

**Immature Recall Ability in Dream Reporting with Children aged 3-5**

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*COMPULSORY DECLARATION*

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## Table of Contents

List of Tables .....	7
Abstract .....	8
Introduction.....	10
Review of the Literature .....	12
Dreaming.....	12
Pioneering Studies of Children’s Dreams .....	13
Children’s Dream Reports .....	15
Dreaming and Memory .....	17
Dreaming and Language .....	18
Dreaming and REM Sleep .....	20
Children’s Dream Research using Dream Reports .....	21
Foulkes’ Longitudinal Study .....	22
Criticism of Foulkes’ Study and Conclusions .....	24
Past Unpublished Studies.....	28
Rationale for Research.....	31
Part 1: Current Study .....	31
Part 2: Comparison to Past Studies.....	33
Quantitative comparison .....	33
Qualitative comparison .....	33
Method.....	34
Part 1: Current Study .....	34
Research design and setting.....	34
Participants.....	34
Inclusion and exclusion criteria .....	35
Ethical considerations .....	35
Measures .....	36
General measures .....	36
Dream recall.....	36
Most Recent Dream Report .....	36
Colace’s Children’s Dream Questions.....	37

Foulkes' Midnight Awakenings Interviews.....	37
Story recall.....	37
Content analysis of dreams.....	39
Procedure.....	40
Part 2: Comparison to Past Studies.....	43
Quantitative comparison.....	43
Effect size measure.....	44
Meta-analytic technique.....	44
Qualitative comparison.....	45
Data Analysis.....	46
Part 1: Current study.....	46
Part 2: Comparison to past studies.....	47
Results.....	48
Part 1: Current Study.....	48
Part 2: Comparison to Past Studies.....	48
Part 1: Current study.....	48
Sample characteristics.....	48
Independent ratings.....	49
Hypothesis 1.....	49
Correlation of word count of first dream report and first story recall.....	49
Hypothesis 2.....	50
Correlation of narrative element of first dream report and first story recall.....	50
Hypothesis 3.....	51
Word count of dream report and story recall between Interview 1 and Interview 3.....	51
Narrative element count of dream report and story recall between Interview 1 and Interview 3.....	52
Hypothesis 4.....	53
Content analysis of dreams.....	53
Activities (A).....	53
Emotions (E).....	53
Social interactions (SI).....	53

Characters (A).....	54
Summary of results Part 1.....	54
Part 2: Comparison to past studies.....	55
Quantitative comparison.....	55
Analysis of effect sizes.....	56
Effect sizes of word count dream/story.....	57
Effect sizes of narrative element count dream/story.....	57
Qualitative comparison.....	58
Active self-representation.....	58
Emotions.....	59
Social interactions.....	59
Summary of results Part 2.....	60
Discussion.....	61
Part 1: Current Study.....	62
Methodological implications.....	62
Hypothesis 1 and Hypothesis 2.....	66
Hypothesis 3.....	67
Hypothesis 4.....	68
Self-representation.....	68
Emotions.....	70
Social interactions.....	71
Characters.....	71
Part 2: Comparison to Past Studies.....	73
Quantitative comparison.....	73
Qualitative comparison.....	74
Limitations and Future Directions.....	75
Summary and Conclusions.....	79
References.....	80
Appendix A.....	93
Letter to the Parents.....	93
Appendix B.....	95
Parental Consent Form.....	95
Appendix C.....	96

Oral Assent Form.....	96
Appendix D.....	97
Demographics Questionnaire.....	97
Appendix E.....	99
Modified Version of the Most Recent Dream Report (Domhoff, 1996).....	99
Appendix F.....	100
Colace’s Children’s Dream Questions.....	100
Appendix G.....	101
Foulkes’ Studies Longitudinal Dream Research Questions.....	101
Appendix H.....	102
Guidelines for Word and Narrative Item Counts.....	102
Appendix I.....	103
Categories and Sub-Categories for Qualitative Analysis of Dream Reports.....	103

## List of Tables

Table 1. <i>Demographic Characteristics of the Current Sample</i> .....	35
Table 2. <i>Examples of Interview Questions Asked for Dream Report and Story Recall</i> .....	39
Table 3. <i>Categories for the Analysis of Dream Content According to the Hall and Van de Castle Coding System</i> .....	42
Table 4. <i>Comparison of Correlations between Word Count of Dream Report and Story Recall and Narrative Count of Dream Report and Story Recall</i> .....	44
Table 5. <i>Demographic Characteristics of the Current Sample (Interview 1)</i> .....	49
Table 6. <i>Mean Word Count of Dream Report and Story Recall in Interview 1 and Interview 3</i> .....	51
Table 7. <i>Mean Narrative Element Count of Dream Report and Story Recall in Interview 1 and Interview 3</i> .....	52
Table 8. <i>Frequencies of Self-representation, Emotions, Social Interactions, and Characters in all Dream Reports (n = 119)</i> .....	54
Table 9. <i>Mean Word and Narrative Element Count of Dream Reports and Story Recall of Studies</i> .....	56
Table 10. <i>Inter-rater Reliability Scores across Studies</i> .....	56
Table 11. <i>Effect Sizes of Studies</i> .....	57
Table 12. <i>Stem-and-Leaf Plot of All Effect Sizes (r) for Word Count</i> .....	57
Table 13. <i>Stem-and-Leaf Plot of All Effect Sizes (r) for Narrative Element Count</i> .....	58
Table 14. <i>Frequencies of Self-representation in the Three Studies</i> .....	59
Table 15. <i>Frequencies of Emotions in the Three Studies</i> .....	59
Table 16. <i>Frequencies of Social Interactions in the Three Studies</i> .....	60

### Abstract

The content of dreams of children aged between three and five years old has been the topic of ongoing debate in past dream research. The bulk of this research was conducted by Foulkes (1982, 1999), who concluded that children of this age group experience impoverished dreams with little emotional content, an absence of active self-participation, and a lack of kinematic imagery (i.e., mental representations of movement, activities and interactions). These conclusions were based on the brief and mundane dream reports provided by children during his 1982 longitudinal laboratory study. However, Foulkes' research did not test the children's memory skills and ability to narrate an event, and did not compare these to the dream reports the children produced. The importance of memory skills and narrative ability as potential confounds when studying children's dreams has been postulated in existing literature.

In view of the findings of past studies on young children's dreams and their cognitive capacity for dreaming, the present study re-examined the quantitative and qualitative features of dream reports of children aged three to five years old. The present study included parameters of testing memory skills and narrative ability to analyse whether these confound the dream report findings, and if so, whether one can draw any firm conclusions about dreams based on a dream report provided by the children.

This research consisted of two parts. The main purpose of the first part of this study was to investigate existing research findings suggesting that children between the ages of three and five years old have impoverished dreams. This part of the study set out to test whether these findings might be an artefact of poor memory and poor narrative skills within this age group. To explore this, 51 children aged three to five years old from local pre-schools were interviewed to report their most recent dream and to recall a story their parents had read to them the previous night. Dream reports and story recalls were compared in terms of both the number of words used and the number of narrative items reported. Results revealed a strong positive correlation between words used in dream report and story recall ( $r = .75, p < .01$ ) and narrative element count in dream report and story recall ( $r = .72, p < .01$ ). As predicted, these results suggested that immature memory development may be a confounding factor in the ability of children to report a dream.

Furthermore, the first part of the study aimed to examine whether familiarity with the interviewer would result in longer and more detailed dream reports and story recalls. Dream

reports and story recalls were compared in terms of interviews conducted (i.e., Interview 1 and Interview 3). Results revealed that there were no significant differences between the word count of dream reports in Interview 1 and Interview 3,  $t(45) = -.62, p = .271$ , as well as no significant differences between the word count of story recalls in Interview 1 and Interview 3,  $t(45) = -.54, p = .298$ . Results furthermore revealed that there were no significant difference between the narrative element count of dream reports in Interview 1 and Interview 3,  $t(45) = -1.02, p = .158$ , and no significant differences between the narrative element count of story recalls in Interview 1 and Interview 3,  $t(45) = -.60, p = .277$ . These results suggest that neither familiarity with the interviewer nor familiarity with the task appeared to significantly affect the ability or propensity to report a dream or recall a story.

Finally, as hypothesised, a content analysis of the dream reports revealed that the dreams of children aged between three and five years old do in fact contain active self-representations, emotions, and social interactions, as well as detailed characters. The content analysis suggested that the dreams of children within this age group are not as impoverished and sparse as previous research claimed.

In part two of the research, a quantitative comparison of two past, unpublished studies, as well as the current study, including 101 participants and 60 dream reports was conducted to investigate the immature recall ability in dream reporting of children aged three to five years old. Word count and narrative element count of dream reports and story recalls were equally strongly correlated ( $R = .71$ ). Furthermore, a qualitative comparison of the two past unpublished studies, as well as the current study, including 111 participants and 167 dream reports was conducted to investigate the frequency of specific dream content provided in the dream reports of children aged three to five years old. Results revealed that the most common content of dream reports were active self-representations, social interactions and emotions. These results are in stark contrast to previous dream research findings (Foulkes, 1999), which concluded that the dream reports of pre-school children were impoverished and lacked active self-representation, social interactions and emotions.

## Introduction

Dreams are an inherent mental function in humans, and many people believe that they may occur in early infancy and even in animals. Dreams have fascinated humankind throughout history, and the study of dreams has attracted much empirical research. However, if accurately identifying when a dream is taking place is difficult, directly accessing the content of dreams and the dream experience is impossible. Dreams are a subjective experience, not observable to others, and so we need to use indirect methods to access this information. One such method is that of investigating retrospective dream reports, which are able to provide some insight into dream content. However, the resemblance of a dream report to the actual dream experience remains uncertain, particularly in dreams reported by young children. As a result, many researchers have questioned whether we can draw any firm conclusions about dreams based on these reports (Ablon & Mack, 1980; Becker, 1978; De Martino, 1955; Despert, 1949; Foulkes, 1982; 1999; Piaget, 1945b).

According to the earliest empirical studies on children's dreams, children as young as one to four years old frequently experience vivid dreams (Despert, 1949; Foster & Anderson, 1936). However, more recent studies on children's dreams (Foulkes, 1982) have challenged these findings. In his sleep laboratory studies, children aged three to five years old provided impoverished dream reports, leading Foulkes to conclude that young children do not yet have the cognitive capacity to experience rich dreams. As such, Foulkes correlated dream recall ability with the development of spatial cognition (i.e., the capacity for mental imagery). These contradictory findings raise important questions. For example, at what age does dreaming start in children? If young children do dream, what is the nature of the content of these dreams? Can researchers ever be sure that a dream report provided by a young child adequately compares to the actual dream experience? Does a child need to be conscious of having had a dream for researchers to conclude that the child is indeed dreaming? The answers to these and other questions are controversial, highlighting the need for additional research into the dream experiences of young children.

As stated, Foulkes (1982, 1999) based his interpretations on the mental capacities he considered to be necessary for dreaming (e.g., ability to symbolically represent absent objects and reflect upon them) and the premise that dream reports are a true reflection of a person's ability to dream and of the dream experience. His findings led him to conclude that spatial cognition in pre-school children is too immature for them to experience rich and vivid

dreams. Since past research has indicated that young children do experience dreams, the present study questioned the basis of Foulkes' findings, and examined the extent to which we could draw reliable conclusions about young children's dream experiences from their dream reports. More specifically, this study investigated whether the recall and narrative abilities of children aged three to five years old have developed sufficiently for them to be able to reliably report their remembered dream experiences.

## Review of the Literature

### Dreaming

The definition of a dream is ‘the images and thoughts that are experienced during sleep’ (The Oxford Companion to the Mind, 2004, p. 266). This definition implies that a dream can occur without conscious recall by the individual. Similarly, Hartmann (2011) stated that the functional roles of sleep and dreaming are fulfilled “whether or not the dream is later remembered” ( p. 9). Hartmann (1973, 1996, 2007, 2011) suggested that, although dreams are crucial for good mental health, mental health does not require that we *recall* a dream.

This theory is consistent with the observations of Ablon and Mack (1980), who found that children often report a dream during the night immediately upon waking, but have no recollection of it in the morning. According to these arguments, the ability of the child to recall and report the dream the following day is not necessarily correlated with whether or not the child experienced a dream. Therefore, the inability to report a dream is not evidence that dreaming did not take place.

Several studies have attempted to establish the developmental stage at which children begin to experience dreams. According to studies based on children’s behavioural signs during sleep (i.e., smiles, cries, movements, and vocalisations), dream activity is already present at the age of one years old (Diatkine, 1975; Fraiberg, 1959; Hug-Hellmuth, 1919). However, Piaget (1945a) suggested that behavioural signs at such a young age are not evoked by mental images present in dreams. He proposed that the first dreams in children appear around the age of two years old, a conclusion he based on his observations of children of that age who spoke in their sleep and were able to report their dream experience upon waking. This finding was supported by other studies that found evidence of children’s dreams between 24 and 30 months of age (Colace, 2004a, 2010; Fiske & Pillemer, 2006; Grotjahn, 1938; Kohler, Coddington, & Agnew, 1968; Niederland, 1957).

As dreaming is a subjective process, access to the conscious experience of dreams can only be gained indirectly through verbal, written, or graphic descriptions provided by the dreamer (Antrobus, Fein, Jordan, Ellman, & Arkin, 1991; Colace, 2010; Domhoff, 1996; Fiske & Pillemer, 2006; Kahan, 1994; Montangero, Pasche, & Willequet, 1996; Resnick,

Stickgold, Rittenhouse, & Hobson, 1994; Solms, 1997, 2004; Strauch & Meier, 1996). It therefore seems likely that a retrospective dream report is influenced by the individual's memory and ability to verbally narrate the memory of the dream experience. It is often difficult to remember and describe a dream, especially for those who do not do so regularly (Fiske & Pillemer, 2006). Therefore, dream research is, by necessity, loaded with biasing variables that can be difficult, if not impossible, to control or account for. Therein lies the complexity of dream research (Colace, 2004a, 2010; Solms, 1997, 2004). This complexity is amplified in research on children's dreams, since young children are often limited in their language and memory skills.

### **Pioneering Studies of Children's Dreams**

Following Freud's observations of children's dreams during his dream studies, researchers attempted to study the dream experiences of children in a more systematic way. Many of these early attempts to study the dreams of children were criticised for not producing statistically significant results (De Martino, 1955; Despert, 1949).

One of the first attempts at a systematic study of dreams according to developmental age was conducted by Kimmins (1937), who collected dreams of 5600 children aged between five and sixteen years old over a two-year period. This author found that the dreams of younger children lacked fantastic and unreal elements, were realistic, and often referred to events that took place the previous day. Another early study on the content of children's dreams was that of Jersild, Markey, and Jersild (1933). They compiled data on the dreams of 400 children between the ages of five and thirteen years old, and found that the content of children's dreams related to concerns in their daily life, and that frightening dreams were frequent. Although this study was accepted by psychoanalysts as valid, since it corroborated some of Freud's ideas, it was criticised for failing to pursue and analyse several items in the data that indicated age differences in dreams (Wilkerson, 1981).

Subsequent to this, Foster and Anderson (1936) conducted empirical studies on young children's dreams, focusing on the nature of unpleasant dreams. According to them, young children between the ages of one and four years old experienced the highest frequency of unpleasant dreams, and that this frequency reduced with age. These conclusions were drawn

from reports by the children's parents, who stated whether they had heard their child crying or moaning during the night (Despert, 1949). The theme of unpleasant dreams was predominant at the time as a result of the impact of psychoanalytical thought, according to which young children's dreams were the nocturnal result of the absence of fulfilment during the day of a simple unexpressed wish. This unexpressed wish, according to Freud, was the reaction of the child's mental life in his sleep experiences of the previous day, which left behind a regret or longing. However, later research showed that behaviour during sleep often does not correspond with the retrospective reported dream content, and that the night terrors Foster and Anderson observed may not have been related to dreaming (Foulkes, 1999). Foulkes (1999) and others suggested that night terrors, and the intense fear and hallucinations associated with them, result from faulty awakenings, rather than from dream behaviour.

Furthermore, Despert (1949) conducted a dream study of 39 children aged between two and five years old using individual play sessions, daily notes on children's behaviour, and reports from parents on their children's dreams. Despert analysed the content of the dreams, and found that children's dreams tended to be simple and often contained animals and human figures, with inanimate objects mainly existing in the background of the dreams. Furthermore, one of his conclusions was that children often experienced unpleasant dreams in the form of nightmares about being eaten by animals.

A further view regarding the dreams of pre-school children was provided by Piaget (1929). He studied the thought processes of the child extensively, and used his findings to explain the nature of dreams. He proposed that young children identified *thought* with their dreams, as they believed that dreams and thoughts originated from the same place. According to Piaget, children were influenced by their subjective experience of themselves to such an extent that they believed mental activities, such as dreams and thoughts, originated in external objects. Based on these assumptions, Piaget described three stages of the origin of dreams: first, young children perceive dreams to be pictures of light or air that appear before their eyes from the external world. At this stage, a child believed that anyone can see the dream. At a later stage, the child believes that a dream originates from inside the body, such as from the head or stomach, but is visible in the outside environment. During the last stage, between three to four years of age, they believe the dream originates in the eye and then moves into the head. According to Piaget (1936), the pre-school child is egocentric and in the stage of 'pre-operational' thinking. During this stage, the child has great difficulty

distinguishing between reality and fantasy. The ability to distinguish dreams from real events is a gradual process that depends on the rate of cognitive development, including language and memory skills, as well as insight provided by parents who explained the differences to the child. Piaget (1945a) then used a method similar to that used by Freud in his study on the development of symbolic activity in children. He found that the nature of a child's dream changes with age, and that very young children may struggle to separate dreams from reality (Mallon, 2002; Piaget, 1945b).

Taken together, the studies of dreams in children conducted by developmental psychologists and neurologists appear to agree that the contents of children's dreams tend to change as the child's cognitive capacities evolve. Therefore, very young children may not have developed the ability to differentiate between their internal world and the external world, and may not have the language abilities necessary to describe the images in their dreams. These factors would make it extremely difficult for a child to verbally describe an internal phenomenon such as a dream, which in turn poses challenges for research, particularly since we rely on dream reports to investigate young children's dream experiences.

### **Children's Dream Reports**

Retrospective dream reports are considered an acceptable form of data in dream research (Colace, 2010; Domhoff, 2003; Foulkes, 1982; Pivik, 2000; Rechtschaffen, 1967; Smith, 2000). However, some researchers argue that the inadequacy of language and differences in dreamers' verbal abilities render dream reports unreliable (Antrobus et al., 1991). Past researchers have identified various methodological difficulties of researching children's dreams, particularly with regard to evaluating the credibility of the dream report (Ablon & Mack, 1980; Becker, 1978; De Martino, 1955; Despert, 1949; Foulkes, 1982, 1999; Piaget, 1945b).

The first difficulty in using retrospective dream reports as data for children's dream research is evaluating the child's understanding of the concept of a dream. Since a child's conception of a dream is a component of the child's developing understanding of the mind, young children may have little understanding of the concept of a dream (Woolley &

Wellman, 1992). Past research suggested that very young children are conceptually confused and ignorant about the subjective nature of dreams (Broughton, 1978; Foulkes, 1982, 1999; Laurendeau & Pinard, 1962; Piaget, 1929). As stated, Piaget (1929, 1945b) suggested that pre-school children believe dreams are external and objective phenomena. He believed that children only develop a mentalistic understanding of dreams and other mental phenomena at the age of six or seven years old. In contrast, other studies have found that children between the ages of three and five do have a sensible, although underdeveloped understanding of the nature of their own and others' minds (Colace, 2004a, 2010; Domhoff, 2003; Estes, Wellman, & Woolley, 1989; Flavell, 2000; Meyer & Shore, 2001; Leslie, 1987; Pillow, 1989; Wellman & Estes, 1986; Wimmer & Perner, 1983; Woolley, 1995; Woolley & Berger, 2002; Woolley & Wellman, 1992).

According to Woolley and Wellman (1992), pre-school children were able to distinguish dreams from concrete physical objects and understand that dreams were nonphysical and private. However, they also found that some three year old children may believe that "dreams are shared between sleeping minds" (p. 378). Similarly, Kinoshita (1994) proposed that young children of pre-school age have the ability to distinguish between dream and wakeful states. Other researchers have suggested that pre-school children as young as four years old are able to use mental categories to define dreams, and that they were able to recognise the difference between imagination and reality better than they are given credit for (Sharon & Woolley, 2004).

Further difficulties when studying children's dreams include evaluating the accuracy of the dream report and the effects of potential recall distortion (Colace, 2010). These problems can occur because of the time interval between the actual dream experience and the reporting of the dream. Past research suggested that memory ability is the primary factor in determining dream recall (Cory, Ormiston, Simmel, & Dainoff, 1975). These findings suggested that children younger than five years old may be unable to report their dreams. Therefore, it could be argued that the immature development of memory skills in pre-school children is a potentially confounding variable for dream research within this age group.

## **Dreaming and Memory**

Freud (1900) considered memories to be instrumental in the formation of dreams. At the time that Freud developed his theory of dreaming, the concept of episodic memory had not yet been developed, so he termed the elements in dreams that coincide with daytime experiences 'day-residues'. More recent studies (e.g., Fosse, Fosse, Hobson, & Stickgold, 2003) have indicated that dreams only rarely portray complete episodic memories, though isolated fragments or features of episodic memories are common in dreams.

Episodic memory (EM) refers to the ability to recall, in detail, an event that occurred in the previous few minutes or hours (Conway, 2001). Many authors have argued that EM is a late-developing memory system that is unique to humans, and is only more-or-less fully functioning after the fifth year of life (Nelson, 1993; Perner & Ruffman, 1995; Tulving, 2002). Past PET and fMRI studies of memory processes have revealed that the frontal lobes play an important role in episodic memory (Fletcher, Dolan, & Frith, 1995; Moscovitch, Kapur, Köhler, & Houle, 1995; Shallice et al., 1994; Squire, 1992). Incomplete development of the frontal lobes during childhood implies that the child may have a limited capacity to organise information and use strategies to optimise information-processing capacity (Baddeley, 1997; Cowan, 1998). According to past memory research, EM develops rapidly between the ages of three and six years, which could explain the peculiar and often conflicting results seen in dream reports of children in this age group (Baddeley, 2000; Bjorklund, 2011; Goswami, 1998; Henry & Millar, 1993; Newcombe, Lloyd, & Ratliff, 2007). These findings suggested that children under the age of five years old may be unable to report their dreams sufficiently and may as a result be unreliable participants for dream research based on dream report data.

Previous research (Farrar & Goodman, 1990; Nelson, 1990) suggested that pre-school children have a better memory for generalised events than specific events and tend to merge memories of a specific event with memories of similar, yet more generalised, events. This suggests that dream reports may merge with real events, making it difficult to distinguish between the actual dream and a real-world event. Childhood amnesia is a term that applies to adults not being able to remember events of early childhood (generally under the age of four or five years of age). The concept suggests that either episodic memory has not developed sufficiently to encode memories in the way that adults do, or that adults are unable to retrieve

memories encoded at that age. Newcombe, Lloyd, and Ratliff (2007) suggested that there is little evidence of developed episodic memory in young children. They also argued that one needs to differentiate between infantile amnesia (i.e., children younger than two years old who have an absence, or near absence of episodic memory), and childhood amnesia (i.e., children between the ages of two and five years old who have a peculiar and generally low rate of remembering episodic events). Newcombe et al. (2007) argued that pre-school children between the ages of three and five years old are in a particularly formative stage of episodic memory development, primarily related to the development of the hippocampus during this period. Furthermore, as stated, the immaturity of the prefrontal cortex, believed to play a vital role in episodic memory, may contribute significantly to childhood amnesia.

However, some past research has found that the memory skills of pre-school children are similar to those of older children, but that they require more prompting and cueing by adults to help them to recall as much information as older children do (Fivush & Hamond, 1990, 2010; Hudson, 1990; Mandler, 1990). In particular, Conway (2001) found that episodic memory is highly cue-sensitive. Furthermore, according to Hudson (1990), pre-school children are at a stage of memory development during which the focus is on learning how to remember, not on what to remember.

The findings regarding memory development in children suggest that dream reports of pre-school children may not be an accurate representation of their actual dream experiences, but instead represent their ability (or inability) to recall a particular event. In addition to this, we must also bear in mind that none of the factors that improve episodic memory, such as repetition, are present in dreams, which makes them particularly difficult to recall, even for adults (Gathercole, 1998). Therefore, conflating children's verbal reports of their dream experiences with the experiences themselves is risky, as the immaturity of their memory could play an important role in what is recalled and expressed.

## **Dreaming and Language**

Language ability develops rapidly during the school-going years (Szaflarski, M., Ritchey, P. N., Leonard, A. C., Mrus, J. M., Peterman, A. H., Ellison, C. G., McCullough, M. E., Tsevat, J., 2006). Past fMRI studies in children have found that language development is

an ongoing process that extends beyond the normal age of language acquisition in early childhood, as cortical substrates supporting language processing are only fully developed by the age of seven years old (Brown et al., 2005; Gaillard et al., 2003; Lidzba, Schwilling, Grodd, Krägeloh-Mann, & Wilke, 2011). Comprehension of spoken language is established much earlier than the production of words, and although most children are able to produce grammatically correct sentences by school-going age, more complex language skills tend only to become manifest after the ages of eight or nine years old (Lidzba et al., 2011; Tomasello, 2000). These more complex language skills include the ability to use vocabulary and syntax skills to recount a series of events in a cohesive manner, such as a narrative. Narration, according to Roth (1986), requires that a speaker produce a monologue that contains an introduction, organised sequence of events, and a logical conclusion. These linguistic skills depend on complex cognitive skills, which are not yet developed in children aged three to five years (Berman & Katzenberger, 2004). As a result, the lack of narrative skill within this age group can have a negative impact on their ability to report a dream.

According to Freudian principles, dreams operate utilising the language of the unconscious, which differs from the language of the conscious mind. Both the unconscious and dreams are structured by the characteristics of primary process thinking, which include mechanisms such as condensation, visual imagery, concretism, displacement, and symbolism. Freud (1911) suggested that the primary processes are innate, existing in the infant's mind from birth. Furthermore, he proposed that primary process thinking is pleasure-seeking and, therefore, disregards reality. During the growth and development of the mental apparatus, ego functions become better at reality-testing and a more sophisticated process of thinking begins to emerge, characterised by order, logic, rationality, and a reliance on verbal abstraction. Freud referred to these skills as 'secondary process thinking', which he suggested is used by a dream mechanism known as secondary revision. Secondary revision is unique to dream work. It edits and structures the dream thoughts into thoughts that seem more logical, connected, and coherent. Without secondary thinking processes, dreams are confusing and disorganised. Since secondary process thinking is only acquired and fully developed at the age of seven years old (i.e., at latency), it is likely that the dreams of children younger than seven years old will not be subject to secondary revision.

Freud proposed that dream work in both adults and children is mainly based in primary process functioning, since primary processes are innate and present from birth.

According to this psychoanalytical theory, even infants experience dreams (Klein, 1932). Then, later, the acquired secondary processes of thought may be the functions that enable an individual to recall, reflect upon, and report a dream.

Language ability depends on the development of secondary process thinking (Noy, 1979). Therefore, it seems reasonable to assume that pre-school children may not yet have the words to describe their dreams, even though they are in fact dreaming. Furthermore, even though young children may be aware that they are dreaming, the instinctual and primitive wishes of a young child's dream may remain too jumbled to report without secondary revision processes. This would make it essentially impossible for a child to describe a dream in a coherent way, and they would quickly forget the experience and perception of a dream or lose it to repression. However, none of these issues preclude the possibility that pre-school children dream. In fact, it is these very issues that make it possible for us to argue that young children may very well in fact experience dreams.

### **Dreaming and REM Sleep**

The discovery of rapid eye movement (REM) sleep (Aserinsky & Kleitman, 1953) and its observed relationship with dreaming opened new methodological possibilities for measuring when dreams take place. Researchers could still only access dream content via dream reports, but they now believed that combining REM and dream reports would enable them to more closely equate the reported dreams and the actual dream experience (Antrobus, Dement, & Fisher, 1964).

Research examining the correlation between REM sleep and dreaming found that in 80% of awakenings from REM sleep, healthy subjects reported having just experienced a dream, while only 5–10% of non-REM awakenings produce similar reports (Aserinsky & Kleitman, 1953; Dement & Kleitman, 1957; Hobson, Stickgold, & Pace-Schott, 1998). These findings led to the assumption that REM sleep is the physiological equivalent of dreaming, or that dreaming is a result of REM sleep (Hobson et al., 1998). These assumptions have been challenged by subsequent research that argues that dreaming can occur without REM sleep, and vice versa, and that the two are controlled by different brain mechanisms (Solms, 2000). This implies that dreams are not necessarily caused by REM sleep (Mancia, 1999), and that

although REM and dreaming frequently occur together (Dement & Kleitman, 1957), they are in fact distinct entities that can occur independently (Solms, 1997). According to Solms, an empirical investigation of the neurological organisation of the conscious experiences themselves was necessary before the causal mechanisms underlying the two classes of phenomena could be identified correctly (Solms, 1997).

According to existing research, REM sleep is present from birth (Colace, 2010) and accounts for approximately 40% of sleep during the early months of life, and for 25–30% during the second year of life (Bosinelli & Cicogna, 1989). Past studies have shown that REM dreams are longer, more emotional, and less coherent, but also more vivid than non-REM dreams (Rechtshaffen & Siegal, 2000). Children tend to experience more REM sleep than adults, which suggests that children should experience REM dreams more frequently than adults do. However, this was contradicted by the findings of Foulkes (1982;1999), who distinguished between experiencing the simple physiological state of REM sleep and the complex mental activity of a dream. As discussed above, according to Foulkes (1982), children do not have dreams until they have developed visual-spatial abilities, irrespective of the type of sleep they experience.

### **Children's Dream Research using Dream Reports**

Past studies investigating children's dreams have employed three main methods. The first method consists of individual interviews with children in a school setting at a given time in the morning. The interviewer asks the child to recall and narrate their previous night's dream/s by means of a standard interview. The reports provided by the children are recorded and later transcribed, verbatim. These transcripts are then classified using content scales to objectively measure and score the contents of the dreams (e.g., Colace & Violani, 1993; Hall & Van de Castle, 1966; Levi & Pompili, 1991). A variation of this method, used with children eight years and older, is the 'Most Recent Dream Report' (Domhoff, 1996), in which the child is asked to write down the most recent dream they can remember (Avila-White, Schneider, & Domhoff, 1999). A variation of the Most Recent Dream Report, using a verbal method for pre-school children, has been used in several more recent, unpublished studies (Alikhani, 2002; Delgado, 2003; Kinnear, 2002; Lympinaki, 2001; Stone, 2009).

The second method has parents interview their children in their home setting after waking. These interviews are collected by the parent over a specified period (e.g., a week or a month) (Colace, Tuci, & Ferendeles, 1997; Foulkes, 1979; Resnick et al., 1994). This method makes it more likely that a child will report a dream experience, as it shortens the time between dreaming and reporting on the dream. This reduces the risk of the child forgetting or changing his or her recollection of a dream. A variation of this method is to ask the child to recount a dream in a familiar and comfortable environment, but not necessarily at home.

The third method for collecting dream reports occurs in a sleep laboratory. Here, children are woken at specific stages of sleep (e.g., REM and non-REM sleep) and asked to report their dreams. The advantage of this method is that it maximally decreases the time between the dream experience and the dream report and, therefore, further reduces the risk of dream alteration (Foulkes, 1982). The studies by Foulkes and colleagues (1969, 1971, 1979, 1982, 1999) focused on the relationship between dream processes and cognitive development in children, and were the first to examine the dreams of children aged three to five using REM sleep and its relationship to dreaming.

### **Foulkes' Longitudinal Study**

Foulkes and colleagues (1982,1999; Foulkes, Pivik, Steadman, Spear, & Symonds, 1967; Foulkes et al., 1969) conducted a series of studies on the dreams of children between the ages of 3 and 15. Their studies were conducted in a sleep laboratory. Foulkes woke children at different stages of sleep (e.g., onset of sleep, REM sleep, and non-REM sleep), and asked them to report on their dreams. The children were divided into two groups and studied over a period of five years, between 1968 and 1973. At the outset of the study, the first group consisted of pre-school children, aged between three and five. The second group consisted of older children, aged between nine and eleven. Before the study commenced, Foulkes interviewed the pre-school children to assess their understanding of the concept of a dream, which he found to be poor (Foulkes, 1982).

The group of younger children reported a very low percentage of dreams after waking from each of the three stages of sleep. The highest percentage (27%) was reported after the children woke from REM sleep, although this is much lower than the percentage of adults

(80%). According to Foulkes' results, dream reports only become truly dream-like after the age of seven.

Foulkes (1982) found that although children as young as three years can report their dreams, the dream reports of the younger group were very brief and contained just one scene, which the children described in a simple, non-narrative fashion. He also found that the dream-reports did not include an active self, social interactions, emotions, or bizarreness. Furthermore, the content of the dream imagery appeared to be most influenced by the child's bodily state (e.g., hunger, fatigue, or thirst), rather than being a symbolic representation of the child's daily social life (Foulkes, 1982). Therefore, Foulkes concluded that the dreams of children aged three to five are rare, impoverished, and blunt, which he attributed to the developmental immaturity of the child's mental apparatus.

Foulkes (1982, 1999) suggested that dreaming depends on how well an individual can simulate and recreate the world mentally, not on the individual's perception of the world. He describes dreaming not as 'passive seeing', but as 'active imagining' (Foulkes, 1982), and suggested that the impoverished dreams of children are the result of their immature visual-spatial and reflective cognitive capacities, which he believed to be prerequisites for dreaming and imagining. Without these prerequisites, Foulkes (1982, 1999) believes pre-school children are not able to symbolically represent themselves interacting, acting, feeling, and moving in imaginary space in their dreams. He based this conclusion on the results of the 'mental rotation paradigm' presented to the younger group of children. In this test, each child was asked to determine whether two pictures of rotated figures were different or the same, and the time taken to make that judgement was scored (Foulkes, 1999). After assessing children's capacity for imaginative thinking using the 'Pickford Projective Pictures', he concluded that pre-school children do not have the mental capacity to be imaginative, and used this to justify their poor dream reports (Foulkes, 1982, 1999).

Foulkes further explained his findings in his book, '*Children's Dreams and the Development of Consciousness*' (1999), in which he suggested that if a child does not have the capacity to consciously reflect about an experience, such as a dream, in order to remember and retell it, then the child could not have been dreaming in the first place. As a result, Foulkes concluded that consciousness is equivalent to self-reflection, and that the

ability to report a dream is evidence of having experienced a dream. According to this conclusion, a pre-schooler is unlikely to have developed consciousness.

### **Criticism of Foulkes' Study and Conclusions**

Although Foulkes (1999) acknowledges that the actual dream and the dream report are not the same thing, and that pre-schoolers' dream reports may not be a true reflection of their dream experiences, he failed to question the conclusions and hypotheses he draws from the dream reports. The points Foulkes fails to address require further discussion.

Firstly, Foulkes (1982, 1999) assumes that an inability to adequately report a dream is sufficient evidence that young children do not have rich dreams, and that self-reflection or some form of metaconsciousness is required for a dream experience to have occurred. If this is correct, then it would follow that animals do not experience vivid dreams, as they are unable to communicate the content of their dreams. However, research at the Massachusetts Institute of Technology (MIT) has revealed strong evidence of dreaming in animals (Louie & Wilson, 2001). Researchers used single-cell recordings of a rat's hippocampus to observe neuronal firing while it performed a maze task. They then found that this neuronal firing was almost exactly replicated while the rat was in REM sleep. These findings suggest that animals do have complex dreams, and are able to retain and recall long sequences of events while asleep. This contradicts Foulkes' assertions that an inability to report a dream is evidence that dreaming does not take place.

Secondly, Foulkes (1999) argues that memory is not a predictor of dream reporting ability. However, his seemingly comprehensive longitudinal and cross-sectional studies did not include any memory tests for children between the ages of three and five. In addition, standard memory tests were only performed on older children (nine to ten years old at the beginning of the study), none of which focused on EM (Foulkes, 1999). This is an important gap in his otherwise rigorous and thorough body of research. A test of spontaneous and elicited recall of a film stimulus, the 'Fidelity of report experiment' (Ray, 1947), was introduced three years into Foulkes' (1982) study. During this test, participants were shown a short movie in which a woman is subject to an armed robbery. They were then asked to tell the interviewer everything they could remember about the movie. The results of this test

showed a significant correlation between dream reporting and EM in young children. However, this test was only introduced when the youngest child in the pre-school group was six years old.

Third, according to Foulkes (1982), “until children are reasonably capable of reflecting on, and symbolically elaborating on their waking experiences and behaviours, they must remain incapable of dreaming effectively about these experiences and behaviours” (p. 275). He concluded that children younger than five years do not have the cognitive skills required to symbolically represent themselves acting and interacting in an imaginary space in their dreams. However, in the dream reports of the pre-school children in Foulkes’ study, it is clear that, however brief, imaginal representation of absent objects does occur. The ability to create a dream report, whether or not it is a true representation of the actual dream experience, requires imagination and the ability to think in images. Moreover, other studies on children’s dreams have found pre-school children’s dream reports to be rich in detail and imagination (Domhoff, 1969; Domhoff & Kamiya, 1964; Resnick et al., 1994).

Fourth, Foulkes’ claims that children younger than five years do not have the capacity for imagination stands in stark contrast to the phenomenon of pretend play, which children normally begin start to engage with from 14 to 24 months of age (Eibl-Eibesfeldt, 1989; Tamis-LeMonda & Bornstein, 1991; Lilliard, Pinkham, & Smith, 2011). Pretend play is defined as the “voluntary transformation of the here and now, the you and me, and the this or that, along with any potential action that these components of a situation might have” (Garvey, 1990, p. 82). Pretend play is guided by a mental representation that is usually different from reality, which requires imagination (Lillard, 1993; Lilliard et al., 2011). Therefore, if children as young as two years of age can engage in pretend play, then they must have a capacity for imagination at a much earlier age than five years, and therefore have the necessary cognitive skills to represent themselves in an imaginary space such as in dreams. Furthermore, Foulkes (1982) found that children confabulated their dream reports. Confabulations are as noteworthy as the dream report itself in providing insight into the capacity for imagination. Therefore, if Foulkes wants to show that children between the ages of three and five have no capacity for imagination, he needs to provide an alternative explanation for the confabulations he found in his study and the richer dream reports found in other studies.

Fifth, Foulkes suggested that the dreams of children below the age of seven do not show an active self-representation, and concluded that young children still lack the cognitive abilities to represent themselves in their dreams (Foulkes, 1982; Foulkes, Hollifield, Sullivan, Bradley, & Terry, 1990). However, other research has found that children as young as three years are able to represent themselves in their dreams in an active role (Colace, 2006a; Colace, Tuci, & Ferendele, 2000; Colace, Violani, & Tuci, 1995; Resnick et al., 1994). For example, of the 133 dream reports collected from 117 children between the ages of three and seven years in Colace's and colleagues 1995 study, 90 dream reports (68%) included an active self-representation, while only 12 dream reports (9%) contained a passive self-representation. An absence of any self-representation was found in 31 (23%) of the dream reports. Similarly, Resnick et al. (1994) found active self-representation in 85% of the dream reports provided by children aged four to five years old. These studies therefore suggest that young children do have the capacity to actively represent themselves in their dreams.

Furthermore, in addition to the conceptual problems, Resnick et al. (1994) criticised Foulkes' method (1982) of waking children at midnight in an artificial laboratory setting to ask them about their dreams. They suggested that morning dream reports in a familiar home setting would be a far more suitable environment in which to study young children's dreams, as children's dreams and reports may depend even more on the environment than those of adults. Resnick et al. (1994) subsequently conducted their own study on the dreams of children between the ages of four and ten in a home setting. Their findings differed markedly from those of Foulkes regarding the dream content of younger children, with 85% of the four- to five-year-olds' dreams containing active self-representation. In addition, these dreams contained familiar characters, such as family members, friends, and animals, and the dream reports were long and detailed, containing similar properties to those of adults. Based on these findings, Resnick and colleagues concluded that pre-school children do have similar dreaming mentation to that of adults, and do have the reflective capacity to recall and report their dreams, as well as to represent themselves actively in their dreams.

Foulkes had anticipated objections to studying children's dreams within a laboratory setting, and attempted to isolate this variable and to reveal it as an insignificant factor in dream research (Foulkes, 1979; Weisz & Foulkes, 1970). As a result, although there were differences in the content of dreams reported in a home and laboratory setting, Foulkes (1979) suggested that these differences were not a result of the environment (i.e., laboratory

setting). He showed that the difference in the dream recall percentages of children woken up at the same time of the morning in both settings (home and laboratory) was not significant, and concluded that the laboratory environment does not have an inhibitory effect on dream recall.

To further investigate the difference between collecting dream reports in different settings, Colace and colleagues (1995, 2004a, 2004b, 2006a, 2006b; Colace, Doricchi, Di Loreto, & Violani, 1993; Colace & Tuci, 1996; Colace et al., 1995, 1997) systematically conducted four studies on children's dreams between 1989 and 1999. He conducted these studies in both school and home settings. Colace found that the dream reports of children aged three to five are very short in length, mostly consisting of just one or two sentences. The median dream report length of the studies in a school setting was 23 words, while in the home setting, the median was 35 words (Colace, 2010).

Although the difference in the length of the dream reports in different settings was nonsignificant, it is interesting to note that dream reports narrated in the home setting to a person familiar to the child (e.g., the parent) do contain 50% more words. Therefore, familiarity with the interviewer may be a factor that encourages the length of verbal reports. Colace (2010) does note that one of the dream reports in the home setting was of exceptional length (277 words) which increased the mean length of the dream reports considerably. The brevity of the dream reports of young children was confirmed in his fourth study, in which he used the Questionnaire on Dream Evolutionary Age (QDEA), completed by the children's parents (Colace, 2006b). These studies found that the greater length of the dream reports of older children was statistically significant, a finding consistent with Foulkes' data on REM dreams, as well as Freud's observations of children's dreams. As a result, Colace (2010) concluded that the brevity of young children's dream reports is the most well verified characteristic of their dreams that differentiates them from the common idea researchers have of dreams as long and complex stories.

Given the above criticism of Foulkes' study, it remains questionable whether any firm conclusions about children's dreams can be drawn from Foulkes' results. Most notably, since Foulkes' did not test the youngest age group's memory skills or ability to narrate an event, he was not able to evaluate the impact of these skills on the dream reports the children produced. As a result, it is debatable whether their dream reports were an efficient and reliable measure

with which to assess the dream life of pre-school children. If we do use dream reports, we need to bear in mind certain confounds (i.e., language and memory development, research setting and familiarity with the interviewer). If these important factors are taken into consideration, dream reports can be a more useful measure for the investigation of pre-schoolers dream experiences.

### **Past Unpublished Studies**

Three past, unpublished research studies (Alikhani, 2002; Kinnear, 2002; Stone, 2009) have attempted to explore the efficacy and reliability of dream reports of young children. These studies aimed to assess the relationship between the length of the children's dream reports and their episodic memory skills. This method resembles the 'Fidelity of report' used in the third year of Foulkes' longitudinal study with his younger group.

The three studies assessed the relationship between the reporting of a bedtime story, recalled the following morning, and the reporting of a dream, operationally defined as the child's Most Recent Dream Report (see Appendix E). Kinnear (2002), who studied the dream and story reports of 18 children between the ages of three and five years old, found richer dream reports than those collected by Foulkes, with an average report length of 20 words, in contrast to the 13–14 words reported by Foulkes. A statistical analysis found a strong correlation between the number of words ( $r = 0.72$ ,  $df = 17$ ,  $p < 0.01$ ) and between the narrative items ( $r = 0.7$ ,  $p < 0.01$ ) in the dream and story reports. Alikhani (2002) studied the dream and story reports of 42 pre-school children of the same age, and found a moderate correlation between word counts (*Spearman's Rho* = 0.305,  $p = 0.024$ ), and a similar correlation to that of Kinnear (2002) for the story element counts between dream and story recall (*Spearman's Rho* = 0.357,  $p = 0.01$ ). Stone (2009) analysed the dream and story reports of 32 children between the ages of three and five years old, and found a significant and strong correlation between the word count of the story recall and the dream report ( $r = 0.63$ ,  $p < 0.01$ ), as well as a correlation between the narrative items in the story and dream reports ( $r = 0.7$ ,  $p < 0.01$ ).

Although the results of the aforementioned unpublished studies indicate that immature recall and narrative ability influence the length and detail of children's dream reports, the

sample sizes of these previous studies were too small to draw any definitive conclusions regarding the relationship between episodic memory (EM) and dream recall ability. Furthermore, these studies solicited only one dream report per participant. As a result, there was no control for the variable of unfamiliarity with the interviewer, which may have influenced the participants' ability to report a dream or recall a story in detail.

Furthermore, since each of the previous studies was limited to only one dream/story recall interview, none of the interviewers were able to establish a significant level of familiarity with the participant, nor any familiarity with the task required. Although Foulkes (1998) argues that persons familiar to young children are not the best collectors of children's dream reports, and that repeated interviewing and familiarity with the task has little effect on children's ability to report dreams, other dream researchers disagree (Colace, 2010; Domhoff, 1969; Resnick et al., 1994).

Two further unpublished studies (Delgado, 2003; Lympinaki, 2001) tested the validity of young children's dream reports by examining the quantitative and qualitative features of the dream reports of children between three and five years old. Similarly to the first three studies described above, these studies consisted of interviews during which the researcher asked the young children to describe their most recent dream. However, no comparison was made to the narration of a bedtime story.

In the study on the dream reports of 19 children aged between three and five years old conducted by Lympinaki (2001), the mean number of words in the children's dream reports was found to be 64. The shortest dream report was 24 words long, and the longest was 150 words long. Furthermore, this study found that 73% of the dream reports contained characters familiar to the child, 27% contained 'human uncertain' characters or strangers, 53% contained aggression and unpleasant interactions, 27% contained friendliness and pleasant interactions, and 47% contained physical activities of the dreamer. All of these findings were higher than those found in Foulkes' longitudinal study (Foulkes, 1982). Lympinaki (2001) compared her findings to those of Foulkes, and concluded that the method used to collect children's dreams influences both the content and length of the dream reports produced by young children.

Lastly, Delgado (2003) analysed and compared the content of the dream reports of 15 children between the ages of three and five years old, and 15 children between the ages of

five and seven old. She found the mean word count in the dream reports of the younger group to be 10.57, which was much lower than the mean count in the reports of the older group ( $M = 20.43$ ). Furthermore, the mean element count of the younger group was 10.43, while that of the older group was 20.57. These findings are in line with Foulkes' study, as the dream reports provided by older participants contained more words than those of younger participants. However, Delgado argues that the significant difference observed between the two age groups in her study was strongly influenced by language repertoire and verbalisation skills, rather than a difference in dream capacity, as argued by Foulkes.

## **Rationale for Research**

### **Part 1: Current Study**

Past research on the dreaming experiences of young children has produced contradictory findings. The age at which children begin to experience dreams, as well as the content of these dreams, continues to be a contentious issue among dream researchers. Most importantly, it appears that the usual method of dream study, the retrospective dream report, may not be an efficient and reliable measure with which to assess the dream life of pre-school children.

Research on children's dreams based on dream reports requires that we include parameters of memory and narrative skill. In other words, we need to determine how well the child remembers a dream, as well as the child's ability to explain what might have happened in the dream.

We cannot know the true content of a dream. This means we have no way to determine a child's recall or narrative ability based purely on the description in the dream report. Therefore, we first need to analyse how well he or she is able to recall and describe a bedtime story, the content of which we do know. If we assume a correlation between a child's ability to recall a story and a dream, we have a basis for analysing the dream report.

By comparing the dream report and the narrative of the bedtime story, we can examine the quality of a child's recall ability. If the recall of the dream and the recall of the story co-vary significantly, we can infer that children who provide impoverished dream reports are demonstrating a limited ability to recall and/or give a narrative account of a dream rather than a limited ability to experience a dream. Conversely, if there is no positive relationship between a child's ability to recall a dream and the story, then this would suggest that the dream experience itself is limited in children between the ages of three and five. As a result, this study includes parameters of memory and narrative skill to assess the relationship between the length of children's dream reports and their episodic memory skills.

The current study builds on the work of three previous unpublished studies: Alikhani (2002), Kinnear (2002), and Stone (2009). These studies all investigated the relationship between young children's ability to report a dream and their ability to recall a story, as described above. To enable a comparison between their findings and those of the current

research, the methodological design used here is very similar to those of the above-mentioned studies. However, there are differences, most notably to address shortcomings identified in each of the previous studies. Therefore, by using and building on the methods of the three original studies, the current study is able to either add to, adjust, or strengthen the findings of the prior research.

The methodological differences between the current and prior studies are as follows: (1) this study recruited a much larger sample for the single sample correlation analysis; (2) three interviews were conducted on separate days to establish whether greater familiarity with the interviewer and the task resulted in longer and more detailed dream reports; (3) based on Colace's findings (1995, 2004b, 2004a, 2006a, 2006b) the interview included more direct and prompting questions in the hope of obtaining a richer dream report; and (4) a quantitative and qualitative comparison was conducted of the findings of the present study and the previous unpublished studies (Alikhani, 2002; Delgado, 2003; Kinnear, 2002; Lympinaki, 2001; Stone, 2009).

The following hypotheses were tested:

H1: There is a positive correlation between the word count in the dream reports and in the story reports of children aged between three and five years.

H2: There is a positive correlation between the narrative element count of the dream reports and story reports of children aged between three and five years.

H3: There is a significant difference between the word count, as well as narrative element count, between Interview 1 and Interview 3, due to increasing familiarity with the interviewer and the task.

H4: In contrast to past research claims by Foulkes, dream content analysis will show that children between the ages of three and five years do report dreams containing: (a) rich content, (b) active self-representation; (c) social interactions; and (d) emotions.

## **Part 2: Comparison to Past Studies**

**Quantitative comparison.** Although the three previous unpublished studies (Alikhani, 2002; Kinnear, 2002; Stone, 2009) suggested the possibility of immature recall ability in dream reporting and story recall in children aged three to five years old, summarising these results quantitatively is problematic because of the small sample sizes. True meta-analytic methodology requires a larger sample size of studies than is possible in the current study, as the past studies chosen for comparison for the current research are limited to studies conducted under supervision of Professor Mark Solms. However, using meta-analytic methods provides a useful way of quantifying the results of individual studies, weighting them for sample size, and producing an overall effect size to test against a null hypothesis. Therefore, this part of this study aims to use a meta-analytic type approach to summarise the results obtained by the three previous investigations, as well as the present study, in an objective way.

**Qualitative comparison.** Although three of the previous unpublished studies (Alikhani, 2002; Delgado, 2003, Lympinaki, 2001) noted some suggestions of the most frequent dream content provided in the dream reports of children aged three to five years old, summarising these results quantitatively is again problematic because of the small sample sizes. The aim of this part of the study is to use a qualitative meta-analytic type methodology to synthesise the findings of the content analysis of these past studies and the current study.

## Method

### Part 1: Current Study

**Research design and setting.** The first two hypotheses looked at the correlation between word count of dream and report and story recall, and the correlation between narrative element count of dream report and story recall. To address this, a one-sample, within-subjects, cross-sectional correlational design was employed to determine the relationship between pre-schoolers' ability to remember and report a dream and their capacity to remember and report a story.

A repeated measures design was employed to investigate H<sub>3</sub> on whether familiarity with the interviewer/task leads to an increase in the word count and narrative count of dream reports between the first and third interview. Then, to address H<sub>4</sub>, a cross-sectional descriptive analysis was used to investigate whether dream reports are rich in content, and include active self-representation, social interactions, and emotions.

The interviews were conducted at the various schools involved in this research. A pre-school teacher, familiar to the participant, was present at all times during the interviews. A quiet room, free of distractions, was used as the interview setting.

**Participants.** A total of 51 children (age range three to five years old) participated in the study. Their demographic characteristics are presented in Table 1. These children were recruited from private pre-schools in the Western Cape. Purposive sampling was employed to ensure that all participants met the age criteria for this research.

Table 1  
*Demographic Characteristics of the Current Sample*

Characteristics	Group			
	AGE 3 ( <i>n</i> = 19)	AGE 4 ( <i>n</i> = 17)	AGE 5 ( <i>n</i> = 15)	Total ( <i>n</i> = 51)
Age range (years: months)	3:0-3:11	4:0-4:8	5:0-5:8	3:0-5:8
Age (years)				
<i>M</i> ( <i>SD</i> )	3.05 (0.34)	4.04 (0.03)	5.05 (0.03)	4.27 (0.87)
Sex				
Male: female	13: 9	8: 9	9: 6	30: 21
Home language				
English: Afrikaans: isiXhosa: other	16: 1: 0: 2	16: 0: 1: 0	13: 1: 0: 1	45: 2: 1: 3

***Inclusion and exclusion criteria.*** Children between the ages of three and five years and 11 months old at the time of the interviews were recruited for the study. Since Foulkes' (1998) study did not reveal any gender differences in dream recall ability, both girls and boys were recruited. Basic comprehension and fluency in English was a minimum requirement for participation in this study. All the participants were recruited from schools that used English as the medium of instruction. Children were included if the parents confirmed that their child had good comprehension and communication skills in the English language (see Demographic questionnaire in Appendix D).

Additional information necessary for determining exclusion was obtained through parents' completion of the demographic questionnaire. Exclusion criteria for the participants included a history of head injury and/or infantile meningitis, or a diagnosis of any neurological condition(s). In addition, a diagnosis or history of attentional disorders (e.g., attention-deficit/hyperactivity disorder), behavioural disorders (e.g., conduct disorder, oppositional-defiant disorder), developmental disorders, psychotic disorders, and/or affective disorders resulted in exclusion from the study. These criteria were set in place so that the child was not affected by other factors that might have influenced their ability to report a recent dream and recall a story, thereby affecting the validity of findings.

***Ethical considerations.*** Permission was granted by the Ethics Committee of UCT Department of Psychology to proceed with the present research. Permission was subsequently obtained from the various private pre-schools to approach their students to participate in the

research. Parents/guardians provided written informed consent for their children's participation, and on the day of the interview, the children provided oral assent to participate.

Parents were assured that anonymity would be maintained, that all data would be kept confidential and be used for research purposes only, and that audio-recordings of interviews would be accessible to the principal researcher only. Participants were not exposed to any risks. If they experienced fatigue at any point, they were allowed to rest between questions. Participants and parents/guardians were also made aware that if at any point they wished to do so, they could withdraw from the study, without any negative consequences. Following completion of the research, a formal presentation providing feedback of the research findings was held for all parents/guardians of the participating children.

### **Measures.**

*General measures.* The parents/legal guardians of the participants were asked to provide basic demographic information before the interviews commenced (see Appendix D). This information was necessary to identify participants who met the exclusion criteria.

*Dream recall.* Semi-structured interviews were conducted based on questioning techniques proposed by Domhoff's Most Recent Dream Report (1996), Colace's research of children's dreams (2010), and Foulkes's longitudinal study of children's dreams (1998). Although there may be some overlap between these interview techniques, including all three was useful for attaining a richer dream report. Table 2 provides an example of the interview questions used to obtain more detailed information on the various aspects of the dream report.

*Most Recent Dream Report.* The interview accessed, in as much detail as possible, the child's most recent dream by asking the child to report on their most recent dream. The participating children were interviewed in an open-ended format, based on the well-validated Most Recent Dream Report (Domhoff, 1996). This measure has been used on children as young as eight years of age, and has proven to be strongly reliable and valid (Avila-White, Schneider, & Domhoff, 1999). The measure was adapted for use with younger children for the previous unpublished studies in this field (Kinnear, 2002; Stone, 2009). The adaptation, the Most Recent Dream Report Instrument (Kinnear, 2002), features an oral format as opposed to asking the children to write down their most recent dream. The adapted measure

follows the same instructions as the original, but uses simplified, age-appropriate language (see Appendix E).

Dream reports were recorded on three separate occasions. The interview commenced with the interviewer asking, ‘*Do you remember having a dream last night, when you were asleep?*’ If the participant did not remember dreaming the previous night, the interviewer asked, ‘*Do you remember a dream that you had another night this week, or maybe last week? Could you tell me about it?*’ In cases where the participant was still not be able to recall a dream, the interviewer asked a more general question, ‘*Can you tell me about any dream you have had when you were asleep?*’ During the second and third interviews, the participant was asked the same questions in the same sequence.

*Colace’s Children’s Dream Questions.* Interview techniques used by Colace (1995, 2004a, 2004b, 2006a, 2006b; Colace et al., 1993; Colace & Tuci, 1996; Colace et al., 1997; Colace et al., 1995) during his studies on children’s dreams were incorporated into each interview (Appendix F). These included questions related to the child’s understanding of the concept of a dream (‘*Do you know what a dream is?*’), asked during the first interview before the Most Recent Dream Report questions, followed by the request to report a recent dream. The participant was then left free to report a dream without any further form of encouragement by the interviewer. Following the free dream report of the child, more specific questions were asked to provide more detail where required (e.g., ‘*In what place were you in the dream?*’).

*Foulkes’ Midnight Awakenings Interviews.* If the participant’s dream report did not contain information about significant features, such as information about the characters in the dream, their actions, the emotions the child experienced during the dream, or the setting of the dream, then the interviewer asked specific questions to aid the child in reporting this information. The questions used were based on the questions used by Foulkes (1998, p.30) in the laboratory midnight awakenings interviews (see Appendix G). For example, should the child provide no information in response to Domhoff’s or Colace’s questions, he/she was prompted with questions such as ‘*What were you dreaming before you woke up?*’, ‘*What were you seeing?*’, and ‘*What was happening just before you woke up?*’

**Story recall.** The participant was asked to recall the story that was read to them by their parent/guardian the night before. Three storybooks were used: *Where’s Tim’s Ted*

(Whybrow, 1999), *Belvedere Dreaming* (Ryan, 2000), and *Mole's Sunrise* (Willis, 2011). The first two books were used in previous unpublished studies (Kinneer 2002, Stone 2009), while the third book was introduced in the current study. All three books are age appropriate and fun, approximately five minutes long in reading time, and contain simple narratives accompanied by imaginative illustrations arguably similar to the substantial visual imagery contained in dreams. Five copies of each book were purchased to enable multiple interviews to be conducted in a single morning.

The interview format for story recall mimicked that used for dream recall. Participants were asked standard questions and prompts about each story. These questions were similar to those used during the dream report interview, starting with, 'Do you remember the story that was read to you by your mom/dad last night before you went to sleep?' and 'Can you remember what happened? Can you tell me?' Further prompts, such as 'Tell me as much as you can remember', 'Can you remember anything else?', and 'What happened after that?' were included in the interview, if and when necessary. As much detail was elicited for the story recalls as for the dream reports to avoid possible bias. Table 2 provides an example of the interview questions asked to obtain more detailed information on the various aspects of the story recall.

Table 2

*Examples of Interview Questions Asked for Dream Report and Story Recall***Dream Report**

Do you know what a dream is? (*first interview only*)

What part of our bodies do we dream with? (*first interview only*)

Can anybody else, other than you, see what you dream? (*first interview only*)

Do you remember having a dream last night, when you were asleep?

Can you tell me what happened in that dream?

*Participant was then left free to answer without further form of encouraging. The free dream report was then followed by further questions where necessary.*

Were you in the dream?

In what place were you in the dream?

Was there anyone else with you in the dream?

Were there any animals in your dream?

Were you happy during this dream? Were you sad?

Was this dream a good or bad one?

Can you remember anything else that happened in the dream?

**Story Recall**

Do you remember the story that your mommy or daddy read to you last night?

Can you tell me what happened in that story?

*Participant was then left free to answer without further form of encouraging. The free story recall was then followed by further questions where necessary.*

What character was in the story?

Where did the story take place?

Were there any other characters in the story?

Were there any animals in the story?

How did the characters in the story feel? Were they happy or sad?

Did you enjoy the story?

Can you remember anything else that happened in the story?

The interviewer had no prior knowledge of the characters and narrative of the three storybooks. This prevented the interviewer from inadvertently guiding the participant's answers. As with the dream report, the story recall was audio-recorded.

**Content analysis of dreams.** A content analysis of the dream reports of each interview was performed by independent raters, based on the Hall/Van de Castle (1966) coding system of dream analysis. The Hall/Van de Castle coding system contains 10 general categories, of which four categories were included in the current study: Characters (C), Emotions (E), Activities (A), Social Interactions (SI) (see Appendix I).

**Procedure.** Each parent at the various pre-schools received a letter containing information about the current research. Written informed consent was obtained from the participants' parents/legal guardians prior to commencement of the interviews. Furthermore, parents/legal guardians completed a demographic questionnaire, which included information necessary for the selection of the participants, as well as to identify children who met any of the exclusion criteria. Oral assent was then obtained from the participant on the day of each interview (Appendix C).

Three independent interviews were conducted with each participant. The protocol employed was based on a previous design used in this field of research that conducted one interview collecting one dream report and one story recall per child (Kinnear, 2002; Stone, 2009). Two dream reports and two story recalls were added to this protocol to provide additional data, as well as to control for confounding variables such as participant shyness and unfamiliarity with the interviewer and task. Audio-recording of the interviews enabled transcription and subsequent rating and coding of the data.

Interviews were held on three separate occasions during school mornings, within a maximum period of two weeks. Morning interviews ensured that the interview was as close as possible to the experience of the dream and the bedtime story of the night before. Short time intervals between the separate interviews allowed the participant to become familiar with the interviewer and the task, which controlled for any shyness and/or discomfort the child may have experienced during the first interview. During each interview, the child was asked to recall a different story and a different dream. A teacher familiar to the child was present during each interview. The teacher was asked to refrain from prompting the child in any way. The interview schedule was flexible, but conformed loosely to the standard format described above.

One storybook was given to the parents/legal guardians of the participants at a time. Parents were instructed to read their child the story once on the night prior to each interview, and to ensure that the child was shown the illustrations. Furthermore, parents were instructed not to discuss the story the following morning, nor to ask the child about any dream they experienced during the previous night. The following morning, the interviewer questioned the children about the story they were read, as well as the dream they had the previous night.

Children were allowed time to become acquainted with the interviewer and to feel at ease at the beginning of the interview by means of questions related to their latest birthday and/or holiday. The length of the acquaintance time varied, but was limited to a maximum of five minutes. Once the child seemed comfortable, the interviewer asked the child to sit near her. The voice recorder was shown to the child and the interviewer explained that it is to help her remember afterwards what the child has said. The interviewer started the interview with an open-ended question about the story their parent read to them the previous night. Following the story recall the interviewer asked the child about their most recent dream.

During each of the three separate interviews, half of the participants were first asked to recall and report the story they heard the previous evening, followed by their dream report. The other half of participants were asked to provide their dream report first, followed by the recall and report of the story. Counterbalancing the order of the recall of the story and the dream report controlled for any confounding variable of sequence of recall and reporting. The questions regarding the story recall and dream report were essentially structured in the same way for each participant. Similar questions were used to prompt for both the story recall and dream report, i.e. if the story recall and dream report did not contain characters, details of the setting in which the dream/story occurred, activities, or emotions, the interviewer used specific questions to help the child to report as many of these elements as they could.

The interviews, excluding the preliminaries, were no longer than 10 minutes in length. The interviews took place in a quiet classroom setting away from other children. Interviews were recorded using a small, unobtrusive hand-held recorder, and were later transcribed. Participants were allowed to rest if they experienced fatigue during the interviews. At the end of each interview, the participant was thanked for his/her participation.

The coding of the dream reports and story recall was conducted by three trained independent raters, who were blind regarding the hypotheses of the current study and had no acquaintance with the participants. The raters were trained to count the words and the narrative elements of both the dream and story recall (see Appendix H for the guidelines of word count and narrative element count). For the word count, raters were asked to literally count the number of words specifically relating to the content of the child's dream and recalled story. Any words implying hesitation (e.g., 'um', 'well'), and introductory phrases (e.g., 'Last night I dreamt that...', 'the story I heard was about...') were not counted.

Furthermore, affirmative or negative single words or phrase answers such as ‘yes’, ‘yes I do’, ‘no, I don’t remember’, and explanatory words such as ‘because’, which were used by the participants in the interview to answer a question and did not contain any new evidence for the dream report and story recall were excluded from the count.

For the narrative count, raters were asked to count all ‘elements’ in the dream reports and story recalls that reflected an individual idea or concept (e.g., ‘the princess flew to the castle’, ‘there was a monster’). One ‘element’ could be composed of several grammatical features, such as an object (concrete or abstract) contained temporally in a relation (verbal or associative) to a character, for example ‘they found the Ted’ or ‘the dinosaur jumped on my head’.

Furthermore, raters were trained to code the content of the dreams using the Hall/Van de Castle coding system. Each category of the content received a code (see Table 3).

Table 3  
*Categories for the Analysis of Dream Content According to the Hall and Van de Castle Coding System*

Category	Subcategory	Code
C - Animals, humans, creatures, objects	Animals	CA
	Friends	CF
	Relatives	CR
	Fantasy Figures	CFan
	Objects	CO
A - Dreamers physically active/passive activities	Active	AA
	Passive	AP
E – Emotions	Positive	EP
	Negative	EN
SI - Social interactions	Aggression	SI-AG
	Friendliness	SI-FR
STR – Striving	Success	STRS
	Failure	STRF
F – Fortunes	Good fortunes	FG
	Misfortunes	FM

Raters noted which categories were present in each individual dream, and counted the frequency of each category within each dream.

## **Part 2: Comparison to Past Studies**

**Quantitative comparison.** A meta-analytic type methodology was employed to standardise the statistical findings across the three previous unpublished studies (Alikhani, 2002; Kinnear, 2002; Stone, 2009) and the first interview of the current study (i.e., Part 1 of this dissertation). A comparison was made to determine the mean effect size for the correlation between the word count of story recall and dream reports, as well as the mean effect size for the correlation between narrative item counts of story recall and dream reports across all three studies.

The primary aim of the quantitative comparison was to combine previous studies of the immature recall ability of dreams of children aged three to five years old conducted at the University of Cape Town and the Anna Freud Centre at the University College in London. These unpublished manuscripts were directly solicited from the two universities. Three English-language unpublished Masters Theses, completed between the years 2001 and 2009, were identified and considered for inclusion, as these studies also examined recall of dream and story in this age range.

To be included, these studies had to meet the following criteria: (a) the study design had to include the report of at least one recent dream and the recall of one story read to the participant the evening before the interview; (b) the participants of the study were between the ages of three to five years old; (c) dream samples were collected in the early morning at the participants school; (d) the correlation coefficient was calculated using Pearson's product moment correlation; (e) and the study information was available in English.

One study (Alikhani, 2002) used Spearman's Rho to calculate the correlation coefficient, and did not provide sufficient data to enable recalculation using Pearson's product moment. The study was therefore excluded from the quantitative comparison. This resulted in three eligible studies being included in this analysis, namely, Kinnear, (2002), Stone (2009), and the Part I of this dissertation, involving a total of 101 participants between the ages of three and five years old.

Children were excluded from the study based on a history of head injury and/or infantile meningitis, a diagnosis of any neurological condition(s), a history of attentional disorders, behavioural disorders, developmental disorders, psychotic disorders, and /or affective disorders.

**Effect size measure.** The sample sizes and means of the word and narrative counts of the first dream report and the first story recall were used to compute effect sizes expressed as correlation coefficients,  $r$ , for the current study. Correlation coefficients were chosen as the effect size metric as they can easily be computed from group means (Hunter & Schmidt, 2004) and are more easily interpreted in terms of practical importance compared with other metrics (Field, 2001; Rosenthal, 1991; Rosenthal & DiMatteo, 2001). Correlation coefficients of past studies were previously calculated by their researchers. Each study contributed two separate effect sizes: one for the correlation between word count of dream report and story recall, and one for narrative count of dream report and story recall. Table 4 shows the included studies, the correlations ( $r$ ), and their significance values ( $p$ ).

Table 4

*Comparison of Correlations between Word Count of Dream Report and Story Recall and Narrative Count of Dream Report and Story Recall*

Study	Variable	$r$	Significance ( $p$ )
Current Study	Word Count Dream and Story	0.75	< .001
	Narrative Count Dream and Story	0.72	< .001
Kinnear (2002)	Word Count Dream and Story	0.72	< .001
	Narrative Count Dream and Story	0.70	< .001
Stone (2009)	Word Count Dream and Story	0.63	< .001
	Narrative Count Dream and Story	0.70	< .001

**Meta-analytic technique.** According to Hedges and Vevea (1998), fixed-effects models are appropriate for inferences that extend only to studies included in the meta-analysis, whereas random-effects models allow inferences that generalise beyond the studies included in the meta-analysis. Similarly, Overton (1998) suggested that when a research domain's population is underrepresented (i.e., only a small number of possibly quite diverse studies have been attempted), a random-effects model is most appropriate. In addition, applying fixed-effects meta-analytic models to random-effects data can have undesirable effects on the outcomes of the analysis (Field, 2003; Hunter & Schmidt, 2000).

In light of the small number of studies, a random-effects conceptualisation of the meta-analytic type comparison was used, to allow for inferences that generalise beyond the studies included in the comparison. The small number of studies made it impractical to look

at moderators because the resulting interaction terms would have had empty cells and the power to detect moderation would have been very low. All analysis were conducted using custom written syntax for Programme R, package Psychometric.

**Qualitative comparison.** This part of the study used a qualitative meta-analytical type methodology to synthesise the findings of the content analysis of past studies that analysed the dream reports of children aged between three and five years old. Although traditionally a meta-analysis is used to transform data from multiple quantitative studies into a common measure using a statistical procedure, some past studies (Hossler & Scalese-Love, 1989; Miles & Huberman, 1991; Schreiber, R., Crooks, D., Stern, P. N., 1997; Paterson, B. L., Thorne, S. E., Canam, C., Jillings, C., 2001) have argued that the meta-analysis process can be adapted to qualitative studies. According to these studies, qualitative meta-analysis, also referred to as meta-synthesis, follows the same replicable procedures as a quantitative meta-analysis, however it is interpretive rather than aggregative. A qualitative meta-analytical type methodology was therefore employed to combine the findings of dream content analysis across three previous unpublished studies.

The primary aim of the qualitative meta-analysis was to combine previous studies of the dreams of children aged three to five years conducted at the University of Cape Town and the Anna Freud Centre at the University College in London. Unpublished manuscripts were directly solicited from the universities. Three English-language unpublished Masters Theses, completed between the years 2001 and 2003, were identified and considered for inclusion, as these also included a content analysis of children's dreams in this age range.

For inclusion in the qualitative meta-analytical type comparison, studies had to meet the following criteria: (a) the study had to include the report of at least one recent dream; (b) the participants of the study were between the ages of three and five years old; (c) and study information was available in English; (d) the study analysed the dream content frequencies of active self-presentation, social interaction, and emotion.

One study (Delgado, 2003) calculated the frequencies of dream content according to different age group parameters, and did not provide sufficient data to enable recalculation of the dream content frequencies for age group three to five years only. The study was therefore excluded from the quantitative comparison. This resulted in three eligible studies being

identified, namely Alikhani (2002), Lympinaki (2001), and Part 1 of this dissertation, involving a total of 111 participants between the ages of three and five years old.

## Data Analysis

**Part 1: Current study.** All statistical calculations were performed using SPSS v19 for Windows (SPSS, 2011). An alpha level of  $p < .01$  was used in all decisions regarding statistical significance as a conservative adjustment of statistical significance.

A Chi-squared goodness-of-fit analysis was conducted on the categorical variable of gender to determine if there was a statistically significant male-female distribution difference between the participants. Furthermore, an Inter-rater Correlation Coefficient reliability test was performed on the scores of the three independent raters: one for word-count and one for narrative element-count. The mean score of the three raters for both word count and narrative element count was used for the statistical analysis. Furthermore, the mean score of the three raters for each category of the content analysis (based on the Hall/Van de Castle (1966) coding system) was used for the frequency of content analyses.

Descriptive and inferential analyses of continuous data involved comparisons to assess the differences between the word count and narrative element count of both dream reports and story recall. Detailed descriptive statistics were computed to characterise all participants' word-counts and narrative element-counts for both the dream and story recall.

Pearson's product moment correlations were employed to correlate the word-count and narrative element count for the first dream report and first story recall. Furthermore, two-tailed t-tests were conducted to analyse whether there were any significant differences between the word counts and narrative element counts of the first dream report and first story recall. This was done in order to confirm that the interview questions and prompts for both dream reports and story recall elicited similar word counts and narrative element counts, and that therefore there was no bias in interview format.

Furthermore, one-tailed t-tests were conducted to investigate whether there were any significant differences in word counts and narrative element counts of dream reports and story recalls between interview 1 and interview 3.

Lastly, detailed descriptive statistics of frequencies of specific dream content were computed for the entire sample.

**Part 2: Comparison to past studies.** All statistical calculations were performed using custom written syntax for Programme R, package Psychometric. All data analyses for the comparison were conducted using the Pearson correlation coefficient ( $r$ ) effect size with the adjustment computations proposed by Hunter and Schmidt (Hunter & Schmidt, 1990). These procedures draw on psychometric theory and are designed to correct for methodological artefacts in primary studies, such as sampling error and measurement error. Both 95% credibility and confidence intervals were computed for each sample-weighted and corrected mean correlation. Credibility intervals provided information about validity generalisation, or the extent to which moderators may be influencing the effect estimate. Confidence intervals were used to estimate the accuracy of the sample-weighted mean effect size in representing the true population parameter. The homogeneity of mean corrected effect sizes were examined to determine if the variability in outcomes was greater than expected from sampling error and measurement artefacts. In addition to credibility intervals, homogeneity of effects were examined using the Q-statistic and the 75% rule (Hunter & Schmidt, 1990).

Furthermore, a qualitative comparison was employed to synthesise the findings of the content analysis of past studies that analysed the dream reports of children aged between three and five years. The weighted means of the frequencies of various dream report content were calculated for each study and subsequently combined and interpreted.

## **Results**

This section will be laid out in the following manner:

### **Part 1: Current Study**

Firstly, I will discuss analyses of measures of socio-demographic characteristics of the sample. Second, outcomes of the inter-rater reliability analysis will be provided. Thirdly, I will discuss the effect sizes in measures of (1) correlation between word count first dream report and first story recall, and (2) correlation between narrative count of first dream report and first story recall.

Furthermore, the difference between the word counts and narrative counts of dream reports and story recall between Interview 1 and Interview 3 will be calculated to analyse whether familiarity with the interviewer and task material had an effect on these variables.

Lastly, differences in frequencies of dream content will be discussed. For each of the outcomes a summary of results will be given.

### **Part 2: Comparison to Past Studies**

Firstly I will discuss analyses of combined effect sizes of the correlations between (1) word count of dream reports and story recall, and (2) narrative count of dream reports and story recall. Furthermore, qualitative outcomes of dream content across the studies of the meta-analysis will be provided.

#### **Part 1: Current study**

*Sample characteristics.* All participants were able to comprehend and communicate in English. The final sample for the current study consisted of 51 children between the ages of 3 and 5 years old (i.e., 19 three-year olds, 17 four year olds, and 15 five year olds). Of the 51 subjects recruited, 51 participated in a first interview, 50 a second interview, and 46 a third interview. Sample characteristics of the current study participants who participated in the first interview ( $N = 51$ ) are presented in Table 5.

Table 5  
*Demographic Characteristics of the Current Sample (Interview 1)*

Characteristics	Total sample ( <i>n</i> = 51)
Age range (years: months)	3:0-5:8
Age (years) <i>M</i> ( <i>SD</i> )	4.27 (0.87)
Sex	
Male: female	30: 21
Home language	
English: Afrikaans: isiXhosa: other	45: 2: 1: 3

With regard to *gender*, a chi-square goodness of fit test indicated that there was no statistically significant difference between the male-female distribution of the participants,  $\chi^2(1, n = 51) = 1.59, p = .208$ . A chi-squared analysis was not performed on the categorical variable of *home language*, as due to the low numbers it would not be possible to meaningfully interpret the result. All participants attended pre-schools that used English as the medium of instruction, and therefore all participants were able to understand the instructions.

***Independent ratings.*** The three independent raters' scores of the interviews used in the current study were analysed for inter-rater reliability. The following Inter-rater Correlation Coefficient scores were derived: Word count dream  $r = .972$ ; Word count story  $r = .988$ ; Narrative element count dream  $r = .974$ ; Narrative count story  $r = .976$ . Inter-coder reliability for dream content based on Hall and Van de Castle "*percentage of perfect agreement*" method revealed a 82% agreement for characters, a 65% agreement for self-representation (i.e., active and passive), a 70% agreement for emotions, and a 80% agreement for social interactions.

**Hypothesis 1: There is a positive correlation between the word count of dream reports and story reports of children between the ages of three and five years.**

***Correlation of word count of first dream report and first story recall.*** The aim was to examine the relationship between word count of dream reports and story recall. The hypothesis was that the number of words used for dream reports would be positively

correlated with the number of words used for story recall. Before proceeding with the correlation analysis, the assumptions underlying the relevant parametric statistical tests were checked. All parameter estimates were normally distributed.

Pearson's Correlation Coefficient was computed to assess the relationship between word count of dream reports and word count of story recall, revealing a strong significant positive correlation between the word count of dream report and story recall,  $r = .75, p < .01$ .

Furthermore, a two-tailed dependent samples t-test revealed that there is a statistically significant difference between the word count of dream reports and story recall,  $t(50) = 3.57, p = .001, d = 0.50$ . Word count of dreams ( $M = 52.58; SD = 56.94$ ) was significantly higher than the word count of stories ( $M = 33.15; SD = 32.44$ ).

In sum, a strong and significant positive correlation was found between the amount of words used to report a dream and the amount of words used to recall a story for the entire sample (age range three to five years old). Furthermore, the amount of words used to report dreams were significantly more than the amount of words used to recall stories.

**Hypothesis 2: There is a positive correlation between the narrative element count of dream reports and story reports of children aged between three and five years.**

***Correlation of narrative element count of first dream report and first story recall.***

The aim was to examine the relationship between narrative element count of dream reports and story recall. The hypothesis was that the number of narrative elements used for dream reports would be positively correlated with the number of narrative elements used for story recall. Before proceeding with the correlation analysis, the assumptions underlying the relevant parametric statistical tests were checked. All parameter estimates were normally distributed.

Pearson's Correlation Coefficient was computed to assess the linear relationship between narrative element count of dream reports and story recall. There was a strong statistically significant positive relationship between the narrative element count of dream report and story recall,  $r = .72, p < .01$ .

Furthermore, a two-tailed dependent samples t-test revealed that there is a statistically significant difference between the narrative element count of dream reports and story recall,  $t(50) = 3.68, p = .001, d = 0.52$ . Narrative element count of dreams ( $M = 40.37; SD = 43.16$ ) was significantly higher than the narrative element count of stories ( $M = 24.40; SD = 23.26$ ).

In sum, a strong and significant positive correlation was found between the amount of narrative elements used to report a dream and the amount of narrative elements used to recall a story for the entire sample (age range three to five years old). Furthermore, the amount of narrative elements used to report dreams were significantly more than the amount of words used to recall stories.

**Hypothesis 3: There is a significant difference between the word count, as well as narrative element count, between Interview 1 and Interview 3 due to increasing familiarity with the interviewer and the task.**

***Word count of dream report and story recall between Interview 1 and Interview 3.***

The aim was to examine the relationship between word count of dream reports and story recall between interview 1 and interview 3. The hypothesis was that the more familiar the child was with the task and the interviewer, the more words he/she would use to describe a recent dream and recall a story. The mean number of words used to report the dream and story in Interview 1 and Interview 3 are presented in Table 6.

Table 6  
*Mean Word Count of Dream Report and Story Recall in Interview 1 and Interview 3*

Interview	$n^a$	Word Count	
		Dream Report	Story Recall
Interview 1	46	55.85 (58.64)	35.51 (38.90)
Interview 3	46	60.93 (73.57)	38.90 (42.87)

*Note.* Means presented with standard deviations in parentheses.

<sup>a</sup>Note that only 46 of the initial 51 children participated in a third interview.

Two one-tailed repeated measures t-tests were conducted to investigate whether familiarity with the interviewer and task influenced word count of dream report and story

recall, respectively. All assumptions underlying these analyses were upheld. The analyses revealed that there is no statistically significant difference between the word count of dream reports in interview 1 and interview 3,  $t(45) = -.62, p = .271$ , as well as no statistically significant difference between the word count of story recall in Interview 1 and Interview 3,  $t(45) = -.54, p = .298$ . Means and Standard Deviations can be seen in Table 6 above.

***Narrative count of dream report and story recall between Interview 1 and Interview 3.*** The aim was to examine the relationship between narrative element count of dream reports and story recall between Interview 1 and Interview 3. The hypothesis was that the more familiar the child was with the task and the interviewer, the more narrative elements he/she would use to describe a recent dream and recall a story. The mean number of narrative elements used to report the dream and story in Interview 1 and Interview 3 are presented in Table 7.

Table 7

*Mean Narrative Element Count of Dream Report and Story Recall in Interview 1 and Interview 3*

Interview	<i>n</i>	Narrative Element Count	
		Dream Report	Story Recall
Interview 1	46	42.82 (44.48)	26.25 (23.70)
Interview 3	46	49.54 (60.74)	29.32 (35.24)

*Note.* Means presented with standard deviations in parentheses.

Two one-tailed repeated measures t-tests were conducted to investigate whether familiarity with the interviewer and task influenced the narrative element count of dream report and story recall, respectively. All assumptions underlying these analyses were upheld. The analyses revealed that there is no statistically significant difference between the narrative element count of dream reports in interview 1 and interview 3,  $t(45) = -1.02, p = .158$ , as well as no statistically significant difference between the narrative element count of story recall in interview 1 and interview 3,  $t(45) = -.60, p = .277$ . Means and Standard Deviations can be seen in Table 7 above.

In sum, neither familiarity with the interviewer, nor familiarity with the task materials, appeared to significantly affect the number of words used to report dreams or recall stories, or the number of narrative elements provided.

**Hypothesis 4: Contrary to past research claims, children between the ages of three and five years do report dreams containing: (a) active self-representation; (b) emotions; (c) social interactions; and (d) rich character content.**

*Content analysis of dreams.* Some past research claims that the dreams of children between the ages of 3-5 are impoverished and passive. To investigate this, I looked at self-representation in activities reported in dreams (i.e., active versus passive self-representation), emotions (i.e., positive versus negative emotions), social interactions (positive versus negative social interactions) and characters (i.e., animals, fantasy figures, relatives, friends, objects). Frequencies are presented in Table 8 below.

*Activities (A).* The participants reported dreams containing either only active self-representations, only passive self-representation, both, or neither. Of all the dreams reported ( $N = 119$ ), more dreams contained at least one active self-representation (29 dreams, 24.40%) than at least one passive self-representation (13 dreams, 10.90%). 69 dreams (58%) contained both at least one active and passive self-representation, while 8 dreams (6.70%) contained neither. Frequencies of active self-representation and passive self-representation in the dream reports of the entire sample can be seen in Table 8.

*Emotions (E).* The participants reported dreams containing either only positive emotions, only negative emotions, both, or neither. Of all the dreams reported ( $N = 119$ ), more dreams contained at least one positive emotion (41 dreams, 34.50%) than at least one negative emotion (7 dreams, 5.90%). 62 dreams (52.10%) contained both at least one positive and negative emotion, while 9 dreams (7.50%) contained neither. Frequencies of positive and negative emotions in the dream reports of the entire sample can be seen in Table 8.

*Social Interactions (SI).* The participants reported dreams containing either at least one positive social interaction, at least one negative social interaction, both, or neither. Of all the dreams reported ( $N = 119$ ), more dreams contained at least one positive social interaction (38 dreams, 31.90%) than at least one negative social interaction (6 dreams, 5.10%). 2 dreams (1.70%) contained both at least one positive and negative social interaction, while 73 dreams (61.30%) contained neither. Frequencies of positive and negative social interactions in the dream reports of the entire sample can be seen in Table 8.

**Characters (C).** The participants reported dreams containing either at least one character, two or more characters, or no characters. Of all the dreams reported ( $N = 119$ ), more dreams contained two or more characters (101 dreams, 84.90%) than just one character (13 dreams, 10.90%), or no characters (5 dreams, 4.20%). Frequencies of character content in the dream reports of the entire sample can be seen in Table 8.

Table 8  
*Frequencies of Self-representation, Emotions, Social Interactions, and Characters in all Dream Reports (n = 119)*

Self-representation	Active	24.40%
	Passive	10.90%
	Both	58.00%
	Neither	6.70%
Emotions	Positive	34.50%
	Negative	5.90%
	Both	52.10%
	Neither	7.50%
Social interactions	Positive	31.90%
	Negative	5.10%
	Both	1.70%
	Neither	61.30%
Characters	One	10.90%
	Multiple	84.90%
	None	4.20%

**Summary of results Part 1.** With regard to hypothesis one, the results of the correlation analysis indicated that there is a highly significant positive association between the amount of words used to report a dream and to recall a story for the total sample (age range three to five years old). Furthermore, the results of a two-tailed t test indicated that there is a statistically significant difference (at the adjusted significance level of  $p < .01$ ) in the word count of dream reports and story recall.

Similarly, with regards to hypothesis two, the results of the correlation analysis indicated that there is a highly significant positive association between the number of narrative elements used to report a dream and to recall a story for the total sample (age range three to five years old). Furthermore, the results of a two-tailed t-test indicated that there is a

statistically significant difference (at the adjusted alpha of  $p < .01$ ) in the narrative element count of dream reports and story recall.

With regard to hypothesis three, results indicated that there was no statistically significant difference between the word counts or narrative element counts between the interviews.

With regard to hypothesis four, content analysis showed that the dreams of preschool children between the ages of three and five are not as impoverished and passive as past research by Foulkes (1998) claims. Results of the content analysis furthermore indicated that positive emotions are more frequent in the dream reports of children in this age group than negative emotions, and that more dreams contained both positive and negative emotions than no emotions. The dream reports contained more positive social interactions than negative social interactions, although more dreams contained neither positive nor negative social interactions than both types of social interaction. Lastly, results of the content analysis indicated that more dreams of children between the ages of three to five years old contain multiple characters (i.e. animals, fantasy figures, relatives, friends and objects) than just one or no characters.

## **Part 2: Comparison to past studies**

*Quantitative comparison.* Three studies met all criteria and were included in the quantitative comparison. One Masters thesis (Alikhani, 2002) was excluded from the quantitative comparison since the author had used Spearman Rho Correlation Coefficient, and raw data was no longer available to redo the data analysis using Pearson correlation coefficient. All studies investigated dream reporting and recall ability of stories of children aged between three and five years. For all studies there were a total of 101 participants included in the comparison. Of the 101 interviews used in the comparison, 60 contained dream reports (59.41%). Of the 51 initial interviews (i.e., Interview 1) of the current study, 40 contained dream reports (78.43%), of the 18 interviews in Kinnear's study 7 contained dream reports (38%), and of the 32 interviews in Stone's study 13 contained dream reports (40.06%). The mean number of words and narrative elements used to report the most recent

dream and story recall of the different studies used in the quantitative comparison are presented in Table 9. Descriptive statistics were not available for the Kinnear study.

Table 9  
*Mean Word and Narrative Element Count of Dream Report and Story Recall of Studies*

Study	<i>n</i>	Word Count		Narrative Element Count	
		Dream Report	Story Recall	Dream Report	Story Recall
Current study	40	52.58 (56.94)	33.15 (32.44)	40.37 (43.16)	24.41 (23.26)
Stone	13	9.67 (18.67)	37.64 (43.35)	4.39 (8.99)	17.28 (23.26)
Kinnear	7	n/a	n/a	n/a	n/a

*Note.* Means presented with standard deviations in parentheses.

Inter-rater reliability was calculated using Inter-rater Correlation Coefficient (ICC) for the current study, and Pearson's Inter-rater Reliability Coefficient for both the Kinnear and Stone studies. Inter-rater reliability scores obtained are presented in Table 10.

Table 10  
*Inter-rater Reliability Scores across Studies*

Study	<i>n</i>	Word Count		Narrative Element Count	
		Dream Report	Story Recall	Dream Report	Story Recall
Current study	40	.97	.99	.97	.98
Stone	13	.98	.99	.98	.95
Kinnear	7	.95	.81	.91	.90

*Note.* Reliability scores for the Current study were calculated using Inter-rater Correlation Coefficient (ICC), and were calculated using Pearson's Inter-rater Reliability Coefficient for Stone and Kinnear's studies

*Analysis of effect sizes.* Cohen's (1988) conventions were used to interpret the magnitude of the effect sizes. Effect sizes  $r = .20$  are considered as small, effect sizes of  $r = .50$  as medium, and effect sizes of  $r = .80$  as large. Table 11 presents the effect sizes obtained from the three studies used in the quantitative comparison.





Table 14  
*Frequencies of Self-representation in the Three Studies*

Study	N	Active Self	Frequency
Current study	119	29	24.40%
Lympinaki	15	7	47.00%
Alikhani	33	11	33.00%
Total	167	47	28.10%

*Emotion.* Emotions were divided into positive and negative emotions. Positive emotions were found in 34.50% of dream reports in the current study, 33% of dream reports in Lympinakis study, and 27% of dream reports in Alikhani's study. The weighted mean of the combined studies of positive emotions in dream reports is 32.90 % ( $N = 167$ ).

Negative emotions were found in 5.90 % of dream reports in the current study, 20% of dream report in Lympinaki's study, and 18% of dream reports in Alikhani's study. The weighted mean of the combined studies of negative emotions in dream reports is 9.60% ( $N = 167$ ).

Results are presented in Table 15.

Table 15  
*Frequencies of Emotions in the Three Studies*

Study	N	Positive Emotion	Frequency	Negative Emotion	Frequency
Current study	119	41	34.50%	7	5.90%
Lympinaki	15	5	33.00%	3	18.00%
Alikhani	33	9	27.00%	6	18.00%
Total	167	55	32.90%	16	9.60%

*Social interaction.* Social interaction was found in 38.70% of dream reports ( $N = 119$ ) in the current study, 67% of dream reports ( $N = 15$ ) in Lympinaki's study and 24% of dream reports ( $N = 33$ ) in Alikhani's study. The weighted mean of the combined studies of social interactions in dream reports is 38.30% ( $N = 167$ ). Results are presented in Table 16.

Table 16  
*Frequencies of Social Interaction in the Three Studies*

Study	N	Social Interaction	Frequency
Current study	119	46	38.70%
Lympinaki	15	10	67%
Alikhani	33	8	24.00%
Total	167	64	38.30%

**Summary of results Part 2.** The most common contents of dream reports of children aged three to five years old were active self-representation, social interactions and emotions. These results are in stark contrast to previous dream research findings (Foulkes, 1998), which found that the dream reports of pre-school children are impoverished and lack active self-representation, social interactions and emotions. An active self-representation was found in 28.10% of the dream reports across the studies. Furthermore, both positive and negative emotions were evident in the dream reports across the studies, with positive emotions reported in 32.90%, and negative emotions reported in 9.60% of the dream reports. Lastly, the results indicated that the dream reports of children in this age group do contain social interactions, as was found in 38.30% of the dream reports across the studies. Although these frequencies indicate that the majority of dream reports did not contain these categories, they do suggest that a substantial amount of dream reports *do*.

## Discussion

The age at which children begin to experience dreams has caused much disagreement among researchers, as have questions regarding the dream content and length of children's dreams. Past research on the dream experiences of young children has produced contradictory findings. One possible reason for the differing findings is that the usual method of collecting dream data, the retrospective dream report, may not be an efficient and reliable measure when assessing the dream life of pre-school children.

In view of the aforementioned contradictory findings, this study sought to combine the strengths of three previous unpublished studies (Alikhani, 2002; Kinnear, 2002; Stone, 2009) with the current study, to determine whether any reliable conclusions could be drawn about children's dream experiences within the pre-school age group. More specifically, this study investigated whether the recall and narrative abilities of children aged three to five years old have developed sufficiently for them to be able to reliably report their dream experiences. To this end, parameters for memory and narrative skill were included to determine each child's ability to remember a dream and narrate what might have happened in the dream.

In an effort to strengthen the findings of the unpublished studies, this study (1) recruited a larger sample, (2) conducted three interviews (instead of just one) to establish whether greater familiarity with the interviewer and the task results in longer and more detailed dream reports, (3) included more direct prompting questions in the hope of obtaining a richer dream report, and (4) conducted a quantitative comparison of the findings across the four studies.

This section is structured in two parts. Part 1 begins with a discussion of the different methods of collecting data on children's dreams. These include using a sleep laboratory (Foulkes, 1998), systematic dream collecting (Domhoff, 1996), home and school settings (Colace et al., 1997, Resnick et al., 1994), and a school setting (Alikhani, 2002; Delgado, 2003; Kinnear, 2002; Lympinaki, 2001; Stone, 2009). Having introduced the various options, these methodologies are then compared to that used in this study.

The remainder of Part 1 discusses the findings of this study based on the dream reports and story recalls. First, the findings of the correlation between the word counts and

narrative element counts of the first set of dream reports and story recalls are discussed. Next, the word counts and narrative element counts of the first and third dream reports are compared. Lastly, this section examines the frequency of specific dream content, including self-representation, emotions, social interactions, and characters, as provided in the three sets of dream reports.

Part 2 describes the quantitative comparison between the current study and past studies. First is a discussion of the quantitative comparison results, including the effect size correlation between the word count and narrative count of the dream reports and story recalls. Then, the qualitative comparison results are examined by discussing the frequencies of the most common dream elements found in the dream reports.

Finally, the section closes by considering the limitations of this study and recommending areas of possible future research.

## **Part 1: Current Study**

**Methodological implications.** Various sampling methods have been used to gather dream data. These include sleep laboratories, systematic dream collecting interviews in a home and a school setting, written questionnaires, and so on (e.g., Colace, 1995, 2004a, 2004b, 2006a, 2006b; Colace et al., 1993; Colace & Tuci, 1996; Colace et al., 1995, 1997, Domhoff, 1996, Foulkes, 1999; Resnick et al., 1994). However, no methods are capable of capturing the dream content directly or observing the dream experience. A dream is an internal phenomenon and only accessible to the dreamer. Therefore, we can only access dream content indirectly and retrospectively by asking a dreamer to describe the dream. This description is called a dream report.

Sleep laboratory dream studies allow the researcher a greater degree of control over the research conditions. Here, dreamers can be woken during specific sleep stages (e.g., REM sleep) and questioned about the dream experience. However, while useful when studying adults, this method presents difficulties in the case of small children. Some researchers (Colace, 1995, 2004a, 2004b, 2006a, 2006b; Colace et al., 1993; Colace & Tuci, 1996; Colace et al., 1995, 1997; Resnick et al., 1994) believe that waking children in the middle of the night in an artificial laboratory setting may have a negative impact on their ability to

report a dream. These researchers suggest that a familiar setting would be a far more suitable environment for dream research. Resnick et al. (1994) found that children's dream studies in a home setting always reported dreams. They believe that studies conducted in a child's home environment allow the child to have a more natural process of sleep, and that the familiar and comfortable setting promotes dream reporting. Similarly, Colace and colleagues (1995, 2004a, 2004b, 2006a, 2006b; Colace et al., 1993; Colace & Tuci, 1996; Colace et al., 1995, 1997) found that dream reports collected in a home environment were longer than those collected in other, more unfamiliar, environments.

In this study, participants were interviewed at the child's school, a familiar environment for the child. Based on the aforementioned findings, a familiar setting, such as a school environment, should have a positive effect on the length of the dream report. The present study found that the average word count in the dream reports of the first interview was 52.58 words. The highest number of words provided for a dream report was 289 words. The basic rule used to assess the length of the dream reports here was similar to that used by Foulkes, permitting a comparison of the number of words used in the dream reports of the various studies. Foulkes (1998) found that children between the ages of three and five years old did not report a dream with more than 50 words (the typical number of words reported by girls was 14 words, and by boys, 13 words). However, the dream reports collected in the present study were longer. Similarly, the dream reports collected by Colace (1995, 2004a, 2004b, 2006a, 2006b; Colace et al., 1993; Colace & Tuci, 1996; Colace et al., 1995, 1997) had an average length of 23 words in a school setting, and an average length of 35 words in a home setting, and so were also longer than the dream reports provided by Foulkes. Then, Kinnear (2002), Stone (2009), and Lympinaki (2001), who also collected dream reports in a school setting, found longer dream reports than those collected by Foulkes, with an average report length of between 20 and 24 words. These findings appear to support the claim that a more familiar environment has an impact on the length of dream reports.

Another important methodological difference in dream report collection relates to when the dream report is collected. In Foulkes' study, dream reports were collected by waking dreamers during the night, and during different stages of sleep. However, the level of alertness and responsiveness is questionable during nocturnal awakenings, especially for young children. Past research has found that cognitive capacities are at their peak during the morning hours, but are at their lowest between midnight and 6 a.m. (Benca, 2009; Carrier &

Monk, 2000). Although Foulkes supported his findings on children's dreaming capacities with cognitive tests that were conducted during the day, his conclusions were based mainly on their cognitive abilities demonstrated in the night-time interviews. Therefore, although Foulkes' methods were not able to reveal whether children have the cognitive skills for dreaming, care should be taken in concluding that these cognitive skills are lacking. Night-time awakenings might simply not be an appropriate way to examine these skills in children, however systematic the methodology may be. Participants in the current study were able to report their dreams in an alert state during the school morning hours. The findings suggest that children of this age do have the cognitive capacity to not only experience dreams, but also to recall their dreaming experiences.

In his study, Foulkes found that the greatest number of dream reports was elicited from REM sleep. In the present study, the stage of sleep during which the child dreamt the reported dream could not be examined, as children were asked to report their dreams during the morning following their most recent dream. What could be examined was the number of children who reported at least one dream (78.43%; first interview). This finding was similar to that of Foulkes, who found that all participants aged three to five in his study reported at least one dream. These findings suggest that a great percentage of three-to-five-year-old children experience dreams, although the frequency of this experience remains uncertain.

However, since past research has indicated that young children do experience dreams, the frequency of their dreams is not of primary importance here. What is important is whether we can draw reliable conclusions about young children's dream experiences from their dream reports. More specifically, are the memory skills of children this age sufficiently developed for them to reliably report their dream experiences? According to past research, episodic memory, which is crucial for recalling and reporting a dream, is a late developing memory system that is only more-or-less fully functioning after the fifth year of life (Nelson, 1993; Perner & Ruffman, 1995; Tulving, 2002). Past studies on children's dreams, such as the longitudinal study by Foulkes, as well as studies by Colace (1997) and Rensick et al. (1994), did not include any memory tests for children between the ages of three and five. This is an important oversight in these past studies, as their results on the length and the content of the dream reports were not compared to children's episodic memory skills. Furthermore, past research has shown that language ability develops rapidly during the school-going years (Szaflarski et al., 2006). Complex language skills, which include the ability to use vocabulary

and syntax skills to recount a series of events in a cohesive manner, such as a narrative, tend only to manifest after the ages of eight or nine (Lidzba et al., 2011; Tomasello, 2000). As a result, the lack of narrative skill within this age group can have a negative impact on a child's ability to convey the richness of a dream.

To address these potential confounding variables, this study included parameters for memory and language skill to determine children's ability to remember a dream and explain what occurred in the dream. This was done by analysing how well the child was able to recall and describe a story, the content of which is known. Based on the assumption that there is a correlation between a child's ability to recall a story and a dream, the inclusion of the story recall provided a basis for analysing the dream reports. In this regard, this study used a similar method to those used in the previous unpublished studies (Alikhani, 2002; Kinnear, 2002; Stone, 2009).

As mentioned earlier, the method used here was based on the methods used in the three previous unpublished studies. However, a limitation of the previous studies was that they only conducted a single interview with each participant. The present study conducted three interviews with each participant, on separate days, to establish whether familiarity with the interviewer and the tasks would result in more detailed dream reports.

Furthermore, the present study included more direct and prompting questions than did the past published and unpublished studies. According to past research, pre-school children require prompting and cueing to help them recall as much information as older children do (Fivush & Hamond, 1990; Fivush & Hudson, 2010; Hudson, 1990; Mandler, 1990). Therefore, the present study included questioning techniques proposed by Domhoff's Most Recent Dream Report (1996), Colace's interview techniques (1995, 2004a, 2004b, 2006a, 2006b; Colace et al., 1993; Colace & Tuci, 1996; Colace et al., 1997; Colace et al., 1995), and Foulkes' interview questions (1998) in the hope of obtaining richer dream reports.

The methods used in the aforementioned studies are different enough to make a direct comparison difficult. However, the disparities between the results of the studies conducted in a laboratory (Foulkes 1982, 1998; Domhoff, 2003) and those conducted in a home and school environment (Alikhani, 2002; Colace, 1995, 2004a, 2004b, 2006a, 2006b; Colace et al., 1993; Colace & Tuci, 1996; Colace et al., 1997; Colace et al., 1995; Delgado, 2003; Kinnear, 2002, Lympinaki, 2001; Resnick et al., 1995; Stone 2009) suggest that dream data collection

methods heavily influence the outcomes of the research. In addition, studies in sleep laboratories may not yield the true richness and complexity of dream experiences, particularly when studying young children.

**Hypothesis 1 and Hypothesis 2: There is a positive correlation between the word count in the dream reports and in the story reports of children aged between three and five years. Furthermore, there is a positive correlation between the narrative element count of the dream reports and story reports of children aged between three and five years.**

The results of the correlation analysis supported the hypothesis that there is a significant positive relationship between the word count and narrative element count of dream reports and story recalls of children aged three to five years. This finding suggests that the ability to report a recent dream is similar to the cognitive capacity required to remember and describe a story read to the child the evening before the interview. Analyses of the results showed that children who were capable of reporting a recent dream were also able to remember and recall the story. Furthermore, children who provided impoverished dream reports were unable to recall the story in much detail. This implies that certain cognitive capacities related to memory are crucial to a child's ability to report a dream experience.

Results indicated that, on average, the children used more words and narrative elements to report the dream than to recall the story, and inferential statistics showed that the differences in the word count and narrative element count between the dream reports and story recalls were significant. The interview format for both the dream report and story recall were identical, and standard questions and prompts were asked by the interviewer in both cases to avoid any potential bias. Furthermore, the order of the story recall and the dream report was counterbalanced between the participants to control for any confounding variable of sequence of recall and reporting. A possible reason for the higher word count and narrative element count in the dream reports could be the children's excitement at describing their most recent dream. The first interviews began by establishing the children's understanding of the concept of a dream and, where necessary, explaining the concept in more detail. Subsequently, the children seemed enthusiastic to tell the interviewer about their latest dream to prove that they had understood what had just been discussed. Bearing this in mind, perhaps

future research should consider always eliciting the dream report first, before the story recall, as the participants were more eager to report their dream than the story.

These results contradict the claims of Foulkes, whose research findings suggested that children between the ages of three and five years old do not have the cognitive capacity to dream, a conclusion he based on their poor performance in reporting their dream upon awakening in the laboratory. Therefore, Foulkes effectively equated dream recall and dream reporting with the experience of dreaming. In contrast, the results of the current study suggest that children in this age group do possess the cognitive ability to both dream and report the dream. Here, an impoverished dream report demonstrates a limited ability to recall a dream rather than a limited ability to experience a dream.

**Hypothesis 3: There is a significant difference between the word count, as well as narrative element count, between Interview 1 and Interview 3 due to increasing familiarity with the interviewer and the task.**

Colace (2010) investigated whether the dream reports of children aged three to five years old would be longer if interviewed by their mother (i.e., a person familiar to the child) than if interviewed by an unfamiliar researcher. He hypothesised that children of this age group may be more at ease in telling their dreams to a person with whom they are familiar than to a stranger (i.e., the interviewer). Although the dream reports collected by parents in Colace's study contained more words on average (average word count of 35) than the dream reports collected in his other studies in a school setting (average word count of 23), he noted that the results were similar. According to Colace (2010), the increased mean of the word count of the home study was due to one dream report of exceptional length (277 words).

To investigate whether familiarity with the interviewer would impact the word counts and narrative element counts of dream reports, the present study added two extra interviews (i.e., two extra dream reports and two extra story recalls) to the protocols employed by previous researchers (Alikhani, 2002; Kinnear, 2002; Stone, 2009). The purpose of the extra interviews was to control for confounding variables such as participant shyness and unfamiliarity with the interviewer. The interviews were conducted on three separate occasions within a maximum period of two weeks. The results showed that the differences between the word counts and narrative element counts of the dream reports between Interview 1 and Interview 3 were not significant.

These results are consistent with Colace's findings, and suggest that familiarity with the interviewer does not have a significant impact on the length and narrative detail of dream reports for children aged three to five years old. Most importantly, these findings suggest that the brevity and simplistic narrative of the dream reports of children in this age group are the most striking and well-verified characteristics of their dream reports. In addition, these characteristics are apparent and consistent, regardless of who interviews the child (i.e., familiar person or stranger). Given this finding, it seems that the results of past studies that conducted only one interview with each child, and therefore only obtained one dream report, are valid and not confounded by unfamiliarity with the interviewer.

**Hypothesis 4: In contrast to past research claims by Foulkes, dream content analysis will show that children between the ages of three and five years do report dreams containing: (a) rich content, (b) active self-representation; (c) social interactions; and (d) emotions.**

In his sleep laboratory dream studies (1982, 1999), Foulkes found that the dream reports of children aged three to five were impoverished and blunt, and did not include an active self, social interactions, or emotions. Based on these dream reports, Foulkes concluded that children of this age group have impoverished dreams, have immature mental apparatus, and lack visual-spatial and reflective cognitive capacities, all of which he believes to be prerequisites for dreaming and imagining.

The results of the content analysis of the present study contradict Foulkes' findings, showing that children between the ages of three and five years do indeed have rich dream experiences. Based on the dream analysis coding scheme of Hall/Van de Castle (1966), a variety of elements were found to be prevalent in the dreams of this age group, including self-representation (i.e., active and passive), emotions (i.e., positive and negative), social interactions (i.e., positive and negative), and multiple characters (i.e., animals, friends, relatives, fantasy figures, and objects). Since in Foulkes' (1982) longitudinal study the dream reports were not analysed using the Hall/Van de Castle (1966) coding scheme, statistically significant differences regarding the content of the dream reports could not be calculated. However, the similarity of some of the basic content categories enables a descriptive comparison between the dream reports of the two studies.

***Self-representation.*** According to Foulkes (1982, 1999), children below the age of seven lack the cognitive abilities to represent themselves in their dreams. He based this conclusion on the dream reports provided by the children aged three to five years in his longitudinal study, in which active self-representation was only very rarely present in the reported dreams. In contrast, the current study found that at least one active self-representation was present in 24.40% of the dream reports, compared to passive self-representation, which was present in only 10.90% of the dream reports provided. More importantly, the present study found that 58% of the dream reports contained at least one active and passive self-representation, while only 6.70% dream reports contained no self-representation at all.

The findings of the present study are in line with other past research (Colace, 2006a; Colace et al., 2000; Colace et al., 1995; Resnick et al., 1994), which found that children as young as three years old are able to represent themselves in their dreams, either in an active or passive role. Colace (1995) found that in dream reports provided by children between the ages of three and seven years old, 68% of dream reports contained an active self-representation, while only 9% contained a passive self-representation. Only 23% of the dream reports in his study lacked any self-representation. Similarly, Resnick et al. (1994) found active self-representation in 85% of the dream reports provided by children aged four to five years old. The findings of both the present study and the aforementioned past studies clearly indicate that children under the age of seven years old do have the capacity to represent themselves in their dreams.

Past research has found that children as young as two years of age are able to engage in pretend play, which requires a capacity for imagination (Eibl-Eibesfeldt, 1989; Lilliard et al., 2011; Tamis-LeMonda & Bornstein, 1991). If children of such a young age have the cognitive skills to represent themselves in an imaginary space, it should follow that children between the ages of three and five years old are able to represent themselves in an imaginary space in dreams. The development of cognitive skills, as mentioned above, is an ongoing process during the pre-school years, and therefore these abilities continue to develop between the ages of three and five years old.

The findings of the present study contradict Foulkes conclusions, as the results clearly show that active self-representation is by no means 'rare' in the dream reports provided by

children between the ages of three and five years old. Over half the children in the present study described some self-representation (i.e., active or passive), a finding that strongly contradicts Foulkes' claims that children under the age of seven do not have the cognitive abilities to represent themselves in dreams.

**Emotions.** Foulkes (1982, 1999) found that emotions (i.e., positive and negative) were rarely mentioned in the dream reports of his participants aged between three and five years old. According to him, the dreams of children in this age group are blunt and lack mention of personal feelings. Similarly, Domhoff (1996) found that emotions are rarely reported in adults' dreams, and even more rarely in the dream reports of children. However, previous unpublished studies (Alikhani, 2002; Lympinaki, 2001) have found both positive and negative emotions in the dream reports of children aged between three and five years old, with a frequency between 27% and 33% for positive emotions, and a frequency between 18% and 20% for negative emotions. The results of the present study are in line with the findings of these previously unpublished studies. Of the dreams reported in the present study, 34.50% contained at least one positive emotion, while 5.90% of dream reports contained at least one negative emotion. More importantly, 52.10% of dream reports contained at least one positive and one negative emotion, while only 7.50% of dream reports contained no mention of emotions at all. The results show that it seems reasonable to conclude that children of this age group do experience emotions in their dreams. If the emotions reported in the present study constitute part of the dreaming experience, then it can be concluded that even very young children are able to symbolically represent and recall dream circumstances and their corresponding affective states. These findings are in stark contrast to Foulkes' (1982) conclusions that children of this age group are unable to symbolically recreate either the feelings in their dreams or the circumstances in which they experienced those feelings.

Furthermore, the results of the present study revealed a higher frequency of positive emotions than negative emotions in children's dreams. There are two possible explanations for this finding. First, the prevalence of positive feelings in children's dreams may suggest that children between the ages of three to five years old do not usually experience unpleasant dreams. However, this explanation contradicts the findings of Foster and Anderson (1936) and Despert (1949), which suggested that children of this age group experience more unpleasant than pleasant dreams. A second possible explanation for the findings could be that the children in the present study simply did not report their unpleasant dreams, or that they

did not report the emotions that may have accompanied their unpleasant dreams. The latter explanation supports the findings of Mack (1965, 1970) and Medici de Steiner (1993), suggesting that children try to forget unpleasant dreams they may have experienced.

***Social interactions.*** Foulkes concluded that social interaction in the dream reports of children between the ages of three and five years old is rare. However, the results of the present study showed that 31.90% of dream reports contained at least one positive social interaction, while 5.10% of dream reports contained at least one negative social interaction. Importantly, 61.30% of dream reports contained no social interaction, while only 1.70% of dream reports contained both positive and negative social interactions.

Although it is evident from the results that the majority of the dreams did not contain either positive or negative social interactions, it is important to note that over one third of dream reports contained only positive social interactions. This finding may be explained by the same reason that unpleasant emotions appear so infrequently in dream reports. Either the children did not experience dreams containing purely negative social interactions, or they more actively tried to remember the dreams containing positive social interactions. It is also possible that social interaction in the dreams of children reflect some of the children developing social concerns (Alikhani, 2002). According to Bee (2000), pre-school children are at an age when socialisation is one of the most important aspect of their lives. The affective experiences of being part of a group and making new friends may, therefore, be reflected in the dreams of children this age. As a result, the positive social interactions the children experience in their dreams may symbolise an attempt to deal with the underlying anxieties of their social environment. However, this is mere speculation, and a detailed investigation into the interaction in children's social experiences and their resultant dream experiences would be necessary to clarify these issues.

With regard to this study, although the majority of dream reports did not contain social interactions, a substantial number of the dream reports did. Although Foulkes concluded that children between the ages of three and five do not have the cognitive ability to symbolically represent themselves socially interacting in an imaginary space in their dreams, these results suggest that they may.

***Characters.*** Foulkes (1982, 1999) found that the dream reports obtained in his longitudinal study were simple and lacked characters. However, Domhoff (1996) found that

the dream reports of children aged between two and six years old frequently contained characters, especially animals. In general, literature suggests that, second to a child's parents, animals appear most frequently in children's dreams (e.g., Blanchard, 1962; Foulkes, 1992; Jersild et al., 1933). Similarly, Alikhani (2002) found that dream reports of children aged three to five years old included relatives and friends, with parents being the most frequent dream figures. Colace (2010) found that the dreams of children of this age group frequently contain characters belonging to the child's imaginary world, such as Santa Claus, characters from television cartoons, famous movies (e.g., Barbie, Teenage Mutant Ninja Turtles, Power Rangers, etc.), or objects such as toys.

The results of the present study are consistent with past research that found rich content in the dream reports of children between the ages of three and five years old. More dream reports in this study contained multiple characters (84.90%) than just one character (10.90%) or no characters (4.20%). Once again, these findings contradict Foulkes' conclusions that the dream reports of children in this age group lack multiple characters.

In summary, a direct comparison between the results of Foulkes' laboratory dream study (1982, 1999) and the findings of studies conducted in a more familiar setting (i.e., school or home), such as the present study, is difficult because of differences in their methodologies. However, the disparities between the findings of the various studies suggest that sleep laboratories have more difficulty reflecting the actual dream experience. The differences between the dream reports of the children aged between three and five years old show that the method used to collect data on children's dreams influences the content and length of the collected dream reports. Foulkes was unable to reveal important aspects of the cognitive skills of children in this age group. This does not necessarily prove that these aspects do not exist at that age, but rather that his data collection method, however systematic, may simply have been inappropriate.

Furthermore, the recall and narrative abilities of children aged three to five years old, as evident in the findings of the present study and past literature, are still developing during the pre-school years. As a result, these abilities are not sufficiently developed for them to reliably report their dream experiences. Therefore, it seems apparent that no reliable

conclusions about young children's dream experiences can be drawn from their dream reports.

## **Part 2: Comparison to Past Studies**

**Quantitative comparison.** Part 2 of the present study investigated the immature recall ability in dream reporting for children between three and five years old using a meta-analytic type approach. Two previously unpublished studies (Kinnear, 2002; Stone, 2009) and the current study were included in the quantitative comparison, involving a total of 101 participants between the ages of three and five years old.

There are several issues to consider when interpreting the meta-analytical type results of this study. For instance, the small selection of studies included in this comparison is directly related to the quality of the analysis outcomes, resulting in high effect sizes. Furthermore, the small sample sizes of the individual studies need to be considered. The meta-analytical type method addresses this issue by combining all three studies for comparison.

Using a random effects model to compute mean effect sizes, a significant medium to high mean effect size was found for the word count in dream reports and story recalls ( $R = .71$ ). Similarly, a significant medium to high mean effect size was found for the narrative element count in the dream reports and story recall ( $R = .71$ ). We cannot rule out that the mean effect sizes would have been lower if more studies with larger sample sizes had been included in the quantitative comparison. However, the pattern of results was consistent with those of past studies that suggested that the cognitive capacities necessary for dream recall and dream reporting are still developing in children between the ages of three and five years old. As such, their ability to report a dream may be influenced by the stage of cognitive development they are in.

The results of this analysis could have implications for the methods employed for dream report collection in dream research involving young children. Parameters for the memory and narrative abilities of children when analysing their dream reports are paramount to determine how well the child is able to both remember and describe a dream. According to the results of the quantitative comparison, immature memory and narrative skills do have a strong impact on dream reporting ability. Without comparing participants' memory skills or

ability to narrate an event, and subsequently comparing these to the dream reports, the dream report can never be an efficient and reliable measure of the dream life of young children.

**Qualitative comparison.** Two previously unpublished studies (Alikhani, 2002; Lympinaki, 2002) and the current study were included in the qualitative comparison investigating the content of dreams reported by children aged between three and five years old. The analysis included 111 participants, 207 interviews and 167 dream reports. A uniform pattern of dream content emerged from the analysis and included three common categories: 1) active self-representation, 2) social interactions, and 3) emotion.

The weighted means were found to be 28.10% for the category of active self-representation, 32.90% for the category of positive emotions, 9.60% for the category of negative emotions, and 38.30% for the category of social interactions.

Although the majority of the dream reports did not include these categories, a substantial proportion of the dream reports did. Again, these findings suggest that the dream reports of children between three and five years old are not as impoverished as previously hypothesised, as they do contain active self-representation, emotions, and social interactions, albeit few.

## **Limitations and Future Directions**

One of the most important limitations of dream research is the difficulty in bridging the gap between a dream and a recollected description of the dream. What a dreamer recalls and reports may not accurately reflect the actual dream (Domhoff, 2003). This limitation is even more pronounced when studying the dreams of children as very young children may struggle to differentiate between fantasy and reality (Ablon & Mack, 1980). In this respect, Foulkes' (1999) argument is valid. As a result, it remains uncertain whether a child is reporting a dream experience while sleeping, a daydream, or a fabricated dream. In an attempt to decrease this possible confusion, in this study, the children were asked whether they knew what a dream was at the beginning of the first interview. If the child was unsure, the interviewer then explained the concept of a dream. However, it remains uncertain whether the children, especially the youngest participants, clearly understood the nature and concept of a dream.

Since the cognitive capacities necessary for recalling, in considerable detail, an event that occurred in the past are still developing during the pre-school years, children between the ages of three and five may be unable to recall their dreams sufficiently, and may as a result be unreliable participants in dream research based on dream report data. Furthermore, inadequate language skills might mean that a child's actual dream experience is far more detailed than the child is capable of reporting at a very young age. Parameters for memory and language skills were included in this research to investigate whether immature recall ability negatively influences the ability to report a dream. The correlations in the results imply that this might well be the case, but without further investigation, this assumption remains just that. Therefore, uncertainty remains about the closeness of fit between a child's dream report and the actual dream experience when eliciting verbal recall from young children. There is, as yet, no way around this limitation.

Given the sample size of this study, it is not possible to draw definitive conclusions regarding the relationship between episodic memory and dream recall ability. The statistical results based on a small sample size may be significantly influenced by even one dream report with a higher word or narrative element count. Therefore, a much larger sample size stratified by age may be required to investigate variations in the stages of cognitive development (i.e., to investigate development of episodic memory via dream and story

recall). This will allow, in turn, a more accurate analysis of the various memory and language abilities of children between the ages of three and five years old.

Pre-school children require more prompting and cueing than older dream research participants do to help them recall as much information as possible. Although the present study used standardised questions and prompts to elicit both a dream report and story recall, and made every effort to ensure consistency between the interviews, some interview questions may not have been identical to others due to interviewer error. Therefore, future research investigating the relationship between dream and story recall needs to ensure that these questions and prompts are identical for both measures to avoid any bias in recall between the dream experience and the recent story.

A further limitation of the present study was finding parents who were willing to cooperate with the requirements of the research. Although a detailed letter of the aims and procedures of the study was sent to all potential parents at the various pre-schools, many parents were unsure whether the stories chosen for reading to the children the night before the interview would elicit unpleasant dreams. Although the stories were explained to be fun and child-friendly in the information letter, some parents remained doubtful and did not volunteer their participation. One mother explained that her three-year-old son experienced nightmares the night after hearing the first story (*Belvedere Dreaming*), and therefore withdrew her son from the study.

Furthermore, the present study relied on parents reading the provided story to their child on the evening before the interview. Although most did so, some participants did not have the provided stories read to them before the second and third interview. As a result, fewer story recalls were provided during these subsequent interviews. Moreover, although every effort was made to ask parents not to discuss the story with their child the following morning, and not to ask the child about any dream they experienced during the night before the interview, their cooperation with these rules remains uncertain. Consequently, children may have been prompted before the interviews without the researcher's knowledge, which would have impacted on their dream reports and story recalls.

Several methods can be used to collect the dream reports of children, each with their own advantages and disadvantages. The method chosen here was to collect dream reports during the morning hours in a familiar school setting. Although a teacher familiar to the child

was present during the interviews, the interviewer was unfamiliar to the child for the first interview. Although some past studies have found that the setting and familiarity with the interviewer to be nonsignificant factors with regard to the length of dream reports (Colace, 1995, 2004a, 2004b, 2006a, 2006b, Colace et al., 1993; Colace & Tuci, 1996; Colace et al., 1995; Foulkes, 1979; Weisz & Foulkes, 1970), other researchers disagree (Lympinaki, 2001; Resnick et al., 1994). The latter group suggest that dream reports collected in a familiar environment, by a familiar person, are longer in length. Therefore, future research should include a parameter for the presence of the mother (or other familiar parent/guardian) during dream report collection in a school setting to investigate whether their presence influences the dream reports, particularly the length.

Furthermore, although interviews were conducted in the early hours of the school day (i.e., between 8.30 a.m. and 10.30 a.m.), the length of time between the dream experience and the reporting of the dream the following morning is uncertain. Therefore, it is likely that the children may have been exposed to visual and verbal material (e.g., art, story books) in the classroom before the interview, which may have interfered with their memories of their recent dream and the story read to them the previous evening. Future studies should ensure that interviews in a school setting are conducted at the beginning of the school day, before commencement of lessons, to better control for any interfering materials.

Additionally, there are a number of limitations of the quantitative and qualitative comparisons between the current study and past studies. The limited availability of past studies that used the same methodology as this study resulted in a very small sample size for the analyses. As a result, the mean effect sizes of the word counts and narrative elements counts of the dream reports and story recalls may be inflated. Although the analyses revealed a significant relationship between immature recall and narrative ability in both the dream reports and story recall, further empirical research based on a larger sample size is needed to examine this relationship in more detail.

Also, a meta-analysis that includes a larger sample of studies and that analyses the content categories of dream reports in more detail is required to obtain a truer reflection of the content of the dreams of children aged between three and five years old. The present study was limited to analysing only the most common features present in the dream reports of young children, and thus only investigated the frequency of self-representation, emotions,

social interactions, and certain characters provided in the dream reports. A more detailed investigation into the frequency of appearance of certain characters, fortunes and misfortunes, as well as wish fulfilment in the dream reports of young children would provide a more precise description of the actual dream experiences of children within this age group.

## Summary and Conclusions

This research investigated whether the traditional method of dream study, the retrospective dream report, is an efficient and reliable measure with which to assess the dream experiences of children aged between three and five years old. To examine this, the present research included parameters of memory and narrative skills in order to determine how well each child of this age group is able to recall a dream, the child's ability to describe the dream experience, and to correlate this with their dream reports.

The findings of the current study indicate that children between the ages of three and five years old do indeed have the capacity to experience narrative-like dreams, which contain a variety of active self-representations, emotions, social interactions and characters. Furthermore, the study shows that children in this age group appear to be capable of reporting their dream experiences in a more detailed and rich manner than Foulkes (1971, 1979, 1982, 1999) found.

The current study examined the nature and strength of a pre-schooler's recall and narrative abilities by comparing the dream report and the narrative recall of a story. Results obtained emphasise the fact that there is indeed a strong relationship between the maturity of a child's episodic memory skills, their language and narrative abilities, and their ability to report a dream, as a strong correlation was found between the recall ability of the dream and the recall ability of the story.

This finding suggests more in terms of what cannot be inferred from the dream reports of children between the ages of three and five years old than what can be inferred from them. The question is therefore not whether children of this age group experience dreams, as this has been established in terms of the relationship between REM phases and dream reporting, but whether any firm conclusions about the dream experiences of children can be drawn from the dream reports they provide.

The current study clearly shows that dream reports, by themselves, provided by children between the ages of three and five years old are not an efficient and reliable measure with which to accurately assess the dream life of children in this age group.

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## Appendix A

### Letter to the Parents

#### UNIVERSITY OF CAPE TOWN




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#### Department of Psychology

University of Cape Town, Private Bag  
Rondebosch 7701, South Africa

#### Re: Children's Dream Research

Dear Parent,

25 February 2013

My name is Yvonne Gartner, I am a mother of three children (aged 7, 13 and 15), and I am a Clinical Neuropsychology Masters student at the University of Cape Town. I am currently doing research exploring the dreams of children between the ages of 3 - 5 years.

As parents we often listen to the wonderful and magical details our children give us about what they dreamt the night before, and are all too often woken up in the middle of the night when our little ones experience nightmares and need to cuddle up with us for the rest of the night. For most of us there is no question that our children experience vivid dreams from a very early age.

However, past research into the dreams of pre-school children has suggested that children, between the ages of 3-5 years, experience dreams with very little emotional content, absence of a self-participant and a lack of active imagery. This finding, which seems counter-intuitive to many parents of young children, was based on the simple and brief dream reports pre-school children gave during past dream research studies when asked to describe their most recent dream.

I believe that a significant oversight of past research into children's dreams has been their lack of testing young children's **memory skills** and their **narrative abilities** before concluding that their dreams are impoverished, simple and mundane. Even adults forget their dreams very quickly after waking up, and trying to describe our dream experiences verbally is difficult for most of us, but especially for young children, whose memory and narrative skills are still developing during the pre-school years. Perhaps the brief dream reports provided by children to researchers are not a direct reflection of their actual dreams, but instead an indication of their limited, *age-appropriate* capacity to remember and/or report their dreams in detail?

Based on this background, my Clinical Neuropsychology Masters research aims to show that young children do in fact experience vivid dreams, and that their dream reports are brief and lack detail due to their immature recall and narrative abilities that are normal at that age, not because they do not experience rich dreams.

I would like to conduct short interviews with children between the ages of 3-5 years at Nsansa Montessori and ask them to describe their most recent dream to me. Furthermore, I will ask them to recall and describe a bed time story that will be read to them by their parents the night before the interview. The recall of the story will serve as an indication of their still developing memory skills and narrative abilities. We can never know for sure whether the description of their dreams is a true reflection of their dream experience, as we do not have insight into their actual dream content. However, we do know the content of the bed time story, and can therefore judge their recall and narrative abilities using these, and then comparing these to the description of their most recent dream.

It is my hope that as many parents as possible will allow me to interview their children for my research. The interviews will be held in one of the rooms at the school in the morning, and a teacher familiar to the child will be present during the interview at all times.

Parents who consent to their child participating in my study will be provided with a short, illustrated, age-appropriate bed-time story, which should be read to their child on the evening preceding my interview with the child. The next morning I will visit the playschool and have a short (approximately 10 minute) chat with the child in one of the rooms, asking him/her about the story they were read the evening before, and to recall and tell me about their most recent dream. Each child will participate in three separate interviews on different days within a two-week period, during which they will be asked to recall three different dreams, as well as three different bed-time stories (each story book will be provided to the parents the day before the interview). I will audio-record the interviews, as I will need to transcribe these later for my research analysis.

All dream and story-reports of the children will be kept confidential, and no names will be included in the research. I will make sure that the children feel comfortable and happy during the interview, and will try my best to make it a fun experience for them. If, at any time, the parent or child feels they would like to withdraw from the study, they are free to do so.

If you consent to your child participating in my research study, please complete the consent form attached and drop off at reception with Lynn before **Friday 1<sup>st</sup> March 2013**. If you have any queries or questions about the research please feel free to contact me on 08241 16777/ [ygaertner@zsd.co.za](mailto:ygaertner@zsd.co.za), or my supervisor, Prof. Mark Solms, on 021 650 3437.

I hope that you will give me permission to include your child's dream/story description in my study. I am sure they will enjoy telling me their dreams and stories as much as I will enjoy listening to their wonderful descriptions.

Kind Regards

Yvonne Gartner

**Appendix B**  
**Parental Consent Form**

I have read and understood the aims and procedure of this research study.

I understand that participation in this study is voluntary, and that I may withdraw my child at any point.

I understand that my child will not be identified except by an initial, and that this anonymity will be maintained throughout the study when the research is published.

I consent to allow my child to participate in this study.

Child's name: \_\_\_\_\_

Date of Birth: \_\_\_\_\_

Parent/legal guardian's name: \_\_\_\_\_

Method of contact:

Home number: \_\_\_\_\_

Cell number: \_\_\_\_\_

e-mail address: \_\_\_\_\_

Date: \_\_\_\_\_

Signature: \_\_\_\_\_

**Appendix C**  
**Oral Assent Form**

Hello. I want to tell you about a research study I am doing. A research study is a way to learn more about something. I would like to find out more about how children your age can remember the stories you have heard and the dreams you have had.

If you agree to join this study, you will be asked to tell me what you can remember about the story your mom/dad read to you last night. You will also be asked to tell me about the dream you had last night.

I will come and see you and ask you questions three times, each time for approximately ten minutes. If you get tired, we can take a break at any time.

You do not have to join this study. It is up to you. No one will be cross at you if you do not want to be in the study or if you join the study and change your mind later and want to stop.

Do you have any questions?

If you sign your name below/tell me to go ahead with the interview, it means that you agree to take part in this research study.

---

Date

---

Signature of Child



f) Is he/she currently taking any prescription medication?

YES

NO

If yes, please specify: \_\_\_\_\_

10. Has your child ever been diagnosed with a social disorder such as conduct disorder or oppositional defiant disorder (ODD)?

YES

NO

If yes, please specify: \_\_\_\_\_

11. Has your child ever been diagnosed with a communication disorder? (For example: Having problems with understanding or producing speech, slow vocabulary development, difficulties recalling words or problems with producing sentences appropriate for his/her age.)

YES

NO

If yes, please specify: \_\_\_\_\_

12. Has your child ever been diagnosed with a pervasive developmental disorder (PDD) such as autism, Asperger's syndrome, Rett's disorder or childhood disintegrative disorder? (Tick the appropriate block).

No developmental disorder \_\_\_\_\_

Autism \_\_\_\_\_

Asperger's Syndrome \_\_\_\_\_

PDD – Not Otherwise Specified \_\_\_\_\_

Other (please specify): \_\_\_\_\_

13. Has your child ever been diagnosed with learning difficulties such as dyslexia or attention-deficit/hyperactivity disorder (ADD/ADHD)?

YES

NO

If yes, please specify: \_\_\_\_\_

## Appendix E

### Modified Version of the Most Recent Dream Report (Domhoff, 1996)

Age: \_\_\_\_\_

Gender: \_\_\_\_\_

Date: \_\_\_\_\_

Interviewer: Do you remember having a dream last night, when you were asleep?

If NOT, ask: Do you remember a dream that you had another night this week, or maybe last week? Could you tell me about it?

If STILL NOT remembering: Can you tell me about any dream that you have had when you were asleep?

OR

Do you remember having dreams? Could you tell me about one? When did you have this dream?

## Appendix F

### Colace's Children's Dream Questions

The interview begins with the first two questions of the standard interview about the understanding of the concept of a dream. The answer provided by the child is then followed by the request to tell the dream:

*Will you please tell me the last dream you have had?*

The child is then left free to answer without any further form of encouraging. The following questions follow the free dream report:

*Was this dream a good one or a bad one?*

*Were you in the dream? (where required)*

*Were you doing something in this dream or were you just watching? (if yes)*

*In what place were you in the dream?*

For every person/fantastic character/setting mentioned in the dream content, it is asked:

*This person (name) who was in the dream, do you know him/her?*

*This place (name) that was in the dream, do you know it?*

*Have you ever been there?*

For every thing and main action appearing in the dream content, it is asked:

*This thing (name) that was in the dream, do you know it?*

*This action (name) that you were doing in the dream, do you actually do it also during the day, sometimes? When was the last time you did this action (name)?*

*Were there any animals in this dream?*

*While you were dreaming, did you know that what was happening to you was only a dream, or did you think it was for real?*

*Were you happy during this dream? Were you sad?*

*Why do you think you had this dream?*

## Appendix G

### Foulkes' Longitudinal Dream Research Questions

What were you dreaming just before you woke up?

OR

What were you seeing?

OR

What was happening just before you woke up?

## Appendix H

### Guidelines for Word and Narrative Item Counts

**Word Count:** Word count will be established in both story and dream reports by two independent raters. The first counted word will be the first word that describes the story or dream. Introductory words such as “*I dreamt that*” and words that indicate clearly waking activity such as “*...when I woke up I thought about the dream/story*” will be excluded from the story or dream word count. Furthermore, repetition and words implying hesitation will be excluded from the count.

Example:

*Child: I, er, dreamt that dogs, um, that dogs came into my room. Then I woke up.*

1            2 3 4 5

Repetition that included new information will be included. Affirmative or negative single words or phrase answers such as “*yes*”, “*yes, I do*”, “*no*”, “*no, I don’t*”, “*I cant remember*” and explanatory words such as “*because*” that are used by the children during the interview to answer a question, but do not contain any new evidence for the dream or story content, will not be counted.

Example:

*Child: Yes, I remember, that, er, I dreamt that dogs, uhm, that big dogs came into my room.*

1            2 3 4 5 6 7

**Narrative Item Count:** Narrative items will be established in both story and dream reports by two independent raters. The narrative item count will represent the number of meaningful chunks of information contained in the report. The same basic guidelines as per word count will be used. All narrative items that can be connected to the story or dream will be included in the count.

Example:

*Child: In the story, there was a boy named Max and he was sent to his room without supper.*

1    2    3    4    5    6    7

## Appendix I

### Categories and Sub-Categories for Qualitative Analysis of Dream Reports

The contents of the dream reports will be coded into the following categories:

C = Animals, humans and objects (humans, animal, objects, creatures)

CA = Animals: this feature in a dream will be classified as such, if there is at least one mention of a real known animal distinct from humans. This category includes mammals, invertebrates, insects and extinct species.

CF = Friends: this feature will be identified whenever the name of a person in the dream is deemed to be a friend of the dreamer

CR = Relatives: a relative will be classified when the dreamer mentions a family relation between himself and the person described, eg *my mommy, sister, uncle*, etc.

CFan = Fantasy Figures: a fantasy figure will be classified as such if a description alluding to a mythical creature, such as a dragon, or a super hero or doll (Spiderman/Barbie) is given.

CO = Objects/Things: any feature of the dream related to inanimate objects will be considered to be an object, such as a toy, book, bicycle, etc.

A = Dreamers physically passive and active activities

AA – Active Self-presentation: a dream feature will be classified as such if the dreamer describes actively participating in the dream, such as reading, playing or running. This definition extends to include dreams that describe the dreamer in motion, such as “going down a slide”.

AP – Passive Self-representation: a dream feature will be classified as such, if the dreamer is involved in the dream, but was passively participating. This category implies that the dreamer was having something done to him, as opposed to being the active one. Eg. “my teacher was reading a story to us”, or “my sister was tickling my feet”.

E = Emotions: words describing the feelings of the dream character (positive and negative)

SI = Social Interactions (aggression, friendliness, sexuality). Social interactions in dreams will be identified wherever the dreamer is speaking about relationships between two or more other people, or when the dreamer reports dreaming about a social exchange occurring between themselves and another person.