

RIDDLE USE AND COMPREHENSION
IN IRISH SCHOOL-AGED CHILDREN:
A DEVELOPMENTAL STUDY
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INTRODUCTION

1.1 Introduction

Whilst language development can be described as a lifelong process (Opler, 1985, cited in Nippold, 1988a), the greatest part of this development occurs during the childhood years. The task of acquiring his or her native language, with which the child is faced from birth, would appear to be a formidable one. However, the evidence that children rise to this challenge with fascination and delight is to be found in the numerous kinds of lore which have been collected from children over the past few centuries (Crossley-Holland, 1982; Opie and Opie, 1959). Included amongst these are the rhymes, riddles, jokes and songs which children relish in sharing amongst themselves, and which are reported to remain almost unchanged when passed from generation to generation (Opie and Opie, 1959).

The forms of folklore which are characteristic of the early childhood years, such as the nursery rhyme and fairy tale, are readily shared between adult and child (McDowell, 1979). However, schoolchildren's lore (including riddles, jokes and songs) differs from early lore in that its content typically remains 'partly inaccessible to adults' (McDowell, 1979: 2). It therefore serves an important social function for children, helping to mark them apart from adults as a social group in their own right. Forms of lore such as riddles and jokes are of additional interest to linguists as they frequently involve the use of what is termed 'figurative language' (Rice and Kemper, 1984). The ability to fully comprehend and make use of figurative language is reported to emerge only in the later years of childhood (Nippold, 1988a; Rice and Kemper, 1984; Winner, 1988).

1.2 Riddles

The 'true' riddle can be defined as follows (Opie and Opie, 1959: 74),

'a composition in which some creature or object is described in an intentionally obscure manner; the solution fitting all the characteristics of the description in the question, and usually resolving a paradox'.

Opie and Opie (1959), who carried out an extensive study of the lore of schoolchildren during the 1950s, state that many of the riddles used by children in this century are actually 300 years old. The observation that the form of these riddles changes little when passed from generation to generation, is illustrated in the following 'cryptic description' of a maid milking a cow which was posed by a 9-year-old child in Dublin in the 1950s (Opie and Opie, 1959: 76):

*Ink ank under a bank
Ten drawing four,*

The same riddle was recorded in a collection in 1631 in the following form (*In A Book of Merrie Riddles*, 1631, no. 59, cited in Opie and Opie, 1959, 76):

*Clinke, clanke under a banke
Ten above foure and neere the stanke.*

Although little is known about the exact cultural origins of riddles (Green and Pepicello, 1984) it is known that their use is by no means restricted to the younger members of society. There is evidence that people of diverse cultures have engaged in riddling for many hundreds of years (Crossley-Holland, 1982). Indeed, riddles are a feature of the rituals of a number of cultures, marking periods of transition in life such as baptism, marriage and death (Handleman, 1996).

The riddle can be described as consisting of two connected parts, the riddle image and its answer (Kangas Maranda, 1971, cited in Lieber, 1976). The riddle image can take a number of forms, although in English it usually takes the question form of the language (Kallen, 1981). Cohen (1996) points out that a riddle im-

age in the form of a question has a very different function to that of a genuine question. A question form is ordinarily used to obtain information which the questioner is seeking. A riddler, however, is already 'in possession of some information which he manipulates the addressee into seeking' through the use of the riddle image (Cohen, 1996: 295). Although in the past the emphasis amongst those studying riddles was on the analysis of the riddle image, Kallen and Eastman (1979: 426) state that 'researchers have now begun to consider the *answer* to a riddle to be of equal importance to its *question*'. They refer to the observation by Maranda (1971) that the influence which the riddle answer has on the riddle image can be seen in the features of style used in the image, such as the use of rhyme or alliteration.

Sources of Ambiguity

The special relationship which exists between the riddle image and its answer has been described by Scott (1965, cited in Kallen, 1981:3) as a 'partially obscured semantic fit' between the two parts of the riddle. Whilst one answer may appear obvious on hearing the riddle image, the true answer is obscured in the riddle image through the use of a 'block element'. The definition of a block element given by McDowell (1979: 18) is 'that deliberate grain of confusion or *ambiguity*' which is contained within the riddle image. Green and Pepicello (1984) give a detailed account of the types of strategy which are used to provide a 'block element' in riddles. They state that the ambiguity in the riddle image may be either grammatically- or metaphorically-based. The latter riddling strategy is more typical of 'true' riddles and will be described in more detail in section 1.2.2.

Block elements which are of the grammatical variety consist of words or phrases which possess more than one underlying form but have the same surface form. Grammatical ambiguity may occur at the phonological, morphological or syntactic levels of the language (Green and Pepicello, 1984). Green and Pepicello (1984: 198) conclude from an examination of the work of Hockett (1970) that the grammatical strategies which are used in many riddles originate as 'accidents of speech', which are found to be amusing and are later utilised in a riddle form. They cite the riddle (193),

*What's the difference between a stag fleeing from hunters and a
midget witch?
One is a hunted stag, the other is a stunted hag,*

as an example of the speech error of metathesis used as a riddle strategy.

Green and Pepicello (1984: 194-97) also give examples of riddles which make use of the three different types of grammatical ambiguity. At the phonological level of the language, the most commonly used riddle strategy is that of simple lexical ambiguity, whereby a single phonetic string can be said to have two unrelated meanings. An example of such a riddle is, '*What turns but never moves? Milk*', Other examples of riddle strategies at the phonological level include the use of metathesis (referred to above) and the use of minimal pairs, as in the riddle,

*What's the difference between a baby and a coat?
One you were, the other you wear.*

At the morphological level, the riddle strategies include the use of homophony between the past participle morpheme of a verb and another word, such as in the well-known riddle, '*What's black and white and read (red) all over? A newspaper*', Other strategies at this level include the use of ambiguity between a morpheme and a whole word (e.g. '*What bow can you never tie? A rainbow*'), the deliberate confusion of an independent word with a bound morpheme, or a 'pseudomorphological' type of strategy, whereby a whole word (e.g. 'key') is deliberately confused with a phonological string ('-key') which is not actually a morpheme, as in the riddle, '*What's the key to a good dinner? A turkey*',

Riddle strategies employed at the syntactic level of the grammar include an ambiguity of phrase structure, where a surface sequence of words can be syntactically analysed in more than one way, such as in the riddle, '*How is a duck like and icicle? Both grow down*'. The riddle, '*What do you call a man who marries another man? A minister*', involves a 'transformational' riddle strategy, whereby 'two different underlying structures have an identical surface form as a result of their syntactic derivations' (Green and Pepicello, 1984: 195). Another syntactic strategy plays upon the literal and figurative interpretations of an idiom, such as, '*What goes most against a farmer's grain? His reaper*'. A

final strategy involves a mixture of devices, such as in the riddle, *'Why can you not starve to death in the desert? Because of the sandwiches (sand which is) there,* ' which involves homophony between a morphemic construction (the plural form of 'sandwich') and another syntactic interpretation ('sand which is').

1.2.1 Metaphor

Metaphor is not only important as a device providing the ambiguity necessary to many 'true' riddles, it has also been studied in its own right as an important example of the 'nonliteral' use of language (Rice and Kemper, 1984). Metaphor is defined by Franklin and Barten (1988: 299) as 'a use of language in which a term (or phrase) customarily applied in one domain is transported across conventional category boundaries and applied in another'. In order to comprehend nonliteral uses of language (such as metaphors and idioms) the listener must be able to go beyond the surface meaning of an utterance and determine what is referred to as the 'speaker meaning' (Searle, 1979). This is the meaning which the speaker wishes to convey through the use of the utterance. In the case of nonliteral uses of language, this will always be different to the surface form of the words uttered by the speaker.

Lakoff and Johnson (1980) give a detailed account of the many ways in which metaphor is used in everyday conversation. They are of the view that some metaphoric expressions have become such an everyday part of language use that speakers of a language may not even be aware that they are using metaphor. For example, we talk of arguments as 'wars' or of time being 'in flight'. Not only is metaphor an important feature of language use, it therefore structures the way in which we think and act from day to day. The distinction can be made between literal and figurative metaphors (Lakoff and Johnson, 1980). Literal (or frozen) metaphors, such as those mentioned above, are those that can be seen as 'dead'. They have been assimilated into the language through overuse and have therefore lost their 'metaphoricity' (Winner, 1998: 17). Figurative or novel metaphors, on the other hand, are those which can be seen as 'alive' as they are creative and serve to illustrate new ideas.

Richards (1936, cited in Kittay, 1987) described all metaphors

as having both a *topic* and a *vehicle* which are linked by a common *ground*. The topic is what the metaphor is about (i.e. the subject of the metaphor). The vehicle is the means through which the speaker can refer back to the topic. The ground is made up of the properties which link the topic and vehicle. An example used to illustrate these elements is Shakespeare's copula metaphor, '*Juliet is the sun*' (Skinner, 1957, cited in Billow, 1977: 84). The topic of this metaphor is 'Juliet' and the vehicle is 'the sun'. The ground is composed of the aspects of the sun, such as its warmth and brilliance, which are shared by both Juliet and the sun.

Types of Similarity

There are a number of types of ground (similarity) on which a metaphor can be based (Winner, 1988). The distinction can be made between sensory and nonsensory kinds of similarity between the topic and the vehicle. Sensory metaphors are those based on similarities of 'shape, sound, colour, motion, texture, smell or some combination of these' (Winner, 1988: 64). For example, a similarity of colour is involved in the sensory metaphor, '*The bird was a rainbow flying in the sky*' (Nippold, Leonard and Kail, 1984: 198).

Nonsensory metaphors are grounded in the types of similarity which are not directly perceived by our senses. This similarity may be of a relational or a psychological-physical nature. Metaphors based on a relational type of similarity link the topic to its vehicle due to a similarity in the way in which the two items function. An example is the likening of the human brain to a computer. The suggestion here is that the brain processes information in the same way a computer does (Winner, 1988). Other metaphors in use in everyday language, such as the notions of time 'flying' or ideas 'blossoming' (Lakoff and Johnson, 1980), involve similar types of ground.

Psychological-physical metaphors are usually based on a similarity between 'sensory attributes of a physical object. . . and psychological, nonsensory attributes of a person' (Winner, 1988: 67). Included here are dual-function terms, such as 'warm', 'sweet' or 'soft' which can be used to describe the physical attributes of objects or the personality traits of people (Asch and Nerlove, 1960, cited in Billow, 1975). Asch (1958, cited in Billow, 1977: 85) gives

the example of the adjective 'hard', which could be applied in a physical sense to a piece of furniture or in a psychological sense to a person. When used to describe a table, the term 'hard' means that the table is resistant to change when physically pushed or pressed. To describe a person as 'hard' might imply that he or she is unlikely to yield to pressure from others. The psychological application of the term is therefore linked to its physical sense, through the notion of an entity resisting change when force is applied. Asch (1955, 1958, cited in Billow, 1977) also reports that historically unrelated languages have been found to contain the same metaphoric descriptions of personality traits, indicating that this is not an arbitrary phenomenon.

1.2.2 Metaphoric Riddles

Good riddles do, in general, provide us with satisfactory metaphor: for metaphors imply riddles and therefore a good riddle can furnish a good metaphor. (Aristotle, trans. Rhys Roberts, cited in Hackiyan, 1966: 2)

A 'true' riddle can be said to involve a metaphoric comparison between two entities which is obscured in some way so as to puzzle the riddlee. A theorist who has contributed greatly to the study of such riddles is Elli Kōngäs Maranda (1971: 196) who states that the metaphors involved in riddles 'are conditional metaphors, and the riddle image states the condition under which the metaphor holds true'. One-half of the metaphoric comparison is therefore revealed in the riddle image (along with information which obscures the answer) and the task for the riddlee is to complete the metaphor, thereby answering the riddle (Green and Pepicello, 1984).

Based on her analysis of Finnish riddles, Kōngäs Maranda (1971: 198-99) concludes that the metaphoric riddle comprises five basic elements. An example used to illustrate these elements is the Finnish riddle, '*One pig, two snouts*', to which the answer is '*A plough*' (referring to the traditional Finnish 'fork plough' which has two prongs or 'snouts'). The first element of the riddle is labelled the 'signans' or given term of the metaphor (in this case, 'a pig'). Secondly, there is a constant premise (similar to the 'ground')

of the metaphor described by Richards (1936, cited in Kittay, 1987) which is true for both the signans, and the the 'signatum'(riddle answer). In this case, the constant premise is that both a pig and a plough can have snouts. The third element is the hidden variable which is never mentioned in the riddle (e.g. that a pig can only have one snout, not two) but which indicates to the riddlee that something which is stated in the riddle image needs to be resolved. The fourth element is the given variable of the riddle (e.g. that two snouts are involved) which is described as 'the condition under which the metaphor holds true' (Köngäs Maranda, 1971: 199). Finally, the other hidden term is the riddle answer or 'signatum' which the riddlee is seeking.

Köngäs Maranda (1971) also observes from her study of Finnish riddles that riddles create a surprise by combining elements from categories or 'sets' which are normally seen as being opposites. Köngäs Maranda found in her analysis of seventy-two riddles that the most commonly occurring contrast between the categories was that of the set of animate entities versus the set of inanimate entities. Within these two sets, almost half the riddles involved a juxtaposition between human objects and cultural objects. About a quarter of the riddles involved the contrast between human beings and wild plants. Only a few riddles contained reference to supernatural entities such as God or to abstract concepts such as number and colour. Metaphoric or 'true' riddles might thus be said to play on listener's ability to view two entities as being equivalent (on a sensory level) due to their shared characteristics, despite the basic knowledge on an ideological level that the two things are not the same and in fact belong to different classes (e.g. animate things versus inanimate things) (Kallen and Eastman, 1979).

Types of Riddle Metaphor

A distinction can be made between riddles which make use of 'frozen' metaphors for their ambiguity and those which involve the generation of a novel metaphorical comparison (McDowell, 1979: 95). The term 'conventional polysemy' is used to describe metaphors which are present in everyday language use (i.e. frozen metaphors). Conventional polysemy occurs where the two mean-

ings of a particular phonetic string are thought of as being related, through a metaphorical comparison (e.g. the leg of a person and the 'leg' of a table). The speakers of the language intuitively consider the two uses of the word to be related, whether or not this is historically the case (McDowell, 1979).

McDowell (1979: 98) cites other examples of riddles which require the literal interpretation of 'dead' or frozen metaphors which have been assimilated into the language. For example, the riddle *'Why did the boy throw his clock out the window?' (To see time fly)*, involves the literal interpretation of the well-known metaphor of time being in flight. A similar type of riddle involves what McDowell (1979: 97) describes as the 'resurrection of automatized language' through the use of fragments of imaginary conversations between usually inanimate objects. These riddles take the form 'What did the X say to the Y?' (McDowell, 1979: 97), such as in the riddles *'What did the rug say to the floor?' (I've got you covered)* or *'What did the big telephone say to the little telephone?' (You're too young to be engaged)*. The ambiguity involved in each of these riddles revolves around the two senses of a particular word or phrases, in this case the two senses of the words 'cover' and the phrase 'to be engaged'.

In addition to the use of metaphors already sanctioned in the language, riddles can involve the strategy termed 'radical' or novel polysemy. Radical polysemy, as described by McDowell (1979), involves the use of a metaphorical comparison between two things, which has not already been assimilated into the language. The most common example is the use of metaphor to remark on the similarity between the sensory (physical) features of two items. The two items may have little in common other than their appearance, 'but these incongruities are momentarily held in abeyance while the common features are held in focus' (McDowell, 1979: 101).

Radical polysemy was the strategy used in many of the riddles in the sample analysed by Köngäs Maranda (1971). As mentioned earlier, she too commented on the fact that the items compared were from vastly different categories or sets. McDowell (1979) notes that the main types of comparison in use in his sample of children's riddles are those of culture versus nature (e.g. a cherry compared to police car lights), animate versus inanimate entities (e.g. an old lady compared to a candle), mankind versus other

forms of life, and finally, cultural artifacts compared with each other.

1.2.3 Solving Riddles

There is some debate regarding the processes involved in the solving of 'true' riddles and in the selection of 'acceptable' answers. Kaivola-Bregenhøj (1996:30) in a discussion based on Finnish riddles, suggests that riddles in which the riddle image is 'semantically vague' can sometimes be solved by guess-work, as there are a greater number of possible answers which fit. The degree of validity of suitable but unexpected answers seems to depend, however, on the judgement of the particular riddler and on the customs of the culture in which the riddling session is taking place. Kallen and Eastman (1979: 418), for example, conclude from their study of Swahili riddles that such riddles are solved through the use of 'symbolic activity' and interaction between the parties involved, rather than a process of reflection and analysis by the riddlee.

Köngäs Maranda (1971, cited in Kaivola-Bregenhøj, 1996) remarks that there is a tendency amongst riddlers of accepting only their original, preferred answer and rejecting other suitable answers. Kaivola-Bregenhøj (1996:32) concludes that in a riddling session the riddler and riddlee take two different approaches to the solving of a riddle. The riddlee uses the process of 'creative guessing' in order to select a suitable answer to the riddle. The answer which the riddler has in mind, however, is founded on 'a conventional interpretation of the image that does not tolerate any variation'.

Whilst the validity of a particular answer may vary depending on the cultural context of the riddling session or the judgement of the riddler, it would appear that there are a number of conditions which the answer to a true riddle must fulfill. It has been remarked that a riddle answer must complete the condition described as a 'partially obscured semantic fit' which exists between the riddle image and its answer (Scott, 1965, cited in Kallen, 1981: 4). In order to satisfy this condition, the riddle answer must share enough features with the riddle image for them to be seen as equivalent within the context of the riddle (through the use of metaphor).

However, the riddle answer must also fulfill the requirement of being significantly different in nature from that of the image, so that the semantic fit between the two of them is sufficiently obscured.

The work of Elli K ng s Maranda (1971) revealed that there are certain semantic groupings which are traditionally more likely than others to be linked in the metaphors involved in true riddles. As observed from her study of Finnish riddles, true riddles generally involve the juxtaposition of opposites (K ng s Maranda, 1971). The item which appears to be described in the riddle image typically belongs to an opposite semantic category or 'set' to that of the riddle answer. Aitchison (1994: 150) also comments that in a good metaphor, 'the subject of the metaphor is compared to something which is quite different from itself, in the sense of coming from a different semantic field'. Thus, the first criteria which a riddle answer might be required to meet is that of belonging to a semantic category which is opposite to that of the riddle image.

Secondly, the notion put forward by Rosch (1975), that some members of a category are considered more 'prototypical' examples of category members than others, might also be borne in mind when judging the degree of obscurity of fit between the riddle image and a possible answer. A riddle answer, one might assume, should be a prototypical example of a member of a category opposite to that item in the riddle image, if the riddlee is to be given the chance to 'solve' the riddle on the first hearing.

A third and essential feature of the riddle metaphor is that the item named the riddle answer must have characteristics in common with the item mentioned in the riddle image. Aitchison (1994: 150) remarks that although the items compared 'must not share major characteristics, they must share' some'. She states that good metaphors typically involve a comparison based on a minor, but 'fairly obvious' characteristic. This third condition, along with those mentioned above, must be fulfilled therefore, if a particular answer is to be judged as completing the riddle.

1.3 Children's Riddling

The most comprehensive developmental account of children's riddling in the literature is that given by John Holmes McDowell (1979). McDowell conducted a detailed analysis of the riddles

collected from a sample of fifty working class, chicano children and twenty-five anglo, middle class children living in Austin, Texas, during the 1970s. The children ranged in age from 4 up to 11 years, though McDowell's analysis focuses mainly on the riddles used by children between the ages of 5 and 8 years.

McDowell (1979: 31) uses the term 'interrogative ludic routine' to label all playful linguistic sequences (such as riddles) which involve an inversion of the everyday speech act of interrogation. He reserves the terms 'riddle' or 'riddle proper' to refer only to interrogative ludic routines which contain an identifiable block element. McDowell found from the analysis of his corpus of riddles that there is a distinct developmental pattern in the kinds of ludic routines which children use.

The riddling of children of 4- and 5-years-of-age is characterised by the use of what Sutton-Smith (1976, cited in McDowell, 1979: 32-33) labels 'preriddles', as children frequently do not yet show awareness of the relationship between the question and answer of the riddle. Children of this age tend either to reproduce a riddle which they have heard elsewhere, without actually comprehending it, or they 'create puzzling questions and give them arbitrary answers'. Another feature which is characteristic of the riddling of children at this age (and which is a feature of riddling at all ages) is the use of interrogative ludic routines which contain no block element and which are 'not intended to confuse' (McDowell, 1979: 34). These early routines are labelled 'descriptive routines' as the riddle image typically involves a description of one or more attributes of an object. Examples of such routines used by the chicano children include (McDowell, 1979: 35):

*What has five sides and lives in the sea? A starfish.
What's square and gots a point at the top? A house.*

Whilst most descriptive routines are based on the physical characteristics of objects, they can also involve the themes of instrumentality (e.g. *'What do you need feet for? To walk'*) or causation (*'How come a rabbit goes into a hole? Cause she eats a lot of carrots'*).

By the age of six years, children have begun to use the 'riddle

proper', whilst still using a large number of descriptive routines. The riddle proper differs from the descriptive routine in that it contains a source of ambiguity (the block element) and its purpose is to trick or confuse, rather than help the riddlee, in finding the answer. The riddle strategies used at this stage are primarily homophony (described earlier) and anomaly, which is the strategy at work in a riddle such as, '*What goes up and never comes down? Your age*'. McDowell (1979: 106) states that riddles involving anomaly serve to challenge everyday states of affairs which we have taken for granted (such as the laws of gravity, in the riddle above).

By seven years of age, children have become more adept at the use of the riddle proper. There is a strong preference for the use of riddles involving all types of linguistic ambiguity amongst children of this age. There is also a marked increase in the use of riddles involving the polysemies (metaphor) at this stage. Anomaly riddles involving the theme of fantasy, such as those involving the generation of 'unnatural facts', are present at this age (e.g. '*What's big and red and eats rocks? A big, red rockeater*', McDowell, 1979: 253). However, riddles involving 'real world' anomaly are equally popular with this age group.

The repertoire of 8-year-old children consists mainly of the riddle proper. McDowell (1979: 208) reports that by this age 'the riddler's progress appears to be virtually complete', with a more sophisticated execution of riddling routines. The items featured in the descriptive routines of children of this age tend to be more exotic than before. Whilst children in this age group still use riddles involving linguistic ambiguity, there is an overall decrease in their use of homophony as a block element. They also favour the use of anomaly riddles with a 'real world' theme. McDowell remarks that children's interest in riddling levels off during the ninth and tenth years, and seems to be diverted to other performance genres at this stage.

Types of Riddle Structure

In addition to identifying the types of riddle strategy which were used by the children, McDowell found that the riddles in his sample were structured in five different ways. Over two-thirds of the

riddles (and descriptive routines) in McDowell's sample involved the construction devices of attribution, causality and instrumentality. Riddles based on attribution, involve the use of many simple descriptive units, which McDowell (1979: 65) describes as being 'stacked'. Examples from his study include the following:

What is white on the outside and green on the inside and hops? Frog sandwich.

What's big and red and eats rocks? A big, red rockeater.

Riddles associated with causality usually take the form of a question and answer sequence involving 'Why' and 'Because'. Examples given by McDowell (1979: 66) include:

Why do birds fly south? Cause it's too far to walk.
Why did the man take hay to bed? To feed the nightmares.

A less frequent structure used in McDowell's sample is that of instrumentality, such as in the riddle, '*How do you keep a skunk from smelling? Hold his nose*'.

The two other riddle structures which were used in the study take the form, '*What did the X say to the Y?*' and '*What kind of X is a P*'. In the former riddle structure, inanimate objects are 'endowed with speech' (McDowell, 1979: 67) and the two possible meanings of a well-known figure of speech are exploited. A well-known example is the riddle involving an imaginary conversation between two chimney pots, '*What did the big chimney say to the little chimney? You're too young to smoke*'. Finally, riddles based on the structure, '*What kind of X is a Y?*' appear classificatory in nature. Yet they frequently involve the use of conventional polysemy, whereby a dead metaphor must again be resuscitated in order to solve the riddle, as in the example, '*What kind of head grows in the garden? A head of lettuce*' (McDowell, 1979: 68).

1.3.1 Children's Comprehension of Riddles

The development of the ability to comprehend riddles has been investigated by a small number of researchers (Fowles and Glanz, 1977; Prentice and Fathman, 1975; Shultz, 1974). Most of the

available research has examined the comprehension of joking riddles which make use of the types of grammatical ambiguity outlined by Green and Pepicello (1984). The development of the comprehension of 'true' riddles has not specifically been examined, although the study by Fowles and Glanz (1977) did include some riddles involving the use of metaphoric language as a source of ambiguity. The development of comprehension of metaphor outside of a riddling context has also been examined by researchers and the findings of these studies will be described in section 1.4.

Fowles and Glanz (1977) examined the comprehension (and appreciation) of riddles in a group of fourteen children, aged between 6 and 9 years (Grades 1 to 3 at school). The children were presented with a series of riddles and were asked to retell and explain each of them. These riddles mainly involved the use of grammatical ambiguity as a block element. 'True' riddles were not specifically included, although some of the riddles contained terms which had both a literal and metaphorical meaning. On examination of the results, Fowles and Glanz (1977) report that the children in the 7-8 year age group performed better than those in the age groups above (8-9 years) and below them (6-7 years). Although they found that the level of comprehension was not closely related to age, the researchers report that riddle comprehension was related to reading ability (as rated by teachers) in each of the age groups.

Fowles and Glanz (1977) also remark from their results that the riddles which the children found most difficult to comprehend were those which contained more advanced vocabulary and those containing abstract or metaphorical language. Riddles in which the two possible interpretations of the ambiguous terms were both concrete were found to be easier to comprehend. Familiarity with the riddles themselves facilitated retelling of the riddles but did not necessarily aid comprehension of them. The researchers state that the influence of factors which are thought to affect ease of comprehension (such as the use of metaphorical meaning as opposed to more concrete meaning) is in need of further investigation, 'using riddles chosen specifically to exemplify these polarities' (Fowles and Glanz, 1977: 450).

In a similar study, Shultz (1974) investigated the comprehen-

sion of riddles in a group of thirty children in the 6-, 8-, 10- and 12-year age groups. An explanation task was again used to examine the children's comprehension of grammatically-based riddles. Comprehension of the riddles was found to increase steadily with age. The 6-year-olds had particular difficulty explaining the two possible interpretations of the ambiguity in the riddles. They were judged to have comprehended just under a quarter of the riddles, with the 8-year-olds comprehending twice this number. The level of comprehension increased to just under two-thirds of the riddles amongst the 10-year-olds and the 12-year-olds performed slightly better again.

Prentice and Fathman (1975) also used an explanation task to investigate the comprehension of joking riddles in a group of forty-eight boys and girls aged 6, 8 and 10 years. Three types of riddles were included in the study, namely those with a theme of aggression, those with a caring or nurturing theme and those with a neutral content. The influence on comprehension of different types of linguistic ambiguity was not examined. Prentice and Fathman report that riddle comprehension was found to increase almost linearly with increasing age. No major differences in comprehension of the different riddle types was found between boys and girls. Overall, comprehension of the riddles was also found to be significantly related to intelligence. A vocabulary test had been used to rate intelligence, however, which in itself is a verbal task and does not examine other cognitive abilities. The older children in the study showed greater comprehension of the riddles with an aggressive or nurturant content than the younger group. The researchers suggest that this may be due either to an increased ability to cope with riddles with an affective content as the child matures or to a difference in the cognitive demands of the different riddle types.

1.4 Development of the Use of Metaphor

Traditionally, the study of metaphor was confined to the domains of philosophy and literature (Winner, 1988). Research into children's ability to use and understand metaphor has only come about in essence in the past thirty years, with increased interest in the topic among those working in the fields of linguistics and cog-

nitive psychology. There is some debate as to when children actually begin to use metaphor in their speech. It has been widely observed that as preschool children develop language, the phenomenon of overextension of words occurs (Bee, 1992). It is thought that children apply a word too broadly because they have not yet learned the correct name for a particular concept. Clark (1973) gives the example of the word 'ball' being extended to label other similarly shaped objects such as apples, doorknobs and balloons. Winner (1988: 90) points out that 'overextensions, like metaphors, are based on similarity, and hence like metaphors, offer clues to how easily children classify the world'. It has been argued that some overextensions may in fact be metaphors (Billow, 1981). Winner (1988) is of the view that while children may overextend words as they lack the correct name for an object, the use of metaphor serves a very different function. A child who is using metaphor might already know the name of the object, but is using a metaphoric name in order to remark on a similarity which he has noticed.

Few studies have examined children's early use of metaphor, but those by Winner (1979) and Winner, McCarthy, Kleinman and Gardner (1979, cited in Winner, 1988) concluded that two kinds of metaphor are characteristic of the speech of young children. The earliest emerging metaphors appear to be those involving the renaming of an object in the context of symbolic play. These renamings are usually based on the actions which an object displays, or on the function of the object (e.g. the child featured in the first study put his foot inside a wastebasket and said 'boot'). Sensory metaphors are reported to be the second form to develop and occur where the child notices a physical similarity between two objects (usually their shape), without using them in pretend play (Winner, 1979). Winner (1979) also remarks that the metaphors used by preschool children are less sophisticated than those of adults or older children in that they consist solely of the renaming of physical objects and are uttered only in the immediate presence of those objects. The renamings are also based on a sensory (physical) or functional similarity which the child has noticed, rather than using the more abstract types of comparison typical of adult metaphors.

Development of Metaphor in School-Aged Children:

A number of studies (Billow, 1981; Gardner, Kircher, Winner and Perkins, 1975; Pollio and Pollio, 1974), have suggested that the incidence of children's spontaneous use of metaphor decreases sharply during the school years. The reasons for this may include the fact that, as they grow older, children are less likely to engage in the kinds of activities (such as symbolic play) which stimulate the use of spontaneous metaphor (Billow, 1981). Furthermore, it has been noted that between the ages of eight and ten years, a literal or 'conventional' stage occurs in children's use of metaphor (Winner, 1988). During this stage, children become far less likely to use metaphor themselves, and may even be resistant to its use. Gardner, Kircher, Winner and Perkins (1975: 128) found that given a choice of endings for a sentence such as 'He looked as gigantic as...', children in this age group chose unimaginative, conventional endings above all other types of ending. They rejected novel endings (which were preferred by adolescents and adults in the study), insisting for example, that the term 'loud' could not be applied to a colour. Winner (1988) reports that this concern with convention is also reflected in the drawings of children of this age.

Other research has suggested that the ability to use metaphor continues to develop during the school years, but that the type of writing tasks typically used in school do not encourage children to make creative use of metaphor. Pollio and Pollio (1974) examined the metaphoric productions of a group of children aged between the ages of eight and eleven years on a story-writing task. The children's use of both novel and frozen (or 'dead') metaphors decreased as their class level in school increased. However, the researchers later presented the same group of children with a structured comparison task, whereby the children were asked to verbalise the similarities between pairs of unrelated items (e.g. 'can and box'). Overall, the children used a greater proportion of novel than frozen metaphors on this task, and their production of both types of metaphor increased (rather than decreased) with their class level. The findings of this study suggest that children in the eight to eleven age group continue to develop the ability to use metaphor, but that in completing school tasks they are increas-

ingly concerned about attaining good marks and so 'are less likely to 'rock the boat' by using words in unconventional or nonliteral ways' (Nippold, 1988b: 189).

1.4.1 Development of Comprehension of Metaphor

There is controversy as to the age at which children first exhibit the ability to comprehend metaphor (Winner, 1988). However, most researchers agree that as children get older, their comprehension of metaphors increases. Early research into children's comprehension of metaphor was based on the 'cognitive prerequisite theory' of development (e.g. Billow, 1975; Cometa and Eson, 1978; Smith, 1976). According to this view, the attainment of the Piagetian stage of formal operational thought is necessary before comprehension of forms of figurative language can occur (Piaget, 1926, cited in Kamhi and Friemoth Lee, 1988). Thinking during the formal operational stage (which begins at about twelve years) is characterised by a move away from the reality of the physical data of the senses towards an anticipation of abstract 'potential' properties of the environment' (Smith, 1976: 242). It was hypothesized that full comprehension of metaphor would not be possible prior to the emergence of this type of abstract thinking. Metaphor comprehension, according to this theory, would therefore be expected to emerge during the late childhood and early adolescent years.

The findings of the studies by Billow (1975), Cometa and Eson (1978) and Smith (1976), which examined children's comprehension of metaphor in relation to their Piagetian stages of development, did not support the cognitive prerequisite hypothesis. The children in Smith's (1976) study, for example, were shown to have an understanding of metaphor before they had reached the formal operational stage of thinking. In addition, a number of studies have reported the finding that even preschool children show a basic understanding of metaphor when simplified testing procedures and age-appropriate materials are used (Gardner, 1974; Gentner, 1977; Vosniadou, Ortony, Renolds and Wilson, 1984; Winner, 1979). Nippold (1988b) reports that although there may be some relationship between cognitive development and metaphor comprehension, no specific pre-requisites for metaphor comprehension

have been identified and the cognitive pre-requisite hypothesis is no longer generally accepted as a theory of metaphor comprehension.

The Language Experience Hypothesis

A theory which has been more widely adopted is the 'language experience hypothesis', which was proposed by Ortony, Turner and Larson-Shapiro (1985). According to this view, the ability to comprehend and use figurative language develops gradually through meaningful exposure to this type of language. As they grow older, children have more exposure to figurative language in both its spoken and written forms, in a variety of contexts. They also have more opportunity to test out their understanding through their own use of such language (Nippold, Taylor and Baker, 1996). The finding of a number of studies that the depth of comprehension of metaphor increases as children grow older might be explained by this theory (Asch and Nerlove, 1960, cited in Billow, 1977; Gentner and Stuart, 1983, cited in Winner, 1988; Pollio and Pickens, 1980; Pollio and Pollio, 1979; Winner, Rosenthal and Gardner, 1976).

Another implication of the language experience theory is that metaphors which occur more often in the language (i.e. frozen rather than novel metaphors) should be easier for children to comprehend than those which have less frequent usage. This notion was explored in studies by Pollio and Pollio (1979) and Pollio and Pickens (1980), involving children between the ages of 8 and 17 years. Both studies reported greater comprehension of the frozen than the novel metaphors at every age level, with comprehension of both types of metaphor increasing steadily as the children got older.

In addition to the novelty of the metaphorical expression, researchers have examined the influence on children's comprehension of factors such as the type of task used to measure comprehension, the type of metaphoric similarity involved and the complexity of the syntactic form of the metaphor. The findings of research into these aspects will be described in the next sections.

1.4.2 Measurement of Comprehension

Winner (1988: 45) concludes from a review of studies into metaphor comprehension that the method used to measure comprehension, 'dramatically affects the level of comprehension revealed'. The contradictory findings of various studies as to when metaphor comprehension emerges have been attributed in large part to the differences in the demands of the tasks used. The two tasks which are most frequently used to assess metaphor comprehension are multiple choice measures (e.g. Gardner, 1974; Nippold, Leonard and Kail, 1984) and explanation or paraphrasing tasks (e.g. Asch and Nerlove, 1960, cited in Billow, 1977; Smith, 1976; Winner, Rosenthal and Gardner, 1976).

Multiple-choice tasks require children to choose from a set of possible meanings or pictures showing the meanings of the metaphors presented. However, these tasks may either under- or overestimate children's comprehension of the metaphors, depending on the type and range of options presented (Winner, 1988). Tasks in which children are asked to paraphrase metaphors offer insight into the degree and nature of their understanding (Nippold and Rudzinski, 1993). The possibility of over-estimating a child's level of comprehension is also greatly diminished. Such tasks have also been criticised, however, due to the metalinguistic demands involved (Vosniadou, 1987). The finding of some studies that metaphor comprehension only emerges in late childhood might therefore be attributed to the significant metalinguistic demands of the tasks used (e.g. Billow, 1975; Cometa and Eson, 1978; Smith, 1976).

A study by Gardner (1974) compared the performance of children aged between 3 and 11 years on a multiple-choice picture task and an explanation task. The level of accuracy using the receptive condition was found to be greater than with the paraphrasing task. Similarly, a study by Winner, Rosenthal and Gardner (1976) involved the use of a paraphrasing measure and a written multiple-choice task. Children who had difficulty paraphrasing the metaphors were often found to have performed well on the multiple-choice measure. Pollio and Pickens (1980) reported parallel findings in their study. In evaluating and comparing the findings of various studies, it is therefore essential that the demands of the measures used be taken into account.

1.4.3 Types of Similarity

A factor which is thought to have a large influence on children's comprehension of metaphor is the type of similarity on which the metaphor is based. Winner (1988) cites the findings of (unpublished) studies by Gentner and Stuart (1983), Mendelsohn, Gardner and Winner (1981) and Shantiris (1983), that nonsensory metaphors pose more difficulty for younger children than those grounded in sensory similarity.

In the study by Shantiris, children of different ages were presented with a series of sensory metaphors, nonsensory metaphors and anomalies. The children were asked to decide whether statements such as, *'Eyes are marbles'* (74) made sense, thereby indicating comprehension of the grounds. At all ages, children found psychological-physical metaphors the most difficult type to comprehend. However, relational metaphors proved no more difficult than sensory metaphors for any age group. A different finding regarding relational metaphors was reported by Gentner and Stuart, whose study involved children aged 5-6 years and 9-10 years. Metaphors based on a sensory similarity (e.g. *'A cloud is like a marshmallow'*) and relational similarity (e.g. *'Tree bark is like skin'* [p. 74]) were presented to the children. When asked to explain the sensory metaphors, children aged 5-6 years performed as well as the older children. They had considerable difficulty explaining the metaphors grounded in a relational type of similarity.

Mendelsohn et al. (1981, cited in Winner, 1988) used a multiple-choice task to probe for comprehension of sensory and nonsensory metaphors in children aged 6 years and above. Children of all ages were found to have more difficulty with metaphors grounded in relational or psychological-physical similarity than those involving sensory grounds. A study by Nippold, Leonard and Kail (1984) contradicted this finding in relation to psychological-physical metaphors, however. Their study involved children aged 7 and 9 years who were again presented with a multiple-choice task. They reported no difference in the ease of understanding between sensory and psychological-physical metaphors. Kogan, Connor, Gross and Fava (1980, cited in Winner, 1988) reported similar findings when a basic picture matching task, with minimal linguistic demands was used.

Literal Interpretation of Nonsensory Metaphor

Studies where explanation tasks are used offer insight into the nature of younger children's interpretation of nonsensory metaphor. The finding that younger children tend to interpret nonsensory metaphors in a literal (physical) sense has been commonly reported. An early study by Asch and Nerlove (1960, cited in Billow, 1977) investigated the comprehension of dual-function terms such as 'hard', 'sweet' and 'warm' in children aged between 3 and 12 years. Whilst the preschool children comprehended the dual-function adjectives in reference to physical objects, they showed no understanding that people could also be described in this way. The 5- and 6-year-olds in the study understood that the adjectives could be applied to people, but only in a physical sense (e.g. 'cold' people were understood to be people who were not warmly dressed). Only between the ages of 7 and 10 years did the children show awareness that the terms could be applied in a psychological sense to people. And only the 11- and 12-year-olds (who understood the metaphors with a level of 96% accuracy) were consistently able to verbalise the metaphorical link between the two senses of the terms.

A study by Winner, Rosenthal and Gardner (1976) also involved the presentation of dual-function terms, but in predicative metaphors. They report that 30% of 8-year-olds and 48% of 10-year-olds were able to explain the psychological meaning of the terms. Prior to this, the children tended to interpret the metaphors literally (e.g. the description of a prison guard as a 'hard rock' was interpreted as meaning that he had hard, tough muscles).

The finding that nonsensory similarity seems to pose more difficulty for children was explained by Keil (1979, 1985, cited in Winner, 1988) in terms of a lack of 'domain knowledge'. The term 'domain' is used here to refer to the categories by which humans beings organise their world (such as furniture, modes of transport or personality traits). 'Domain knowledge' therefore refers to the knowledge which a child has about the properties and functions of things within a particular domain and about the boundaries of that domain. Keil was of the view that in order for a child to comprehend a metaphor, he or she must be not only be familiar with the referents of the topic and vehicle, but must also have knowl-

edge of the two domains to which the topic and vehicle belong. Keil's hypothesis that knowledge of the world increases as children get older was supported by the findings of the study by Gentner and Stuart (1983, cited in Winner, 1988) mentioned earlier. Prior to the presentation of the metaphor task used in their study, Gentner and Stuart asked each child to describe the items mentioned in the metaphors (e.g. tree bark, skin etc.). The list of properties which the children gave for each item was found to increase considerably with age.

The results of Keil's own study (1985, cited in Winner, 1988: 82-83), which involved children between 5 and 9 years of age, suggest that metaphor comprehension 'emerges on a domain-by-domain basis'. Once the children understood a metaphor involving items from the two domains, such as the properties of plants applied to ideas (e.g. *The idea bloomed*'), they also showed understanding of most other metaphors involving items from those domains.

1.4.5 Syntactic Form

A small number of studies have investigated the influence on comprehension of the syntactic form of a metaphor (Nippold, Leonard and Kail, 1984; Renolds and Ortony, 1980; Winner, Engel and Gardner, 1980). The study by Nippold, Leonard and Kail (1984) involved children aged 7 and 9 years. Equal numbers of predicative metaphors (involving only one topic and one vehicle) and proportional metaphors were presented to the children. Proportional metaphors contain two topics and two vehicles and involve the use of analogy at an underlying level (e.g. *The bird's nest was a piggybank that had no coins*' [p. 198]). The researchers found that the children had more difficulty understanding the proportional metaphors than the predicative ones. The 9-year-olds also displayed a greater level of comprehension than the 7-year-old children.

An earlier study by Winner, Engel and Gardner (1980) (involving children aged 6, 7 and 9 years) compared ease of comprehension of five different syntactic presentations of metaphor. The researchers had firstly hypothesised that the rewriting of a predicate metaphors in the form of a simile (a comparison involving the

term 'like') would facilitate comprehension, by highlighting that a comparison was being used. Secondly, a similar prediction was made in relation to topicless metaphors (in which the vehicle is stated but the topic is only implied). Topicless metaphors were rewritten both in the form of an explicit analogy (e.g. 'A *picture frame surrounds a picture and _____ surrounds a field*' [p. 26]) and in the form of a question (which the researchers labelled a 'riddle', e.g. '*What is like a picture frame but surrounds a field?*' [26]).

The study found that the original and simile versions of the predicative metaphors were equally difficult for the children to comprehend. The analogy forms of the topicless metaphors were also no more accessible to the children than their original forms. However, the 'riddle' forms were found to be easier to comprehend than the topicless metaphors. The predicative metaphors were also more difficult to comprehend than the topicless metaphors. A study by Renolds and Ortony (1980), involving a more naturalistic task, similarly reported no difference in the ease of comprehension between predicative metaphors and similes. Whilst it can therefore be concluded that syntactic form may have some influence on the degree of comprehension of metaphor, further research is needed to determine the exact nature of this relationship.

1.5 Researcher's Questions

To date, there is only a small body of research covering the development of riddling skills in children. Few studies have documented the development of riddle use and it would appear that none of the available studies have examined Children's ability to answer riddles. The research into riddle comprehension has mainly involved the use of grammatically-based joking riddles, as opposed to metaphorically-based, 'true riddles'. These are all areas, therefore, which are in need of further investigation. Most of the studies which have examined children's comprehension and use of riddles and metaphors have reported no significant difference in the performance of boys and girls in these areas. The use of both quantitative and qualitative types of comparison might therefore be useful in revealing any subtle differences in the performance of the two groups.

After reviewing the literature, the following questions were posed by the researcher in order to explore the development of metaphoric riddling in Irish school-aged children:

- 1) Are there developmental patterns in the types of answer which children give to metaphoric riddle questions?
- 2) Does the ability to comprehend metaphoric riddles (i.e. riddle question and answer sequences) improve with age?
- 3) Is there a developmental pattern in the types of riddles which children use?
- 4) Are there differences in the developmental patterns displayed by boys and girls in riddle comprehension and use?

METHODOLOGY

2.1 Purpose

The purposes of this study were

- 1) to investigate the riddle-answering skills of Irish school-aged children
- 2) to investigate the development of comprehension of metaphoric riddles in Irish school-aged children
- 3) to investigate the effect of different types of metaphoric similarity on comprehension
- 4) to investigate the development of children's own use of riddles
- 5) to investigate the effect of gender differences on the results of the study.

2.2 Design

A linguistic approach was used in the research study, incorporating elements of an experimental design.

2.3 Preliminary Procedure

Selection of Metaphor-Based Riddles

Twelve riddles which involve the use of metaphor (see Appendix 1) were chosen from a wide selection of popular children's riddle and joke books.

TABLE 1: Criteria in Selecting Riddles

The riddles chosen

- involved the use of metaphor to provide either ambiguity in either the 'question' or 'answer' of the riddle.
- occurred frequently in the riddle and joke books and were therefore more likely to be familiar to the children.
- included six riddles involving the use of metaphor based on sensory grounds and six involving nonsensory grounds.
- involved a simple 'question and answer' format.

Construction of Probe Questions

Questions to be used in order to test for comprehension of the twelve metaphor-based riddles were constructed. The use of these questions was based on the assumption that children who had fully understood a metaphoric riddle would be able to state the similarities or 'ground' which formed the basis for that metaphor. For example, the metaphoric riddle, '*What has legs but cannot walk? (A table)*' is based on a shared physical characteristic which has been noticed between a table and a human being (or animal). The ground in the case of this metaphor is the notion that a table and a

human being both have legs. The probe questions which were constructed to test for comprehension of the Riddles 1-12 therefore looked for the grounds of the metaphors involved and took the form, 'How is X like Y?', where the items mentioned were those involved in the metaphorical comparison. The task for the children is to verbalise the grounds which have already been implied in Riddles 1-12 (presented previously).

2.4 Children Involved in the Study

Educational Setting

The children involved in this study attended either:

- (a) an all-female primary school or
- (b) a mixed-sex primary school.

Both schools are located in an urban setting, are English-speaking schools and are judged to be similar in socio-economic status.

Preliminary Introduction

A letter of introduction was sent to each school prior to the commencement of the study, along with an explanation of its aims and a description of the procedure involved. Discussions were then held with the principal teachers, outlining the selection criteria for the children involved. A letter explaining the aims of the study and the procedure involved was sent to the parents or guardians of children identified as suitable for participation in the study. Permission for their children to be involved in the study and for audio-taping of the interviews was obtained in writing from interested parents and guardians.

Selection of Children for the Study

A list of children who were suitable for involvement the study was compiled by each class teacher. From this, children who were within the average age range for the particular class level (including both boys and girls) were identified. Parental permission for possible participation in the study was obtained for the children in

this group. Children were then chosen at random from the group by the researcher for participation in the study. Twenty-four children participated in all. Six children were chosen from each of the 3rd, 4th, 5th, and 6th classes. Equal numbers of boys and girls were chosen from each of the class levels.

TABLE 2: Selection Criteria

The children involved in the study

- were within the average age range for their class levels.
- were judged by their teachers to be developing normally and to be of average ability.
- had no reported speech and language difficulties or difficulties with written language.
- had the written permission of their parents or guardians to take part in the study.

TABLE 3: Class Levels and Average Age Ranges

CLASS	AGE RANGE FOR	AVERAGE AGE RANGE THE CLASS LEVEL
3 rd Class	8yrs 0m to 9yrs 4m	8yrs 2m to 8yrs 8m
4 th Class	8yrs 11m to 10yrs 2m	9yrs 3m to 9yrs 9m
5 th Class	9yrs 10m to 10yrs 11m	10yrs 1 m to 10yrs 7m
6 th Class	10yrs 10m to 12 yrs 8m	11 yrs 0m to 11yrs 6m

TABLE 4: Details of the Children Selected

CLASS	CHILD NO.	AVERAGE AGE
3 rd Class	1-6	8 years 5 months
4 th Class	7-12	9 years 5 months
5 th Class	13-18	10 years 3 months
6 th Class	19-24	11 years 4months

2.5 Procedure

The procedure was informal in nature and essentially took the form of a riddling session between the researcher and each child. There were three main tasks involved in the procedure, however the order of presentation of these tasks was frequently altered depending on the interests of the children involved. For example, if a child was especially eager to begin telling riddles at the start of the interview, then the third task was completed first.

The children were interviewed individually by the researcher. Each interview was audio-recorded for later analysis. The interview began with the researcher introducing herself to the child and explaining that she was doing a project which was looking at the riddles which children use. The riddle tasks were then introduced with the following explanation:

I'm going to tell you some riddles to see if you've heard any of them before and then afterwards you can tell me any riddles that you know. Some riddles that you might have heard before are ones like, 'Why did the chicken cross the road? (To get to the other side)' or 'What goes up when the rain comes down? (An umbrella)' or 'What has hands but no arms? (A clock)'.

The child was given a chance to answer the introductory riddles (above) if he or she was able. Otherwise, the answers to the riddles were given by the researcher. Further examples of riddles were given if necessary, until the child understood the 'question and answer' nature of the riddles. Three tasks were then presented to the child:

Task 1: Listening to Riddles

The first task (Task I) involved the presentation of the metaphoric riddles. The task for the child was to listen to Riddles 1-12 (see Appendix 1) and their riddle answers. The children could also attempt to answer the riddles if they so wished. The presentation of each riddle-question was followed by a pause, during which the child had an opportunity to answer the riddle or to respond, 'I don't know'. Children who attempted to answer the riddle were encouraged to state why they had given that answer. The researcher

then responded, *'That's very good. Another answer that I was going to say was. . . '* and provided the child with the target response. Similarly, children who did not attempt to answer the riddle were provided with the target response.

Task 2: Responding to Probes

This task was introduced with the instruction, *'I'm going to give you some more questions now which are a bit the last ones. You listen to them and try to think of the answers '*. The questions which had been constructed to probe the children's comprehension of the riddles were then presented in random order (i.e. in a different order to their corresponding riddles). The children were encouraged to listen to each question and try to think of the answer. Some of the terms which were involved in the nonsensory Riddles (7-12) were in more abstract than those involved in the sensory Riddles (1-6). The depth of the children's comprehension of the metaphors involved in Riddles 7-12 was therefore probed further by encouraging the children who gave correct answers to elaborate further. Prompts such as, *'Can you tell me a little bit more about that? 'or, 'What is a bright person like?'*, were therefore used to probe for full understanding of the non sensory metaphors.

Task 3: Riddle-Telling

Finally, the children were asked, *'Do you know any riddles a bit like the ones that I've told you? '* and the riddles which they told were recorded. Riddles which children contributed at any other point during the interview were also recorded for later analysis.

2.6 Analysis Protocol

The interviews were later transcribed from the audiotape. The responses collected from the children on each of the three tasks were analysed both quantitatively and qualitatively, where applicable. Patterns which emerged in the style of answering on all of the tasks were recorded and described.

RESULTS

3.1 Introduction

This study sought to investigate the development of children's ability to both comprehend and pose metaphoric riddles. The following questions in particular were investigated:

- 1) Are there developmental patterns in the types of answer which children give to metaphoric riddle questions?
- 2) Does the ability to comprehend metaphoric riddles increase with age?
- 3) Is there a developmental sequence in the types of riddles which children use?
- 4) Are there differences in the developmental patterns displayed by boys and girls in riddle comprehension and use?

3.2 Development of the Ability to Answer Metaphoric Riddles

Although the main aim of Task I (where Riddles 1-12 were presented) was simply to allow the children to listen to the riddles, the informal nature of the interview meant that many children attempted to answer the riddles also. The task involved in answering the riddles which were based on nonsensory grounds (7-12) was much different to that involved in answering the sensory riddles (1-6). In compiling the list of riddles prior to testing (from riddle and joke books), it became apparent that, in general, riddles based on nonsensory grounds only contain the use of metaphorical language to provide ambiguity in their answers, rather than in the riddle questions. In order for the children to answer riddles 7-12, they were therefore required to have made use of metaphorical language in their answers. From the sample of 216 answers to these non sensory riddles, only two answers were judged as possibly completing the riddles. A large proportion of the other answers were 'Don't know' responses. Analysis of the children's answers therefore focused on their responses to the riddles (1-6) involv-

ing sensory metaphors, which are more typical of 'true' riddles.

The answers given by the children to the true riddles were analysed by the tester and classified in three ways. The answers were firstly considered to be 'target' or canonical answers if they were the same as, or very similar to the answers which had been found in the riddle and joke books. Secondly, children in all of the age groups gave a number of 'alternative' answers to the riddles, which had not been found in any of the riddle or joke books. All of the alternative answers given by the children were judged as fitting the descriptions given in the riddles to some degree, although some were deemed more suitable than others. This finding will be described in more detail below. The final group of answers were 'Don't know' responses.

An examination of the results firstly from a quantitative point of view revealed some possible developmental patterns. The overall accuracy of the children in supplying the target answers to the riddles was found to be greater amongst the older children as compared with the younger groups. However, the 8-year-old group were found to have given more target answers than the 9-year-olds. Whilst the 9-year-old group did not give the target answer for any of the riddles, they were the group most likely to give an 'alternative' type of answer to the riddles. The proportion of target answers given increased greatly after 9 years, to just over a quarter of the answers of the 10-years-olds and two-fifths of the answers given by the 11-year-olds.

About half of the answers given by the 8- and 9-year-olds were classified as 'alternative' answers. The incidence of alternative-type answers decreased overall amongst the two older groups, with just under a quarter of the answers of the 10-year-olds being of this type. The level was slightly higher amongst the 11-year-olds, at about one-third of answers. The proportion of 'Don't know' responses gradually increased, from just over two-fifths of answers at 8 years to half of the answers at 10-years-of-age. The proportion of 'Don't know' answers was lowest amongst the 11-year-olds (the oldest group), and this was also the group who were most likely to respond with the target answer.

Analysis of the Alternative Answers

A second type of analysis was also used to examine the 'alternative' riddle answers generated by the children. This involved the examination of the answers in terms of their ability to satisfy the condition known as a 'partially obscured semantic fit' which exists between the riddle question or 'image' and its answer (Scott, 1965, cited in Kallen, 1981: 4). In order to fulfill this condition, the riddle answer firstly had to belong to a semantic field opposite to that of the riddle image.

The second condition which the children's answers had to fulfill was that of being judged a prototypical example of a member of the particular semantic category. The final criteria which was used was that the riddle answer had to share some obvious, minor characteristic with the item in the riddle image in order to complete the metaphorical comparison.

The first kinds of answers which the children gave to the riddles were considered to be 'anomalies' because they did not strictly fit the description given in the riddle image, even in literal terms. There were just a couple of instances of such answers, both of which were given by 9-year-old children. These answers belonged to the same superordinate category as the item implied in the riddle image (i.e. animate) and were therefore not considered to have a great degree of obscurity as answers. However, in the case of each of the responses of this type, the children had created an explanation to make the answer fit the description in the riddle image, as can be observed from this example:

Image: What can howl but has no mouth? Answer and Explanation: 'A frog or a toad, because a toad can let out a big noise and their mouths are different to ours'.

Just over a fifth of the answers given by the children were those which were considered to be 'literal' answers as they fitted the description used in the image in a literal sense, and there was no attempt to give an answer which had originally been obscured through the use of metaphor. The riddle answer was therefore from the same category (animate) as the riddle image in each case. This type of answer was given with the greatest frequency amongst the 8- and 9-year-olds, with few instances amongst the older children. Examples include the following:

Image: What has legs but cannot walk? Answer: Tadpoles.

Image: What has eyes but cannot see? Answer: A bat.

Image: What goes around all day with its tongue sticking out and sits by the bed at night? Answers: A dog, A cat.

Answers of a similar type to those above involved the use of a feature named in the riddle image, put in a situation so that it fitted the description in the image as in this example:

Image: What has teeth but no mouth? Answers: Teeth in a box.

The third group of answers were those which came from the same superordinate category or set as was implied in the riddle image (i.e. animate), but involved some *change of state* so that the human or animal was made to fit the description in the image, as in these answers:

Image: What has legs but cannot walk? Answers: A person that has a spell put on them.

Image: What has eyes but cannot see? Answers: A dead fish.

Just over one-tenth of the answers in the study were of this nature and were given by children from all age groups. Examples of the changes of state described include the use of magic, the death of the animate entity or the existence of a disabling condition.

The remaining types of answers given in the study were those which were considered to have some degree of validity as conventional riddle answers, as they came from an opposite category to the item implied in the image (inanimate) and were obscured to some extent. However, the requirement of a 'partially obscured semantic fit' was judged to be fulfilled more readily by some of these types of answers than others. Some of the answers given were therefore judged as being more suitable in terms of completing the riddle than others. The fourth overall group of answers were labeled 'replica-type answers' due to the fact that they involved the naming of an object which was considered to be a *representation* of a living thing. These answers were therefore considered to be partially obscured in that they came from the opposite superordinate category to the human or animal implied in the

riddle (i.e. they were inanimate objects). They were also man-made or 'cultural' objects, as opposed to 'natural' objects, according to Köngäs-Maranda's (1974) method of classification. However, they were not considered prototypical examples of inanimate objects as they were generally objects which bore a likeness to a real living creature or part of a living creature (e.g. a teddy bear can be thought of as an inanimate representation of a real bear). These answers accounted for about one-sixth of the responses given by the children and occurred with greatest frequency amongst the 9 and 10-year-olds and included the following:

Image: What has legs but cannot walk? Answer: A doll or a teddy; A gymnastic horse (i.e. a wooden horse used in gymnastics).

Image: What has eyes but cannot see? Answer: Joke glasses (with eyes drawn on them) Cats' eyes on the road

A similar group of answers were those which, although they were not considered to represent a living thing, were considered to be linked very closely to the animate item implied in the riddle image. These answers came from the inanimate category but were not considered to be obscured to a degree sufficient to provide good metaphor in the riddle. For example, the answer, '*trousers*', given for the riddle image, '*What has legs but cannot walk?*' was considered to be partially obscured because the item is inanimate, but was judged to be too closely related to a human leg, as a trouser leg actually fits over a human leg. It was therefore not considered a good example of a metaphorical renaming. Similarly, the answer given by two children to the riddle image, '*What runs but never walks?*' was '*a runner*' (running shoe). Such an answer does not involve a metaphorical renaming, and instead involves the use of a name closely related to the action named in the riddle image. Overall, there were only a few answers in this fifth group and they were given only by the 8- and 9-year-old children in the study.

The sixth and largest group of answers in the study (accounting for just over two-fifths of responses given) were those which were considered to have most validity as answers for each of the riddles. They involved the naming of items which belonged to the inanimate set and which could also be considered to involve good examples of metaphor. These answers involved the use of meta-

phor of two kinds. Firstly, the 8- and 9-year-olds gave answers which were characteristic of 'radical polysemy'. Such answers involved the creative metaphorical renamings of an object or an action by the children, based on some type of similarity which they had noticed. This is illustrated in the following examples:

Image: What has teeth but no mouth? Answers: A piano; A needle (one tooth).

Image: What goes around all day with its tongue sticking out and sits by your bed at night? Answers: (The safety sticker on) a lamp; Your tie.

The remaining answers involved the use of 'conventional polysemy' as they were metaphorical terms which are already present in the language (e.g. the 'eye' of a needle, the 'running' of an engine). Almost a third of the answers given in the study were of this type and their use was most common amongst the wand 11-year-olds. The two meanings of terms involving conventional polysemy are intuitively thought of by native speakers as being related. It was this type of metaphor which was in use in the original 'target' answers for the riddles, such as the 'leg' of a table or the 'howling' of the wind. These answers therefore tended also to involve more prototypical examples of inanimate objects than the other types of answers which were given (such as the 'repilca-type answers'). These answers included the following:

Image: What has teeth but no mouth? Answers: A trap; A saw.

Image: What has eyes but cannot see? Answers: A needle; A pin (meaning 'a needle').

Image: What runs but never walks? Answers: Your nose; A car engine; A tape recorder.

The children as a group were judged to be more successful in providing answers which fulfilled the condition of a 'partially obscured semantic fit' for the first four of the six riddles based on sensory similarity. The contrast involved in the target answers for Riddles 1-4 was that between an animate entity and an inanimate one, but more specifically between a human being and a cultural object. This contrast was made in a number of the answers which

were suggested by the children. However, the contrast involved in Riddles 5 and 6 (when the original answers are used) was that between an animate entity (human or animal) and a natural object (i.e. water, the wind). The answers which the children suggested, although valid in that they were from the inanimate set, all belonged to the set of *cultural* objects, such as the following answers:

Image: What runs but never walks? Answers: A car engine; A tape recorder.

Image: What can howl but has no mouth? Answers: A radio; The alarm system (burglar alarm); A hairdryer; An alarm clock; The brakes on a car.

The set of natural objects did not feature in any of the answers given by the children in the study.

Summary: Ability to Answer True Riddles

Overall, the children's accuracy in giving 'target' or canonical answers increased with age. The only exception to this pattern was amongst the 9-year-old children who gave less target answers than the 8-year-olds. Children aged 8 and 9 years were also the most likely to give a response other than the target answer. The 9-year-olds also gave the most alternative answers of any of the groups. The 11-year-olds were the group least likely to give a 'don't know' response and most likely to give the target response.

The riddle answers classified as 'alternative' answers were analysed in terms of their ability to complete the condition known as a 'partially obscured semantic fit' between the riddle image and the answer. Overall, the 10- and 11-year-olds, were more likely to give an answer which was from a category opposite to that of the item implied in the riddle image. The prototypicality of the riddle answer which belonged to an opposite category was also greatest amongst the 10- and 11-year-olds. 'Literal' types of answers were characteristic of children aged 8 years, while 'replica-type' answers occurred with greatest frequency amongst the 9- and 10-year-olds. The answers judged as metaphorical which were given by the 8- and 9-year-olds tended to be more novel than those of the 10- and 11-year-olds, who made use of metaphors already sanctioned in the language.

The patterns which emerged overall in the types of answer given by the children at different age levels are summarised in Table 5 below.

TABLE 5: The types of answers given by the children in each age group to the riddles based on sensory similarity (n = 24).

	8 years	9 years	10 years	11 years
Target Answers	11%	0%	28%	39%
Alternative	47%	53%	22%	30.5%
'Don't Know' Responses	44%	47%	50%	30.5%

3.3 Development of the Ability to Comprehend Metaphoric Riddles

The method used to test for comprehension of metaphoric riddles (i.e. riddle question and answer sequences) consisted of two tasks. The children were firstly posed twelve metaphoric riddle questions and given their answers (Task 1). They were later asked randomly ordered questions based on the riddles which looked for the ground of each metaphor (i.e. the children had to state the type of similarity mentioned in the riddles earlier). This was Task 2. The 'probe' questions were of the form, 'How is X like V?' or 'How could X be like Y?', where the items mentioned were the topic and vehicle involved in the metaphorical comparison. As stated earlier, the use of these questions was based on the assumption that children who had fully understood a metaphoric riddle would later be able to recall the similarities or *ground* which formed the basis for that metaphor. Children who were able to state the grounds of the metaphoric riddles were therefore judged to have understood these riddles.

In examining the results of this task, some developmental patterns emerged. Overall, the number of children judged as being able to recall the grounds of the metaphoric riddles on Task 2 was seen to increase with age. This therefore suggests increased comprehension of metaphors in the context of riddles amongst the older children as compared with the younger ones. The answers which

the children gave on this task were analysed as either being correct (*i. e.* the target response), an alternative response, or a 'don't know' response.

A comparison of the results indicates that the greatest difference in performance between children in consecutive age groups is between the 8- and 9-year-olds. The 8-year-olds were able to recall the grounds of the riddles with 72% accuracy compared with the 80% level of accuracy achieved by the 9-year-olds. However, the 75% level of accuracy achieved by the 10-year-olds was lower than that of the 9-year-old children. The 11-year-olds displayed the greatest level of comprehension and were able to recall the grounds of 83% of the riddles.

The number of 'don't know' responses was found to decrease overall amongst the older children. Whilst just under a fifth of the 8-year-olds gave a 'Don't know' response, only one-tenth of the 11-year-olds gave such a response. However, the number of 'alternative' responses given was greatest amongst the 9- and 10-year-olds. This finding is described in more detail in section 3.3.2.

Summary: Comprehension of Riddles Involving Metaphor

The ability to comprehend the metaphoric similarity involved in the riddles presented was observed overall to increase with age, as judged through the use of a 'probe' task. Only the performance of the 10-year-olds was not in keeping with this pattern. The greatest increase in the ability to comprehend the riddles appeared to occur between the ages of 8 and 9 years. The 11-year-olds achieved the greatest level of accuracy overall in recalling the grounds of the metaphoric riddles. A quantitative summary of the overall patterns of responding on the task probing *for* comprehension is given in Table 6 below.

TABLE 6: Types of response given by children in different age groups on the task testing for comprehension of the metaphoric riddles (n = 24).

	8 years	9 years	10 Years	11 Years
Expected Explanation	72 %	80%	75%	83
Alternative Answer	10%	17%	12.5%	8.3%
'Don't Know' Response	18%	3%	12.5%	8.3%

3.3.1 The Effect of Type of Similarity on the Comprehension of Metaphoric Riddles

The riddles presented to the children were of two types (see Appendix 1). The first six were metaphoric riddles which demanded that the listener view the topic of each metaphor in terms of its vehicle, based on shared *sensory* grounds. The topic and vehicle are linked in these sensory metaphors due to similarities of appearance (e.g. the physical appearance of the leg of a table likened to that of the leg of a person), of sound (an animal's howling likened to the howling of the wind), or of movement (the movement of a person likened to the movement of water). The remaining riddles (7-12) also involved metaphorical uses of language, though the similarities between the topic and vehicle were of a nonsensory nature. The nonsensory metaphors were of either a psychological-physical type (Riddles 7 and 8) or a relational type (Riddles 9-12).

The most striking pattern when comparing the overall performance on the task which probed for comprehension of the riddles (Task 2) was the difference in the children's ability as a group to comprehend sensory as opposed to nonsensory riddles. Examining the results firstly from a quantitative point of view, the children were shown to comprehend the sensory riddles (1-6) with between 75% and 88% accuracy overall (as judged by the use of the probe question task). However, their level of comprehension of the nonsensory metaphors involved in Riddles 7-12 was lower, ranging between 59%-78% overall, as judged by the same task.

A comparison of the performance of each age group on the probe question task indicates firstly that there were no large differences amongst the age groups in their level of comprehension of the riddles involving sensory metaphor. The 8- and 9-year-olds were judged to have comprehended the sensory metaphors with an 86% level of accuracy, and this increased very slightly for the 11-year-olds. The performance of the 10-year-olds on this task (who comprehended 75% of the sensory metaphoric riddles), however, was not in keeping with the performance of the other age groups. Secondly, the correct answers which were given on the probe question task for the sensory riddles were found to be qualitatively very similar across the age groups.

A more noticeable pattern emerged in the abilities of the children to verbalise the similarities involved in the nonsensory metaphors. A comparison of the results from the younger children with those of the older group reveals both quantitative and qualitative differences on this task. The 8-year-olds verbalised the similarities involved in the nonsensory metaphors with a 59% level of accuracy (as measured by the use of the probes on Task 2). This level increased considerably to 75% for both the 9- and 10-year-old children, and was slightly higher for the 11-year-olds, at 78%.

A further pattern emerged in the depth of comprehension of the nonsensory riddles which was indicated by the responses given by the children. Many of the younger children (8- and 9-year-olds) correctly recalled the similarity which was earlier implied in each riddle and were therefore deemed to have understood the metaphor involved. In the case of Riddle 7, for example, the question which probed for comprehension of the nonsensory metaphor was, 'How could a person be a bit like the sun?', to which the accepted answer was 'If they're bright' or 'They could both be bright'. Although it was assumed once they had given the correct answer that the younger children were aware that the terms could be applied in two senses, their explanations (when prompted further) were generally less accurate and less complete than those of the older group (10- and 11-year-olds).

In the case of the riddles involving psychological-physical metaphors (which involved the dual-function adjectives 'bright' and 'hard'), the 8- and 9-year-olds tended to verbalise only the physical sense of the terms in their explanations, as opposed to both senses. Examples of such explanations include the following:

Question: How could a person be a bit like the sun? Child (8 years of age): 'If they were bright'. (Further prompt): 'If someone's bright, their teeth would be all shiny'.

Question: How could a person be a bit like concrete? Child (9 years of age): 'Because they could be hard as well'. (Further prompt): 'Like, cement would be really hard and a hard person can hurt if they bump into you'.

The explanations given by the 10-year-olds more frequently contained reference to both the psychological and physical mean

ings involved in the metaphors than those of the younger children. Only the 11-year-olds who had given the target answer were consistently able to articulate the fact that the terms could be used to refer to both an object (in the literal sense) and a person (in the psychological sense). Responses which were more typical of the older children include the following:

Question: How could a person be a bit like the sun? Child (10 years of age): 'They could be bright '. (Further prompt): 'Well, the sun could be bright because it shines a lot, but a bright person would be really clever and good at their work. And they can kind of shine like that because they're so clever...'

Question: How could a person be a bit like concrete? Child (11 years of age): 'Both of them could be sort of hard'. (Further prompt): 'Something might happen to them and they would take their anger out on other people and stuff.'

The ability to verbalise both senses of the relational metaphors involved in Riddles 9-12 appeared overall to be present slightly earlier in this group of children than the ability to explain the psychological-physical metaphors. The ability to articulate the relationship between both meanings of the relational metaphors was indicated in some of the responses given by the 8- and 9-year-old children. For example, the following responses were given by children in this age group:

Question: How can time be a bit like a bird? Child (8 years of age): 'It can fly and a bird can fly'. (Prompt): 'When time flies it means that it goes really fast '.

Question: How could a person be a bit like a broken up jigsaw? Child (9 years of age): 'A broken up jigsaw falls to pieces and the person could fall to pieces because they're sort of sad and want to do something but they can't do it '.

Children in all the age groups who were unable to verbalise the similarity involved in the relational metaphors tended to give a 'Don't know' response, rather than an incomplete or inaccurate response. By 10- and 11-years-of-age, the children who gave correct responses to the questions probing for comprehension of the

relational metaphors were consistently able to articulate the grounds of these metaphors. The following examples are typical of such explanations:

Question: How could a telephone be a bit like a person who's going to get married soon? Child (10 years of age): 'It could be engaged'. (Prompt): 'If a telephone is engaged it means that it's busy because someone is talking on it when you're trying to ring them'. (Prompt): 'The person who's engaged is busy because they're going to get married to someone soon'.

Question: How could a person be a bit like a sweeping brush? Child (11 years of age): 'Because they could be pushed around'. (Prompt): 'If someone gets pushed around it means that people don't respect them or take any notice of them. And people make a sweeping brush clean up by pushing it around the floor'.

Summary: The Influence of the Type of Similarity on Comprehension

Riddles involving a sensory type of metaphoric similarity were found to be more easily comprehended by children from every age group than those involving nonsensory similarity. The level of comprehension of the sensory riddles was found to vary little with age. The 10-year-olds, however, achieved a lower level of accuracy than the younger children for this type of riddle.

Comprehension of riddles involving a nonsensory type of similarity increased greatly between 8 and 9 years, but varied little beyond that age. The older children in the study (10- and 11-year-olds) indicated a greater depth of comprehension of the nonsensory metaphors, when elaborating on their responses to the probes, than the younger groups. Overall, the ability to verbalise both meanings of the relational type of metaphor was observed to emerge earlier (at 8 or 9 years) than in the case of the psychological-physical type of comparison (at 10 years). The accuracy of each age group in answering the probe questions for the sensory and nonsensory riddles is summarised in Table 7 below.

TABLE 7: Accuracy of each age group in comprehending riddles involving sensory and nonsensory metaphors (as judged by the use of the probe question task) (n = 24).

	Sensory Metaphors	Nonsensory Metaphors
8 years	86%	59%
9 years	86%	75%
10 years	75%	75%
11 years	88%	78%

3.3.2 The Ability of the Children to Remark on Types of Similarity not Implied in the Riddles

The ability to remark on a similarity between two entities might essentially be said to be the ability which is involved in creating a metaphor. The children in the oldest age group tested in this study (the 11-year-olds) were the most likely to verbalise the similarity involved in the riddles which they had heard earlier (for Task 2), which was the desired response on this task. However, in analysing the results it also became apparent that a number of children who were unable to correctly recall this similarity were able to compare the items involved on other grounds which were not implied in the original riddles. A number of these responses were highly thoughtful and creative. Additionally, some of the children who were able to recall the similarity implied earlier in the riddles added to their answers by giving other ways in which the items involved are similar.

The incidence of the 'alternative' responses was greatest amongst the 9- and 10-year-olds in the study. Examples of these responses are given below. A further pattern emerged in the type of responses collected from the children from different age groups. The younger children in the group (8 years of age) were most likely to give creative responses which were based on a sensory similarity between the two items. The sensory similarities which were noted were either physical in nature or were similarities of movement. Responses which were typical of the 8-year-olds include the following:

Question: How is a table a bit like a person? Child (8 years of age): Because they have legs. And the table stands still when the TVs on and so does a person.

Question: How is a potato a bit like a face? Child (8 years of age): 'Because sometimes it has dots somewhere. And supposing the dots got stuck together and another dot went up like a mouth, it would look like a face'.

The creative responses of children aged between 9 and 11 years were more frequently based on a relational type of similarity than any other type of similarity. Such responses remarked upon a similarity between two items in the ways in which they function (as opposed to a purely physical type of similarity). Although the boundary separating relational and psychological-physical metaphors is often vague (Winner, 1988), there appeared to be few examples of psychological-physical metaphors amongst the creative responses. Examples of the responses grounded in a relational type of similarity include the following:

Question: How is a shoe a bit like a mouth? Child (9 years of age): 'Because you put your foot into it. It's like the shoe is kind of eating your foot. But If you take your foot out, it's not kind of slobbery or anything. And you can 'put your foot in it' if you 're talking and you say something you shouldn't say'.

Question: How could a person be a bit like the sun? Child (10 years of age): 'If it 's bright and it gives off rays. You know, like if people are clever they kind of give their information out. And the sun sends affrays. A clever person gives rays of information out to other people, you know?'

Question: How could a person be a bit like a rock? Child (11 years old): 'If they 're tough '. (Prompt): A tough person might have their mind made up about something and it would be really hard to 'get around' them, to get them to change their mind. And if there's a really big rock in the middle of the road or somewhere then it would be really hard to get around that too '.

In analysing the responses it also became clear that individual children were more likely than others to give creative responses.

For example, the following responses were all given by a ten year-old girl:

Question: How is a table a bit like a person? Child: 'They have legs and they make you eat. As soon as you see the table you kind of go, 'Grand, this means food. Just sit down, eat!' And I don't like vegetables or potatoes or anything like that and my Mum makes me eat them'.

Question: How is a shoe a bit like a mouth? Child: 'It has a tongue. And if it's old, it opens too much. You know the way if the shoe is old, the top of it comes apart and it opens. And when you get older you tend to talk a lot more, so your mouth opens more. Like, my granny used to talk a lot... '.

Question: How can the wind be a bit like a wolf? Child: 'It howls. And it can carry things, like frogs or fish. Like sometimes you can have rain with a frog in it because of the way the water evaporates up into the cloud and the frogs could be taken up into the clouds with the fish'.

Summary: Ability to Comment on Similarities not Implied in the Riddles

Children who were unable to recall the target type of similarity in the riddles presented earlier were sometimes able to compare the topic and vehicle based on other grounds. The incidence of these 'alternative' answers was greatest amongst the 9- and 10-year-olds. The creative explanations given by the 8-year-olds were all based on a sensory type of similarity. Children between the ages of 9 and 11 years were more likely to base their creative explanations on a relational type of nonsensory similarity. A couple of instances of explanations based on psychological-physical grounds were also recorded amongst the older children. Overall, some children were more likely than others to make use of a creative type of response rather than a 'Don't Know' response.

3.4 Development of the Use of Riddles

The final task in the study involved the children being asked to tell the researcher any riddles which they knew. The riddles which

were collected were analysed in terms of both their overall structure and the types of 'block element' involved, according to the methods of classification described by McDowell (1979) in his study and by Green and Pepicello (1984). Having been asked to supply the researcher with some riddles, many children supplied a number of jokes also, perhaps viewing the riddles and jokes as being linked through their common property of humour (see Appendix 3). In collecting and analysing the sample of riddles it also became obvious, however, that the boundaries between what constitutes a riddle and a joke are not always well defined. For example, some of the responses which were classified by the researcher as 'jokes' made use of the device known as 'catching' which is a common feature of riddles. It must therefore be borne in mind when examining the results that the division between the concepts of 'joke' and 'riddle' is often an arbitrary one. Whilst the jokes which the children supplied were not analysed in detail, a cursory examination indicates that metaphor was not used as a source of ambiguity in any of the jokes in this sample.

Analysis of Riddle Structure

The riddles which were collected from the children in this study were firstly analysed in terms of their overall structure (according to the types of structure described by McDowell, 1979: 66-68). Three main types of structure featured in the present sample.

Over half the riddles and descriptive routines in this sample were based on attribution, which involves the use of many simple descriptive units, which are described as being 'stacked'. Riddles of this type were most common amongst the 8-year-olds (though half of these were descriptive routines) and the 11-year-olds. Examples of these riddles include the following:

What's got two legs, a medium-sized body and a very, very big tail? A peacock. (Girl, aged 8 years)

What do you call a chimp with a banana in each ear? Anything you like—he can't hear you! (Boy, aged 10 years)

What do you call a cucumber with four doors? A slammer. (Girl, aged 10 years)

Almost a third of the riddles in this study were concerned with causality and usually took the form of a question involving 'Why' and answer beginning with 'Because'. This type of structure was used most by the 8- and 9-year-olds. Examples of this nature included the following:

Why did the egg go around the world? Because he wanted to be an eggs-plorer. (Boy, aged 10 years).

Why did the boy bury his clock? Because the batteries were dead. (Girl, aged 12 years).

Riddles based on instrumentality did not feature in the sample collected in this current study. The two other riddle structures which McDowell (1979) describes, take the form, 'What did the X say to the Y?' and 'What kind of X is a P'. Only the former construction featured in the present sample of riddles, whereby inanimate objects appear to be engaged in imaginary conversations and the two possible meanings of a well-known figure of speech are exploited. This structure was used in approximately a quarter of the riddles in the current study and its use decreased steadily amongst the older children. Typical examples include the following:

What did the big biscuit say to the little biscuit? 'Crumbs'. (Girl, aged 8 years).

What did the skeleton say to the toilet? 'You can't get anything out of me'. (Boy, aged 8 years).

Analysis of Types of Riddling Device Used

The content of the riddles was analysed according to the types of block element or other riddling device which were used to provide ambiguity or confusion, using the descriptions of riddling devices given by Green and Pepicello (1984) and McDowell (1979). The riddles were each assigned to what was judged to be the most appropriate category in each case, although in reality some of the riddles could be classified as belonging to more than one category.

There were firstly some examples of descriptive routines given by an 8-year-old girl which, by definition, do not contain a block element and involve the description of one or more attributes of an object. The routines which this child supplied were as follows:

What's big and has a very big appetite? An elephant.

What can you get that can be different colours and very soft? A cushion.

What's got two legs, a medium-sized body and a very, very big tail? A peacock.

What's green and brown and has different colours all over it? A Christmas tree.

The rest of the riddles can be classified as 'riddles proper' as they all employed some type of device which was intended to cause confusion on the part of the riddlee. Riddles involving block elements of both a grammatical and a metaphorical variety were collected in the study. Of the grammatically-based riddles collected from the children in this study, only riddles which made use of phonological and morphological types of ambiguity were recorded. Phonological ambiguity was the device used in a quarter of the riddles collected in the study and simple lexical ambiguity was the device used more often than any other by the children. Included here were words which involved homophony in that they made use of a single phonetic string which had two unrelated meanings. Riddles such as, '*What did the big chimney say to the little chimney? (You're too young to be smoking) ' or 'Why did the tortoise cross the road? (He wanted to get to the Shell station) ' made use of two possible interpretations of a single word. The use of this type of ambiguity increased up to 10 years, but decreased sharply amongst the 11-year-olds. The second type of single-word homophony was that of conventional polysemy, in which the two meanings of the word are thought of as being related. This will be described along with the riddles involving the use of metaphor. Also at the phonological level, there was just one example (given by a 8-year-old girl) of the use of ambiguity involving minimal pairs ('paws' and 'Claus'), in the riddle: '*Why does a lion like**

Christmas? Because of his sandy paws (Santa Claus) '. No other types of phonological ambiguity were featured in this sample of riddles.

Ambiguity at the morphological level accounted for about one-tenth of the riddles collected and was only used by the 9- and 10-year-olds in the study. The riddles involving morphological ambiguity were of three kinds. Firstly, the riddle given by a 10-year-old girl, *'What's black and white and read/red all over? (A newspaper) ' involves the use of homophony between the past participle morpheme of the verb 'to read' and the colour adjective 'red'. Secondly, the riddle 'Why did the egg go all around the world? (Because he wanted to be an eggs-plorer) ' involves the deliberate confusion of the word 'egg' with the bound morpheme 'ex-'. Thirdly, the 'pseudomorphological' type of ambiguity was also featured in the riddles, whereby an actual word is deliberately confused with part of another word (though not a morpheme). This type of ambiguity is involved in the riddle, *'What did the hat say to the scarf? (You stay here and hang around and I'll go on a head)',* Here, the word 'head' is deliberately confused with the phonological sequence 'head' in the word 'ahead'. This second phonological string cannot be described as a morpheme, as it is not used as a unit which gives meaning in any other word.*

About a fifth of the riddles collected were metaphorically-based and these mainly involved the use of conventional polysemy (i.e., metaphors already sanctioned in the language). Children from all of the age groups made use of this type of ambiguity in their riddles, although its use increased amongst the 10-year-olds and then decreased amongst the 11-year-olds. Examples of riddles which might be described as involving conventional polysemy include the following:

Why did the chicken cross the road? To show he had guts. (Girl, 10 years).

Why did the burglar buy a surfboard? Because he wanted to stay on the criminal wave. (Boy, 10 years)

Why did the boy bury his clock? Because the batteries were dead. (Girl, 11 years).

Only a couple of instances of metaphorically-based riddles involving 'radical' or novel polsemy were recorded. One 8-year-old girl supplied a riddle which involves comparison (between an egg and a tennis ball) This riddle involved partial obscuring of the answer, but would be very difficult for the riddlee to guess, based on everyday knowledge of the world:

*What s round and yellow,
Laid in a nest
But won't hatch like the rest?
A tennis ball.*

A version of the classic example of the use of metaphor in riddling, the Riddle of the Sphinx, was supplied by one 9-year-old boy:

*What has four legs in the morning, two legs at midday and in the evening has three legs?
Answer: 'It's the three stages of man. He crawls in the morning, then walks and then gets a walking stick '.*

Whilst the expectation set up in the riddle image is that some type of mythical creature is being described, the metaphor in fact involves a comparison with the life stages of a human being.

A feature which appeared almost exclusively in the riddles of the oldest children in the study (the 11-year-olds) was the use of anomaly. An early example of a riddle which might be said to involve anomaly, in the form of a contradiction based on knowledge of the world, was the following 'puzzle', given by an 8-year-old boy:

Greek Riddle: This Greek king came into his castle and these people came along and tried to take him. But before they could take him, he took poison.

Why did they still take him?

Answer: Greek kings take small bits of poison all the time so that if they have to take poison it won't harm them. And that's why they still took him—because he was still alive.

More typical examples of the use of anomaly in riddling were given by the 11-year-olds:

What gets bigger the more you take out of it? A hole.

What gets wetter the more it dries? A towel. Girl, 11 years of age)

Riddle: What's as green as grass, as red as a rose, white as snow, black as coal?

Answer: A blackberry. When it's not ripe it's green. It flowers white. When it's not quite right it's red and when it's ripe it turns black. (Boy, 11 years)

The 11-year-olds in the present study also provided a few riddles which involved the generation of 'unnatural facts'. The answers to these riddles usually involved the naming of imaginary creatures whose features were a combination of real life attributes and imaginary ones. Riddles of this nature included the following:

What do you call a fly without wings? A walk. (Boy, aged 11 years)

What has sixteen wheels and pink spots? An elephant with the measles on rollerblades. (Girl, aged 12 years)

The riddling device known as 'catching' was also employed most often by the 11-year-olds in this study. A characteristic of catch riddles is that the riddle question appears to be a conundrum and the riddlee is tricked into thinking that an ingenious answer is required (Opie and Opie, 1959). The answer, however, does not involve any type of play on words and is instead a plain fact, stated in a very ordinary manner. It is for this reason that these riddles can be described as 'victimising' the riddlee (McDowell, 1979), as illustrated in these examples from the current study:

What's pink and fluffy? Pink fluff

Why did the tortoise cross the road? He wanted to get to the Shell station. (Boy, aged 10 years)

Why did the turkey cross the road? It was the chicken's day off. (Girl, aged 11 years)

Summary: Children's Use of Riddles

The riddles in this sample involved three main types of construction. Over half the riddles collected made use of a structure based on attribution. Almost a third of the riddles were concerned with causality and took the form of a 'Why?/ Because' question and answer sequence. The remaining riddles (just over a quarter of the sample) involved the use of the structure, 'What did the X say to the Y?', whereby inanimate objects are featured in imaginary conversational situations, and the two meanings of the a well known figure of speech are exploited. A quantitative summary of the types of riddle construction used by children from each of the age groups is shown in Table 8.

A number of types of riddling device were used in this sample to provide ambiguity or confusion. A few examples of the 'descriptive routine' which does not contain a block element were given by an 8-year-old girl in the study. Simple lexical ambiguity was the most commonly used source of ambiguity in the sample, followed by the use of metaphor known as conventional polysemy.

The younger children were more likely to use novel metaphors than the older group. The use of metaphoric terms already in existence in the language (conventional polysemy) was favoured by the 8- and 10-year-olds in the study. The 10-year-olds made more use of metariddles than any other age group. The use of phonological ambiguity and conventional polysemy decreased at 11 years of age, to be replaced by the use of riddles involving anomaly and the use of 'catch riddles'. A quantitative summary of the types of riddling device favoured by the children in different age groups is given in Table 9 below.

TABLE 8: The types of riddle structure used by children from each age group (n = 24).

	8 years	9 years	10 Years	11 Years
Attribution	9	3	5	11
Causality	4	5	3	1
'What did the X say to the Y?'	3	2	2	1

TABLE 9: The numbers of riddles involving each type of riddling device used by children from different age groups (n =24).

	8 years	9 years	10 years	11 years
Descriptive Routine	4	0	0	0
Phonological Ambiguity	3	4	5	1
Morphological Ambiguity	0	2	2	0
Radical Polysemy		1	0	0
Conventional Polysemy	3	1	4	1
Catch Riddles	1	0	1	4
Metariddles	1	1	4	2
Anomaly / Use of unnatural facts	1	0	0	6

3.5 A Comparison of the Performances of Boys and Girls in the Study

The performance of the boys and girls on each of the three tasks used in the study was compared in both quantitative and qualitative terms. Whilst the overall performance of the two groups was found to be similar at every age level, there were some areas where slight differences were noted.

(1) Answering Metaphoric Riddles

The types of answer given by the girls and boys to the 'true' riddles (1-6) were firstly compared using a quantitative type of analysis. As described earlier, the three types of answer which were given on this task were the 'target' answer (the answer which the tester had in mind), an 'alternative' answer or a 'Don't know' type of response. When the overall accuracy of the two groups of children in answering the riddles was compared, it was observed that the girls were slightly more accurate than the boys in providing the target answer. The girls gave the target answer for 22% of the riddles, compared with 17% for the boys. The boys were more likely overall to give an 'alternative' type of answer than the girls.

The types of answer given by the two groups of children within each age group were also examined. Whilst in the 8 and 11 year age groups, the girls were found to have given more target answers than the boys, the 9- and 10-year-old girls and boys were found to have performed equally well. The 8-, 9- and 11-year-old boys gave approximately 15% more 'alternative' answers than the girls in these age groups, though this pattern was reversed amongst the 10-year-olds.

Secondly, a qualitative type of analysis was used to compare the validity of the 'alternative' types of answer given by the boys and girls. The answers were examined in terms of their ability to complete the condition of a 'partially obscured semantic fit' between the riddle image and the answer. As described earlier, six different types of answer were identified from the overall sample of alternative answers. Answers which were labelled 'anomalies' and 'literal answers' were given with equal frequency by the boys and the girls. These were answers which were not considered to complete the riddles, as they usually belonged to the same superordinate semantic category as the item implied in the riddle image. A similar group of answers was those which involved a 'change of state' so that the human or animal in the answer was made to fit the description in the riddle image. These were found to be used more often by the boys than the girls. The girls, however, were found to have given more 'replica-type' answers overall than the boys.

Of the answers which were judged as completing the riddles (i.e. those involving metaphor), more answers based on a novel type of metaphorical similarity were used by the girls than the boys. However, the boys were found to have given a third more answers which were judged as completing the riddles than the girls. They also gave twice as many answers which were based on conventional polysemy as the girls.

(2) Comprehension of the Metaphoric Riddles

The performance of the boys and girls on the task which probed for comprehension of the riddles was also compared. Whilst the performance of both groups differed slightly at each age level, no obvious developmental trends were apparent. The accuracy of the boys in the 8 and 9 year age groups in recalling the grounds of each riddle, for example, was slightly better than that of the girls. The opposite was the case, however, amongst the 10- and 11-yearolds.

Only at the age of 10 years was there a large discrepancy in the performance of the two groups, where the girls comprehended the grounds of 81 % of the riddles compared with the level of accuracy of 69% obtained by the boys. The latter score, however, is not in keeping with the overall trend of improved comprehension with increasing age which was displayed by the other age groups. The proportion of 'alternative responses' given by boys and girls on the probe task was also found to be similar overall. The only exception to this finding was amongst the 8-year-olds, where the girls were far more likely than the boys to compare the items in the probe question on grounds other than those in the original metaphor.

The children's comprehension of the riddles was also examined in terms of the effect of the type of metaphoric similarity (i.e. sensory or nonsensory) on comprehension. With the exception of one age group, both the girls and the boys were found to have greater comprehension of the riddles grounded in sensory similarity than the nonsensory riddles. Only the 10-year-old boys showed greater comprehension of the nonsensory than the sensory metaphors, though their level of comprehension of both types of riddle was again not in keeping with the overall pattern shown by the other groups.

A qualitative comparison of the girls' and boys' explanations of the grounds of the nonsensory metaphors was also used. The pattern of increasing depth of comprehension of the nonsensory metaphors with age was found to be similar for both groups of children. The ability to verbalise both meanings of the relational types of metaphor was found to emerge at 8 or 9 years amongst the boys and the girls. Similarly, the ability to explain the grounds of the psychological-physical types of metaphor emerged slightly later overall in both groups.

A qualitative examination of the 'alternative responses' supplied by the children showed similar patterns overall in the types of creative comparisons used by the boys and the girls at each age. Whilst the comparisons based on sensory grounds were characteristic of the younger children, the older groups tended to use relational comparisons, as described earlier. Neither group used psychological-physical types of comparison in their creative responses. These patterns were generally consistent for both boys and girls.

(3) Use of Riddles

Due to the small size of the sample of riddles collected from the children, the riddles were grouped in four ways for the purposes of comparison of the patterns of use of the boys with those of the girls. The riddles were categorised according to the type of riddling device involved in each case. The four overall categories of riddle were those based on grammatical ambiguity, riddles involving metaphor, catch riddles and metariddles, and lastly, riddles involving anomaly or the use of unnatural facts.

The first finding was that overall the boys contributed a greater number of 'riddles proper' than the girls. Whilst twenty-six of the riddles in the sample were collected from the boys, the girls contributed twenty-one riddles. However, an additional four 'descriptive routines' were contributed by one of the 8-year-old girls in the sample. Secondly, the boys were found to have used twice as many riddles involving grammatical ambiguity as the girls. Whilst the girls were most likely to use this type of riddle at the age of 8 years, its use was favoured by the boys at the ages of 9 and 10 years.

There was little difference, however, between the boys and girls in their use of the other riddling devices. Whilst the boys were found to have used marginally more metaphoric riddles than the girls in the study, the girls made slightly more use of catch riddles, metariddles and riddles involving anomaly. Both boys and girls used more riddles involving conventional polysemy as a block element than radical polysemy. The use of catch riddles, metariddles and riddles involving anomaly was also favoured by the older children in both groups.

Summary: A Comparison of the Performance of Boys and Girls in the Study

The performance of the girls and boys on each of the three tasks in the study was compared in both quantitative and qualitative terms.

(1) Summary: Answering Metaphoric Riddles

The types of answer given by the girls and boys to the 'true' riddles (1-6) were firstly compared from a quantitative perspective. Whilst the girls were found to have given slightly more target answers overall, the boys were more likely to give an 'alternative' type of answer. Secondly, the answers were compared in terms of their ability to satisfy the condition of a partially obscured semantic fit with the riddle image. Overall, the boys gave more answers judged as completing the riddles than the girls, and they also used twice as many answers based on conventional polysemy. The girls were more likely to base their answers on a novel type of metaphorical similarity. The types of riddle answer given by the girls and boys are compared in Tables 10 and 11 below:

TABLE 10: An overall comparison of the types of riddle answer given by boys and girls in the study (n=24).

	Target Answers	Alternative Answers	'Don't Know' Responses
Girls	22%	33%	45%
Boys	17%	43%	40%

TABLE 11: A comparison of the types of answers given by the girls and boys in the study to the riddles based on sensory similarity (n = 24).

	8 Years		9 Years		10 Years		11 Years	
	girls	boys	girl	boys	girls	boys	girls	boys
Target								
Answers	17%	5%	0%	0%	28%	28%	44%	33%
Alternative								
Answers	39%	55%	44%	61%	28%	17%	22%	39%
'Don't Know' Responses								
	44%	39%	66%	39%	44%	55%	34%	28%

(2) Summary: Comprehension of Riddles (Boys and Girls)

The performance of the boys and the girls on the task which probed for comprehension of the metaphoric riddles was firstly compared in quantitative terms. Whilst the level of accuracy obtained by both groups differed slightly at each age level, no obvious developmental trends were apparent. The only age at which there was a large difference in the performance of the two groups was at 10 years, where the level of accuracy obtained by the boys was much lower than that of the girls. With the exception of the 10-year-old group just mentioned, both the girls and boys were found to have greater comprehension of the riddles grounded in sensory, rather than non sensory similarity at each age level.

A qualitative comparison of the children's explanations of the nonsensory metaphors found that the pattern of increasing depth of comprehension with age was similar for both groups. The ability to verbalise the grounds of the relational and psychological-physical metaphors was in general found to emerge at the same ages for both boys and girls. The proportion of 'alternative responses' given by boys and girls on the probe task was also found to be similar overall. Comparisons based on shared sensory features were in general typical of the younger children in each group, whilst relational metaphors were used from the age of 9 years. A quantitative comparison of the types of response given on the probe task by the girls and boys at each age level is given in Table 12.

The influence of the type of metaphoric similarity on the level of accuracy of the two groups is summarised in Table 13.

TABLE 12: The types of response given by boys and girls in different age groups on the task testing for comprehension of the metaphoric riddles (n = 24).

	8 Years girls boys		9 Years girl boys		10 Years girls boys		11 Years girls boys	
Target Answers	69.5	75%	78%	83.5%	81%	69.5%	86%	80.5%
Alternative Answers	19.2%	0%	19.5%	14%	11%	14%	8.5%	8.5%
'Don't Know' Responses	11.3%	25%	2.5%	2.5%	8%	16.5%	5.5%	11%

TABLE 13: Accuracy of boys and girls in comprehending riddles involving sensory and nonsensory metaphor (as judged by the use of the probe question task) (n = 24).

	8 years girls boys		9 years girls boys		10 years girls boy		11 years girls boys	
Sensory Similarity	89%	83%	83%	89%	84%	67%	94%	83%
Nonsensory Similarity	83%	89%	83%	89%	84%	67%	94%	83%

(3) Summary: Use of Riddles (Boys and Girls)

The boys were found to have contributed a greater number of 'riddles proper' overall than the girls. They were also found to have used twice as many grammatically-based riddles as the girls in the study. There was little difference between the boys and girls in their use of the other riddling devices. Both boys and girls used more riddles involving conventional polysemy as a block element than radical polysemy. The use of catch riddles, metariddles and

riddles involving anomaly was also favoured by the older children in both groups. A quantitative sununary of the types of riddling device used by the boys and girls in each age group is given in Table 14 below.

TABLE 14: The numbers of riddles involving each type of riddling device used by girls and boys from each age group (n = 24).

	8 years		9 years		10 years		11 years	
	girls	boys	girls	boys	girls	boys	girls	boys
Grammatically- Based	2	1	1	5	1	5	1	0
Metaphorically- Based	3	1	0	2	2	2	0	1
Catches/ Metariddles	1	1	0	1	3	1	3	3
Anomaly/ Unnatural Facts	0	1	0	0	0	0	2	4

DISCUSSION

4.1 Introduction

This study sought to explore the development of riddle use and comprehension in Irish school-aged children. This involved the examination of:

- a) the types of answer which children from different age groups gave to the metaphoric riddles
- b) the type of response given by children from different age groups to a task probing for comprehension of metaphoric riddles

c) the effect of the type of metaphoric similarity on comprehension of these riddles

d) the types of riddle which were contributed by children from different age groups.

The following four questions had been posed by the researcher:

1. Are there developmental patterns in the types of answer which children give to metaphoric riddle questions?
2. Does comprehension of metaphoric riddles improve with age?
3. Do children use certain types of riddles before they use others?
4. Are there differences in the developmental patterns displayed by boys and girls on these tasks?

Each of these questions will be examined in terms of the results which were obtained in this study. The overall conclusions which may be drawn from these results will then be outlined. Finally, the limitations of the study will be set out and suggestions for further research will be made.

4.2 Is There a Developmental Pattern in the Types of Riddle Answers Used by Children?

The approach of children to the answering of true riddles is an area which, up to this point, has not been investigated by researchers. However, the results of the current study would suggest that the tendency of providing canonical answers to such riddles is present in some children from the age of 8 years. Furthermore, it appears that this tendency continues to become more marked between the ages of 8 and 11 years.

The first finding of note in this study was that the tendency to give answers which are typical of those found in riddle books increased with age. Secondly, the creative answers which were offered by the older children in the study were found to be more

canonical than those offered by the younger groups. Both findings would suggest that children's awareness of the conventional requirements of the riddling form gradually increases with age.

As stated above, it was found in the current study that the tendency of children to give a canonical riddle answer seems to increase overall with age. However, the 9-year-olds in the study were an exception to this overall pattern. Whilst a small proportion of the 8-year-olds provided the answer which the tester had in mind, none of the answers given by the 9-year-olds were of this nature. A possible explanation for this finding is the small size of the sample of children used in the study (six in each age group). The abilities of the six particular children in this group may not be representative of the children in their age group in general.

The high proportion of 'alternative' answers given by children in every age group provides support for the notion put forward by Kaivola-Bregenhøj (1996) that riddles are solved through a process of 'creative guessing'. The qualitative examination of this type of answer suggests that children's awareness of the conventional requirement of a partially obscured semantic fit between the riddle image and answer seems to increase with age. The riddle answers which were judged as fulfilling this condition were seen as satisfying three criteria. They were firstly members of a semantic category opposite to that of the item implied in the image, they secondly shared some minor characteristics with the item in the riddle image, and they were thirdly prototypical members of the category to which they belonged.

The results of this study suggest that there may be a developmental sequence in which children develop awareness of the conventional need to fulfill each of these criteria. The 'anomaly' answers which were used by the younger children in the study, for example, were found to fulfill none of the criteria necessary for a partial obscurity of semantic fit. These answers generally belonged to the same semantic category or 'set' as the item in the riddle image. They tended not to be prototypical members of that category and were found not to fit the description given in the image, even in a literal sense (e.g. *'What can howl but has no mouth? A frog'*). However, in each case the children had created an explanation to make the answer fit the description in the image. This suggests an emerging awareness of the need for the riddle image to have features in common with its answer.

The 'literal' answers given in the study were found to fulfill the criteria of having features in common with the item implied in the riddle image. This type of answer was mainly used by the 8 and 9-year-olds in the study, with some instances amongst the older children. Such answers do not involve the use of metaphor, however, as they belong to the same semantic category as the item implied in the image (i.e. animate). About half the answers given could not be considered prototypical members of this category (e.g. 'tadpoles', 'a bat'). Awareness of the need for the riddle answer to have features in common with the riddle image would therefore appear to be the first of the three riddle-answering skills to emerge.

A similar group of answers were those which fitted the riddle image literally but which involved a 'change of state' (e.g. death, the use of magic) so that the animate entity was made to fit the description in the image. Examples of this type of answer were found in all age groups. The use of such a 'change of state' might indicate an emerging awareness that riddle answers are generally obscured from the sight of the riddlee in some way and that the use of logic might be necessary in order to solve the riddle. However, these answers did not fulfill two of the criteria necessary for riddle answers. They belonged to the same category as the item implied in the image and were not prototypical members of this category due to the special conditions displayed by each of the members (e.g. 'a *blind man*').

The group of 'replica-type' answers which were given by the 9- and 10-year-olds, in the study were found to fulfill two of the three criteria necessary for a partial obscurity of semantic fit. These answers belonged to the inanimate category and had characteristics in common with the item implied in the riddle image. The fact that these answers were typically used by a slightly older group of children, suggests that the awareness of the need to give an answer which is from an opposite semantic category might be the second of the three riddle-answering skills to emerge. The 'replica-type' answers were not judged as being metaphorical, however, as they shared too many characteristics with the item in the riddle image. The answers therefore tended not be prototypical members of the inanimate category. Aitchison (1994: 150) points out that although the items compared in a good metaphor must

have some characteristics in common, 'the items must not be too similar because the metaphor will be incomprehensible'.

The answers which were judged as having the most validity as canonical riddle answers were those which involved the use of metaphor and also fulfilled the three criteria outlined earlier. Whilst some metaphorical answers were given by the younger children in the group, these tended to involve the use of 'radical polysemy'. These answers therefore involved the use of a novel metaphorical similarity which an individual child had noticed. Some of these answers were not considered to be prototypical members of the inanimate category (e.g. *'The safety sticker on a lamp'*) and would be very difficult for a riddlee to guess. The metaphorical answers which were most typical of the 10- and 11-year-olds were those involving conventional polysemy. These metaphorical answers were considered to be prototypical members of the inanimate category, as they involved comparisons which are already sanctioned in the language. It would appear from these responses that the awareness of the need to give a prototypical riddle answer might be the last of the three conventional riddle-answering skills to develop.

The overall findings of this study would suggest that the awareness of the conventional requirement of satisfying the condition of a partially obscured semantic fit may emerge in three general developmental stages. Whilst there was some individual variation in this pattern amongst the children in this study, an overall developmental sequence was observed. The tendency of giving an answer which has characteristics in common with the item in the riddle image was found to be present in children aged 8 and 9 years. Whilst the tendency of giving an answer from the opposite semantic category was displayed by a few of the younger children, this feature typically emerged at 9 or 10 years of age. The tendency of giving an answer which satisfied all three answering conditions, was most frequently observed amongst the 10- and 11-year-olds in this study. This would suggest that, in general, the tendency of generating creative answers which satisfy the requirement of a partial obscurity of semantic fit emerges between the ages of 10 and 11 years.

4.3 Does Comprehension of Metaphoric Riddles Improve with Age?

Whilst no other study has specifically examined children's comprehension of metaphoric riddles, the development of comprehension of grammatically-based riddles and the development of metaphor comprehension are both areas which have been investigated by researchers. The studies of children's riddle comprehension have produced conflicting findings. While Prentice and Fathman (1975) and Shultz (1974) reported a steady improvement in riddle comprehension with age, Fowles and Glanz (1977) found no such relationship. There is much evidence in the literature, however, to suggest that the comprehension of metaphors improves with age (e.g. Asch and Nerlove, 1960, cited in Billow, 1977; Gentner and Stuart, 1983, cited in Winner, 1988; Pollio and Pickens, 1980; Pollio and Pollio, 1979; Winner, Rosenthal and Gardner, 1976).

The results of the present study suggest that there is an overall improvement in the comprehension of metaphoric riddles between the ages of 8 and 11 years. The greatest increase in the level of comprehension occurred between the ages of 8 and 9 years. The performance of the 10-year-olds in this study, however, was found to be poorer than that of the 9-year-olds. Fowles and Glanz (1974) reported a similar irregularity in the developmental patterns of riddle comprehension displayed by the children in their study. They concluded from their results that riddle comprehension was not related to age, but to reading ability. The children in their study who displayed superior riddle comprehension were found to be those who were also rated as successful readers by their teachers. They state that the ability to attend to the surface properties of the language, rather than focusing solely on the literal interpretation of the words, is one which is necessary for riddle comprehension and is also essential to reading. Unlike the riddles used in this study, the riddles used by Fowles and Glanz (1977) were mainly grammatically-based. The ability to extract nonliteral meaning is none the less necessary for comprehension of both types of riddle. Had an assessment of reading ability been used with the children in the current study, it might have been possible to establish whether such a link between metaphoric riddle comprehension and reading ability, rather than age, was in existence.

The overall pattern of improved comprehension with increasing age, which was displayed by the other groups in the current study, would suggest, however, that the performance of the group of 10-year-olds in this study may not have been representative of that children from this age group in general. Had a larger sample of children been included in the study, a more even developmental pattern of improving comprehension might have emerged. Such a pattern of development was reported in the studies by Prentice and Fathman (1975) and Shultz (1974).

The Language Experience Hypothesis

The finding of this study that even 8-year-old children displayed comprehension of metaphoric language contradicts the cognitive prerequisite hypothesis put forward by Piaget (1926, cited in Kamhi and Friemoth Lee, 1988). According to this hypothesis, the attainment of the stage of formal operational thought is a prerequisite for comprehension of figurative forms of language.

Whilst no assessment of cognitive abilities was administered to the children in this study, the formal operational stage typically does not begin until the age of twelve years. It might therefore be fair to assume that the younger children in this study would not yet have attained this cognitive stage of development. This overall finding that metaphor comprehension emerges prior to the formal operational stage of thinking concurs with those of Billow (1975), Cometa and Eson (1978) and Smith (1976).

The results of this study provide some support, however, for the language experience hypothesis proposed by Ortony, Turner and Larson-Shapiro (1985). According to this theory, children's comprehension of figurative language develops gradually through meaningful exposure to such language. As they grow older, children have more exposure to metaphoric language and more opportunity to test out their understanding. The depth of comprehension of metaphors would therefore be expected to increase with age. Such a pattern of development was noticed amongst the children in this study between the ages of 8 and 11 years. A number of researchers have noted this pattern of an increasing level of metaphor comprehension as children grow older (Asch and Nerlove, 1960, cited in Billow, 1977; Gentner and Stuart, 1983,

cited in Winner, 1988; Pollio and Pickens, 1980; Pollio and Pollio, 1979; Winner, Rosenthal and Gardner, 1976).

4.3.1 The Effect of the Type of Similarity

There is some controversy in the literature regarding the effect of the type of metaphoric similarity on comprehension. A number of researchers have found that metaphors grounded in non sensory similarity are more difficult for children to comprehend than those based solely on sensory characteristics (e.g. Gentner and Stuart, 1983, Mendelsohn, Gardner and Winner, 1981 and Shantiris, 1983, all cited in Winner, 1988). A small number of studies have reported no difference in the ease of understanding of such metaphors (Kogan, Connor, Gross and Fava, 1980, cited in Winner, 1988; Nippold, Leonard and Kail, 1984). No studies to date have formally compared children's level of comprehension of riddles involving the two main types of metaphoric similarity. However, Fowles and Glanz (1974) found that riddles involving metaphorical language were more difficult for children to comprehend than those involving ambiguous, concrete terms.

The results of the current study suggest that the type of similarity on which a metaphor is based can have an effect on children's level of comprehension. The children in this study were found overall to have a greater level of understanding of riddles based on a sensory type of metaphoric similarity than those involving a nonsensory metaphoric comparison. The quantitative results of the study suggest that the difference in the level of the comprehension of the two types of metaphor was greatest at the age of 8 years. The overall level of understanding of the sensory metaphors was found to increase only slightly between 8 and 11 years. However, comprehension of the nonsensory metaphors was found to increase greatly overall between these ages, with the greatest increase in the level of comprehension occurring between the ages of 8 and 9 years. The level of comprehension of the sensory metaphors which was displayed by the 10-year-olds in the group is not in keeping with the overall developmental trend in this study. As suggested earlier, the small size of the overall sample of children included in the study might have contributed to this irregularity in the overall developmental pattern.

The findings of this study concur with those of the studies cited by Winner (1988) that the comprehension of nonsensory metaphors poses more difficulty for children of all ages than the comprehension of sensory metaphors (Gentner and Stuart, 1983; Mendelsohn, Gardner and Winner, 1981; Shantiris 1983, all cited in Winner, 1988). The qualitative analysis of the children's performance on the explanation task also suggests some developmental differences in the comprehension of the two types of nonsensory metaphor used in this study. Whilst some of the younger children in the study were able to explain the grounds of the relational metaphors, the ability to explain both senses of the psychological-physical metaphors did not appear to emerge until the age of 10 years. A similar type of trend was reported by Shantiris (1983, cited in Winner, 1988), who found that psychological-physical metaphors were more difficult for children of all ages to comprehend than those grounded in a relational type of similarity.

The finding that younger children tend to interpret psychological-physical metaphors in a literal sense has been reported by Asch and Nerlove (1960, cited in Billow, 1977) and Winner, Rosenthal and Gardner (1976). The explanations of the grounds of the psychological-physical metaphors which were given by the younger children in this study also involved a 'literal' type of interpretation. Only the explanations given by the 10- and 11-yearolds in this study consistently contained reference to both the psychological and physical senses of the terms. Children aged 8 and 9 years tended to verbalise only the physical sense of terms such as 'bright' or 'hard' in their explanations. However, the same children had often responded appropriately to the 'probe' task, where they simply had to recall the grounds of the riddles presented earlier. This task frequently required only a single-word answer. This overall finding is consistent with that of Asch and Nerlove (1960, cited in Billow, 1977) who reported that children between the ages of 7 and 10 years are aware that dual-function terms can be applied in a psychological sense to people. The ability to explain both senses of the dual-function terms was also found to be consistent only after the age of 10 years in their study. Winner, Rosenthal and Gardner (1976) however, report that almost a third of the 8year-olds in their study were able to explain the psychological meaning such terms.

Measurement of Comprehension

The difference in the performance of the younger children on the 'probe' and 'explanation' tasks in the current study provides support for the view that explanation tasks can under-estimate children's level of metaphor comprehension. A number of the 8 and 9-year-olds were able to recall the appropriate grounds of the nonsensory metaphors when a single-word response was required, yet their explanations of the same metaphors frequently indicated only a 'literal' type of understanding. Theorists such as Vosniadou (1987) have criticised the use of explanation tasks due to the significant metalinguistic demands involved in verbalising the grounds of a metaphor. The results of the studies which have compared children's performance on multiple-choice and explanation tasks suggest that the ability to comprehend metaphors develops prior to the ability to fully explain them (Gardner, 1974; Winner, Rosenthal and Gardner, 1976; Pollio and Pickens). It is therefore likely that the children in this study had a greater level understanding of metaphors at every age than their performance on the explanation task would suggest.

Sources of Difficulty with Nonsensory Metaphor Comprehension

The finding that younger children tend to have a lower level of comprehension of nonsensory metaphors was attributed by Keil (1979, 1985, cited in Winner, 1988) to a lack of knowledge about the properties of things in the world. The term 'domain knowledge' is used to describe children's knowledge of the properties and functions of the items in the world's categories or domains. Keil found that in order for a child to comprehend a metaphor, he or she must firstly have knowledge of the two domains involved in the metaphor (Keil, 1985, cited in Winner, 1988).

The finding that the younger children in the current study displayed less understanding of the nonsensory metaphors than those in the older groups might therefore be explained in terms of a limited knowledge of particular domains. Younger children may not yet have sufficient knowledge of domains such as that of personality traits, for example, and therefore tend to misinterpret metaphors involving these domains. The language experience

hypothesis (Ortony, Larson and Shapiro, 1985) is also useful in explaining this finding. The use of non sensory types of metaphoric similarity is typically a feature of the spoken and written language of adults and older children (Winner, 1988). Younger children are thus less likely than their older counterparts to have meaningful exposure to such metaphors on a daily basis. The finding that younger children have difficulty with nonsensory metaphors might therefore be attributed in part to a limited knowledge of the domains involved and a lack of meaningful exposure to this type of metaphor.

In interpreting the results of this particular study, however, the syntactic context in which the nonsensory metaphors were presented must also be considered as a possible source of difficulty. A small number of researchers have reported that the syntactic presentation of a metaphor can influence children's level of comprehension (Nippold, Leonard and Kail, 1984; Renolds and Ortony, 1980; Winner, Engel and Gardner, 1980). The sensory metaphors in this study were presented in the context of a true metaphoric riddle, which generally took the form, '*What has X but no Y?*'. However, the riddles grounded in nonsensory similarity took a greater variety of syntactic forms, such as '*What did the X say to the Y?*' or riddles involving 'Why / Because' structures. The possibility that the syntactic presentation of the nonsensory metaphors might have contributed the lower level of comprehension of these metaphors must therefore be considered also.

The studies to date which have reported children's greater difficulty with nonsensory, than sensory metaphors have generally involved the presentation of such metaphors either in a predicative sentence or in isolation. The overall results of this study suggest that this finding also holds when metaphors are presented in the context of riddles. A small number of riddles involving each of the types of similarity was used in the study, however, and the number of children included in each age group was also relatively small. Further research on a much wider scale is therefore necessary before any general conclusions can be drawn.

4.3.2 Remarking on Types of Similarity not Implied in the Original Riddles

A small number of children from each age group in the present study were found to give an 'alternative' type of explanation when presented with the task probing for comprehension of the metaphoric riddles. The use of an alternative type of explanation would suggest that these children did not comprehend the grounds of the metaphors which they had heard earlier. However, given the great creativity of some of the children's responses, the use of an alternative type of explanation might simply indicate a greater degree of imaginativity on the part of these children. The use of an alternative explanation might therefore be attributed in some cases to a different approach to the answering of the probe questions, rather than a lack of comprehension of the metaphoric grounds. The notion that the children used different approaches in completing the probe task is evidenced in the finding that certain children were much more likely than others use a creative type of comparison.

The fact that the probe questions were based on the metaphoric riddles was not made explicit to the children in the study. Some children may therefore have used an alternative type of explanation because they were not aware that the probe questions related back to the metaphoric riddles. A number of children who gave the target response to the probe task also went on to describe other similarities between the items mentioned in the probe question. Again, this suggests that the children may have been eager to demonstrate their creativity in comparing the two items, rather than simply giving the target answer only.

Whilst the overall number of creative (i.e. alternative) explanations given in this study was relatively small, this type of response was given with greatest frequency by the 9- and 10-yearolds. The finding that children in these age groups were the most likely to be creative in their use of metaphoric comparisons contradicts the notion of there being a 'conventional' stage in children's use of metaphor between the ages of 8 and 10 years (Winner, 1988). Gardner, Kircher, Winner and Perkins (1975) reported that children between these ages in their study tended to reject the use of metaphor, preferring instead to use language in a conventional, unimaginative way. A similar finding was reported

by Pollio and Pollio (1974) when a story-writing task was used. However, when Pollio and Pollio presented the same group of children with a structured comparison task (similar in format to the 'probe' task used in this study), the children's use of metaphors was found to increase steadily between the ages of 8 and 11 years. The fact that the comparison task in the current study was presented in the context of an informal riddling session might therefore have encouraged the children to be less inhibited in their use of language.

An examination of the creative metaphoric comparisons which were used by the children in this study suggests that there is a developmental sequence in the types of metaphoric similarity used. The creative comparisons which were used by the 8-year-olds in the study were based solely on a sensory type of grounds. Children between the ages of 9 and 11 years were found to favour a relational type of grounds in the comparisons which they used. A few instances of the use of psychological-physical types of similarity were reported amongst the older children in the study. The order of acquisition of the creative use of metaphor, which is suggested by these results, is similar in nature to that which was observed in the children's comprehension of metaphoric riddles in this study.

The overall results of the current study suggest that the period between 8 and 9 years of age may be a time of rapid development in both the ability to verbalise metaphoric grounds and in the comprehension of metaphors. The greatest overall increase in the level of metaphor comprehension amongst the children in this study (as judged by their performance on the probe task) was found to occur between the ages of 8 and 9 years. The transition from making creative comparisons involving a sensory type of similarity to making comparisons grounded in relational similarity was also found to occur between the ages of 8 and 9 years of age. The use of metaphor by all of the children in the study (and not just those who used a creative response) would need to, be examined, however, before overall conclusions could be drawn in relation to the development of this skill.

4.4 Do Children Use Certain Types of Riddles Before They Use Others?

McDowell (1979) concurs with the observation by Sanches and Kirshenblatt-Gimblett (1976, cited in McDowell, 1979) that children's level of acquisition of the language seems to be reflected in their verbal play. These researchers remark that the focus of children's verbal play progresses 'from sound play to sense play, finally culminating in play with sociolinguistic rules' (McDowell, 1979: 192). The results of the current study suggest that by 8 years of age, children are able to make use of riddles involving most types of linguistic ambiguity and also riddles which involve a playful violation of sociolinguistic rules.

The current study differs from that of McDowell (1979) in that it involves an examination of riddle use by children from the age of 8 years. The study by McDowell, however, focused on riddle use in children below this age. He concluded from his results that the development of riddling skills is virtually complete by this age. The finding of the current study that children aged 8 years displayed some use of all the types of riddles used by the older groups, would also support this notion. The patterns of use which were displayed by the children in the current study might therefore be interpreted as reflecting their preferences in using riddles, rather than indicating a particular stage of acquisition.

The results of the present study suggest some overall trends in riddle use between the ages of 8 and 11 years. A significant finding of this study was that the children favoured the use of riddles proper over the use of descriptive routines. McDowell (1979) noted in his study that older children continue to use descriptive routines once they have exhausted their repertoire of riddles proper. He also noted that the routines of the older children in his study generally involved the description of exotic, rather than mundane items. The descriptive routines which were supplied by the 8-year-old girl in this study also involved the use of such items (e.g. an elephant, a peacock).

It appears from the results of this study that children between the ages of 8 and 11 years favour the use of homophony as a block element in their riddles. The use of grammatically-based riddles in this study was found to increase overall up to the age of 10 years.

This finding is contrary to that of McDowell, who found a decrease in the use of homophony after the age of 7 years. However, a dramatic decline in the use of grammatical ambiguity was noted amongst the 11-year-olds in the current study. Whilst phonological and morphological types of ambiguity were featured in the riddles in this study, syntactic riddle strategies were not used.

McDowell (1979) found that metaphoric riddles were favoured by the 7- and 8-year-olds in his study. Both radical and conventional types of polysemy were featured in the current study. The use of radical polysemy was a feature of the 8- and 9-year-olds but was not used beyond this stage. There were therefore few examples in the study of children's creative use of metaphor. The use of metaphors which are already sanctioned in the language (conventional polysemy) was featured in a much larger proportion of the riddles. No overall developmental trend emerged in the use of this type of metaphor, although it was used by children in all age groups.

The analysis of the riddles collected in this study suggests that the period between the ages of 10 and 11 years is a time of great change in the types of riddling device used. Whilst the riddles collected from the children in the other age groups largely involved the use of linguistic ambiguity (including metaphor), the 11-year-olds in the study preferred the use of catch riddles, metariddles and riddles involving anomaly or unnatural facts. The finding that children in this age group favoured the use of 'catch riddles' is in keeping with the sequence of development described by Sanches and Kirshenblatt-Grimblett (1976, cited in McDowell, 1979). Catch riddles involve the victimisation of the riddlee and can thus be described as violating the sociolinguistic rules of the language. The popularity of metariddles at this age might also reflect an increased eagerness to 'trick' the riddlee. These riddles frequently involve the use of a well-known riddle question to which the riddlee might give the traditional answer. The child, on the other hand, is in possession of the updated answer which the riddlee has far less chance of guessing.

The finding that children in the 11 year age group strongly favoured riddles involving anomaly is an interesting one, as McDowell (1979) found that the use of such riddles emerges as early as six years of age. Whilst it is difficult to explain the popu-

larity of anomaly riddles and riddles involving unnatural facts at this age, their use might indicate a general move away from linguistic ambiguity as a source of humour. Such a pattern of development has been reported by researchers such as McGhee (1979, cited in Nippold, 1988c) who found that adolescents favour jokes where a greater cognitive challenge is involved to jokes involving linguistic ambiguity.

Types of Riddle Structure

Whilst five main types of riddle structure featured in McDowell's (1979) study, the riddles in the present study made use of three types of structure. McDowell found that the structures of attribution, causality and instrumentality were the most frequently used in his study. The use of the structures of attribution and causality accounted for approximately three-quarters of the riddles in the current study. The results of the present study suggest that the structure of instrumentality is not a feature of the riddling of children over the age of 8 years.

The remaining riddles in this study involved the use of the structure, '*What did the X say to the Y?*'. However, the structure '*What kind of X is a Y?*' which featured in McDowell's study, was not used by the children in this study. The overall results of the current study suggest that the structure of attribution is a consistent feature of the riddling of children between the ages of 8 and 11 years. The use of the structure of causality, however, appears to decline after the age of 9 years. Whilst the use of the riddle form, '*What did the X say to the Y?*', was most popular amongst the 8-year-olds, the results of this study suggest there is a decline in its use after this age.

4.5 Are There Differences in the Developmental Patterns Displayed by Boys and Girls?

The studies to date which have examined children's use and comprehension of both riddles and metaphors have reported no significant difference in the performance of boys and girls in these areas. The results of this study would concur with this overall finding. However slight differences in the performance of the boys and girls were detected on some of the tasks in this study.

Whilst the performance of the boys and girls on the riddle comprehension task was very similar at every age, some differences were noted in their performance on the riddle-answering task and in their use of riddles. Whilst the girls in the current study were found to be more likely to give the target answer on the riddle-answering task, the boys were found to have contributed a greater number of 'riddles proper' when asked to tell the researcher any riddles which they knew. The alternative answers which the boys gave on the riddle-answering task were more often found to be canonical than those given by the girls.

The boys were found to have generated twice as many alternative riddle answers based on conventional polysemy as the girls, and were also twice as likely to contribute riddles involving grammatical ambiguity. The girls were more likely to base their answers on a novel type of metaphoric similarity. These last findings might suggest a preference amongst the boys for the use of types of ambiguity which are already sanctioned in the language, as opposed to the more novel approach which appears to have been taken by the girls. It was noted by the researcher during the collection of the data that the boys generally showed a greater interest in the reading of riddle books than the girls in the study. The use of grammatical ambiguity is a common feature of the riddles in such books. The types of response which were given by the boys in the study might therefore be related to their greater familiarity with this type of ambiguity. A comparison of the performance of boys and girls would need to be carried out on a much larger scale, however, before such findings could be generalised to the population as a whole.

4.6 Overall Conclusions

This study set out to examine the development of riddle comprehension and use in Irish school-aged children. It was firstly concluded from the results of this study that the tendency of children to give canonical riddle answers increases between the ages of 8 and 11 years. It also appears that there are three general stages in the emergence of children's awareness of the conventional requirement of a partial obscurity of semantic fit between the riddle question and answer.

The results of the current study concur with the widely-reported finding that the comprehension of metaphors improves with increasing age. The comprehension of metaphors in the context of riddles was found to increase overall between the ages of 8 and 11 years. The findings of this study provide support for the hypothesis that the comprehension of nonliteral language develops gradually through meaningful exposure to such language. It also appears from the results of this study that the type of metaphoric grounds affects the degree of comprehension of metaphoric riddles. The creative use of metaphor which was displayed by some children in response to the 'probe' task contradicts the notion of there being a 'conventional' stage in metaphor use between the ages of 8 and 10 years.

The analysis of the types of riddles collected from the children in this study suggests that there is a change at about 11 years of age in the types of riddling device which children use. Children up to this age appear to favour the use of linguistic ambiguity as a riddling device. After the age of 11 years, however, children show a preference for the use of catch riddles, metariddles and riddles involving anomaly.

The performance of boys and girls was compared on all of the tasks used in this study. Whilst their performance on the comprehension tasks was almost identical, slight differences were observed in the types of riddling device which were favoured by each group. Due to the small size of this study, however, no overall conclusions about the influence of gender on riddling skills can be drawn at this stage.

4.7 Limitations of this Study and Implications for Further Research

The main limitation of this study was the small size of the group of children included in the study. It is possible that individual differences amongst the children may have influenced the results. The children in this study were all Irish and all came from a middleclass background. It is therefore possible that cultural factors might also influence the results. A relatively small number of riddles involving each type of metaphoric similarity was also presented to the children.

The tasks used in the study would therefore need to be replicated on a much wider scale, with children from a variety of cultural backgrounds, before any findings could be generalised to the overall population. Were the study to be repeated, it might also be of value to test out the hypothesis put forward by Fowles and Glanz (1974) that riddle comprehension is related to reading ability, rather than age. A formal assessment of reading ability would therefore need to be administered to the children in the study in addition to the riddle tasks.

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APPENDIX 1

List of 12 Riddles Used in Task I (Chosen from Children's Riddle and Joke Books)Riddles involving a metaphorical comparison based on sensory grounds

1. What has legs but cannot walk? *A table.*
2. What has teeth but no mouth? *A comb.*
3. What has eyes but cannot see? *A potato.*
4. What goes around all day with its tongue hanging out and sits by your bed at night? *A shoe.*
5. What runs but never walks? *Water.*
6. What can howl but has no mouth? *The wind.*

Riddles involving a (nonsensory) metaphorical use of language

7. Why did the teacher wear sunglasses to school? *Because the class was so bright.*
8. What happened when the thief fell into the cement? *He became a hardened criminal.*
9. Why did the boy throw his clock out the window? *He wanted to see time fly.*
10. What do jigsaw puzzles do when they get bad news? *They go to pieces / They fall apart.*
11. What did the big telephone say to the little telephone? *'You're too young to be engaged'.*
12. What did the sweeping brush say to the vacuum cleaner? *'Don't you wish people would stop pushing us around?'*

Explanations of the Types of Metaphors Involved in Riddles 1-12Riddles involving a metaphorical comparison based on sensory grounds

Riddles 1-4 are based on a comparison between the physical features of an animate entity and those of an inanimate one,

Riddle 5 is based on a comparison between the movement of a human or animal (running) and the movement of a natural object (water).

Riddle 6 is based on a comparison between the sound of a vocalisation by an animate entity and the sound of a natural phenomenon (the wind).

Riddles involving a (nonsensory) metaphorical use of language

Riddles 7 and 8 involve dual-function adjectives which are based on the comparison between a physical notion (e.g. brightness or hardness) and a psychological one.

Riddles 9-12 are based on relational types of similarity.

The comparison involved in Riddle 9 is that between an abstract entity (time passing) and the movement of an animate (or inanimate) entity (flight) .

The comparison on which Riddle 10 is based is that between a physical action of falling apart and a psychological state (getting upset).

The comparison involved in riddle 11 is between the notion of a telephone being in use therefore unavailable and someone who is engaged to be married and therefore unavailable.

The comparison involved in riddle 12 is between the physical act of pushing something around and the act of bullying someone psychologically.

**Probe Questions Which Followed the Riddles
(Questions Used in Task 2)**

Riddles involving a metaphorical comparison based on sensory grounds

(Target answers are in italics)

1. How (In what way) is a table a bit like a person? *It has legs.*
2. How is a comb a bit like a mouth? *It has teeth.*
3. How is a potato a bit like a face? *It has eyes.*
4. How is a shoe a bit like a mouth? *It has a tongue.*
5. How could water be a bit like a person in a race? *It can run.*
6. How can the wind be a bit like an owl? *It can howl.*

Riddles involving a (nonsensory) metaphorical use of language

7. How could a person be a bit like the sun? *They could be bright.*
8. How could a person be a bit like a rock? *They could be hard.*

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Riddles involving a (nonsensory) metaphorical use of language

7. How could a person be a bit like the sun? *They could be bright.*
8. How could a person be a bit like a rock? *They could be hard.*
9. How can time be a bit like a bird? *It can fly.*
10. How could a person a bit like a broken up jigsaw? *They've gone to pieces / They're falling apart.*
11. How could a telephone be a bit like a person who's going to get married soon? *It could be engaged.*
12. How could a person be a bit like a sweeping brush? *They could be pushed around.*

These questions were presented in random order.

APPENDIX 2

The Children's Alternative Answers on the Riddle Answering Task

1. What has legs but cannot walk?

8 years: Girls:(None)

Boys: Trousers; tadpoles; A person that has a spell put on them.

9 years: Girls: A doll or a teddy;

Boys: A footpath.

10 years: Girls: A gymnastic horse;

Boys: (None)

11 years: Girls: (None)

Boys: A person in a wheelchair.

2. What has teeth but no mouth?

8 years: Girls: A piano; a fork;
Boys: Teeth in a box.

9 years: Girls: False teeth;
Boys: A needle (one tooth).

10 years: Girls: Shark teeth on a piece of string;
Boys: A trap.

11 years: Girls: (None)
Boys: A saw (two answers).

3. What has eyes but cannot see?

8 years: Girls: A bat;
Boys: Joke glasses.

9 years: Girls: A person in a painting;
Boys: A bat; a needle.

10 years: Girls: A dead fish; Cats' eyes on the road;
Boys: A pin (needle).

11 years: Girls: (None)
Boys: A blind man.

4. What goes around all day with its tongue sticking out and sits by your bed at night?

8 years: Girls: A dog; The safety sticker on a lamp;
Boys: A dog.

9 years: Girls: A dog;
Boys: A dog or cat; A rude teddy. A dog.

10 years: Girls: A dog;
Boys: (None)

11 years: Girls: A dog; Your tie;
Boys: (None)

5. What runs but never walks?

8 years: Girls: A runner; A cheetah;
Boys: Your nose; A car engine;

9 years: Girls: An ostrich; Your nose;
Boys: Runners (shoes); A bicycle or rollerskates.

10 years: Girls: (None)
Boys: A tape recorder;

11 years: Girls: A car (the engine);
Boys: A robot that is programmed to run, not walk.

6. What can howl but has no mouth?

8 years: Girls: A radio;
Boys: The alarm system (burglar alarm).

9 years: Girls: A hairdryer;
Boys: A frog or toad; A whistle.

10 years: Girls: (None)
Boys: (None)

11 years: Girls: An Alarm clock;
Boys: The radio; The breaks [brakes-ed] on a car; A car.

APPENDIX 3

Riddles Collected from Each Class Group

Third Class (Girls)

Child No.2

- (1) What did the big biscuit say to the little biscuit? 'Crumbs.'
- (2) What's big and has a very, very big appetite? An elephant.
- (3) What can you get that can be different colours and very soft? A cushion.
- (4) What's got two legs, a medium-sized body and a very, very big tail?
A peacock.
- (5) What's green and brown and has different colours all over it? A Christmas tree.

Child No.3

- (6) What's round and yellow, laid in a nest, but won't hatch like the rest?
A tennis ball
- (7) What did the ground say to the rain? 'If you keep this up my name
will be mud. '
- (8) Why does a lion like Christmas? Because of his sandy paws (Santa
Claus).
- (9) What has keys but can't open any doors? A piano.
- (10) Why did the wolf cross the road? Because the chicken hadn't been
invented yet.

Third Class (Boys)

Child No.4

- (11) What did the skeleton say to the toilet? 'You can't get anything out
of me'.
- (12) Why did the skeleton cross the road? Because he needed to go to The
Body Shop.
- (13) What do you call a chimp with a banana in each ear? Anything you
like—he can't hear you!

Child NO.5

- (14) Greek Riddle: This Greek king came into his castle and these people
came along and tried to take him. But before they could take him, he
took poison.
Why did they still take him?
Answer: Greek kings take small bits of poison all the time so that if they
have to take poison it won't harm them. And that's why they
still took him—because he was still alive.

Fourth Class (Girls)

Child NO.7

- (15) What did the big candle say to the little candle? 'I'm going out to
night' .

Fourth Class (Boys)

Child No. 10

- (16) What did the big chimney say to the little chimney? 'You're too young
to be smoking'.

Child No. 11

- (17) Why did the egg go all around the world? Because he wanted to be
an eggs-plorer!

Child No. 12

- (18) Why did the egg start crying? Cause it was all cracked up.
- (19) What is a math teacher's favourite tree? A geometree.
- (20) Why did Dennis bring a ladder to assembly? Because his teacher
wanted him to sing higher.
- (21) What has four legs in the morning, two legs at midday and in the

evening has three legs? Answer: It's the three stages of man. He crawls in the morning, then walks and then gets a walking stick.

- (22) Why did the tortoise cross the road? He wanted to get to the Shell station.
- (23) What do water and a nose have in common? They can both run if they're cold.

Fifth Class (Girls)

Child No. 13

- (24) What's black and white and re(a)d all over? A newspaper. Or it could be a penguin or a zebra with sunburn.
- (25) What do you call a cucumber with four doors? A slammer. (A slammer is a sandwich).
- (26) Why did the chicken cross the road? To show he had guts.

Child No. 15

- (27) Riddle: In comes two legs, carrying one leg and puts it on three legs. In comes four legs and out goes five legs. Out comes two legs and throws three legs at four legs. (And you've got to figure out the answer over 24 hours). Answer: In comes two legs (a human), carrying one leg (a leg of lamb) and she puts it on a three-legged stool. And in comes a four-legged dog and takes it outside (and that's the five legs that go out, the dog and the leg of lamb). And when two legs sees that the leg of lamb is gone she picks up the three-legged stool and goes outside and throws it at the dog.

Fifth Class (Boys)

Child No. 17

- (28) Why did the hedgehog cross the road? To show his friends he had guts.
- (29) Why does a golfer wear two pairs of trousers? In case he gets a hole in one.
- (30) Did you hear about the surfing burglar? He stayed on the criminal wave.
- (31) What did the hat say to the scarf? You stay here and hang around and I'll go on a head.
- (32) What's a frog's favourite football stadium? Croak Park.

Child No. 18

- (33) What did the big hand say to the little hand? I'll be around in an hour'.
- (34) Why is the baseball stadium hot after the game? Because all the fans have left.

Sixth Class (Girls)

Child No. 19

- (35) What has sixteen wheels and pink spots? An elephant with the measles on rollerblades.

- (36) What's black and white red all over? A nun who's fallen down the stairs.
(37) Supposing, supposing, three men were a-frozing. One died. How many were left? None-because you're only supposing.

Child No. 20

- (38) Why did the turkey cross the road? It was the chicken's day off.

Child No. 21

- (39) Why did the boy bury his clock? Because the batteries were dead.

- (40) What gets bigger the more you take out of it? A hole.

- (41) What gets wetter the more you dry? A towel.

- (42) What's big, purple and eats spaceships? A big, purple spaceship eater.

Child No. 23

- (43) What do you call a fly without wings.? A walk.

- (44) Riddle: What's as green as grass, as red as a rose, white as snow, black as coal? Answer: A blackberry. When it's not ripe it's green. It flowers white. When it's not quite right it's red and when it's ripe it turns black.

Child No. 24

- (45) What did the big chimney say to the little chimney? 'You're too young to be smoking'.

- (46) What's pink and fluffy? Pink fluff.

- (47) What's brown and sticky? A brown stick.

- (48) What's blue and fluffy? 'Blue fluff'? No, pink fluff with a cold.

Jokes Collected from the Children

Third Class (Girls)

Child No.2

- (1) The Dad asked the girl, 'Do you want any help with your homework?' .
And the girl said, 'No thanks, I can get it wrong by myself.'

Third Class (Boys)

Child No.5

- (2) This man was in a pub watching a match. He drank half his glass of Harp and put it down on the table. And this little green goblin comes along while he's watching the game. And the goblin goes, 'Be, wee, wee, wee, wee' (putting his finger in the glass) and fills it up again. Then the man comes back, 'Now, don't do that'. And the green goblin comes back and goes, 'Be, wee, wee' and fills the glass up again.

And the man says, 'If you do that again, I'll pull down your yocks and pull your wey off. And the man puts down the drink and watches the T.V. again. And the goblin comes back and goes, 'Be, wee, wee', and the man goes, 'That's it!'. (Gestures puffing some-

thing oft). And the man says, 'Now, how will you go to the toilet? and the goblin goes, 'Bee, wee, wee, wee' and the glass overflows.

- (3) If I was a teacher, I'd give my pupils glasses. Get it? *My pupils*
glasses.

Fourth Class (Girls)

Child No.7

- (4) Knock, knock,
Who's there?
Boo who?
There, there, don't cry. It's only a joke.

Child No.8

- (5) Knock, knock.
Who's there?
Owls.
Owls who?
Yes, they do, don't they?

Fourth Class (Boys)

Child No. 10

- (6) Knock, knock, Boo.
Who's there?
Banana who?
Knock, knock.
Who's there?
Banana.
Banana who?
Knock, knock.
Who's there?
Orange.
Orange who?
Orange you glad I didn't say banana?
- (7) There were three elephants called Shut Up, Mercy and Trouble. And one day Trouble went missing. And Shut Up went to the police station and the policeman asked Shut Up for his name. So he said 'Shut Up'. And the policeman said, 'Are you looking for trouble?'. 'Yes, please'. So the policeman said, 'Right then, you're going to get it'. So Shut Up shouted for Mercy. And the policeman said, 'It's alright, I wasn't serious'.
- (8) One day a boy wanted to go to the toilet and he asked his teacher if he could go. And she said, 'No'. And then she said, 'Say your ABC'. So he said, 'Abcdefghijklmno_qrstuvwxyz'. 'Where's your 'p' '?'. And the boy said, 'It's dribbling down my leg'.

Child No. 12

- (9) This is a joke about Newcastle Football Club, saying that they're not very good:

'Somebody broke into Newcastle's Trophy Room'. 'Really?'

'Yeah'.

'What did they take?'

'Everything. They're looking for a man with a black and white carpet'.

Fifth Class (Girls)

Child No. 13

- (10) There's a little boy and a granny and he's walking down the road when he comes across a five pound note. And he says, 'Granny, Granny can I pick the five pound note off the ground? And the granny says 'No, because anything on the ground is dirty'. And then he comes across a ten pound note and he says, 'Granny, Granny can I pick up the ten pound note? And the granny says, 'No, because anything on the ground is dirty'.

And then he comes across a hundred pound note and he says, 'Granny, Granny, can I pick up the hundred pound note? And she says, 'No, because anything on the ground is dirty'. The granny falls on the ground and she says, 'Sonny, sonny, pick me up' and the boy goes, 'No, because anything on the ground is dirty'.

- (11) 'Anything I say, you have to say, 'And so did the fat lady'. One day I went into a shop...'

'And so did the fat lady'.

'I got bread and milk' .

'And so did the fat lady'.

'I paid for the bread and milk'.

'And so did the fat lady'.

'I went out of the shop'.

'And so did the fat lady'.

'I bought a balloon'.

'And so did the fat lady'.

'The balloon burst'.

'And so did the fat lady'.

- (12) This man always drove to work on an egg. And one day it wouldn't start. So he rang the AA and the AA came out and said, 'Well, we'll take the yoke out'. So they took the yoke out and the car started and he drove to work. And when he got to work he rang the AA to thank them because his car was all white now because they had taken the yolk out.

Child No. 14

- (13) Mr. McCarthy and Mrs. McCarthy were a family in America. Mrs. McCarthy always stayed at home and Mr. McCarthy always went to work. And when Mr. McCarthy came home one day he said, 'Did any mail come today? And Mrs. McCarthy said, 'No, there's only been female in the house all day'.

- (14) Paddy Englishman, Paddy Irishman and Paddy Scotsman all walked into a bar. And one of them said, 'I need to go to the toilet'. So Paddy Scotsman walks up to the toilet and he opens the door and he hears this sound: 'I am the ghost of the one black eye'. And he runs out really quickly and says, 'There's a ghost in the toilet!'

So, Paddy Englishman, thinking he's being really brave, walks in and he hears the sound, 'I am the ghost of the one black eye' and he runs out and says, 'There really is a ghost in the toilet'. So Paddy Irishman goes in and the door opens and he hears the voice, 'I am the ghost of the one black eye'. And he says, 'Yeah. And you'll be the ghost of the two black eyes in a second if you don't shut up'.

Fifth Class (Boys)

Child No. 16

- (15) How do you know a blonde has been at her computer? There's Tippex all over the screen.
- (16) Doctor, doctor, I've got a spanner in my throat.' 'Are you choking?'
'No, I'm serious.'
- (17) 'Waiter, there's a fly in my bowl'. 'He'll be swimming in the Cup tomorrow.'

Child No. 18

- (18) Paddy English, Paddy Irishman and Paddy Scotsman were all going to jail for five years. And they were each allowed to bring five hundred things with them. Paddy Englishman brought five hundred bottles of wine, Paddy Scotsman brought five hundred cakes and Paddy Scotsman [Irishman-ed] brought five hundred cigarettes. When the five years were up, Paddy Englishman came out drunk, Paddy Scotsman came out fat and Paddy Irishman came out and said,
'Does anyone have a light?'

Sixth Class Girls)

Child No. 20

- (19) Paddy Englishman, Paddy Irishman and Paddy Scotsman were out in the desert and they each bought one thing in the shop. Paddy Englishman bought a bottle of water, Paddy Scotsman bought a baseball cap and Paddy Irishman bought a car door. And they each asked each other why they had bought these things. Paddy Englishman wanted the water to drink if he got hot. Paddy Scotsman wanted the cap to keep the sun out of his eyes. And Paddy Irishman wanted the car door so that if it got too hot he could roll down the car window.

Child No. 21

- (19) What goes black and white thump, black and white thump, black and white thump? A nun rolling down the stairs.
What goes black and white, 'Ha, ha', black and white, 'Ha, ha', black and white, 'Ha, ha'? The nun who pushed her.

Sixth Class (Boys)

Child No. 23

- (20) What do you call a Lada going up a hill? A miracle.
- (21) What do you do if a Kerryman throws a grenade at you? You pull out the pin and throw it back.
- (22) What do you do if a Kerryman throws a pin at you? You run because he probably has the grenade between his teeth.
- (23) How do you drown a Kerryman? Knock on the door of his submarine.
- (24) Did you hear about the Kerryman's dictionary? It has an index.
- (25) Have you heard about the Kerryman's latest inventions? The water proof teabag and the underwater hairdryer.
- (26) What's black and white and goes, 'Thump, thump, thump, crash?' A nun falling down the stairs.
And what's black and white and goes, 'Ah, ha, ha!' The nun who pushed her.

Child No. 24

- (27) This idiot is in bed and the phone rings. And the voice says, 'Hello, is this 2333964?' And the idiot says, 'No, this is 2333963'.
'Oh, I'm sorry to get you out of bed'. 'No, it's OK. I had to get out of bed anyway to answer the phone.'