LD with norms given for children aged 16 years and 2 months, to obtain standardised scores and percentiles (Arscott, Dagnan & Stenfort Kroese, 1998; Dye, 2001). With the BPVS-II, as norms are provided for children up to the age of 15 years and 8 months only this is not possible.

The BPVS-II was used in the current research to identify adequate verbal understanding to enable participants to respond to the interview questions and also as a measure of receptive language ability. Raw scores were converted into age equivalent scores.

2.4.3 Learning Disability Casemix Scale (Pendaries, 1997)

LD Casemix Scale is a questionnaire completed by family, staff or carers to determine the severity of an individual's LD in terms of the ICD-10 criteria (see 1.5.1) of mild, moderate or severe LD. There are 14 disability variables on which individuals are rated, including physical, cognitive and adaptive skill variables. The Casemix scale also determines the severity of

challenging behaviour demonstrated by an individual, in terms of none, mild and severe. There are nine challenging behaviour variables.

The validity of the Casemix scale as measured against the Adaptive Behaviour Scale (ABS-RC2, Nihira, Leland & Lambert, 1993) is good for disability and fair for behaviour (Pendaries, 1997). Reliability is good (Pendaries, 1997). The Casemix scale was chosen over the ABS-RC2 as it is a much shorter measure, which would be less time consuming for staff to complete. The LD Casemix scale was used in the current study as a measure of challenging behaviour. The LD Casemix scale is presented in appendix 8.

2.4.4 Modified version of the Sally-Ann test (Wimmer & Perner, 1983)

The Sally-Ann task is a simple version of a false belief task devised by Wimmer and Perner (1983). It is used to explore first order ToM abilities (Premack & Woodruff, 1978), described as 'the ability to attribute independent mental states to oneself and others, in order to explain behaviour' (Happé, 1994, p.39). The task shows a pictorial story about two dolls, one called Sally and one called Ann. Sally has a basket and Ann has a box.

This research study used the same framework, but in order to make the test more age appropriate, changed the dolls to men (Mark and Ben), the basket to a box, the box to cupboards, and the marble to chocolate. The story was presented to participants both verbally and visually. The verbal description was as follows: 'In the story there are two men, one called Mark and one called Ben. Mark has a box and Ben has a cupboard. Mark has some chocolate. Mark places his chocolate in his box and then goes out. Whilst he is out Ben moves Mark's chocolate from the box and places it in his own cupboard. Ben then goes out. Mark comes back in'.

The test question asked, 'where will Mark look for his chocolate?' There was also a memory question, which asked 'where was the chocolate in the

beginning?’ and a reality question, which asked ‘where is the chocolate really?’ These two questions provided important information regarding the possible reasons for test failure. For example:

- if an individual answered all questions correctly (test, memory and reality) then they had passed the test and could be assumed to possess first order ToM ability;
- if an individual answered the test question incorrectly, but the reality and memory questions correctly, then they had failed the test and could be assumed to lack first order ToM ability; or
- if an individual answered either the reality or memory question incorrectly, then regardless of their response to the test question, their results could be assumed to be unreliable, suggesting incomprehension of the test.

The assessment has previously been applied to both the LD and ASD populations and has been found to be a reliable measure of first order ToM (e.g. Baron-Cohen et al., 1985; Leslie & U. Frith, 1988; Perner, Leslie & Leekam, 1989). The assessment was used in this study as a measure of participants’ first order ToM ability. The false belief test is presented in appendix 9.

2.4.5 Background information

Background information was gathered from participants and staff. The background information sheet is presented in appendix 10. This information consisted of gender, date of birth, ethnic origin, diagnosis, medication and any difficulties the participant felt they had with anger, anxiety or depression. This information identified conditions that may have resulted in an individual not meeting the inclusion criteria (e.g. history of head injury). The information was also used to explore the association between ability to accurately conceptualise dreams and the likelihood of receiving a diagnosis of psychosis or prescription of psychotropic medication. Participants’ reports of anger, anxiety or depression allowed for examination of their explanation of

these emotions and whether they shared any similarities with their dream experiences.

2.5 Ethical approval

An application for ethical approval for the study was sought through one of the Local Research Ethics Committees (LREC) within the regional Health Authority. A number of changes to the proposed research method were required to obtain ethical approval.

Initially the Block Design subtest of the Weschler Adult Intelligence Scale (WAIS III, Weschler, 1997) was to be administered to each participant. The ethics committee did not feel that the information to be gained justified the extra time that this would require with each participant. As the data obtained from this measure would not provide information that would be as clinically relevant to professionals working with individuals in this area, this measure was omitted.

The ethics committee expressed concern regarding the abilities of people with LD to give consent to the research. Whilst this is a concern when conducting research with such vulnerable groups, it is unacceptable both legally and morally to refuse an individual the opportunity to make decisions regarding their own lives (Glass, 1997; Law Commission, 1995). The law also states that no one else can give consent on behalf of another adult (British Medical Association, 1995). The researcher was clear that each individual would be required to understand what was being asked of them and would be able to withdraw their consent at any time. The process used to obtain consent is described in section 2.3.3. Letters were also sent to families/carers, where individuals agreed, so that the process was open and individuals could discuss participation in the research with them if they wished. Day centre staff were always aware of an individual's participation.

2.6 Issue of consent

Careful consideration was given to the issue of consent. Murphy and Clare (1997) consider the following as the necessary capacities an individual must possess in order to give consent:

- the ability to understand what is being asked of them, including the potential benefits, risks and consequences of not giving consent;
- the ability to retain the relevant information for long enough for an informed decision to be made; and
- the ability to make a decision free from coercion or pressure.

Capacity, however, is not a fixed concept and different levels of capacity may be considered sufficient depending on the nature of the issue for which consent is being sought. As the current study had a low risk of negative consequences arising as a result of participation, only a low degree of capacity was required for individuals to be considered able to give valid consent to participate.

2.7 Procedure

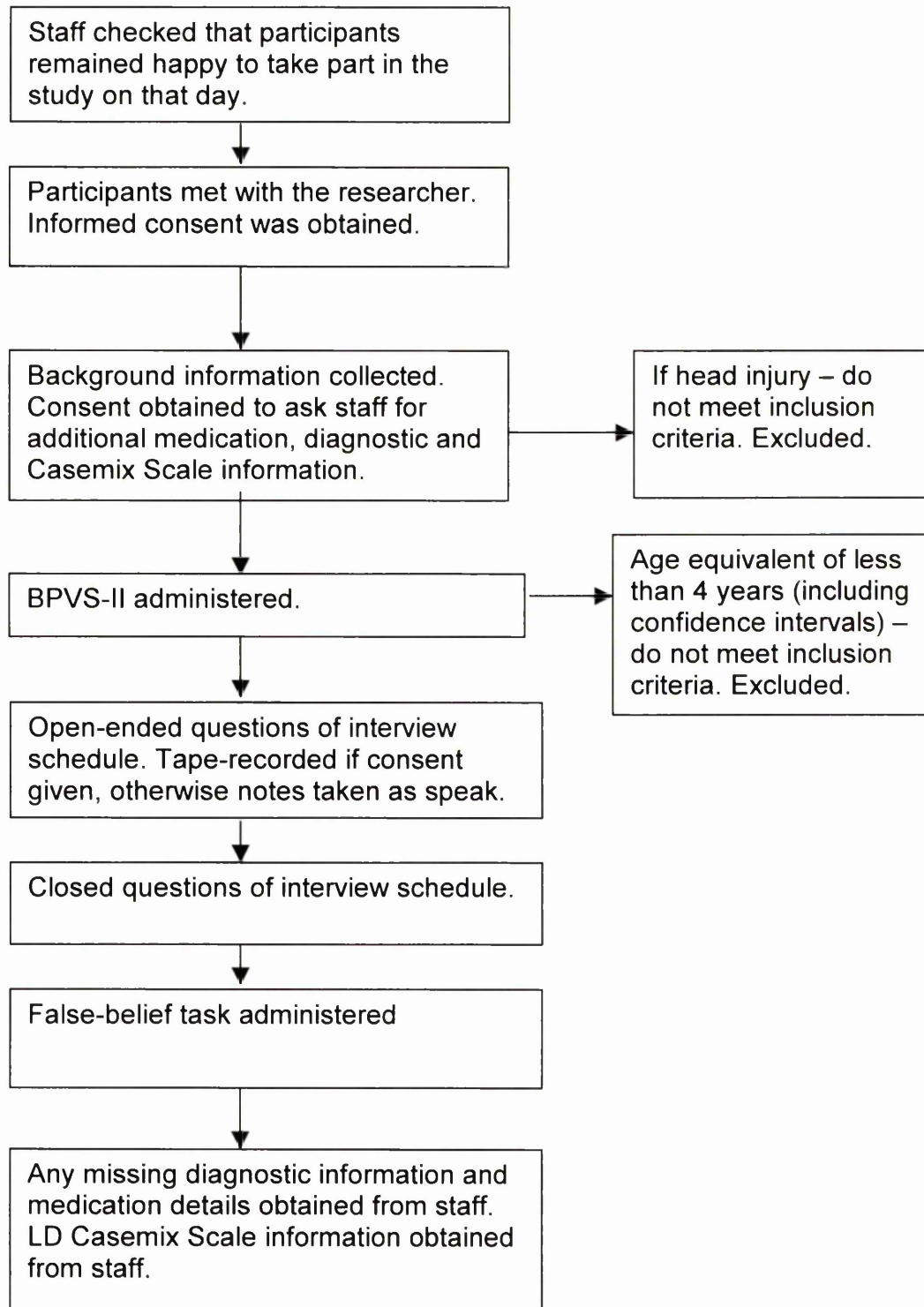
Individuals agreed to participate in the study on a voluntary basis, receiving no monetary payment. Participants incurred no expenses. All were seen at service locations on the days they normally attended. A private room was used for the interviews, ensuring that the information would be confidential and there would be no interruptions. Interviews were arranged at the convenience of participants. Service staff made sure that participants were willing to take part on the day of the study, prior to the interview commencing, in order to prevent the possibility of causing distress or disruption. Behavioural indicators of consent were used throughout the interviews and any signs of distress and discomfort would have been viewed as a participant withdrawing their consent to take part. However, this did not occur at any time.

Each participant's understanding of the study was reassessed, along with their understanding of the benefits and costs of taking part and written consent was obtained. The background information was initially obtained from participants and their consent for requesting any missing information from staff (e.g. medication details or diagnostic details of which they were unclear) was obtained. No participant refused this request.

The BPVS-II was then administered. This was followed by the open-ended questions of the dream interview schedule. Participants were reminded that this was to be tape-recorded and their consent for this was again sought. If an individual refused then this was accepted and their answers were written as they spoke. There were a number of specific prompts on the interview schedule for participants who said very little. For example standard prompts of 'Could you tell me anything else about that?' were given. The closed question section of the dream interview schedule was then administered. Lastly, the first order ToM test was administered. Participants took breaks as required.

The interview generally took between forty-five minutes and an hour, excluding breaks. The LD Casemix scale was then given to service staff to complete, consent for this had again been requested during the collection of background information (again no participant refused this). Figure 3 depicts the procedure.

Figure 3. Procedure



If participants failed to meet inclusion criteria it was explained to them that not all the assessments were required and that some of the later tasks may present them with some difficulties. Participants were not distressed by this information. Some participants remained keen to share their dream experiences and these were noted down (however, they have not been included in the analysis).

It had been agreed with services that had participants become distressed recounting dream experiences follow-up would be provided. This provision depended upon the nature of distress. For example, if participants disclosed a traumatic experience reflected within their dreams then further psychological support could be sought through the local psychology department (who was supporting the research). If participants were simply distressed by the research experience, the researcher would meet with them to discuss their concerns. Neither procedure was required.

2.8 Confidentiality

In order to maintain participant confidentiality, each participant was assigned an individual anonymised code. This code was used on all record forms for that person and in data stored on computer.

2.9 Data analysis

All data analysis was performed using computer package SPSS for Windows version 11.5.

2.10 Planned statistical analysis

In order to explore the hypothesis that participants would produce a significantly greater percentage of correct responses to questions relating to real objects and objects seen in photographs as compared to objects in dreams, the Friedman test was planned. This is a non-parametric test used to compare observations repeated on the same participants. It is the non-

parametric alternative to the repeated measures ANOVA when the assumption of normality or equality of variance is not met. As the test is non-parametric it makes no assumptions about the distribution of the data, which, based on previous studies (e.g. Edwards, 1999; Stenfert Kroese et al., 1998), was anticipated to be skewed.

CHAPTER THREE

RESULTS

3. RESULTS

3.1 Overview of Chapter 3

This chapter provides details of the statistical analyses conducted in order to explore the hypotheses of the study.

3.2 Distribution of data

The distributions of all data were checked for deviations from normality using measures of kurtosis [the degree of peak or flatness of the distribution, Dancey & Reidy, 2002] and skewness [the most often observed deviations from normality, Dancey & Reidy, 2002]. See Table 1 for the distribution of data for correct answers to questions regarding the perceptually public/private, non-physical/physical and individuated properties of real objects, objects in photographs and objects in dreams. Table 2 shows the distribution of data for correct answers to questions relating to the ability to think and dream about real or fictional objects and also for the BPVS-II age equivalent scores.

Table 1. Distribution of the data – dreams, photos and objects

Percentage of questions correct regarding:	Skewness	Kurtosis
Total about real Objects	-3.860 (standard error: 0.330)	15.943 (standard error: 0.650)
Total about objects in photographs	-1.952 (standard error: 0.330)	5.284 (standard error: 0.650)
Total about objects in dreams	-0.555 (standard error: 0.330)	-1.093 (standard error: 0.650)
Perceptually public – real objects	-3.112 (standard error: 0.330)	9.167 (standard error: 0.650)
Perceptually public – objects in Photographs	-6.658 (standard error: 0.330)	45.785 (standard error: 0.650)
Perceptually private – objects in dreams	-0.451 (standard error: 0.330)	-1.188 (standard error: 0.650)
Physical – real Objects	-4.944 (standard error: 0.330)	23.338 (standard error: 0.650)
Non-physical – objects in photographs	-1.097 (standard error: 0.330)	-0.422 (standard error: 0.650)
Non-physical – objects in dreams	-0.381 (standard error: 0.330)	-1.509 (standard error: 0.650)
Individuated – Dreams	0.142 (standard error: 0.330)	-1.070 (standard error: 0.650)

Table 2. Distribution of data – real and fictional objects and BPVS-II age equivalent scores

Percentage of questions correct regarding:	Skewness	Kurtosis
Real objects	-1.554 (standard error: 0.330)	1.485 (standard error: 0.650)
Fictional objects	0.145 (standard error: 0.330)	-1.197 (standard error: 0.650)
Dream about real Object	-1.141 (standard error: 0.330)	-0.235 (standard error: 0.650)
Dream about fictional object	0.115 (standard error: 0.330)	-1.698 (standard error: 0.650)
Think about real Object	-1.639 (standard error: 0.330)	1.755 (standard error: 0.650)
Think about fictional object	0.478 (standard error: 0.330)	-1.548 (standard error: 0.650)
BPVS age equivalent Score	0.544 (standard error: 0.330)	0.143 (standard error: 0.650)

Cut-offs of -1 to $+1$ are used to detect a normal distribution for both skewness and kurtosis. The results of the analysis revealed that the data was on the whole non-normally distributed. The data for the percentage of questions answered correctly regarding dreams in total, the perceptually private, non-physical and individuated properties of dreams and the non-physical properties of photographs more closely resembled the normal distribution, as did the questions regarding fictional objects. The BPVS-II age equivalent scores were normally distributed. As on the whole, as the results were non-normally distributed non-parametric tests were chosen as a conservative measure.

3.3 Participant characteristics

An original target sample size of 52 participants was set. This was achieved. Of the 62 participants who fulfilled the initial inclusion criteria (discussed in 2.3.1) ten were not included in the statistical analysis. The reasons for this were as follows:

- nine did not obtain a reliability score of 75 per cent across the closed-question section of the dream interview schedule. This was required in order to be included in the data analysis (in line with the study of Stenfert Kroese et al., 1998);
- one participant was excluded as they answered 'yes' to every question (in line with Woolley & Wellman's 1992 study).

The data from the 52 *reliable* participants was included in the data analysis.

3.3.1 Chronological age and receptive language ability

Receptive language ability was expressed as an age equivalent score converted from the raw score on the BPVS-II (Dunn et al., 1997). Mean chronological age and receptive language ability are presented in Table 3, together with standard deviations and ranges. Both were normally distributed.

Table 3. Age and receptive language ability of participants

	N=52
Chronological age (yrs.mths)	
Mean	34.5
(SD)	(9.2)
Range (min.-max.)	19 – 58
Receptive language ability (yrs.mths) (BPVS-II)	
Mean	8.99
(SD)	(3.3)
Range (min.-max.)	3.1 – 17

3.3.2 Gender, ethnicity and severity of LD

The frequencies of participants in terms of gender, ethnicity and severity of LD are presented in Table 4.

Table 4. Frequencies for gender, ethnicity and severity of LD

	Frequency	Percentage
Gender		
Female	22	42.3%
Male	30	57.7%
Ethnicity		
White British	50	96.2%
Black British	2	3.8%
Severity of LD (Casemix scale a)		
Mild	50	96.2%
Moderate	2	3.8%
Severe	0	0%

The number of males and females who took part in the study were similar. Of the 52 participants included in the data analysis, only two were of a minority ethnic origin. Both of these participants were Black British. One of the exclusion criteria was insufficient receptive language ability, resulting in inability to understand task instructions. This may have precluded some potential participants from being recruited and may have resulted in some bias in the sample.

According to the results of the LD Casemix Scale (Pendaries, 1997) the majority of participants (50) had mild LD. However, the range of scores found on the BPVS-II suggested a more varied range of ability in participants, at least in terms of receptive language ability.

3.3.3 Aetiology of LD

The frequencies of different aetiologies of LD within the sample are presented in Table 5.

Table 5. Frequencies of aetiology of LD

Aetiology of LD	Frequency	Percentage
Learning disability non-specified	40	76.9%
Downs syndrome	9	17.3%
Autistic Spectrum Disorder	2	3.8%
Fragile x syndrome	1	1.9%

The majority of participants (40) had LD of a non-specified aetiology. The study had hoped to recruit a 10 per cent sample of individuals with ASD, however, only managed to recruit two participants (3.8 per cent) (see section 2.3.3).

3.3.4 Epilepsy, psychosis and medication

The frequencies of participants with epilepsy, diagnosis of psychosis and prescription for psychotropic medication are presented in Table 6.

Table 6. Frequencies of epilepsy, diagnosis of psychosis and prescription for psychotropic medication for participants

	Frequency	Percentage
Diagnosis of epilepsy		
None	41	78.8%
Epilepsy	11	21.2%
Diagnosis of psychosis		
None	50	96.2%
Psychosis	2	3.8%
Psychotropic medication		
None	47	90.4%
Psychotropic	5	9.6%

3.3.5 Severity of challenging behaviour

The severity of challenging behaviour was measured by the LD Casemix Scale (Pendaries, 1997). The frequencies of the different severities of challenging behaviour found within the sample are presented in Table 7.

Table 7. Frequency of the different severities of challenging behaviour

Severity of Challenging Behaviour	Frequency	Percentage
Casemix scale b		
None	45	86.5%
Mild	7	13.5%
Severe	0	0%

3.4 Testing hypotheses

3.4.1 Hypothesis 1

(a) Participants will produce a significantly greater percentage of correct responses to questions relating to real objects and objects seen in photographs as compared to objects in dreams.

Hypothesis one proposed within-group differences between responses to questions relating to real objects, objects seen in photographs and objects in dreams.

3.4.1.1 Total percentage of correct responses

Before analysing each dimension individually a Friedman two-way analysis of variance (ANOVA) was carried out on the combined responses from the dimensions concerning real objects, objects in photographs and objects in dreams (Table 8 & Table 9). A Friedman two-way ANOVA was used due to the skewed nature of the data, particularly related to the total percentage of correct responses for real objects and objects seen in photographs (see Table 1). The correct responses took into account answers to questions across three of the dimensions:

- perceptually public/private;
- physical/non-physical; and
- Individuated/shared.

3.4.1.1.1 *Friedman two-way analysis of variance comparing total percentage of correct responses across the three groups of objects*

Table 8. Median and range of percentage of correct responses:

	Median	Range
Real objects	100%	33.3-100%
Objects in photographs	100%	16.67-100%
Objects in dreams	67.86%	0-100%

Table 9. Test statistics:

N	52
Chi-Square	68.405
d.f.	2
Asymp. Sig. (2-tailed)	0.000

The Friedman analysis demonstrated a highly significant difference between the total percentage of correct responses across the three groups when all dimensions were combined ($\chi^2=68.405$, $p<.001$). The differences were unlikely to be due to sampling error. The medians suggested that significantly fewer questions in total were answered correctly regarding objects in dreams.

Planned pair-wise comparisons using the Wilcoxon signed-ranks test revealed significant differences between all three groups. However, the greatest significance values were found between total percentage of correct responses for real objects compared to objects in dreams and objects in photographs compared to objects in dreams.

The median of the real objects condition (100 per cent) was higher than that of the objects in dreams condition (67.86 per cent). The Wilcoxon test statistic was converted into a z-score of -5.658 (Dancey & Reidy, 2002) with an associated 2-tailed probability of $<.001$. The median of the objects in photographs (100 per cent) was higher than that of the objects in dreams condition (67.86 per cent). The Wilcoxon test statistic was converted into a z-score of -5.613 with an associated 2-tailed probability of $<.001$. A

significance value of $p < .017$ was used due to the multiple comparisons made. It could therefore be concluded that significantly fewer questions were answered correctly about objects in dreams across all the dimensions combined and that such a difference was highly unlikely to have arisen by sampling error (Table 10).

Table 10. Wilcoxon tests comparing total percentage of correct responses in the three groups of objects

	Objects in Dreams vs. real objects	Objects in photographs vs. Real objects	Objects in photographs vs. Objects in Dreams
Z	-5.658a	-2.629a	-5.613a
Asymp. Sig (2-tailed)	0.000	0.009	0.000

a=based on positive ranks

b=based on negative ranks

3.4.1.2 *Perceptually public/private and physical/non-physical properties of real objects, objects in photographs and objects in dreams*

Figure 4 illustrates the response pattern that would be expected if participants had a perfect understanding of the perceptually public nature of real objects and objects seen in photographs, as opposed to the perceptually private nature of objects in dreams. Figure 4 also indicates the response pattern expected if participants had a perfect understanding of the physical/tangible nature of real objects in comparison with objects seen in photographs and objects in dreams. Stenfert Kroese et al.(1998) first described this pattern. Figure 5 illustrates the observed response pattern of the participants in the present study.

Figure 4. Response pattern illustrating a perfect understanding of the perceptually private/public and physical/non-physical properties of real objects, objects in photographs and objects in dreams

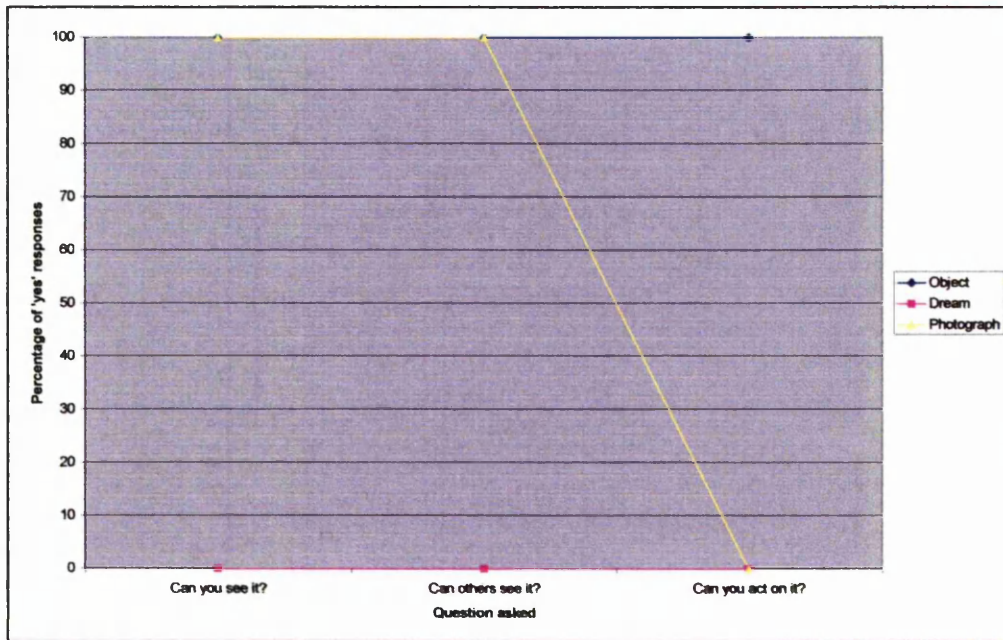
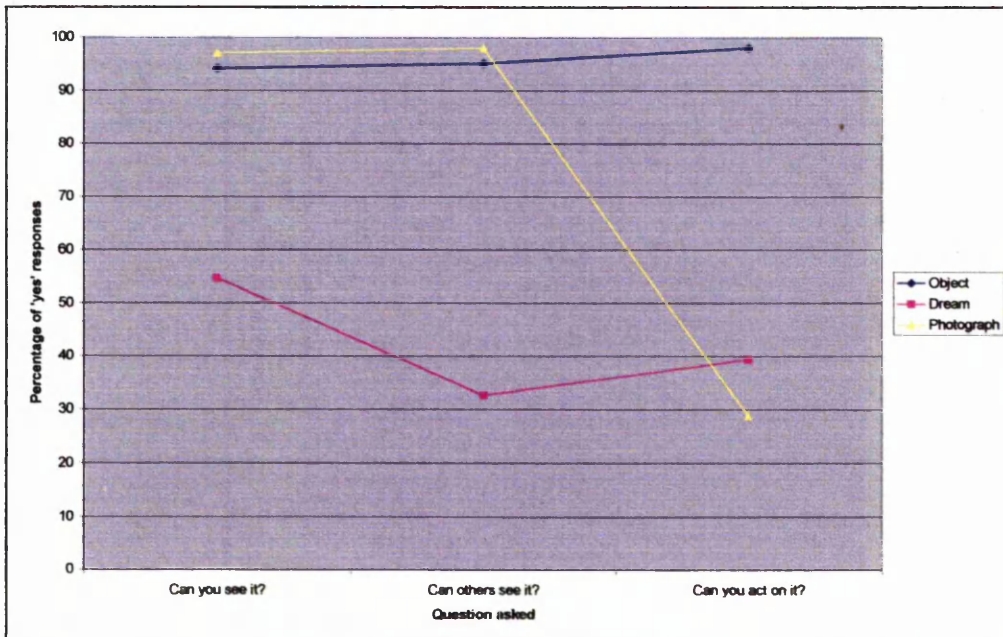


Figure 5. Observed response pattern for participants regarding the perceptually private/public and physical/non-physical properties of real objects, objects in photographs and objects in dreams



(b) Participants will produce a significantly greater percentage of correct responses to questions relating to the perceptually public/private real objects and objects seen in photographs as compared to objects in dreams.

As the data, in particular the perceptually public nature of photographs and objects was skewed (Table 1) the most appropriate statistical test was the Friedman two-way ANOVA. This was carried out on the data concerning the perceptually public/private properties of real objects, objects in photographs and objects in dreams (Table 11 and Table 12).

3.4.1.2.1 *Friedman two-way analysis of variance comparing percentage of correct responses regarding the perceptually public/private dimension across the three groups of objects*

Table 11. Median and range of percentage correct responses

	Median	Range
Real objects	100%	25-100%
Objects in photographs	100%	0-100%
Objects in dreams	66.67%	0-100%

Table 12. Test statistics

N	52
Chi-Square	51.209
d.f.	2
Asymp. Sig. (2-tailed)	0.000

The Friedman analysis demonstrated a highly significant difference regarding the percentage of correct responses on the perceptually public/private dimension across the three groups of objects ($\chi^2=51.209$, $p<.001$). The differences found were unlikely to be due to sampling error. The medians suggested that fewer questions were answered correctly about objects in dreams, compared to real objects and objects in photographs.

Planned pair-wise comparisons using the Wilcoxon signed-ranks test revealed significant differences between two of the groups. The differences in the percentage of correct responses for real objects compared to objects

in dreams were highly significant. The median for the real objects condition (100 per cent) was higher than that in the objects in dreams condition (66.67 per cent). The Wilcoxon test statistic was converted into a z-score of -4.545 with an associated 2-tailed probability of $<.001$. The differences in the percentage of correct responses for objects in photographs compared to objects in dreams were highly significant. The median for the objects in photographs condition (100 per cent) was higher than that in the objects in dreams condition (66.67 per cent). The Wilcoxon test statistic was converted into a z-score of -4.910 with an associated 2-tailed probability of $<.001$.

It could therefore be concluded that significantly fewer questions were answered correctly about objects in dreams than real objects and objects in photographs across perceptually public/private dimension and that such a difference was highly unlikely to have arisen by sampling error (Table 13). A significance value of $p<.017$ was used due to the multiple comparisons made. The difference between the percentage of correct answers regarding real objects and objects in photographs was not significant ($p=.119$).

Table 13. Wilcoxon tests comparing percentage of correct responses (perceptually public/private) in the three groups of objects

	Objects in Dreams vs. real objects	Objects in photographs vs. Real objects	Objects in photographs vs. Objects in Dreams
Z	-4.545a	-1.561b	-4.910b
Asymp. Sig (2-tailed)	0.000	0.119	0.000

a=based on positive ranks

b=based on negative ranks

(c) Participants will produce a significantly greater percentage of correct responses to questions relating to the physical/non-physical nature of real objects and objects in photographs as compared to objects in dreams.

As the data, particularly that concerning the physical/non-physical properties of real objects were skewed (Table 1) a Friedman two-way ANOVA was carried out on the data (Table 14 & Table 15).

3.4.1.2.2 *Friedman two-way analysis of variance comparing percentage of correct responses regarding the physical/non-physical dimension across the three groups of objects*

Table 14. Medians and ranges of percentages of correct responses

	Median	Range
Real objects	100%	50-100%
Objects in photographs	100%	0-100%
Objects in dreams	75%	0-100%

Table 15. Test statistics

N	52
Chi-Square	35.830
d.f.	2
Asymp. Sig. (2-tailed)	0.000

The Friedman analysis demonstrated a highly significant difference regarding the percentage of correct responses on the physical/non-physical dimension across the three groups of objects ($\chi^2=35.830$, $p<.001$). The differences were unlikely to be due to sampling error. The medians suggested that fewer questions were answered correctly about objects in dreams, compared to real objects and objects in photographs.

Planned pair-wise comparisons using the Wilcoxon signed-ranks test revealed significant differences between all three groups. The differences in the percentage of correct responses for real objects compared to objects in dreams were highly significant. The median in the real objects condition (100

per cent) was higher than that in the objects in dreams condition (75 per cent). The Wilcoxon test statistic was converted into a z-score of -4.682 with an associated 2-tailed probability of $<.001$. The differences in percentage of correct responses real objects compared to objects in photographs were highly significant. The median for real objects (100 per cent) was the same as for objects in photographs (100 per cent). However, the Wilcoxon test statistic was converted into a z-score of -3.610 with an associated 2-tailed probability of $<.001$. The difference between the percentage of correct answers regarding objects in photographs and objects in dreams were also significant. The median in the objects in photographs condition (100 per cent) was higher than that in the objects in dreams condition (75 per cent). The Wilcoxon test statistic was converted into a z-score of -2.577 with an associated 2-tailed probability of $p=.01$. A significance value of $p<.017$ was used due to the multiple comparisons.

It could therefore be concluded that significantly fewer questions were answered correctly about objects in dreams than real objects and objects in photographs across the physical/non-physical dimension and that such a difference was unlikely to have arisen by sampling error (Table 16).

Table 16. Wilcoxon tests comparing percentage of correct responses (physical/non-physical) in the three groups of objects

	Objects in Dreams vs. real objects	Objects in photographs vs. Real objects	Objects in photographs vs. Objects in Dreams
Z	-4.682a	-3.610a	-2.577b
Asymp. Sig (2-tailed)	0.000	0.000	0.010

a=based on positive ranks

b=based on negative ranks

3.4.2 Hypothesis 2

Participants will produce a significantly greater percentage of responses suggesting that dreams are entities that are shared with others than responses suggesting that dreams are individuated entities.

Approximately 29 per cent of answers reflected a shared notion of dreams, that two people sleeping in the same room would have the same dream. Approximately 27 per cent of answers reflected a private notion of dreams, that even if two people were sleeping in the same room they would not have the same dream. Approximately 42 per cent of answers reflected an inconsistent conceptualisation of the individuated versus shared properties of dreams, that is participants gave inconsistent answers to the same questions. These answers suggested that a significant proportion of participants were either unclear or inaccurate in their responses to the individuated nature of dreams.

3.4.3 Hypothesis 3

(a) Participants will give a significantly greater percentage of correct responses to questions relating to real objects as opposed to fictional objects.

(b) Participants will give a significantly greater percentage of correct responses to questions relating to the ability to dream about or think about real as opposed to fictional objects.

Hypothesis three proposed within-group differences between responses to questions relating to real objects and fictional objects.

The ideal response pattern demonstrating a perfect understanding of the nature of thoughts and dreams as mental events that can contain both real and fictional content is shown in Figure 6. Stenfert Kroese et al. (1998) first described this. Figure 7 illustrates the observed response pattern for participants in the present study.

Figure 6. Response pattern illustrating a perfect understanding of thoughts and dreams as mental events that can include both real and fictional content.

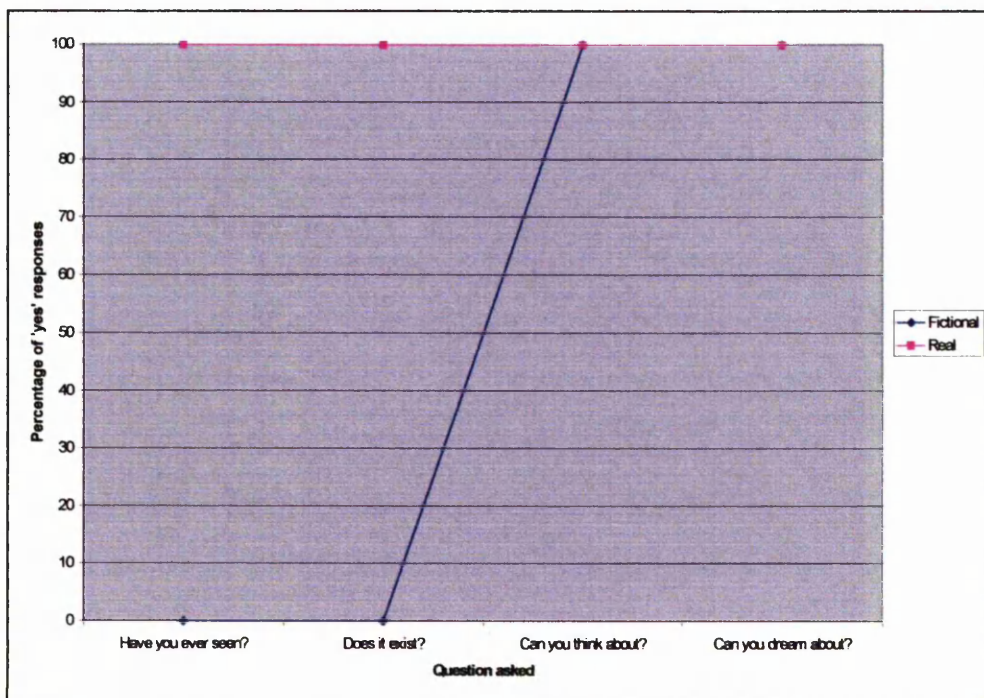
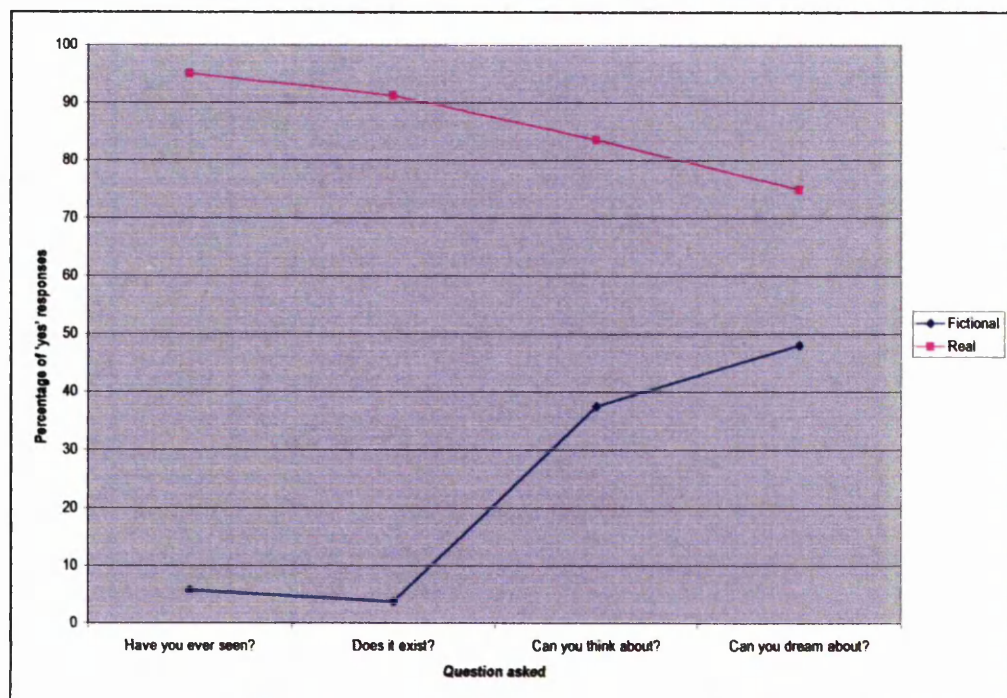


Figure 7. Response pattern illustrating observed pattern of responses for participants in the present study regarding the understanding of thoughts and dreams as mental events that can include both real and fictional content.



As a conservative measure, due to the data being over the cut-off for a normal distribution (Table 2), Wilcoxon signed-rank tests were carried out on the total percentage of correct responses regarding real and fictional objects; on the percentage of correct responses for ability to dream about real or fictional objects; and on the percentage of correct responses for the ability to think about real or fictional objects (Table 17).

Table 17. Wilcoxon tests comparing percentage of correct responses for real and fictional objects

	Overall Percentage of correct Responses for fictional vs. real objects	Percentage of correct Responses for Ability to dream about fictional objects vs. ability to dream about real objects	Percentage of correct Responses for Ability to think About fictional objects vs. ability to think about real objects
Z	-4.420a	-3.873a	-5.0529a
Asymp. Sig (2-tailed)	0.000	0.000	0.000

a=based on positive ranks

b=based on negative ranks

The analysis demonstrated a highly significant difference between the overall percentages of correct responses for fictional and real objects. The median of the real objects condition (100 per cent) was higher than that of the fictional objects condition (70 per cent). The Wilcoxon test statistic was converted into a z-score of -4.420 with an associated 2-tailed probability of <.001. It could therefore be concluded that significantly fewer questions were answered correctly about fictional objects and that such a difference was highly unlikely to have arisen by sampling error.

The observed response pattern (Figure 7), however, suggested that participants were generally confident that real objects can be seen and exist, whilst fictional objects cannot be seen and do not exist.

With regards to the ability to think about real and fictional objects, the percentage of correct answers showed a highly significant difference. The median of the 'think about' real condition (100 per cent) was higher than that of the 'think about' fictional condition (0 per cent). The Wilcoxon test statistic was converted into a z-score of -5.052 with an associated 2-tailed probability of <.001. It could therefore be concluded that significantly fewer questions were answered correctly regarding the ability to think about fictional objects, and that such a difference was unlikely to have arisen by sampling error.

Similarly, with the ability to dream about real and fictional objects, the percentage of correct answers again showed highly significant differences. The median of the 'dream about' real objects condition (100 per cent) was higher than that of the 'dream about' fictional objects condition (50 per cent). The Wilcoxon test statistic was converted into a z-score of -3.873 with an associated 2-tailed probability of <.001. It could therefore be concluded that significantly fewer questions were answered correctly regarding the ability to dream about fictional objects, and that such a difference was highly unlikely to have arisen by sampling bias.

Overall, significantly higher proportions of correct answers were given regarding the possibility of dreaming and thinking about real objects, as opposed to fictional objects. Answers reflected the belief of a large number of participants that it was impossible to dream or think about fictional objects.

3.4.4 Hypothesis 4

(a) Participants who pass the modified version of the Sally-Ann task will answer a greater percentage of questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who fail the modified version of the Sally-Ann task.

(b) Participants who pass the modified version of the Sally-Ann task will answer a greater percentage of questions correctly about the perceptually private nature of dreams (as measured by the closed-question section of the

dream interview schedule) than participants who fail the modified version of the Sally-Ann task.

(c) Participants who pass the modified version of the Sally-Ann task will answer a greater percentage of questions correctly about the non-physical nature of dreams (as measured by the closed-question section of the dream interview schedule) than participants who fail the modified version of the Sally-Ann task.

(d) Participants who pass the modified version of the Sally-Ann task will answer a greater percentage of questions correctly about the individuated nature of dreams (as measured by the closed-question section of the dream interview schedule) than participants who fail the modified version of the Sally-Ann task.

(e) Participants who pass the modified version of the Sally-Ann task will answer a greater percentage of questions correctly about the potentially fictional nature of dreams (as measured by the closed-question section of the dream interview schedule) than participants who fail the modified version of the Sally-Ann task.

Hypothesis four proposed within-group differences between participants in terms of first order ToM abilities in relation to percentage of correct answers about dreams.

A Kruskal-Wallis one-way ANOVA was carried out on the three groups of ToM ability (Table 19) (Table 18 shows the number of participants in each category). The analysis was carried out on all properties of dreams; including the total percentage of questions answered correctly about dreams and the percentages of questions answered correctly regarding the perceptually private, non-physical, individuated and potentially fictional nature of dreams.

Table 18. First order ToM abilities

	N	Percentage of Sample
Has 1 st order ToM	25	48.1%
Lacks 1 st order ToM	16	30.8%
Failed memory or Reality question	11	21.2%

Table 19. Kruskal Wallis test comparing within group differences in first order ToM ability.

	Total % Correct questions About Dreams	% correct questions – perceptually private (dreams)	% correct questions – non-physical (dreams)	% correct questions – individuated (dreams)	% correct questions dream about fictional object
Chi-Square	4.239	6.982	6.900	4.215	10.428
d.f.	2	2	2	2	2
Asymp. Sig	0.120	0.030	0.032	0.122	0.005

Grouping variable: false belief result.

Descriptive statistics showed that the number of participants who 'had first order ToM' (e.g. passed false-belief test and appropriately answered reality and memory questions) was higher (n=25) when compared to those who 'lacked first order ToM' (e.g. failed false belief test, but answered reality and memory questions correctly) (n=16) and those who failed either the memory or reality question (n=11). Participants who 'had first order ToM' answered, in total, a greater percentage of questions correctly about dreams (median=78.57 per cent) compared to participants who 'lacked first order ToM' (median=64.29 per cent) and who failed the reality or memory question (median=28.57 per cent). Results of the Kruskal Wallis analysis gave a χ^2 of 4.239 with an associated probability value of .120. Although results were in the direction expected, the analysis demonstrated no statistical difference between any of the groups (grouped on ToM ability) in relation to the total percentage of questions answered correctly about dreams.

The Kruskal Wallis analysis, however, did find significant group differences with regards to first order ToM and percentage of correct responses regarding the perceptually private nature of dreams. Participants who 'had first order ToM' answered fewer questions correctly about the perceptually private nature of dreams (median=66.67 per cent) compared to participants who 'lacked first order ToM' (median=74.00 per cent) and who failed the reality or memory question (median=33.33 per cent). Results gave a χ^2 of 6.982 with an associated probability value of .030. The results were not in the direction predicted. Pairwise comparisons using the Mann-Whitney demonstrated that the largest significant difference was between the 'had first order ToM' and the failed the reality or memory question groups ($p=.012$). There was also a difference between the 'lacked first order ToM' and the failed reality or memory question groups ($p=.029$). A significance value of $p<.017$ was utilised given the multiple number of analyses performed, which suggested that this is a statistically significant difference. Results suggested that those participants who failed the ToM test due to incomprehension answered less questions correctly regarding the perceptually private nature of dreams. The difference between the number of questions answered correctly regarding the perceptually private nature of dreams by those who 'had first order ToM' and 'lacked first order ToM' was not significantly different ($p=.869$).

There were also significant group differences with regards to first order ToM and percentage of correct responses regarding the non-physical nature of dreams. Participants who 'had first order ToM' answered a greater percentage of questions regarding the physical nature of dreams correctly (median=100 per cent), compared to participants who 'lacked first order ToM' (median=62.5 per cent) and participants who failed the reality or memory question (median=25 per cent). Results of the Kruskal Wallis analysis gave a χ^2 of 6.900 with an associated probability value of .032. The results were in the direction predicted. Pairwise comparisons using Mann Whitney tests revealed that the significant difference was between the 'had first order ToM' group and the failed the reality or memory question group

($p=.008$). A significance value of $p<.017$ was utilised due to the multiple comparisons made. This, suggested that those participants who failed first order ToM tests due to incomprehension answered significantly less questions correctly regarding the non-physical nature of dreams. The difference in the percentage of correct answers between the 'had first order ToM' and 'lacked first order ToM' group was not statistically significant ($p=.237$), nor was the difference in the percentage of correct answers between the 'lacked first order ToM' and failed reality or memory question group ($p=.264$).

There were no group differences found using the Kruskal Wallis analysis with regards to the percentage of correct responses about the individuated nature of dreams ($p=.122$). Participants who 'had first order ToM' answered a median of 50 per cent of questions correctly regarding the individuated nature of dreams, compared to participants who 'lacked first order ToM' (median=50 per cent) and those who failed the reality or memory question (median=25 per cent).

There were group differences with regards to the percentage of correct responses regarding the ability to dream about fictional objects. Participants who 'had first order ToM' answered a greater percentage of questions correctly regarding the ability to dream about fictional objects (median=100 per cent), compared with those who 'lacked first order ToM' (median=25 per cent) and those who failed the reality or memory questions (median=0 per cent). The results were in the direction predicted. Results of the Kruskal Wallis analysis gave a χ^2 of 10.428 with an associated probability of .005. Pairwise comparisons using Mann Whitney tests revealed that the largest significant difference was between the 'had first order ToM' group and the failed the reality or memory question group ($p=.007$). There was also a difference nearing statistical significance between the 'had first order ToM' group and the 'lacked first order ToM' group ($p=.023$). However, a significance value of $p<.017$ was utilised due to the multiple comparisons made, which suggested that this was not statistically significant. This

suggested that those participants who failed first order ToM tests due to incomprehension answered significantly fewer questions correctly regarding the ability to dream about fictional objects and that participants who 'lacked first order ToM' answered fewer questions correctly regarding the ability to dream about fictional objects when compared to the 'had first order ToM' group. The difference in the number of correct answers between the 'lacked first order ToM' and failed reality or memory questions group was not statistically significant ($p=.440$).

3.4.5 Hypothesis 5

Participants who have received a diagnosis of psychosis (as determined by their background information) will answer fewer questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who have not received a diagnosis of psychosis.

Hypothesis five proposed within-groups difference between participants in terms of diagnosis of psychosis in relation to percentage of correct answers regarding dreams.

The small number of participants within the diagnosis of psychosis group ($n=2$) compared with the number of participants who did not have a diagnosis ($n=50$) meant that statistical analysis was not suitable. Descriptive statistics showed that participants who had a diagnosis of psychosis answered a lower percentage of total questions correctly regarding dreams (median = 46.43 per cent) than participants who had no diagnosis of psychosis (median = 67.86 per cent). Given the very small sample of participants with a diagnosis of psychosis, however, it was highly likely that the smaller percentage of total questions answered correctly about dreams in the psychosis group was due to sampling error.

3.4.6 Hypothesis 6

Participants who receive psychotropic medication (as determined by their background information) will answer fewer questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who do not receive psychotropic medication.

Hypothesis six proposed within-groups differences between participants in terms of receiving a prescription for psychotropic medication in relation to percentage of correct answers regarding dreams.

Again the number of participants who received medication was small ($n=5$) compared to the number of participants who did not receive medication ($n=47$). Descriptive statistics showed that participants who received medication answered more questions correctly regarding dreams (median = 78.57 per cent) compared to participants who did not receive medication (median = 64.29 per cent). Given the very small sample of participants who received psychotropic medication, however, it was highly likely that the smaller percentage of total questions answered correctly about dreams in the non-medication group was due to sampling error.

A Mann-Whitney U test was carried out, with medication as the grouping variable. The Mann Whitney was found to be 104.000 ($z=-0.422$) with an associated probability of .673. The analysis demonstrated no difference between individuals who received psychotropic medication and those who did not in relation to the total percentage of questions answered correctly about dreams.

3.4.7 Hypothesis 7

Participants who display challenging behaviour (as measured by a score of above 7 on the LD Casemix Scale) will answer fewer questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who do not display challenging behaviour (as measured by a score of below 7 on the LD Casemix Scale).

Hypothesis seven proposed within-groups differences between participants in terms of severity of challenging behaviour in relation to percentage of correct answers regarding dreams.

The descriptive statistics showed that there was a higher number of participants who displayed no challenging behaviour (n=45) compared to those with mild challenging behaviour (n=7). There were no participants with severe challenging behaviour. Participants with mild challenging behaviour answered more questions correctly in total regarding dreams (median=71.43 per cent) as compared to participants with no challenging behaviour (median=64.29 per cent). However, given the small number of participants with mild challenging behaviour, it is possible that the lower total percentage of correct responses regarding dreams in the no challenging behaviour group was due to sampling error.

A Mann-Whitney U test was carried out, with severity of challenging behaviour as the grouping variable. The Mann Whitney was found to be 138.000 ($z = -0.527$) with an associated probability of .598. The analysis demonstrated no difference between individuals who displayed mild challenging behaviour and those who do not in relation to the total percentage of questions answered correctly about dreams. The number of participants in the mild challenging behaviour group was small.

3.4.8 Hypothesis 8

(a) There will be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the total percentage of

questions answered correctly regarding dreams (as measured by the closed-question section of the dream interview schedule).

(b) There will be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the percentage of questions answered correctly regarding the perceptually private nature dreams (as measured by the closed-question section of the dream interview schedule).

(c) There will be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the percentage of questions answered correctly regarding the non-physical nature dreams (as measured by the closed-question section of the dream interview schedule).

(d) There will be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the percentage of questions answered correctly regarding the individuated nature dreams (as measured by the closed-question section of the dream interview schedule).

(e) There will be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the percentage of questions answered correctly regarding the potentially fictional nature dreams (as measured by the closed-question section of the dream interview schedule).

In order to investigate the possible relationship between receptive language ability and percentage of questions answered correctly about dreams, Pearsons product moment correlations were computed separately for each of the dream dimensions (Table 20). Parametric analyses were utilised due to the normal distribution of the receptive language ability variable and the nearly normal distribution of the dream variables. Non-parametric correlations (spearman's rho) were also computed and gave equivalent results.

Table 20. Correlations between percentage of correct answers regarding dreams and receptive language ability.

% of questions answered correctly for each dream dimension	Correlation Coefficient	Sig. (2-tailed)
All dream Questions	0.467	0.000
Perceptually private	0.457	0.001
Non-physical	0.547	0.000
Individuated	0.246	0.079
Potentially fictional	0.396	0.004

Four of the correlations were found to be statistically significant. The relationship between receptive language ability and total percentage of questions answered correctly about dreams was found to be positively and moderately related ($r=+0.467$, $p<.001$). Thus as receptive language ability age-equivalents rise so does the total percentage of questions answered correctly about dreams.

The relationship between receptive language ability and percentage of questions answered correctly regarding the perceptually private nature of dreams was found to be positively and moderately related ($r=+0.457$, $p=.001$).

The relationship between receptive language ability and percentage of questions answered correctly about the non-physical nature of dreams was found to be positively and moderately related ($r=+0.547$, $p<.001$).

The relationship between receptive language ability and percentage of questions answered correctly about the possibility of dreaming about fictional objects was found to be positively and weakly-moderately related ($r=+0.396$, $p=.004$).

No significant correlation was found between receptive language ability and percentage of questions answered correctly about the individuated nature of dreams.

3.5 Dream content

3.5.1 Participants reports of dreams

There were six participants who did not report any dream content. The remaining 46 participants all reported some dream content. The content of participants' dreams will not be discussed in detail, however the descriptions contained a range of characters and events. Dreams involving family members and friends were described by 12 participants. Dreams concerning girlfriends or boyfriends were described by eight participants. Deceased relatives featured in the dreams of eight participants. Characters such as dragons, monsters and aliens were found in four dream reports. In terms of events, three participants described dreams about past problems, six described dreams about flying/parachuting/gymnastic events, four participants dreamt about holidays and one dreamt about dying. Reports also contained descriptions of dreaming about excitedly anticipated future events (four) or worrying future events (two). Four participants reported that their dreams were premonitions of things to come, whilst eight participants reported nightmares.

3.5.2 Participants responses to open-ended questions

Participants' responses to open-ended questions reflected a range of beliefs regarding when, where and how dreams occurred. Participants may have given responses in more than one category.

When

Dreams occurring at night were reported by 22 participants, 25 when asleep, one when tired, two in the day and four that dreams could occur at anytime.

Where

Dreams occurring in bed were reported by 26 participants, four reported dreams occurred at home, two in the bedroom, one outside in the road, nine in their heads and 19 in their minds.

How

Ten participants saw dreams as replays of events that had already occurred. Eighteen participants said that dreams were a result of "inner thinking", brain processes, activity of the mind, having something on your mind or "pictures" in the head. One participant referred to REM sleep. The remainder of responses included dreams occurring because of the eyes being shut, due to God, due to beer, having another eye in your head, from your heart and visions. Eighteen participants were reluctant to speculate how dreams occurred.

3.5.3 Participants responses to questions about their difficulties

A number of participants linked difficulties with getting upset or angry to their dreams. In these instances it was usual that events that they found upsetting whilst awake were dreamt about in the following nights, rather than dreams being the cause of upset in the following days. For example, one participant described arguments at a day centre resulting in anger and upset and these arguments were then reflected in later dream experience.

A common association was in upsetting thoughts about deceased relatives resulting in the experience of dreaming about the deceased individuals at night. One participant talked about seeing her deceased parents at the end of her bed and being able to hear them, and her distress that they would not come back to life.

CHAPTER FOUR

DISCUSSION

4. DISCUSSION

4.1 Overview of Chapter 4

The results of the study will be discussed in relation to each of the hypotheses initially suggested in chapter 1 (see 1.8.1). The findings will be discussed in relation to those of previous studies, in particular those investigating dream conceptualisation in adults with LD, but also with regard to research examining the development of conscious experience in individuals with and without LD (particularly their inner experiences). The responses to the open-ended questions will also be discussed and there will be a brief discussion of the implications of the findings regarding dream content. The limitations and strengths of the study will be considered. The possible implications of the findings for both theory and clinical practice will be discussed, along with suggestions for possible future research.

4.2 Discussion of results in relation to the hypotheses

The findings of the study will be discussed in relation to the hypotheses and comparisons will be made with findings from related studies. Some initial interpretations of these findings will be made, however more detailed interpretations in relation to theory will be discussed in Section 4.7.

4.2.1 Hypothesis 1

Participants will produce a significantly greater percentage of correct responses to questions relating to real objects and objects seen in photographs as compared to objects in dreams.

Hypothesis one made predictions regarding the total percentage of correct responses about real objects, objects in photographs and objects in dreams (including three of the dimensions, see 3.4.1). It also made suggestions about the percentage of correct responses regarding the perceptually private/public and physical/non-physical nature of real objects, objects in

photographs and objects in dreams, separately. The discussion of the hypothesis will follow this format.

4.2.1.1 *Total percentage of correct responses*

Participants answered a median of 32.14 per cent of the total questions regarding dreams incorrectly, whilst the medians for the percentage of questions answered incorrectly regarding real objects and objects in photographs were both 0 per cent. Significant differences were observed across the three groups. The range of percentage of correct answers for objects in photographs (16.67-100 per cent), compared to that of real objects (33.3-100 per cent), suggested that participants found photographs more difficult to conceptualise than objects. This difference was also statistically significant. Therefore, the hypothesis that in total a significantly greater percentage of correct responses would be produced regarding real objects and objects in photographs as compared to objects in dreams was well supported by the data and so the null hypothesis could be rejected.

The findings were comparable with those of Stenfert Kroese et al. (1998) who found a total of 40 per cent of questions answered incorrectly regarding dreams, and Edwards (1999) who found the LDO group answered a total of 38 per cent of questions regarding dreams incorrectly. It was, however, unclear whether the figures quoted in the previous studies referred to the mean or median percentages, as the mean percentage of incorrect answers regarding dreams in the present study was more similar (41.76 per cent). However, the total percentage of answers in the present study included the individuated nature of dreams also, whilst the two previous studies only included the perceptually public/private and physical/non-physical dimensions in the total percentages reported.

4.2.1.2 *Perceptually public/private dimension*

With regards to the perceptually public/private dimension participants answered a median of 33.33 per cent of answers regarding objects in dreams incorrectly. Again this was compared to medians of 0 per cent of incorrect answers regarding real objects and objects in photographs.

Significant differences were observed across the three groups. The ranges again suggested that participants found objects in photographs more difficult to conceptualise (0-100 per cent) when compared to real objects (25-100 per cent). However, this difference was not statistically significant. The hypothesis that a significantly greater percentage of correct responses would be produced regarding the perceptually public/private nature of real objects and objects in photographs as compared to objects in dreams was, therefore, well supported by the data and so the null hypothesis could be rejected.

This finding suggested that a substantial proportion of participants believed that dreams were entities that could be seen by themselves and by others and that others who went into their bedrooms whilst they were dreaming would be able to see the dream taking place.

The previous research of Edwards (1999, in the LDO group) and Stenfort Kroese et al. (1998) also found significant differences across the three conditions. Visual inspection of the graphs describing the observed pattern of participants responses to the questions asking 'can you see it?' and 'can others see it?' showed similar patterns of responding across all three studies. However, the present study appeared to demonstrate a greater percentage of incorrect 'yes' responses to the 'can you see it?' question about dreams (approximately 55 per cent, compared with approximately 30-40 per cent in the previous two studies).

4.2.1.3 *Physical/non-physical dimension*

With regards to the physical/non-physical dimension, the median percentage of incorrect answers regarding objects in dreams was 35 per cent, compared to 0 per cent regarding real objects and objects in photographs. Significant differences were found across the three groups. Again the ranges suggested that participants found objects in photographs (0-100 per cent) more difficult to conceptualise than real objects (50-100 per cent) and this difference was statistically significant. Therefore, the hypothesis that a significantly greater percentage of correct responses would be produced

regarding the physical/non-physical nature of real objects and objects in photographs as compared to objects in dreams was well supported by the data and so the null hypothesis could be rejected.

The findings suggested that a substantial number of participants believed that dreams were physically present and that the objects in dreams could be touched and manipulated. Therefore, for a substantial number of participants dream objects were real, actually present in the room and could be deliberately affected by the dreamer.

Stenfert Kroese et al. (1998) also found statistically significant differences between number of correct responses regarding the physical/non-physical nature of real objects, objects in photographs and objects in dreams. However, the only significant group difference was between real objects and objects in dreams ($z=-4.14$, $p<.001$). Edwards (1999), however, did not find such a difference. In the LDO group no significant differences were observed across the three conditions. Again, visual inspection of the graphs detailing the observed pattern of responses to the 'can you act on it?' question showed a comparable percentage of incorrect 'yes' answers for objects in dreams for the present study and the Stenfert Kroese et al. (1998) study (approximately 40 per cent). Edwards (1999) found a lower percentage (approximately 20 per cent) of incorrect 'yes' answers. As suggested by Edwards (1999) this could be accounted for by the sample of participants (all inpatients in residential services offering cognitive behavioural therapeutic programmes), who may have had more experience in differentiating and discussing their thoughts, emotions and behaviours.

Taken together, the findings of the hypotheses regarding each of the dream dimensions imply that a large proportion of the participants believed that their dreams were taking place around them, that they could be witnessed by others (if they were present in the room) and that they could be touched and manipulated.

4.2.2 Hypothesis 2

Participants will produce a significantly greater percentage of responses suggesting that dreams are entities that are shared with others than responses suggesting that dreams are individuated entities.

Approximately 29 per cent of answers reflected a shared notion of dreams, with a similar proportion (approximately 27 per cent) of answers reflecting a private notion of dreams. Of particular significance was the finding that a large proportion of answers (approximately 42 per cent) reflected an inconsistent conceptualisation of the individuated versus shared properties of dreams. The hypothesis was, therefore, not supported by the data and the null hypothesis could not be rejected.

The findings suggested that a large proportion of participants were unclear about whether dreams were shared with others or whether they were private. This suggested the potential for much confusion regarding whether other individuals would have access to, or already know about their dreams, if they had been sleeping in the same room.

The results were again comparable with the findings of Stenfert Kroese et al. (1998), who found that approximately 26 per cent of answers reflected a shared notion, 30 per cent reflected a private notion and 44 per cent suggested a lack of clarity regarding whether dreams were shared or private. Edwards (1999) found a higher percentage of answers reflecting the individuated nature of dreams (approximately 57 per cent). This again may be explained by the sample of participants in Edward's (1999) study.

4.2.3 Hypothesis 3

Participants will give a significantly greater percentage of correct responses to questions relating to real objects as opposed to fictional objects.

Hypothesis three made predictions regarding the total number of questions answered correctly regarding real objects and fictional objects. It also made predictions regarding the number of questions answered correctly about the

ability to think about real and fictional objects and the ability to dream about real and fictional objects. The discussion of the hypothesis will follow this format.

4.2.3.1 *Total percentage of correct responses*

In total participants answered a median of 100 per cent of questions correctly regarding real objects compared to 70 per cent of questions regarding fictional objects. Significant differences were found between the two groups. Therefore, the hypothesis that in total a significantly greater percentage of questions would be answered correctly regarding real objects as compared with fictional objects was well supported by the data and so the null hypothesis could be rejected.

The previous studies (Edwards, 1999; Stenfert Kroese et al., 1998) did not report data regarding the total percentage of correct answers about real and fictional entities, so a direct comparison was not possible. However, visual inspection of the observed pattern of responses across the four questions over all three studies demonstrated a similar pattern of responding.

4.2.3.2 *Ability to think about fictional entities*

The median of the 'think about' real condition was 100 per cent, whilst that of the 'think about' fictional condition was 0 per cent. Therefore, significantly fewer questions were answered correctly regarding the ability to think about fictional objects. The hypothesis that a significantly greater percentage of questions would be answered correctly regarding the ability to think about real objects as opposed to fictional objects was, therefore, well supported by the data and the null hypothesis could be rejected.

This was comparable with the findings of Stenfert Kroese et al. (1998) who also found significantly less questions answered correctly regarding the ability to think about fictional objects (-5.13 , $p < .001$) and Edwards (1999) ($z = -4.354$, $p < .001$).

4.2.3.3 Ability to dream about fictional entities

The median of the 'dream about' real objects condition was 100 per cent, whilst that of the 'dream about' fictional objects condition was 50 per cent. Therefore significantly fewer questions were answered correctly regarding the ability to dream about fictional objects. Therefore, the hypothesis that a significantly greater percentage of questions would be answered correctly regarding the ability to dream about real objects as opposed to fictional objects was also well supported by the data and the null hypothesis could be rejected.

This was again comparable with the findings of Stenfert Kroese et al. (1998) who also found significantly fewer questions answered correctly regarding the ability to dream about fictional objects ($z=-3.89$, $p<.001$) and Edwards (1999) ($z=3.666$, $p<.001$).

Visual inspection of the observed pattern of responses suggested that the percentage of answers given regarding the impossibility of dreaming about fictional entities was comparable across two of the studies (both the present study and Stenfert Kroese et al., 1998, approximately 50%). Although, again Edwards (1999) sample gave a higher proportion of correct responses (60 per cent).

Taken together the findings suggested that participants were prone to believing that what they dreamt about reflected reality in some way, as dreams had to be about real entities. Interestingly, the finding regarding the inability to think fictional thoughts was even more striking (with a median of 0 per cent), suggesting that participants *believed* all the thoughts they had must be about real things.

4.2.4 Hypothesis 4

Participants who pass the modified version of the Sally-Ann task will answer a greater percentage of questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who fail the modified version of the Sally-Ann task.

Hypothesis four made predictions regarding the relation of first order ToM ability to the total percentage of questions answered correctly about dreams and also to the percentages of questions answered correctly regarding the perceptually private, non-physical, individuated and potentially fictional nature of dreams, separately. The discussion of the hypothesis will follow this format.

4.2.4.1 Total percentage of correct responses

No significant differences were found in the total percentage of correct answers regarding dreams between individuals who 'lacked first order ToM' (median=64.29 per cent), 'had first order ToM' (median=78.57 per cent) or failed the reality/memory questions (median=28.57 per cent), although results were in the direction expected. The hypothesis participants who passed the modified version of the Sally-Ann task would answer a greater total percentage of questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who failed the modified version of the Sally-Ann task was not supported by the data and so the null hypothesis could not be rejected.

There were no previous studies examining this area on which to make comparisons, although the direction of the results fit with the developmental literature regarding ToM. Namely, that those participants who appeared to 'lack first order ToM' (or at least who failed the test of this ability) had greater difficulty with the conceptualisation of dreams as inner (mental) experiences. For example, Wellman (1994) considered that the first component of ToM ability was the ability to distinguish between the real [physical] world and the mental [inner world]. However, given the lack of statistical significance

regarding this ability, caution would be required when proposing such an association.

4.2.4.2 *Perceptually private dimension*

Participants who 'had first order ToM' answered fewer questions correctly about the perceptually private nature of dreams (median=66.67 per cent) compared to participants who 'lacked first order ToM' (median=74 per cent). Participants who failed the reality or memory question answered the least questions correctly (median=33.33 per cent). The only significant difference was between the 'had first order ToM' group and the failed reality/memory question group. Therefore, the hypothesis that participants who passed the modified version of the Sally-Ann task would answer a greater percentage of questions correctly about the perceptually private nature of dreams (as measured by the closed-question section of the dream interview schedule), than participants who failed the modified version of the Sally-Ann task was not supported by the data and so the null hypothesis could not be rejected. This suggested that first order ToM ability was not associated with the ability to accurately conceptualise dreams as perceptually private entities.

4.2.4.3 *Non-physical dimension*

Participants who 'had first order ToM' did answer a greater percentage of questions regarding the physical nature of dreams correctly (median=100 per cent), compared to participants who 'lacked first order ToM' (median=62.5 per cent) and participants who failed the reality or memory question (median=25 per cent). However, the only significant difference was between the 'had first order ToM' group and the failed the reality or memory question group. Therefore, the hypothesis that participants who passed the modified version of the Sally-Ann task would answer a greater percentage of questions correctly about the non-physical nature of dreams (as measured by the closed-question section of the dream interview schedule), than participants who failed the modified version of the Sally-Ann task was not supported by the data and so the null hypothesis could not be rejected. However, results were in the direction predicted.

The findings, again, suggested that first order ToM ability was not significantly associated with the ability to accurately conceptualise dreams as non-physical entities. However, the direction of the results suggested that this was a promising line of enquiry and were in line with the developmental literature viewing the ability to distinguish internal from external events as a component of ToM ability (e.g. Wellman, 1994).

4.2.4.4 *Individuated dimension*

With regards to the individuated nature of dreams the median percentages of correct answers in the 'had first order ToM' and 'lacked first order ToM' groups were equivalent. Therefore, the hypothesis that participants who passed the modified version of the Sally-Ann task would answer a greater percentage of questions correctly about the individuated nature of dreams (as measured by the closed-question section of the dream interview schedule), than participants who failed the modified version of the Sally-Ann task was not supported by the data and so the null hypothesis could not be rejected. These findings suggested that first order ToM ability was not associated with the ability to accurately conceptualise dreams as individuated entities.

4.2.4.5 *Potentially fictional dimension*

Participants who 'had first order ToM' answered a greater percentage of questions correctly regarding the ability to dream about fictional objects (median=100 per cent), compared with those who 'lacked first order ToM' (median=25 per cent) and those who failed the reality or memory questions (median=0 per cent). The results were in the direction predicted. The largest significant difference was between the 'had first order ToM' group and the failed the reality or memory question group. However, there was a difference nearing statistical significance between the 'had first order ToM' group and the 'lacked first order ToM' group ($p=.023$). As a significance value of $p<.017$ was utilised as a conservative measure due to the multiple comparisons made, this was just over the cut off for statistical significance. This level of significance was applied as an approximation of Bonferonni corrections to correct for multiple comparisons (Field, 2000). These corrections were used

to reduce the chance of a Type-I error occurring [incorrectly rejecting the null hypothesis], but reduce the power of the statistical tests and increase the likelihood of a Type-II error [incorrectly accepting the null hypothesis]. Although Bonferonni corrections have been found to be more powerful than some other post-hoc corrections when the number of comparisons being made is small (Field, 2000), there remained a risk that a significant difference in the percentage of correct responses regarding the ability to dream about fictional entities would go unnoticed between the 'had first order ToM' and 'lacked first order ToM' groups.

Therefore, the hypothesis that participants who passed the modified version of the Sally-Ann task would answer a greater percentage of questions correctly about the potentially fictional nature of dreams (as measured by the closed-question section of the dream interview schedule), than participants who failed the modified version of the Sally-Ann task was partially supported by the data, although the null hypothesis could not be unequivocally rejected. The results could, therefore, be taken to support the proposal that first order ToM ability is associated with the ability to entertain the possibility that dreams could be about fictional entities, although caution should be applied when interpreting this finding. However, this seemed another promising line of enquiry.

There was no directly related research with which to compare the findings, but there are similarities with the findings of Scott and Baron-Cohen (1996) who investigated the ability of children with ASD, LD and those 'developing normally' to produce 'unreal' changes to their representations of people and houses. The poor performance of participants with ASD was believed to fit with Leslie's (1987) proposal regarding metarepresentation. The authors discussed the findings in relation to ToM ability, in that representing an unreal object required the ability to pretend, or represent, a pretend attitude (or mental state) towards an object (a *decoupled* representation) (Scott & Baron-Cohen, 1996). The association of this ability with ToM in the present study, which was approached statistical significance, suggested that the difficulties participants demonstrated with the ability to think, or dream, about

fictional entities may be associated with the inability to represent a pretend attitude towards an object.

4.2.5 Hypothesis 5

Participants who have received a diagnosis of psychosis (as determined by their background information) will answer fewer questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who have not received a diagnosis of psychosis.

Formal statistical analysis of the data was not possible, due to the small number of participants with a diagnosis of psychosis. However, descriptive statistics showed that the results were in the direction predicted, with those participants with a diagnosis of psychosis ($n=2$) answering fewer questions in total correctly regarding dreams (median=46.43 per cent) compared to those without a diagnosis (median=67.86 per cent). The data did not provide support for the hypothesis and so the null hypothesis could not be rejected.

There were no studies with which the results could be compared. The data would seem to suggest that inaccurate conceptualisation of dreams may be more likely to be associated with a diagnosis of psychosis. However, given the very small sample size, this is highly likely to be due to sampling error. The small sample of participants with a diagnosis of psychosis made it impossible to accurately assess whether receiving such a diagnosis could be associated with conceptualisation of dreams.

4.2.6 Hypothesis 6

Participants who receive psychotropic medication (as determined by their background information) will answer fewer questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who do not receive psychotropic medication.

Formal statistical analysis was carried out, although the number of participants who received psychotropic medication was small ($n=5$), compared to the number of participants who did not receive psychotropic

medication (n=47). However, no differences were found between the two groups. Descriptive statistics demonstrated that results were not in the direction expected, with participants who received medication answering more questions correctly. The data did not provide support for the hypothesis and so the null hypothesis could not be rejected.

The small sample size in the medication group made it impossible to adequately assess whether the likelihood of receiving a prescription of psychotropic medication was associated with ability to conceptualise dreams. There were no studies with which the findings could be compared.

4.2.7 Hypothesis 7

Participants who display challenging behaviour (as measured by a score of above 7 on the LD Casemix Scale) will answer fewer questions correctly about dreams (as measured by the closed-question section of the dream interview schedule), than participants who do not display challenging behaviour (as measured by a score of below 7 on the LD Casemix scale).

Again despite the small number of participants in the challenging behaviour group (n=7) compared with the no challenging behaviour group (n=45), formal statistical analysis was carried out. However, no differences were found between the two groups. The descriptive statistics demonstrated that the results were not in the direction predicted, with those with mild challenging behaviour answering a greater percentage of questions correctly. The hypothesis was, therefore, not supported by the data and so the null hypothesis could not be rejected.

Again the small sample size in the mild challenging behaviour group made it impossible to accurately assess whether the likelihood of demonstrating challenging behaviour was associated with ability to conceptualise dreams. There were no studies with which the findings could be compared.

The premise behind hypothesis seven, that emotional distress produced by dreams may be displayed through challenging behaviour in individuals with

LD (e.g. Glick & Zigler's 1995, finding that even individuals with mild LD demonstrated emotional distress through challenging behaviour), had similarities with the hypothesis made by Edwards (1999) regarding distress caused by nightmares. Edwards explored the association between reported nightmare distress and accurate conceptualisation of dreams. Edwards (1999) found no such association. However, given the generally low level of emotional affect reported by participants in the present study in relation to dreams, perhaps this was not unexpected.

4.2.8 Hypothesis 8

There will be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the percentage of questions answered correctly regarding dreams (as measured by the closed-question section of the dream interview schedule).

Hypothesis eight made predictions regarding the total percentage of correct responses regarding dreams and also with regards to the percentage of correct responses about the perceptually private, non-physical, individuated and potentially fictional nature of dreams, separately. Discussion of the hypothesis will follow this format.

4.2.8.1 Total percentage of correct responses

Support was found for the hypothesis that there would be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the total percentage of questions answered correctly regarding dreams (as measured by the closed-question section of the dream interview schedule). Therefore the null hypothesis could be rejected.

4.2.8.2 Perceptually private dimension

Support was also found for the hypothesis that that there would be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the percentage of questions answered correctly regarding the perceptually private nature dreams (as measured by

the closed-question section of the dream interview schedule). Therefore the null hypothesis could be rejected.

4.2.8.3 *Non-physical dimension*

The hypothesis that that there would be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the percentage of questions answered correctly regarding the non-physical nature of dreams (as measured by the closed-question section of the dream interview schedule) was also supported by the data. Therefore the null hypothesis could be rejected.

4.2.8.4 *Individuated dimension*

The hypothesis that that there would be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the percentage of questions answered correctly regarding the individuated nature of dreams (as measured by the closed-question section of the dream interview schedule) was not supported by the data. Therefore the null hypothesis could not be rejected.

4.2.8.5 *Potentially fictional dimension*

Support was found for the hypothesis that that there would be a significant positive correlation between receptive language ability (as measured by the BPVS II) and the percentage of questions answered correctly regarding the potentially fictional nature of dreams (as measured by the closed-question section of the dream interview schedule). Therefore the null hypothesis could be rejected.

Taken together the findings suggested that the ability to accurately conceptualise dreams was associated with receptive language ability. Overall, age equivalents on the BPVS-II were found to correlate positively, but moderately, with percentages of correct answers regarding dreams. This was with the exception of the individuated nature of dreams, which showed no such association. These findings were comparable with those of Edwards (1999), although she only examined the relationship with the total

percentage of questions answered correctly regarding dreams. Stenfert Kroese et al. (1998) did not examine this association.

4.3 Discussion of responses to open-ended questions

Those participants who could be encouraged to provide responses to open-ended questions demonstrated a largely competent understanding of when, where and how dreams occurred. In terms of 'when' dreams occurred the majority of responses suggested at night and when asleep. In terms of 'where' the majority of responses given suggested dreams occurred in bed and in the mind. The suggestion that dreams occurred in bed did not appear literal. Participants did not appear to be implying that whilst they themselves were in the bed the dream was also literally located there. The question of 'how' dreams occurred caused the most difficulties, although a large number of participants saw dreams as a result of 'inner thinking', brain processes, activity of the mind, having something on your mind or 'pictures' in the head. However, there were many participants who were unwilling to give answers to the open-ended questions, in particular to the 'how' question, for which 18 participants failed to provide any answer. This suggested a bias in the analysis of the results of the open-ended questions, as it seemed likely that those who could not be encouraged to answer had a less developed understanding of dreams. Four participants described dreams as premonitions, depicting future events. However, none seemed unduly distressed by this view.

4.4 Discussion of dream content

The majority of participants described some dream experience. The proportion of participants who did not experience dreams (11.5 per cent) was lower than the proportion found by Stenfert Kroese et al. (1998), where 21.2 per cent of participants failed to report dream content; and Edwards (1999) where 28.6 per cent of participants in the LDO group did not report dreams. The variety of dream content described by participants seemed to

support the suggestion made by Turner and Graffam (1987), namely that adults with LD have rich and diverse dream experiences.

Of particular interest is the similar finding of this study to that of Turner and Graffam (1987), that a proportion of participants (approximately 15 per cent in the present study) described dreams regarding deceased relatives. These dreams seemed to reflect participants' feelings of grief and the time spent thinking about relatives during the day. In general, these dreams did not appear to result in undue distress or disturbance upon waking. However, one participant described the dream experience of seeing and hearing her deceased parents at the end of her bed and feelings of distress that they would not come back to life. This may also suggest that her understanding of death was at an earlier developmental stage (c.f. Harper & Wadsworth, 1993; McEvoy, 1989).

Whilst the participant in the present study seemed to cope well with this experience, an example of a grief reaction reflected in dream experience and resulting in significant consequences was given by Edwards (1999). In her study one participant described nightmares following the death of his mother, at which time he also began to sleep walk. He recalled not understanding what was happening, believing (as did his family) that he was 'going mad'. This resulted in the breakdown of his living arrangements. The participant commented that things could have been different if he had understood more about nightmares and sleepwalking at the time. This also seemed to show agreement with findings that dreams regarding the deceased often elicited salient emotional reactions, for example chronic sleep disturbance, emotional distress and chronic crying spells (Turner & Graffam, 1987).

Another participant in the present study described his deceased grandmother talking to him at night. This participant had a diagnosis of 'schizophrenia' and saw the images as hallucinations. However, as all occurred at night when he was in bed, it seemed likely that he could be describing dreams. This experience could also possibly be understood in

terms of a grief reaction, in line with the research demonstrating visual or auditory images of the deceased (Grimby, 1993; Reese, 1971). It was unclear, however, what events or symptoms had resulted in his diagnosis of 'schizophrenia' and whether the descriptions of his grandmother had contributed.

As discussed (see 3.5.3), in these instances it was usual that events that they found upsetting whilst awake were dreamt about in the following nights, rather than dreams being the cause of upset in the following days. However, the case examples described above do suggest the potential for significant consequences as a result of misunderstood or misinterpreted dream experiences.

Many dream experiences did seem to share similarities with real events, although the descriptions given by participants were often quite short with prompts required to obtain more detail. This appeared to fit with Hilivaki's (1987) finding that children with LD used few words to describe their dreams. Participants' descriptions of dreams often involved family members, friends, boyfriends and girlfriends doing everyday activities. The findings that dream reports also contained anticipated future events also suggested themes of everyday, or realistic, events. This supported Strauch and Meier's (1992, cited in Meier, 1993) finding that dreams in general are neither purely fantastic nor purely realistic and instead demonstrate an elaboration on realistic experience. However, there were descriptions of less realistic occurrences, such as aliens, monsters and so on.

The interviews did not require participants to rate the realistic nature of the perceptual experience, making this aspect of dreaming difficult to analyse. However, descriptions did demonstrate that participants had the experience of seeing and hearing characters in their dreams, and that they often experienced emotions in relation to their dreams. Some participants described waking up in a sweat, frightened, or even laughing. This supports Hobson's (2002) discussion of the realistic nature of dreams in terms of perceptual experience and emotional effects. It also fits with research

demonstrating that during dreaming visual and auditory perceptions predominate (Strauch & Meier, 1992, cited in Meier, 1993).

In relation to research regarding the confusion between descriptions of dream experiences and real events (Kemp et al., 2003), it was at times difficult for the researcher to be sure whether participants were describing dreams, actual experiences or other internal phenomena, such as thoughts. One participant described dreaming during the day whilst awake, which she described as pictures jumping into her head, for example, an image of a cat. It was unclear whether these were example of thoughts occurring when her attention had wandered from what she was doing. There was additional confusion where some participants had taken the question about dreams to be a question about their wishes and desires.

4.5 Limitations of the study

4.5.1 Sample of participants

The power calculation suggested a target sample size of 52 participants and this was achieved. However, the inclusion criteria could potentially have excluded some possible participants, perhaps affecting the generalisability of the findings. For example, one of the exclusion criteria was insufficient receptive language ability, resulting in inability to understand task instructions. This could have precluded individuals from ethnic minorities, along with individuals who rely on augmented communication, such as signing. Although there were no instances of such individuals approaching the researcher to take part, the way in which the research was discussed could have screened these individuals out at the outset.

The fact that the study was explained to be about dreaming could have resulted in a selective bias in those individuals who put themselves forward for participation. Individuals who had little or no understanding, or experience, of dreams may have been put off, or may not have seen the point in taking part. It was explained that prior experience or understanding

was not required, however, this may still have had an impact in terms of inherent interest. This was apparent in the complete lack of participants gained from a service provided for individuals with ASD. Service staff explained the research to potential participants, however, subsequent discussion found that none of the potential participants had recognised dream experiences and despite assurances that this did not preclude them from participation, they still did not wish to take part. Social desirability effects may also have meant that individuals with LD were less keen on taking part in something that may find them responding “incorrectly” (e.g. Sigelman, Budd, Spanhel & Schoenrock, 1981).

4.5.2 Use of measures

4.5.2.1 *The Dream Interview Schedule*

The dream interview schedule (originally used by Stenfert Kroese et al., 1998) had a number of potential flaws. As noted by Stenfert Kroese et al. (1998) it could be argued that the greater percentage of incorrect responses to questions regarding dreams were due to acquiescence effects (Sigelman et al., 1981). For example, participants answered ‘yes’ to questions in order to appear more socially desirable and to agree with the interviewer (Stenfert Kroese et al., 1998). In order to be correct the majority of the questions regarding dreams required a ‘no’ answer, that is all those questions relating to the perceptually private, non-physical and individuated nature of dreams. Similarly, the question regarding the non-physical nature of photographs also required a ‘no’ answer. This question produced the greatest percentage of incorrect answers regarding photographs.

However, in agreement with the findings of Stenfert Kroese et al. (1998) this hypothesis does not hold true across the whole of the interview schedule. For example, the questions regarding the ability to think and dream about fictional entities all required ‘yes’ answers to be correct. As demonstrated by figure 7, participants gave a large proportion of ‘no’ answers to these questions, as they did in the Stenfert Kroese et al. (1998) and Edwards (1999) studies. Perhaps the social desirability of agreeing with the researcher was overridden by the social desirability of not wanting to admit

to thoughts or dreams which may have been considered unusual or bizarre (e.g. Stenfert Kroese et al., 1998). Edwards (1999) produced some support for this hypothesis, although results of the analysis of the association between participants' understanding of the ability to dream about fictional entities and social desirability scores were not statistically significant.

The 'no' responses to questions regarding the ability to think or dream about fictional entities also require consideration in view of the findings of the present study regarding the association with first order ToM deficits and of the research of Scott and Baron-Cohen (1996). Taking this position, it could be argued that the 'no' responses to the questions regarding fictional entities were not an artefact of the interview schedule, but were a demonstration of first order ToM deficits. Any future use of the interview schedule should explore the possibility of acquiescence by ensuring that the interview questions regarding objects, photographs and dreams require equal proportions of 'yes' and 'no' responses. Also a matched question design could be utilised, whereby the first time the question is asked it requires a 'yes' answer and the second time a 'no' answer (and vice-versa).

Further consideration of the process of conducting the closed question section of the dream interview schedule raises the possibility of other potential confounding factors. It was apparent that at times some participants felt that the questions may have been asking for more complicated answers than they at first suggested, that perhaps they were "trick" questions. For example, in response to the first question that was asked ('can John see his dog?') a small number of participants answered 'no' but then stated that John could see the dog if he were 'wearing his glasses' or if he were 'not blind'. A small number also suggested that he could see the dog only if the dog were 'not hiding'. These participants provided this qualification of their responses without any prompting from the researcher, as this was not permitted when following the procedure. This meant that the responses of these participants could be scored appropriately. However, this raises the possibility that there may have been a greater proportion of participants who could also have been confused

regarding what the question was asking but have simply answered 'no' without further qualification of the reasons. This may have meant that a number of the responses scored as incorrect on the interview schedule may have been a result of a misunderstanding of what was being asked rather than reflecting an inaccurate conceptualisation of real objects, objects in photographs or objects in dreams. However, given that this could have applied to all the questions asked on the closed-question section of the interview schedule and that the questions regarding dreams required a 'no' response to be correct, if a large number of participants had responded in this way then it would seem likely that the conceptualisation of objects in dreams would have appeared better understood than that of real objects and objects in photographs. This was not the case. Through the process of conducting the closed-question section of the interview schedule the researcher found that it was those participants with a milder level of LD that were most likely to provide answers with greater conviction or with qualifying statements. It is possible that participants with a greater severity of LD may have been providing answers based on a less than clear understanding of what was being asked. Given that the procedure did not allow for any clarification of their responses, however, this was impossible to determine.

These difficulties did not arise to such a large extent in the child development studies, where the initial responses were probed in greater depth. In order to develop the quality of the reasoning of participants in the child dream conceptualisation studies, the interviews did not stop at first answers. The children were prompted to justify or explain their assertions through a series of sub-questions, counter-questions or suggestions to explore the limits of their understanding (e.g. Laurendeau & Pinard, 1963; Woolley & Wellman, 1992). This was not applied to the present study, nor to the previous studies of conceptualisation of dreams in adults with LD (e.g. Edwards, 1999; Stenfert Kroese et al., 1998). It was felt in the present study that a rigorous interview schedule might prove distressing for participants. Also, given the nature of acquiescence and social desirability in participants with LD (e.g. Sigelman et al., 1981), it was possible that repeated

questioning of a participant's view may have been taken as evidence that the participant had answered the original question incorrectly. Participants therefore may have altered their answer in line with what they believed the interviewer to want to hear.

The lack of rigorous questioning in the present study may at times have limited the information obtained from participants. For example, when answering 'yes' to 'can you see it?' it was often unclear whether the participant believed the dream to be present as an external phenomena or whether they simply meant that the dream was visual in quality. Therefore, it was difficult to distinguish between which of Piaget's (1929, cited in Wellman & Estes, 1989) two viewpoints on the degree of realism in dreams participants' responses suggested. For example, whether participants could not distinguish between the dream entity and the actual corresponding real entity, or whether dream entities were viewed as images of the real entity with the images themselves as physical (e.g. Wellman & Estes, 1986).

The strengths and weaknesses of the measure are both reflected in the above discussion. The strength of the measure being reflected in the possibility of its use with participants with a greater severity of LD on the basis that it does not require lengthy verbal responses in order for people to be able to respond to it. The weakness unfortunately stemming from this same point, that due to the interview only requiring 'yes' or 'no' response, it is not possible to be wholly confident that all of the responses reflect an inaccurate or accurate conceptualisation of real objects, objects in photographs and objects in dreams, rather than incomprehension of what was asked. The measure also required participants to listen and respond to relatively large amounts of verbal information. This again could have caused difficulties for participants, particularly those with a greater severity of LD, in terms of remembering or comprehending what was being asked.

With regards to the interpretation of data produced by the interview schedule, the importance of the artificial nature of the interview situation requires consideration. Laurendeau and Pinard (1963), regarding the

research examining children's conceptualisation of dreams, noted 'that the child's answers often seem to spring from a rigorous system is largely due to the questioning itself, which forces the child to formulate explicit beliefs heretofore unexpressed and still relatively uncommunicable' (p.14). It was, therefore, possible that the same applied to the beliefs of the participants with LD. The participants may have been prompted to become conscious of and conceptualise mental attitudes that had not previously been formally considered. The questions may have brought about 'the systematisation of a way of thinking which itself is not systematic' (Laurendeau & Pinard, 1963, p.14).

4.5.2.2 *The BPVS-II*

Although the BPVS-II (Dunn et al., 1997) has been used widely in both research and clinical practice with adults with LD, it was designed and standardised for children. It is important to consider that age equivalent scores (calculated from the raw data) were likely to demonstrate some degree of error when applied to adults.

4.5.2.3 *The Learning Disability Casemix Scale*

Analysis of the LD Casemix Scale (Pendaries, 1997) data suggested that the majority of participants had mild LD. However, the range of scores found on the BPVS-II suggested a more varied range of ability in participants, at least in terms of receptive language ability. It seemed possible that the Casemix scale may have, on occasion, provided results that underestimated the severity of participants LD. One possible reason for this may be that day service staff, who may not have been used to assessing adaptive skills in the day service environment, completed the scales. These skills may have been overestimated due to staff's lack of familiarity with certain aspects of individuals' lives. It may also be that some individuals had more developed adaptive skills than verbal intelligence, which were picked up more readily by the LD Casemix scale. Adaptive skills do form an important aspect of the AAMR definition and classification system of LD (Luckasson et al., 1992)

4.5.2.4 *The Modified version of the Sally-Ann test*

In the present study the modified version of Wimmer and Perner's (1983) false belief task was presented in story board form (a pictorial representation) along with the verbal presentation of the story. It is possible that the pictorial representation could have been more difficult for people with LD to understand as opposed to acting the story out with dolls (e.g. Baron-Cohen et al., 1985). However, the participants with LD had demonstrated the ability to generalise pictures to real entities by answering questions on the BPVS-II. False belief tests have been used with other clinical groups using pictorial formats (e.g. C. Frith & Corcoran, 1996, in their study using participants with 'schizophrenia'), but the generalisability of these to individuals with LD is unlikely to be straightforward.

4.5.2.5 *Background information*

Participants and day service staff were asked for information regarding medication and diagnosis. During this process it became apparent that services were not always fully up to date with relevant diagnoses or medication if these were not considered to directly affect service provision. Therefore, it was possible that some diagnoses or medication prescriptions may have been missed, which may have affected the data utilised for the hypotheses regarding the links with dream conceptualisation.

4.6 Strengths of the study

4.6.1 Inclusion and exclusion criteria

The stringent inclusion and exclusion criteria represent a strength of the study. The BPVS-II cut off criteria for receptive language ability of participants was chosen in line with the developmental research regarding the conceptualisation of dreams. Woolley and Wellman's (1992) study demonstrated that children of four years of age and above could understand and respond appropriately to the interview schedule. For this reason, data from three of the participants (who scored under four years on the BPVS-II) was excluded from the analysis.

Participants were also required to be 75 per cent reliable in their responses across the interview schedule. This criteria matched that set by Stenfert Kroese et al. (1998) in their original study and was designed to ensure that participants were not simply selecting random 'yes' or 'no' answers to the questions. The use of these criteria meant that data from nine participants was excluded from the analysis. Data from another participant was also excluded due to a high rate of acquiescence, as he responded to all questions with a 'yes' answer (c.f. Woolley & Wellman, 1992).

The criteria were selected with the aim of reducing the risk of Type-I and Type II errors due to sampling error. One of the difficulties of introducing strict inclusion criteria is that small sample sizes reduce the power to detect significant differences in statistical analyses. This was not the case in the present study, however, as the sample size from the power calculation was met. However, the results of the data regarding the association of first order ToM ability with accurate conceptualisation of dreams may have been of greater significance with a larger sample size.

4.6.2 Consent process

Careful consideration was given to the issue of informed consent for participation in the study. The procedures utilised were in line with good practice, as developed in a study specifically exploring the issue of consent in individuals with LD (Dye, 2001). Information regarding the study was provided on at least two occasions and participants' understanding assessed at each. It was made clear to participants throughout the study that they were free to withdraw at any time and without any negative consequences. Behavioural indicators of consent were observed at all times.

In addition to the views of participants themselves, day service staff and/or family and carers were informed of participants' desire to take part. They were given the opportunity to contact the researcher prior to the study if they so wished, however, this did not occur on any occasion. There was only one known instance of a potential participant changing their mind due to the concerns of their family.

4.7 Implications for theory

This section discusses the possible interpretations of the findings in relation to theory and the subsequent implications for clinical practice. Suggestions for future research in order to explore the interpretations further will also be discussed.

4.7.1 Conceptualisation of dreams in adults with LD

In the current study significant differences were found regarding the ability of participants to accurately conceptualise real objects, objects in photographs and objects in dreams. This fit with the previous findings of dream conceptualisation studies in adults with LD (Edwards, 1999; Stenfert Kroese et al., 1998). Not only were adults with LD significantly less able to accurately conceptualise dreams according to the total percentage of correct answers, but also more specifically they were less able to conceptualise dreams according to their perceptually private and non-physical nature. In line with the previous research (e.g. Edwards, 1999; Stenfert Kroese et al., 1998) participants were also confused regarding the individuated nature of dreams (demonstrated by the finding that 42 per cent of answers reflected an inconsistent conceptualisation of the individuated nature of dreams). The ability to dream about fictional entities was also considered impossible by a large number of participants.

It is recognised that the results are predicated on the assumption that the closed-question section of the dream interview schedule is valid. It is important that the methods used to investigate the understanding of people with LD are sensitive enough to detect a true picture of their understanding. The limitations discussed previously (see 4.5.2.1) suggest that there are some aspects of the closed-question section of the dream interview schedule that may lead to the suggestion that it is perhaps sensitive to other confounding factors, such as a lack of comprehension of what is being asked. However, overall, it is felt that the interview schedule is a valid measure of the conceptualisation of dreams, particularly given its development in the literature regarding the development of cognition.

The generalisation of these findings would suggest that a large proportion of adults with mild to moderate LD are likely to be confused regarding the perceptually private, non-physical, individuated and potentially fictional nature of dreams. Many adults with mild to moderate LD are likely to be vulnerable to believing that their dreams are taking place around them; that they can be witnessed by other people if they are present in the room; that they can be touched and manipulated; that others asleep in the same room may actually share their dream experience and that their dreams are generally about real events.

The conceptualisation of dreams as perceptually public, physical and shared entities suggests a *realistic* misconception of mental entities, namely the attribution of physical properties to the dream (e.g. Piaget, 1929, cited in Wellman & Estes, 1986). This level of realism, whilst found by Piaget (1927, cited in Laurendeau & Pinard, 1963) in children up to 12 years of age was not observed by more recent studies involving children (e.g. Laurendeau & Pinard, 1963; Wellman & Estes, 1986; Woolley & Wellman, 1992). The methodology of the current study more closely resembled the recent studies (e.g. Wellman & Estes, 1986; Woolley & Wellman, 1992), who found that a *realistic* misconception of dreams did not occur above the age of three years. The exception was the belief that dreams could be shared between sleeping minds, which was found in many of the three year olds (Woolley & Wellman, 1992). The findings of the child studies demonstrated, in contrast to the current study, a generally coherent mentalistic understanding of dreams (Woolley & Wellman, 1992).

The current findings suggest that many adults with mild to moderate LD do not have a coherent mentalistic understanding of dreams and that they have significant difficulties with the understanding of dreams as internal phenomena, different from external [real] events. The conceptualisation of dreams in the present study (along with the studies of Edwards, 1999 and Stenfort Kroese et al., 1998) demonstrated a much more *realistic* understanding of dreams than that found in children (e.g. Woolley & Wellman, 1992). This may have implications for the ability of adults with LD

to distinguish other internal phenomena (such as thoughts) from external events.

The answers of participants to the open-ended questions seemed to suggest a less *realistic* (Piaget, 1929, cited in Wellman & Estes, 1986) conceptualisation of dreams than that obtained by the closed interview schedule. This could be interpreted in relation to the artificial nature of the interview schedule (Laurendeau & Pinard, 1963). However, in contrast to Laurendeau and Pinard's (1963) statement regarding the interview forcing participants to conceptualise something hitherto not conceptualised, the reasoning seems coherent when assessed more naturally. However, the very nature of the open-ended questions meant that it was participants with milder LD who could provide answers. As previously suggested a large number of individuals failed to provide any answers to the open-ended questions. These findings are therefore unlikely to be representative of the whole sample and those of the closed interview schedule are likely to suggest a more comprehensive conceptualisation of dreams, taking into account the views of those with a greater severity of LD.

It would have been useful to have compared individual participant's answers on the open-ended questions with their answers to the closed-questions in order to determine whether they reflected a consistency in the conceptualisation of dreams. This may have helped to further clarify the validity of the closed-questions section of the interview schedule. This would need to be addressed before the findings could be written up for wider publication.

The disparity between the findings of the child research and the research regarding adults with LD has implications for the conceptualisation of LD as a result of 'delayed' or 'different' development (Baumeister, 1987). The conceptualisation of dreams by adults with mild to moderate LD, as found not just in the present study, but also in those of Edwards (1999) and Stenfert Kroese et al. (1998), does not appear to simply reflect an earlier stage of development. That is unless the conceptualisation of dreams found

in adults with LD reflects a stage similar to the development of children under the age of three. However, given that this is impossible to measure, as children this age would have difficulty with an experimental situation, this is difficult to empirically examine.

The finding that a large number of participants described dreams regarding deceased relatives (c.f. Turner & Graffam, 1987) and were confused as a result regarding the permanence of death, suggests that perhaps these experiences do reflect an earlier stage of development (c.f. Harper & Wadsworth, 1993; McAvoy, 1989). However, as the conceptualisation of death was not explored in detail, it cannot conclusively be described as 'delayed' rather than 'different'.

Many of the descriptions of dreams provided by participants involved action sequences and the self as an active participant, equivalent at least to those of children aged seven to nine years in Foulkes 1982, 1985 and Foulkes et al.'s 1990 research. They were not dissimilar to dreams of adults without LD described by Hobson (2002). Other participants provided less detail, stating more simply that dreams were about certain individuals but providing little other detail. Again, it was observed that participants with more developed communication skills that could provide more complex narratives. It is unclear, as suggested by Edwards (1999), whether verbal ability was associated with the ability to experience complex dreams or simply to report them. It is also possible that the dreams reported were not reflective of the more general experience of dreams for the individuals. For example, it has been found that dreams recalled from home reporting tend to be more bizarre and attention grabbing than those reported on awakening in a sleep laboratory (e.g. Foulkes, 1982; Kerr, 1993), although the fact that they were reported suggests that on occasion such dreams occurred.

4.7.2 Cognitive correlates of dream conceptualisation

4.7.2.1 *ToM ability*

It should be noted that Edwards (1999) found that a number of participants with 'schizophrenia' (without LD) also had difficulties with the

conceptualisation of dreams, although the sample size ($n=14$) was very small. This similarity in conceptualisation of dreams by individuals with LD and individuals with psychosis would seem to suggest a parity of experience, which could perhaps be explained by disruptions in both groups of the abilities needed to source monitor (e.g. Johnson et al., 1993; Johnson & Magaro, 1987). Some of the reasons for disruption of the ability to discriminate the required clues to the internal or external nature of the phenomena may be similar in people with LD and those with psychosis.

One possible reason for the difficulty with the conceptualisation of dreams, which may possibly be related to difficulties with the ability to source monitor, is lack of ToM ability. The current study explored the relationship between first order ToM (an absence of which has been found to be associated with psychosis e.g. C. Frith, 1992) and the ability to accurately conceptualise dreams. Whilst overall first order ToM was not associated with ability to conceptualise dreams, there was an association (nearing statistical significance) with the ability to conceptualise dreams as potentially fictional entities. In Edwards' (1999) study a minority of the participants with a diagnosis of 'schizophrenia' were confused regarding the ability to dream about fictional objects (approximately 20 per cent of answers reflected this) and think about fictional objects (approximately 25 per cent of answers). Whilst it is not possible to conclude that these difficulties were as a result of ToM impairments of participants with schizophrenia (as ToM was not investigated), it is not an unrealistic assertion.

Whilst none of the other dream dimensions produced a statistically significant association with ToM, some of the results were in the direction predicted (e.g. for the overall conceptualisation of dreams and for the non-physical conceptualisation). In the Edwards (1999) study there were participants with 'schizophrenia' who made errors regarding all aspects of dream conceptualisation. Whilst Edwards (1999) had suggested that it was likely that the individuals with LD in her study failed the questions based on incomprehension rather than specific difficulties with ToM, the present findings suggest possible similarities in the reasons for inaccurate

conceptualisation of dreams by individuals with LD and individuals with psychosis (and no LD). However, given the lack of statistical significance, caution is suggested in making this interpretation. Some support for the hypothesis could be assumed from the finding of the difficulties of individuals with ASD (also likely to have ToM impairments) with a task requiring the ability to draw impossible (unrealistic) pictures (e.g. Scott & Baron-Cohen, 1996, see 4.2.4.5). Further support is provided by Hulburt et al. (1994) whose results suggested 'the ability to attribute mental states in experimental ToM tests and the ability to introspect on one's own thoughts in the experience sampling task are strongly linked' (p.394).

The findings of the present study regarding the appropriate failure of the first order ToM task (that is those who answered the memory and reality questions correctly, whilst failing the belief question) of 30.8 per cent of the participants, adds further support for specific ToM deficits in people with LD (e.g. Yirmiya et al., 1998). This suggests that some individuals with LD fail false belief tasks due to specific problems with mentalisation rather than due to incomprehension of the tasks. The pass rate on the first order ToM test in the present study (48.1 per cent) is not dissimilar to that found in the study by Happé (1995).

4.7.2.2 *Receptive language ability*

The findings of the present study support those of Edwards (1999) that as receptive language ability improves so does accuracy of dream conceptualisation, or at least accuracy to report dream conceptualisation. As receptive language ability has been found to correlate positively with measures of general intelligence (e.g. Elliott, 1983), it could be cautiously viewed as a measure of developmental level. However, the researcher is not suggesting that adults with LD function at the same developmental level as those with matched receptive language due to the additive factors of experience and differing measures of intelligence. If the cautious view is applied to the findings, however, they would appear to support Piaget's stage model of an increase in objectivity associated with an increase in cognitive ability.

The findings of the present study regarding the association of first order ToM ability with dream conceptualisation (only nearing statistical significance with regards to the ability to dream about fictional entities) need consideration in view of the findings of receptive language ability. As ToM could be equated to Piaget's view of egocentrism, this ability would again be expected to increase along with general cognitive development. In this way, it would also be expected to be associated with receptive language ability. This has been found to be the case in previous research on ToM ability, for example Happé (1995) found ToM ability to be related to VMA in both her LD and ASD groups (although not in the LD group). Similarly, ToM abilities were shown to be associated with performance and VMA in individuals with LD, ASD and those 'developing normally' reflecting an association with cognitive abilities (Yirmiya et al., 1998). However, individuals with ASD (in particular) and LD demonstrated difficulties in ToM ability over and above those found in 'normally developing' children of matched mental age. This would suggest that both individuals with ASD and LD have specific impairments in ToM ability and that while they show some association with VMA, they are not fully explained by this. This would perhaps support 'difference' theorists who would suggest that all individuals with LD have one or several specific cognitive deficits.

In order to assess whether first order ToM test scores in the present study were associated with receptive language ability (or VMA), a one way ANOVA was performed on BPVS-II age equivalent scores and the result of the false belief test. This found them to be significantly associated ($F=8.194$, $df=2$, $p=.001$). However, the fact that receptive language ability was found to be associated with all the dimensions of dream conceptualisation (with the exception of the individuated dimension) whereas ToM was not, suggests that the association is not straightforward. Nor would this be expected from the findings that whilst ToM is associated with VMA, deficits found in people with LD are over and above that expected from 'normally developing' children (e.g. Yirmiya et al., 1998). Therefore, it would appear that the

measures of receptive language ability and first order ToM utilised in the present study are measuring different aspects of ability.

4.7.3 Impact of inaccurate conceptualisation of dreams

4.7.3.1 *Likelihood of obtaining a diagnosis of psychosis*

The present study found no support for an association between accurate dream conceptualisation and the likelihood of receiving a diagnosis of psychosis, although the results were in the direction predicted (albeit with a very small sample size in the psychosis group). However, the possible association of ToM ability with dream conceptualisation (in particular the association with the ability to dream about fictional objects, which is on the border of statistical significance), suggests that this may prove a reasonable line of enquiry. It appears that the deficits in both populations would share similarities, particularly in view of the support for an association of ToM ability and symptoms of psychosis (e.g. Drury et al., 1998; C. Frith, 1992; C. Frith & Corcoran, 1996; Pickup & C. Frith, 2001; Sarfati et al., 1999). The prevalence of diagnosis of psychosis in the research sample was not dissimilar to that found in recent epidemiological research (e.g. Shoumitro et al., 2001; Taylor et al., 2004).

The experience of conducting the research interviews suggests support for the difficulties with the application of a psychiatric diagnostic model to individuals with LD (as suggested by Stenfert Kroese et al. 2001). For example, some participants had greater difficulties than others in providing self-reports due to difficulties in communication skills. The researcher sometimes had difficulty determining whether the understanding of the topic of the conversation was the same (e.g. whether the same kind of 'dream' was being referred to, whether the participant was describing thoughts, and so on) and also whether on occasion participants felt it necessary to elaborate on experiences to please the researcher (as suggested by Foulkes, 1993, in relation to collecting children's dream reports). The researcher was particularly aware of all these factors given the rationale for the research, but still found them difficult to resolve.

4.7.3.2 Likelihood of receiving psychotropic medication

The present study found no association between accurate dream conceptualisation and the likelihood of receiving psychotropic medication. The results were not in the direction predicted (although again the medication group sample size was very small). It could be possible that the 9.6 per cent of the sample that received medication answered a greater percentage of questions correctly for the reason that they received medication. The medication may have had the desired effect on the brain processes of the individuals that had received it, e.g. they no longer had any symptoms of psychosis and their thinking was in line with a more *objective* (e.g. Piaget, 1927, cited in Laurendeau & Pinard, 1963) view of reality.

4.7.3.3 Likelihood of displaying challenging behaviour

The present study found no association between accurate dream conceptualisation and the likelihood of displaying challenging behaviour. The results were not in the direction predicted (although the sample size was very small). One possible explanation for the lack of challenging behaviour may be that individuals were not overly distressed by their dream experiences. From the answers to the open-ended questions this certainly appears to be the case.

Very few participants reported distress at their dream experiences and those that did tended to report that the distress quickly disappeared. Any distress due to dream experiences was therefore unlikely to be displayed when at the day services. Perhaps the level of distress required to produce such extreme reactions so as to result in the rating of challenging behaviour is unlikely to be caused by dreams. For example, it may be that much greater life events are required e.g. sudden loss, or the need to adapt to novelty, which may result in catastrophic reactions (Levitas & French Gilson, 1994).

The degree of distress reported needs consideration given the findings of the self-report research regarding emotions. For example the self-reports with more questionable reliability were those where individuals with LD were asked to report 'negative' events or traits, including adaptive and

maladaptive behaviour and ratings of anger and depression (e.g. Benson & Ivins, 1992; Voelker et al., 1990). Participants could have been reluctant to report 'negative' experiences of distress.

It may also be the case that a measure of challenging behaviour may not have been the best way to obtain a measure of emotional distress, particularly with a sample of individuals with mild to moderate LD. Glick and Zigler (1995) found that even individuals with mild LD were likely to show symptoms of temper outbursts, physical assaults and fewer somatic complaints or depressed cognitions. However, their original suggestion had been that there is a developmental progression in the expression of emotional disturbance. Individuals with severe LD were hypothesised to be more likely to demonstrate emotional disturbance through actions (showing symptoms of turning against others rather than against themselves), whilst individuals with milder LD were hypothesised to be more likely to show emotional disturbance through their cognitions. Perhaps the individuals in the present study who, in contrast to Glick and Zigler's (1995) sample, were not a clinical sample, fit better with their original hypothesis. The fact that Glick and Zigler's (1995) sample were all psychiatric inpatients may have meant that challenging behaviour was more likely.

A self-report measure of emotional distress may have been better suited to the needs of the client group. For example, Lindsay et al. (1994) found that people with LD had a degree of insight into their emotions and could describe them given measure on which to do so, and could do so consistently across different measures.

The prevalence of challenging behaviour in the present study was similar to that found in previous research, e.g. population studies have found a rate of 6-14 per cent (Emerson, 1995; McClaren & Bryson, 1987).

4.8 Implications for clinical practice

4.8.1 Conceptualisation of dreams by adults with LD

There are implications for clinical practice related to the possible 'different' experience of some adults with LD regarding dreams (and possibly other mental phenomena). The position of difference theorists is that these cognitive differences would result in qualitatively different ways of making sense of the world (Barrett & Jones, 1996), or possibly, qualitatively different experiences. Any clinical involvement would need to ensure that the understanding or experience of dreams, or perhaps any mental event, was not assumed to be the same (or to be communicated in the same way) for individuals with LD, in comparison to individuals without LD.

Examples of where similar understanding has incorrectly been assumed were reported by participants in the present study, for example the participant who was diagnosed as having 'schizophrenia' whose grandmother spoke to him at night. Although it was not clear whether this experience had led to the diagnosis of 'schizophrenia', it seemed likely to be involved as the participant himself now described the experience as a hallucination. The possibility that this may have been a misunderstood dream experience did not appear to have been discussed with him. This demonstrates the inherent difficulties in attempting to diagnose 'breaks' in reality testing in individuals who have difficulty communicating or conceptualising their view of reality (Weisblatt, 1994) and suggests that their view of reality should be closely examined before any conclusions are made. It also supports the statement that 'it would seem likely that verbally unsophisticated people are sometimes mistakenly diagnosed as hallucinating' (Slade & Bentall, p.94).

A similar disparity with the understanding of an individual with LD, compared with those without LD was described in the study by Edwards (1999). The explanation of dreaming, nightmares and sleepwalking to the individual with LD following the death of his parent may have resulted in an understanding of his actions (for himself and his family), which may have prevented the

dissolution of his living arrangements. It is also possible that a closer examination of his understanding of death and further explanation of this to him and his family members may have alleviated some of the confusion and distress.

The above examples suggest that similar understanding should not be assumed and that the combination of grief and misunderstood dream experiences can have catastrophic effects, which could have been minimised by simple psychoeducation. Stenfert Kroese et al. (1998) suggested that the implications of such an incorrect conceptualisation may well be profound, that individuals may experience more negative emotions such as distress, guilt and fear due to dreamed actions and events because of a lack of clarity with regards to the difference between dream life and real life.

The current findings also have relevance for the deployment of individual therapies for people with LD, an area which is currently expanding in both the application of psychodynamic therapies (e.g. Sinason, 1992) and also cognitive behavioural therapies (e.g. Stenfert Kroese, Dagnan & Loumidis, 1997). Whilst the understanding of dreams may be more directly relevant to the psychodynamic therapists, the understanding of mental experiences in general has implications for the use of cognitive techniques. If these experiences are understood or experienced differently to those of adults without LD, then further adaptations may be required to make the therapies relevant.

Particularly relevant to the use of cognitive techniques is the finding that a large proportion of the present sample (and those of Edwards, 1999 and Stenfert Kroese et al., 1998) reported that it was impossible to think about fictional entities. This has possible implications for evaluating the evidence for thoughts, as clients with LD may believe that by definition their thoughts are true (i.e. they are real and it is not possible to think about things that are not real). Also, if the results were interpreted as participants being unwilling to admit to bizarre or unusual thoughts due to social desirability effects (e.g.

Sigelman et al., 1981), then clients with LD in therapy may also be unwilling to admit to thoughts they feel others would rate as bizarre. This may cause difficulties for obtaining true descriptions of negative automatic thoughts or images.

4.8.2 Implications of ToM ability

The similarity in the conceptualisation of dreams by individuals with mild-moderate LD and individuals with psychosis (bearing in mind that Edwards, 1999 was under powered) would seem to suggest a potential similarity in the experience, or interpretation of the experience, by the two groups. This creates further potential for the misdiagnosis of psychotic symptoms in individuals with LD, where their descriptions of dream experiences will be reported to health professionals and potentially may be interpreted by health professionals in the same way as those reported by individuals with psychotic symptoms. This potential similarity in reporting and conceptualisation of experiences may also lead to individuals with LD scoring highly on measures designed to assess current psychotic symptomatology, such as the ICD-10 version of the PASS-ADD (Moss et al., 1998). The worst case scenario is that this “evidence” of psychopathology will result in the inappropriate prescription of psychotropic medication or the resettlement of the individual to a psychiatric inpatient unit.

The reaction of the individual to the reported experiences should be the key to determining the appropriate course of action. The course of action should not be directed by the reaction of carers or health staff to the reported experiences. In the discussion of the child development literature it was hypothesised that children were unlikely to be distressed by their lack of ability to distinguish internal from external events (as this situation is not unfamiliar). There are exceptions to this, however, for example the emotional distress that can be caused by nightmares (Laurendeau & Pinard, 1963). Whereas individuals with psychosis may demonstrate greater disturbance due to a novel deficit in ToM ability associated with the presence of psychotic symptomatology, which remits when the symptoms resolve (e.g. C. Frith & Corcoran, 1996), it could be hypothesised that individuals with LD

are also unlikely to be distressed, on the whole, by their inability to distinguish internal from external events as this reflects their normal experience. Again, there may be possible exceptions, perhaps demonstrated by the effect of the dreams of the participant in the Edwards (1999) study following the death of his parent. In such circumstances, exploration and explanation of the current state of affairs seems the most appropriate and least intrusive option.

There is evidence from studies of non-clinical samples of individuals without LD that individuals can experience unusual perceptual experiences (that may be classified as 'psychotic' by health professionals) and learn to accept and manage these without distress. For example, Romme and Escher (1996) sought responses regarding the experience of hallucinations from an appearance on Dutch television. They divided their respondents into patients (i.e. those who had sought and received psychiatric treatment) and non-patients (i.e. those who had managed their experiences without professional help). The findings suggested that it may not be the nature of the hallucinatory experiences per se that determines whether people become psychiatric patients or not, but the way in which individuals react to their experiences. When discussing individuals with LD it is important that the reaction of the individual takes precedence and, as suggested, the least intrusive methods of managing the situation should initially be attempted (e.g. psychoeducation).

This may be considered to be similar to more recent cognitive approaches to psychosis (e.g. Morrison, 1998), derived from the concept that psychotic symptoms are a misunderstood reflection of the real world and that delusional beliefs are formed and maintained in a similar way to normal beliefs (Garety & Helmsley, 1994). In these cases cognitive therapy takes the stance that psychotic symptoms and beliefs can be identified, evaluated and tested, in the same way as any other belief can, in cognitive therapy. Some of these techniques could be applicable to individuals with mild to moderate LD, although this would need empirical evaluation. It would also require consideration in view of the finding that individuals with LD believe

their thoughts to be real and that it is not possible to think about fictional things. Given Edwards (1999) findings this may also have implications when working cognitively with individuals with psychosis.

4.9 Suggestions for future research

4.9.1 Changes to the interview schedule

The findings of the present study have replicated the findings of previous research regarding the conceptualisation of dreams in adults with mild to moderate LD (Edwards, 1999; Stenfert Kroese et al., 1998). However, these studies have all utilised the same dream interview schedule in a very similar format. A number of potential limitations of this interview schedule have been identified (see 4.5.2). The main limitation is the need for respondents to answer 'no' to almost all of the questions regarding objects in dreams to be correct. Further research should alter the phrasing of the questions to ensure an equal spread of 'yes' and 'no' answers are required across all questions (e.g. real objects, photographs and dreams).

Further research may also benefit from adding to the interview schedule to enable further questioning to explore the limits of participants' understanding (e.g. Laurendeau & Pinard, 1963; Woolley & Wellman, 1992). This would provide more detailed information, particularly regarding the degree of realism being suggested by participants, e.g. whether the dream is present in the room and taking place around the individual, whether an image of the dream is present in the room, or whether individuals report seeing their dreams simply due to the visual quality of them. Further questioning of participants responses may also clarify whether the answers that were given reflected comprehension of what was being asked. For example, where participants are asked 'can John see the dog?' it may be useful to then ask for clarification e.g. 'what makes it possible for John to see the dog?' or 'why can't John see the dog?'. As suggested there are a number of difficulties with more rigorous questioning and all efforts would be needed to ensure more detailed questioning did not result in distress or changes in the answers of participants due to social desirability effects. It is also possible

that more detailed questioning would rule out some participants with a greater severity of LD from taking part in the research, as questions requiring them to justify or clarify their responses may be too verbally complex for them. In terms of the amount of verbal information that participants are required to process it may be useful for future research to provide pictorial prompts to remind participants what happened during the story. For example, a picture of John sitting in his living room with the dog sitting in front of him.

It is possible that the use of more open-ended questioning, such as that used by qualitative methods would be useful with participants with mild LD, so that their answers were not gained under the constraints of the interview schedule. However, this may exclude participants with a greater severity of LD from taking part in the research.

4.9.2 Investigation of the importance of ToM ability in dream conceptualisation

Given the direction of the majority of results for first order ToM ability, it is possible that an association may have been found with dream conceptualisation if the sample size had been larger. A replication of the current study with a larger sample size would help clarify the results.

The finding of Edwards (1999) that a number of her participants with 'schizophrenia' (without LD) had difficulties with the conceptualisation of dreams may have shed light on the relevance of ToM ability. For this reason further research would be useful which compared dream conceptualisation in individuals with psychosis (and no LD) with dream conceptualisation in adults with LD, using a larger sample size than that used by Edwards. A measure of ToM ability should be used with both groups to determine the association of this with dream conceptualisation.

4.9.3 Investigation of association of dream conceptualisation with the likelihood of receiving a diagnosis of psychosis

The current study was unable to accurately assess the association between dream conceptualisation and having received a diagnosis of psychosis, due to the small number of participants with a diagnosis of psychosis that were recruited. This may be addressed by the use of a larger sample size. Also the targeted recruitment of individuals who had received a diagnosis of psychosis (and had LD) may be more appropriate.

In view of the similarity of conceptualisation of dream experiences (and thoughts) in individuals with psychosis (and no LD) and adults with LD (e.g. Edwards, 1999), it seems possible that individuals with LD may be likely to score highly on measures designed to assess psychopathology. This could be explored by the use of a measure of psychopathology (e.g. the PASS-ADD, Moss et al., 1998) in future studies assessing dream conceptualisation. This would determine whether individuals are scoring higher than would be expected, and obtaining diagnoses, due to their inability to determine internal from external experiences. There would remain the complicating factor that individuals who inaccurately conceptualise dreams may actually be more likely to be psychotic due to these beliefs. However, as previously stated, the response to the individual should be based on their response to the experience rather than its simple presence.

4.9.4 Exploration of distress in relation to dream experiences

As discussed the present research used a measure of challenging behaviour as an indicator of emotional distress. This may have been misjudged given the severity of LD within the participant sample. Future research should examine this association using self-report measures.

4.9.5 Exploration of the effects of social desirability on responding

Edwards (1999) examined social desirability in her study. Whilst she did not find any statistically significant association with responses to the dream interview, the effect sizes suggested that it was worth exploring further.

4.10 Conclusions

It has been suggested that adults with LD are impaired in their ability to conceptualise dreams as perceptually private, non-physical, individuated and potentially fictional entities. Two previous studies have sought to explore this difficulty. Findings from the current study indicated that a proportion of individuals with LD do have difficulties accurately conceptualising dreams. They have a *realistic* understanding of dreams, that leaves them vulnerable to believing that dreams are real events, occurring around them, that they and others can see and manipulate. The ability to accurately conceptualise dreams (or at least report accurate conceptualisation) was found to increase with receptive language ability. In addition to this, the current study also found there to be some association between first order ToM ability and the ability to understand that dreams can be potentially fictional entities. There was not any empirical support, however, for evidence of a direct effect of the ability to conceptualise dreams on the likelihood of receiving a diagnosis of psychosis, receiving a prescription of psychotropic medication or of developing challenging behaviour.

In light of the recognised limitations of the study some caution was exercised in interpreting the findings. Possible implications for theory and clinical practice were discussed, in particular with reference for clinicians to carefully consider whether the understanding of the experience of mental entities discussed during therapeutic, or diagnostic, sessions were the same for the clinician and the individual with LD. Suggestions for future research were made.

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Service Information Sheet:

A Study of the Conceptualisation of Dreams in Adults with Learning Disabilities and Autistic Spectrum Disorders.

Aim of the research:

The research aims to look at the way that adults with learning disabilities understand dreams. The research also hopes to look at the understanding of dreams of adults with autistic spectrum disorders as well as learning disabilities, in order to see whether there are any differences in the understanding of dreams in this group of individuals.

The research will look at links between the understanding of mental states and the understanding of dreams.

The research will also look at links between the understanding of dreams, diagnosis of psychosis and use of psychotropic medication with adults with learning disabilities.

Reason for research:

Other researchers have suggested that confusion about internal states, difficulties differentiating between real and imagined events, and limited abilities in expressing these may have implications for the diagnosis of psychosis with adults with learning disabilities. It is possible that dream reports by adults with learning disabilities may be misinterpreted by others as hallucinations.

The literature shows that there is an elevated diagnosis of psychosis in adults with learning disabilities.

The literature also shows the high frequency with which psychotropic medication is prescribed to adults with learning disabilities.

Process:

Day centres in the North West area will be approached in order to identify potential participants.

Participants will then be approached by the researcher who will explain the purpose of the research. The researcher will provide both written and verbal explanation of the study.

The participants will be given at least 7 days to consider whether they wish to consent to take part in the research.

Once consent has been obtained the researcher will arrange a time to visit the participant at the day service. Approximately 1-½ hours will be required with each participant. The session could be split over two visits, although it is anticipated that only one session will be required.

The researcher will conduct with each participant:

- a structured interview
- a number of cognitive assessments

The researcher will also want to collect information on:

- diagnosis and medication
- challenging behaviour

Once this is completed no further contact will be required with participants.

Feedback:

The researcher will provide feedback of the findings to the participating services and individuals once the research is completed should they wish.

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Version No.1, November 2003.

APPENDIX 2.

Participant information sheet



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Conceptualisation of Dreams in Adults with Learning Disabilities and Autistic Spectrum Disorders Study

Participant Information Sheet

(NB To be read aloud if the participant has any literacy problems that might impair their understanding)

Please read this sheet carefully.

We are asking people to take part in a study on what people with learning disabilities (including people with learning disabilities and autistic spectrum disorders) know about dreams.

The study will be written up as a thesis as part of a professional qualification and will be put into a library. Papers will be written from the study and published in journals. This means that members of the public will be able to read about the study.

Information about the findings will also be fed back to the service providers so that they understand more about how dreams may affect people with learning disabilities.

What is the study about?

This study is about what people with learning disabilities think and know about dreams.

We are interested in how your dreams affect you.

We are interested in any medical diagnoses given to you and if you have been given any medication due to diagnosis.

What does the study involve?

We will meet you to explain the study. You will then be asked to think if you want to take part.

If you decide you would like to take part you will be seen by the researcher who will complete some short assessments with you about your thinking and understanding.

There will also be a short interview on what you know and think about dreams.

The interviews will be recorded on audiotape so that we do not miss important information. Once they have been written out the tapes will be destroyed.

The researcher will also want to ask you about any medication and diagnosis.

We want to ask you about any difficulties you may have and if we can talk to your carers or family about these.

You will be able to stop any time you like.

How long will the study last?

The interview and assessments should take about 1 ½ hours.

What do participants have to do?

You will meet the researcher for about 1 ½ hrs and complete the interview and the short assessments.

After you have taken part we can talk to you about the interview and assessments.

You do not have to share this information. If you want to share this information with your carers or family this will be up to you.

When it is finished we can provide you with a summary of the study.

What are the likely benefits?

The study will add to our understanding of learning disabilities and will help to indicate more clearly what kinds of help are likely to be most useful.

Will personal details be kept confidential?

All records will be kept confidential. Information from the study will be analysed anonymously, so that the identity of each individual participant remains private. This means that when the papers are written and information given to services, they will not know who the data is about.

What if I change my mind?

You do not have to take part in this study. If you have agreed to take part, you can stop at any time without giving your reasons. This will have no effect on any service you are receiving.

Who can I talk to for further information?

Mrs Anna Dodd

Trainee Clinical Psychologist

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Wythenshawe Hospital

Southmoor Road

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Tel: 0161 291 5881

PLEASE DO NOT HESITATE TO ASK IF YOU HAVE ANY MORE QUESTIONS
NOW OR LATER

Thank you for reading this information sheet

Version 3, April 2004.

APPENDIX 3.

Consent form

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1824

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Consent Form

Project: A Study of the Conceptualisation of Dreams in Adults with Learning Disabilities and Autistic Spectrum Disorders.

Researchers: Anna Dodd, Dr Dougal Hare & Dr Steven Hendy

Please initial box

1. I confirm that I have read and understood the information sheet dated
for the above study and have had the opportunity to ask questions

☐

2. I understand that my participation is voluntary and that I am free to withdraw at any
time, without giving any reason, without my medical care or legal rights being
affected

☐

3. I agree to take part in the study

☐

Name of participant Date

Signature

Name of researcher Date

Signature

Version 1, November 2003.

APPENDIX 4.

Letters to families/carers

The University
of Manchester

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6th December 04

Dear ...,

I am writing to inform you that ... has been contacted regarding his willingness to participate in a research project. The research is titled "A study of the conceptualisation of dreams in adults with learning disabilities and autistic spectrum disorders".

I have enclosed a Family/Carers Information Sheet in order to explain the nature and process of the research.

If you have any questions please don't hesitate to contact me.

Yours Sincerely,

Anna Dodd
Trainee Clinical Psychologist.

Version no. 1, March 2004

APPENDIX 5.

Family/Carer information sheet

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Conceptualisation of Dreams in Adults with Learning Disabilities and Autistic Spectrum Disorders Study

Family/Carer Information Sheet

Please read this sheet carefully.

We are approaching people with learning disabilities (including people with learning disabilities and autistic spectrum disorders) to take part in a study on what they understand about dreams.

The study will be written up as a thesis as part of a professional qualification and will be stored in the University of Manchester library.

What is the study about?

This study is about what people with learning disabilities understand about dreams and how their dreams might affect them.

We will want to obtain information regarding medical diagnoses and if any medication has been prescribed due to diagnosis.

What does the study involve?

The researcher will be visiting day services in the North West region. We will be asking individuals with learning disabilities (including people with learning disabilities and autistic spectrum disorders) if they would like to take part in the study. Initially they will be given an information sheet, which their keyworkers can look over with them.

If they indicate that they would like to take part the researcher will meet them at the day service and explain the study in more detail. They will then be given time to think about whether they would like to take part.

If the individual decides that they would like to take part the researcher will visit them again and formally obtain their consent.

The researcher will then complete some short assessments regarding skills in thinking and understanding. There will also be a short interview asking about their experience of dreams and also questions designed to elicit understanding of dreams. The interviews will be recorded on audiotape so that important information is not missed. Once they have been written out the tapes will be destroyed.

The researcher will also ask participants about medication and diagnosis. If participants are unable to provide this information we will seek their permission to ask keyworkers at the day service, or to contact family or carers to obtain this information. The researcher will also seek permission to ask day centre workers or family/carers about any behavioural difficulties that the participant may have.

If this permission is given we may need to contact you to obtain this information. The participant will be able to withdraw from the research at any time they like. If they appear distressed at any time the researcher will be mindful of this and stop the interviews.

How long will the study last ?

The interview and assessments should take about 1 ½ hours.

What do participants have to do?

Participants will meet the researcher for about 1 ½ hrs and complete the interview and the short assessments. This may be split into two shorter sessions if the participant prefers this.

After the assessments are completed we will feedback this information to participants if they like. This will be completely confidential. An anonymised summary of the research will be provided to services.

What are the likely benefits?

The study will add to the understanding of learning disabilities (including those with learning disabilities and autistic spectrum disorders) and will help to indicate more clearly what kinds of help are likely to be most useful.

Will personal details be kept confidential?

All records will be kept confidential. Information from the study will to be analysed anonymously, so that the identity of each individual participant remains private.

What if the participant changes their mind?

The individual does not have to take part in the study. Even if they have agreed to take part they can stop at any time without giving their reasons. This will have no effect on the service they receive.

Who can I talk to for further information?

Mrs Anna Dodd

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PLEASE DO NOT HESITATE TO ASK IF YOU HAVE ANY MORE QUESTIONS
NOW OR LATER

Thank you for reading this information sheet

Version 1, March 2004.

**APPENDIX 6. Open question interview schedule
(Stenfert Kroese et al., 1998)**

DREAM QUESTIONNAIRE

Part 1 :

Q1. Do you have dreams?

Prompt (if yes) : Tell me a bit about your dreams.
 Can you give me an example?

Q2. What is a dream?

Prompts : When do they happen?
 Where do they happen?
 How do they happen?

Q3. What do dreams make you feel like?

Prompts : Happy, scared, sad, angry?

APPENDIX 7.

Closed question interview schedule (Stenfert Kroese et al., 1998)

Part 2A

Q1. Physical object.

Now I'm going to tell you about a man called John. John lives in a house with his wife Sue and his dog. The dog is sitting in front of John.

(Illustrate position of John and the dog.)

- a) Can John see his dog?
- b) If Sue were in the same room, could she see the dog?
- c) Can John stroke the dog if he wants to?

Q2. Dream (one).

John is asleep in bed now. He is dreaming that he is on holiday, sitting on a sandy beach in the sunshine.

- a) Can John see the sand with his (own) eyes?
- b) If Sue went into the bedroom now could she see the sand (too)?
- c) If John dreamed he scooped up a handful of sand, would the sand still be there when he woke up?

Q3. Photograph

John is awake now and is sitting in his house. There is a photograph of his dog on the shelf.

(Illustrate position)

- a) Can John see the photograph of the dog?
- b) If Sue came in; could she see the photograph of the dog?
- c) Could John throw a ball for the dog in the photograph to fetch?

2A

Q4. Dream (two).

John and Sue have been for a long walk with the dog and now they have both fallen asleep. John is dreaming that he is holding an apple.

a) Is Sue dreaming of an apple too?

(If yes) Do two people sleeping in the same room always dream about the same thing?

(If no) Is there any way two people could have the same dream at the same time?

So, John is dreaming that he is holding an apple,

b) If John's friend David came into the room now, could he see this apple?

c) Could John really eat the apple?

Q5. (i) Fictional / Real distinction

a) Have you ever seen a banana that is blue?

b) Is there such a thing as a blue banana?

c) Could you think about a blue banana?

(If no) Could anyone think about a blue banana?

d) Could you dream about a blue banana?

(If no) Could anyone dream about a blue banana?

e) Could you draw a blue banana?

(If no) Could anyone draw a blue banana?

a) Have you ever seen a fish that can swim?

b) Is there such a thing as a swimming fish?

c) Could you think about a swimming fish?

(If no) Could anyone think about a swimming fish?

d) Could you dream about a swimming fish?

(If no) Could anyone dream about a swimming fish?

Part 2B

Q1. Physical object.

Now I'm going to tell you about Alice and her son Mark. Alice and Mark are going out. Alice picks up her hairbrush.

- a) Can Alice (really) see the hairbrush?
- b) What about Mark. If Mark were stood next to Alice could he see the hairbrush (too)?
- c) Could Alice really brush her hair with the hairbrush?

Q2. Dream (one)

Alice is asleep in bed now. She is dreaming that she is buying some eggs.

- a) Can Alice see the eggs with her (own) eyes?
- b) If Mark went into Alice's bedroom, could he see the eggs (too)?
- c) If Alice dreamed she dropped the eggs, would they be smashed on the bedroom floor when she woke up?

Q3. Dream (two)

Now Alice and Mark are both asleep in the same room. Alice dreams it is raining and she is holding an umbrella.

- a) Is Mark dreaming that he is holding an umbrella too?
- (If yes) Do two people in the same room always dream about the same thing?
- (If no) Is there any way two people could have the same dream at the same time?

So, Alice is dreaming that she is holding an umbrella,

- b) If Mark's sister Lucy went into the bedroom now, could she see the umbrella?
- c) Could Alice really open up the umbrella?

28

Q4. Photograph

Alice is awake now and is sitting in her house. She picks up a magazine with a picture of a bus on the front.

- a) Can Alice see the bus with her (own) eyes?
- b) If Mark was there, could he see the picture of the bus (too)?
- c) Can Alice ride on the bus in the picture?

Q5. (i) Fictional / Real distinction

- a) Have you ever seen a cow that can fly?
- b) Is there such a thing as a flying cow?
- c) Could you think about a flying cow?
(If no) Could anyone think about a flying cow?
- d) Could you dream about a flying cow?
(If no) Could anyone dream about a flying cow?
- e) Could you draw a flying cow?
(If no) Could anyone draw a flying cow?

Q5. (ii)

- a) Have you ever seen a tomato that is red?
- b) Is there such a thing as a red tomato?
- c) Could you think about a red tomato?
(If no) Could anyone think about a red tomato?
- d) Could you dream about a red tomato?
(If no) Could anyone dream about a red tomato?

APPENDIX 8.

Learning Disability Casemix Scale (Pendaries, 1997)

Learning Disability Casemix Scale

(Invicta Community Care NHS Trust)

For each of the following, write the most appropriate number in the blank before the item and tick the appropriate box after the item.

A1 Sensory Impairment

- 0 = Good vision and hearing even if wearing glasses or aides
- 1 = Impairment of vision even when wearing glasses and/or minor impairment of hearing which does not affect personal safety (e.g. crossing a road)
- 2 = Significant impairment of vision or hearing which can, in certain circumstances, affect personal safety
- 3 = Totally blind or totally deaf or both

Any significant changes in sensory impairment over the past six months? Yes / No

A2 Comprehension

- 0 = Able to understand a relatively complex conversation (e.g. planning an outing)
- 1 = Able to understand the gist of a simple conversation
- 2 = Able to understand simple commands (words or signs)
- 3 = None or little understanding

Any significant changes in comprehension over the past six months? Yes / No

A3 Expression

- 0 = Able to participate in a relatively complex conversation (for example, commenting on a planned outing or expressing preferences when buying an article of clothing)
- 1 = Able to relate a simple practical experience either verbally or by using sign language
- 2 = Able to communicate basic needs such as hunger, fear, pain etc with words or signs
- 3 = Totally unable to communicate

Any significant changes in expression over the past six months? Yes / No

A4 Mobility

- 0 = Totally mobile
- 1 = Mobile but not for long distances and/or unable to manage stairs easily
- 2 = Mobile but with aids only (e.g. canes, frame, support)
- 3 = Wheelchair bound

Any significant changes in mobility over the past six months? Yes / No

A5 Toileting

- 0 = Completely continent day and night at all times
- 1 = Has occasional accidents
- 2 = Able to exercise reasonable control of sphincters if taken to the toilet at regular intervals
- 3 = Totally unable to control sphincters even when taken to the toilet frequently

Any significant changes in toileting over the past six months? Yes / No

A6 Personal Hygiene

- 0 = Can look after personal hygiene competently
- 1 = Can wash self but needs assistance or reminders when washing hair, taking a bath or changing sanitary towel
- 2 = Able to perform some small tasks (e.g. drying face with towel) with help and support from carers
- 3 = Totally dependent on carers for all aspects

Any significant changes in personal hygiene over the past six months? Yes / No

A7 Dressing

- 0 = Can dress appropriately by self
- 1 = Can dress without any physical assistance but not always appropriate for the season
- 2 = Can dress with assistance from carers
- 3 = Needs to be dressed by carers

Any significant changes in dressing over the past six months? Yes / No

A8 Eating

- 0 = Can feed self with knife and fork in a socially acceptable manner
- 1 = Can feed self with knife and fork but tends to be messy
- 2 = Can feed self only once food has been cut / prepared
- 3 = Has to be fed by carer, cannot feed self even with a spoon

Any significant changes in eating over the past six months? Yes / No

A9 Time

- 0 = Can tell the time, date and season
- 1 = understands the concept well (hours, day, year) but cannot read the clock
- 2 = Can tell morning from afternoon or today from yesterday / tomorrow
- 3 = No concept of time

Any significant changes in time understanding over the past six months? Yes / No

A10 Money / Numeracy

- 0 = Competent at managing bills and/or bank account, cashing allowances etc.
- 1 = Can give correct amount, check change, but still needs support / help to manage bank account, bills etc. even when systematically involved by carer
- 2 = Knows what money is for but needs support / help when purchasing small items
- 3 = Has no concept of money

Any significant changes in numeracy over the past six months? Yes / No

A11 Literacy

- 0 = Enough reading and writing ability to cope with everyday situations
- 1 = Can read short, simple sentences but cannot write
- 2 = Can recognise some written words when printed or the most commonly used symbols such as those used for men's or ladies toilets
- 3 = No understanding of the most commonly used symbols of the social sight vocabulary

Any significant changes in literacy over the past six months? Yes / No

A12 Road Sense

- 0 = Competent even in unfamiliar surroundings
- 1 = Competent in familiar surroundings only
- 2 = Has some limited idea of road sense but cannot be trusted on his/her own
- 3 = No idea of danger

Any significant changes in road sense over the past six months? Yes / No

A13 Self Initiated Activity

- 0 = Enjoys being engaged in activities, usually initiated by self
- 1 = Shows occasionally that he/she can take initiative and participate in simple but purposeful activities
- 2 = Usually passive, needs constant encouragement to take part even in very simple activities, usually not for very long
- 3 = Resists engagement even into very simple activities either passively (stubbornness) or actively (protests)

Any significant changes in self-initiated activity over the past six months? Yes / No

A14 Sustaining Attention

- 0 = Ability to sustain attention is sufficient for completing a relatively complex task, such as playing a team game
- 1 = Ability to sustain attention is sufficient to complete a relatively complex task as long as she/he is helped to re-focus by staff
- 2 = Ability to sustain attention is limited to simple and short tasks
- 3 = Unable to concentrate, even on simple tasks. Needs constant reminders by staff and/or physical prompts

Any significant changes in sustaining attention over the past six months? Yes / No

C1 Offensive Behaviours Any one or combination of the following: screaming, regurgitating, noisy behaviour, smearing with saliva or faeces, pica, drooling or any similar offensive or antisocial habits.

- 0 = None present
- 1 = Observed by at infrequent intervals
- 2 = Observed often
- 3 = Chronic condition

Any significant changes in offensive behaviours over the past six months? Yes / No

C2 Self Injurious Behaviours Any one or combination of the following: biting self, eye-poking, scratching self, picking at sores, slapping self or similar behaviours resulting in self harm.

- 0 = Above behaviours not observed
- 1 = Above behaviours observed occasionally
- 2 = Above behaviour often observed with no or little danger for the person
- 3 = Above behaviours are chronic and are potentially harmful for the person

Any significant changes in self-injurious behaviours over the past six months? Yes / No

C3 Aggression towards Others

- 0 = Aggressive behaviour never or very rarely observed
- 1 = Occasional verbal aggression and/or threats
- 2 = Frequent verbal aggression and/or occasional physical aggression not resulting in serious injury
- 3 = Frequently involved in physical assaults but without a risk of serious injury
- 4 = Has been involved in physical aggression resulting at least once in the past 3 years in grievous bodily harm (with or without a weapon)

Any significant changes in aggression towards others over the past six months? Yes / No

C4 Destructive Behaviour

- 0 = Behaviour not observed
- 1 = Careless with personal and/or other peoples property
- 2 = Frequently damages personal and/or other peoples property
- 3 = Substantial damage caused on several occasions to furniture, fittings, building, vehicles etc. if left unsupervised
- 4 = Arson or act of similar gravity towards properties or vehicles

Any significant changes in destructive behaviour over the past six months? Yes / No

C5 Inappropriate Sexual Behaviour

- 0 = Sexual behaviour is socially acceptable
- 1 = Sometimes undresses in public if not supervised
- 2 = Inappropriate sexual conduct involving self only (e.g. exposes self, masturbates in public) if left unsupervised
- 3 = Inappropriate sexual behaviour involving a member of the public (e.g. groping, grabbing etc.) Or explicit sexual threats
- 4 = Rape, attempted rape, paedophile conduct at least once in the past 3 years

Any significant changes in inappropriate sexual behaviour over the past six months? Yes / No

C6 Repetitive Behaviour Any one or combination of the following: rocking of body back and forth, flapping hands, flicking fingers, pacing up and down, constant running, echolalia or similar stereotyped behaviours.

- 0 = Above behaviour(s) not observed
- 1 = Above behaviour(s) observed rarely and not for long
- 2 = Above behaviour(s) often observed but with regular periods of calm when behaviour is normal or near normal
- 3 = Above behaviour are virtually chronic

Any significant changes in repetitive behaviour over the past six months? Yes / No

C7 Disruptive Unreasonable Behaviour Any one or combination of the following: bickering, frequently involved in disputes, uncooperative, bad tempered, jealous, possessive.

- 0 = Above behaviour(s) not observed
- 1 = Above behaviour(s) observed rarely, usually not for long
- 2 = Above behaviour(s) observed regularly in certain situations only
- 3 = Above behaviour(s) are frequent, even when reasonable demands are made

Any significant changes in disruptive unreasonable behaviour over the past six months? Yes / No

C8 Dealing with Frustration

- 0 = Able to cope with frustration in a way which is appropriate to the situation
- 1 = Easily frustrated but easily calmed down
- 2 = Easily frustrated, needs a lot of attention/reassurance to calm down
- 3 = Frequently unable to control emotions, crisis point is reached quickly, frustration is spectacular, the crisis tends to take a long time to resolve

Any significant changes in dealing with frustration over the past six months?

C9 Excess or Deficit of Social Interaction *Excess:* Any one or combination of the following: attention seeking, over friendliness, touching people inappropriately, talking too much or any similar social excesses. *Deficit:* Any one or combination of the following: Withdrawn, unresponsive, indifferent, shy, prone to avoid social contact, or any similar social deficits

- 0 = Social behaviour is good in most circumstances
- 1 = Can display social excesses or social deficits in certain circumstances and usually not for long
- 2 = Prone to display social excesses or deficits but usually tends to respond positively when encouraged or corrected by amending behaviour accordingly
- 3 = Prone to display social excesses or deficits but does not respond to encouragement or prompting etc.

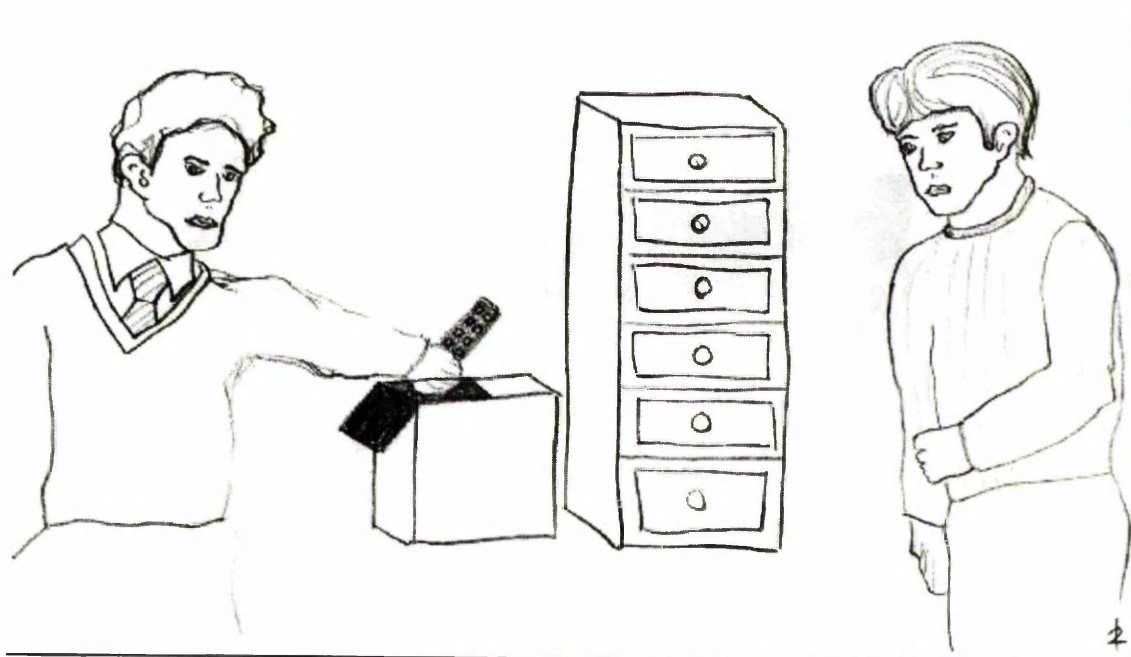
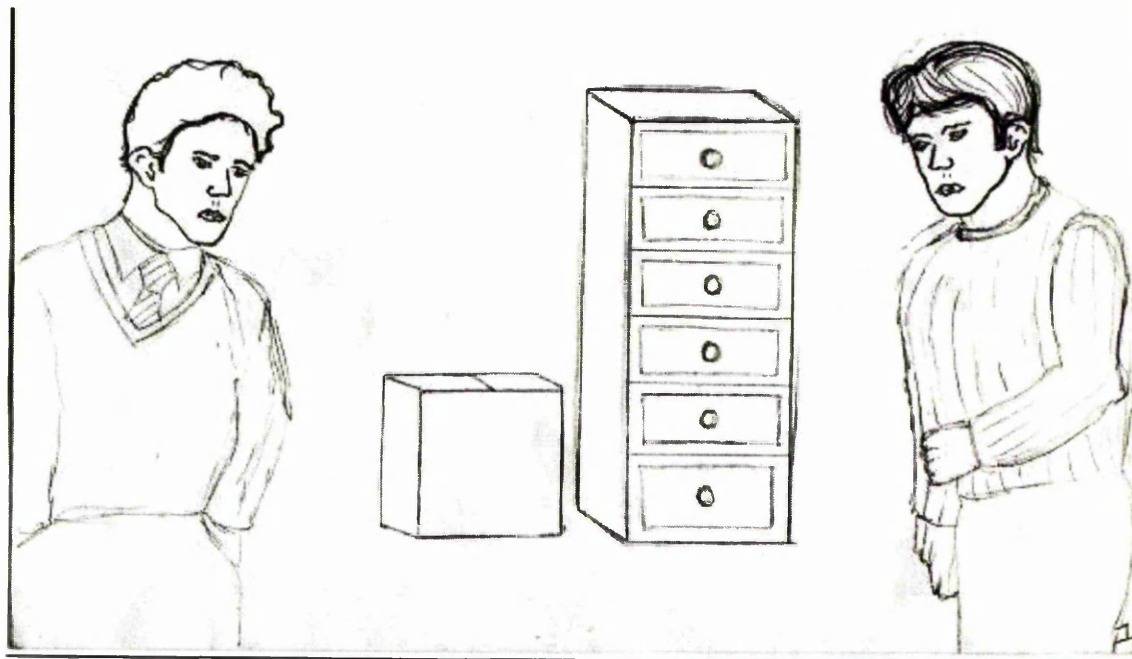
Any significant changes in excess /deficit social interaction over the past six months? Yes / No

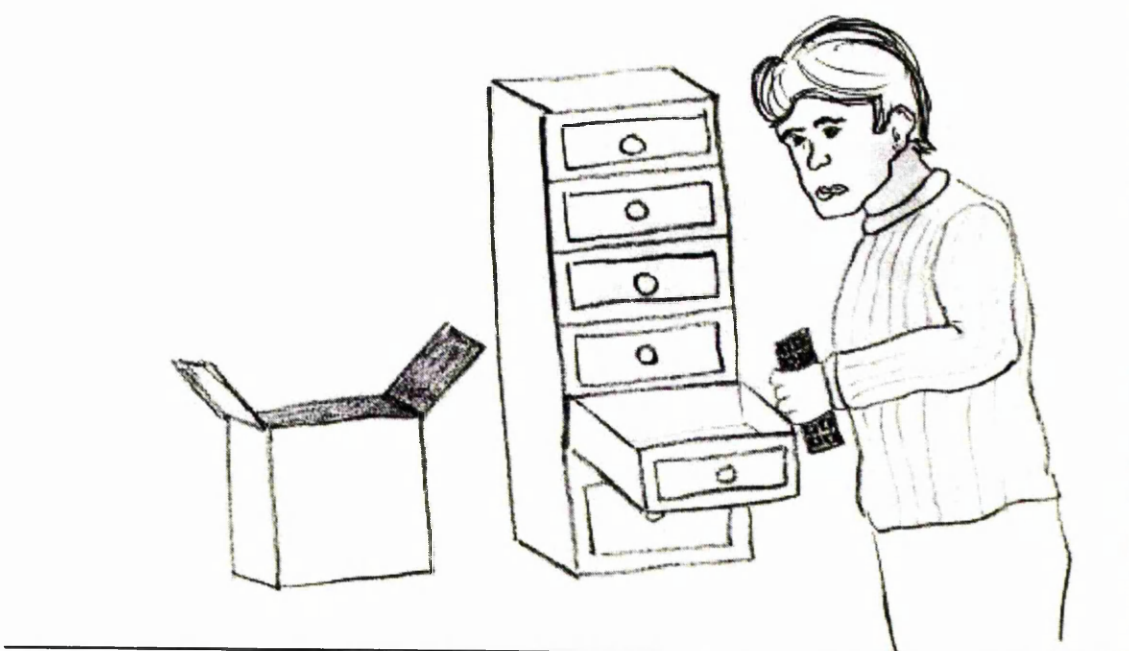
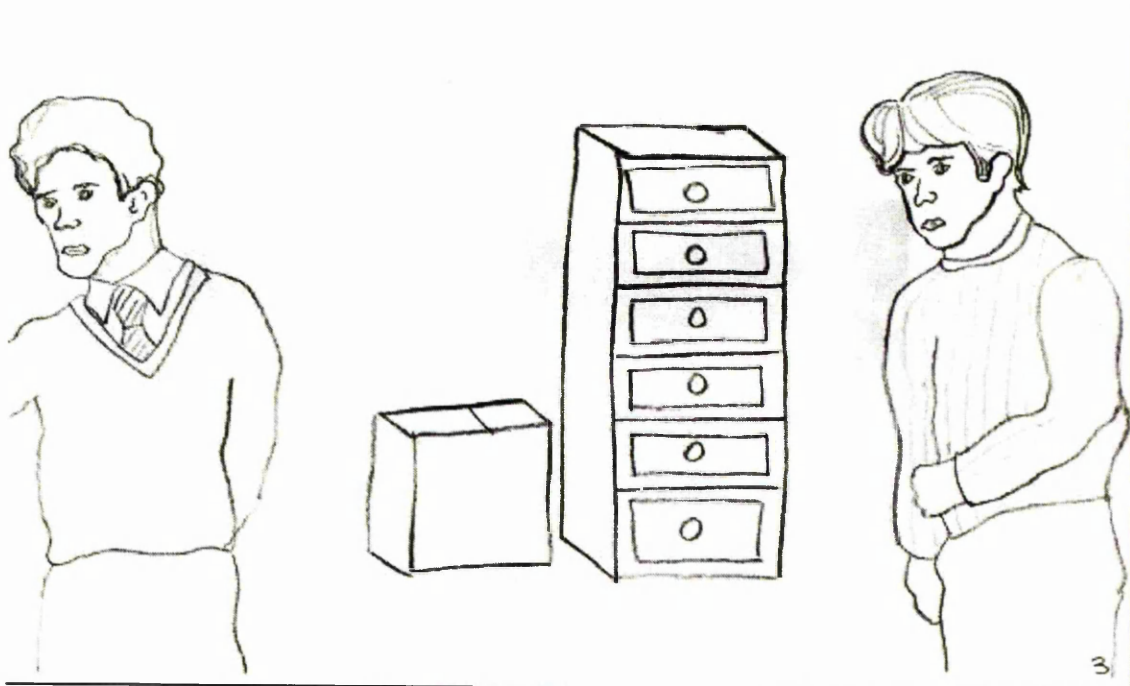
Suggested Scoring

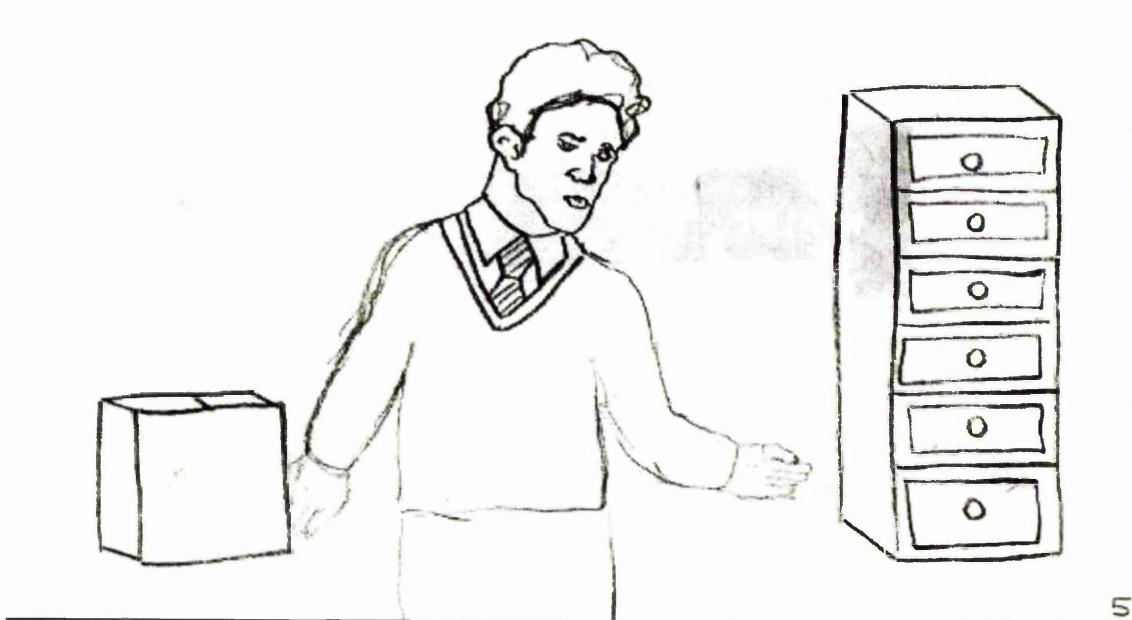
Dimensions			Challenging behaviour (Sum of scores on Items C1-C9)		
			0-6	7-13	14-30
			0	I	2
Learning disability (Sum of scores on Items A1-A14)	0-13	A	A0 (Mild disability, no challenging behaviour)	A1 (Mild disability and mild challenging behaviour)	A2 (Mild disability, with severe challenging behaviour)
	14-24	B	B0 (Moderate disability, no challenging behaviour)	B1 (Moderate disability and mild challenging behaviour)	B2 (Moderate disability, with severe challenging behaviour)
	25-42	C	C0 (Severe disability, no challenging behaviour)	C1 (Severe disability and mild challenging behaviour)	C2 (Both severe disability and severe challenging behaviour)

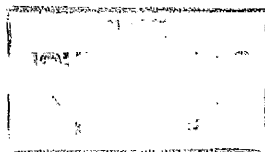
APPENDIX 9.

False belief test (based on Wimmer & Perner, 1983)









APPENDIX 10. Background information sheet

BACKGROUND INFORMATION

Participant Code:

GENDER:

D.O.B:

AGE:

ETHNIC ORIGIN:

Are you taking any medication?

(If yes) what is it?

Do you have any diagnoses?

(If yes) what are they?

Do you have any difficulties, like getting upset or angry?

(If yes) what are they?

Is it OK for me to speak to your key worker?

(The following information will be collected from key worker)

DIAGNOSIS:

MEDICATION:

CHALLENGING BEHAVIOUR (CASEMIX SCALE):

NOTES: