

**Looking for and making sense of
'special' words**
**Metaphor recognition and interpretation by
schoolchildren**

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VRIJE UNIVERSITEIT

**Looking for and making sense of
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**Metaphor recognition and interpretation by
schoolchildren**

ACADEMISCH PROEFSCHRIFT

ter verkrijging van de graad Doctor aan
de Vrije Universiteit Amsterdam,
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door

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geboren te Cali, Colombia

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Preface

Working as a psychologist with pre-school and primary school children in Cali I became strongly involved in language teaching and learning. I was part of the research group Language, Cognition and Education (Lenguaje, Cognición y Educación) at the University of Valle, where we developed training programmes with teachers focusing on promoting the analysis of language while engaging children in a playful manner. Together with the teachers we developed and implemented reading and writing activities for children of different school grades using a variety of texts such as lullabies, songs, poems, stories, as well as expository texts, to help children develop their language skills and particularly their capacity to reflect on the content and the structure of the texts.

Our approach was a new experience for children and teachers as we used well written texts that were challenging for them. We avoided the type of explicit and oversimplified stories normally used in the schools, which, as pointed out by for example McNamara et al. (1996) and Montes interviewed by Saidón (2000), seem to be a result of the underestimation by book producers of the capacity of their audience. According to McNamara et al. (1996), this simplification may be annoying and may not encourage active reading. Teachers may have a similar view as these book producers. In our case, for example, they were surprised that we used Leon Tolstoy's story *Cómo aprendí a montar a caballo* (how I learned horse-riding) with 3rd graders (8-9 years old), claiming that this text was too difficult, until we showed that children could deal with it and actually liked it.

In the activities with children we looked at what Scardamalia and Bereiter (1992) call content knowledge and discourse knowledge. With some support, children proved to be able to understand the more complex texts we gave them and enjoyed rereading and studying them in detail, which was another surprise for the teachers, who thought children would become bored if they read the same text even just twice. Working in this way with real texts and text analysis orients children to look at the text in terms of content and structure. As suggested by Olson (2009), it is also likely to contribute to the development of a higher level of literacy, which is not necessarily made an object of instruction in schools, but is crucial in order to acquire metalinguistic knowledge to be able to talk and think about text and language.

Many children appreciated these sessions, where they learned to explore texts and to produce their own stories. They also encountered metaphors in these texts and sometimes even young children gave interesting interpretations. This caught my attention and I became particularly interested in children's awareness of metaphorical uses and how they made sense of them. My initial review of the literature showed that the ability to deal with metaphors increases with age, but in daily practice I found several occasions where a younger child did better than some of the older children. I also realized that metaphors in texts vary for instance in their linguistic form, occurrence, and ease of understanding. This strengthened my interest and set me off on a journey to try to better understand the way in which children in primary school advance in their recognition and interpretation of metaphor. I was particularly interested in analysing the effect of reading comprehension in addition to school grade, as I expected better readers to be better at metaphor processing. Taking into account that important differences exist in the linguistic form of metaphor as well as the level of conventionality I also considered it useful to review these influences further. The results of this journey are reflected in this dissertation.

I initiated my quest at Barcelona University where I did my MA focusing on classification of metaphors according to daily use, lexicalization and the type of link between domains, whilst also exploring the influence of syntactic structure and familiarity on metaphor understanding in children. This first approximation to the field of metaphor led me to start my PhD work at Barcelona University. My subsequent exploration of the field brought me into contact with Gerard Steen, who became my supervisor as an extramural student of VU University Amsterdam and my guide in the world of metaphor, in doing PhD research, and in writing this dissertation. I am most grateful for his continued support and encouragement.

The problem that motivated the research for this dissertation is to better understand metaphor recognition and interpretation in school-age children. In line with this research problem the goal is to establish the influence of the school grade and reading comprehension skills of the children, as well as of linguistic form and conventionality of the metaphors embedded in texts from literature and science on metaphor recognition and interpretation. The approach to meet this goal is to test metaphor recognition and interpretation with four groups of children: two from 4th grade (average age 9 years and 3 months) and two from 6th grade (average age 11 years and 7 months), both with low and high

reading comprehension skills. The texts that are used as stimulus materials come from children's literature and science books that are present in the schools of the children. The study adopts Steen's (2011a) three dimensional model of metaphor in language, thought and communication to look at the recognition and interpretation of both nominal (*A is B*) and verbal metaphorically used words whilst also taking into account their level of conventionality. In addition I will explore the possible influence of the deliberateness of the metaphors on recognition.

My contacts in the educational community in Cali enabled me to trigger the interest of the heads of two schools where I could work with children at the end of 3rd and 5th grade and to continue with a selection of these children when they were in 4th and 6th grade. The children were involved in the research on a voluntary basis and with permission of their parents. I am grateful for the efforts of the children that enthusiastically took part in the sessions although their participation meant spending considerable time with us but also additional work to catch up with the lessons they missed. It was very encouraging to listen to their comments at the end of the research period. Many of them very much liked the assignments and several were sad when the research was over, with some asking whether we would come back. This positive feedback strengthened me in the idea that my research approach can, in fact, be used to develop a teaching programme that can help children to improve their metalexical development using metaphorical language.

I also would like to express my thanks to my colleagues from the University of Valle, particularly to the motivated team that supported me in the data collection in the schools: Yamileth Bejarano, Johnny Cruz, Julieth Salazar, and Viviana Varón. This team also helped in data analysis together with María Mercedes Cardona, Carolina Duque, Roxana Medina, and Juan Andrés Moreno. I am also grateful for the assistance I received, particularly in scanning, photocopying, and delivery of the materials, from Galieth, Diana Marcela, and Eliana, who at different times were part of the administrative staff of the programme when I was working with children in Colombia. I am equally grateful for the support given by Luz Gabriela Puerta and Elizabeth Naranjo in helping me to review child literature and science texts respectively, and by Martha Elena Correa y Jorge Andres Ríos for developing a nice booklet with the texts used that was given as a present to the children. The research would not have been possible without the support of the heads of the schools, the section coordinators and especially Claudia Quintero, who also helped with the

review and adjustment of the linguistic materials for the research. The cooperation of the teachers was invaluable as some of the research activities interfered with their daily work, which they readily accepted. Carmen Eliza Dumancelly, the librarian of one of the schools, deserves special mention for helping a lot with the selection of the books. She was very good with the children, allowing them to be in the library as they waited for their turn and at those moments (sometimes quite long) she read and played with them and encouraged them to read books and make use of the library.

In developing my findings I received valuable support from Gerben Mulder who guided me in data analysis and from Mike Hannay who edited the dissertation. I conclude this preface with a word of thanks to my friends Griselda, Doralba, and Marta for their encouragement and particularly to Jan Teun, my partner, who has encouraged me, believed in me, and stood by me during the ups and downs in the development of my research, which was carried out on less than a shoestring budget.

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1. Introduction

I will start this chapter with a reflection on the educational context of my research. This includes an overview of the schooling system in Colombia and a more general exploration of the possible differences in language development of children during the school years, which are crucial for mastering the spoken and written language skills required to be able to properly comprehend and produce language. I will also look at important factors that promote the linguistic development of school-age children, including literacy, schooling, and cognitive development. I will then turn to reading comprehension, which may be a better indicator of progress made by children in their knowledge of language than their school grade alone. I conclude with a brief introduction on the reason why metaphors are an important problem in this context, what my goal is in addressing this problem, and an account of my research questions.

1.1 *The school system in Colombia*

The educational context in Colombia has changed from a centralized system in which the Ministry of National Education (Ministerio de Educación Nacional - MEN) established the content and the goals for each academic subject and grade to a more decentralized approach in which the teaching community plays a role in the transformation and improvement of formal education (MEN, 1998). Educational institutions gained in autonomy and became responsible for developing their own curriculum based on their own goals (Proyecto Educativo Institucional) but are required to follow the competence factors indicated in the guidelines of the MEN. The language area comprises five competence factors which are shown in Table 1.1 with the levels for 1st to 3rd and 4th and 5th grade respectively. These two clusters are of particular interest for my research as they outline the competence levels for the children that have been involved. These factors include a strong orientation to textual analysis, exploring language in context, and the comprehension and production of different types of texts (e.g., descriptive, expository, narrative, and argumentative). Grammar and figurative language are hardly addressed in the guidelines and in the official language knowledge tests (Prueba SABER Lenguaje) (ICFES, 2009; MEN & ICFES, 2009ab).

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Table 1.1

Overview of competence factors in Language in the Colombian system

Main factor	Level for 1st to 3rd grade	Level for 4th and 5th grade
Text production	Produces oral text that responds to different communication objectives	Shows use of intonation and articulation that matches specific communication objectives
	Produces written text that corresponds with different communication needs and pays attention to some aspects of grammar (e.g. concord, tenses, pronouns) and orthography (accents, capital letters, etc.)	Adopts a strategic approach (looking at objectives, readers and context) in the production of written text that corresponds with different communication needs and understands formal aspects of language including the link between sentences
Text understanding and interpretation	Understands different types of text	Understands different types of texts and applies some strategies to find, organize and store information
Literature (aesthetic perception of language)	Understands literary text that contributes to the development of its (the child’s) creative capacity	Establishes reading hypothesis with respect to the relation between the elements of a literary text and their link with the context
Communication and other symbolic systems	Recognizes means for mass communication and can characterize the information they disseminate	Characterizes means for mass communication and selects part of their information to produce new texts
	Understands some forms of non-verbal communication	Characterizes codes for non-verbal communication and is able to indicate it can use them in communication
Ethics of communication	Identifies the principle communication elements and roles to enrich its (the child’s) own communication	Understands and analyses basic roles, relations and rules in communication to identify intentions and expectations of others to enhance the efficiency of communication processes

(Based on MEN, 2006, p. 32-35)

Only the test for 9th grade includes some figurative expressions (sayings, proverbs) and mentions understanding of implicit information in texts. This suggests that reflections about grammar and figurative language should primarily be part of teaching at secondary schools. Hence it seems that the stimulus for primary school teachers to

emphasize these aspects is small, as it may be expected that teachers will take these tests into account when developing their curricula.

Actual work plans from the teachers confirm the limited attention that is given to metaphorical language in the first school years. With the younger group of children (preschool until 2nd grade) the emphasis is on reading short texts that may include stories, but also riddles, rhymes, poems, and songs. In writing the focus is on copying letters and text from the blackboard. In 3rd grade children start to write more independently. As of 2nd grade children start their first steps in the analysis of language through teaching of parsing, focused on the differences between nouns, adjectives, and verbs, which in 3rd grade is extended to also learning some of their grammatical functions. Parsing, defined by RAND (2002, p. 105) as “the process of segmenting words into constituents, assigning the constituents to syntactic categories, and interrelating the constituents structurally”, is of particular importance for my research on metaphor in language use.

In 4th and 5th grade the goals for parsing are somewhat more elaborate and reference is also made to figurative language. Children, for example, are expected to be able to distinguish between words with different functions, sentence structure, and also to understand and produce personifications, similes and metaphors, identify hyperboles and to use non-verbal communication. For the approach to figurative uses of language the emphasis is clearly on poetry and much less on other genres even though the guidelines of the MEN mention a wider range of types of discourse. After 5th grade, reflection on grammar is further emphasized to support the construction of poems and a personal writing style. It is at this stage that the plans mention the analysis of the structure of language as an important element, which is in line with the language knowledge test of ICFES for ninth grade.

Ochoa (2008), based on a study of notebooks from 50 students of 3rd and 6th grades, found that grammar is still taught in a conventional way and is not linked with the comprehension and production of texts, thus not using it to the fullest extent for the development of communicative competence. She concludes that the emphasis in teaching is still on which grammatical categories have to be taught and not on what they are used for in communicative situations. One of her hypotheses for this limited response to the new orientation embedded in the law is that teachers have gaps in their knowledge about the relationship between grammar and communicative competence.

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The findings of the study of Rodríguez and Quintero (2005) that included all but one of the 91 public schools in Cali, Colombia, found an important discrepancy between the curricula, which follow by and large the guidelines of the MEN, and teacher practices, which are still quite conventional. Furthermore the variety of materials that are used is very limited and mainly restricted to literature (literary text, myths, and poems), leaving aside other genres. Another important indication of a conventional approach is that the activities for text comprehension often focus on questions related to explicit content (the literal level), such as where does the story take place, who are the characters, what is the name of the story, etc. Such activities do not promote the construction of higher level inferences that facilitate, for instance, the exploration of cause-effect relations, and even less the development of a critical reading attitude which, as stressed in the MEN (1998), is needed for an in-depth understanding of the genre and for capturing author intentions. The link between the latter and critical reading by children is also stressed by Olson (1997, p. 507), who indicates that critical reading is based on “the ability to recover the putative intentions of the writer”.

In sum it seems that the competence based orientation of the MEN allows for a dynamic approach to language learning that would favour, among other things, better language comprehension with room for working with metaphor. In practice, however, it appears that many teachers see language analysis as just being the understanding of the content of a story (Ochoa, 2008; Rodríguez & Quintero, 2005). Hence further change is needed and it is my hope that my research can provide insight into practical options for teachers to deliberately work with metaphors in classroom settings.

1.2 Later language development

The school system in Colombia includes important innovations in the guidelines for Spanish language teaching that provide considerable scope for new and creative language learning methods where metaphorical uses of language can have a relevant role in enriching metalinguistic development and improving reading comprehension. I will therefore now highlight a number of key aspects of language development related to school-age children and the changes that occur over their schooling period. My intention with this section is not to give

an exhaustive account of later language development, as this is beyond the scope of this study, but to give sufficient information to provide insight in the main factors that influence later language development, such as cognition and schooling, which are important for metaphor comprehension and recognition.

Later language development is also referred to as “language development after age 5” (Karmiloff-Smith, 1986), “language development during the school-age and adolescent years” (Nippold, 1998) or “language development across childhood and adolescence” (Berman, 2004). This covers the age range that corresponds to elementary, middle and high school (roughly between the ages of 6 to 18), but several authors stress that it does not stop there and continues into adulthood (Berman, 2007; Nippold, 2004). Berman (2004, 2009) presents a model of language development with three stages that follows the usage-based account of language and language acquisition (e.g. Tomasello, 2003). The first two stages of this model concern the rapid and highly efficient process of language development in the pre-school years, in which the child becomes a ‘native speaker’. The third stage then becomes of particular interest for present purposes, as this is when the child gradually develops to “being a proficient speaker (and/or writer) of a given language”, which is a longer process that takes from school years to adulthood (Berman, 2004, p. 9).

According to Berman (2004) three types of interrelated knowledge come into play in the acquisition of language proficiency: linguistic, cognitive, and social knowledge. Linguistic knowledge refers to the repertoire of linguistic forms (grammatical and lexical options) that need to be mastered to become a user of a language; cognitive knowledge concerns the ability to interrelate these expressive options to understand language and communicate; and social knowledge refers to knowledge about the favoured linguistic options in different communicative contexts in a given linguistic community. The advance in language proficiency is the core of later language development, which demands interplay between the knowledge of the different linguistic options, the cognitive maturation to make appropriate use of and comprehend them, and an understanding of the different language uses related to diverse communicative contexts. This implies that later language development involves an advanced and flexible interaction between a higher level of linguistic knowledge and more experience with language use in different communicative contexts (Berman, 2004, 2007), as we shall now see.

1.2.1 Main characteristics of later language development

Later language development is a complex and extended process which includes learning new words and gaining better understanding of these words. This lexical development is combined with syntactic development in which the child learns to apply more complex language structures (Berman, 2007; Nippold, 1998). Advances in these two areas are paired with an increase in metalinguistic knowledge, which allows the child to better reflect on language (Morais & Kolinsky, 2004), and with enhanced understanding of figurative language (Gibbs, 1994; Winner, 1995), which is important for recognition and interpretation of metaphors. During the school years children may progress considerably in language development, as I will discuss in this section.

Qualitative and quantitative change in lexical development

School-age children go through a complex process of lexical development that extends over a number of years (Dockrell & Messer, 2004). The change in the quality of the children's vocabulary includes the increased use of words that are less common semantically; words applied in more formal settings and not just daily talk; more abstract words, as well as the understanding and use of figurative meanings (Berman, 2007; Nippold, 1998). During their years at school, children learn to incorporate many new words and meanings into their lexicon, use old words with new meanings, and become better at using appropriate words in their conversations with other children and adults (Nippold, 1998). The growth of the lexicon during the school years is huge, as children may know some 60,000 words by the end of formal schooling, and even higher estimates exist. This growth slows down when they reach adulthood, because less new words are encountered unless they are also learning other languages (Aitchison, 2003; Bloom, 2000). The growing understanding of words includes the secondary meaning of polysemous terms (e.g., *sweet*, *wood*, *to fight*), adverbs of likelihood (e.g., *possibly*, *likely*) and magnitude (e.g. *rather*, *extremely*), metalinguistic verbs (e.g., *imply*, *confirm*) and metacognitive verbs (e.g., *infer*, *assume*, *hypothesise*) (Nippold, 1998, 2004). Primary meanings of polysemous words are already mastered by pre-school children, but understanding of higher level meanings (i.e., metacognition and evaluation) of mental verbs, for example, is subject to a more extended process of development (Booth & Hall, 1995, p. 533).

Children enter school with considerable differences in lexical knowledge. During their years at school the process of learning new words advances, but this does not necessarily reduce the differences in lexical knowledge among children (Nagy, 2007). One important reason may be that children with a more developed lexicon may need less contextual support to comprehend new words (Dockrell & Messer, 2004) and therefore may learn faster and advance more than children in the same age group with less lexical knowledge. This is also supported by the finding of a longitudinal study by Cain and Oakhill (2011) that children with better reading comprehension skills and more advanced reading habits made more progress in vocabulary growth than poorer comprehenders. Although new words can be learned from one or few exposures to written contexts (Nagy et al, 1985), several authors (e.g. Cain et al., 2003; Dockrell & Messer, 2004; Nagy, 1997) agree that deep word learning demands increasing comprehensible encounters in reading and listening experiences. In fact, reading has been counted as one of the main influences on vocabulary development (Cunningham & Stanovich, 2001; Nagy, 1997).

Advance in syntactic development

Over the school years children increase the number of words they use per sentence and include more sentences in their discourse. They also gain knowledge about more complex language structures and learn to apply them (Berman, 2007; Nippold, 1998). Studies in different languages (Berman & Nir-Sagiv, 2004; Jisa, 2005; Jisa & Viguié, 2005) provide evidence of qualitative changes in syntactic development (e.g., increasing use of passive constructions, expression of modality through modal auxiliary verbs). Berman (2007) reviewed different studies that explored English texts produced by children and found that the use of past progressive decreases, whereas the use of past perfect increases from 4th grade to high school.

Tolchinsky (2004) notes that older children create constructions of higher syntactic density that involve more complex hierarchical organization. Along the same lines, Nippold (1998, p. 161) indicates that there is an increase in the length of sentences by the use of 'intrasentential cohesion devices': conjunctions (subordinating, coordinating, and correlative) used to join ideas within sentences. Tolchinsky (2004) supports this age-dependent development pattern with a review of narratives and expository texts produced by school-age

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children (9 - 16 years old). In these texts the complexity of syntactic constructions seems to differ depending on the type of discourse and the context of the communication

In later language development schoolchildren progressively learn to apply familiar forms and structures for new functions in more complex ways and at the same time they learn to use new forms for available and new functions. In this development process they become increasingly proficient at adapting these forms and structures to different communicative contexts to meet their discourse purposes. As they grow older and progress at school, they become gradually more able to apply a wider variety of options that are available in language (Berman, 2007; Nippold, 2004; Tolchinsky, 2004; Tolchinsky et al., 2005).

Increasing metalinguistic knowledge

With the growing linguistic and cognitive development, the child also gains more metalinguistic knowledge, which according to Morais and Kolinsky (2004) is the ability to think consciously about language. It is the reflection upon language and its features as different from using and understanding it. It seems plausible to assume that young children already have a basic level of metalinguistic awareness and that this becomes progressively more explicit and conscious as they grow older (Homer, 2009; Ravid & Tolchinsky, 2002). Bialystok (1993, p. 213) indicates that a range of definitions of metalinguistic awareness exist that may differ considerably. These, however, have in common that they "consistently point to two features of metalinguistic awareness: the attention to language forms and the manipulation of linguistic units".

Herriman and Tunmer (1983) observe that language processing metalinguistic operations that are different from normal are not automatic. Their model predicts that phonological awareness and word awareness are more important in the early stage of reading (acquisition of decoding skills), but that thereafter form and pragmatic awareness become more important, when the emphasis shifts to comprehension of text. Others (Homer, 2009; Kurvers, et al., 2006; Morais & Kolinsky, 2004; Ravid & Tolchinsky, 2002) also indicate that metalinguistic awareness is not a single skill, but includes several abilities each related to a particular aspect that is assumed to be the object of reflection. As a result, the number of abilities that fall under the label of metalinguistic awareness has grown. Several authors (Groot et al., 1995; Nippold, 1998; Schecter and Broughton, 1991; Winner & Gardner, 1993) refer to the connection

between metalinguistic awareness and metaphor processing by children and, according to Nagy (2009), a relation also exists with reading comprehension. The general view is that better metalinguistic skills support metaphor processing, as I will discuss in more detail in section 3.2.

It should be stressed that metalinguistic development is promoted by the increasing complexity of literacy tasks and activities that students face in school and that it proceeds into adulthood (Berman, 2004, 2007; Ravid & Tolchinsky, 2002). Peskin and Olson (2004), for example, observe that young children show competence in taking into account both the surface form (what is said) and the intended meaning (what is meant), but a higher level of understanding, such as that required for interpreting poetic discourse, is difficult to achieve even for adolescent students.

Advanced interpretation and use of non-literal language

Several authors indicate an age-related improvement of the understanding of figurative language, such as Gibbs (1994), Vosniadou (1987a), Vosniadou et al. (1984), and Winner (1995) for metaphors, Cain et al. (2009), Gibbs (1987), Levorato and Cacciari (1995) for idioms, and Ackerman (1986) and Crespo et al. (2007) for irony. Even young children show understanding of metaphorical language that matches their naturalistic contexts. Keil (1986) found, for example, that even preschool children demonstrated an understanding of some metaphors, such as “*the car is dead*”, but not of others, such as “*the idea bloomed*”. As children grow older, this understanding increases further, as I will discuss in detail in Chapter 2.

Gibbs (1987, p. 569) showed a similar age-related trend in the comprehension of idioms, where younger children (kindergarten and 1st graders) were able to give the intended meaning of syntactically frozen idioms (e.g. *turn back the clock*), but had difficulties with idioms of other syntactic forms (e.g. *lay down the law*). Older children (3rd and 4th graders), by contrast, were able to explain different types of idioms equally well, particularly if supportive context was provided. Other authors (Cain et al., 2005; Cain et al., 2009) agree with this age-related development, but stress that this also depends to a considerable extent on other factors, such as text processing skills and reading comprehension.

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Perner (1999) posits that children begin to understand irony when they are 6 to 8 years old. However, as indicated by Olson (1994), this is not a universal development, as older children (8 - 10 years old) and even some adults may have difficulties with understanding irony. Interpreting irony demands the elaboration of second-order inferences to identify the beliefs or intentions of the speaker/writer. Second-order inferences refer to the thought about another person’s beliefs or intentions (Colston & Gibbs, 2002; Perner, 1999; Perner & Wimmer, 1985; Winner & Gardner, 1993). A typical example of second-order belief or thought is a kind of reflection like “*John thinks that Mary thinks that...*” (Perner & Wimmer, 1985, p. 437).

Whereas understanding of figurative uses of language in general seems to increase with age, it is also affected by other factors. Cameron (2003) indicates, for example, that linguistic, conceptual and discourse factors influence children’s metaphor interpretation. In her study (2003) she found that the linguistic form of a metaphor affected its processing: verbal metaphors were noticed less than nominal metaphors and prompted less accurate interpretations, which she relates to the greater flexibility in meaning of the verbs. Metaphor interpretation may also fail due to lack of or insufficient conceptual knowledge of the domains involved. In relation to discourse Cameron (1996, 2003) mentions inaccurate interpretation of metaphors due to difficulty in making proper use of discourse context as well as possible differences in the complexity of mappings required to comprehend what she calls ‘scientific metaphors’ and ‘poetic literary metaphors’. Concerning the latter, Peskin and Olson, (2004) found that interpretation of metaphors used in poetic discourse was very challenging even for adolescents. The potential influence of such factors makes it relevant to not only explore the effect of school grade in recognition and comprehension of metaphor but also the influence, for example, of reading comprehension of children, linguistic form and types of discourse, as will be discussed in Chapters 3 and 4.

Development of discursive skills

One of the main changes in language development beyond childhood occurs in the use of extended discourse (Berman, 2007; Berman & Ravid, 2009; Karmiloff-Smith, 1986; Tolchinsky, 2004). Karmiloff-Smith (1986, p. 474) states that the remarkable characteristic of later language development is the “gradual functional shift” in the use

of the linguistic categories as “organizers of coherent and cohesive text”. She presents a study with 4- to 9-year-old children and observes, for example, that although children under 5 year old produced well-constructed narratives (coherent, cohesive, correct syntax, without lexical and gender errors) their constructions were more of “a series of juxtaposed utterances” than a “single unit”. She states that the main difference between narratives from young and older children is that the latter organize their text around a “thematic subject constraint” (for instance, around one of the characters of the story).

The evolution of children’s narratives to more structured constructions is also pointed out by Berman (2007). She observes that studies in different languages indicate that children around the age of 9 to 10 have better consolidated narrative schemas in oral productions and in their written stories. This process of growing narrative proficiency continues over the years of adolescence and results in a richer elaboration of text with age and schooling (Berman & Nir-Sagiv, 2004; Jisa, 2005; Jisa & Viguie, 2005; Tolchinsky et al., 2005). An important part of this growth seems to be established in high school, as Berman and Ravid (2009) found stronger differences between junior school (12-13) and high school (15-16) than between junior and the younger age group (9-10).

The emerging picture is that discursive skills have a long developmental path (Berman, 2007; Tolchinsky, 2009), which is already manifested in conversational interactions with child-caretakers, for example, as well as in narratives and the production of formal texts related to discussion of topics (e.g. essays, persuasive writings) (Berman, 2007). This increasing discursive development clearly demands that children have not only a repertoire of linguistic structures but also the knowledge about different types of discourses in order to understand and produce language (including metaphorical uses) that is appropriate to diverse communicative contexts and purposes.

From this section it can be concluded that the school period is crucial for language development and leads to important changes in lexical and syntactic knowledge, discursive skills, advanced interpretation and use of non-literal language, as children increase their lexicon, learn multiple and more abstract word meanings and advance in their metalinguistic awareness. These advances allow children to better reflect upon language and to become better at understanding figurative language, including recognition and interpretation of metaphors. Language development, however, is not uniform, and important

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differences exist even among children of the same school grade. Age is, therefore, not the only relevant child-related factor to take into account when exploring potential differences in recognition and comprehension of metaphor. It is also important to acknowledge that other factors that are not directly related to the child may influence differences among children, including metaphor related aspects, which I will explore further in section 1.4. I will now turn to factors that may be important in influencing later language development and will also explore whether this may create differences between children of the same age group.

1.2.2 Factors promoting later language development

Even before entering school, children have some experience with reading and writing. In school, however, they are exposed to a more systematic and focused process, which helps them to increase their proficiency with language (e.g. Berman, 2007; Homer, 2009; Nippold, 2004; Ravid & Tolchinsky, 2002). In this section I will discuss main factors involved in the language development of children in their school period, which include cognitive development, the schooling process and out of school activities (Astington, 1998; Berman, 2007; Kuhn & Franklin 2006; Kuhn & Pease, 2006; Nagy, 2007; Nippold, 2004). I will explain why important differences may exist among children of the same age group, which may influence, among others, their ability to understand metaphors. I will conclude with the suggestion that reading comprehension may be a very useful indicator to reflect such differences.

Cognitive development

Learning a native language and communicate with others is one of the major achievements in the cognitive development of young children. This ability develops through social interaction of the child with people in its daily environment (Oates & Grayson, 2004; Rogoff, 1998). Whereas a review of the different theories that exist about cognitive development is beyond the scope of my dissertation, it is important to note that several of these theories claim that cognitive development is characterized by both quantitative and qualitative change over the primary school years and beyond (Kamhi & Lee, 1988), which may count for differences even among children of similar age and their performance with metaphor.

Kuhn and Franklin (2006) state that for most children cognitive skills develop in a similar age-bound way in early childhood, although differences may arise among them.

In middle childhood (approximately 6 to 12 years of age), however, the situation changes, as in this period development depends much more on the individual experience of children. This results in a large variability in cognitive achievements among children and between them and adults, with some children matching, or even outperforming several adults on different reasoning tasks (Kuhn & Franklin 2006; Kuhn & Pease, 2006). This is important for my research, as it implies that cognition levels may differ considerably among children of the same school grade.

Cognition and language learning are closely related and interact with each other. Gentner (2003), for example, indicates that learning language symbols provides a basis for structuring knowledge. If an analogy pattern is found by someone and registered, then this knowledge is available to make sense of other analogies. In turn there are also some aspects of cognitive development that seem to have considerable relevance for later language development and for understanding figurative language. One of these, with particular importance in connection to metaphor, is the improvement in abstract thinking. Nippold (1998) suggests that the reasoning of school-age children and adolescents shows their increasing ability to think more abstractly than younger children. This allows them not only to acquire abstract concepts but also to use and understand them, a process that is supported by the increase in socio-cognitive abilities. This position, however, is not unchallenged. Keil (2006), for example, agrees that clear changes occur when children grow up, but this may not have much to do with their ability to grasp abstract relations. He poses that a reason for younger children not being able to explain metaphors in which abstract relations link the two domains may not be the result of a weaker abstract ability, but a limitation in explicitly talking about abstract relations. He also indicates that limitations in domain knowledge may play a role, stressing the domain specificity of cognitive strategies, with children doing better in domains they are familiar with. Hence it seems that it cannot be confirmed at this stage that the difference in performance between younger and older children results from differences in their capacity for abstract thought, but may be caused by other factors as well.

Schooling and out of school environment

Schooling plays a major role in later language development, but it also interacts with the home environment, which still leads to considerable differences among children of the same age group (Astington, 1998; Nagy, 2007). Children coming to school are mainly looking for meaning (what is said) and do not look at text for form (the properties of text). Schooling, then, helps the child to make a transition when they learn to talk about text and to question it. They come to understand that printed words are a representation of the world that allows reflection about the real world and they obtain metalinguistic knowledge about language by learning to distinguish letters, words, sentences, etc. (Olson & Pelletier, 2003). Nippold (2004) stresses the importance of an active analysis –that includes metalinguistic reflection– about written texts and spoken discourse. This is a relevant part of schooling, although children may already have (part of) these metalinguistic insights through oral games and other activities with parents and peers before coming to school (Olson & Pelletier, 2003). Nevertheless, according to Nagy (2007) differences in insights among children do not necessarily become smaller in the first years of schooling as most teachers do not adopt specific strategies to reduce them.

Another point about schooling is that as children advance in their school grades they encounter words with more abstract meanings and of low frequency use (from both the lessons in the classroom and in the textbooks) in addition to richer syntactic constructions that are significantly more common in texts than in casual spoken contexts (Nippold, 1998; 2004). As noted by Berman (2007) and Nippold (2004), school tasks in reading and writing different types of text (e.g. narrative, expository, argumentative, and descriptive) give opportunities to children to reflect about what they read or hear, thus increasing their potential to process metaphor. Schooling exposes children to different genres, which is important to help interpret language, but this may also be influenced strongly by activities their out of school environment, such as reading, writing, watching television, playing games, participation in social interaction within the community, and conversational experiences at home (Garton and Pratt, 2009). Some (often middle and higher class children) may be exposed to more genres than other children, who may have to learn most at school (Olson & Pelletier, 2003).

Reading and writing

For school-age children written language becomes an important source for the development of language (Berman, 2007; Nippold, 1998, 2004; Tolchinsky, 2004). Speech has a lesser influence as it is often of much lower lexical quality as compared to written language (Cunningham & Stanovich, 2001). Around the age of 8 to 10 (3rd or 4th grade of school) children have advanced in their reading skills and are able to read more independently (Nippold, 1998, 2004; Olson & Pelletier, 2003; Ravid & Tolchinsky, 2002). This has a favourable effect on their ability to select and focus on their interests (the fields and topics they would like to know more about) and on increasing and specialising their vocabulary. Having a higher level in reading also facilitates the analysis of the structure and functioning of the language itself, promoting a more advanced metalinguistic awareness, vocabulary, syntax, and understanding of figurative language (Berman, 2007; Nippold, 1998, 2004; Ravid & Tolchinsky, 2002).

Reading and writing contribute to the growing understanding of the relation between form and meaning, which, for example, favours reflection over metaphorical uses (Olson & Pelletier, 2003). Writing facilitates more conscious thinking about formal aspects of language and its uses when children have acquired the basic writing skills (e.g. Nippold, 2004; Olson & Pelletier, 2003; Tolchinsky, 2004). Reading practice may differ considerably among children, as indicated by Anderson et al. (1988), who found important differences in the volume of independent reading (e.g. newspapers, magazines, mail) by 5th graders. As a result, children of the same age school groups may show a considerable variation in language development, as better and more frequent readers may make more progress, since words are more easily added to their knowledge base by repeated exposure, for example (Nagy, 1997).

In conclusion, cognitive development, schooling and social life, and experience with written language are important factors that contribute to and interact with later language development in the school-age period. These factors may not affect children of the same age in a similar way, as language skills and cognitive development may vary considerably among them when they come to school. Most educators do not take such differences into account in their teaching programmes and therefore differences in language development do not necessarily get smaller during the school years. Out-of-school activities and the home environment may also differ considerably among children, which may

add to the diversity. The proficiency in reading and writing that emerges in the school period is very important, as it turns children into independent readers that can decide to read topics of their choice. This is yet another reason that may lead to considerable differences among children in the same grade. It is therefore imperative to adopt another indicator, in addition to school grade, that may be used to differentiate children in the context of my research. Reading comprehension seems to show potential in that respect, as I will discuss in the next section.

1.3 Reading comprehension and later language development

In the first two sections of this chapter I have shown that the school period is very important for the linguistic and cognitive development of children, but that this does not affect them in a uniform way. Some benefit more, develop stronger linguistic skills and adopt a broader knowledge base than others. I have also explained differences that exist in the curricula of children from 3rd and 5th grade in Colombia. Based on this situation it may be expected that important age-related differences will exist, as well as differences among children of the same age. In this section I will explore how this relates to reading comprehension and whether a reading comprehension test might be an option to be used as an indicator to differentiate linguistic skills among children.

Reading comprehension can be understood as “an active and complex process that involves understanding written text, developing and interpreting meaning, and using meaning as appropriate to type of text, purpose and situation” (NAGB, 2008, p. 2). Several authors (e.g., Cain, 2009; Cain & Oakhill, 2007; Perfetti, 1999; Perfetti et al., 2005; RAND, 2002) stress that readers build a mental representation of a text message using different processes at multiple levels. The reader must look at the surface level of representation and retrieve the meaning of words (lexical processes) and combine these into sentences (syntactic processes). To understand the meaning of the text the reader needs to go further by relating the separate sentences and making inferences to fill in missing details, building on the reader’s conceptual knowledge and experience. During this process skilled readers monitor whether their comprehension makes sense, and when the latter is not the case, the reader can take steps to solve the problem. Understanding story

structure, inference making, and comprehension monitoring are essential for higher level comprehension of text (Cain & Oakhill, 2007; Oakhill & Cain, 2012; Perfetti et al., 2005). The skills to construct meaning vary considerably among and even within readers, depending on age, experience, schooling, linguistic context and knowledge of conceptual domains.

Graesser et al. (1997) make a reference to two levels of processes that seem particularly relevant: the communication level, at which the author is trying to clarify ideas to the reader, and the text genre level, which concerns the type of genre (e.g. narration, description, and journalism). Taking into account the difference between readers indicated above it seems plausible to assume that skilled comprehenders may also be more aware of the communicative dimension of the text. In this context it is also interesting to refer to the work of Beck et al. (1996) who have developed a training approach that is called Questioning the Author, which, for example, resulted in children becoming better at text comprehension. Furthermore, better comprehenders may also have more insight into a larger number of text genres. Perfetti (1994) mentioned the importance of knowledge of text structures and genres for text comprehension and indicated that reading experience greatly contributes to enhancing this knowledge. Oakhill and Cain (2012) confirmed this view based on a longitudinal study that among others showed considerable differences between poor and good comprehenders.

According to the “simple view of reading”, reading comprehension can be viewed as a function of two components: i) decoding and ii) linguistic comprehension and both are needed for making reading successful (Hoover & Cough, 1990). Decoding is defined in this concept as efficient word recognition, which involves obtaining “a representation of the printed input that allows access to the appropriate entry in the mental lexicon, and thus, the retrieval of semantic information at the word level”. Linguistic comprehension is “the ability to take lexical information (i.e., semantic information at the word level) and derive sentence and discourse interpretations” (1990, p. 130-131). Adlof et al. (2011) explored the relative influence of the two components on reading comprehension and found that the correlation between word reading (tested by asking children to name pseudo-words) and reading comprehension (tested by asking children questions about a story they read) reduced as they grew older. They found that in 4th grade some 18.8% of difficulties in reading comprehension were associated with

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problems with word reading whereas in 8th this reduced to 0. This is an important finding in relation to my research, as it suggests that possible differences in reading comprehension between 4th and 6th graders depend much more on differences in linguistic understanding than on word reading.

A more comprehensive approach to reading comprehension was developed by RAND (2002), which also is supported by more recent authors such as McNamara and Kendeou (2011) and McNamara and Magliano (2009). The approach takes three main aspects into account:

- *The reader who is doing the comprehending*, which requires a range of skills and abilities including cognitive capacities (such as memory, analytical ability and inferencing), motivation, and knowledge (e.g., vocabulary, domain knowledge, and linguistic and discourse knowledge).
- *The written text that is to be comprehended*, which can be easy or difficult for the reader depending, for example, on the content, the vocabulary, linguistic structure, discourse style and genre. It is the interface with the reader that makes it easy or difficult to construct mental models of the text.
- *The activity of which comprehension is a part*, which includes the purposes, processes, and consequences associated with the act of reading. The purpose of reading may be self-initiated, but also imposed by a teacher. In the latter case it may make a difference to the energy the reader will put into text comprehension, and to whether the reader readily accepts the assignment, or does not, which then may result in incomplete comprehension.

Whereas the combination of these aspects has not been tested, several studies are available that show the relevance of the reader, the text and the activity for reading comprehension of children. Authors such as Adlof et al. (2011), Brandão & Oakhill (2005), Cain & Oakhill (2006a), Oakhill et al. (2003), Oakhill et al. (2005), Oakhill & Cain (2012), Verhoeven et al. (2011), and Zipke (2007) have explored the relation between different reader skills and reading comprehension. The second aspect has been studied independently and in most studies also in interaction with the reader (e.g. Best et al., 2006; Best et al., 2008; McNamara, et al., 1996; McNamara et al., 2011). The influence of the reading activity on reading comprehension is explored by fewer authors, including for example Anderson et al., (1988) and Cain (1999). All these studies use

one or more tests to measure reading comprehension of different age groups.

The act of reading interacts with the reader in that it contributes to making changes in the abilities and knowledge of the reader. Motivation is an important factor, as this may lead to readers being more alert when reading, but may, for example, also result in some children being more eager to read outside class. Reading comprehension skills are influenced by contextual factors, such as the home environment of the children, but also the neighbourhood of the school, as it is well known that schools in low-income areas may have less means and less skilled teachers than schools in better off areas (RAND, 2002).

A finding that emerges from these studies is that differences exist in reading comprehension between different age groups, but also between children of the same age. The latter has important potential for my research, as reading comprehension may be a good indicator to establish differences in language development among children and can be tested in a relatively simple way. This will provide a solid basis for comparison between children in the same and different school grades in their performance on metaphor recognition and interpretation.

1.4 Metaphor recognition and interpretation by children

In the first sections of this chapter I have shown that the linguistic skills and the cognitive development of children in the school period are not uniform and interact with their reading ability. I have argued that reading comprehension may be a good indicator to reflect possible differences in these skills among children of the same school grade. I have also shown that differences in reading comprehension are associated with factors related to the reader (abilities, knowledge, goals, and motivations), but also the text, and the activity in which reading takes place. I expect that these differences may have an effect on metaphor recognition and interpretation.

One aspect related to the reader that requires special attention, particularly in connection with metaphor recognition, is the relationship between metalinguistic awareness and reading comprehension. Nagy (2007, p. 62) posits that metalinguistic awareness has a correlation with reading comprehension and that the metalinguistic aspects of reading comprehension are not limited to understanding word meanings, but

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also entail comprehension monitoring of linguistic form, which characterizes many “subtleties of meaning – style, sarcasm, metaphor, and mood”. Different authors (e.g. Yuill, 2007, 2009; Zipke, 2007, 2008; Zipke et al., 2009) have pointed to the relationship between reading comprehension and a particular aspect of metalinguistic awareness, namely the understanding of the possibility that a word or sentence can have more than one meaning. Zipke (2007, p. 129), for example, concludes that “understanding that words and sentences can have more than one meaning improves comprehension by allowing readers to think flexibly”. This conclusion is based on research with 6th and 7th graders using structural riddles and ambiguous sentences differing in the source of linguistic ambiguity.

This understanding of the possibility of multiple meaning is crucial to be able to recognize and provide richer interpretations of metaphors, as this requires the differentiation between the basic meaning and the meaning of metaphorically used words in the linguistic context. Because of the relationship between reading comprehension and metalinguistic awareness (Gombert, 1992; Nagy, 2007), it may be expected that children with a higher level of reading comprehension have also gained more metalinguistic awareness and are better at comprehension monitoring. As a consequence, they may be more aware of linguistic form, and this in turn may affect their recognition of metaphors and perhaps also their interpretation. This possible effect of reading comprehension on metaphor recognition and interpretation is one of the central pieces of my research and I am aware of only two studies that have looked at this relation. Pickens, Pollio and Pollio (1985) found a positive correlation between reading comprehension and metaphor comprehension of children in group 3 to 7 (approximate age 8 to 12 years) but did not look at possible differences within this broad group. The other study was done by Ripoll-Salceda and Aguado-Alonso (2007), who found a relationship between reading comprehension and the written explanation of metaphors by 2nd graders (approximately 7 years old). It may be concluded that positive indications of the relation between reading comprehension and metaphor recognition and interpretation seem to exist, but as I will demonstrate in the overview of metaphor research with children presented in this section, it is important to look beyond child related factors and also explore the influence of linguistic and discourse aspects.

Metaphor research with children became popular in the 1970s, particularly among psychologists exploring the developmental changes in metaphor interpretation, and to a lesser extent in metaphor production. In interpretation studies children were asked to explain metaphors of the form *A is B* such as: *Hair is spaghetti; clouds are flying ice cream* (Billow (1975, p. 416) and *the smell of my mother's perfume was bright sunshine* (Winner et al. 1976, p. 291), but some also used other linguistic forms such as adjectives: *she has pearly teeth* (Billow, 1975, p. 416). These metaphors were presented without a linguistic context, showing that the emphasis was put on the skills and performance of children and not on text processing. The main view resulting from this first period was that child development is a stage-like process in which the ability to interpret metaphor develops later in childhood, as the research at that time showed that young children were not able to properly explain metaphors.

In the 1980s and 1990s the main focus of the research in metaphor interpretation remained on the analysis of the cognitive abilities of children. However, the emphasis was placed on methodologies that were more suitable for younger children, such as multiple choice and enactment (e.g. Reynolds & Ortony, 1980; Vosniadou et al., 1984; Vosniadou & Ortony, 1986; Waggoner et al., 1997). A considerable number of these studies included metaphors in short stories developed for the research and some, such as Siltanen (1989), explored the effect of the length of the story on metaphor interpretation. The results of these studies changed the overall perspective by indicating that young children were also able to understand metaphors, provided the child had the necessary domain knowledge. The influence of the latter was shown in particular by Keil (1979, 1986). The research also pointed to the influence of a supportive linguistic context on metaphor comprehension. One emphasis in this period was the exploration of possible differences in interpretation of metaphors depending on the type of mapping that was required between the two different domains involved. Three main types of links were established (perceptual or attributional, e.g., *the sun is like an orange*, Gentner, 1988, p. 50; relational, e.g. *a tire is a shoe*, Gentner & Stuart, 1984, p. 8; and psychological, e.g., *a soft person*, Schecter & Broughtfon, 1991, p. 119). Research findings, however, were not conclusive about possible age related effects of these different types of links (Cameron, 1996, 2003; Gentner, 1983; Winner, 1988).

One prominent form of nominal metaphor (*A is B*) was the dominant stimulus in research. Broderick (1992), however, pointed out that this is a

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limitation, since this type of linguistic form was not frequently encountered in a series of popular children books that he reviewed. Colston and Kuiper (2002), reflecting on this finding, indicate that although testing children with metaphors developed by adults and not using those encountered in the literature or daily talk of children in itself is fine, this may lead to an underestimation of the true ability of children to make sense of metaphor. It can be argued that this makes it relevant to pay more attention in metaphor research to the linguistic contexts children are exposed to in real life, such as children's literature, science texts, children's movies, TV programmes, and spoken language, as well as the linguistic form of the metaphorical sentences.

Only few authors have looked at metaphors with other linguistic forms. This includes Reynolds and Ortony (1980), who explored differences in interpretation between metaphors and similes, and Winner et al. (1980), who investigated understanding of the same metaphor expressed in different syntactic forms, including similes. As far as I am aware, it was not until much later that a study examining linguistic form reappeared, when Cameron (2003) explored interpretation of both nominal and verbal metaphors and found differences in their processing. What emerges from this limited research is that linguistic form is not a marginal factor in processing, particularly of nominal and verbal metaphors. I will discuss this in detail in Chapter 4, where I will explore the literature about metaphor-related factors that may influence recognition and interpretation of metaphors. There I will also look at conventionality of the metaphor, as this seems to have a role on metaphor processing (Bowdle & Gentner, 2005; Gentner & Bowdle, 2001, 2008).

Similar to the limited attention for the linguistic dimension of metaphor in research with children is the exploration of their competence with metaphor in real language use. To my knowledge, Cameron (2003) is the first researcher that makes an analysis of the nature and use of metaphors in discourse, investigating classroom discourse and science texts, and who puts genre on the research agenda concerning children and metaphors with her study of the analysis and understanding of metaphor in science texts. This situation is quite different for adults, where research includes, for example, exploration of the influence of two genres, literature and journalism, on metaphor processing (Steen, 1994), and the research on discourse analysis (e.g. Cameron, 2007; Herrmann, 2013; Krennmayr, 2011; Semino, 2008; Steen et al., 2010).

The emphasis in the research on child development using fabricated materials, mostly single sentences, instead of metaphor in natural discourse may explain why so few studies exist about metaphor recognition by children. The first experimental study looking into metaphor recognition that I am aware of is Groot et al. (1995) who indicated that children of 6 years of age could recognize some metaphors that had been put at the end of a brief text and provided a sharp contrast with this text. Yet it is almost 10 years later when Cameron (2003) takes a more comprehensive linguistic cognitive approach in her research looking at metaphor use in discourse with children, where she established, for example, that children reading some science texts were aware of some metaphorical uses.

Another gap is the lack of research on the understanding of authorial intentions in metaphorically used language. Whereas some studies (e.g. Olson, 1997; Winner, 1988; Winner & Leekam, 1991) have been done with other types of figurative language, which make it plausible to assume that children develop the ability to understand authorial intentions particularly in the school period, this has not been done with metaphors. Olson (1997, p. 497), for example, concludes from his own research and a literature review, which looks among other things at how children cope with sarcasm and irony, that the ability to understand authorial intentions emerges in stages. Initially, around the age of 5 “what is meant is taken to be what the speaker thinks” and only later around the age of 10 children “could report what the speaker wanted the listener to think”. But he also stresses that, whereas 8 or 9-year-old children have the basic language concepts for making inferences, assumptions, warranted and true assertions, and false beliefs, there may be important individual and cultural differences among them in their ability to understand and reflect upon language. Children with better understanding of the type of discourse are likely to be better at discovering authorial intentions as this may give clues how to take the text for example as facts, assumptions, promises, etc. (Olson & Pelletier, 2003).

What is emerging from this section is that metaphor research with children has been dominated by developmental psychologists who constructed specific research materials instead of exploring metaphor in natural discourse. Their research focused primarily on looking at the abilities of children to interpret metaphors and hardly at their skills at recognizing them. I have pointed out that metaphor recognition is a neglected area in research with children. Steen (2004, p. 1296) stressed

that understanding factors that may contribute or inhibit metaphor recognition “may be helpful to second and foreign language learners, and it may also be relevant to text design” and I would add to this that it may also be useful to school-age children as first language learners (for reading comprehension development but also for text production). I fully agree with his point that metaphor recognition deserves more attention, as “language users may need to know a metaphor when they see one in order to improve the quality of their monitoring of metaphorical and non-metaphorical language use”. What also emerges is that child-related factors, and particularly reading comprehension, deserve attention as a possible predictor of the performance of children with metaphors. It is equally important to explore the effect of metaphor-related factors such as the linguistic dimension and conventionality, as well as the class of discourse in which the metaphors are embedded.

These findings raised my interest to analyse the recognition and interpretation of metaphors by children in text processing looking at different school grades and levels of reading comprehension, whilst also exploring the effect of different types of metaphors embedded in different types of texts. I decided to use linguistic materials from the school environment of the children involved in my research, as I will explain in more detail in my research objectives in the next section.

1.5 Purpose of the research and research questions

In the previous sections I have discussed the main characteristics of and factors relating to the cognitive and linguistic development of school-age children, and have shown that important age-related differences exist, as well as differences between children of the same age. These differences depend not only on cognitive and linguistic development resulting from activities in the school, but also on out-of-school experience. I have argued that reading comprehension might be a good indicator of such differences that may be of relevance to recognizing and interpreting metaphor in texts. I have briefly presented the school system in Colombia, looking particularly at Spanish language teaching, where figurative language receives limited attention in primary school, suggesting that this is not potentially an intervening factor in my research, but also implying that the reflection on language uses required

for metaphor recognition and interpretation is not likely to be common practice for the participants in my research.

I have also presented an overall picture of metaphor research with children, which has been dominated by developmental psychologists who have paid particular attention to the ability of children to interpret metaphors. Their studies showed that this ability generally seems to increase with age. Therefore, it may be expected that older children are able to provide richer and more complex interpretations of metaphor, but the research findings are not sufficiently clear on whether this follows a “pure developmental pattern (i.e., as you get older, you get more of it or better at it)” (Pearson et al. 1992, p. 158), or is also influenced by other factors and in particular by language comprehension. The latter is likely to be the case, taking into account the important differences that exist in language and cognitive development among children of the same school grade. It may be expected that such differences do indeed have an influence when children are trying to make sense of a text with metaphors.

The research to date has some limitations, as stressed by Broderick (1992), in that it mostly used metaphors that were not selected from the children’s daily life and the literature they could access, but which were mostly established for the research by adults and, at best, included an invented linguistic context. This may, in fact, lead to an underestimation of the real capacity of children to interpret metaphors (Colston & Kuiper, 2002). What also emerges is that very little attention has been paid to metaphor recognition in research with children, whereas this is an important aspect that may contribute to better understanding and production of text. Not only child-related factors need to be taken into account, but also the influence of metaphor-related factors such as linguistic form and conventionality, as well as the type of discourse in which the metaphors are embedded.

My overarching idea is that a more comprehensive approach is required in the analysis of metaphor processing by children that can benefit from research experience with adults and recent theoretical developments, such as the “new contemporary theory” of Steen (2011a) in particular, who proposes a three dimensional model that comprises three different, but related angles to study metaphor: language, thought and communication, as I will discuss in detail in Chapter 2. This model stresses that the processing of metaphors is affected by the properties of metaphors in terms of their linguistic form, their conceptual structure (conventional versus novel) and their communicative dimension (i.e.,

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whether they are used deliberately or not). These potential influences strengthened my idea to investigate the effect of linguistic form by looking at the most prominent nominal form of metaphor (*A is B* metaphors) and verbal metaphors and also to explore the influence of conventionality on metaphor recognition and interpretation. It also called my attention to the need to look at the possible influence of the communicative dimension, i.e. whether a metaphor is perceived as deliberate, when interpreting my results. Another main conclusion from the preceding sections is that metaphor research with children also has to take into account the point made by Krennmayr (2011, p. 12) that “to develop a deep understanding of metaphor, it is necessary to move beyond invented examples and decontextualized materials”. Hence, in the case of school-age children it can be argued that it is particularly important to look at literary and science texts, because they are types of discourse they frequently use at school.

Against this background I have formulated the following overall goal for my research: *to gain further understanding of the way in which children, with low and high reading comprehension levels and from two different school grades, when reading texts from literature and science, recognize and interpret metaphors that vary in their linguistic form and conventionality.* In relation to this goal I have developed the following research objectives:

Research objective 1. To establish whether there are differences in explicit metaphor recognition between children from two school grades and two levels of reading comprehension and the possible influence of linguistic form, metaphor conventionality, and domain of discourse using nominal (*A is B*) and verbal metaphors selected from a sample of children’s literature and science textbooks. This research objective is explored through the following specific research questions:

- (1) To what extent do children from 4th and 6th grade differ in their explicit recognition of metaphors?
- (2) What is the relationship between the level of reading comprehension of children and their explicit recognition of metaphors?
- (3) What is the difference in explicit recognition of nominal (*A is B*) and verbal metaphors?

- (4) What is the influence of metaphor conventionality on explicit metaphor recognition?
- (5) What is the difference in explicit recognition of metaphors in literary and science text by children from 6th grade?

Research objective 2. To determine whether there are differences in metaphor interpretation between children from two school grades and two levels of reading comprehension and the possible influence of linguistic form and metaphor conventionality, using the same metaphors as mentioned above. This objective is explored through the following specific research questions:

- (1) To what extent do children from 4th and 6th grade show differences in their interpretation of metaphors?
- (2) What is the influence of reading comprehension on interpretation of metaphors?
- (3) What is the difference in interpretation of nominal (*A is B*) and verbal metaphors?
- (4) What is the influence of metaphor conventionality on interpretation of metaphors?

1.6 Outline of the dissertation

In this first chapter I have provided the framework of my research, including information about the school system in Colombia, and the main characteristics of and important factors in later language development, also connecting it with reading comprehension. At the end of the chapter I introduced my research theme of metaphor recognition and interpretation by children, showing an overview of research in this area. I ended the chapter with a presentation of my research objectives and research questions for the experimental studies that are reported in this dissertation. In Chapter 2 I will discuss metaphor processing and give an in-depth analysis of metaphor recognition and interpretation. In Chapter 3 I address a set of child-related factors that influence metaphor recognition and interpretation, particularly knowledge of conceptual domain, metalinguistic competence and use of linguistic context. This

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chapter includes findings obtained in research with children, and I also discuss reading comprehension not only as a factor of influence, but also as a potential indicator for metaphor competence of children. In Chapter 4 I focus in another part of the theory, which deals with factors that are related to the metaphors themselves, taking into account their linguistic dimension (linguistic form), conceptual dimension (conventionality) and communicative dimension (deliberateness).

In Chapter 5 I turn to my exploratory studies, first of all to the selection of my participant groups and the research material. I first report on the identification of the school grades and the reading comprehension study, presenting the results of this test with 469 children. This is followed by a description of how these results were used to identify the participants for the experimental studies of metaphor recognition and interpretation. Subsequently, I present the framework I adopted for the identification of metaphorically used language, which I applied to a selection of 34 children's books comprising two different domains of discourse: literature and science. I complete this chapter with the presentation of the 38 metaphors from literature and the 18 from science that I selected for my research and the way I established the conventionality of these metaphors. In Chapter 6 I discuss the behavioural study on metaphor recognition carried out with 98 children in the 4th and 6th grades, after having tested my methodological approach with 12 children. This is followed by Chapter 7, which presents the behavioural study on metaphor interpretation with 65 children. In Chapter 8 I draw the findings from the studies together, link these with contemporary theory, present my conclusions, and give suggestions for further research in this challenging area.

2. Metaphor processing: recognition and interpretation

Traditionally metaphors were seen as a linguistic oddity with little interest for linguists, psychologists, anthropologist and other researchers. With the development of the conceptual metaphor theory of Lakoff and Johnson in the 1980s, however, the situation changed dramatically, when it was recognized that metaphors play an important role in cognition. This initiated a proliferation of studies from different academic disciplines, which has deepened our understanding of metaphors. Research moved from the analysis of isolated phrases to using a range of analytical techniques to explore metaphor in language and thought, including the influence of context on metaphor use and understanding. It also covers very different areas, including teaching and learning, art, gesture and music, and shows the importance of metaphor in everyday life (Gibbs, 2008).

Although the scope of metaphor studies has become much wider in recent years, this has not affected the general definition of metaphors. Many authors, including Cameron (1996, 1999a) Gibbs (1994), Vosniadou (1987a), and Steen (1994, 2007), seem to agree with the widely quoted phrase of Lakoff and Johnson (1980, p. 5) that “the essence of metaphor is understanding and experiencing one kind of thing in terms of another”. There is also agreement on the point that metaphors bring together two different domains that are more or less distinct, but this difference can be made sense of when they are put together (juxtaposition). For example, in the sentence *my mind is a bit rusty*, the addressee is invited to compare the mind with a machine made of steel, and to construct the entailment that the mind is functioning slowly (Steen, 2007).

Lakoff and Johnson (1980) posit that metaphor can be understood as a mapping between two distinct conceptual domains (a source and a target domain). The mapping itself may not be straightforward and may include what Gibbs (2008) refers to as embodied simulations. An example of this is the metaphor *a teacher is a fisherman* (2008, p. 174), which may trigger a process in which a reader visualizes what it might be like to be a fisherman and use these ideas to help make sense of the metaphor. The claim of Lakoff (1993) and Lakoff and Johnson (1980) that conceptual mappings are required to understand metaphor has been

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very central to the development of studies about metaphor, but needs further precision.

Thus, the Career of Metaphor Theory (Bowdle & Gentner, 2005; Gentner & Bowdle, 2001, 2008) suggests that novel metaphors are made sense of by comparison between the source and target domain (cross-domain mapping), because no pre-stored information is available in the knowledge base of the reader. Over time such novel metaphors become well known in a linguistic community and evolve into conventional metaphors that no longer require cross-domain mapping but are understood by categorization or lexical disambiguation. Glucksberg (2008) supports the view that to understand metaphor both comparison and categorization processes may be employed but suggests that further research is needed to find out when the one is chosen over the other. A well-known example of processing by categorization that he uses is the metaphor *my lawyer is a shark*. This metaphor may not trigger a process in which the reader or listener starts to think of the shark as a fish, but instead they may see the lawyer and the shark as part of the same category of predators, that are vicious and merciless. A question that arises from this in relation to my research is that whereas this example may work in this way for adults, the process may be different for children. When a young child comes across this metaphor it may not have established a category that includes lawyers and sharks, but see this as words belonging to two different domains, which may trigger a process of cross-domain mapping.

Steen (2008, 2011a) argues that research findings suggest that most metaphors in language may not be processed metaphorically, that is by cross-domain mapping. He calls this 'a paradox of metaphor' as it has been widely accepted that metaphor entails cross-domain mapping, but in practice it seems that this may not be the case for most metaphors. He suggests that this paradox can be resolved by looking at the communicative function, i.e., whether a metaphor is produced or received as deliberately metaphorical or not. A deliberate use implies that it has the overt purpose to change the perspective of the addressee to look at the topic from a different conceptual domain. For example, in the case of *Juliet is the sun* (Steen, 2008, p. 222) it is obvious that Juliet cannot be the sun, thus implying a clear invitation to the reader to adopt a different perspective and find the set of attributes of the sun that Juliet exemplifies. According to Steen this is a deliberate metaphor, because it is likely that the reader solves it by comparison, as opposed to non-deliberate metaphor, such as the conventional metaphor *time flies*,

where it can be assumed that the reader is not invited to change his or her perspective. Novel metaphors are likely to be deliberate and to trigger processing by comparison. This is not the case for conventional metaphors, unless they are used in such a way that they prompt the reader to employ cross-domain mapping.

So far I have particularly addressed what Steen (2011a) refers to as the psychological or behavioural approach to metaphor, which concerns the processing of metaphors in the mind and the products that result from this. I will adopt the psychological approach in the part of my research where I explore children's recognition and interpretation of metaphors embedded in literary and science texts. This is different from the semiotic or symbolic approach, which according to Steen (2011a) concerns the analysis of symbolic data to identify, for example, metaphorically used words (Table 2.1). Semiotic research is about what is metaphorical for a linguist analysing metaphors present in speech or text.

Table 2.1
Dimensions and Approaches of Semiotic and Psychological Metaphor Research

Approach Dimension	Semiotic/symbolic	Psychological/behavioural
Linguistic	What is the linguistic form?	Are two distinct senses activated and related?
Conceptual	What is the conceptual structure?	Are two distinct domains activated and related?
Communicative	What is the communicative function?	Is the individual aware of encountering or producing a metaphor?

(Based on Steen, 2011a)

Cameron (1996, p. 52) indicates that linguistic metaphors are “stretches of language that can be identified by an analyst as metaphor according to stated criteria, and that are seen to have the potential to be actively processed as metaphor”. Crucial in this statement is that it refers to potential and not to actual metaphorical processing, and therefore it includes all metaphors. I also use this approach when identifying nominal (*A is B*) and verbal metaphors in texts available in the schools of the children involved in my research, as I will discuss in Chapter 5.

Important progress has been made with the study of metaphor processing. Based on the prevailing definition, analysts may identify many metaphors in language, but Steen (2008, 2011a) claims that it is

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likely that most of these metaphors are not processed metaphorically (by cross-domain mapping). He therefore suggests that it is necessary to look at the communicative dimension of metaphor, i.e., whether its use is deliberate and invites the addressee to change their perspective of the topic referred to in the text. To be able to better understand metaphor recognition and interpretation by children in reading it is necessary to explore the thinking and research about metaphor processing in relation to linguistic form, conceptual structure and the communicative function, which I will do in the next section. Thereafter I will present some research about metaphor recognition and metaphor interpretation with children.

2.1 The challenge of metaphor processing

Gibbs (1993, 1994) presented a fourfold distinction, which gives a good insight into metaphor processing in usage. According to him, “language interpretation takes place in real time ranging from the first milliseconds of processing to long-term reflective analysis” (1993, p. 255) (Figure 2.1). Gibbs (1994, p. 116-117) makes a distinction between four possible moments in the processing of linguistic metaphors and in the subsequent reflection by language users that may occur:

1. “*Comprehension* refers to the immediate moment-by-moment process of creating meaning for utterances. These moment-by-moment processes are mostly unconscious and involve the analysis of various pieces of linguistic information (e.g., phonology, lexical access, syntax), which, in combination with context and real-world knowledge, allows listeners/readers to figure out what an utterance means or a speaker/author intends. [...] Contemporary psycholinguistic research suggests that comprehension processes operate within the time span of a few hundred milliseconds up to a few seconds at most.” (1994, p. 116). For example, readers or listeners will grasp the implied meaning of the metaphor *a good friend is a treasure*, without even being conscious that it is a metaphor. They can understand something like “*a good friend is valuable and has to be safeguarded*”.
2. “*Recognition* refers to the conscious identification of the products of comprehension as types. For example, the meaning understood by a reader of a particular utterance may be consciously recognized as

metaphorical.” (Gibbs, 1994, p. 116). Some readers of the same metaphor indicated above may realize that a difference exists between the basic meaning and the meaning suggested by the metaphor, and thus understand that the writer uses the linguistic expression “to convey a particular message to the reader” (Steen, 1994, p. 102). They recognize the metaphor as they understand that in this case treasure does not mean jewels, gold, precious stones and so on, but refers to a great value, and is a way to talk about the significance of good friends. Readers may even express their awareness and mention, for instance, that there is a comparison or a figurative use of language.

3. “*Interpretation* refers to analysis of the early products of comprehension as tokens. One can consciously create an understanding of a particular type of text or utterance as having a particular content or meaning.[...] This process operates later than comprehension processes and usually requires conscious reflection about what a text or speaker means” (Gibbs, 1994, p. 117). Exploring the same metaphor used in item 1: *a good friend is a treasure*, some readers or listeners may start to reflect about the importance of a real friend and may interpret the utterance as: “*good friends are like a treasure that you do not want to lose, that you really want to preserve*”.
4. “*Appreciation* refers to some aesthetic judgment given to a product as either a type or token. This, too, is not an obligatory part of understanding linguistic meaning, because listeners/readers can easily comprehend utterances or texts without automatically making an aesthetic judgment about what has been understood.”(Gibbs, 1994, p. 117). Steen (1994, p. 122), reporting on his experiment using the thinking out loud method, gives an example: a reader verbalizes a qualification of the metaphor *the bird of prey hung ready over its quarry* by expressing “*Oh my, now we get a very strong metaphor poured over us*”. This statement clearly shows a judgment of the reader about the quality of the metaphor.

For Gibbs (1994, p. 115), “the early moment of comprehension is the immediate process of creating meaning for utterances, whereas the last three moments are the products based on comprehension”. Steen (2011a) suggests that many metaphors may, in fact, be processed unconsciously. Their processing may involve both an immediate

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accessing of the metaphorical meaning in the case of lexical disambiguation or an unconscious recognition of the difference between what is said and what is meant (Figure 2.1). In the latter case the “metaphor may be also decoded and conceptualized with reference to some part of the literal meaning of the vehicle” (Steen, 1994, p. 99) and as a result the reader may unconsciously face the problem that the meaning does not fit with the co-text and/or the context. The ‘wrong’ meaning is then immediately discarded and the reader searches for a metaphorical sense in order to reach a sound interpretation.

This kind of recognition is generally unconscious, because the “mismatch” is solved so fast that it goes unnoticed. This is the classic picture of metaphor processing in cognitive linguistics. The reader may only consciously become aware of the metaphor as a metaphor (explicit recognition) when this process takes longer because the problem is harder to solve, or because in hindsight the reader is struck by the utterance and identifies it as figurative use of language. Steen (2011ab; 2013) clarifies this further by indicating that only deliberate metaphors can “impinge” on the consciousness of the receiver as metaphorical.

Steen (2007) suggests that in the case of lexical disambiguation, multiple word meanings are accessed at the same time, and depending on the context and the predominant meaning of the word for the reader a choice is made. If this is the metaphorical meaning and fits the context, the metaphor is not processed metaphorically (no cross-domain mapping).

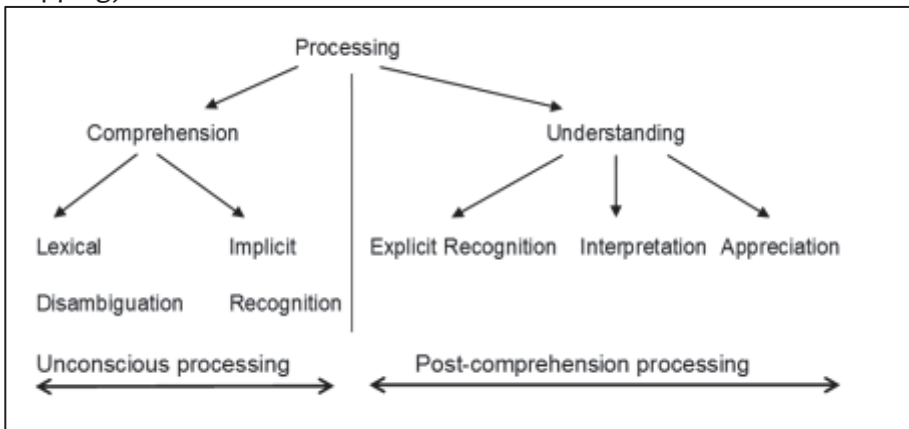


Figure 2.1 Processing of Metaphors (based on Steen, 1994)

Giora (2003, 2008) provides important insights into the process of understanding metaphors by introducing the role of salience in the

online accessing of word meanings. *Salient* word meanings (metaphorical or non-metaphorical) are meanings that are retrieved the quickest, because they are frequent, familiar, conventional, and prototypical. These meanings are “coded in the mental lexicon” and will be accessed immediately, irrespective of whether this is supported by the context or the intent of the author (Giora, 2008, p. 146). She (2003) gives an example of the word *mouse* and indicates that its most salient meaning for computer experts may be the *computer mouse*. This implies that, although it can be argued that the salience of utterances is personal, it may be shared by a user’s community. For example, in the case of a user community of biologists *mouse* may first activate the meaning of a rodent. Giora argues that context-driven and linguistic processes run in parallel, which implies that both can lead to activating a specific word meaning, which may be retained or discarded by the reader or listener at any point in the process of making sense of a text.

The concept of salient meaning helps to better understand metaphor processing. In the case of lexical disambiguation, multiple word meanings are likely to be activated in parallel but if the implied meaning in the context coincides with the most salient meaning for the reader/hearer, understanding of the metaphor is immediate and other, less salient meanings may be expected to be discarded without further thought. If the predominant salient meaning does not match the context, or the salience of alternative meanings is fairly equal, the reader will need to make an extra effort to select the most appropriate meaning.

The deliberateness of a metaphor is another aspect that is predicted to have an important influence on metaphor processing (Steen, 2008, 2011a). A metaphor is used deliberately when it has the communicative intention to invite the addressee to look at the topic from a different conceptual domain. For example, in *this air conditioning feels like there’s an asthmatic sat on my dash-board, coughing at me* (Steen, 2013), meanings related to a respiratory illness (*asthmatic* and *coughing*) are employed to refer to the poor functioning of the air-conditioner. However, in the case of the very conventional metaphor *this movie is a blockbuster*, it is very unlikely that addressees are requested to change their perspective and think of the literal meaning of *blockbuster* as a huge bomb.

In this context it needs to be stressed that, as seems to be implied by Cameron (2003) and as is explicitly stated by Steen (2008, 2011a), a conventional metaphor is not the same as a non-deliberate metaphor as,

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conventional metaphors can be used deliberately to obtain a specific goal. Steen (2008, p. 228) points out that the same metaphor “may function as either deliberately or non-deliberately metaphorical”. This is because its potential metaphorical mapping remains stable (from the linguistic and conceptual perspective), but its communicative function may change depending on the goals or intentions of the producer and the awareness about its metaphorical use.

Steen (2008, 2011a) suggests that deliberate metaphors even if they are conventional induce comparative processing (cross-domain mapping) even if they are conventional, but that this is not necessarily the case when the metaphor is not deliberate. As indicated by Steen (2013), deliberate metaphor does not necessarily give rise to conscious reflection of its metaphorical use. Further research is required to establish whether an addressee who is encouraged to process by comparison (cross-domain mapping) is more likely to recognize the metaphor as a metaphor. In the case of deliberately used conventional metaphors it is also necessary to explore the effect of their ‘signalling’, which may give away clues that facilitates recognition.

For some metaphors it may be difficult to establish whether they are deliberate, as according to Goddard (2004, p. 1213) “In many cases, the speaker or author’s real intended meaning may never be known with absolute certainty”, as it is inferred or attributed by the language user or the metaphor analyst. The emerging discussion on the deliberateness of metaphor (Steen, 2011a, b; Gibbs, 2011a, b) is a positive development, as it contributes to further understanding of metaphor. In the context of my research, the claim of Steen (2011a) that deliberateness may have an important influence on metaphor recognition on line or in retrospect is a particularly relevant aspect to take into account when reviewing my findings, as it may have an effect on the recognition of conventional metaphors. However, it is necessary to add here that it is not imperative that a deliberate metaphor is indeed recognized as metaphor (Steen, 2013).

In this section I have discussed that metaphor processing may involve conscious and/or unconscious processing, which may affect the way metaphors are perceived. In many cases addressees just make sense of a metaphor without a process of conscious cross-domain mapping. They do not experience that there is a potential difference between the meaning as used in the context and the more basic meaning and do not recognize or appreciate the metaphor. For other metaphors, however, the first moment of comprehension is followed by a stage in which the

metaphor may be recognized, interpreted and/or appreciated. Salient word meanings may have an important influence in this process. If the salient meaning coincides with the metaphorical meaning then it is very likely that the addressee solves the metaphor by lexical disambiguation and grasps the figurative meaning possibly without realizing that it is a metaphor, unless the metaphor is deliberate and this is grasped by the addressee. In most cases a deliberate metaphor, be it novel or conventional, will be processed by cross-domain mapping (conscious or unconscious), which in turn may affect its recognition on line or in retrospect (Steen, 2011a). Such differences in metaphor processing make it relevant to analyse the effect of conventionality and deliberateness both on recognition and interpretation of metaphor, as I will address in the next sections. The issue of deliberateness is particularly important in the discussion of my research findings, as it may, for example, have implications for the results in relation to the recognition of conventional metaphors.

2.2 Recognition of metaphors by children

Since only a limited number of metaphors may be subject to cross-domain mapping, which may affect metaphor recognition, I will now explore in more detail the process involved in the explicit recognition of metaphors by language users. I will refer to two studies on metaphor recognition by children and will discuss the process of elicited metaphor recognition that I adopt for my research. I define metaphor recognition as a psychological process in which a reader/hearer becomes to a more or a lesser extent aware of the differences between the basic meaning and the meaning of the metaphorically used word(s) in the context (Steen, 1994, 2004). I agree with many authors (including Gibbs, 1993, 1994, 2002; Glucksberg & Keysar, 1993; Glucksberg, 2008; Steen, 1994, 2007, 2011a) that metaphors may make perfect sense to readers but need not be explicitly recognized as such. If the phrase *Sam is a pig* (Searle, 1993, p. 98) is used in a context of talking about persons, then for many readers or listeners it may be very obvious that the meaning *a pig is an animal* is not the most appropriate one. Hence, the thought of using this meaning to make sense of the text may not even cross their mind (or at best implicitly, i.e., without realizing it). This means that comprehension and recognition of metaphor are two different and independent

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processes that may or may not go together. According to Olson (1988, p. 218, 219), recognition of a metaphor as a metaphor “requires that the child has a concept of metaphor, a concept that distinguishes metaphor from literal meaning” with ‘literal’ being defined as “the interpretation that is most closely related to the wording”. Instead of literal meaning it seems more precise to talk about the basic or direct meaning of metaphorically used words (meanings that are not understood in terms of other meanings, Steen, 2007), and to indicate that the child needs to be able to distinguish this basic meaning from the meaning triggered by the context.

Fundamental to the concept of metaphor is that the child’s cognitive and linguistic development allows it to differentiate between an event (physical or linguistic) and the representation of this event (Olson, 1988). When children understand that an utterance is a representation of an event they can accept that different interpretations may be possible. When they hear the statement *the bat is black*, they may see that this utterance can have two alternative meanings, one referring to a small animal that flies in the night, and the other as a wooden object used in baseball. In other words, they can accept that a term has more than one meaning and that there can be a difference or indeterminacy between what is said and what is meant. Torrance and Olson (1994) indicate that children around six years of age have undergone the cognitive and linguistic development that enables them to understand these differences and therewith recognize some instances of language such as errors, lies, sarcasms and metaphors. Children of eight years and older may thus be expected to have the cognitive and linguistic base to recognize metaphors.

Another relevant point in relation to research with children concerns the discussion about deliberate metaphors. For children this aspect may be more complex as some conventional metaphors in a specific linguistic community may in fact be novel for a child if it has not yet ‘stored’ the metaphorical meaning in his/her lexicon that is developing, a process which, as shown in Chapter 1, is particularly prominent over the school years. Hence, in this case such conventional metaphors may still be processed metaphorically, even if they are not used deliberately. When a young child comes across the metaphor presented by Glucksberg (2008) *my lawyer is a shark*, it may not have established a category that includes *lawyers* and *sharks*, but see these as words belonging to two different domains, which may trigger a process of cross-domain mapping. It may also be the case that because of limitations in reading comprehension

and metalinguistic skills, for example, a child misses signals that indicate that a metaphor is deliberately used. As a consequence, it may not process the metaphor by cross-domain mapping and may not recognize it as a metaphor.

It can be concluded that recognition of metaphor requires distinguishing between the basic or direct meaning of metaphorically used words and their meaning in the context. This process may be implicit or explicit. In implicit recognition the reader/hearer does not realize that a potential semantic ‘problem’ caused by a linguistic metaphor was solved and does not consciously recognize the metaphor as he would in explicit recognition. This implies that a reader/hearer may be able to make sense of a linguistic metaphor without realizing that it is a metaphor. Another important conclusion is that already in the early school years the children have the cognitive and linguistic development that may allow them to recognize metaphors.

Different factors play a role in recognition, including, for example, the linguistic form and the conventionality of the metaphor, which relates to my research questions. Another relevant factor may be whether the metaphor is deliberate, ‘inviting the addressee’ to map distinctive conceptual domains. As my research focuses on metaphor recognition by children in text reading and includes asking them to review text to recognize metaphors, I will discuss this in some more depth in the next section, as well as whether the task of elicited metaphor recognition may have an influence on recognition.

2.2.1 Metaphor recognition in text reading

In the context of my research I am particularly interested in the explicit recognition of metaphors by children in text comprehension, which, according to Steen (1994), occurs when the unconscious ‘act of comprehension’ has finished. Based on his account two main situations may be distinguished:

1. The metaphor is recognized because the reader gradually becomes aware of the semantic incongruity between what is said and what is meant and is not able to solve the ‘problem’ unconsciously. The reader sees that the literal or more basic meaning does not match the use of the utterance in the specific context and therefore searches consciously for a metaphorical meaning. For example *the*

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fog comes on little cat feet (Goddard, 2004) obviously cannot be literally correct. It entails a very strong ‘invitation’ to the reader to find another perspective, which involves a considerable chance that the metaphor may be recognized.

2. The reader accesses the metaphorical sense directly or solves the ‘discrepancy’ unconsciously and thereafter realizes (post comprehension) that the utterance is a metaphor because of its uncommon features. It may be striking or odd to the reader, it may involve a strong tension between the basic meaning and the meaning in the context, etc. The reader then becomes aware that the utterance expresses a particular view or intention of the speaker or the author, and thus recognizes it as a metaphor. Here it is more difficult to provide a generic example, but the metaphor *we can build our understanding* (Cameron, 1999a) may serve as illustration. Most people will interpret this metaphor as *we can increase our understanding*. Afterwards, however, some addressees may understand that it is used metaphorically, if they realize that building has another sense, in which it relates to physical construction.

In both situations the reader is involved in normal text processing. However, as I will explain in the next section, metaphor recognition may work differently when the reader is asked beforehand to specifically identify metaphorically used words.

2.2.2 Elicited metaphor recognition by children

The process of elicited recognition of metaphors differs from what Steen (2004) calls ‘spontaneous’ recognition, referring to his thinking out loud experimental studies. In spontaneous recognition, which was also used by Cameron (2003), a researcher establishes in retrospect, on the basis of verbal protocols, whether a reader has recognized a metaphor. In elicited metaphor recognition, a child (or an adult) is asked to underline metaphorically used words in a text. This adds an extra element, because the child is given a specific task, which differs from normal reading in that it is reading with a specific purpose. The child may, in a way, be more inquisitive and alert than when reading normally. This may result in the recognition of more metaphorically used words than when reading a text without a specific instruction or purpose. This,

however, may in turn be influenced by the level of reading comprehension, as will be discussed in Chapter 3.

When a child is asked to read a text and underline metaphorically used words (elicited recognition), two possible scenarios may happen:

1. In the first scenario, the child does not underline anything because it did not (explicitly) recognize the metaphor. It does not realize that there is a difference between what is said and what is meant. This may occur when:
 - a. The child only knows one meaning (be it metaphorical or nonmetaphorical) of the metaphorically used words and unconsciously thinks that it makes sense. This may be lexical disambiguation or the unconscious acceptance of a 'wrong' word meaning. It will, for example, not underline *riding on* in the case of the metaphor used by Reinhart (1976) *I have seen the mermaids riding seawards on the waves*, when it believes that mermaids can ride on waves.
 - b. The child unconsciously solves the tension and discards the non-metaphorical meaning immediately or after a very brief hesitation (in the mind) to select the proper option (implicit recognition). Using the same metaphor about mermaids, the child in the first moment may find it 'strange' that *riding on* is used in the context of *water* (seawards, waves). It may then quickly rethink *riding on* as *floating* and accept this solution staying within the domain of water.
 - c. The child does not 'see the problem' for other reasons. It may, for example, still be focusing more on the reading of words rather than the text as a whole. It is primarily trying to understand the meaning of *mermaids*, *seawards*, etc.
2. In the second scenario, the child notices and underlines the metaphor before reading on (explicit recognition). This may happen because:
 - a. It has not solved the 'problem' unconsciously and needs more time to understand it after it has 'processed' the metaphor implicitly. This explicit recognition is post-comprehension, because the child consciously recognizes the metaphor (sees a difference between what is said and what is meant, such as in *Juliet is the sun* or in *the mermaids riding the waves*, if it associates

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riding with horses). It sees the tension and starts trying to solve the problem by cross-domain mapping. This may happen irrespective of being asked to identify the metaphor or not, but when asked it will be more alert. Accordingly, there is a better chance that the metaphor is not missed than perhaps in normal reading, where it may just ‘unconsciously’ replace *riding* with *floating*, and not *move towards* cross-domain mapping.

- b. It has solved the ‘problem’ unconsciously and then realizes (post-comprehension) that it is a metaphor because it is striking, different or odd, has a strong tension between the more basic and the figurative meaning, etc. In the case of *the mermaids riding the waves*, for example, it may realize in retrospect that *riding* relates to *horses*, which then portrays a striking image of a mermaid sitting on a horse. It may also know the metaphor as a metaphor from earlier texts, and may be a more experienced reader of literature. This recognition may happen irrespective of being asked to identify the metaphor or not, but when asked the child may be more alert.

From this general section about metaphor recognition we may conclude that it is an area that merits further theoretical development and research with children. I will come back to this point in Chapter 3, when exploring more specifically the influence of child-related factors, and in Chapter 4, where I will discuss how some metaphor properties may affect metaphor recognition.

2.3 Interpretation of metaphors by children

Against the background of the theory presented in the section on metaphor processing and language interpretation of Gibbs (1994), Giora (1997, 2003) and Steen (1994, 2007, 2011a), I will now discuss theoretical views about children and metaphors proposed by different authors (Gibbs, 1994; Vosniadou, 1987a; Winner, 1988) and identify different options that may arise when a child tries to make sense of a metaphor. Most researchers involved in studies with children use the word ‘interpretation’ both in terms of process (the way in which a child makes sense of a metaphor), as well as for the products (the outcome of the process). The situation is even more confusing, as theory and research about interpretation of metaphors by children is reported on by different

researchers, such as Groot et al. (1995), Keil (1986), Vosniadou (1987a), Vosniadou et al. (1984), who loosely use different terms, such as ‘interpretation’, ‘understanding’ and ‘comprehension’, almost synonymously. Whereas I think that it would be more precise to follow the Gibbs’s definitions of interpretation and comprehension, I will still report on the research of others, using the terms they use in their studies. For my own research findings I will use the term ‘interpretation’ which, following Gibbs (1994), I take as the understanding constructed after the comprehension of the meanings of a metaphorical sentence, when reporting on answers children provided in the interpretation task.

Searle (1993) suggests that interpreting figurative language involves first processing the literal meaning, before accessing the figurative meaning. This claim has been rejected, however, as a general theory by many authors (including Gibbs, 1993, 1994, 2002; Glucksberg, 2008; Glucksberg & Keysar, 1993; Steen, 1994, 2007). For children the claim of literal processing has been even stronger. Levorato and Cacciari (2002, p. 129), for example, propose, based on research with idioms, the Global Elaboration Model for the development of the competence of figurative language. The first phase in their model concerns literal processing, and they claim that up to the age of approximately 7 “children process language literally even when it does not make sense in the linguistic context”. However, taking the positions of others, including Gibbs (1994), Vosniadou (1987a), Vosniadou et al. (1984), and Winner (1995), there is little evidence to support this claim, as even pre-school children show understanding of metaphorical language if more sensitive measures and more naturalistic contexts are used in the research. For example, Vosniadou et al. (1984) showed that young children could enact metaphors (presenting their understanding in a play) embedded in a story with clues about the metaphor, but not in a story that presented a metaphor without supportive information. Keil (1986) found that even young children could understand the metaphor *the car is dead*, but not *the idea bloomed*. Gibbs (1994) and Vosniadou (1989) take these findings as a clear argument against an initial literal phase, as these performances would put the child in the literal and non-literal stage at the same time. A good illustration of the variety of answers that may be received from children is shown by Waggoner et al. (1985, p. 1160). The metaphor *Jill was a kitten in a room filled with balls of yarn* (a metaphorical sentence used in a story of a girl visiting the zoo) resulted in different responses from children including some literal explanations, such as “*Jill was a cat*”,

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“*she was bored*”, “*she always wanted to see animals*”, as well as more figurative interpretations such as “*she really liked it there*”

Taking into account Gibbs (1994), Giora (1997, 2003), Steen (1994, 2007), Vosniadou (1987a), and Winner (1988), the following four options may arise when a child tries to make sense of a metaphor:

1. It grasps the meaning of the metaphor, because the salient meaning of the metaphorically used word(s) matches the meaning of the word in the context. It can explain this meaning if sufficiently vocal, but may not have understood that it is a metaphor unless it was for example striking, novel or deliberate;
2. It grasps the meaning, but only after unconsciously accessing different salient meanings of the utterance. Because of contextual clues, however, the child may easily discard some of the options, whilst keeping the metaphorical meaning which it can explain. Also, in this case it may not have recognized the metaphor as metaphor.
3. The child faces a comprehension problem, as it is conscious about the fact that the meaning that comes to mind (which may be the more basic meaning) does not fit in the given context, or is not plausible. Gibbs (1994) and Winner (1988) support the point that several metaphors, when taken literally, may be very implausible (which is clearly shown in examples such as *hair is spaghetti*, and *the car died*). As a result, the child has to make an additional effort to make sense of the metaphor, trying to maintain coherence with the context. It will have to match the ‘incongruous’ lexical item(s) in the metaphor with the content of the sentence or story. In this case the child will have recognized the metaphor and will be able to explain it
4. The child captures the idea that there is a ‘problem’, because it seems that what is said is not what is meant, but it is not able to solve this ‘problem’ (cannot make sense of the metaphor). So it has recognized the metaphor, but is not able to provide a proper explanation.

In the first two options cross-domain mapping may not happen at all or, at best, will be implicit, and the metaphor will not be recognized. In the last option the child recognizes that there is a mismatch between the senses in the metaphorical sentence, but cannot explain it. Only in the third option does a mapping of the structure of the source domain onto the structure of the target domain take place. This implies that the perception of the target domain is organized in terms of the source

domain. The mapping involves constructing links between the target and source domain and there is some evidence that this process is influenced by the development of the child and the type of mapping that is needed.

Evidence as to whether different types of mappings pose different types of challenges to children is not conclusive. Gentner and Stuart (1984) found that the child's competence in dealing with attributional mappings is already present in young children, but does not increase with age. This is different for relational mappings, which show a marked increase over time. Winner (1988) suggests that perceptual or sensory links come into action first, followed by relational or functional links, and then physical-psychological links. She (1988, p. 60) gives the example that young children can explain a description of *clouds as pillows* (sensory similarity; they look alike), indicating that clouds are fluffy like and white, but these children have more difficulty with, or cannot do this for *a cloud is a sponge* (functional similarity; both hold water), and have even more difficulty with finding a connection between a cloud and a sad memory.

Vosniadou (1987a), however, suggests that relational mappings per se are not harder than attributional mappings, but require more knowledge of conceptual domains. She supports this point by referring to Verbrugge (1979), indicating that young children use both relational and perceptual information to make sense of the world around them. Gentner (1988) also indicates that it seems most plausible that the failure of children to make relational mappings is not a question of cognitive limitations, but a lack of understanding about the relations within conceptual domains. Information on the complexity of psychological mapping is also not conclusive. Keil (1986) found that metaphors involving psychological mapping were more difficult for 5- to 9-year-old children than other metaphors and similar findings are presented by Winner (1988). However, Nippold et al. (1984) found no difference in the performance of children of 7 to 9 years between metaphors that involved perceptual and psychological mappings.

Whereas the effect of the nature of mappings cannot be established with certainty, it seems reasonable to assume that some metaphors pose greater interpretation problems than others, also because they may require multiple mappings. Cameron (2003) explains that the interpretation of the metaphor *dancing dinghies* may need to make perceptual (shape dancer-dinghies), relational (moving up and down on the water), and psychological (happiness) links.

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Other factors that may contribute to a possible failure of children to make sense of a metaphor (Cameron 2003, Vosniadou, 1987a) include:

- Limitations in conceptual knowledge (especially about the source domain but also about the target domain) that inhibits the construction of the link between the (metaphorical) source and the target domain. Evans and Gamble (1988), reflecting on, for example, the metaphor *that day the road was a banana peel*, indicate that although the salient attribute of *slippery* for *banana peel* is well known, it may not be the case for *roads*. It can be posed that whereas *slippery* is a plausible attribute for *roads*, differences in knowledge and experience may imply that it is less prominent for children than for adults.
- Lack of an appropriate linguistic context, which may have a negative influence on the interpretation of the metaphor. For example, Waggoner et al. (1997) did an experiment, using psychological metaphors such as *Suzie is a bouncing bubble*, and *John was a snorting bull*. They selected metaphors that evoked different emotions: happiness, fear, anger, sadness, and placed these at the end of stories that portrayed similar emotions. These materials were chosen based on a selection process with a group of adults and the researchers. Children were asked about the emotion that was portrayed by the metaphor. When the emotion in the story and the metaphor were congruent, some 99% of the children from 3rd and 5th grade gave the correct emotion. However, when the emotions in the story and the metaphor were incongruent, only 9 and 12% of these children respectively gave the correct emotion portrayed by the metaphor, whereas the others gave the emotion reflected in the story.
- Limitations particularly for young children in metalinguistic and metacognitive development that do not allow them to produce an adequate verbal response. For example, Vosniadou and Ortony (1986) concluded that for young children, enactment seems easier than giving a verbal explanation. They presented children with a story about Jack, an ill-behaved circus elephant, ending with: *Jack was a child being carried to his room*. In the condition where children showed what they understood by playing with toys (enactment condition), all children put the elephant in his cage. In the paraphrase condition this was very

different. Only after repeated questioning did some children indicate that Jack was put in his cage; others got confused and even started to doubt whether Jack was an elephant.

The overall picture emerging from this section is that metaphor interpretation is a process very different from metaphor recognition. Giving a proper interpretation of a metaphor does not imply that it was recognized as metaphorical. The claim that children first process the literal meaning before accessing the figurative meaning has been rejected by many authors, with several of them indicating that even pre-school children show understanding of metaphorical language if more sensitive measures and more naturalistic contexts are used in the research. I have also discussed that many metaphors may be processed directly and do not involve cross-domain mapping at all. In many instances, respondents will be able to give plausible answers, inferring what the metaphor implies without realizing that they are dealing with a metaphor.

I have presented four options that may arise when a child tries to interpret a metaphor, in which I have shown that salience of word meanings, previous knowledge and a supportive context play an important role. In two options the child can explain the metaphor, but does not recognize it. In the third option it can explain and recognizes the metaphor, whereas in the last option it recognizes the metaphor, but is not able to give a proper explanation. I have shown that different types of cross-domain mappings may be involved (attributional, relational and psychological), and that different views exist about the challenges these entail for metaphor interpretation by children. I have also discussed that three main types of problems may occur that may result in inappropriate interpretation. This includes: limitations in constructing the link between the two domains; lack of or inappropriate linguistic context; complexity of the task for the child.

2.3.1 Exploring metaphor interpretation with children

I will now proceed with the presentation of some of the methodologies that have been used to explore the interpretation of metaphors and will reflect on some results of different studies to establish a point of reference for my research. Initial research, such as the work by Pollio and Polio (1979), used single sentence metaphors. This

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gradually changed towards studies with metaphors embedded in short text, in response to findings that the context may be supportive (e.g. Reynolds & Ortony, 1980; Vosniadou et al., 1984 and Waggoner et al., 1985). In trying to find out whether a child has grasped the intended meaning of a metaphor, researchers have used different tasks including:

- Verbal explanation, asking children to explain the metaphor
- Multiple choice task, making children choose between different answers
- Thinking out loud, based on a guided conversation with children about a stretch of text

Verbal explanation tasks have been used by many authors, including Keil (1986), Schechter and Broughton (1991), Siltanen (1989), and Waggoner et al. (1985). Researchers provide children with single metaphors or metaphors in text and ask them to explain the meaning of what is said or written. In some studies questioning is thereafter continued, particularly if the paraphrasing does not provide the intended meaning. Some further clues may then be provided to assist the child in its explanation. Results of the task are analysed and typically clustered in different categories, ranging from literal to what Keil (1986), for example, called ‘full metaphoric explanation’, when the child gave a response that came very close to correct adult meaning (see Chapter 3 for more details on his study).

The researchers mentioned above all indicate that they were aware of the criticism that paraphrasing has limitations, as younger children may not have the metalinguistic competence to explain a metaphor even though they understand it. However, they consider this less of a limitation, particularly for older children. Schechter and Broughton (1991) add to this that interviewing is more difficult in terms of quantification, but is more suited to understand reflective thinking. I agree with this observation, as interviewing may reveal, for example, the source of information that is used and whether this relates more to the context or previous knowledge of the child, but also provides insight in potential mappings that the child makes.

An example of the latter is provided by Schechter and Broughton (1991, p. 127), who asked children to explain the term *a sharp person*. The specific question: *In what way are a knife and a person like that both sharp?*, for example, resulted in a response showing an elaborate metaphorical understanding: *“It’s kind of like a knife is sharp and it catches things quickly, and it’s just kind of the same way – like a knife’s*

supposed to have a keen edge, and you talk about keen and sharp people..... A knife is physically sharp, and it cuts through things. And a person is mentally sharp and they see through things”.

Multiple choice tasks have been used by different researchers primarily to avoid what they see as a problem, namely that the children may have limitations in their verbal explanation capacity to explain a metaphor. They posit that this may cause results to not properly represent the true understanding of children. Tasks varied between providing children with a choice with only two answers, such as Nippold et al. (1984), using a multiple choice listening task, and Waggoner et al. (1997), asking children about the emotions a specific metaphor entails. The latter, however, completed their procedure by asking the children afterwards to explain their choice. Others, such as Reynolds and Ortony (1980), gave a choice between four alternatives. Pollio and Pollio (1979) also provided a choice between four possible answers, including a correct metaphorical answer, a ‘correct’ literal interpretation and two incorrect literal interpretations. They state, however, that writing the responses was an extremely arduous task, as quite a few metaphors are difficult to render into literal language. This complexity may affect the results of the test. It may lead to an under- or overestimation of children’s understanding, also because the answers that are provided may not match the answers children would give on their own (Winner, 1988).

Goal-directed Interactive Think-Aloud (GITA) is a method Cameron (2003) presents based on Steen’s approach, using a sentence by sentence Thinking Out Loud (TOL) with adults. Steen (1994) indicates that TOL is a good method to obtain insight in metaphor processing that merits further application. He adds, however, that it also has its limitations, as many metaphors may not come to the surface of the readers’ attention, because they may not represent a semantic problem for them. TOL may, for example, provide limited information on the processing of metaphors that are not deliberately used. Cameron (2003) tried TOL (which she calls TA: Thinking Aloud) with an 11-year-old and found that this task proved very difficult. In reaction to this experience she turned the individual TA task into an interactive assignment (GITA). In this she also took into account the Vygotskian socio-cognitive framework that centres on the fundamental role that social interaction plays in the development of cognition. In her study, two children were asked to read and discuss a text to evaluate whether it would be suitable for slightly younger children.

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The guided dialogue among the two children provided very rich insights into their thinking and the way they tried to make sense of metaphors and solve their comprehension problems. Cameron captured the children's socio-cognitive thinking processes through the analysis of the verbal protocols from their interaction. This included a review of comments about the metaphors and successful and incorrect understanding. GITA seems to be more child-friendly, but has the limitation that it does not allow measuring individual behaviour. Also, Cameron found indications that the children's knowledge of domains increased as a result of their dialogue. This may imply that if applied to a series of texts, the learning process might influence the discussion and the comprehension of the children.

The methodological approaches presented above have different demands for their development and implementation and for the quantification and categorization of the results. Taking these into account, and particularly the finding that verbal explanation seems to provide the richest insights in the interpretation of metaphors by children, it seems valid to adopt this method for my research, also because the possible limitation that findings may underestimate the performance does apply to children that are younger than those in my research group.

2.3.2 Some results in terms of metaphor interpretation

In this section I present the results of studies on the interpretation of metaphors by children, in order to give an indication of the level of interpretation by children of a similar age as the children that participate in my research. The intention is just to give an indication of metaphor interpretation, types of metaphors and the research methods that were used, and the variation between the studies (Table 2.2). I will give some clarification to put the results into perspective, but will not give a detailed description of the studies, as this is done in Chapters 3 and 4.

Results suggest possible age related differences, but also differences within age groups. It is important to stress, however, that results between the different studies cannot be compared, as they are quite different in scope and type of analysis. Three studies used verbal explanation and two used a multiple choice task. One study (Siltanen, 1989) tried to establish whether the child inferred the intended meaning of the metaphor in the first answer, whereas the other study (Keil, 1986)

gave additional guidance through follow-up questions and additional information. Another aspect is that the metaphors that were used differed considerably. Two were presented in single sentences or with preceding short sentences (Keil, 1986; Pollio & Pollio, 1979), whereas others (Schechter & Broughton, 1991; Siltanen, 1989; Waggoner & Palermo, 1989) were given in a linguistic context.

Table 2.2

Metaphor Interpretation in Five Studies with Children

Reference	Age ¹	Results	Type of task	Stimuli
Keil (1986)	8	52% (6 -100%)	Verbal	Different types of novel metaphors
	9.5	79% (50-100%)	explanation	
Siltanen (1989)	6 – 8	9 – 60%	Verbal explanation	Metaphors in the form A is B with three levels of difficulty (ranging from concrete to abstract nouns)
	9 –12	29 – 83%		
Schechter and Broughton (1991)	8 10-12	Better results for the older group ²	Verbal explanation	Psychological metaphors (texture - person)
Waggoner and Palermo (1989)	7	60% novel; 63.3% common	Multiple choice	Emotional metaphors; novel and conventional (common)
	9	70.4% novel; 68.8% common		
Pollio and Pollio (1979)	9-10	43% novel; 56% frozen	Multiple choice	Novel and Frozen metaphors
	11-12	60% novel; 70% frozen		

Notes: 1. For all studies I have included only the results of the two age groups that were closest to the age of the children in my research.

2. The combination of the data presented does not allow for calculation in percentages.

The results of Keil (1986), Siltanen, (1989) and Schechter and Broughton, (1991) show that the children's answers may differ considerably when asked to interpret a metaphor. These answers ranged from a minimal explanation to much more elaborated interpretations, showing more metaphorical awareness and sometimes indicating that they involved complex mappings (as shown in the example of Schechter and Broughton (1991, p. 127), in relation to a *sharp person* explained in section 2.3.1). The studies also use different levels of categorization of answers. Keil (1986), for example, classifies an answer of a child as full metaphorical explanation, when it comes very close to what he calls

'correct adult meaning' (non-literal, fully precise comparison). Siltanen (1989), in her study, tested different metaphors of the type *A is B* that vary in difficulty (abstractness or concreteness of topic and vehicle noun terms). She used three different categories for comprehension, which I will explain on the basis of her example *the river is a snake* (1989, p. 204). She scored children as comprehending the metaphor if their answer was perceptually grounded (shape, colour; e.g., 'curvy things', 'long brown curvy thing'), conceptually grounded (conceptual similarities; e.g., 'dangerous killers') or both perceptual and conceptually grounded (e.g., 'long, curvy, brown killers'). Schecter and Broughton (1991) adopted different levels when assessing comprehension in short interviews with children. Their second level showed a minimum degree of understanding the implied meaning with answers for the metaphor *a hard person*, such as "*a person that is hard on people*". Waggoner and Palermo (1989) explored metaphor understanding in terms of whether the child could establish the correct emotion evoked by a metaphor, using a forced-choice task. They followed this by asking the children to explain their answer. Responses that revealed that the children were able to explain their choice were scored as complete metaphorical interpretation (e.g. *snorting bull* means 'angry' because '*a snorting bull is angry*'). Pollio and Pollio (1979) used a multiple-choice task giving four different options including one incorrect metaphorical interpretation, two incorrect literal interpretations, and one with the intended meaning, suggesting that for them comprehension implies understanding the intended meaning.

A general comment that can be made is that results of these studies concern the interpretation of metaphor, where the intended meaning is grasped, which some researchers refer to as 'full understanding' or 'metaphoric interpretation'. This does not seem to imply that the child recognizes the metaphor as a metaphor. For example, an answer classified by Keil (1986, p. 89) as non-literal fully precise comparison for the metaphor *the idea was mowed down* was: "*it would probably mean that somebody had a better idea and just – they decided to use that idea and not the idea you had*". This answer grasps the intended meaning, but it cannot be construed whether the respondent has reflected in any way on the basic meaning of *mowing down* (which according to the Macmillan dictionary is: "*killing a lot of people*" and according to the Oxford dictionary: "*to kill somebody using a vehicle or a gun, especially when several people are all killed at the same time*"), as different from the meaning in the context. In that sense, Winner and Gardner (1993) are more precise in referring to two levels of understanding: a basic level, in

which the implied meaning is grasped, and a more metalinguistic understanding, which allows distinguishing between the implied meaning and the more basic or literal meaning.

In sum, considerable differences exist in research methods and definitions, as well as in results, which make that studies of metaphor comprehension by children between the ages of 6 and 12 cannot be directly compared, but can still serve as a general point of reference for my research. All studies suggest that younger children (6 to 8 years) are less able to interpret metaphors than older ones (9 to 12 years), but several studies also show important differences among children within the same age group, which makes it relevant to explore child-related factors in metaphor interpretation, as I will discuss in Chapter 3. Another point is that there is a difference between understanding conventional ('common', 'frozen') and novel metaphors, which was significant in the case of Pollio and Pollio (1979), but not in the case of Waggoner and Palermo (1989), making it relevant to look into this aspect in more detail, as I will do in Chapter 4.

2.4 Conclusion

In this chapter I have presented the generally accepted notion of metaphors as a device for seeing something in terms of something else and referred to the difference between a semiotic research approach, which includes the way in which an analyst identifies and characterizes a metaphor in text or speech, and the psychological research approach, which looks at the way metaphors are processed in the mind and the products resulting from these processes (Steen, 2011a). The Career of Metaphor Theory (Bowdle & Gentner, 2005; Gentner & Bowdle (2001, 2008) proposes that novel metaphors are made sense of by comparison between the source and target domain (cross-domain mapping), because no pre-stored information is available in the knowledge base of the reader, whereas more conventionalized metaphors are solved by categorization or lexical disambiguation. This has important implications, as addressees may only be able to make sense of a metaphor without a process of conscious cross-domain mapping. They do not experience that there is a potential difference between the meaning in the context and the more basic meaning, and do not recognize or appreciate the metaphor.

Giora (2003, 2008) provides important insights in the process of understanding metaphors by introducing the concept of salient word meanings. These are the (metaphorical or non-metaphorical) meanings of a word that are retrieved the quickest, because they are readily available in the mind and will be accessed immediately, whether this meaning is supported by the context or the intent of the author or not. Hence, if the salient meaning is the metaphorical meaning, it is likely that the metaphor is immediately understood. If the salient meaning does not make sense however, the receiver needs to find an alternative meaning to make sense of the metaphor, which is likely to encourage a process of cross-domain mapping. This process is more likely to be the case in novel metaphors, where the difference between the basic meaning and the meaning in the context is more pronounced, and it is less likely that the latter is the salient meaning.

One crucial finding from the psychological research is that, as pointed out by different authors (Gibbs, 1993, 1994; Giora, 1997, 2003, 2008; Steen, 2008, 2011a), many, if not most metaphors are processed unconsciously, and may not trigger cross-domain mapping. Steen (2008, 2011a) calls this the ‘paradox of metaphor’ and proposes a three dimensional framework. He uses the two dimensional framework of the Career of Metaphor Theory (Bowdle & Gentner, 2005; Gentner & Bowdle (2001, 2008), which comprises a linguistic and a conceptual dimension with a communicative dimension to be able to explain why many metaphors are not processed by cross-domain mapping. He introduces the term deliberate metaphor for those metaphors that are expressly meant to change the addressee’s perspective on a topic. This, he points out, is likely to be the case for most novel metaphors, but may also be the case for conventional metaphors that are deliberately used, an aspect that I will need to take into account in my research when I look at the influence of the effect of conventionality in metaphor recognition and interpretation. The possibility that some of the conventional metaphors are deliberately used may, in fact, ‘alert’ the reader to the presence of a metaphor in a similar way as in a novel metaphor; hence facilitating its recognition.

Another important point emerging from this chapter is that interpretation and recognition of metaphor are two different and independent processes that may or may not go together. A reader may very well be able to understand a metaphor, but this does not mean that it is recognized as metaphorical. Fundamental to the concept of metaphor is that the child’s cognitive and linguistic development allows it

to differentiate between an event (physical or linguistic) and the representation of this event (Olson, 1988). This differentiation implies that the child can understand and accept that a word can have different meanings, an understanding that according to Torrance and Olson (1994) is present in 6-year-old children.

Metaphor recognition has not received much attention in research (Steen, 2004), and even less in studies with children. This makes recognition, and also interpretation of metaphor by young readers a relevant issue for further analysis. Different factors seem to play a role, including the linguistic dimension, the conventionality of the metaphor, whether it is deliberate or not, the linguistic and cognitive skills of the children, but also the task used. In an elicited metaphor recognition task, where children underline metaphorically used words, the child will be more alert and pay more attention to the uses of language in a text and may, as a result, recognize more metaphors than it would do in a normal reading process, provided the child has the ability to orient his/her reading to a particular purpose.

A larger volume of research is available about the interpretation of metaphors by children. The review of studies with children shows that several terms, such as 'metaphor interpretation', 'metaphor understanding', and 'metaphor comprehension', are used almost synonymously by different authors. Some researchers, such as Keil (1986), talk about 'full comprehension' of a metaphor, where they refer to the understanding of its meaning. The latter, however, does not imply that the metaphor is recognized as a metaphor as their research does not include recognition, or that cross-domain mapping has taken place. To make sense of a metaphor, different types of mappings have been explored in research with children (attributional or perceptual, relational or functional, and psychological). Whereas this research is not conclusive on their effect, it seems reasonable to assume that some metaphors pose greater demands in this respect than others, also because some may require multiple mappings.

Different research methods have been used, including multiple choice tasks, verbal explanation and Goal-directed Interactive Thinking Aloud. All these methods have some advantages, but also drawbacks. I pointed out that despite the criticism that exists about verbal explanation, it seems the most suitable methodology to use in my interpretation study, as it can be applied to the children of the age involved in my research and allows more insight to be gained into their reflection about the metaphors. Answers to verbal explanation tasks

reported by other researchers ranged, for example, from a minimal interpretation that can count as successful comprehension to richer, deeper, more elaborated interpretations. Such differences I will take into account in the presentation of my results in Chapter 7.

The research with children is very diverse, and the results I brought together cannot be directly compared, because of differences in linguistic material and research methods. Nevertheless, some preliminary conclusions seem to emerge as the studies on metaphor interpretation show that, in general, metaphor interpretation progresses with age, which is in line with the general theory on child development. At the same time, some studies show that important differences exist between children of the same age group. This is relevant for my research, as it suggests that other variables related to children may be in play. Several studies also show that factors related to the metaphor itself, such as its conventionality, seem to have an impact on interpretation, but findings are not conclusive. I will therefore explore the influence of some important factors related to the children in more detail in Chapter 3 and of some metaphor properties on recognition and interpretation in Chapter 4.

3. Child related factors influencing metaphor processing

In the previous chapter I have shown that even young children can already interpret metaphors and that their competence in general terms increases with age, suggesting a relation with the overall development of the child. However, several of the studies discussed in Chapter 2 also show that differences exist among children of the same age group. In this chapter I will therefore explore some child related factors that may influence their recognition and interpretation of metaphors, and look at some related studies.

Two relevant factors are knowledge of conceptual domains and metalinguistic competence, as these seem to develop during school years in particular. The importance of domain knowledge is mentioned by different authors, including Cameron (2003), Keil (1986, 1989) and Vosniadou (1987a). Nippold (1998) suggests that a major transition occurs in children around the ages of 8 through 10 years, when they learn advanced vocabulary, more complex figurative meanings, and more abstract concepts. This motivates the expectation that important differences in metaphor recognition and interpretation may be observed between 4th and 6th graders.

Metalinguistic competence is mentioned among others by Bialystok (1993), Gombert (1992), Homer (2009), Morais and Kolinsky (2004), Nippold (1998), Ravid and Tolchinsky (2002). It may also differ considerably between my age groups, as the emerging view is that the ability to reflect upon and analyse language as an object of thought evolves from a functional level, where the child learns from external factors (e.g. the reaction of adults) what “works” and what is incorrect to a conscious level, where the child becomes aware and uses the rules that apply to language. Young children may already have some basic or initial metalinguistic skills, shown, for example, by the application of linguistic self-correction, but these skills become progressively more explicit and conscious when children start to reflect on language. Cognitive and linguistic development, as well as literacy and schooling, play a crucial role in this transformation (Homer, 2009; Ravid & Tolchinsky, 2002).

Another issue is the use of linguistic context. Different authors (e.g. Özçalışkan, 2005; Siltanen, 1989; Vosniadou et al., 1984; Waggoner et al.,

1985) indicate that the linguistic context can be supportive for metaphor interpretation. This may imply that richer explanations are found when metaphors are presented in context than when metaphors are presented as single sentences, as children can support their interpretation by using information from the context.

This in turn brings in reading comprehension as another relevant factor. Although this has received much less attention, some evidence based on research with idioms (Cain et al., 2005) indicates that better readers have an advantage in using contextual information. It seems that reading comprehension may indeed be of influence, as some studies (Pickens, Pollio & Pollio, 1985; Ripoll-Salceda & Aguado-Alonso, 2007) suggest that children with a higher level of reading comprehension are better at metaphor comprehension. The effect of reading comprehension on metaphor recognition has not been explored. Such an effect, however, seems plausible, as Cain (1999, p. 303) found that better comprehenders in particular are able to adapt their way of reading to their reading goals, which in turn may help them to focus on reflecting about uses of language. Readers with higher comprehension skills have more advanced metalinguistic knowledge (Nagy, 2007; Yuill, 2007, 2009; Zipke, 2007, 2008; Zipke et al., 2009) and knowledge of text structure (Oakhill & Cain, 2012) and may be better at understanding genre features, which according to Olson and Pelletier (2003) contributes to identifying authorial intentions. Hence, it may be expected that high readers will be better at understanding the communicative intention of metaphorical uses of language.

I will discuss the potential influence of the four factors mentioned in this section in more detail in the next sections, looking both at the general theory as well as at some specific studies with children.

3.1 Knowledge of conceptual domains

In order to be able to see one thing in terms of another it is necessary to have knowledge of the conceptual domains that are involved in a metaphor. This knowledge should allow the reader or listener to recognize that the metaphorically used words refer to a source domain that is different from the target domain. They also need to realize that the words referring to the source domain have to be interpreted in terms of the target domain and construct what Croft (2002, p. 162) calls the conceptual unity of domain. To illustrate this, he

gives the example of *Denmark shot down the Maastricht treaty*, where he indicates that readers need to realize that this is not about a military act. Following this suggestion it can be posited that the words *shot down* belong to the domain of war (See Figure 3.1), which contrasts with the domain of *treaty*, which relates to *political activity*. According to Croft, these metaphorically used words then need to be interpreted as *caused to fail* in the domain of *political activity*.

The domain of *war* includes **entities** such as: guns, army, battlefield, fights, damage, bombs, craters and **relations** between entities such as: bombs create craters, guns shoot holes in things, armies engage in fights, etc.
 (This example was developed following an example of Cameron (2003, p. 11) related to the vehicle in the metaphor *the atmosphere is a blanket of gases*)

Figure 3.1 Example of Entities and Relations in the Conceptual Domain of War

Clausner and Croft (1999) suggest that ‘domain’ is the broadest term for the background knowledge structure that is needed to comprehend concepts. Or, as Croft (2002, p. 166) indicates, a domain is “a semantic structure that functions as the base for at least one concept profile (typically many profiles)”. He gives an example of the letter ‘T’, which has the alphabet as base domain. Yet this base domain presupposes a domain of writing system and in turn a domain of a writing activity and so on. Hence the concept of the letter ‘T’ is defined by a whole system of domain relations that need to be understood. In view of the complexity of these systems it is not surprising that there is a degree of indeterminacy about the notion of what constitutes a conceptual domain and, as stressed by Steen (2007), little guidance is available from the work of Croft to help an analyst to clearly distinguish one conceptual domain from another. This indeterminacy implies that differences may occur, for example, in the identification of metaphors among researchers (and also among readers), which may affect the precision of research findings.

A further complication is that whereas it is not easy to distinguish domains by themselves, they are also not static because of shifts and changes in language that take place in a language community over time. As a result of the process of conventionalization, for example, many metaphors that were credited as novel because of their clear contrast between domains gradually turn into expressions or relations without any dissimilarity because their domains merge over time. For example, when it was first used, *a blueprint for development of the economy* was a

novel metaphor that linked development to what Gentner and Bowdle (2001, p. 229) describe as “the blue and white photographic print of an architect plan”. This connotation of blueprint, however, has changed into “anything that provides a plan”. It may even be anticipated that over time the term *blueprint* could lose its literal meaning, as blueprints are increasingly being replaced by computer images.

The perception of incongruity between domains (what counts as metaphorical) may also differ among specific linguistic or socio-cultural communities, as differences may exist in meanings and in the links between them among such different groups of language users (Cameron, 1999b; Steen, 2007). For example, in the metaphor *the lizards, worshippers of the sun*, the salient meaning of the term *worshipper* for a child from a church-going community may be related to someone who is devoted to god. This child may be alerted to a possible “conflict” in meaning as for him/her the term “*worship*” triggers the connection with a human religious activity. As *lizards* cannot be members of a religious community, this might prompt the recognition of the presence of the two distinct domains (human religious activities and animals). For other non-religious communities *worshipper* may be associated directly with the meaning of somebody that loves or has affection for something, and may not be connected with a religious activity. In this case it can be argued that the incongruity (human-animal) would be smaller and harder to perceive. Hence what is metaphorical to one language community does not have to be so for another. Children gradually acquire the norms and conventions that are used in a language community as part of their language development (Cameron, 1996). In this context it is also important to realize that school-going children are exposed to the language in their school and the one being used at home, which thus may create differences among them even within school grades.

In this section I have discussed the complexity related to the definition and distinction of conceptual domains and the importance of domain knowledge, which seems to be one of the factors that may explain differences in metaphor processing. I will now turn to specific studies that have been carried out with children. This notably includes the ground breaking empirical research of Keil (1986), who explored the influence of the knowledge of conceptual domains on metaphorical competence, following on his earlier research on the emergence of conceptual distinctions (Keil, 1979, 1983).

Research with children

Nippold (1998) indicates that as children progress through school, they increasingly get access to a growing number of topics, including those of a more abstract nature. Young children will acquire words with more concrete referents, whereas older children acquire words that refer to more abstract concepts, such as *welfare*, *relevance*, etc., as also suggested by Keil (1986). This difference between early and later language development is also supported by Berman (2004). The increase of the children's knowledge base is strongly supported by the growing independence in reading and their involvement in the literate community. These factors favour semantic and conceptual development, which is necessary to access and learn advanced and complex vocabulary and understand abstract concepts.

An example of the latter is the finding of Lijnse (1990), cited in Amin (2009), about the initial ideas of students about the concept of energy. This initial idea reflects how energy is conceived in written documents for the general public, which is of a much more varied and informal nature than the tight definition in science. Hence over the school years a considerable increase in domain knowledge occurs. Yet differences exist in the thinking about how this increase in knowledge influences metaphor comprehension (and perhaps also metaphor recognition, although that is not referred to by authors).

In his empirical study on the influence of the knowledge of conceptual domains on metaphorical competence with children between 5 and 9 years old, Keil (1986) found that metaphors based on the distinction between physical and non-physical objects (*the car is dead*) were understood earlier than those based on physical-mental distinction (*the idea was not ripe yet*). He also suggests that whereas this was the normal pattern in concept acquisition, it is not true for all children. Some showed opposite behaviour, suggesting that other developmental factors may also play a role.

In his study Keil (1986) asked children to explain the meaning of a total of 66 metaphorical sentences comprising eight different domain combinations, three of which are shown in Table 3.1. When children did not respond with a metaphorical explanation, a second question was posed, asking the child whether another explanation was possible. For example, if for the metaphor *she was a smooth person* the child gave a literal interpretation (e.g. "*a smooth person feels smooth to touch on the skin*"), the interviewer would say something like "*well, suppose we aren't talking how smooth the skin was or how smooth that person is to touch*

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but something else when we say she is smooth. Do you know what we might mean then? Can you think of another way that person might be smooth, something else this could mean?”

If the answer still did not improve much and remained literal, a third step was taken, in which the domain was suggested by the interviewer. In the case of the example this could be the following intervention: *“suppose when we talked about people being smooth we were talking about the sorts of things they do, you know how they act or behave. What do you think it might mean then?”* Furthermore if a child provided the same interpretation for two different metaphors (e.g. explaining that a *smooth person* and *soft person* both meant a *nice person*), a question was posed how the two expressions differed in meaning, if at all.

Interpretations were categorized based on the answer to the first question, if that was the only one, or the answer to the second question. Scoring was done by two researchers and disagreements were resolved through discussion.

To classify the answers Keil (1986, p. 81) established four categories: 1) literal interpretation; 2) correct inference of appropriate domain but mistaken in dimension (e.g., *a smooth person* is a “jealous” person); 3) Correct domain and approximately metaphorical interpretation (e.g., *a sunny person* is a “nice” person “but the child refused to elaborate further and may also have described a soft person as a ‘nice’ person”. 4) ‘Fully precise comprehension’, defined as interpretations that are very close to correct adult meanings with a correct inference of the appropriate domain and appropriate dimensions (e.g. explaining *the idea was not ripe yet* by saying “*it would mean that it just wasn’t time for the idea –that you had some more planning to do before you had to use that*”).

Table 3.1
Some Examples of Metaphors Used by Keil (1986)

Domains		Metaphor
weather conditions	personality traits	S/he was a sunny person
textures		S/he was a smooth person
tastes		S/he was a sour person
plant states	Ideas	The idea bloomed The idea was not ripe yet The idea was moved down
animate properties	Cars	The car was thirsty The car was tired The car was sick

Overall children performance in each of the eight domain pairs improved with age. From the data presented by Keil (1986, p. 90) it can be derived that the group of 8 years old scored an average of 53% on the highest level ('fully precise comprehension'), whereas the group with an average age of 9.5 years explained 79% of the metaphors in this way.

A question arises, however, whether the methodology used in the research has not contributed to the level of performance. If the first answer was literal, the researcher helped the child by pointing out that something else (other than literal) was expected. In these cases, the second answer was used to establish the score. This is likely to create bias, as it may be expected that the additional question leads to fewer literal answers. Keil's paper unfortunately does not provide information on the number of children who were asked this second question, and hence its possible effect cannot be explored. Performance may also have been affected by the fact that when children still gave a literal answer the domain was pointed out to them by the interviewer. Although in this case the score of literal answer was kept, still it cannot be ruled out that making the domain differentiation explicit may have had a positive effect on the answers for subsequent metaphors of the same domain pairs that children had to make sense of. An important point emerging from this is the need to be careful with the research protocol to reduce the risk of influencing the research results.

Keil (1986) proposes that once a child passes a certain threshold level in the knowledge of a domain, it may make the 'click' of juxtaposing this domain to another one and understand a metaphor relating those two domains. After this first juxtaposing has occurred, the child applies this knowledge to other metaphors related to the same conceptual domains, including more complex ones. This is feasible, because at the threshold level the child has already acquired considerable knowledge of the structural relations (similarities, contrasts) between concepts of the same domain.

Vosniadou (1987a) suggests, however, that this is a more gradual process, in which children improve in metaphor understanding as they learn about more aspects that distinguish domains. This idea is based on earlier research (Vosniadou & Ortony, 1983) with 1st and 3rd graders with a text that presented the healing of an infection as a war between white and red blood cells. Inferential questions were used to explore different types of relations, such as physical characteristics and activities, thoughts and feelings, plans and goals, and causal consequences. The results showed that children only transferred feelings and thoughts between

these two domains (e.g. *white blood cells are brave fighting germs*). This suggested that the distinction between at least the domains human/animal and animate/inanimate was not yet fully established, and that children may master some aspects of these distinctions before others.

Schechter and Broughton (1991) also argue that this is a gradual process and say that it is not an issue of "all or nothing", of passing the threshold of knowledge and juxtaposition of two domains, which allows children to understand all metaphors between these domains. Their findings indicate that the same child showed differences in the understanding of different psychological metaphors. They also found that this understanding matures over time, together with growing domain knowledge.

It can hence not be concluded if development of domain knowledge and metaphor competence is a gradual process or whether it goes in leaps; perhaps the most plausible option is that it is a combination of the two. The latter for example can be supported by Vosniadou's (2009) argument that children, when exposed to science in school, may even become confused, because the new scientific information does not match their naïve explanations of physics. They may not be able to just add some of the new ideas, including metaphors, to what they already know. She quotes an example from Vosniadou and Brewer (1992), indicating that some children may initially think that there are two earths: one following the new concept they learn at school, earth being a spherical planet in space, and another that fits with their naïve concept of the earth being flat. In this case it seems plausible to assume that a development leap occurs when the child embraces the new concept about the earth, as at that moment several earth related issues may fall into place. Such types of 'clicks' are not likely to happen at the same age for all children, which thus contributes to individual differences in the development of domain knowledge and metaphor competence. This is in line with, for example, Fischer and Silvern (1985), who state that child development is characterized by stages that lead to commonalities within the same age groups on the one hand, but, on the other hand, that there is a wide range of individual differences within these groups.

The relation between metaphor understanding and domain knowledge makes it plausible to assume that the latter is also crucial for the recognition of a metaphor as a metaphor, as this involves the realization of the presence of two different conceptual domains that are juxtaposed. Accepting this hypothesis would also imply that children may

recognize metaphors related to some domains earlier than those related to other domains as a consequence of the progressive acquisition of conceptual distinctions. Keil (1986), for example, found clear differences between the scores for metaphor interpretation in different domain pairs, and these were larger in the group of 5-year-olds. The general order of acquisition was: car-animate; wind-vocalization; animals-occupation; idea-plant; book-eating; weather/texture/taste-person, but not all children followed the same order. Whether this order remains the same in middle childhood is uncertain, as Fischer and Silvern (1985), for example, mention that children are exposed to diverse contexts in that period, and it can be argued that this may also affect the order of acquisition.

What emerges from this section is that the notion of domain is complex, making clear delineation difficult. Also, domains are not static, as they may merge or get differentiated over time. Another important point is that the knowledge of conceptual domains develops over time, and that for some children this process starts earlier than for others. It is not clear how greater domain knowledge will work out for metaphor recognition, but it may be anticipated that children with more domain knowledge might be able to distinguish better between domains, which may favour recognition, and when asked to interpret a metaphor will give a richer interpretation that includes a reflection about both domains. It can also be argued that children with more domain knowledge also have more knowledge of the different senses of words and, as a result, may be less alert of their metaphorical uses.

According Schecter and Broughton (1991), the advancement in domain knowledge also allows children to improve their judgement on the use of, for example, polysemous words. Children become more aware of the physical and psychological meaning of the same term (e.g. *cold*, *hard*) and are able to explain the connection between these two senses, showing a higher capacity to reflect upon language. I will therefore discuss this growing metalinguistic competence of school-going children in the next section.

3.2 Metalinguistic competence and metalexical awareness

In the previous section I have discussed the complexity and importance of knowledge of conceptual domains for the recognition and

interpretation of metaphors. However, the influence of domain knowledge is not an isolated issue, as metaphor processing also seems to be influenced quite strongly by the development of metalinguistic competence and metalexical awareness of children, which allows them to better reflect on language (Morais & Kolinsky, 2004). In Chapter 1 I have shown that school-age children expand their metalinguistic knowledge. In this section I will address the idea that this knowledge facilitates the identification of differences between the meaning as used in the context and the basic meaning of words, which is crucial for metaphor recognition.

Winner and Gardner (1993) stress that metalinguistic competence, the ability to reflect upon language and its features, is essential for a listener or reader to be able to recognize and appreciate the metaphoricality of metaphor and irony. Nippold (1998) broadens this to the identification of meanings of figurative language such as proverbs and idioms. She indicates that it allows children to analyse the words in an utterance in the linguistic context and develop a relevant interpretation. Metalinguistic competence includes a diversity of abilities, some of which may be easier to master at a younger age, whereas others emerge at a later age. I adopt the suggestion of Homer (2009) that it seems plausible to assume that young children already have a kind of basic level of metalinguistic awareness, which increases over time together with language and cognitive development. In that sense it is more precise to talk in terms of a change in the nature of language awareness, where the initial and basic level of implicit metalinguistic knowledge of young children becomes progressively more explicit and conscious (Homer, 2009; Ravid & Tolchinsky, 2002).

It may be expected that the growth in metalinguistic competence with age and schooling, strongly influenced by the process to learn to read and write as discussed in Chapter 1, goes hand in hand with better recognition and interpretation of metaphors. School years provide children and adolescents with opportunities to learn and think more carefully about language, as they explore different topics and types of discourse. The increasing complexity and diversity of language assignments in classroom activities and the use of new words and linguistic constructions stimulate metalinguistic competence (Berman, 2007; Nippold, 2004). At the same time, it is also plausible that differences among children of the same age will exist, as metalinguistic competence is related to individual growth in language and cognitive abilities. The potential influence of metalinguistic competence seems

quite important, particularly for metaphor recognition and richer interpretation, but this has not been an issue of much study, as I am only aware of one exploratory study with children that examines this relation, and one that focuses on metalexical awareness, which I will now discuss.

Groot et al. (1995), to my knowledge, is the first study exploring elicited metaphor recognition by children. They were interested in the age at which recognition of metaphor and irony as a special way of using language emerges. Drawing on the thinking of Olson (1988), their study explored comprehension (“understanding what is meant”) as well as awareness (“detecting a distinction between what is said and what is meant”) of metaphor and irony. They indicate that this kind of metalinguistic awareness is necessary for a full comprehension of metaphor. Groot and colleagues tested one group of 6-year-olds and another of 7-year-olds from three schools. Groot and colleagues developed eight short stories of four lines (two to four sentences), which ended with either a literal or a non-literal utterance (metaphor or irony). Examples of stories they used with a metaphorical ending and a literal ending are shown in Figure 3.2.

Metaphor

Four-year-old Paul was very mad. His sister was baby-sitting for him and wouldn't let him have any candy. Paul threw himself down on the rug and screamed. Their parents called to see if everything was okay, and his sister told them that Paul was having a temper tantrum. When their parents got home that evening, Paul's sister said to their parents: "The storm isn't over yet"

Paraphrases:

Correct: Paul was still being naughty.

Literal: It was still raining outside.

Irrelevant: Paul still wasn't very smart

Literal

Ted and Amy were going to have a picnic. Ted read the weather forecast to make sure that it was going to be nice out. It said that it was going to be sunny all day. So they put some food in a basket and went to a beautiful spot under a tree. They had a wonderful time. Ted said to Amy: "This was the perfect afternoon"

Paraphrases:

Correct: Ted had a great time.

False: Ted had an awful time.

Irrelevant: Ted had homework to do that night

Figure 3.2 Example of the Materials Used by Groot et al (1995)

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At the beginning of the test they played one story with a literal ending to the children and told them that this would be one type of stories they would hear. Then they played a story with a figurative ending and drew attention to the last line. They explained that this was the other type of story, which they referred to as the way a boy named Max likes to talk. They then played all eight stories one by one, asking the following two questions after each story while the tape was stopped. They asked if the final utterance sounded like something Max would say to test whether the child was aware of the metaphor, with the correct answer being 'yes' for stories with a figurative ending and 'no' for stories with a literal ending sentences. Thereafter they asked the child to select from among the three paraphrases the answer that "meant the closest to what the character in the story meant".

The three different paraphrases were read to the child in random order. In the case of stories with a figurative ending the paraphrases comprised three options: correct, literal and irrelevant. In the case of the literal ending the options were: correct, false and irrelevant, as shown in their example (Figure 3.2). The findings suggest that:

- 25 percent of the children scored positively on recognition (awareness of the discrepancy between to say and to mean) and scored positively on comprehension of the metaphor (understanding the implied meaning).
- 31 percent scored positively on recognition but not on comprehension
- 8 percent scored positively on comprehension but not on recognition
- 34 percent failed on both aspects.

These findings suggest that 56% of the children recognized the metaphors, that is, they realized the incongruity between what was said and what was implied, whereas 33% comprehended the metaphors, suggesting that recognition is less difficult than comprehension. The authors (1995, p. 268) point out that "metaphors are perceived as marked before the child can understand them", as only 8% scored positively on comprehension without recognizing the metaphor. They also found that 7-year-olds did significantly better on awareness than 6-year-olds. For metaphor comprehension this cannot be proven, as performance on the forced choice task for both 6 and 7-year-old children was not statistically significant.

A limitation of the study which the researchers mention themselves is that it used what they call “whole-sentence” metaphors, placed at the end of the story. This type of metaphor does not have semantic incompatibility in itself and can be understood, in fact, without considering an alternative meaning. Only because its meaning contrasts sharply with the text does the sentence become metaphorical. This type of metaphorical structure is clearly deliberate, according to the definition of Steen (2008), as the final sentence orients the addressee to look at it as different from the context. This implies that there is considerable disparity between the context and the ending sentence, which may make it easier for children to notice the contrast.

Groot et al. (1995) argue that awareness scored higher than comprehension precisely because of the contrast between the context and the metaphor, making the metaphor literally irrelevant, which may draw the attention of the reader. It can be argued that the low score on interpretation is strongly influenced by the fact that the ending sentence has a clear literal meaning and is not related to the context, making it more complex to make sense of the figurative meaning. This is quite different in many other metaphors, as the authors indicate themselves. For example, a metaphor in a text may be just a sentence which includes one or a few metaphorically used words, where the incongruity is in the sentence itself, but the surrounding text may provide clues for metaphor interpretation. This is clearly not the case in the examples of Groot and his colleagues.

Given the specificity of the type of metaphors that were used in the study of Groot et al. and the fact that performance on the forced choice task for comprehension was not statistically significant, their findings cannot be generalized. Hence it cannot be concluded that metaphor recognition is easier for children than comprehension. In fact the opposite remains more plausible, as it can be argued that explicit recognition implies a reflection on language (metalinguistic competence), which seems more demanding than comprehending the implied meaning of a metaphor.

Goddard (2004) also acknowledges the importance of metalinguistic awareness in relation to the recognition of metaphorical uses of language. He points out, however, that a more specific term, namely metalexical awareness, is needed to refer specifically to the identification of differences in meanings of a word. Goddard in particular argues that metalexical awareness, being a special kind of metalinguistic awareness, is needed to make sense of ‘active’ metaphors (a term he adopted from

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Goatly, 1997). In 'active' metaphors (which can be conventional or novel), speakers use words in a way that draws attention to the words themselves, because the meaning of the words is different from their usual meaning. An example given by Goddard (2004, p. 4) is: *Language is, so to speak, the mirror of the mind*. Other examples of speakers commenting on their choice of words include wordings such as: *as it were, if you like, and speaking metaphorically*. Goddard indicates that these expressions occur fairly frequently in conversation, oral narrative and journalism, but this also depends on the culture. He poses that the use of active metaphor is an overt indication of metalexical awareness of the speaker.

Metalexical awareness in general has been defined by Gombert (1992, p. 63) as "the subject's ability, on the one hand, to isolate the word and identify it as being an element of the lexicon, and on the other hand, to endeavour to access the internal lexicon intentionally". A considerable body of research exist in this area, with some researchers focusing more on the awareness of words as separate entities (e.g. Karmiloff-Smith et al., 1996; Kurvers et al., 2006; Kurvers & Uri, 2006) and others putting more emphasis on the child's reflection on the relations between words and meanings (Asch & Nerlove, 1960 cited in Gombert, 1992; Bialystok, 1986; Doherty & Perner, 1998; Özçalışkan, 2005; and Winner et al., 1976). Some of these include research with synonyms and others with polysemous words. However, what drew my attention is the study of Schecter and Broughton (1991), as in my view it clearly links metalexical awareness with metaphors.

Schecter and Broughton (1991) explored children's awareness of the differentiation between physical meanings (related to objects) and non-physical (figurative) meaning (related to people) of polysemous terms (*hard, warm, sweet, etc.*) and children's construction of a link between these two meanings in psychological metaphors. Based on their longitudinal research on these psychological metaphors, they propose that the progression over time of metaphorical explication is characterized by four age related levels:

- Level 1: No differentiation of meanings (approximately 6-8 years old). The terms have only one meaning for the child, the basic or physical meaning (e.g. children indicate that people can be warm as shown by the answer "they could have warm blood") (p. 131).
- Level 2: Initial differentiation of meanings (around 8-10 years old). An initial differentiation takes place between the physical

meaning (*a radiator is warm*) and non-physical (psychological) meaning (e.g. *a warm person* is “someone who has love and affection”), but no explanation could be given why both a loving person and a radiator could be called warm (no relationship between the two meanings) (p. 132).

- Level 3: Clear differentiation between meanings (approximately 10-12 years). Children explicitly make a relationship between the two meanings (physical and non-physical) of the term and are able to contrast them (e.g. “a hard person is a person without feelings”. “A very flabby person can be a hard person. Because it's not a physical characteristic”. The child then added “There's mental, the way they think” (p. 127).
- Level 4: Abstract reflection on both meanings (around 12-14 years). Children show a more abstract reflection on the two meanings and its relationship. For example, a child answered the question “does someone’s bright’ has anything to do with the sun is bright?” “Yeah, I guess so. It’s just the way our thinking has developed. Because smartness and intelligence are abstract, so we give it to something that’s more tangible” (p. 133).

These four levels show a clear improvement of the capacity to reflect over language in relation to the terms used in psychological metaphors. A recent study by Piquer-Píriz (2010), with Spanish speaking children learning English as second language, shows a similar pattern in that of the 6-year-olds only 6% associated the lexemes *cold* and *warm* with their psychological meaning of friendly and unfriendly behaviour, whereas for the 8- and 10-year-olds this was 18% and 76%, respectively. This metalinguistic development is, as discussed in Chapter 1, promoted by the increasing complexity of literacy tasks and activities that students face in school and develops together with advances in vocabulary, syntax, and understanding of figurative language (Berman, 2004, 2007; Nippold, 1998, 2004; Ravid & Tolchinsky, 2002).

According to Schechter and Broughton (1991) the improved capacity to reflect on language occurs together with increased domain knowledge. This they found by comparing children’s explications of metaphors with their knowledge of concepts of life and consciousness obtained in semi-structured interviews. Younger children (6-10 years) were lower in both the metalexical awareness in relation to psychological metaphors and the knowledge of concept of life and consciousness than

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older children (12-14 years). The highest level of metalexical awareness defined by Schecter and Broughton (1991), which occurs at the age of 12-14, enables children to give a rich metaphorical interpretation, shown by what the authors (1991, p. 139) call “a mature conception of metaphor”.

These findings about the explication of psychological metaphors, however, cannot be generalized to other metaphors. Not all metaphors are equally difficult in terms of the complexity of concepts involved, for instance, and a considerable difference may also exist in the triggering of the reflection on their basic and figurative meanings. Hence it is reasonable to expect that younger children, for example, can show a more advanced metalexical awareness of metaphors related to conceptual domains about which they have in-depth knowledge. This claim is supported by the finding of Özçalışkan (2005, p. 316) that five-year-old Turkish speaking children were already able to comprehend motion metaphors (e.g. *the time flies by* and *the idea passes through the mind*) and were able to reason about the underlying metaphorical mappings.

What seems to emerge is that both the growing metalinguistic competence, particularly metalexical awareness, and the increase in domain knowledge have a positive influence on the comprehension of metaphors. This supports the finding of many researchers that with growing of age, children will show more advanced levels of metaphor interpretation. It is interesting to see that Schecter and Broughton (1991) suggest that there is an important shift in the levels of metalexical awareness in relation to psychological metaphors between children of 8 to 10 years old and those of 12 to 14 years. Even though these findings cannot be generalized it cannot be ruled out that this shift also may apply to some other types of metaphors, either. As discussed in Chapter 1, a relationship seems to exist between metalinguistic and metalexical awareness and reading comprehension (Gombert, 1992; Nagy, 2007; Yuill, 2007, 2009; Zipke, 2007, 2008; Zipke et al., 2009), which makes that better comprehenders will have more developed metalinguistic and metalexical knowledge. Hence, not only age but also reading comprehension is at play. In addition, factors such as the home environment (Garton & Pratt, 2009) and the preferences of children for knowing about specific topics (Nippold, 1998) are likely to have influence on language development and on the enrichment of knowledge of certain domains.

A point of reflection is whether growing metalexical awareness equally affects metaphor interpretation and recognition. It can be argued

that it is, in fact, more important for metaphor recognition, as reflection on language helps to identify the mismatch between a basic meaning and the meaning given in the context. In the case of interpretation it seems plausible to assume that in several, if not many, metaphors the implied meaning can be understood without necessarily performing a metalexical activity.

In sum, empirical evidence shows that metalexical awareness, which is particularly important for metaphor recognition, develops over time. In their research with psychological metaphors Schecter and Broughton (1991) identified four different levels of metalexical awareness. The highest level they define occurs at the age of 12-14, and enables the children to give a rich metaphorical interpretation of polysemous terms involving physical and psychological senses. It cannot be confirmed nor ruled out that this also applies to other types of metaphors, and that children at an earlier age may reach an advanced level, for example for metaphors linking more familiar conceptual domains. This may also explain some of the differences that were found by Schecter and Broughton in metaphor interpretation within the same age group.

3.3 Use of linguistic context

In the previous two sections we have seen that domain knowledge and metalinguistic and metalexical awareness are relevant in metaphor processing. Another factor which seems particularly important for my research, where I use metaphors embedded in text, is the influence of linguistic context, as I will discuss in this section. Different authors, including Gibbs (1994) and Vosniadou (1987b), stress the important role of linguistic context in the comprehension of literal uses of language, and even more so in understanding figurative language, particularly for readers with limited knowledge of conceptual domains. Vosniadou (1989) differentiates between situational, linguistic and intrinsic context. Situational context is what the speaker/writer and reader/listener physically share (what they can see, hear and feel) and intrinsic context refers to the common or culturally shared experience between them, as that may also help to understand metaphors. Here I will focus on what shecalls the linguistic context, the information provided in the story in which the metaphor is embedded, or what can be inferred from this information.

Levorato and Cacciari (1995, 2002) indicate that the use of contextual information is the most important factor in their model for the development of figurative competence, the Global Elaboration Model (GEM). This theory has initially been developed to explain the comprehension and production of idioms, but the authors indicate that it also applies to the development of figurative language in general. According to GEM (Levorato and Cacciari, 2002, p. 128), comprehension and production of figurative language do not require special procedures or sources of knowledge compared to what children normally do with literal language. It is acquired “as part of the abilities children develop in order to acquire and process language in general”.

Contextual information may facilitate the reader or listener to give meaning to metaphors, but not all metaphors are presented in this way. As discussed in section 3.2, Groot et al. (1995, p. 266), for example, used metaphors where the context does not provide clues to establish the intended meaning of the metaphor. An example is the story that talks about an angry boy and closes with the line *the storm is not over yet*, but there is no storm and no reference is made to anything related to weather. This would be different, for example, for a metaphor such as *the mermaids riding on the waves* (Reinhart, 1976, p. 387). If this metaphor were put in a story about mermaids, children may more easily come up with an interpretation of the intended meaning, using words like *swimming*, *floating*, etc. Hence the context may help to disambiguate what attributes or properties of the focus of the metaphorical expression are relevant in connection with the topic or target domain to identify the intended meaning. As stated by Waggoner et al. (1985, p. 1156), “contextual support makes the meanings of the metaphors predictable”.

Different experimental studies (e.g. Özçalışkan, 2005; Siltanen, 1989; Vosniadou et al., 1984; Waggoner et al., 1985; Waggoner et al., 1997) have demonstrated the importance of context in children’s understanding of metaphors. Vosniadou et al., (1984) for instance, showed that even young children understood the intended meaning when metaphors were presented with a related context. This conclusion is based on the fact that the children chose more predictable metaphorical endings of short stories, with the predictability being established by pilot research and the use of a control group. Vosniadou (1987b) indicates that it is natural to assume that young children, because of their limited conceptual and lexical knowledge, base their inferences about the meaning of the metaphorical sentence mainly on the linguistic context. This suggests that it may be expected that children will have a better understanding of

a metaphor if the intended meaning is more closely related to the context.

The findings of Waggoner et al. (1997) support this claim. They showed, with research involving children between 7 and 11 years old, that the influence of context can be quite strong. They (1997, p. 219) used metaphors depicting one of four types of emotions (happiness, anger, sorrow, and fear) such as *a colourful rainbow* (happiness) and *a snorting bull* (anger). These metaphors were presented at the end of three different types of stories (contexts) that either evoked an emotion congruent or incongruent with the dominant meaning of the metaphor, or a neutral emotion. An example of a happy story they (1997, p. 220) provide is: *Johnny went to the zoo with his aunt. Sometimes when he went places with his aunt, his aunt would buy him things. Johnny saw a big red balloon that he really wanted. He asked his aunt to buy it for him and she did. Johnny was a [metaphor inserted here].*

Comprehension was assessed with a forced-choice task where children were asked to choose between two emotions. For example, when it is said that “*Betty was a bouncing bubble*, does this mean she is happy or sad?” Thereafter they were asked to explain their answer. In general, Waggoner et al. found that children, and even a considerable part of the college students, followed the meaning suggested by the context instead of the emotion portrayed in the metaphor. Children would answer that a metaphor such as *a Betty was a colourful rainbow* (1997, p. 219) placed at the end of a sad story represented the emotion of sadness (and not of happiness, as expected by the researchers). Asked for the reason of their choice one child, for example, indicated that “a rainbow turned upside down is a frown, and you frown when you're sad”, thus adjusting the emotional meaning of the metaphor to fit with the (sad) context. This finding stresses the importance of an appropriate context for better metaphor interpretation. The research also showed, however, that context is not the only factor, as even the youngest group of children (1st grade) gave proper interpretations of several of the metaphors presented with an incongruent context, showing that their answer was based on the metaphor itself and not on the context.

One reason for children giving answers in which they followed the meaning of the metaphor even when preceded by a context that was not supportive may be what Giora (1997, 2008) calls the salient or dominant meaning of words in the metaphor, as discussed in section 2.1. In her graded salience hypothesis (GSH) she suggests that in the initial phase of language comprehension a contextual and a lexical process take place in

parallel. Referring to different authors, she (1997, p. 185) indicates that the “salience of a word or an utterance is a function of its *conventionality* (e.g., Gibbs 1980), *familiarity* (e.g., Blasko and Connine 1993), *frequency* (e.g., Hogaboam and Perfetti 1975; Neill, Hilliard, and Cooper 1988), or *givenness status in a certain* (linguistic and non-linguistic) *context*”. Giora cites Rayner, Pacht, and Duffy (1994), stating that whereas the context may facilitate activation of a word's meaning, it does not inhibit activation of salient word meanings. More recently Giora (2008) no longer includes context in this function, which suggests that the salient meaning is embedded in the mind and is automatically triggered independent of the context.

Another aspect that according to Waggoner et al. (1985) plays a role in metaphor comprehension is the way in which the information in the story is organized. They suggest that it is important to use a story with well-structured grammar to avoid that children would need to spend energy on sorting out the structure and have less processing capacity available for metaphor understanding because they struggled more with the story. This is a relevant point also in relation to the influence of reading comprehension where poor comprehenders would be even at a greater disadvantage. The findings of Waggoner and colleagues showed that even younger children were able to explain the metaphor embedded in such type of story, although in a less comprehensive way than older children.

The length of the context may also have an influence according to Siltanen (1989), based on research with children ranging in age from 6 to 12 years. She explored the understanding of metaphors presented with no context, a short context (8 to 10 words before the metaphor) and long context (60 to 100 words), but not including words that would give away the meaning of the metaphor. The metaphors ranged in difficulty based on the abstractness or concreteness of the topic and the vehicle terms, with metaphors ranking lowest in difficulty when both terms were concrete (e.g. *Butterflies are rainbows*) and highest in difficulty when both terms were abstract (e.g. *Informers are the uranium of criminal justice*) (1989, p. 204). She found that with increasing age children comprehended more difficult metaphors and demonstrated more elaborate interpretations, which seems to be in line with the findings of Waggoner et al. (1985) and others. With respect to the influence of the length of the story, her findings are more ambiguous and not statistically significant, except for the results for the 9- to 11-year-olds, which showed that metaphors preceded by supportive short or long contexts were

understood more often and resulted in more elaborate interpretations than no-context metaphors.

In this section we have seen that the influence of linguistic context has been investigated by several authors. In the early eighties it was already recognized that contextual information influences the comprehension of metaphors and the findings of the studies pointed out that metaphors are better understood and lead to richer interpretations when presented in a supportive context. Different authors agree that for young children linguistic context is even more relevant, as it provides important support, given their limited conceptual and linguistic knowledge. Less clarity exists on some other aspects, such as the influence of the length and the structure of the context. We have also seen that, in some cases, children ignored the context and based their interpretation on the metaphorical sentence instead. This is in line with the graded salience hypothesis of Giora (1997, 2008) which suggests that the salient meanings of words work in parallel with the context. Hence, in this case it can be argued that, for children giving this type of interpretation, the salient meaning of the words in the metaphor had prevalence over those prompted by the context.

3.4 Reading comprehension

In the previous section we have seen that linguistic context favours metaphor interpretation, but not all children benefit from it in the same way. The use of context seems to be related to a more general capacity of text comprehension, as indicated by several researchers (e.g. Brandão & Oakhill, 2005; Cain, 2009; Cain & Oakhill, 2004; Cain et al. 2003, 2004; Perfetti, 1999). Levorato and Cacciari (1995), for example, stress that to understand figurative language (and language in general) it is essential to move beyond piece-by-piece elaboration of sentences (e.g. trying to make sense of the words as separate entities) to constructing a global and coherent meaning of a text. This section therefore looks at a possible relation between explicit recognition and interpretation of metaphors by children and reading comprehension, building on information presented in Chapter 1. The importance of context for metaphor interpretation suggests that readers with a low reading comprehension will be at a disadvantage, as they will be able to extract less information from the preceding context (Cain & Oakhill, 2004; Cain et al., 2003, 2004; Cain &

Towse, 2008). This would imply that, in their case, the salient meaning of metaphorical and non-metaphorical used words may play a more prominent role (at the expense of context) than for readers with a high reading comprehension.

A large body of research exists on reading comprehension, but, to my knowledge, not on the relation between metaphor processing and reading comprehension. I only found two studies, which I will address here. Ripoll-Salceda and Aguado-Alonso (2007) explored the relationship between metaphor understanding and reading comprehension with children from 2nd (mean 7 years and 9 months) and 4th grade (mean 9 years and 9 months). They asked children to give a written explanation of the meaning of six metaphorical sentences that differed in the type of link involved (two perceptual, two relational, two psychological) for somebody that does not understand these sentences. Reading comprehension was explored with the ACL test developed by Català et al. (2001), which contains a specific questionnaire for each school grade.

The conclusion Ripoll-Salceda and Aguado-Alonso draw from their study is that in the group of the 2nd graders a relationship existed between reading comprehension and responses to metaphorical sentences, with higher readers obtaining better results. However, the researchers did not explore this relationship for the 4th graders, as 93% of the answers given by this group were labelled by researchers as “attributional metaphorical interpretations” and they indicate that because the group made so few mistakes, it was not feasible to make this analysis. An important problem with this decision, however, is that the category of attributional metaphorical interpretation they use to compare with reading comprehension levels includes three sub-categories, which they (2007, p. 60) illustrate with the example: *The arms of this policeman are harbour cranes* (*Los brazos de este policía son grúas de puerto*). Category (1) answers using a wrong dimension of the vehicle term (e.g. colour instead of strength; “the arms of the policeman are yellow”); (2) answers with an insufficient use of a correct dimension of the vehicle term “the arms of the policeman are very big”; and (3) answers properly, using the correct dimension of the vehicle (e.g. “the policeman has strong arms”). It can be argued that, in fact, only the last sub-category shows a fair understanding of the metaphor. The researchers mention the results of this 3rd sub-category, which for 2nd graders was 21.4% and for 4th graders 53%, which in fact seems more in line with the levels found in other studies with children (Table 2.2 in section 2.3.2). Unfortunately, however, the researchers did not analyze

whether there were differences between low and high readers for this subcategory. Hence it seems that we cannot take their findings as sufficient evidence of a positive relationship between reading comprehension and metaphor interpretation.

The second study concerns Pickens et al. (1985), who found a positive correlation between reading ability and metaphor comprehension of children in group 3, 5 and 6 (approximate age 8 to 11 years) and in group 7, 9 and 11 (12 to 17 years). Their data only report on the two groups as a whole and do not establish whether the effect was equal for the younger and older children within the groups. Another point they derive from their results is that there seems to be a positive correlation between what they call “context sensitivity” (choosing literal completion in a literal context and metaphorical completion in a metaphor context) and reading ability among children from the age group of 8 to 11 years. However, the specific test procedure for metaphor comprehension seems to have limitations, as they used a cloze question test which includes several less probable answers. In the examples they presented in their article the four multiple choice options include one literal answer, one metaphorical answer and two answers that had little relation with the metaphor or did not make much sense (see Figure 3.3).

<p>Carefully I entered the house. The (1) curtains tried to block my view. Death-like darkness..... (2) the room.</p> <p>Words to select from to include in the blank spaces: Sunlit; fat, <i>cobweb</i> (metaphoric), and thin (literal) <i>Blanketed</i> (metaphoric), filled (literal), brightened, and lifted</p> <p>(Pickens et al.,1985, p. 497)</p>
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Figure 3.3 Example of the cloze test for metaphor comprehension

With this type of answers it can be argued that children could, in some cases, have guessed what to choose after first discarding the answers that did not make sense, which may have led to an overestimation of their comprehension level. Some other experimental studies with children do exist that analyse the link between comprehending other forms of figurative language and reading comprehension, including Cain et al. (2005) and Cain and Towse (2008). I will present the study of Cain et al. (2005) in some detail, as they follow a comprehensive approach to establish the relationship between the understanding of different types of idioms and reading comprehension. In total 28 children of 9 and 10 years old participated in the study, half of

them good reading comprehenders and half poor reading comprehenders. This group was selected after having performed different reading tests (word reading ability and vocabulary knowledge). Children were asked to provide verbal explanations of the idioms.

To understand the findings of the study it is important to first explain that an idiom is a figurative expression that allows for a literal explanation if viewed by itself, but that takes a non-literal meaning because it differs from a given context (Cain et al., 2005). In this respect it differs from a metaphorical sentence, where in many cases a literal explanation is not plausible (Gibbs, 1994; Winner, 1988). The idioms Cain et al. (2005, p. 67) used varied according to three factors: familiarity (real or novel), transparency (transparent or opaque), and context (presented in isolation or in a supportive narrative context). In transparent idioms the figurative sense can be inferred from the individual words, which is not the case for opaque idioms, as the latter cannot be explained without information from the context or prior knowledge. Their example of a transparent idiom is *to get away with murder* (e.g. “to escape punishment for something serious”) and of an opaque idiom is *to be wet behind the ears* (meaning “to be young and inexperienced”). They selected 24 idioms, 6 for each combination of two of the factors (real-transparent, real-opaque, novel-transparent, and novel-opaque). An example of a story and questions for the interpretation of an idiom provided by the authors are presented in Figure 3.4.

<p>Idiom To get away with murder Sarah was playing with her Frisbee in the lounge. By accident, she hit one of mum’s best vases. Mum heard the noise and rushed in. She didn’t notice Sarah and her Frisbee. She just saw Rover, their dog, and the vase on the floor in pieces. “Bad dog!” she shouted. “You’ve broken my favourite vase.” Sarah had got away with murder.</p> <p>Literal questions What was Sarah playing with? What was the dog called?</p> <p>Idiom question What does it mean when it says that “Sarah had got away with murder”?</p> <p style="text-align: right;">Cain et al. (2005, p. 75)</p>
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Figure 3.4 Example of the Materials Used by Cain et al.

Cain et al. (2005) found a clear positive relation between reading comprehension and idiom comprehension. Children with higher level of reading comprehension performed better overall than lower readers, but this pattern was not significant for all types of idioms. In addition,

interpretation of idioms was greatly facilitated by context, as children better explained idioms presented in context than in isolation. However, it was not the same for all children, as good comprehenders did significantly better in the understanding of the meaning of opaque idioms in context. This suggests that children with a low level of reading comprehension had more difficulty with identifying and integrating pertinent information from the context to work out the figurative meaning of opaque idioms. It can be argued that the effect of reading comprehension may work in a similar way for the interpretation of metaphors, as better comprehenders would have higher levels of text skills that facilitate construction of the meaning of the metaphor and the text. This might be even more prominent in relation to novel metaphors, which are likely to have higher demands in terms of text processing.

The same would apply to metaphor recognition, as the construction of a coherent representation of the text may facilitate the awareness, for instance, of those words that seem to constitute a dissonance with what the text is about. It seems that this suggestion is supported by the point raised by Perfetti et al. (2005, p. 247) that higher levels of reading comprehension require that readers must adopt a “high standard of coherence” and critically explore “whether the text makes sense”. It can thus be argued that this goal for coherence will encourage them to resolve inconsistencies in the text, including those brought about by figurative language, instead of ignoring or not noticing them.

Better comprehenders are also more able to adapt their mode of reading to meet their reading goals. Cain (1999, p. 303) found, for example, a difference between 8-year-old skilled and less skilled comprehenders who were asked to skim a text (telling them that it was important to “read the story as quickly as possible and find an answer to a special question”) and to study a text (indicating that the essence was how well they would answer questions related to the story). She found that skilled comprehenders read considerably faster in the skimming task and remembered more when reading in study mode, whereas for the less skilled comprehenders there was no difference between these two modes of reading in speed or what they remembered. She concludes that this implies that skilled comprehenders are better at adapting the reading task to match the goal of reading. Her finding that children adapt their way of reading may also have implications for metaphor research, as it may be expected that better readers may be able to focus more on a task where they are, for example, asked to recognize metaphors, than less skilled readers could.

Better readers may not only be able to adjust their way of reading, but also to think more critically about the text and to see it, in the words of Olson (1997, p. 507), as “an expression of some author’s beliefs”. They will have more advanced metalinguistic knowledge (Nagy, 2007; Yuill, 2007, 2009; Zipke, 2007, 2008; Zipke et al., 2009) and more advanced knowledge of genre. The latter, according to Olson and Pelletier (2003), contributes to attributing authorial intentions, which in turn will facilitate metaphor recognition when given a task of elicited recognition, as better readers may be more aware of the communicative intention of metaphorical uses of language in a text.

In this section I have discussed two studies with metaphors, which had some methodological limitations and are not conclusive about the relationship between reading comprehension and metaphor understanding. The third study from Cain et al. (2005) provides stronger evidence that the proper interpretation of idioms by children is affected by their proficiency in reading comprehension. I have argued that although the two studies are not conclusive, it is plausible that children with a higher level of reading comprehension will be better at metaphor interpretation. This effect, however, may be influenced by other aspects (e.g. metaphor presented in context or isolation; novelty of the metaphor) similar to what Cain et al. (2005) suggest for idioms.

It may also be expected that good comprehenders are better in metaphor recognition, as higher levels of reading comprehension are likely to imply they will be more alert about text coherence and more aware of potential mismatches in the text. The nature of the task may also have an effect, in that elicited metaphor recognition may enable children to identify a larger number of metaphors than in a normal reading task. The possible influence, however, is likely to be different depending on reading comprehension ability. Following Cain’s (1999) findings, I have argued that readers with higher reading comprehension skills may be expected to be better in elicited metaphor recognition than readers at a lower level, as they more easily adapt their way of reading focusing for example on the uses of language with less attention to the story content.

3.5 Conclusion

In this chapter I have discussed several important child-related factors that may influence the recognition and interpretation of

metaphors by school-age children: knowledge of conceptual domains, metalinguistic competence and metalexical awareness, use of linguistic context, and reading comprehension. Common in the theories about metaphor is the presence of a relation between two conceptual structures, the source and target domain. The ability of children to make consistent relational mappings between domains increases with age and it seems reasonable to assume that this is a process that sometimes is gradual and at other moments goes in leaps. I raised the point that growing domain knowledge supports metaphor interpretation, which may result in richer interpretations with more indications of the reflection about the two domains. I also indicated that research on the effect of domain knowledge on metaphor recognition is lacking. It may be anticipated, on the one hand, that children with more domain knowledge are more able to distinguish between domains which may favour metaphor recognition. On the other hand, however, children with more knowledge may also have a broader understanding of words related to the specific domain, including those that are figuratively used. As a result, these words may no longer stand out for them, and this may reduce the level of recognition, unless triggered by, for example, the deliberateness of the metaphor.

In this section I have also explained that metalinguistic competence is important for metaphor recognition and interpretation, but that different schools exist about the age at which this competence develops. One reason for such differences seems to result from the fact that this competence includes a diversity of abilities, some of which may be easier to master at a younger age, whereas others emerge at a later age. Researchers usually only explore some of these abilities, which accounts for differences in their findings. Another reason is that this metalinguistic knowledge evolves from a functional to a conscious level. Metalinguistic skills are initially implicit and progressively become progressively more explicit and conscious. Cognitive and linguistic development, as well as literacy and schooling, play a crucial role in this transformation. Metalexical development is of particular importance for metaphor processing, which starts before the school age. Young children can already interpret some types of metaphors, but because of differences in their knowledge and exposure to language in their pre-school years, the performance in metaphor interpretation may vary considerably among children from the same age group. Much less is known about the development in children of the ability to recognize metaphors.

I have also discussed that contextual information is important for the interpretation of literal uses of language, but even more so in understanding figurative language and in the recognition of metaphor. A factor that may interfere with the information from the context, however, is the salient meaning of the metaphorically used words for the reader or listener. When the salient meaning is the metaphorical meaning and goes in the same direction as the text, interpretation may be easier, but recognition may not necessarily, unless perhaps the reader is triggered by the deliberateness of the metaphor. When the salient meaning is not the metaphorical meaning, the reader may become more alert of a “problem” and recognize the metaphor because the salient meaning does not fit the context, but this can also make it more difficult to make sense of the metaphor.

Regarding the influence of reading comprehension on metaphor interpretation and explicit recognition I have indicated that this has not been an issue of much research. I am aware of two studies that suggest a positive correlation between reading comprehension and metaphor understanding. Although I have indicated that some limitations exist in these studies, it still seems plausible to expect a positive effect of reading comprehension, as the findings of studies with idioms also tend to point in the same direction, showing that good readers do considerably better than poor readers. Based on this finding I anticipate that whereas metaphorical competence progresses with age and school grade, reading comprehension will also have an important influence on metaphor recognition and interpretation. Better readers, for example, have better metalinguistic skills, make more appropriate use of linguistic context, and are more able to adapt their way of reading to follow specific reading purposes.

Finally, it is also important to realize that considerable differences exist between metaphors. I have mentioned, for example, metaphor conventionality, but have not yet elaborated on possible implications. In the next chapter I will therefore turn to the potential influence of some of the properties of metaphors on explicit metaphor recognition and interpretation. I will explore linguistic form, looking at nominal (*A is B*) and verbal metaphors, conventionality, and the deliberateness of metaphors.

4. Metaphor properties influencing metaphor processing

The discussion presented in Chapter 3 shows that metaphor recognition and interpretation are affected by the conceptual and linguistic knowledge of children. The situation, however, is still more complex because considerable differences exist among metaphors, as can be seen from the examples in Figure 4.1. An important question arises, then, whether such differences may affect the recognition and interpretation of metaphors. In my approach I follow the three-dimensional framework proposed by Steen (2008, 2011a), already addressed in Chapters 1 and 2, by exploring three metaphor properties: linguistic form, conventionality, and deliberateness pertaining respectively to the linguistic, conceptual, and communicative dimensions of metaphor.

- The color *of* gold (Broderick, 1992, p. 184)
- The wind *seized* the leaves (Broderick, 1992, p. 184)
- *Lollipop trees* (Cameron, 1999a, p. 15)
- The tree *took* the fire and *hid* it (Cameron, 1999a, p. 15)
- We can *build* our understanding (Cameron, 1999a, p. 15)
- The river *betrayed* its proximity (Steen, 1999, p. 85)
- She's my *bodyguard* (Cameron, 2003, p. 90)
- It's like a *miracle* (Cameron, 2003, p. 90)
- You're *spokes in a wheel* (Cameron, 2003, p. 90)
- *A feast* of fun (Cameron, 2003, p. 90)
- It won't take *long* (Cameron, 2003, p. 95)
- The music *helps* (Cameron, 2003, p. 243)
- Where does the time *go*? (Cameron, 2003, p. 243)
- Shall I *compare thee to a summer's day*? (Shakespeare's Sonnet XVIII, cited by Steen, 2008, p. 225)
- A party can't even *decide* its name (...) (Krennmayr, 2011, p. 73)
- Labour *hopes* to transform the situation by increasing (...) (Krennmayr, 2011, p. 123)

Figure 4.1 Examples showing the wide variety of metaphors

The thinking about metaphor has come a long way from its early days, where metaphor was seen as a feature of language particularly related to poetics or political rhetoric. This narrow view changed under the influence of cognitive linguistics, which introduced the view that metaphor plays a crucial role in the conceptualization and understanding of language. Some seminal publications, such as Ortony (1979) and

Lakoff and Johnson (1980), prompted the ‘turn’ to the cognitive aspect of metaphor. Emphasis was put on the conceptual content and the conceptual mapping between domains, as pointed out by Cameron (1999a), for example. Glucksberg and Keysar (1990, 1993) raised a point of critique concerning conceptual metaphor theory, indicating that metaphor comprehension may not necessarily require cross-domain mapping, but in many cases can be understood by categorization. As explained in Chapter 2, this view is developed in a more comprehensive way by Bowdle and Gentner (2005) and Gentner and Bowdle (2001, 2008), who in their two-dimensional Career of Metaphor Theory indicate that the way metaphors are processed depends particularly on their conventionality (distinguishing between novel, conventional and dead metaphors) and their linguistic form (where they explore metaphor of the form *A is B* and similes of the form *A is like B*).

In Chapter 2 I have also indicated that I follow the view of Steen (2008), who posits that this two-dimensional model is not sufficient to explain why most metaphors are not likely to involve cross-domain mapping, and that an additional dimension is needed, namely the communicative function, which relates particularly to whether the metaphor is deliberately used. I will address the three dimensions of Steen’s model (2008, 2011a) in this chapter by first exploring what is known about the linguistic form, and particularly the effect of nominal *A is B* and verbal metaphors on metaphor recognition and interpretation by children. I will then move to the conceptual dimension, which concerns the conventionality of the metaphor, and may have influence in its own right (conventional versus non-conventional), but may also interact with the linguistic form (conventional *A is B* versus non-conventional *A is B*, conventional verbal versus non-conventional verbal, etc.). In the last section I will then turn to the communicative dimension and discuss particularly the potential influence of deliberateness and its possible interaction with the linguistic form and conceptual structure of metaphor.

4.1 Linguistic form and metaphor processing

Studies with children have mostly used nominal metaphors of the form *A is B*, such as *butterflies are rainbows* (Siltanen, 1989, p. 204) and *the prison guard was a hard rock* (Winner et al., 1976, p. 291). The

incidence of this type of metaphors, however, is low in language use (Broderick, 1992; Steen et al., 2010). Broderick (1992) reviewed 53 popular (frequently read) children's books and found that noun phrase metaphors were rare. One of the texts Cameron (2003) used in her research with children illustrates this pattern, as only two out of 13 linguistic metaphors were nominal. In the second text she used the number was higher, with 8 nominal metaphors out of a total of 23. Broderick (1992) and Cameron (2003) suggest that verbal metaphors (e.g. *money doesn't grow on trees* (Cameron, 1996, p. 62) are much more frequent than nominal metaphors. Other linguistic forms that can be found include similes such as *a cloud is like a sponge* (Gentner, 1988, p. 50), adjectives such as *sharp person* (Schecter & Broughton, 1991, p. 127), and adverbs such as *Bello and Bradley [...] both baldly lied* (Steen 2004, p. 1302).

In the Career of Metaphor Theory (Bowdle & Gentner, 2005, Gentner & Bowdle, 2001, 2008) the linguistic dimension of metaphors is explored by looking at the difference between metaphor and simile. Several authors, however, have pointed to the variety of linguistic forms of metaphors in discourse (e.g. Cameron, 1999a; Cameron, 2003; Gibbs, 1999; Goatly, 1997; Steen, 2011a; Steen et al., 2010) and the need to enhance metaphor research by going beyond the *A is B* format (Cameron, 1999a; Steen, 1999; Steen, 2011a). It seems relevant to explore the relation between the linguistic form of metaphor and its recognition and interpretation by language users. I focus my analysis on nominal (*A is B*) and verbal metaphors, taking into account that *A is B* metaphors have been extensively used in research with children, but are less present in language than verbal metaphors (e.g. Broderick, 1992; Cameron, 2003)

Different authors mention the possible influence of the word class of the linguistic items and particularly the difference between nominal and verbal metaphors on metaphor recognition (e.g. Cameron, 2003; Goatly, 1997; Steen, 2004) and metaphor interpretation (e.g. Cameron, 2003; Reyna, 1985, 1987). Cameron (2003), in her exploratory study with children, found that students were more likely to notice nominal than verbal metaphors. Steen (2004), working with adults, presents similar findings in that direction, as his respondents underlined nominal metaphors more frequently than verbal metaphors. This finding, however, was not statistically significant. Reyna (1987) suggests that nominal metaphors may be easier to interpret because verbs are semantically more complex, as they have a wider variety of meanings. Other authors, too, point to the difference of verbal and nominal

metaphors, such as Goatly (1997), who indicates that nouns mostly represent things and therefore more easily create rich images related to their conceptual domain. In her discussion about metaphor identification Cameron (2003, p. 71) suggests that "a concept domain is most easily understood if labelled by a noun that refers to an entity and its underlying concept." She indicates that this is different for metaphorically used verbs, as the analyst not only needs to understand the lexical meaning of the verb, but also has to move to the domain of the conventional collocate and juxtapose this with the domain of the collocate used in the text. Cameron posits that nominal metaphors do not require this additional process and, as a result, seem to stand out more than verbal metaphors.

The influence of linguistic form on metaphor recognition has been explored in some studies with adults. Graesser et al. (1988) examined what metaphors from persuasive discourse (six debates from the MacNeil/Lehrer News Hour) were noticed by college students. Participants had to underline any part (words, phrases, and sentences) that they thought was metaphorical or another type of figurative language. The authors made a classification of metaphors that included, among others, the syntactic frame (e.g., nominal, verbal, and adjectival) and also what they called 'explicit comparisons' (direct comparison either as a metaphor *A is B*, or as a simile *A is like B*). Their identification resulted in 504 metaphors. The categories were not mutually exclusive and therefore a metaphor could be classified in more than one group. The results did not indicate significant differences between the awareness of metaphors with different syntactic frames, but interestingly showed that the metaphors classified as 'explicit comparisons' were best recognized by participants.

More recently, Steen (2004) explored the effect of some structural properties of metaphors and their relation with metaphor recognition. The material of Steen's study included 54 metaphorically used words (e.g. nouns, adjectives, and verbs) present in the lyrics of "Hurricane" by Bob Dylan. Participants received a brief explanation about contemporary metaphor research and conceptual metaphors, and were asked, while reading and listening to the song, to underline any part of the text that they thought was metaphorical, taking into account the illustration previously received. Results showed that nominal metaphors were more frequently underlined than verbal metaphors, but the difference was not statistically significant.

These two exploratory studies with adults seem to suggest that linguistic form of the metaphor has some influence on metaphor recognition. I will now look at two studies with children that have explored processing of nominal and verbal metaphors. Reyna (1985) is the first study that I am aware of that looked at the understanding of both nominal and verbal metaphors by children. Her study involved 16 children of 6 years and 16 of 9 years of age. Two types of stimuli were compared (1985, p. 159, 160). An example of the first type is *the pig laughed at the girl* as the last sentence in a story of a child playing at a farm, which seems to relate to a pig having fun with the girl and making joyful noises. Reyna indicates that in this case the incongruity is caused by the combination of a non-human noun with a human-requiring verb. Another example in this category she presents is *the thunderstorm spanked the boy* as the last sentence in a story about an angry father and a boy. The second type of stimuli combined a human noun with a non-human-requiring verb, such as *the angry father struck the boy with lightning*. Reyna (1985) found that 9-year-olds were better at metaphor interpretation than 6-year-olds which is in line with results of others (Keil, 1986; Siltanen, 1989). She (1986) also suggests that her study shows that predicative (verbal) metaphors are harder to interpret than nominal metaphors. Yet from the information she provides in the report of her study (Reyna, 1985) it is not clear whether the same story was used when focussing on noun or verb meaning, and how this supported the explanation by the children. As a result, we cannot be sure about her findings and conclusions from her comparisons related to linguistic form.

Almost 20 years later Cameron (2003) carried out an exploratory study about the recognition and understanding of nominal and verbal metaphors with two 10-year-old children. She explored how children make sense of linguistic metaphors that they encounter, using two texts from science lessons. The texts comprised different types of metaphors, which, as part of the development of the research materials, were categorized by the researcher and by different adults aware of the metaphor criteria of the researcher.

Cameron applied a task she called GITA (Goal-directed Interactive Think Aloud), as explained in Chapter 2, which records the interactive and collaborative process of talking-and-thinking of children in a classroom activity. The children were asked to review the texts and discuss whether these were suitable for children slightly younger than themselves. The discussion of the two children about the texts in the presence of the researcher was recorded and the verbal protocols were

analysed according to an adapted categorization system developed from Steen's study (1992a). The two indicators used for metaphor recognition were the frequency of explicit comments about the usefulness of the metaphor to facilitate understanding, and the discussion about the vehicle term in the verbal protocols.

Although her study concerns a very small number of children, it is still relevant to look at her findings, because the study involved linguistic material from natural discourse, exploring what children did while reading and trying to make sense of texts with metaphors. She found that the two children recognized more nominal than verbal metaphors and were better at discussing them. The nominal metaphors were explicitly discussed by the children and positively evaluated by them (e.g., by saying "it's quite a good way of putting it") (2003, p. 165). Children focused their discussion particularly on the vehicle term and in several instances added previous knowledge to their conversation. Vehicle terms of verbal metaphors were not directly mentioned in this way. The discussion pattern of sentences with verbal metaphors was similar to sentences without metaphors. She also found that the interpretation of verbal metaphors was less accurate and attributes this to the greater flexibility of verbs, as their meaning is extended through the use of different collocates. This characteristic of verbs makes it easier to accept that verbs have more meanings, which may reduce the possibility of recognition.

In this section I have looked at the linguistic dimension of metaphor, which is one of the two factors for metaphor processing addressed in the Career of Metaphor Theory (Bowdle & Gentner, 2005; Gentner & Bowdle, 2001, 2008) and one of the three dimensions in Steen's model (2011a), which forms the basis for the structure of this chapter. I have discussed that most studies with children have focused on nominal (*A is B*) metaphors, whereas verbal metaphors, for example, are more present in discourse. I have also shown that several authors indicate that differences exist between nouns and verbs that seem to affect metaphor recognition (e.g. Cameron, 2003; Goatly, 1997; Steen, 2004) and metaphor interpretation (e.g. Cameron, 2003; Reyna, 1987). However, research results are not conclusive and may have been influenced by the level of conventionality, for example. This makes it necessary to move to the exploration of the conceptual dimension, which I will address in the next section.

4.2 Conventionality and metaphor processing

As concluded in the previous section, comparing nominal *A is B* and verbal metaphors as different categories at play in metaphor processing, is a simplification as the linguistic dimension interacts with the conceptual structure, the conventionality of the metaphor, as I will discuss in this section. According to Lakoff and Johnson (1980, p. 139) the way people communicate with each other is essentially metaphorical. Conventional metaphors “structure the ordinary conceptual system of our culture, which is reflected in our everyday language”. The metaphorical expressions that people use are based on conceptual metaphors that are conventional mappings between conceptual domains. For instance, linguistic expressions such as *your claims are indefensible* and *He attacked every weak point in my argument* (Lakoff & Johnson, 1980, p. 4) are based on the conventional conceptual metaphor ARGUMENT IS WAR, which involves mapping between the domain of “verbal discourse” and “armed conflict” when processed in people’s mind. However, as discussed in Chapter 2, several authors have indicated that it is not plausible to assume that all metaphors require cross-domain mapping. The Career of Metaphor Theory (Bowdle & Gentner, 2005; Gentner & Bowdle (2001, 2008) indicates that metaphors evolve over time from novel into conventional (and eventually dead) metaphors, a view that also underpins the three dimensional model of Steen (2008, 2011a), which I follow in my research. This process of conventionalization has implications for metaphor processing in that conventional metaphors may no longer require cross-domain mapping, but may be understood by categorization or lexical disambiguation, unless, as stressed by Steen (2011a), they are perceived as deliberate.

Based on earlier work of Gentner and colleagues with adults, Gentner and Bowdle (2008) report that comprehension of conventional metaphors is faster than of novel metaphors, but also that conventionality interacts with linguistic form. Novel similes are comprehended faster than novel metaphors, whereas conventional similes require more comprehension time than conventional metaphor.

Bowdle and Gentner (2005, p. 199) indicate that novel metaphors involve metaphorically used words (base terms) that “refer to a domain-specific concept, but are not (yet) associated with a domain-general category”. They give the example of *science is a glacier*, with glacier having a literal sense (“a large body of ice spreading outward over a land

surface”), but no related metaphorical sense (“anything that progresses slowly but steadily”). In the case of conventional metaphors Bowdle and Gentner’s (2005, p. 199) suggestion is that the metaphorically used word(s) have become polysemous, which implies that they have both a basic meaning and a metaphorical meaning which are “semantically linked due to their obvious similarity”. Over time a base term can become conventionalized through repeated figurative use and become polysemous (words with multiple meanings or senses) by acquiring a domain general meaning in addition to its basic meaning. This is illustrated by their example *a gene is a blueprint*, with the conventional base term *blueprint* having two closely related senses: “a blue and white photographic print in showing an architect’s plan” and “anything that provides a plan”.

A conventionalized metaphor may evolve further and entirely lose the connection with the original base concept. It then becomes a dead metaphor, which no longer has any sense of metaphoricity. According to Gentner and Bowdle (2001) two different options can be distinguished. The first option is that the base term becomes completely embraced in the domain and therewith becomes homonymous (“those language forms which exhibit one form and two distinct senses that cannot be related to each other,” Steen, 2007, p. 141). Gentner and Bowdle (2001, p. 230) provide the example *a university is a culture of knowledge*, where *culture* is used quite literal as *society* and in this context no longer refers to *growth* as in *bacteria culture*. A second option is that the base term entirely loses its original meaning as in their other example (2001, p. 230) *the movie Titanic was a blockbuster*, where readers no longer know that a *blockbuster* was a *bomb*.

Gentner and Bowdle (2001) stress the difference between conventionality of and familiarity with a metaphor. An individual may become familiar with a specific metaphorical expression (a fixed pairing of a ‘base term’ and non-metaphorical term) by repeated exposure and add this to the stock of metaphorical expressions in his or her mind. This differs from conventionality, which refers to the base term that has become polysemous in a linguistic community, and implies that conventional metaphors can be familiar or not familiar (Bowdle & Gentner, 2005) Hence, familiarity of an individual with a particular metaphorical expression (at the linguistic level) may interact with conventionality, which relates to the conceptual structure. The effect of this interaction, however, may be limited, as both familiar and non-

familiar conventional metaphors are not expected to be processed by cross-domain mapping.

I am not aware of any study of the effect of conventionality on metaphor recognition by children and very few studies have explored this influence on interpretation. Pollio and Pollio (1979) conducted an experiment with the interpretation of what they called novel and frozen metaphorical uses. Their study involved 149 children between 9 and 14 years old (4th grade to 8th grade), who were asked to interpret 17 novel and 17 frozen metaphors that were taken from linguistic productions by children collected in earlier research. These were given to three independent raters, all native speakers, to identify figurative uses and to judge them as frozen or novel. they (1979, p. 114) defined frozen as “those non-literal instances that have become conventional or clichéd in the language” (e.g. *the heart of the forest*), whereas novel was defined as “new linguistic creations developed in a given situation which the rater had never (or rarely) encountered in that context before” (e.g. *I was amazed my feet were brave enough to take me there*). Raters compared their findings, and after discussion, and irrespective of their first rating, agreed whether a metaphor was considered to be frozen or not frozen. Inter-rater reliability between the three raters (based on an agreement in the initial scores of at least two raters) was better for novel metaphors (Mean 84%; range 73 – 97%) than for frozen metaphors (Mean 76%; range 45 – 95%).

Metaphors were presented in a single sentence and interpretation was tested through a multiple choice task with four randomly presented alternatives: a correct literal interpretation, an incorrect metaphorical interpretation, and two incorrect literal interpretations.

Their findings showed that for all groups novel metaphors were more difficult to understand than frozen ones, and that there was a significant difference in comprehension between grades, with the lower grades understanding fewer metaphors. Pollio and Pollio also found a positive correlation between comprehending novel and frozen metaphors, from which they (1979, p. 118) conclude that “a single, as yet unspecified, process seems to underlie the child’s ability to understand both novel and frozen figures of speech”.

The study shows the complexity of establishing conventionality, as the initial rating of frozen metaphors in particular resulted in only a 76% agreement among raters. The scores were then compared and after further discussion among raters a final decision was taken. For the novel

metaphors the initial agreement was somewhat better, but several metaphors still showed considerable disagreement among raters.

Waggoner and Palermo (1989) carried out an experimental study where they tested the comprehension of 24 emotion-descriptive metaphors depicting the emotions of love, happiness, pride, fear, anger and sorrow. The study was carried out with 160 participants: three groups of children aged 5, 7, 9, and a group of college students (40 subjects from each group).

The research materials were selected by presenting 140 metaphors to 22 college students with the task to score each of them on a 7-point scale from 'common' to 'novel'. Raters did not receive definitions of those terms, but were given some examples of 'common' and 'novel' metaphors. A common metaphorical description for an overweight person would be 'a blimp' whereas the term *blue whale* would be a novel description. Based on the results of the rating 24 metaphors were selected, 12 with the highest scores on common and 12 with the highest scores on novel, with the additional requirement that there was also at least 70% agreement about the emotion the metaphor depicted according to the raters.

The 24 metaphors were placed at the end of 12 stories (2 for each contrasting pair of emotions: love-happiness, love-pride, pride-happiness, anger-fear, anger-sorrow, and sorrow-fear). Each story explored two emotions using two different metaphors per emotion (1 common and 1 novel). For example, a short story about Betty and her father, looking at 'love - happiness', would end with the line: "Betty was a [metaphor expressing the emotion]", giving a choice between four options. The love options: *Red rose* (common) and *warm word* (novel) and the happiness options: *chirping bird* (common) and *laughing raindrop* (novel).

Children were given three practice stories. The first practice story was told, as well as the 4 possible answers, and the correct answer was explained. Thereafter the children were told two more stories and had to choose the answer they felt to be most appropriate and then explain why they chose it. These answers were accepted by the interviewer without comments and corrections. Then the 12 stories were presented to them on tape, one by one, with questions being asked immediately after each story. Answers were categorized as 1 = no answer; 2 = answer not showing awareness of metaphor; 3 = some awareness of link between emotion and metaphor ("stormy sky means angry because stormy means angry" and "Rolling grape means love because I love

grapes”) and 4 = answer shows direct relation between metaphor and emotion (“snorting bull means angry because a bull snorts when it is angry”) (Waggoner & Palermo, 1989, p. 154).

The findings showed that age had an effect, with more correct explanations being given by the older children. Waggoner and Palermo mention that more common metaphors were explained than novel metaphors, but this was not statistically significant. This differs from the results obtained by Pollio and Pollio (1979), who found statistical evidence that frozen metaphors were easier to understand than novel metaphors. Waggoner and Palermo (1989) argue that the reason that their findings differ from those of Pollio and Pollio may be the result of the metaphor selection process. There is indeed a difference between the two studies in that Waggoner and Palermo used an additional criterion for metaphor selection. In their case, they only used those metaphors from both ends of the common-novel scale if they were also rated by at least 70% of their raters as being clear in depicting a particular emotion. Perhaps this criterion has led to the selection of novel metaphors that were easier than when the selection would only have been based on common-novel rating. Another difference worth mentioning that may have been of influence is the use of context. Pollio and Pollio used single lines, whereas Waggoner and Palermo used short stories, which may have given more clues to make sense of novel metaphors.

The only more recent study with children in this field that I am aware of was done by Özçalışkan (2005), who explored possible differences between the interpretation of ‘idiomatic’ (high frequency) motion verbs (e.g. *time flies* and *hours pass*) and ‘non-idiomatic’ (low frequency) motion verbs (*time drips* and *days crawl*) embedded in short stories. The study was implemented with 60 monolingual young Turkish children (oldest group 5-6 years of age) and 20 young adults (18-21 years of age). Research materials were selected from an earlier study with texts produced by students and adult elicitations in Turkish. Idiomatic verbs were chosen from among verbs that were used at least five times in these texts to describe a particular domain, and non-idiomatic verbs were chosen from among verbs that were used once or twice. Özçalışkan used a forced choice task and semi-structured interviews with the oldest group of children and the young adults to establish metaphor interpretation.

Her findings show an improvement of metaphor interpretation with age, with no significant differences in the interpretation of the idiomatic

and non-idiomatic verbs within each age group. She (2005, p. 314) suggests that this indicates that when children understand a specific mapping of X IS A MOVING ENTITY, they can extend this to different target domains such as *time*, *ideas* and *sickness* (*time flies*, *time drips*, *ideas pass*, *sickness bounces*) (2005, p. 298). Some caution is needed, however, with this explanation, as she always gives the idiomatic version before giving the non-idiomatic version in her experiment, which may have influenced results. Furthermore, her material may have had an effect. The example story she uses (2005, p. 299) includes the metaphors *time flies* and the *hours pass* as part of the story. The child is then asked to choose from two possible answers (forced choice task), but in this case only the 'correct answer' also includes the word *time*, which may have been of influence in choosing this option for an answer. Her findings that conventionality does not affect metaphor interpretation are in line with the results of Waggoner and Palermo (1989), but contradict those of Pollio and Pollio (1979), making further analysis relevant.

In this section I have discussed metaphor conventionality, which relates to one of the two dimensions in the Career of Metaphor Theory. This theory indicates that a novel metaphor evolves over time into a conventional (and eventually dead) metaphor. As a result a reader may no longer process the metaphor by cross-domain mapping, but make sense of it by categorization or lexical disambiguation, unless, as suggested by Steen (2011a), it is used deliberately. I have also discussed, however, that the effect of conventionality on metaphor interpretation has not been shown conclusively in studies with children. The results of the few studies that have been carried out with children, looking at the interpretation of novel and conventional metaphors, vary considerably. One out of three studies found a significant difference, with novel metaphors being more difficult to interpret by children than conventional metaphors, whereas the other two did not find such a difference. The latter may, however, be the effect of interfering factors in the research methodology. In one study metaphor clarity (in terms of meaning), assessed by a group of students, was used as an additional selection criterion, which may have led to the exclusion of more complex novel metaphors in particular. The other study always presented the conventional metaphor in a specific target domain first, followed by the novel metaphor that was connected to the same domain, which may have created bias in the results. Özçalışkan (2005) also used a multiple choice with only two answers and in the example she provides the correct answer, which makes it easier to connect the meaning of the

metaphor to the right answer. I have also indicated that the effect of conventionality on metaphor recognition has not been studied with children.

4.3 Deliberateness and metaphor processing

In the previous two sections I have discussed the two elements proposed in the Career of Metaphor Theory that are crucial in metaphor processing, being the conventionality or novelty of a metaphor and the linguistic form, focusing on the difference between nominal (*A is B*) and verbal metaphors. Two main points raised in these two sections are that very limited research has been carried out with children taking these two factors into account, and that findings are not conclusive. Steen (2008, 2011a), in addition, has posited that the two dimensions of metaphor in language and metaphor in thought are not sufficient to explain why most metaphors may not be processed metaphorically, that is by cross-domain mapping. He argues that metaphor in communication needs to be added to the theory as a third dimension, where he refers to deliberateness of metaphors in particular. As I will discuss in this section, the possible difference in processing makes it important to explore the issue of deliberateness, as this may, for example, have an influence on the effect of conventionality on metaphor recognition and interpretation.

Deliberateness of metaphor has been discussed by a few authors, including Cameron, (2003, 2008), Goddard (2004), and Steen (2008, 2011a). Cameron (2003) explored deliberateness in a discourse perspective, looking at the way teachers used metaphor in classroom teaching and the effect of deliberateness on interpretation. She differentiates between metaphors that were used deliberately to explain a specific issue and conventionalized metaphors, which she defines as “just the way to say it” (2003, p. 100). Cameron (2003, p. 101) gives the example of a teacher who explains the origin of the name of a character called Skidda. The teacher used conventionalized metaphors in the explanation, such as “remember it actually *comes from* the word Skiddaw, which is a hill”; “he’s been named *after* it”; but also what Cameron refers to as (“probably”) deliberately used metaphors such as Skidda “is a sort of *nickname*, a sort of *corruption* of Skiddaw”. The presence of the words *sort of* seems to suggest that the teacher wants to draw attention to the metaphorically used words *nickname* and *corruption*. Hence it seems plausible that these metaphors are deliberate,

taking into account Goddard's (2004, p. 1214) point that the use or interpretation of a deliberate metaphor, which he prefers to call "active metaphor", implies to some extent the awareness that some words(s) are applied outside of "their usual uses".

Cameron (2003, 2008, p. 202) relates deliberateness particularly to the use of metaphorically used words in talk. She states that "all novel metaphors are deliberate, since some kind of search for an appropriate expression must have preceded production". She also indicates that deliberateness is not necessarily novel: it is not a characteristic per se of a metaphor, but depends on its usage (goal) in a specific discourse context, which implies, as she states herself, that conventionalized metaphors can be deliberate. Cameron (2008, p. 202) reports that some 10% of the linguistic metaphors in her research material from classroom teaching was deliberate and that most of them were "nominal rather than verbal", and were "signalled in some way". With the latter she (2003, 2008) refers to signals such as pauses and hesitation or the use of tuning devices such as *sort of* and *kind of*.

Steen (2008) is the first who situates deliberateness in the framework of the communicative dimension of metaphor and much earlier he (1994) had already linked the communicative aspect of text processing to explicit metaphor recognition. He posits that it makes an important difference if a metaphor is deliberate and therewith invites an addressee to change his/her perspective of the target domain of the metaphor by looking at it from a different conceptual domain. This, in general, will be the case for novel metaphors, as it is reasonable to assume that these are deliberate, and thus are expected to trigger active cross-domain mappings. For conventional metaphors this is quite different, as these are expected to be mostly resolved by categorization or disambiguation, as discussed in the previous section.

Conventional metaphors may, however, regain their metaphorical strengths when they are deliberate. Steen (2011b, p. 54) provides the example of a teacher asking students "to think of a political party as if it were a family with a strict or nurturing father", where the metaphor is deliberate (teacher's invitation to compare), but the mapping is conventional (social organized group is presented as a family). In this case it is expected that students will be triggered to solve this metaphor by comparison. They may, however, not be aware of this, as according to Steen (2011b; 2013) a differentiation exists between deliberate metaphor use and the producer and/or receiver being conscious about the cross-domain mapping that is implied.

The notion of deliberateness has been criticized by Gibbs (2011a; 2011b) among others, who expressed his doubts about categorizing a metaphor as deliberately used, as he (2011a) points out, for example, that we do not know what process Shakespeare went through to decide when choosing *Juliet is the sun*. He has a point there, in that we cannot know for certain, and even Shakespeare may not have been aware of the process in his mind when he wrote this metaphorical expression that clearly triggers a beautiful comparison. Another point raised by Gibbs concerns the complexity of analyzing cues (evidence) in language to establish whether metaphorically used words were meant to be deliberate and, if so, whether this indeed requires a different kind of processing in comparison to other metaphors. Despite these critiques I find the concept of deliberateness a relevant proposition in the context of my research, as Steen's point that deliberate metaphors trigger cross-domain mapping by definition seems indeed to make it plausible that they have a higher chance of being recognized, although, as indicated by Steen (2013), it needs further research to clarify when this happens.

For my research the question whether an author was aware of the production of a deliberate metaphor is not pertinent. My concern is related to the possible effect of deliberateness of metaphor on a reader. This includes whether, as Steen (2011a, p. 37) puts it, "the overt invitation on the part of the sender for the addressee to step outside the dominant target domain of the discourse and look at it from an alien source domain" may, for example, have triggered differences particularly in the recognition of conventional metaphors. Hence my question is whether conventional metaphors that get recognized more frequently can be classified as deliberate. In this context it is also important to try to understand what may trigger a child to attribute intentionality to an author that a metaphor is deliberately used by. I am not aware of studies with children on understanding authorial intentions in metaphorically used language, but, as already discussed in section 1.4, understanding authorial intentions evolves over the school period with children of 8 or 9 years of age in general, who have already developed the basic concepts and language skills to consider an author's beliefs or intentions (Olson, 1997). Yet differences exist among children in their ability to understand and reflect upon language (Yuill, 2009; Zipke, 2007, 2008; Zipke et al., 2009), with children with better understanding of genre being at an advantage, as they may be better at discovering cues that lead them to attributing authorial intentions to spoken or written language (Olson & Pelletier, 2003).

Finding cues to deliberateness

What may help children to take a metaphor to be deliberate, to assume that it is an invitation to look at the target domain from a completely different source domain, that they are ‘invited’ to change their perspective on the topic of the text? In short, what makes a metaphor deliberate? Cameron (2008), for example, indicated that in her research she found that deliberate metaphors in speech were nominal and signalled in some way through pauses, hesitation or tuning devices such as *sort of*. Others (e.g. Goatly, 1997; Goddard, 2004) also provide examples of signalling devices that may alert the addressee, such as *so to speak, as it were, metaphorically or figuratively speaking*. Krennmayr (2011) stresses that whereas there are no reliable methods to determine the deliberateness of a metaphor, signalling devices and other text features may help an analyst to establish the deliberateness that can be attributed to a metaphor.

She (2011, p. 155) suggests that metaphors identified with the help of such features are the ones that “a reader would intuitively recognize as metaphorical”, but adds that this will need to be explored further through experimental research in order to yield insights into processing by language users. She also mentions that signalling does not always imply that the figurative expression is deliberate and meant to change the perspective of the addressee by thinking in an alien domain. This she (2011, p. 157) illustrates with a very conventional idiom *sleep like a log*, which is signalled, but not likely meant to be deliberate. It can be argued that this idiom is commonly used in this form and accordingly it is likely that it can be readily retrieved by the reader as a salient meaning from memory without cross-domain mapping. To make it deliberate, an additional effort would be needed to draw attention to the idiom by indicating, for example: *she was not sleeping like a bear but like a log*.

For present purposes there is the additional point of language development. Children will have less linguistic knowledge than adults, which may not allow them to notice and analyse these features of language. Hence just looking at deliberateness from the perspective of an adult or an analyst may not match the perception of children. This makes it worthwhile to analyse some characteristics of the best and worst recognized metaphors and to explore if these may be related to possible effects of deliberateness.

What to expect in terms of recognition and interpretation

Steen (2011a, p. 37) indicates that deliberate metaphors have a strong communicative aim, which he illustrates with the metaphor *science is like a glacier*. He states that the use of the term *is like* clearly invites the reader to make a cross-domain mapping between the two different domains of *science* and *glacier*. This invitation could even be stronger when using a different signalling device such as: *metaphorically speaking, science is like a glacier*. Because of this communicative goal, which seems to be absent in non-deliberate metaphors, it is plausible to expect that deliberate metaphor has a much higher chance that it would be recognized and would lead to a slightly richer interpretation (Steen, 2011a; 2013). Possible support for the higher chance of recognition seems to be the finding of Graesser et al. (1988, p. 147), who tested metaphor recognition with 60 college students using a total of 504 metaphors and found explicit comparisons (*A is B* metaphors and similes), one of the indicators for deliberateness, to be a significant predictor for metaphor recognition. Some caution is needed with this conclusion, however, as they add that the fact that college students usually identified explicit comparisons may reflect their school education, where English courses explain that a metaphor is a comparison of the type *A is B* and that similes are comparisons of the type *A is like B*.

To my knowledge only Cameron (2003) reports on a study with children, where she suggests that the interpretation of deliberate nominal metaphors in two science texts were explicitly noticed and resulted in the discussion of both topic and vehicle terms by the two children that were involved. Discussion of both terms seems to indicate that cross-domain mapping took place. She clearly mentions that this finding cannot be generalized, but is specific to her exploratory study. However, taking into account that it may be expected that the deliberateness has an influence on whether a metaphor is processed by cross-domain mapping, it seems relevant to explore the possible effect on recognition and interpretation in more detail. It can be posited that it is important not only to look at the influence of novel versus conventional metaphors, but also at the possibility that some of the conventional metaphors were used deliberately. I will explore this potential interplay in my research by analysing different aspects of the best and worst recognized metaphors, including conventionality and the deliberateness that can be attributed to them.

4.4 Conclusion

In this chapter I have explored the question whether the properties of metaphor influence their recognition and interpretation. I follow the three-dimensional framework proposed by Steen (2008, 2011a) that differentiates between metaphor in language, thought and communication. He builds his framework on the two dimensional Career of Metaphor Theory of Bowdle and Gentner (2005), which suggests that the way metaphors are being processed depends particularly on their linguistic form (where they explore metaphor of the form *A is B* and similes) and their conventionality, distinguishing between novel, conventional and dead metaphors. Steen (2008, 2011a) posits that a third dimension needs to be added, namely communication, as important differences exist in the deliberateness of metaphors, and this in turn is likely to have an effect on metaphor processing.

Most studies with children have used nominal metaphors of the form *A is B*, and in some of them these metaphors were embedded in stories developed for the research. This linguistic form, however, is less present than other forms, such as verbal metaphors, as indicated by Broderick (1992) and Cameron (2003).

Results of some studies with adults (Graesser et al., 1988; Steen, 2004) seem to suggest that nominal metaphors have a somewhat higher chance of being recognized than verbal metaphors, but this would need to be confirmed by further research. The first study with children was done by Reyna (1985), who asked them to explain respectively the noun and the verb in different metaphors. Her overall finding was that 9-year-old children were better at metaphor interpretation than 6-year-olds. Reyna (1986) referred to this study, indicating that differences exist in the interpretation of nominal and verbal metaphors, but this conclusion is problematic, as it is not clear whether she used the same type of text preceding the metaphors and how this may have supported the children. A more recent exploratory study (Cameron, 2003) with two 10-year-old children using linguistic material from natural discourse showed better recognition of nominal than verbal metaphors and found that nominal metaphor triggered more discussion. Hence it is relevant to explore the influence of linguistic form on metaphor recognition and interpretation, whilst taking into account that differentiating just between *A is B* and verbal metaphors is a simplification. I still consider this to be useful as a working hypothesis, keeping in mind that the situation is more complex,

as other intervening factors may be in play, including the conventionality of the metaphor, for example.

I have discussed the Career of Metaphor theory (Bowdle & Gentner, 2005; Gentner & Bowdle, 2001, 2008) which posits that metaphors are not stable entities, but may proceed over time through a career path from novel metaphors through conventional metaphors to dead metaphors. This process of conventionalization in a linguistic community may have consequences for the way metaphors are being processed, as novel metaphors are typically resolved by comparison, that is by cross-domain mapping, whereas for conventional metaphors this may be a process of categorization or lexical disambiguation, as over time the metaphorically used words may become polysemous (words with multiple meanings or senses). Eventually the metaphorical meaning may even disappear, which turns the metaphor into a dead metaphor. A high degree of conventionalization of a metaphor implies that the link between the two ideas can hardly be recognized as metaphor.

Conventionality, according to Gentner & Bowdle (2001), should not be confused with the familiarity of an individual with a specific metaphorical expression. Familiarization involves repeated exposure to a specific metaphor, which may result in a person including it in the stock of metaphorical expressions in his or her mind. This may apply to both novel and conventional metaphors, as long as an individual comes across the metaphor a number of times and as a result this specific metaphor may be readily available for retrieval, and therefore may not be resolved by cross-domain mapping. The influence of familiarity, however, may be limited, as it is not very likely that a person comes across a novel metaphor several times. Being familiar with a conventional metaphor has no effect, as cross-domain mapping is not expected and unfamiliarity with conventional metaphors is less likely, taking into account their conventionality within a linguistic community. However, this may be somewhat different for children, as I will indicate in Chapter 5.

I am not aware of any study with children on the effect of conventionality on metaphor recognition and only of a few studies on metaphor interpretation, of which the results are not conclusive. One of the three studies found a significant difference, with novel metaphors being more difficult for children to interpret than conventional metaphors. The other two did not find such a difference, but as I have indicated, there are some doubts as to the methodology they used. This inconclusiveness makes it worthwhile to explore the effect of

conventionality further, whilst also taking into account the possible influence of the deliberateness of the metaphor.

I follow the account of Steen (2008, 2011a) that deliberateness of the metaphor, as part of the communicative dimension, needs to be added to the metaphor discussion, because this more comprehensive view allows us to rethink metaphor processing but also to put discourse in the core of the analysis. The discussion about what counts as a deliberate metaphor and the potential effect of deliberateness on metaphor processing is still very new and is a subject of debate among different authors. For my research the question is whether deliberateness may influence the recognition particularly of conventional metaphors. A first list of signalling devices to identify deliberateness has been developed by Krennmayr (2011), but she and Steen (2011a), indicate that further research is needed to better establish the deliberateness of a specific metaphor in a given context. This is why I find deliberateness of metaphor an attractive proposition to consider, as it affords a more comprehensive analysis of metaphor recognition in text processing.

Recognition and interpretation of metaphors in written text obviously occur in relation to the linguistic material intended to be understood. In the next chapter I will explore the presence of nominal (*A is B*) and verbal metaphor in children’s literary books and science textbooks that were available to the schoolchildren involved in my research. I will show how I have developed my research material by making a selection from these texts and thereafter established the conventionality of the metaphors to be used for the metaphor behavioural studies. I will then explore differences in recognition and interpretation of these metaphors and reflect on the results and make an analysis of the possible influence of deliberateness by analysing a number of the best and worst recognized metaphors.

5. Selection of participants and materials

The preceding chapters provide the theoretical framework for my research concerning metaphor processing by school-age children. This includes a discussion of cognitive and linguistic development of school going children and their educational setting in Colombia. I have addressed metaphor recognition and interpretation in particular, as well as some child- and metaphor-related factors that seem to be at play. The main insight emerging from these chapters is that age (school grade), which is the main parameter used to compare children's performance, seems to be too limited. I have argued that reading comprehension needs to be added as an indicator to reflect linguistic and cognitive differences among children, taking into account that metaphor processing in written language is part of reading comprehension. The latter encouraged me to explore metaphor processing in a more natural context than most previous studies with children by selecting research material from textbooks available in schools involved in my research.

I will now turn to the approach I used to select my participant groups and to develop the research material for the behavioural metaphor studies. In view of my interest to investigate not only the influence of school grade but also of reading comprehension in metaphor recognition and interpretation by children, I needed to identify their reading comprehension performance to be able to select research groups with lower and higher comprehension levels. In the first section I will therefore explain the methodology I have used, the results of the reading comprehension test, and the way I have chosen the research groups. In the second part of this chapter I present the development of my research materials, which I selected from a sample of literature and science texts, and then conclude this chapter with the procedure I used to establish the conventionality of these metaphors.

5.1 Selection of participants

5.1.1 Identification of school grades

I opted to do my research with somewhat older children, who had already advanced in reading acquisition, in order to reduce the interference of limitations in word reading skills. I also took into account

the shift that occurs in language development of children around the age of 8 to 10 years according to Nippold (1998), when they learn advanced vocabulary, develop a more elaborated understanding of figurative meanings, and construct more abstract concepts. I therefore decided to look at this group, which on average corresponds with 4th grade in Colombia, and compare their performance with that of an older group with more experience in terms of schooling. For the latter I chose 6th graders, having in mind the findings of Schecter and Broughton (1991) of clear differences in metalexical awareness between 6- to 10-year-old and 12- to 14-year-old children. Focusing on these two school grades also affected the research methodology, as working with older children allowed me to use a verbal explanation task, a method that fits well with the interest of having more insight into children’s interpretation of metaphors. In addition, selecting two school groups that are not too far apart made it feasible to use the same linguistic materials, ensuring that these would not be too difficult for the younger group and not too easy for the older group. I expected that this would also be of importance in order to keep the children motivated when participating in the different sessions.

5.1.2 Assessment of reading comprehension

As mentioned in the previous section, the reading comprehension levels of the students from the 4th and 6th grade needed to be explored in order to be able to select two groups in each of these school grades: one with a comparatively high level versus one with a low level of reading comprehension. Reading comprehension is influenced by properties of the reader, the text to be comprehended, and the activity in which comprehension takes place (see Chapter 1). In general, reading comprehension increases with age, but important differences may exist among children of the same school grade. These may depend on several factors, including differences in word reading and language comprehension skills. These language processing skills may in turn be influenced by language development at school (e.g. Adlof et al., 2011; McNamara & Kendeou, 2011; RAND, 2002), but also by the home environment of children (e.g. Finn, 1998; RAND, 2002). Of particular interest for my research is that reading comprehension is strongly influenced by metalinguistic awareness (Nagy, 2007; Yuill, 2007; 2009; Zipke, 2007, 2008; Zipke et al., 2009). This would suggest that children with higher reading comprehension levels are more capable of

understanding that words and sentences may have different meanings, which may facilitate metaphor recognition and yield richer metaphor interpretation.

Although other factors may play a role (Kendeou, Savage & van den Broek, 2009), a relatively simple view of reading primarily focuses on comprehension as being a combination of word reading, that is decoding the letters into words, and language comprehension, which implies making sense of these words and elaborate interpretations at the sentence and discourse level. From this perspective Adlof et al. (2006) explored the relative influence of word reading and language comprehension on reading comprehension. They found a correlation between language comprehension and reading comprehension of 81% in 4th grade and 100% in 8th grade. The influence of word reading reduces with age and already may be quite small in 4th grade and even smaller in 6th grade. This is an important finding for my study, as it helped me to decide not to explore word reading in a separate test.

Assessing reading comprehension is complex (e.g. Cain & Oakhill, 2006b; Català et al., 2001; Fletcher, 2006; Magliano et al., 2007; McNamara & Kendeou, 2011; RAND, 2002; Snowling et al., 2009) because it is a product of interactions between the reader, the text, the activity, and the socio-cultural context where reading comprehension takes place (RAND, 2002). Different reading comprehension tests exist, but these are not uncontroversial, as they may comprise limitations relating to the tests themselves or to their potential use by teachers (Kendeou et al., 2012; McNamara & Kendeou, 2011; RAND, 2002; Snowling et al., 2009). The main limitations pointed out by these authors based on a review of different tests include:

- Tests are not sufficiently comprehensive to reflect the complexity of reading comprehension and do not reflect the understanding that it is a developmental process
- Conflation of comprehension with vocabulary, prior or particular domain knowledge, word reading ability, and other abilities or knowledge related to comprehension
- Focus on the product at the expense of information about the process of reading comprehension
- Limited clarity in the level of reliability and validity
- Lack of awareness that factors such as type of texts, instructions, and response format affect students' performance

In my search for a reading comprehension test in Spanish I found that no official test was available in Colombia. I did, however, come across a comprehensive test developed by Català et al. (2001) for children in Spain called ACL (Análisis Comprensión Lectora), which has also been used in various countries in Latin America, including Peru (Young Steindl, 2010), Honduras (Duarte, 2005) and Mexico (Vázquez Pérez, M. E., 2006). It can be argued that many of the limitations of reading comprehension tests do not apply to the ACL test of Català et al. (2001). The authors are aware of the complexity of reading comprehension, as they indicate that it may involve different levels of understanding which result from different abilities of the reader (Català et al., 2001). They stress that it should not be taken as the only test to establish, for example, educational objectives. Català and colleagues make a comparison by indicating that a reading comprehension test is just like looking at a tree, which, together with the experience of the teachers, can help to get a fair impression of the forest (i.e. reading comprehension level).

The ACL test includes different components related to language, mathematics, social and natural sciences and comprises a variety of types of genres (called narrative, informative, and poetic). It has a clear focus on analysing both surface level representation and higher level comprehension skills. A strong point of the test is that it recognizes the developmental aspect of reading comprehension and uses grade specific materials that are fairly similar to the reading materials children are exposed to in their normal life. This is in line with the recommendation of Magliano et al. (2007) that a reading comprehension test needs to include texts and activities that are representative for the participants. The response format of the test is multiple choices with four or five possible answers, which according to Cain and Oakhill (2006b) is positive, as it reduces the influence of guessing. Another feature of the test is the presence of text fragments instead of sentences. This, according to Adlof et al. (2006), minimizes the influence of word reading and increases the influence of language comprehension. The ACL test, which I will present in more detail in the next section, is not only comprehensive in that it includes test elements related to different types of comprehension, but it has also been subjected to extensive testing.

In sum, it seems that most of the limitations mentioned in this section do not apply to this test, with the exception of the conflation of text comprehension with word reading and the focus on the product of reading comprehension. Conflation, however, seems of lesser importance for my research groups, when we take into account the

finding of Adlof et al. (2006) suggesting that word reading may only have limited effect in 4th grade and virtually no effect in 6th grade. Furthermore, whereas understanding of a text does indeed involve a process and a product (the (un)comprehension as end result), my goal was to differentiate between reading comprehension levels of participants, that is to establish the overall achievement of reading comprehension, for which the assessment of the product is sufficient (van den Broek, 2012). Hence, the ACL test is a good choice for the purpose of identifying good and poor readers.

Method

Materials

I used the ACL test (Spanish version) developed by Català et al. (2001) to establish the reading comprehension levels as a basis for my further studies. The authors report that their test was constructed on the basis of the taxonomy of Barrett (presented by Clymer, 1972) and Johnston (1989) and Cooper (1986) and was validated with some 3980 children of different schools in Barcelona in Catalan and thereafter in Spanish with several thousand children from public and private schools in Madrid (Spain). The test involves the following five components:

- *Literal comprehension*, to review how well students are able to identify and understand information explicitly presented in the text.
- *Reorganization*, to assess whether students can analyse, summarize and organize the explicit information given in a text.
- *Inferential comprehension*, to analyse whether the student combines the ideas and information that is in the text with their intuition and personal experience to understand the text structure and to make assumptions about the story and the intentions of the characters. This requires reasoning and imagining that extend beyond the written text.
- *Critical comprehension*, to explore whether students evaluate and judge the text with help of external criteria (provided by the teacher, from other sources of information, or using criteria from their own experience, knowledge or values).
- *Authorial intentions*, to assess whether students are able to capture the intention of the author as implied in the text.

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The ACL test comprises a series of multiple choice questions, each with five possible answers, and consists of seven texts and 25 questions for 3rd grade and ten texts and 35 questions for 5th grade. The tests of these two school grades were used in order to identify the reading comprehension levels at the end of the school year just before students moved to the next grade, to be able to select the children for the subsequent behavioural studies among the fresh 4th and 6th graders.

As noted above, the test includes different areas of the school curriculum: language, mathematics, social and natural sciences, and different type of genres: narrative, informative, poetic. An important characteristic is that the materials are grade specific, to avoid that they are too complex for the lower grades or too simple for higher grades. This has the advantage that the tests are better tuned to the expected reading comprehension capacities of the children in each school grade. With the tests it is feasible to identify children with low and high levels of reading comprehension within the same grade, but because the score levels are grade specific results between school grades cannot be compared.

Some of the words and settings used in this test were not applicable in the Colombian context, such as some of the names of food, titles of movies, places, etc. These I have changed into locally used terms and known settings for Colombian children living in Cali, to avoid that unknown words and settings would negatively influence the validity of the tests.

Changes included substituting words in the test that are hardly used in Colombia with words that are common in Colombia such as *children* (*niños*) instead of *pequeños* (*small children*), *dinner* (*comida* in Colombia) instead of *cena*, *trading card* (*caramelos* in Colombia) instead of *cromos*, *sticker album* (*cartilla* in Colombia) instead of *album*, *cupcake* (*pastelitos*) instead of *magdalenas*, *container* (*tarro*) instead of *bote*, *basket* (*canasto*) instead of *cesta*, *to throw out* (*botar*) instead of *tirar*; expressions like *he is very hungry* ([*Miguel*] *tiene mucha hambre*) instead of *a hunger that devours him* (*un hambre que le devora*), *what they bring for him to eat* (*lo que traen para comer*) instead of *what they bring for him as main course* (*lo que traen de primer plato*), [*he*] *was very furious* (*le dió una rabia*) instead of *took a tantrum* (*cogió una rabieta*). Other examples of changes in words concerned the names of food *rice with milk* (*arroz con leche*) instead of *flan with cream* (*flan con nata*), *to pick up mangos* (*coger mangos*) instead of *to pick up mushrooms* (*coger setas*); physical

characteristics a girl with curly hair (*niña de pelo rizado*) instead of blonde girl (*niña rubita*).

Finally, I changed the settings in two cases, whilst preserving the meaning of the story, for others that were familiar for the children living in Cali. This concerned (a) a text about cinemas with movies that were showing, their screening hours and prices, and the corresponding questions and answers; (b) a drawing of a location included in an item that asked children to interpret this drawing and calculate distances and times to reach some of the places as well as the related questions and answers. In this case the setting of *the marshlands (las marismas)* was changed to a Natural Park of the Pance River (*Ecoparque del río Pance*) close to Cali.

It was necessary to make these changes to the test to ensure that its validity was not negatively influenced by children not being aware of the meaning of several of the words, and of some places and or contexts. It was important to avoid such interferences as these are not related to their language skills, but to being unfamiliar with words or settings familiar in Spain and not in Cali.

Participants

A total of 469 children, 233 girls and 236 boys, all native speakers of Colombian Spanish, took the ACL test. The sample consisted of children from two schools and two different school grades. It included 213 children from 3rd grade (girls 101, boys 112) and 256 children from 5th grade (girls 132, boys 124) (Table 5.1). Differences in age distribution between the groups in the two schools were tested with ANOVA and proved not to be statistically significant at the $p < .05$ level. The statistics showed the following results for 3rd grade [$F(1,212) = 0.27, p = .61$] and for 5th grade [$F(1,255) = 2.98, p = .09$].

Table 5.1
Overview of Children Involved in ACL Tests from the Two Schools

Grade	School 1		School 2		Combined	
	# children	Age (SD)	# children	Age (SD)	# children	Age (SD)
3rd	196	9.2 yr. (0.7)	17	9.3 yr. (0.7)	213	9.3 yr. (0.7)
5th	225	10.8 yr. (0.8)	31	11.1 yr. (0.9)	256	10.9 yr. (0.8)

Procedure

The test was applied at the end of the school year with children from 3rd and 5th grade. This approach followed the suggestion of Català et al. (2001) that the test is best applied at the end of the school year to identify the reading comprehension level that children have reached after completing their studies in a particular school grade. This methodological consideration suited me very well, as it gave me time to process the results in the summer holiday and to subsequently make arrangements with the school to carry out the behavioural metaphor studies. In the beginning of the new school year I then worked with the chosen children for testing metaphor recognition and interpretation, who had then moved on to the 4th and 6th grade respectively.

In line with the recommendations of the developers of the test, the sessions were scheduled for the morning hours. At the beginning students received an explanation of the task to be performed, which they then did in their regular classroom under supervision of their teacher and an assistant researcher. Children were given a break half way during the test.

Results

Results of the multiple choice tasks were collected at the end of the session and processed by using a template with holes in the locations of the correct answers. This minimized the possibilities of mistakes and all random checks by the main researcher confirmed the scores that were established. The results are presented in Figures 5.1 and 5.2 and in Table 5.2, which also includes the maximum scores that can be obtained in the test for each group.

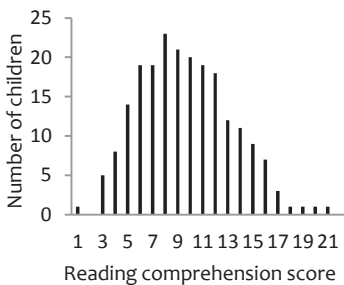


Figure 5.1 RC Scores 3rd Grade

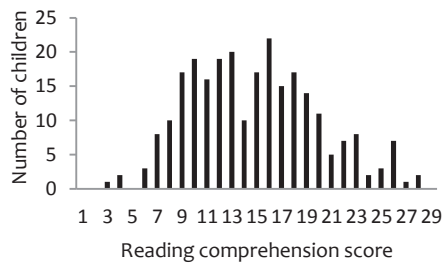


Figure 5.2 RC Scores 5th Grade

Table 5.2

Results Reading Comprehension Tests at the End of the School Year

Grade	School 1		School 2		Combined	
	# children	RC (SD)	# children	RC (SD)	# children	RC (SD)
3rd	196	9.6 (3.7)	17	9.7 (3.8)	213	9.6 (3.7)
5th	225	14.6 (4.9)	31	16.3 (6.6)	256	14.8 (5.2)

Notes: RC = Reading Comprehension; Maximum test score for 3rd grade: 25 and for 5th grade: 35

The graphs and the table clearly show a considerable variation in reading comprehension in both grades. Results between the two grades cannot be compared as the test materials used for each grade are different. Similar to the age of the participants (Table 5.1) there was no statistical difference in their reading comprehension between the two schools at the $p < 0.05$ level for 3rd grade [$F(1,212) = 0.010, p = .920$] nor for 5th grade [$F(1,255) = 2.981, p = .085$], implying that I can combine the results of the two schools in my research.

Discussion

As discussed in Chapter 1, the children involved in my research are in the third stage of the model of language development of Berman (2004, 2009), which implies that they are gradually becoming proficient speakers and readers. This process proceeds through the school years into adulthood and is characterized by the development of an advanced and flexible interaction between a higher level of linguistic knowledge and more experience with language use in different communicative contexts (Berman 2004, 2007). With increase of age and schooling children gradually become more able to apply a wider variety of options that are available in a language (Berman, 2007; Nippold, 2004; Tolchinsky, 2004; Tolchinsky et al., 2005), which will affect their reading comprehension. My findings seem to point out that the effect of schooling might be more important than age, as in 3rd grade I did not find a statistically significant correlation between age and reading comprehension, implying that there is no statistically significant difference in reading comprehension levels between younger and older children within the same school grade. In 5th grade my findings show a (weak) statistically significant negative correlation between age and reading comprehension, implying that younger children within this group scored a little better.

The wide difference in reading comprehension among children of the same school grade shown in Figures 5.1 and 5.2 supports the views of Kuhn and Franklin (2006) and Kuhn and Pease (2006) that considerable differences may exist in the cognitive development of children based on their individual experiences and that these may become even larger when children start to work more independently in schools. Several authors (e.g. Magliano et al., 2007; RAND, 2002) point out that the reading ability of children (e.g. word reading, inference making, metacognitive skills, relevant domain knowledge) is likely to show differences, depending on their education and experience with written language. RAND (2002) also points out that this may be affected by the home environment. Looking at the wide spread in performance reflected in the graphs and the particular interest shown by some parents in my study, it seems indeed possible that especially children with better performance receive more support from their home environment. The wide variety in the results also supports the potential influence of other factors, including variability of the text and differences in domain knowledge mentioned by several authors (e.g. Adlof et al., 2011; Magliano et al., 2007; McNamara & Kendeou, 2011, RAND, 2002), because the ACL test includes a variety of types of texts.

It should be noted that the reading comprehension test combines assignments that require different skills. This implies that children with a similar score may have important differences, as one child may have scored points in one part of the test as a result of greater domain knowledge, for example, whereas another child may have scored points because of more developed cognitive skills. This may result in children with a similar score in reading comprehension having different skills for metaphor understanding. I will not be able to assess this in detail, but will explore whether considerable differences indeed exist in the results of both recognition and interpretation in relation to children with similar levels of reading comprehension.

5.1.3 Conclusion

The results of the reading comprehension assessment showed very large differences in reading comprehension between children in the same school grade. These differences ranged from a reading comprehension level of 1 to 21 (out of 25) in 3rd grade and 3 to 28 (out of 35) in 5th grade. This suggests that these children are at different levels

of linguistic and cognitive development, a finding that is supported by different authors. These differences are not likely to become smaller, but may even become bigger as those with better levels of development may benefit more from reading practice and develop stronger linguistic skills and adopt a broader knowledge base than others, unless specific measures are taken to improve the skills of poor comprehenders (Cain, 2009; Clarke et al., 2010; Hulme & Snowling, 2011; Oakhill and Cain, 2012; Snowling et al., 2009). This very wide difference in reading comprehension should alert teachers to pay attention to the diversity in levels of skills (e.g. inference making, word reading, metacognitive skills) among children of the same school grade and address this diversity in their teaching methods and teaching programme.

The differences I found in reading comprehension between children in the same school grade supports my point made in the first chapter, namely that age is not sufficient as an indicator to explore metaphor understanding among children. Reading comprehension seems to be a pertinent aspect in this respect, as the difference in reading comprehension levels makes it plausible that children of the same grade will show differences in the recognition and interpretation of metaphorical language. Exploring the relation between reading comprehension and metaphor understanding underscores the idea that metaphorically used words in written language are part of the texts that readers are trying to make sense of. This search for understanding, that is in principle the goal of comprehensive reading, demands, as we have seen, a set of abilities, knowledge, goals, and motivations that are likely to vary even among children from the same school grade.

I have used the data I obtained in the reading comprehension assessment to make a selection of the children with lowest and highest reading comprehension levels from each of the two school grades. In this way I was able to establish four groups of participants for my studies on recognition and interpretation of metaphors, which I address in Chapters six and seven.

5.2 Selection of experimental materials

In the preceding chapters I have shown that most research with children has been carried out with nominal metaphors (*A is B*) or similes, which have either been used as single lines or were embedded in short

stories developed for the purpose of the studies. I have indicated that this seems to be a limitation, as Broderick (1992), for example, found other linguistic forms to be more common in children’s literature. Another point that was raised is that context is of importance for metaphor recognition and interpretation, and therefore I have chosen to work with metaphors embedded in existing texts that are available to children involved in my research.

To obtain more insight in the presence of nominal (*A is B*) and verbal metaphors I present some studies related to metaphor identification in books intended for children in section 5.2.1 and subsequently report on my exploratory study in section 5.2.2, in which I reviewed the presence of these type of metaphors in a total of 34 children’s literary books and science textbooks and used this study to select the research materials for the behavioural studies on metaphor recognition and interpretation. I explain the procedure I adopted for the identification of nominal (*A is B*) and verbal metaphors in these 34 books, which were selected from school libraries. In section 5.2.3 I also show some of the difficulties that were encountered in the identification process and discuss the results of this identification study, which showed considerable variations in the presence of metaphors in the different books, and follow this by my conclusions in section 5.2.4.

5.2.1 Exploring *A is B* and verbal metaphor in two types of discourse

I looked at the presence of *A is B* and verbal metaphors in a sample of literary books and science texts available in the libraries in the schools that participated in my research. Trying to define children’s literature for my research makes me confer with different authors (Gubar, 2011; Hunt, 1999; and Lesnik-Oberstein, 1999), who indicate that this is very difficult, as it comprises both books written for children, often in a way that also makes them appealing for adults, who are the prime buyers, as well as books that had originally been written for adults, but also appeal to children. As indicated by Gubar (2011), two opposing views exist in the thinking about children’s literature. One group of authors (called “definers”) posits that it is feasible to establish a category of child literature which shares specific characteristics related to the target audience. This group, however, also recognizes that some books exist which are less clear in their characteristics. Others, called “antidefiners”,

such as Lesnik-Oberstein (1999), indicate that to think of children's literature as just a separate reading category is not feasible. She supports her claim with examples from Townsend (1980), who posits that texts belonging to the category of literary books supposedly intended for children such as *Alice in wonderland* are also read by adults, and some 'adult' books, such as *Robinson Crusoe* and *Tom Sawyer*, are also read by children. Gubar (2011) indicates that defining children's literature is difficult or even impossible and proposes a middle ground by embracing the family-resemblance approach developed by Wittgenstein in the early 1950s. An example of such an approach is the family of games, which also has such a wide variety ranging from specific board games to the Olympic Games. Hence, the 'members of the family' have similarities, but are not necessarily the same, which implies that not all characteristics need to be shared. Adopting this view makes it possible to include a rich variety of books in the family of children's literature that also allows one to accommodate differences in children's books developed in different cultures, and changes over time.

Such changes over time are pointed out by Robledo (2007), who provides an account of the gradual development of children's literature in Colombia, looking at the narrow category of books specifically written for children. She indicates that this is the work of individual authors and at no point in history has turned into a kind of school or group of authors working together to advance children's literature. She distinguishes three important moments in Colombia, starting with the 1920s, when a child magazine (*Chanchito*) was established by Víctor Eduardo Caro that aimed at providing children access to the best of children's literature in the world. In this period, specific 'historic' books for children were also published, such as *La vida de Bolívar para los niños (the life of Bolivar for the children)* by Simón Latino (pseudonym for Carlos H. Pareja) (1930). A subsequent episode starts in the seventies, when the Enka award for children's literature was established. In this period several authors that started to publish (and some still do) include Celso Román, Luis Darío Bernal, Jairo Aníbal Niño and Triunfo Arciniegas. This increased the production of children's books, which was sustained in the next decades, and also triggered important developments, such as the establishment of groups to support and promote reading, publication of literary journals, new literary awards and book fairs with a sizable section of children's literature.

As indicated by Robledo (2007), Colombian children's literature in the seventies was characterized by being not very enjoyable and

primarily didactic, showing children how to act, whilst not truly recognizing (and understanding) that the child is an individual reader, who is able to enjoy books beyond the pedagogical intentions and desires of adults. However, this partly changed in the late eighties, when new authors came to the fore, such as Gloria Cecilia Díaz, Ivar da Coll, Irene Vasco, Evelio José Rosero, Yolanda Reyes and Pilar Lozano. They displayed a much better understanding of children and dealt with topics such as school and family life, but also explored conflicts between adults and children and sensitive topics such as kidnapping, death and fear that were absent before. In recent years a new interest seems to have arisen around children’s literature, as reflected, for example, in some of the orientations of the Ministry of Education (MEN, 2006), as presented in Chapter 1.

For my research I follow the idea of Gubar (2011) that it is not necessary to clearly define children’s literature, but that it is sufficient to talk about a family of children’s literature. This view allows me to take a pragmatic approach and to just choose publications from children’s literature that are readily available in school libraries and classified for the age category of my research.

For science texts the situation seems to be different, as scientific discourse is often addressed to specific target groups such as specialists, students, and lay readers. In general these texts have in common that they are meant to provide or expand knowledge about particular issues (Halliday, 2004). In the case of school-age children, textbooks are the prototypical educational materials used in school. Many science textbooks for children are developed for specific age groups, usually by several authors, including teachers, and peer reviewed by other educators. Furthermore, in Colombia, as presented in Chapter 1, guidance is provided by the Ministry of Education in the form of learning standards for children of different age groups, which comprise, for example, the requirement that they need to know a number of basic concepts (MEN, 2006).

Different authors including Gentner (1982a), Steen (1994) and Cameron (2003) refer to the possible influence of the type of discourse in metaphor processing. Gentner’s study (1982a) reports that respondents in her study found literary metaphors (“expressive metaphors”) to be typically richer and more easily appreciated than scientific analogies (“explanatory metaphors”). The latter were perceived as more abstract and higher in clarity, possibly because, as Cameron (2003) indicates, they are used for the explanation of specific concepts. Steen (1994)

appreciates the important contribution to metaphor theory made by Gentner, but argues that clear and explanatory metaphors may be found both in literature and in science and may differ in richness and clarity. He indicates that Gentner conflates the type of discourse in which a metaphor occurs and the communicative function of the metaphor: explanation or expression (which he refers to as “evocation”). It is not a question of literary or scientific metaphors per se, but of metaphors in literature or science text that are perceived as literary or scientific by the reader. This perception may depend on the type of discourse, but also on other aspects, such as the type of reading (e.g. quick reception, repeated reading, in-depth study) (Steen, 1992b). The presence of a metaphor in a specific type of discourse may lead the reader to characterize a metaphor as being explanatory (in science) or evocative (in literature) and this may have contributed to the differences found by Gentner (1982a). Following this line of thinking, it can be argued that if a difference in type of discourse has such an important influence on the perception of readers of metaphors in literary and science text, then it is worthwhile to explore whether this may also have an effect on metaphor recognition, as found for example by Steen (1994) with journalistic and literary reading with adults.

To my knowledge, differences between metaphors in literature and science or other classes of discourse have not been researched in texts intended for children, with two exceptions: Colston and Kuiper (2002) with fiction and non-fiction texts and Cameron (2003), who examined metaphor in classroom discourse and science texts, which I will discuss in this section. This is different for adults, where more publications exist, including the work of Goatly (1997) exploring types of discourse such as conversation, news reports, advertising, popular science text and modern poetry; Semino (2008) analysing the use of metaphors in literature, politics, science, education, advertising and illness (depression), and Steen et al. (2010) looking at academic discourse, news texts, fiction, and conversation. These studies show that distribution, forms and functions of metaphors vary depending on the type of discourse under analysis.

Primary school children have access to different genres, including literary texts, in the school library or texts that are read to them in their classroom (for language lessons), for example, but they also read explanatory texts related to science. In the last two decades some researchers have investigated the presence of metaphors or figurative comparisons in real language use intended for children (Broderick, 1992;

Cameron, 2003; Colston & Kuiper, 2002), all of them using materials in English. In the absence of metaphor identification research in Spanish texts for children, I will use these studies as a point of reference for the development of my methodology.

Broderick (1992, p. 184) examined the presence of literal and figurative comparisons in 53 popular ("frequently read") children's books and informative texts such as: *Know about Time* and *From Graphite to Pencil*. The linguistic material for his study was selected by a school librarian, a public librarian, and several parents of young children. The procedure to identify the comparisons is not presented in his publication, but it seems that the classification was made by the author alone. The comparisons were classified based on their form, including, for example, superlative (e.g. *most*, *least*), comparative (e.g. *more*, *less*), simile (e.g. *like*, *as*), equation (e.g. *that fellow was a bad apple*), descriptive phrase (e.g. *the wind seized the leaves*), and based on content (degree of similarity between the two things being compared). Broderick uses three categories: literal, intermediate, and figurative. In the latter he includes descriptive figurative phrases but states that many of these (78%) could also be classified as intermediate (between literal and figurative) because of their conventionality, given that their sense was listed in the Webster's New Collegiate Dictionary. Still, he decided not to do so, because they were strikingly figurative and also because "what is conventional for adults may not be so for children" (1992, p. 187). One of his findings is of particular relevance in that the linguistic form *A is B* was rarely present in the books he examined, whereas this form seems to be the most frequently used in metaphor research with children. This observation is in line with current findings in research on metaphor in educational discourse Cameron (2003) and on metaphor in different types of discourse (Steen et al., 2010).

Colston and Kuiper (2002) performed a quantitative analysis on the presence of metaphorical uses in 40 books of popular children's literature. Their classification includes genre distinguishing between fiction and non-fiction (texts with an expository function). Books were selected from a large public library in the USA. Metaphorical comparisons that were looked for included linguistic expressions of conceptual metaphors, nominal metaphors, similes and personifications. The identification was carried out by two independent readers, after having received an explanation through examples about the types of metaphorical comparisons to be identified and doing a trial with a children's book. The authors report complete agreement between the

two raters, which is rare. Colston and Kuiper (2002) attribute their consensus to the very clear understanding of the raters how to do the identification of the four types of metaphors, and the simplicity and lack of ambiguity of the metaphors present in many children's books.

The procedure of Colston and Kuiper also included a final stage, where one of the readers read each book again and, depending on its length, counted or estimated the metaphor density (number of metaphors divided by total number of words). In 'shorter' books ("short enough texts to reasonably enable a direct counting" (p. 35) metaphors and words were counted directly; in 'longer' books (those that "would have made direct counting cumbersome" (p. 35) the calculation of metaphors and words was estimated, based on a sample of a minimum of three representative pages per book. One of their findings is that there were significantly more metaphors in fiction than in non-fiction books, which suggests that type of discourse may have an influence on the incidence of metaphorically used language. Unfortunately, Colston and Kuiper do not provide separate information about the incidence of each of the four categories they mentioned, which would have been of interest to learn what they found in terms of the presence of nominal metaphors.

Cameron (2003) studied metaphor in classroom discourse and in science books used by children. The part concerning identification and understanding of metaphors in science books has been very informative for the development of my exploratory study on metaphor identification. She selected two texts, about equal in length (245 and 235 words), taken from two books that were considered as representative of those that children use to find additional information on topics taught in science class. The researcher identified the metaphors by finding vehicle terms (nouns or verbs) whose meanings were potentially incongruent with the conventional meanings of the lexical items of the surrounding text related to the same idea, but could be understood by an alternative and sound interpretation.

Cameron found that the texts included both verbal and nominal metaphors, with the former being present in a larger number. Overall metaphor density of the two texts was 57 and 101 per 1000 words respectively, according to my calculation based on Cameron's figures, and a density of 47 and 49 per 1000 words respectively, when only counting nominal (*A is B*) and verbal metaphors. This is high in comparison with the data from different researchers presented by Cameron (2003), which indicate overall metaphor densities ranging from

20 to 60 per 1000 words in spoken discourse and 10 to 25 per 1000 words in basic readers and literature. She (2003, p. 201-202) explains the very high density of metaphors in one of the texts (about the heart) because it comprises several instances of what she calls "technical metaphors", such as *the heart relaxes*, which are subsequently explained by what she refers to as a "sub-technical metaphor" such as *blood is the body's transport system, (the walls) ... squeeze blood, and strong tubes*. In the other text, which is about the ozone layer, this phenomenon is less present. It is worth noting that there are considerable differences between metaphor densities found by Cameron and the studies she refers to, which might have to do with possible differences in the operational definitions of metaphor that were used in the different studies, but also with other factors, such as age categories of books, style, genre, and topic.

The identification procedure Cameron (2003) used included a crosscheck in which a group of adults (25 in the case of one text and 17 for the other) with Master's degrees and knowledge about the criteria established by the researcher underlined what counted as metaphors for them. The differences were analysed to establish the final set of linguistic nominal and verbal metaphors. She presents the results of the crosscheck for one of the texts, which showed important differences, with some metaphors being identified by more than 60% of the adults, whereas for several other metaphors this was as low as 20%. Nominal metaphors were more easily identified than verbal metaphors. The relatively low scores show the complexity of the identification of metaphor, which is underlined by the fact that in the crosscheck one metaphor was identified by a few participants that had not been spotted by the researcher. Hence this makes it relevant to explore possible improvement in metaphor identification procedures as was subsequently done by the Pragglejaz Group (2007).

In this section I have mentioned that it seems that metaphors in literary and science are perceived differently. I have also discussed that genre may have an influence on the presence and type of metaphors, and that this has been a subject of research with adults, but hardly with children. Few studies developed in the last two decades have explored the presence of metaphor in discourse intended for children. Main findings of these studies include that the form *A is B* was not the main type of metaphor in a selection of children books, that verbal metaphors are larger in number than nominal metaphors in science textbooks, and that metaphor density in fiction is higher than in non-fiction books.

Furthermore, I have presented methods used by researchers for metaphor identification as a background to the approach I have taken in my study of potential differences in the presence of metaphor in two types of discourse that schoolchildren are exposed to, which I will address now.

5.2.2 Metaphor identification study

The previous section shows that literature suggests that metaphor densities differ between genres and also that genre may have an influence on the way metaphors are perceived, for example, as ‘literary’ or ‘scientific’. I have also indicated that few studies have analysed the presence of metaphors in real language use intended for children. To learn more about this issue I implemented an exploratory study on metaphor identification, which I report on in this section. The goal of this study was to establish and compare the presence and density of nominal (*A is B*) and verbal metaphors in a sample of children’s literature books and science textbooks in Spanish.

Method

Establishing what counts as metaphor in language is not an easy task. Some authors (e.g. Cameron, 1996; 1999b; Steen, 2007; Steen et al., 2010) have stressed the importance to have in mind that metaphor is always related to a user or group of users of a given language in a particular discourse context. Individual, social and cultural differences make that what counts as a metaphor for one group may differ from another group or even individuals. This highlights the importance of the analyst having an in-depth understanding of the language used by the discourse community. In my research, which concerns children living in Cali (Colombia), this was the case, as the three analysts who participated in the study are native Spanish speakers from Cali.

In this study the linguistic metaphors are identified at a symbolic (semiotic) level, which involves the process of analysing text to “identify particular classes of signs and sign structures as metaphorical” (Steen, 2011a, p. 46). This is different from exploring metaphors at the behavioural level, which includes metaphor recognition and interpretation by language users (the cognitive processes and products) (Steen, 2007, 2008, and 2011). Metaphorically used lexical items identified

by analysts in this specific study include both conventional and non-conventional metaphors. According to (Steen, 2007; 2011a; Steen et al., 2010), these are not necessarily processed metaphorically (that is by cross-domain mapping) by readers.

The orientation used for this analysis is that a linguistic metaphor is a stretch of language with a contextual meaning that differs from the more basic meaning; a word or words that potentially introduce an alien conceptual domain in relation to what the idea or topic is about (Cameron, 2008; Steen 2007, 2011a). Two methods for manual metaphor identification were taken into account: metaphor identification through vehicle terms -MIV- (Cameron, 2003, 2006) and the metaphor identification procedure -MIP- (Pragglejaz Group, 2007).

In the MIV procedure the identification of vehicle terms is the key point to identify linguistic metaphors. A vehicle term is the part (word or phrase) that contrasts to some extent with the on-going discourse. This contrast can be determined by identifying whether the vehicle term has a more basic meaning that differs from its meaning in a given context (contextual meaning). In addition, it has to be possible to make connections between the meaning of the vehicle term and the domain of the on-going discourse by some “transfer of meaning” (interaction between topic and vehicle) (Cameron, 2003, p. 60), in order to construct a sound interpretation of the stretch of language.

The MIP procedure developed by the Pragglejaz Group (2007, p. 3) is more comprehensive, as it determines all lexical units in the text and establishes their meaning in context and whether they have a more basic contemporary meaning. The latter they define as “tending to be:

- More concrete [what they evoke is easier to imagine, see, hear, feel, smell, and taste];
- Related to bodily action;
- More precise (as opposed to vague);
- Historically older;”

Given that the focus of this study was to identify nouns and verbs used metaphorically and that manual metaphor identification is a very demanding task both in terms of time and of knowledge and expertise, I decided to concentrate on vehicle terms comprising nouns used in the form *A is B* and verbs, instead of examining each lexical unit in the text, as indicated in the MIP procedure. For metaphor identification we looked at the potential vehicle incongruity and the possibility of its resolution by

transfer of meaning between the source and target domain, as indicated in the MIV (Cameron, 1999b; 2003), whilst also exploring the indirectness of the word meaning as presented in the MIP (Pragglejaz Group, 2007) to identify the metaphorically used words. Furthermore, as suggested in the MIP, we used an external reference (dictionary) to check the intuitions of the analysts in case of doubts.

The steps in the approach adopted for my study can be summarized as follows:

1. Reading of the entire text separately by two analysts to have a general comprehension of its meaning
2. Second reading and identification and underlining of the vehicle terms related to the word-classes of nouns (in the linguistic form 'A is B') and verbs, according to the stated criteria
3. In case of doubt about the basic meaning the individual analyst consults the dictionary
4. Comparing and discussing results between the two analysts that have read the text, using the dictionary to check the basic meanings of the words in those cases where it proved to be difficult to reach agreement.

The following examples from my linguistic material may serve to illustrate the procedure of identifying metaphorically used words.

- (1) [The lion] fell and hurt one of his legs. The bird of Paradise, scared by that movement, and by that silver without compassion, flew away to the forest. The lion roared with pain and anger. ([El león] cayó y se lastimó una pata. El ave del paraíso, asustada por aquel salto, por aquel león de plata sin misericordia, huyó hacia el bosque. El león rugió de dolor y de rabia) [From the story 'El león que escribía cartas de amor']
- (2) Outside the wind was whistling and roaring, the waves were rolling over and breaking noisily against the coast, it was dark, it was cold and the storm was blowing, whereas in the little house the temperature was pleasant. (Afuera, el viento silbaba y rugía, las olas se abatían y venían a romperse estruendosamente contra la costa, estaba oscuro, hacía frío y la tempestad soplaba, mientras que en la casita reinaba un calor agradable) [From the story 'La gente pobre']

The use of the word *roar* (*rugir*) (underlined) differs in these two examples. In the first case the sense of *roar* is the action performed by the lion, to produce a deep sound. Therefore, in this case there is no semantic contrast between the basic meaning of the word *roar* and the given context (Cameron, 2006). Furthermore, if we look up the word *roar* (*rugir*) in the Spanish dictionary (DRAE¹) it has the following meanings:

1. Dicho del león: bramar (dar bramidos). (Referred to the lion: to produce roars)
2. Dicho de una persona enojada: bramar (manifestar con voces la ira). (About an angry person: to bellow)
3. Crujir o rechinar, y hacer ruido fuerte. (To creak or squeak, to produce a loud noise)
4. Empezarse a decir y saberse lo que estaba oculto o ignorado. (To start telling and knowing what was hidden or ignored)

That means that no more basic meaning of the word ‘roar’ exists than what is evoked by the text (Pragglejaz, 2007). This analysis produces the conclusion that the term *roar* in (1) is not used metaphorically.

In the second case the meaning in context of the word *roar* is related to the action of producing a loud noise by the wind. Text (2) is about the difference in the climate outside and inside a house. This implies that there is a contrast between the topic of this text and the basic meaning of *roar* (related to the lion). Moreover, the senses provided by the dictionary indicate a more basic meaning (more concrete in this case, related to the lion) than what is suggested by the context. Hence, a contrast exists between the basic and contextual meaning and the latter can be understood by comparison with the basic meaning. It thus can be concluded through the criteria of Pragglejaz (2007) that in (2) the word *roar* is used metaphorically.

Materials

The sample for the study comprised a total of 34 contemporary texts, 20 from children’s literature and 14 from science textbooks. A larger sample would have made the task too demanding in light of the limited resources that were available. The texts were selected from the libraries of the two schools where the studies with the children were carried out. The selection for literature was made taking into account the

¹ Diccionario de la Real Academia Española (Dictionary of the Royal Spanish Academy).

target audience age (8 to 12 years old), frequency of use by children, and diversity in the topics.

Understanding science text requires background knowledge, and therefore I initially looked at texts used in the grades children had completed (3rd and 5th). An initial review showed, however, that using the same texts for 4th and 6th grades would result in the material either being too complex for the younger group or too simple for the older group. I therefore adjusted the target audience criteria and only selected science texts that were used in 4th and 5th grade, whilst keeping the other two criteria, and only explored metaphor recognition with 6th graders, because of their expected advanced background knowledge.

The knowledge of the school librarians was helpful in identifying the group of books to be checked. The target audience age for the literary books was established by looking at the suggestions of the publishers, the advice of the school librarians, and my own experience working in reading activities with school-age children. For the science textbooks the target grade was taken from the inside covers and information from the school librarians about science projects of 4th and 5th graders. The frequency of use was taken from the loan registers from the school librarians. Diversity of the topics was checked by examining the summaries and the tables of contents.

The books from literature were reviewed completely, except for two very long books, where a number of chapters were selected. Most of the science books were very long, some even having more than 200 pages. Here, some shorter books were reviewed completely, whereas for the longer books a random selection of 10 pages was made and analysed.

Tools

There is no specific dictionary for Spanish in Colombia, except for a short dictionary of slang words which are only used in Colombia ('Colombianismos'), published in 2008 (the 3rd edition) by the Colombian Academy of Language (Academia Colombiana de la Lengua). Therefore the dictionary of the Spanish Language of the Royal Spanish Academy (diccionario de la lengua española de la Real Academia de la Lengua – DRAE) was used to identify the meanings of the vehicle terms. This dictionary is published by the Royal Spanish Academy (Real Academia Española - RAE) and is the most authoritative dictionary for the Spanish language. The Royal Spanish Academy and 21 academies of the Spanish Language (each one representing one Spanish speaking country) make

part of the Association of the Academies of the Spanish Language (Asociación de Academias de la Lengua Española). Hence, this absence of a Colombian dictionary suitable for the purposes of this study is not an inconvenience, because the dictionary DRAE is the result of the study and approval of the Association of the Academies of Spanish Language, of which Colombia is a member (RAE, 2008). A second dictionary, the dictionary of the Spanish Language Espasa-Calpe 2005 (Diccionario de la Lengua Española Espasa-Calpe 2005) was also used in doubtful cases, mainly to complement the meanings, where necessary, and to have some examples of use.

Annotation

The 34 texts were examined following the established procedure to identify the nouns (*A is B*) and verbs that were considered being metaphorically used. The word (noun or verb) was the unit of analysis for the identification. The analysts made a distinction between nominal *A is B* metaphors (e.g. *La red de ríos, lagos y océanos es el sistema circulatorio de la Tierra* / *The network of rivers, lakes and oceans is the circulatory system of the earth*) and verbal metaphors (e.g. *con el silencio, florecían mejor los pensamientos* / *with the silence, the thoughts bloomed more*).

Each text was checked by the main researcher and one of the two assistant researchers, who were students in their final year of their bachelor study 'Philosophy of Language' at the University of Valle (Cali, Colombia). Two teams were formed: one team checked some 30% of the literary books and the other team checked the remaining 70% and all science texts. The goals of the study and the general background of the research (also covering the recognition and interpretation studies) were explained to the assistant researchers, as well as the definition of metaphor that was adopted and the identification procedure. Definitions and examples of metaphorically used nouns and verbs were given, and this was followed by a practical metaphor identification exercise. All three analysts independently reviewed one story that was not part of the sample and compared and discussed results in detail in a number of sessions to clear up any difficulties.

This initial experience included several meetings of the three analysts to discuss the findings and the problems that were encountered. Thereafter the two teams proceeded with the discussion of the first three books. Analyst agreement within one of the teams was 67% and in the other team 71%, but the in-depth discussion of the results and the consistent use of the dictionary ensured that in almost all cases the

analysts came to an agreement, with the lead researcher having the final say. To calculate the agreement between the analysts first the final set of metaphors that had been identified and agreed upon was established and thereafter the percentage of metaphors on which the analysts agreed before discussion was calculated.

For subsequent literary books, analyst agreement increased to 84% before discussion for one of the teams and 81% for the team that did 30% of the literature books. This suggests that the analysts improved their identification skills in comparison with the review of the initial three books. For science books, analyst agreement reached 84% before discussion. Cohen's κ was run to determine the level of agreement between analysts. For the team that reviewed 30% of the literary books there was moderate agreement between analysts ($\kappa = .403, p < .000$), but at the low end of the scale suggested by Landis and Koch (1977), which is between .40 and .60. For the other team the agreement was also moderate, but still considerably better, as it was close to the high end of the scale with $\kappa = .549, p < .000$ for literature and $\kappa = .593, p < .000$ for science texts. Nevertheless, with only moderate agreement before discussion caution is needed with respect to the interpretation of findings.

It is important to stress that the identification process is complex and benefits a lot from the detailed discussions between analysts and the joint consultation of the dictionary. To illustrate the complexity I will discuss some examples of the problems we encountered.

- *Metaphors in Fantasy stories*

In several of the books we found interplay between fantasy and metaphorical uses, which required very careful reasoning to identify the metaphors. In this context it is interesting to mention that Reyna (1985) suggests that fantasy and novel metaphor are related. She states that both require imagination and demand that the reader goes beyond conventional concepts and interpretations. Reyna (1985, p. 145-146) indicates that “fantasy consists of imagining the impossible” and gives the example of *a talking rabbit* as “an entity that has properties that are incompatible in reality”. Levin (1993) raises the point that this incompatibility may be solved by construing the utterance which then is to be taken as metaphorical, but another option exists in not taking the conditions in the world as fixed and instead construing a ‘different world’. This is the approach I use in my research, as it seems more pertinent for this type of fantasy story,

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where human properties are attributed in real terms to some characters in the story, such as animals and the wind. The reader is invited by these stories to imagine that he or she is in a 'different world', where other actors are capable of human actions, meaning that the verbs concerned are not used metaphorically, as shown and discussed in the following examples:

- (3) “Todos me miran”, piensa incómoda la Nariz. “Me siento como si algo repugnante se me pegara al cuerpo.” Así que se escapa a toda prisa y se va de la ciudad. (“Everybody is looking at me”, the Nose thinks and feels uncomfortable. “[I] feel like as if something repulsive was stuck to my body”). Then [she] escapes quickly and leaves the city) [From the story ‘Aventuras de una nariz’ p. 12]

The perception of the metaphorical use of *escapar* (to escape) may be generated by the ‘mismatch’ between to *escape* (*escapar*) and the subject of the action (the Nose). However, in the context of the fantasy created in this story, the Nose is portrayed as an entity with human characteristics and can therefore perfectly perform the action to *escape*, which is therefore not used metaphorically.

- (4) Ni siquiera le hizo caso al pi-pi-pi de su reloj que le *anunciaba* el comienzo del otoño en Chile y Argentina. Ni se inmutó cuando escuchó la señal enviada por los vientos del norte que necesitaban su ayuda para formar un huracán [...] No recordó tampoco el SOS de Trombondó. Así se llama un viento que vive en el lejano Chocó, un rincón del mundo donde el mar *abraza* la selva y no para de llover. ([He - Turbel] did not even pay attention to the pi-pi-pi of his watch that *announced* the beginning of the autumn in Chile and Argentina. He was not perturbed when hearing the signal sent by the winds from the North that needed his help to organize a hurricane [...] He did not remember the SOS of Trombondó either, the wind with this name that lives in the remote Chocó, a corner of the world where the sea *hugs* the jungle and the rain never stops. [From the story ‘Turbel, el viento que se disfrazó de brisa’ p. 2-14]

In this story the wind Turbel and his friends (other winds such as Trombondó) behave as human beings and hence several terms that denote human actions are not interpreted as metaphorical uses. However, the *watch* and the *sea* maintain their original character (thus not capable of human action), and therefore *announced* and *hugs* should be taken as metaphorical uses.

- *Metaphors of the form A is B*

Usually such metaphors were very clear, but some were still initially missed by some of the analysts, possibly because of the use of the future tense and the absence of the topic or target domain (a common grammatical option in Spanish), as shown in the following examples. Although I also followed Levin in these two stories, accepting that animals can talk, laugh, etc., this does not influence the *A is B* metaphors in this case, as they connect different domains. In these stories an animal, although capable of human action, is not a statue and an opossum is not a bear.

- (5) Seré una estatua hasta el final promete Ananías ([I] will be a statue until the end—Ananías promises) [From the story ‘Garabato. Historias de Eusebio III’ p. 12]
- (6) Esta vez le dijo, seré un viejo oso gruñón (This time [the female opossum] said to him, [I] will be an old grumpy bear [From the story ‘No te rías, Pepe!’ p. 12])

- *Verbal metaphors*

The identification of verbal metaphors generally posed more difficulties than the identification of nominal (*A is B*) metaphors. As noted by Cameron (1999b, 2003, 2008), it requires that the lexical meaning of the verb is established, and that the meaning of its basic collocates, and of those that are evoked by the discourse context, are also determined. In quite a number of cases the difference between the basic and contextual meanings of a verb was not difficult to identify, as its sense in a given context stands out from the basic meanings of the verb, as shown in the following examples:

- (7) Y quedó pensativo. Tropezó con un problema: no estaba acostumbrado a *fabricar* pensamientos nuevos. (And [he] got thoughtful. [He] *ran into* a problem: [he] was not used to *building* new thoughts) [From the story ‘Turbel, el viento que se disfrazó de brisa’ p. 27]
- (8) Los mirlos construían sus nidos de aterciopelado musgo y las golondrinas volvían a *rasgar* el azul del cielo con sus negras alas afiladas. (The blackbirds were building their nests of velvety moss and the swallows returned to *tear* the blue sky with their black wings) [From the story ‘El camión bordado’ p. 10]

For other verbs the situation was more complex, as shown and discussed in the following two examples.

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- (9) ¡Tu boca es un campo de batalla! El enemigo principal es el sarro, un recubrimiento blanco y pegajoso que se forma en los dientes. Primero *intenta* destruir la parte externa de tus dientes con un ejército de ácidos. Después fabrica venenos y con ellos *ataca* tus encías. ¿Cómo puedes responder? El arma que tienes más a mano es tu cepillo de dientes. Pero empléalo con cuidado, porque si no ayudarías a tu enemigo. (Your mouth is a battlefield! The main enemy is the tartar, a white and sticky layer that grows on the teeth. It tries first to destroy the external part of your teeth with an army of acids. Later on it produces poisons and with them attacks your gums. How can you respond to this? The weapon that you have at hand is your toothbrush. However, you have to be careful when using your toothbrush otherwise you will help your enemy) [From the text ‘El cuidado de tus dientes. In: ‘Tu cuerpo’ p. 100]

In this excerpt about the actions of the tartar there are four verbs (*try*, *destroy*, *make*, and *attack*) that allow me to exemplify the differences concerning the difficulty in establishing whether there is a metaphorical use.

The verb *intentar* (to try), according to the RAE dictionary, has the following meanings:

1. Tener ánimo de hacer algo (to have the interest to do something)
2. Preparar, iniciar la ejecución de algo (to prepare, to start carrying out something)
3. Procurar o pretender (to attempt to do something)

All of these senses imply human bodily actions. This seems to be supported in the examples given in the Spanish Language Espasa-Calpe 2005 dictionary: “intentaré llegar a tiempo” (I will try to come on time); “intentamos poner en marcha una campaña informativa” (we tried to launch an informative campaign); “intenta ponerte en mi lugar” (try to put yourself in my place). These meanings of the verb contrast with the sense implied in the text given the entity (the tartar) that performs the action, which implies a metaphorical use.

The verb *destruir* (to destroy), according to the RAE and Espasa-Calpe dictionaries, has the following meanings in relation to concrete things:

1. Reducir a pedazos o a cenizas algo material u ocasionarle un grave daño. (To destroy something concrete, or cause severe damage) [RAE dictionary];
2. Deshacer, arruinar una cosa: en el terremoto se destruyeron muchos edificios. (To destroy or to ruin a concrete thing; e.g. in the earthquake many buildings were destroyed) [Espasa-Calpe dictionary]

Hence in this case, differently from the previous example (intentar, to try), the verb *to destroy* is not used metaphorically, as it coincides with the basic meaning given in the dictionary.

The verb *fabricar (to make)* has the following meanings, according to the RAE dictionary.

1. Producir objetos en serie, generalmente por medios mecánicos. (To produce objects in series, usually by mechanical means)
2. Construir un edificio, un dique, un muro o cosa análoga. (To build a building, a dike, a wall or something similar)
3. Elaborar (To produce)
4. Hacer, disponer o inventar algo no material. Fabricar alguien su fortuna. Fabricar una mentira. (To create or invent something abstract: e.g. to fabricate a fortune; to fabricate a lie)

In this case the contextual meaning given in the text has to do with *elaborar (to produce)* (meaning number 3), which is widely used in Colombia and seems to fit well, as *tartar* comprises micro-organisms that produce (*elaboran/producen*) poisons. In this case it seems that this meaning is as basic as meaning number (1), and therefore we decided that the verb is not used metaphorically.

Finally, the verb *atacar (to attack)*, according to the RAE dictionary, is related to a physical confrontation:

1. En un arma de fuego, una mina o un barreno, apretar el taco. (Related to guns or a mine to activate the trigger)
2. En un combate, emprender una ofensiva. La escuadrilla atacó al amanecer. (During a combat, to launch an offensive; e.g. as dawn broke, the squadron attacked)

Here, the term is used metaphorically in the text, as its contextual meaning contrasts with its more basic meaning.

An additional point needs to be mentioned concerning the complexity in identification and the moderate inter-rater agreement. The verbs to destroy (*destruir*) and to make (*fabricar*) are used in the presence of other words that are used metaphorically and relate to the idea of physical confrontation (*battlefield, enemy, army of acids, weapon*). This seems to produce a bias, at least for some of the analysts, towards initially rating these verbs as used metaphorically, as they, and particularly the verb *destroy*, also have meanings related to war. The discussion between analysts proved useful for resolving such differences in identification and for reaching agreement.

- (10) [...] entonces el rumor *llegó* como una música lejana que poco a poco fue *llenando* todo el espacio. (...) y desde ese día también la idea de ir al mar no la *abandonó*. (Then the sound *came* like music from far away that gradually started *filling* the environment... and since that day the idea to go to the sea did not *abandon* her) [From the story ‘La botella azul’ p. 23]

In this fragment we have another example of the differences between verbs when determining metaphorical use (*come, fill, and abandon*).

Meanings of the verb *llegar* (to come) in the RAE and Espasa-Calpe dictionaries include:

1. Alcanzar el fin o término de un desplazamiento. (To reach the end of a movement) [RAE and Espasa-Calpe]
2. Dicho de una persona o de una cosa: Acercarse a otra. (About a person or thing: to get close to another) [RAE]
3. Alcanzar cierta altura o extenderse hasta cierto punto: el agua le llegaba hasta la cintura. (To reach certain level or point; e.g. the water came up to [her] waist) [Espasa-Calpe]

According to these meanings, it seems that the basic meaning of *to come* (*llegar*) is related to an action of a person or a concrete object, whereas in the text it is used in combination with a sound. Hence, in this case, there is a more basic sense than the contextual meaning, which implies that the verb is used metaphorically.

Regarding the verb *to fill* (*llenar*), some of the more relevant meanings for our analysis are the following:

1. Ocupar por completo con algo un espacio vacío; la sala se llenó de invitados. (To fully occupy an empty space with something; e.g. the living room filled up with guests) [RAE and Espasa-Calpe]
2. Dicho de un conjunto de personas: Ocupar enteramente un recinto. (Related to a group of people; e.g. to fully occupy the premises [RAE])
3. Cargar, colmar. Lo llenó de favores, de improperios, de enojo. [To burden, to fill; e.g. [they] loaded him with favours; [they] burdened him with insults, and annoyances) [RAE]

In this case, too, the basic meaning of the verb *to fill* is more related to filling a space with a physical entity (e.g. *to fill a room with people or a bottle with water*), whereas the contextual meaning refers to the more abstract term *sound* (of the sea). Therefore the verb is used metaphorically.

The last verb *abandonar* (*to abandon*) is, according to the RAE and Espasa-Calpe dictionaries, related to bodily actions, as shown in the following meanings.

1. Dejar, desamparar a alguien o algo; abandonar a un bebé. (To leave, to abandon to somebody or something; e.g. to abandon a baby)
2. Dejar un lugar, apartarse de él; abandonar la casa. (To leave a place, to go away of a place; to abandon the house)
3. Caer de ánimo, rendirse en las adversidades y contratiempos; debe luchar contra su enfermedad y no abandonarse. (Losing heart, to give up; e.g. [he] has to fight against his illness and not give up)

In this case the more basic meaning of the word *to abandon* is clearly related to an act of a person and not, as in this context, of an idea (an abstract entity), which implies that it is used metaphorically. In this case, in fact, all meanings in the dictionary are more basic than the contextual meaning of the word in the text.

It is worth mentioning that the high metaphor density in this story was complex for some of the analysts and needed detailed discussions to ensure that metaphorical uses were not overlooked. In cases like these, adopting a metaphor

identification procedure and consulting the dictionary proved very relevant and helpful, but not always easy.

5.2.3 Results and discussion

In this section I present information on the 34 books that comprised the sample for metaphor identification and provide a quantitative analysis of the findings of this exploratory study. In total we reviewed 20 children literary books written by 17 different authors. Nine of the authors come from Latin America, including five from Colombia. The stories vary in length and in topics that are addressed. The 14 science textbooks we analysed were all from different authors, nine of them coming from Latin America, including seven from Colombia. Most of the books are very nicely illustrated; often including drawings that supported the story or topic, and many have beautiful covers (see Figures 5.3 and 5.4). Further information about some characteristics of the books is provided in section 5.4.



Figure 5.3 Examples of Some of the Covers from Children’s Literature

The sample of books that was reviewed includes quite a variety of topics and presence of metaphorical uses. In some of the texts, both in

literature and science, several closely connected linguistic metaphors are presented in the story, as shown in the following examples.

- (11) Así, como recién llegado de la guerra, lo vieron recorrer el bosque, de un lado a otro, como alma en pena. En realidad su guerra apenas había comenzado. La imagen del ave del paraíso era una bala que lo hería sin lástima en lo más tierno del corazón. (In this way, [they] saw him [the lion] as if he had just come back from the war, going from one place to another, like a lost soul. In fact, his war had just started. The image of the bird of paradise was a bullet that was hurting him in the softest spot in his heart) [From the story 'El león que escribía cartas de amor, p. 8-10]

In this excerpt some parts refer to the metaphor *Love is war*.



Figure 5.4 Examples of Some of the Covers from Science Books

- (12) Nuestro organismo está expuesto continuamente al ataque de agentes extraños. Estamos rodeados de miles y miles de partículas de polvo, virus y microbios que tratan por todos los medios de atravesar la frontera de

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nuestro cuerpo [...] Las células de la piel estrechamente unidas, son una *pared protectora* natural entre el cuerpo y el medio ambiente. [...] La tos rechaza las sustancias extrañas y actúa como *guardián* de los pulmones [...] En muchas ocasiones los agentes extraños logran *penetrar* y comienzan su *labor de ataque* al organismo. (Our organism is continuously exposed to the *attack of alien agents*. We are surrounded by thousands and thousands of particles of dust, virus and microbes that try in many ways to *enter the frontier* of our body [...]. The cells of the skin that are strongly united are a natural *protecting wall* between the body and the environment. [...] Coughing expels the alien substances and is *the guardian* of the lungs [...]. In many occasions the *alien agents manage to enter* our body and start *attacking* the organism) [From the text ‘Por qué nos enfermamos’ in: ‘Cosmos 4. Ciencias Naturales y Educación para la Salud’ p. 31-32]

In this excerpt the risk of getting ill as a result of virus and microbes, and the self-protection of the body against this attack, is presented through the metaphor *the illness is an enemy*.

Quantitative findings

This section presents the results of the analysis of the presence of nominal (*A is B*) and verbal metaphors in the literary and science books (Tables 5.3 and 5.4). The overall picture shows considerable variation in metaphor density in the different books, with two literary books and two science books not even having a single nominal (*A is B*) or verbal metaphor.

A Wilcoxon Signed Ranks Test showed that there is a statistically significant difference between the density of nominal (*A is B*) metaphors per 1000 words ($M = 0,42$, range 0 – 2,6) and verbal metaphors ($M = 4,01$, range 0 – 15,3); ($Z = -3,517$, $P = 0,000$). The highest density was 15,3 for verbal metaphors in one of the stories, which did not include any nominal (*A is B*) metaphor. For science texts the difference in density is lower, but still statistically significantly fewer nominal (*A is B*) metaphors were found ($M = 0,58$, range 0 – 2,0) than verbal metaphors ($M = 1,82$, range 0 – 7,7); ($Z = -2,705$, $P = 0,007$). In science a highest density of 7,7 was found for verbal metaphors in a text that also had nominal (*A is B*) metaphors (density 1,5).

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Table 5.3

Density of Nominal (A is B) and Verbal Metaphors in 20 Literary Books for Children

No	Title, author, year of publication, total number of pages	M per 1000 words	
		Nominal (A is B)	Verbal
1	Aventuras de una nariz. Viviane Schwarz (Germany); (translation: Alejandro Pérez Viza); 2002; 26p	0.0	9.5
2	Clemencia, la vaca que quería ser blanca. Verónica Linares (Bolivia), 2003; 56p	0.0	0.6
3	Como aprendí a montar a caballo (relato de un señor). (In: La ratoncita-niña y otros cuentos). Leon Tolstoi (Russia); (translation: Luz Amorocho);1997; 7p	0.0	0.0
4	El barbero y el coronel. Ana María Machado. (Brazil); (translation: Juan Fernando Esguerra); 1999; 48p	0.0	0.0
5	El camión bordado. Ana Balzola (Spain); 1982; 28p	0.0	15.3
6	El león que escribía cartas de amor. Triunfo Arciniegas (Colombia);1989; 32p	0.7	2.0
7	El valle de los Cocuyos. Gloria Cecilia Díaz (Colombia); 1986; 127p	1.2	2.3
8	Garabato. Historias de Eusebio III. Ivar Da Coll (Colombia);1990; 32p	2.6	6.6
9	La botella azul. Gloria Cecilia Díaz (Colombia); 2002; 48p	0.2	10.2
10	La escuela vuela. Eveline Hasler (Switzerland); (translation: Ana Garalón);1997; 38p	0.0	1.3
11	La estrella que le perdió el miedo a la noche. Pilar Lozano (Colombia); 2002; 36p	0.0	4.0
12	La gente pobre. (In: La ratoncita-niña y otros cuentos) Leon Tolstoi (Russia);) (translation: Luz Amorocho); 1997; 8p	0.0	7.1
13	La princesa y el pirata. Alfredo Gómez Cerda (Spain);1995; 32p	0.0	2.6
14	La venganza de la trenza. Graciela Montes (Argentina);1998; 28p	0.8	0.8
15	Las golosinas secretas. Juan Villoro (Mexico);1998; 40p	0.0	0.8
16	Minka. María Seidemann (Germany); (translation: Ana Garralón); 1997; 40p	0.5	2.2
17	No te rías, Pepe. Keiko Kasza (Japan); (translation: Cristina Aparicio); 1997; 30p	1.5	1.5
18	Tano en la frontera del tiempo. Fernando Alonso (Spain);1989; 159p	0.5	3.9
19	Tocotoc. El cartero enamorado. Clarisa Ruiz (Colombia);1998; 56p	0.0	1.4
20	Turbel, el viento que se disfrazó de brisa. Pilar Lozano (Colombia); 2001; 40p	0.5	8.2
	Mean for number of metaphors per 1000 words	0.42	4.01
	Range	0 – 2.6	0 – 15.3

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Table 5.4

Density of Nominal (A is B) and Verbal Metaphors in 14 Science Books for Children

No	Title, author, year of publication, total number of pages	M per1000 words	
		Nominal (A is B)	Verbal
1	Bajo las olas. Kristin Joy Pratt (USA); (translation: Alma Flor Ada); 1995; 44p	0.8	1.5
2	Conciencia 6. Ciencias Naturales y Educación Ambiental - Básica Secundaria. Martha Patricia Acevedo Trujillo et al.; (Colombia); 2003; 231p	0.2	0.7
3	Cosmos 4. Ciencias Naturales y Educación para la salud. Jorge Ibarra Montenegro (Colombia); 1997; 216p	0.5	1.4
4	Cosmos 5. Ciencias Naturales y Educación para la salud. Diana Lineth Parga Lozano (Colombia); 1997; 219p	0.8	0.4
5	Descubre los insectos. David Suzuki (Canada); (translation: Irene Amador); 2003; 95p	0.4	0.4
6	Diego y Valentina... descubren la ciencia. Helmer Pardo Pineda (Colombia); 2000; 112p	0.0	2.2
7	El color de las aves en el paisaje de las microcuencas. Giovanni Cárdenas, Adriana Giraldo, Duberney Ortega (Colombia); 2003; 20p	0.0	0.0
8	El legado del Apolo. Pablo Cuartas Restrepo (Colombia); 2005; 33p	0.0	0.0
9	La respiración. Luci Cruz Wilson (Mexico); (Serie: Fenómenos Naturales); 2000; 35p	1.1	1.1
10	La Tierra ¡Qué pasada de planeta! Javier Lascurain (Spain); 2002; 95p	0.8	2.6
11	Los temblores. (Serie: Fenómenos Naturales); Juan Tonda (Mexico);1995; 34p	0.0	0.5
12	Proyectos Fascinantes. Sonido. Bobbi Searle (USA); (translation: Diana Esperanza Gómez); 2005; 48p	0.0	0.9
13	Tu cuerpo (Vol. 5 colección: El mundo de los niños); Salvat Barcelona (Spain),1987;159p	1.5	7.7
14	Vida y Naturaleza 5. Doris Amanda Espitia de González et al. (Colombia); 1993; 176p	2.0	6.1
	Mean for number of metaphors per 1000 words	0.58	1.82
	Range	0 – 2.0	0 – 7.7

Discussion

The findings show a higher presence of verbal metaphors ($M = 4.01$ per 1000 words) than nominal (*A is B*) metaphors ($M = 0.42$ per 1000 words) in literature texts and a similar situation for science texts, where verbal metaphors scored an average of 1.82 and nominal (*A is B*) metaphors scored an average of 0.58. This overall finding is in line with

Broderick (1992), who found few nominal (*A is B*) metaphors in children's books.

In the case of science books it is in line with the information presented by Cameron (2003). A fair comparison with metaphor densities of others is not really feasible, taking into account that my source material is children's books, whereas the most comprehensive analysis available, made by Steen and colleagues, deals with text for adults. Yet the relative low number of nominal (*A is B*) and verbal metaphors is a point of attention, as I actually expected to find a larger number of verbal metaphors in particular in these publications, taking into account the metaphor densities found by others in text used with children, as reported by Cameron (2003). Metaphor densities range from 10 to 25 per 1000 words and metaphor density in one text in her own study even went up to 101, although it is important to mention that she characterizes this as very high. The densities she mentioned, however, include other metaphors in addition to verbal and nominal (*A is B*) metaphors. In my study I found, for nominal (*A is B*) and verbal metaphors together, an average density in literature of 4.3 per 1000 words and a highest density of 15.3 in one of the publications. For science texts the average for this combination was 2.4 per 1000 words and a highest density of 9.2.

The difference between my results and those of the researchers reported by Cameron may be explained in part by my focus on nominal (*A is B*) and verbal metaphors. Cameron, for example, reports that nominal and verbal metaphors together represented 62% of the metaphors that were identified in classroom discourse. Even though I cannot compare this directly, as it concerns spoken text, it still points out that other types of metaphors make up an important part of the total. It is also necessary to mention that the inter-rater agreement was only moderate, and because we did not check all verbs in the dictionary, it cannot be ruled out that we missed some of the metaphorically used verbs. However, this does not change the finding that nominal (*A is B*) metaphors were significantly fewer in number, but at best may imply that some more verbal metaphors were present.

A much more important point is my adoption of the approach suggested by Levin (1993), namely that in the case of fantasy stories it is plausible that the producer is, in fact, describing a fantasy world in which animals and abstract entities (such as the wind) can show human behaviour. Verbs used in this context, therefore, were not classified as used metaphorically in our analysis, but we do not know how other

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researchers may have dealt with this. With over 60% of the reviewed books related to fantasy, this can make for a considerable difference in average metaphor density, as shown in the excerpt of *Aventuras de una nariz* (Figure 5.5). In this publication the density of this type of verbs (vf in Figure 5.5) (in the fantasy world) was 90 per 1000 words, whereas for the metaphors (v in Figure 5.5) we scored in the story this was only 9.5. Hence, if we did not assume the fantasy world, we would find some 100 verbal metaphors per 1000 words.

Los libros le gustan (vf). “Éste huele a tinta, y este otro a polvo”, piensa (vf).
“Mmm. Quizá pudiera quedarme (vf) aquí”.
Pero no puede.
La biblioteca *cierra* (v) de noche, y todos tienen que irse. Pero ¿adónde?
-Conozco (vf) el mejor lugar del mundo
-dice (vf) un perro-.
¡Ven conmigo!

[She] likes (vf) the books. “This smells of ink, and this one of dust” she thinks (vf)
“Mmm. Perhaps I can stay (vf) here”
But [she] cannot
The library *closes* (v) at night and everyone has to go, but to where?
I know (vf) the best place in the world –says (vf) a dog
–Come with me!

(v) = verbal metaphor whether fantasy world is assumed or not
(vf) = verbal metaphor if fantasy world is not assumed (non-human entity not capable of human action)

Figure 5.5 Excerpt of ‘Aventuras de una Nariz’ to Illustrate Difference in Metaphor Density

Furthermore, it cannot be ruled out that some other factors may contribute to the differences in metaphor densities, including possible differences between Spanish and English, and the potential effect of translation into Spanish of some of the books. The age category used for book selection might also be a factor, taking into account that Gubar (2011, p. 211), for instance, mentions that texts for adults such as *Arabian Nights* were adapted (simplified) for children. It goes beyond the current exploratory study, however, to review differences in metaphor densities in literature in more detail. The same applies for science texts, where metaphor densities were even lower. Here it is not an issue of fantasy world, but as shown in the excerpts (Figure 5.6), many verbs are indeed not used metaphorically.

El payaso *recibe* (v) su nombre, por sus colores brillantes y por su boca curvada hacia abajo. Estos pececitos tienen una relación extraordinaria con las anémonas de mar, es lo que se llama una relación simbiótica. La anémona es un animal estacionario con varias hileras de tentáculos venenosos alrededor de la boca. El payaso protege sus huevos de animales predadores, poniéndolos junto a la anémona. A su vez ayuda a alimentar a la anémona. El pez se protege de la picazón de su anfitrión por medio de una cubierta mucosa que le cubre las escamas. Las franjas blancas que tiene en el cuerpo le sirven de camuflaje cuando se esconde entre los tentáculos de la anémona.

(The clownfish gets its name from its bright colors and his downcurved mouth. These fish have an extraordinary relationship with sea anemones; it is what is called a symbiotic relationship. The anemone is a stationary animal with rows of poisonous tentacles around the mouth. The clownfish protects her eggs from predatory animals by laying them next to the anemone. In turn it helps to feed the anemone. The fish is protected from the itching stings of its host by means of a mucous cover on its scales. The white stripes on the body serve as camouflage when hiding among the tentacles of the anemone).

(v) = verbal metaphor

Figure 5.6 Excerpt of the Science Text ‘Bajo las Olas’ to Illustrate Low Metaphor Density

5.2.5 Conclusion

In the previous sections I have reported the study of the presence of nominal (*A is B*) and verbal metaphors in 20 children’s literary books and 14 science books and compared the results with other studies. My study is one of the few that have analysed the presence of metaphors in real language use intended for children and the first of its kind with Spanish texts. Findings showed that significant differences exist between the densities of *A is B* and verbal metaphors in science and literature (Table 5.5). This is in line with recent comprehensive studies with adults, which found differences in terms of metaphor distribution, word class and type of discourse (e.g. Krennmayr, 2011; Steen et al., 2010).

Table 5.5
Overview of Metaphor Density per 1000 Words (Average and Range)

	Nominal (<i>A is B</i>) metaphors	Verbal metaphors
Literary books (n = 20)	0.42 (0 – 2.6)	4.01 (0 – 15.3)
Science texts (n = 14)	0.58 (0 – 2.0)	1.82 (0 – 7.7)

The linguistic material for the study was selected from literary and science books present in school libraries of the children from Cali (Colombia), who participated in the metaphor behavioural studies. Metaphor identification was carried out by three native Spanish speakers

from Cali. We used a combination of elements from two methods for manual metaphor identification, the MIV (Metaphor Identification through vehicle terms) used by Cameron (2003, 2006) and the MIP (Metaphor Identification Procedure) of the Pragglejaz Group (2007). This allowed us to concentrate on vehicle terms comprising nouns used in the form *A is B* and verbs instead of examining each lexical unit in the text, as indicated in the MIP. I have presented several examples of the materials we analysed and the arguments we used to identify the *A is B* and verbal metaphors. Some of these examples demonstrate that the identification of the metaphorical use of some verbs was particularly complex and in that respect I do not concur with the statement of Colston and Kuiper (2002, p. 34) in relation to the ease of the identification of metaphorical uses of language as "the texts in many children's books are very simple and ambiguous cases of metaphor are rare". This statement seems an oversimplification of reality, because, as discussed in this chapter, the family of children's books varies in complexity not only because of the age of the addressees, but also because of styles of authors, genre, etc.

The lower presence of nominal (*A is B*) metaphors is in line with the finding of Broderick (1992) that *A is B* metaphors, which are often used in research with children, are less present in children literature than, for example, verbal metaphors. A point that I discussed in more detail is that metaphor density in my texts is low in comparison with accounts of other researchers, as reported by Cameron (2003). I have argued that part of the difference can be explained because I only looked at two types of metaphors and other forms may also have a considerable presence. A main factor for the low number of verbal metaphors in literature was the adoption of the approach of Levin (1993), which meant taking fantasy as 'a new world', where non-human characters are capable of human activities such as speech and the verbs used in these acts are therefore not to be taken as used metaphorically. I also mentioned some other potential factors, including simplification of texts, differences between Spanish and English, and the effect of translation. Further research is needed to explore the possible influence of these factors.

My study confirms the importance to explore metaphor in real language in order to understand the presence and nature of metaphor in classes of discourse that children encounter and use as members of a linguistic community. Based on the review of the 34 books from two types of discourse children are familiar with in schools, I established my linguistic material by selecting parts of these texts, as will be discussed in the next section.

5.3 Selecting and adjusting the research materials

In this section I discuss the way the linguistic materials, including the metaphors, were selected and adjusted to carry out the behavioural studies of metaphor recognition and interpretation by the children that are reported in the next chapters. I also present the procedure that was used to establish metaphor conventionality.

A total of 18 text fragments were taken from the sample of the 34 books that were analysed in the identification study. Important criteria for selection included the diversity in topics, the texts being enjoyable, comprehensible and sufficiently comprehensive to be read in the reasonably short period of time that was envisaged for the data collection. Furthermore, in the case of children's literary books, the aim was to find texts that would be sufficiently interesting and challenging for both 4th and 6th graders, to be able to give them the same linguistic materials.

The final selection comprised ten text fragments of ten children's literary books and eight text fragments from seven science textbooks. The selection of these fragments was carried out by the researcher and discussed with three colleagues, two with a literary and pedagogical background (for the children's literary texts), and another with a science-related pedagogical background (for the science textbooks).

It proved possible to find a good variety of reasonably short texts, but still several needed some adjustments, including shortening part of the text without losing coherence. In two cases it was also necessary to include some information from an earlier part of the story to provide the contextual information needed to make the excerpt comprehensible in itself. Another adjustment was the necessity to add eight nominal (*A is B*) metaphors and two verbal metaphors to the literary texts to ensure that a sufficient number of nominal (*A is B*) and verbal metaphors was present in the text fragments to allow for statistical comparison. These additional metaphors were taken from some children's poem books and some books for teaching language found in the schools.

For our study of science books we found several texts with a sufficient number of nominal (*A is B*) metaphors, but these sections comprised just a few verbal metaphors. Therefore, instead of trying to include a larger number of verbal metaphors, I decided to focus on nominal (*A is B*) metaphors only for this part of the research. Although we did not have to add *A is B* metaphors here, we did decide to remove

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some signals indicating figurative use or comparison to avoid calling explicit attention to the metaphor. This decision was taken to keep balance in the linguistic materials and to reduce the influence of such possibly interfering factors in recognition. This was done in four cases, as indicated below:

- (13) El hombre, *en forma similar al acueducto*, cuenta con una compleja red de tuberías que transporta la sangre (Men, *in a similar way as the water supply system*, have a complex network of tubes that transports the blood) [From the text 'Vida y Naturaleza 5' p. 46]

In this case the text *in a way similar to the water supply system*, which makes the comparison explicit, was deleted.

- (14) Los riñones son *prácticamente* unos filtros, a donde llega una arteria con sustancias de desecho (The kidneys are *in fact* filters, where an artery comes with waste substances) [From the text 'Cosmos 4. Ciencias Naturales y Educación para la salud' p. 35-36]

Here the text *in fact* was deleted.

- (15) La tos rechaza las sustancias extrañas y *actúa como* guardián de los pulmones (Coughing repels the strange substances and *acts like* the guardian of the lungs) [From the text 'Por qué nos enfermamos' in: 'Cosmos 4. Ciencias Naturales y Educación para la Salud' p. 31-32]

The adjustment in this case was to put *is (es)* instead of the text *acts like (actúa como)*

- (16) Los sismos ocurren cuando la "*cáscara*" de nuestro planeta, llamada corteza terrestre, se mueve en forma brusca. (Earthquakes happen when the "*shell*" of our planet, called earth's crust, moves abruptly) [From the text 'Los temblores' p. 7]

Here the inverted commas that draw attention to the figurative use of the word *shell (cascara)* were deleted.

The literary texts dealt with different topics, such as friendship, solidarity, love, feelings of sadness and happiness, beauty, risk and suspense. Fragments differed in length and contained different numbers of metaphorical utterances (average 3.8 per text, variance between two and six). Fragments ranged from 84 to 304 words and on average contained 1 metaphorical utterance per 42 words, with a variance between 21 and 80 words per utterance for the different fragments. The ten fragments from literature included 18 nominal (A is B) and 20 verbal

metaphorical utterances. Nominal metaphors include copular form² (e.g. *María era un angel/ Maria was an angel*) and nominal group (e.g. *sus pinturas eran una fiesta de colores/ his paintings are a feast of colours*); verbal metaphors include single verbs (e.g. *el viento se entra/ the wind enters*), multi-word verbs and specifically verb phrase metaphors (e.g. *Tano paseaba la mirada por su cuarto/ Tano's glance passed through the bedroom*).

Fragments from science textbooks refer to different issues, including processes in the body (circulation, respiration, excretion, become ill, and teeth illness), plant nutrition, earthquakes and life in the ocean. The eight fragments from science texts included 18 nominal (A is B) metaphors (average 2.3 per text variance between 1 and 5). On average the science fragments had one nominal (A is B) metaphor per 73 words varying between 34 and 198 for the different fragments, which was higher than the ratio in the literary texts. An example of the type of metaphor that was used is the following: *las mitocondrias son las fábricas de energía en todos los seres vivos/the mitochondria are the factories of energy in all living beings*.

5.3.1 Establishing conventionality

As already indicated in Chapter 4, researchers have followed different procedures to analyse the conventionality of the linguistic material used in their studies with children. A common approach is to ask adults to make this assessment, possibly in view of the complexity of this task for children. Cameron (1996; 1999b) stresses that it is very important to be precise about procedures and indicates that some studies with children use metaphors selected by adults through pilot studies, implying that their findings relate to children's comprehension of adult metaphors. The same reasoning can be applied to adult rating of metaphor conventionality in studies with children. I therefore wanted to explore the possibility of involving children in the conventionality rating and tested two approaches with two different groups of participants.

The first procedure, based on Pearson (1990), consisted of asking children between 5 and 9 years old to repeat metaphorical sentences. It was observed that repetition was not a problem for the older children, but less accurate repetitions were provided by

² Labels taken from Cameron (2003).

the youngest children (5 to 6 years old), whilst also showing differences among them. Some less familiar metaphorical utterances such as *the night softly sews your eyelids* posed some difficulties even after repetition. Unfortunately, no clear trend could be established and the older children faced relatively few problems after repetition, which made it not feasible to use this approach to possibly establish conventionality.

I then tried a second procedure, which consisted of giving children a few metaphors and asking them whether they had heard the sentences before. In the case of a positive answer I proceeded to explore where children remembered they had encountered each of the expressions. As I expected this task to be more demanding, I tested it with older children (7 to 10 years old) than those in the first procedure. The test generated a variety of explanations that were at times very 'creative' but also implausible. Some children were keen to show that they knew the sentences and mentioned, for example, that they had heard the sentence *the eyes of the dressmaker were deep blue pools* (*los ojos de la costurera eran pozos de azul profundo*) in a conversation between their parents or from people talking in the street, and one child even indicated that he had heard the bus driver using this sentence. Interestingly, there were also answers where some children referred to the possible source of the metaphor by saying for example "I have heard this in a poem" or "this comes from poetry". Other children gave the impression that they were not really thinking about the metaphors, but just providing alternated affirmative and negative replies. In general, the answers showed the complexity of the task and did not generate a clear pattern that might have been an indication of the conventionality of the metaphors.

When this second attempt failed, I decided to adopt adult scoring, despite its limitation of being possibly different from the conventionality as perceived by children. I involved 16 Colombian native speaking teachers from one of the schools of the children who participated in the study. I faced one risk, in that I could not be sure that teachers would not use some of the sentences in their own lessons and that this might affect my research. Hence I first looked at the selected metaphors with the colleagues who participated in the selection and adjustment of the linguistic material. We concluded that the selection contained both conventional and non-conventional metaphors and this allowed me to perform the analysis on conventionality with the teachers

after completing the recognition and interpretation studies with the children.

The group of raters included teachers from different teaching areas (Spanish language, English language, mathematics, social science, natural science, etc.) and with different educational backgrounds, ranging from technical training to university degree (bachelor's degree). The teachers did the scoring individually in a group meeting in their school. They received an explanation about metaphor conventionality defined as the degree of use in a linguistic community (Cameron, 2003). It was stressed that metaphors become conventionalized because of the repeated use of the metaphorically used term: a metaphor starts as non-conventional and gradually may develop into highly conventional or even a dead metaphor.

Teachers were asked to score the degree of conventionality for each of the 56 metaphors that were used. Scores were given on a 7-point scale, which embodied the contrast between low conventionality (1) on the one extreme and a high degree of conventionality (7) on the other. I used this approach to accommodate the fact that metaphors may not be fully conventional or non-conventional, but somewhere in between. In the explanation of the task it was stressed that the conventionality referred to the metaphorically used term in the metaphorical expression, and not to the metaphorical sentence as a whole. To illustrate, teachers were told that, for example, in *Juan es mi sol* (*Juan is my sun*) the conventionality had to be estimated for the meaning of the sun, implied in metaphorical link *person-sun*, and not for the specific metaphorical sentence. The other example that was provided was *Camila vuela al trabajo cada día* (*Camila flies to her work every day*). In this case it was also mentioned that it is important not to consider the specific line, but to judge the conventionality of the idea of *to fly* as referring to the action of doing something in a hurry or of running away to somewhere.

Metaphors were presented in different orders to the raters. Half of the group was first given the metaphors from children literary texts, whereas the other half got the metaphors from science textbooks. Furthermore, all metaphors were presented in random order. Forms were checked immediately after completion and if this was needed, teachers were asked to complete the forms if they had missed a score. After the scoring assignment a brief discussion was held with the teachers about their experience with the test. Some interesting comments included that several teachers felt that scoring metaphors in science texts was harder than in literature, which they attributed to the

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fact that the linguistic material from literature is more common to them, as opposed to the science texts.

Inter-rater agreement was estimated for the conventionality scale of the metaphors, resulting in a Cronbach’s alpha of 0.84, indicating a good correlation in the scoring of the raters. The rating of the metaphors is shown in Tables 5.6, 5.7 and 5.8.

Table 5.6

Conventionality Rating of Nominal (A is B) Metaphors in Texts from Literature

Metaphor	Rating
- Las lagartijas son adoradoras del sol (Lizards are worshippers of the sun)	2.6
- La imagen del ave del paraíso era una bala que lo hería en lo más tierno del corazón (The image of the bird of paradise was a bullet that was hurting him in the softest spot in his heart)	2.6
- Sus cabellos que eran una bandada de chupaflores (her hair that was a flight of hummingbirds)	2.6
- Los cocuyos son reyes en la noche (The glow-worms are kings of the night)	2.7
- Las pinturas de Eusebio son una fiesta de colores (Eusebio’s paintings are a feast of colours)	3.1
- El río del valle es un gigantesco espejo que tiembla durante la noche (The river of the valley is a gigantic mirror that vibrates during the night)	3.2
- Las manos de Miguel José eran un par de mariposas (The hands of Miguel Jose were a pair of butterflies)	3.3
- Los cocuyos son hijos de las estrellas (The fireflies are children of the stars)	3.8
- Los ojos de la costurera eran pozos de azul profundo (The dressmaker’s eyes were deep blue pools)	3.8
- Sus miradas son dagas piratas (Their gazes are pirate daggers)	4.1
- ¡Nuestra casa es una isla! (Our house is an island!)	4.2
- Su corazón era una bolita de fuego (His heart was a ball of fire)	4.4
- El campo era una alfombra de mil verdes distintos, con rojos, lilas, morados, blancos y rosas (The field was a carpet in thousand tonnes of green, with red, purple, violet, white and rose)	4.7
- El sol es el mejor despertador del mundo (The sun is the best alarm-clock around the world)	5.1
- Su sonrisa era un arco iris (Her smile was a rainbow)	5.1
- Los objetos eran tesoros (The objects were treasures)	5.1
- Su voz era un regalo para los sentidos (Her voice was a gift for the senses)	5.6
- María era un ángel (Maria was an angel)	6.3
Mean	4.0

Table 5.7

Conventionality Rating of Verbal Metaphors in Texts from Literature

Metaphor	Rating
- [los últimos rayos del sol] teñían de púrpura las paredes de la torre ([The last beams of sunlight] were colouring the walls of the tower purple)	2.4
- Las golondrinas volvían a rasgar el azul del cielo con sus negras alas (The swallows returned to tear the blue sky with their black wings)	3.1
- Juana remendaba una vieja vela para tener luz en la noche (Juana was sewing an old candle to have light during the night)	3.1
- [el viento] me alborota la carta ([The wind] disturbs the letter)	3.2
- Un haz de sol que caminaba por su habitación (A beam of sunlight that was walking through her bedroom)	3.2
- Un rayo de sol avanzaba por la colcha (A beam of sunlight was advancing over the blanket)	3.3
- Los últimos rayos del sol incendiaban alguna nubecilla (The last beams of sunlight were setting some little cloud on fire)	3.4
- David lucha contra sus lágrimas (David fights with his tears)	4.6
- Los pájaros inundaban con sus trinos el ambiente (The birds flooded the environment with their warbles)	4.8
- [Tano] abrió sus ojos y paseó la mirada por su cuarto (Tano's [...] glance passed through the bedroom)	4.8
- Una duda se instaló en la cabeza de Anastasia (A doubt settled in the mind of Anastasia)	4.9
- Su carta había tocado el corazón de la costurera (His letter had touched the heart of the dressmaker)	5.1
- El viento se entra (The wind enters)	5.3
- La tempestad soplabla (The storm was blowing)	5.3
- Con el silencio, florecían mejor los pensamientos (<i>with the silence, the thoughts bloomed more</i>)	5.3
- Tocotoc tuvo una idea que le iluminó el rostro (Tocotoc had an idea that lighted his face)	5.3
- El silencio envolvió las calles y el campo (The silence enfolded the streets and the field)	5.5
- El viento rugía (The wind was roaring)	6.0
- Las lágrimas escaparon de sus ojos (The tears escaped from her eyes)	6.1
- El corazón que se le explotaba (His heart almost was bursting)	6.5
Mean	4.6

The tables indicate that conventionality is not a black-and-white issue, as the scores are by no means uniform. For my analysis I calculated the means and looked at the sets of data. I then made the choice to rank the metaphors with a score below the mean as less conventional and those with a score above the mean as more conventional.

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Table 5.8

Conventionality Rating of Nominal (A is B) Metaphors in Texts from Science

Metaphor	Rating
- El corazón es un depósito provisional (The heart is a provisional container)	2.6
- La vejiga urinaria es una bolsa de paredes musculosas (The urine bladder is a bag with muscular walls)	3.1
- Los pulmones son dos bolsas de consistencia esponjosa (The lungs are two spongy bags)	3.7
- Las plantas son sofisticados laboratorios vivientes (Plants are sophisticated living laboratories)	3.8
- La corteza terrestre es la cáscara de nuestro planeta (The earth's crust is the shell of our planet)	4.1
- La tos es el guardián de los pulmones (Coughing is the guardian of the lungs)	4.3
- ;Tu boca es un campo de batalla (Your mouth is a battlefield!)	4.4
- Las células de la piel estrechamente unidas, son una pared protectora natural entre el cuerpo y el medio ambiente (The cells of the skin are a natural protecting wall between the body and the environment)	4.5
- El vehículo encargado del transporte de sustancias es la sangre (The vehicle involved in transporting substances is the blood)	4.6
- [El hombre, cuenta con una compleja red de tuberías que transporta la sangre] Esas tuberías son las arterias, venas y capilares (These tubes are the arteries, veins and capillaries)	4.6
- La circulación de la sangre en el hombre se realiza por medio del aparato circulatorio que es un conjunto de caminos o vías (The circulatory system is a combination of paths or roads)	4.8
- Las mitocondrias son las fábricas de energía en todos los seres vivos (The mitochondria are the factories of energy in all living beings)	4.8
- La red de ríos, lagos y océanos es el sistema circulatorio de la Tierra (The network of rivers, lakes and oceans is the circulatory system of the earth)	4.9
- De allí pasan al corazón que es una bomba que no se cansa de impulsarlas (From there [the blood cells] go to the heart that is a pump that does not stop pushing them)	5.0
- Algunas veces una herida puede ser la puerta de entrada de estos materiales (Sometimes a wound can be the entry door for these materials)	5.0
- Los riñones son unos filtros, a donde llega una arteria con sustancias de desecho (The kidneys are filters, where an artery comes with waste)	5.1
- Los azúcares son el combustible que la célula quema para obtener energía (Sugars are the fuel which the cell burns to obtain energy)	5.4
- El combustible para que nuestro cuerpo funcione y podamos realizar todo lo que nos proponíamos son los alimentos (The fuel that makes our body function is our food)	6.2
Mean	4.5

With this approach I labelled nine nominal (*A is B*) metaphors in literary texts as less conventional and nine as more conventional metaphors. In the same texts I found 8 verbal metaphors to be less conventional and 12 to be more conventional.

In science texts there were eight less conventional and ten more conventional nominal (*A is B*) metaphors. An alternative would have been to use 4.0, the middle value of the scale, as a cut-off point. This would have made no difference for nominal (*A is B*) metaphors in literary text and would have shifted one verbal metaphor to being more conventional. Only in the case of the nominal (*A is B*) metaphors in science texts would the effect have been stronger, with another four metaphors then being classed as more conventional. It is also important to note that the score of a few metaphors is close to the mean, implying that their conventionality is not that distinct, whereas other metaphors are ranked more clearly as either more conventional or less conventional. I will therefore pay special attention to the results obtained with the highest and lowest ranking metaphors.

5.3.2 Conclusion about the research materials

From the sample of 34 books, ten text fragments of ten children's literary books and eight text fragments from seven science textbooks were selected in consultation with two colleagues, both with a pedagogical background and knowledge about texts. Although it proved possible to find a good variety of reasonably short texts, still several of them needed some adjustments, including shortening without losing coherence. A more important adjustment was the addition of eight nominal (*A is B*) metaphors and two verbal metaphors to the literary texts to ensure having enough nominal and verbal metaphors in the text fragments to allow for statistical comparison. For science texts the situation was even more complex, as we had several fragments with a sufficient number of *A is B* metaphors but just a few verbal metaphors. Therefore, instead of trying to include a larger number and a wider variety of verbal metaphors, the decision was taken to concentrate just on nominal (*A is B*) metaphors.

To establish the conventionality of the metaphors I tested two methods with children, as I was keen to establish conventionality from a child's perspective. My first approach was to use a repetition task, but this proved unsuccessful, as older children had no problems with any of

the metaphors that were tested. I then proceeded with a second trial, asking children if and where they had heard a specific metaphor. This test was also unsuccessful, as it generated very creative but less plausible answers.

After these two unsuccessful approaches I turned to adult rating of conventionality, asking 16 teachers from the schools to rank each metaphor on a scale of seven. The result had a Cronbach's alpha of 0.84, indicating a good correlation in the scoring of the raters. The rating showed quite a variation in conventionality, ranging on the one extreme a score of 2.1 for the 'least conventional metaphor' and 6.5 for the 'most conventional metaphor'. In most cases the distribution was not black-and-white, and several metaphors were closer to the mean than to the extreme, but the inter-rater agreement was very good. Hence I split the metaphors in two groups of respectively less and more conventionalized metaphors.

The linguistic material that resulted from the analysis of the texts and metaphors presented in this section was used in the two behavioural studies with children that are reported in Chapters 6 and 7.

5.4 Overview and explanation of reviewed books

In this section I present some information about the reviewed children literature (Table 5.9) and the science texts (Table 5.10)

Table 5.9

Overview of Children Literature Used in the Thesis

#	Title, author, year, pages	Topic and characteristics
1	Aventuras de una nariz. Viviane Schwarz (Germany); (translation: Alejandro Pérez Viza); 2002; 26p	T: Desperate and personal search to gain self-esteem: to find the right place to fit and to belong. C: Powerful Illustrations and page design that centre around the main character in the story (for instance the page with information about author, illustrator, editorial, etc. resembles a face).
2	Clemencia, la vaca que quería ser blanca. Verónica Linares (Bolivia), 2003; 56p	T: Low self-esteem and self-image leading to seeking advice from others to try to change the physical appearance. C: Illustrations per page that portray each character and situation.

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|----|--|---|
| 3 | Como aprendí a montar a caballo. In: La ratoncita-niña y otros cuentos. Leon Tolstoi (Russia); (translation: Luz Amorocho); 1997; 7p | T: The courage and determination to achieve a goal despite the obstacles.
C: Only one illustration; first-person narrator. |
| 4 | El barbero y el coronel. Ana María Machado. (Brazil); (translation: Juan Fernando Esguerra); 1999; 48p | T: The triumph of intelligence and ingenuity over force and power.
C: Colourfully illustrated. Funny story with presence of string of words that repeats the previous sentences ('retahíla'). |
| 5 | El camisón bordado. Ana Balzola (Spain); 1982; 28p | T: The reward for being nice and kind-hearted.
C: Fairy tale. Fully illustrated. |
| 6 | El león que escribía cartas de amor. Triunfo Arciniegas (Colombia); 1989; 32p | T: Madness as an element of romantic love as well as self-destruction and destruction of the other related feelings of unanswered love.
C: Illustrated; characters are animals full of human features. |
| 7 | El valle de los Cocuyos. Gloria Cecilia Díaz (Colombia); 1986; 127p | T: The value of recovering and preserving personal history to learn about one's origin and construct identity.
C: Few illustrations; engaging narrative recreated in a fantasy setting. |
| 8 | Garabato. Historias de Eusebio III. Ivar Da Coll (Colombia); 1990; 32p | T: An unexpected positive result in spite of unreliable promises.
C: A funny story fully illustrated. |
| 9 | La botella azul. Gloria Cecilia Díaz (Colombia); 2002; 48p | T: The power of the friendship to face and overcome frustration, loss and pain
C: A touching and beautiful illustrated story. |
| 10 | La escuela vuela. Eveline Hasler (Switzerland); (translation: Ana Garalón); 1997; 38p | T: The discovery of the importance to enjoy and appreciate what life has to offer, through experiencing new, exciting but also difficult situations.
C: Illustrated story with some elements of fantasy. |
| 11 | La estrella que le perdió el miedo a la noche. Pilar Lozano (Colombia); 2002; 36p | T: The encouragement and mutual support to face and overcome a shared feeling: fear.
C: Elements of fantasy. Fully illustrated. |
| 12 | La gente pobre. In: La ratoncita-niña y otros cuentos. Leon Tolstoi (Russia); (translation: Luz Amorocho); 1997; 8p | T: Generosity and solidarity in spite of limited economical resources.
C: Only one illustration. |
| 13 | La princesa y el pirata. Alfredo Gómez Cerda (Spain); 1995; 32p | T: Audacity to decide to follow one's own wish, contrary to the usual expectation of most people.
C: A beautifully illustrated story; the plot is connected to other traditional children stories. |

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- 14 La venganza de la trenza. Graciela Montes (Argentina);1998; 28p
T: The enjoyment and satisfaction generated when seeing that a powerful person receives 'a taste of their own medicine'.
C: Fantastical and humorous. Graphic illustrations that portray the plot of the story very well.
- 15 Las golosinas secretas. Juan Villoro (Mexico);1998; 40p
T: Jealousy and envy that are faced up with magic sweets and love.
C: Illustrated, elements of fantasy. Presence of colloquial language from Mexico, some comments about local situations, and a touch of irony in relation to the USA.
- 16 Minka. María Seidemann (Germany); (translation: Ana Garralón); 1997; 40p
T: Development and strengthening of a friendship by showing concern and solidarity.
C: Few illustrations along seven chapters.
- 17 No te rías, Pepe. Keiko Kasza (Japan); (translation: Cristina Aparicio); 1997; 30p
T: Value of laughter, happiness, and spontaneity, and the richness of learning from each other.
C: Fully illustrated. A lovely, sweet, and at the end, funny story.
- 18 Tano en la frontera del tiempo. Fernando Alonso (Spain);1989; 159p
T: Freedom, the value of nature, and the fight for happiness.
C: There are several colloquial expressions commonly used in Spain. This story is part of a collection of five books where the main character, Tano grows up and matures.
- 19 Tocatoc. El cartero enamorado. Clarisa Ruiz (Colombia);1998; 56p
T: Shyness, tenderness, and the development of a romantic love.
C: Lovely story fully illustrated. Presence of wordplay and puns.
- 20 Turbel, el viento que se disfrazó de brisa. Pilar Lozano (Colombia); 2001; 40p
T: The discovery and enjoyment of new experiences by learning how to be patient and calm.
C: Illustrations focused on the main character that help understand his features and the plot of the story.

Notes: T (Topic): Main subject of the story or text; C (Characteristics): Main features in terms of general presentation of the story or text

Table 5.10

Overview of Science Texts Used in the Thesis

#	Title, author, year, pages	Topic and characteristics
1	Bajo las olas. Kristin Joy Pratt (USA); (translation: Alma Flor Ada); 1995; 44p	T: Marine animals C: Content presented in an alphabet format. Beautifully illustrated.
2	Conciencia 6. Ciencias Naturales y Educación Ambiental - Básica Secundaria. Martha Patricia Acevedo Trujillo et al.; (Colombia 2003); 231p	T: Living beings and aquatic ecosystems; chemical elements; energy, forces and machines; the Earth and the solar system. C: Each chapter starts with an exercise to explore previous knowledge and closes with suggestions to test the competences (“laboratory” of scientific abilities)
3	Cosmos 4. Ciencias Naturales y Educación para la salud. Jorge Ibarra Montenegro (Colombia); 1997; 216p	T: The human body; living beings; ecosystems; the environment, the matter; food; natural resources. C: Sections in each chapter guide the learning activities (e.g. “creative application”, “evaluation”, “to predict”, “express your ideas”).
4	Cosmos 5. Ciencias Naturales y Educación para la salud. Diana Lineth Parga Lozano (Colombia); 1997; 219p	T: The human body; living beings; the environment and its protection; matter, energy and change; science, technology and society. C: In addition to content, each chapter includes a glossary, learning activities, and questions to evaluate the topics.
5	Descubre los insectos. David Suzuki (Canada); (translation: Irene Amador); 2003; 95p	T: The insect and its characteristics. C: Combination of content with several simple experiments to better understand the life of insects.
6	Diego y Valentina... descubren la ciencia. Helmer Pardo Pineda (Colombia); 2000; 112p	T: Energy, electricity, rain, molecules, earthquake. C: The information is offered mainly through experiments presented in sequence through illustrated dialogues between two children (Diego and Valentina) and mostly with their grandfather. The experiments are carried out with elements available at home. Presence of Colombian colloquial language.
7	El color de las aves en el paisaje de las microcuencas. Giovanni Cárdenas, Adriana Giraldo, Duberney Ortega (Colombia); 2003; 20p	T: The biodiversity in the Valle del Cauca (Colombia), stressing its importance and providing a description of the birds in that area. C: The information comes from research projects in a village in the target region of the book.
8	El legado del Apolo. Pablo Cuartas Restrepo (Colombia); 2005; 33p	T: Mankind’s journey to the moon. The ‘Apollo’ missions C: Includes pictures of satellites and space crafts sent to the space, some of the astronauts, the surface of the moon, etc., and also a glossary.

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- 9 La respiración (Serie: T: Respiration in living beings.
Fenómenos Naturales). Luci C: Content information is complemented with
Cruz Wilson (Mexico); 2000; questions and proposals to think about and
35p explore a particular situation or phenomenon
related to the topic. Includes a closing summary
that also stresses the role and importance of
plants for human respiration.
- 10 La Tierra ¡Qué pasada de T: The Earth and its characteristics.
planeta! Javier Lascurain C: Includes several sections related to the topic: a
(Spain); 2002; 95p story; a set of questions and answers and
curiosities; games (cross word and tests).
Sometimes use of colloquial language from Spain.
- 11 Los temblores (Serie: T: Earthquakes
Fenómenos Naturales). C: Includes historical information of the main
Juan Tonda (Mexico);1995; earthquakes that have occurred in the world and
34p instructions in case of emergency with an
earthquake. The closing section indicates explicit
expectations about the learning related to the
nature of the earthquakes and the behaviour in
case of experiencing this natural phenomenon.
- 12 Proyectos Fascinantes. T: Sound and its characteristics
Sonido. Bobbi Searle (USA); C: Presence of technical but simple vocabulary.
(translation: Diana Includes several experiments to help to
Esperanza Gómez); 2005; understand the topic.
48p
- 13 Tu cuerpo (Vol. 5 colección: T: The different parts of the human body and
El mundo de los niños); related issues (e.g., bones, muscles, brain, teeth,
Salvat Barcelona illness, thoughts, and feelings).
(Spain),1987;159p C: The descriptions and explanations of the
functioning of different parts of the body usually
include recommendations or advice to get better
(for instance, in case of illness) or to face
situations that put the welfare at risk.
- 14 Vida y Naturaleza 5. Doris T: The natural world; the structure of matter; the
Amanda Espitia de González Earth; the energy.
et al., (Colombia); 1993; C: Each chapter includes different subtitles that
176p suggest what needs to be carried out by the
students (e.g. "to reflect", "to comment with your
friends", "[I] read and comment", etc.). The book
includes a concluding section and a glossary.

Notes: T (Topic): Main subject of the story or text; C (Characteristics): Main features in terms of general presentation of the story or text.

6. Explicit recognition of metaphors

6.1 Introduction

In Chapters 3 and 4 I have discussed different aspects of children and metaphors that may influence their recognition and interpretation of metaphors. I have shown that during the school-age period important changes occur in child development that result in improved linguistic and metalinguistic skills, which in turn may have a positive effect on the child's capacity to deal with metaphors. This is confirmed by metaphor research with children reported in Chapter 2, which shows better interpretation of metaphor by older children. Child development, however, is not uniform, and differences exist between children of the same age. I have posited that reading comprehension may be a good indicator to establish differences in language development among children which suggests that we should explore the relationship between reading comprehension, school grade and the recognition and interpretation of metaphor. Chapter 5 demonstrates that considerable differences do indeed exist in reading comprehension levels between children of the same school grade. This analysis allowed me to select four groups of children for further study, two from 4th grade and two from 6th grade with low and higher reading comprehension levels respectively. These are the groups whose recognition and interpretation of metaphor I have examined in the research that is reported here.

I have also discussed that according to the new contemporary theory metaphor varies in three dimensions: linguistic, conceptual, and communicative (Steen 2011a). This makes it essential to look beyond child-related factors and to also investigate the influence of metaphor-related aspects when exploring the recognition and interpretation of metaphors by children. To be able to take these aspects into account I made an analysis, as reported in Chapter 5, of the presence of nominal (*A is B*) and verbal metaphors in 34 literature and science texts that children can access in their school. I used this study to establish the linguistic materials for my empirical studies on metaphor recognition and interpretation, as reported in this chapter and the next.

In this chapter I present a metaphor recognition study which looks at the influence of school grade, reading comprehension level, linguistic form, conventionality, and discourse domain on the recognition of

nominal (*A is B*) and verbal metaphors by addressing the following five research questions:

- (1) What is the influence of grade on explicit metaphor recognition?
- (2) What is the influence of reading comprehension on explicit metaphor recognition?
- (3) What is the influence of linguistic form on explicit metaphor recognition?
- (4) What is the influence of metaphor conventionality on explicit metaphor recognition?
- (5) What is the influence of domain of discourse on explicit metaphor recognition?

Exploring explicit metaphor recognition is challenging, as few experimental studies have addressed this issue with adults (Graesser et al., 1988; Steen, 1994; Steen, 2004) and even fewer with children (Cameron, 2003; Groot et al., 1995). To my knowledge, as mentioned in section 3.2, Groot et al. (1995) is the first study on elicited metaphor recognition by children that stresses the difference between identifying the intended meaning and recognizing a metaphor as a metaphor. Their research involves short stories developed for the study, where the metaphorically used words are put in the last line and contrast sharply with the story. Results showed that some 56% of 6- and 7-year-old children were able to recognize metaphors. Although my participants are older, it is still possible that they will obtain lower scores, because it is likely that the contrast generated between the story and the final metaphorical sentence in the Groot et al. study boosted children's metaphor awareness. In several cases in my research this contrast may be less noticeable because of the conventionality and the linguistic form of the metaphors, but also because the metaphors are not located at the end of a contrasting context, but rather occur anywhere in the fragments from children's literature or science textbooks.

Cameron (2003) explored metaphor recognition with two children (9 and 10 years old) based on the analysis of their interactive and collaborative process of talking-and-thinking while they read and discussed two different texts. An attractive aspect of Cameron's methodology is that she used linguistic materials from the school and a child-friendly research approach that closely resembled every day student practices, which I also tried to adopt. She is also innovative in

looking at what happens with verbal and nominal metaphors in written text, and found that the two children involved in her study were better at noticing and discussing the latter.

Based on the information presented in the previous chapters I anticipate that my research will show that children with higher reading comprehension levels will be better at metaphor recognition, as they have a more advanced lexicon, more metalinguistic skills, and will be better at using contextual information. I also expect that children from 6th grade will recognize more metaphors than 4th graders, as in principle they have had more exposure to written language and education, but their metaphor recognition may also vary, taking into account the difference in reading comprehension levels within each school grade.

In terms of the influence of metaphor properties I expect that nominal (*A is B*) metaphors will be better recognized than verbal metaphors, because it seems likely that metaphorical use may be more noticeable when the source and target domain are presented directly by nouns, as pointed out in some publications (Cameron, 1996, 2003; Goatly, 1997; Steen, 2004), although statistical evidence is not available to support this. Novel metaphors may stand out more than conventional metaphors, but this effect may be more limited, as some conventional metaphors may be well recognized if they are used deliberately (Steen, 2008, 2011a).

Steen (1994, 2004) posits that even the indication of the domain of discourse may affect recognition. He (1994) found that the same text presented as literary text stimulated adult readers to pay more attention to metaphors than when it was presented as a journalistic text. The presentation as literary text resulted in a greater number of metaphors being recognized. Based on Steen (1994) and also on Gentner's (1982a) discussion of differences between metaphors in literature and science, it is my expectation that metaphors from children's literary books will be recognized more frequently than those from science textbooks. I anticipate that children reading literature will be more alerted to metaphor and may also perceive more of them as literary metaphors ("expressive metaphors"), which, according to Gentner, are typically richer and more easily appreciated than scientific analogies ("explanatory metaphors"), which are more likely to have higher presence in science texts.

For metaphor recognition I decided to adopt an underlining procedure, as used by Steen (2004), as this is a type of task that is quite familiar to schoolchildren. I tested the approach in a pilot study with a

group of twelve children, six from 3rd grade and six from 5th grade from one of the schools. Following Steen's (2004) approach I first explained the underlining task. However, taking into account that I worked with relatively young children, I did not give a theory of metaphors and did not even use the word 'metaphor' in the explanation. Instead, I presented a number of examples of more and less conventionalized metaphors to illustrate the difference between the metaphorical meaning of a word in a given context and a more basic meaning of that word in another context.

In the pilot study children were not only asked to underline, but also to provide the reason(s) for their underlining. These explanations showed that an important motivation for underlining was their lack of knowledge about the meanings of some words. In fact, children in the pilot test underlined a considerably larger number of unknown words than metaphorically used words. To reduce this interference I needed to adjust the approach and decided to introduce a preparatory step in which I asked children to underline unknown words. This had several advantages. The task of underlining unknown words is relatively easy for children and is common in language lessons. This first task also allowed me to better introduce the second step, where the children were asked to underline words that were used in a different way (metaphors). In this second introduction I could stress that this was a different assignment which was not about unknown meanings. Another advantage was that the meaning of several of the unknown words could be discussed, which may have contributed to children obtaining some additional knowledge about several words and to reflect on their comprehension of some meanings. This, in turn, may have helped them to obtain a better understanding of the text fragments, which is needed to be able to identify the source domain words that refer to issues different from what the text itself is about (target domain).

This two-step approach proved a vast improvement over the initial one-step approach. Although words unrelated to metaphors were still underlined in the recognition task (second step), their number was much lower than in the pilot test. This change of approach had the advantage that it generated separate data on the underlining of unknown words in the first step and that it then helped children to focus on metaphor recognition in the second task. The new approach allowed me to add the issue of unknown words to my research to explore whether the complex process of lexical development that extends over years and leads to an increased vocabulary (Dockrell & Messer, 2004) is reflected in the level of

reading comprehension. It may be expected that readers with higher reading comprehension level will underline fewer unknown words, and the same applies to children from 6th grade in comparison with 4th graders. I therefore added this analysis as an objective to my research and formulated the following additional research questions related to unknown words:

- (1) What is the effect of grade on the underlining of unknown words?
- (2) What is the influence of reading comprehension on the underlining of unknown words?
- (3) What is the difference in underlining unknown words in literary and scientific texts by children from 6th grade?

I will now turn to the description of my research method, where I will explain the approach followed for both the exploration of unknown words and metaphor recognition, and then present and discuss my results.

6.2 Method

Materials

The experimental materials used in the study included ten fragments from children's literary books comprising a total of 1599 words (range per text: 84 – 304) and eight fragments from science textbooks comprising 1313 words (range per text: 59 – 346), as explained in sections 5.3 and 5.3.1 (Chapter 5). The ten fragments from literature included 18 nominal (*A is B*) metaphorical sentences, nine being classified as conventional and nine as non-conventional (Table 5.6). These texts also contained 20 verbal metaphorical sentences, including 12 that were scored as conventional (Table 5.7). The eight fragments from science texts with 18 nominal (*A is B*) metaphors included ten that were established as conventional and eight as non-conventional (Table 5.8). As discussed in Chapter 5, I made some adjustments to some of the texts I selected for my research and added a few verbal metaphors. The pilot testing showed, however, that the task was too long for several children. Some of the longer texts were consequently shortened without losing the essence of the stories, while one story with only one metaphor was

even deleted, as this metaphor could easily be included in one of the other texts.

Participants

As explained in section 5.1, I selected four groups of participants, two from 4th grade with low and high reading comprehension levels respectively, and two from 6th grade with the same characteristics. Children were asked if they wanted to participate, and this worked well, with the exception that in 6th grade three children with a higher reading comprehension level initially were not allowed to participate by their parents. Therefore we approached three other children, but the first three returned later, having talked to their parents and received permission, and turned out to be really keen to take part in the sessions. This increased the number of participants to 33. We started with 30 poor readers from 6th grade, but 4 children only participated in the first session of underlining unknown words and did not want to proceed, because they did not want to miss their lessons after all.

In 4th grade we decided to limit the number of participants to 40, as we anticipated that it would be important to work in smaller groups with these younger children. Fortunately, only one child dropped out. He started with the underlining task of unknown words, but did not proceed because his mother withdrew her approval and could not be convinced to change her opinion, as she did not want her child to miss his lessons.

The sample that eventually completed the recognition study therefore looked as follows: For metaphor recognition in children's literary books we had 39 children from 4th grade aged 9;3 (minimum 8;1 to maximum 10;6) and 59 children from 6th grade aged 11;7 (minimum 10;6 to maximum 14;6). The total of 98 children included 48 girls and 50 boys. In view of the difference in science texts used for the two school grades as explained in Chapter 5, and the specific knowledge required for the comprehension of these texts, only the group of 59 children from 6th grade participated in the task of metaphor recognition in the science texts. All participants were native speakers of Colombian Spanish.

Table 6.1 shows the reading comprehension levels. The difference between the two groups for 4th grade using a one-way ANOVA is statistically significant ($F(1,38) = 143.88, p < .000, r = 0.89$). The same applies for the two groups in 6th grade using the same test ($F(1,58) = 224.30, p < .000, r = 0.76$), which suggests that the two groups suit the purpose of my research.

Table 6.1

Reading Comprehension Levels of the Research Groups

Grade	RC level	Mean (SD)
4th (n = 39)	low (n = 20)	4.15 (1.04)
	high (n = 19)	16.05 (2.07)
	Total	9.95 (6.24)
6th (n = 59)	low (n = 26)	9.62 (3.37)
	high (n = 33)	22.67 (3.28)
	Total	16.92 (7.32)

Note: Means in percentages with Standard Deviation (SD) in brackets

Design

As mentioned before, I designed two separate tasks for the children, one related to the underlining of unknown words and the other concerning the underlining of metaphors, which I introduced as “words that express a different meaning of what the text is about”. The children of 4th grade only did the assignments only for literature texts, whereas the 6th graders also did them for science texts. I will discuss these tasks separately below.

Design of task 1: Underlining unknown words

The unit of analysis in this task was the percentage of words underlined by children in the fragments. In texts from literature I analysed the influence of grade and reading comprehension (independent variables) (Table 6.2). For this analysis I used a two-way ANOVA with reading comprehension (low or high) and grade (4th or 6th) as between-subject factors. In a different analysis I compared the underlining of unknown words in literary and science texts by 6th graders. There I used a two-way mixed ANOVA with reading comprehension (low or high) as between-subject factor and domain of discourse (science and literature) as within-subject factor (Table 6.2).

Table 6.2

Variables in the Analysis of Underlined Unknown Words (Task 1)

Analysis	Independent variables		
	Domain of discourse	School grade	Reading Comprehension
1	Literature	4th and 6th	Low and high
2	Literature and science	6th	Low and high

Design of task 2: Underlining metaphorically used words

The unit of analysis in this task was the focus term underlined by children in the fragments of the texts from literature (both grades) and science (6th grade only). A positive score was given for metaphor recognition when the focus term was underlined (alone or in combination with other words from the metaphorical sentence) (see Figure 6.1). The counts were registered per child, but also per metaphor, to be able to analyse possible differences in recognition between metaphors.

Underlined words were checked and counted separately by a research assistant and the researcher who independently decided on the positive recognition and on the number of words belonging to metaphors and the other underlined words. Each of the researchers had a master copy with the underlined metaphorical sentences, which included a double underlining of the focus term to facilitate counting.

1	Los pájaros <u>inundaban</u> con sus trinos el ambiente (The birds flooded the environment with their warbles)
2	con el silencio, <u>floreçían mejor los pensamientos</u> (with the silence, the thoughts bloomed more)
3	El <u>vehículo</u> encargado del transporte de sustancias es la sangre (The vehicle involved in transporting substances is the blood)
4	¡Tu boca es <u>un campo de batalla!</u> (Your mouth is a battlefield!)
5	¡Tu boca es <u>un campo de batalla!</u> (Your mouth is a battlefield!)

Figure 6.1 Some Examples of Metaphor Underlining

For the analysis of the results with children’s literary texts and 4th and 6th graders I used a four-way mixed ANOVA with two between-subject factors (reading comprehension and grade) and two within-subject factors (linguistic form and conventionality) (first row in Table 6.3).

To examine the performance of 6th graders in metaphor recognition in texts from literature and science I used a three-way mixed ANOVA with reading comprehension as the only between-subject factor and domain of discourse and conventionality as within-subject factors (second row in Table 6.3). For both analyses the dependent variable was the number of underlined metaphors (focus term).

For the statistical analysis it can be argued that both the children and the metaphors should not be taken as fixed but as random variables. It has been pointed out, among others, by Clark (1973), but has also been stressed by Mulder (2008) that this aspect is not sufficiently taken into

account by many language researchers. In his widely quoted article on the language-as-fixed-effect fallacy Clark (1973) shows that standard ANOVA is not able to cope with this issue, and may hence provide statistical results that are biased. The way to deal with this is to do separate F analyses by collapsing the database for the children and the metaphors respectively. The F_1 resulting from the first analysis indicates what would happen roughly if the same set of metaphors were given to another sample of 98 children of 4th and 6th grade with high and low levels of reading comprehension. If these results are statistically relevant, then they are not only relevant for the group that is tested, but also for the group from which the children were drawn. The F_2 resulting from the second analysis of 38 metaphors indicates what would happen if the original group of 98 children were given a random set of metaphors with the same characteristics in terms of linguistic form and conventionality.

Table 6.3

Variables in the Analysis of the Underlining of Metaphors (task 2)

Analysis	Independent variables				
	Domain of discourse	School grade	Reading Comprehension	Linguistic form	Conventionality
1	Literature	4th and 6th	Low and high	Nominal (A is B) Verbal	Conv. Non-conv.
2	Literature and science	6th	Low and high	Nominal (A is B)	Conv. Non-Conv.

To go beyond these partial generalizations Clark (1973) and others suggest a solution by introducing a quasi F ratio (F') and using the minimum value of F' (min F'). I have adopted this approach and have calculated the min F' value for the variables that gave significant results in the separate F_1 and F_2 analysis. With help of the critical F value calculator I then assessed the significance (p) of the min F' . Taking into account, however, that I am only doing an experiment with a limited number of children and metaphors, which may vary in other aspects, such as their deliberateness, I will critically review my statistical findings and discuss whether they are in line with my interpretation of theory, as the min F' may be too conservative.

Procedure

As mentioned in the introduction to this section, the recognition study was carried out in two steps: (1) underlining of unknown words and (2) underlining of metaphorically used words. We invited two children

(one girl and one boy from 4th and 6th grade respectively) who participated in the pilot study to talk about their experience to the group of children selected for the study. The two children told the group that they enjoyed taking part in the readings and assignments and commented that they realized that people learn more when reading a text several times. Particularly the boy encouraged the group to participate in the sessions and stressed that a nice part of the work with our team was that “it allows you to think, you can express your ideas and it does not matter whether you make mistakes”.

The recognition test was started by providing the texts from literature in random order to participants. Thereafter the science fragments were given to children from 6th grade only in separate sessions, as it was anticipated that comprehension of these texts would require specific knowledge of some topics that are not included in the curriculum for 4th graders.

Children received the materials and were allowed to take as long as they needed, after which they left to return to their normal class. To reduce the possible pressure on children that had not yet finished the assignment when others were leaving, I divided the group of 4th grade into two, as it was expected that children with low reading comprehension levels would be slower readers, and therefore might take longer to complete the underlining tasks. For children from 6th grade this proved more difficult, as their availability depended on their lesson schedule, which included more compulsory classes, making it more complex to fit in the sessions for the experimental studies. Therefore, this approach only worked for 4th graders, and indeed proved to be practical, as the group with lower reading comprehension level took approximately ten minutes longer to complete the task. Hence, by working in two groups the low comprehension readers faced less pressure from better readers already leaving after completing their underlinings. Still, it implies that poor readers in 4th grade had a bit more time to complete the test, which may be a confounding factor that I will return to in the discussion in section 8.2.2.

Procedure for task 1: Underlining unknown words

Children were told that the overall idea was to better comprehend a number of text fragments. Therefore they would start with the identification of unknown words in order to give them the opportunity to discuss and learn some new meanings. To circumvent the possible

attitude of some children that they did not want to show any lack of knowledge, it was stressed that this was not an examination or contest, but rather an activity to focus on those words that they did not know, and to discuss these words later on with the group so that they would understand those meanings better. In this way children were encouraged to freely underline words that they did not know.

Children received the text fragments one by one in a random order. In the case of literary texts two sessions were organized with five text fragments per session, and in the case of science texts it proved possible to do all eight fragments in one session. Children were asked to underline the unknown words in each text and were allowed to leave, after completing the underlining task, to return to their normal class without waiting for others.

Results were analysed for each grade and words that were most frequently underlined as unknown were identified. In four group sessions (two for 4th and two for 6th grade) these unknown words were written on the blackboard and discussed with the children. It was anticipated that the meetings about meanings would be richer with the participation of poor and good readers from the same school grade in the same sessions, as good readers could promote the discussion. Therefore the groups were mixed and this did indeed result in a good exchange of ideas. In many of the cases of the literary texts, children among themselves managed to find the word meaning by considering the context more carefully. As a result, only a few words needed to be explained by the researcher. For the science texts, which included a considerable number of technical terms, more explanation was needed.

Procedure for task 2: Underlining metaphorically used words

A number of examples were used one by one to explain the recognition task. These examples included sentences from literary discourse containing nominal (*A is B*) and verbal metaphors, as well as less and more conventionalized metaphors (Figure 6.2).

The following procedure was used for each of the examples (*gold, magnet, to fly, to dance*) (*oro, imán, volar, danzar*) to promote reflection about meanings and different uses of a word. First the children were asked about the meaning of each word (“Let’s think what is ...?”) and their answers were written on the blackboard in the classroom. Thereafter, they were first shown a sentence with the word used in its basic meaning and the children were asked for an explanation. Their

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answers were basically similar to the initial answers already on the blackboard. Subsequently, they were shown another example, where the same word was used metaphorically and were asked to explain the meaning.

<p>‘I have a golden ring’ (Tengo un anillo de oro) ‘Time is golden’ (El tiempo es oro) (nominal (A is B), conventional) ‘Yesterday we carried out an experiment with a magnet’ (Ayer hicimos un experimento con un imán) ‘Her smile is a magnet’ (su sonrisa es un imán) (nominal (A is B), novel) ‘The bird flies’ (El pájaro vuela) ‘Time flies’ (El tiempo vuela) (verbal, conventional) ‘I saw her dancing in the concert with great elegance’ (En el concierto vi que ella danzaba con mucha elegancia) ‘The light danced over the water’ (la luz danzaba sobre el agua) (verbal, novel)</p>

Figure 6.2 Examples Used in Explaining the Metaphor Underlining Assignment

The next step was to encourage the children to think about the difference in the meanings between the uses in both sentences (more basic and metaphorical) by posing the questions “do you find any difference in the meaning between the two sentences?” This resulted in answers where children indeed expressed the differences in the meanings in the two sentences. An example is the reflection about *I have a golden ring* and *time is gold*: “these are different; the second [referring to the metaphorical] differs from metal and jewellery, it means you should not waste time” (“Son diferentes, en la segunda es diferente de metal y joyas, es que no hay que desperdiciar el tiempo”). “This belongs to another meaning, for example that time is precious, and you have to use it well” (“Ésta pertenece a otro significado, por ejemplo el tiempo es valioso, que uno debe aprovecharlo”). “This word has changed [referring to the word in the metaphorical context]; it does not mean that time is made of gold, but that you have to use it well” (“Esa palabra ya no es la misma [la utilizada en el contexto metafórico], no dice que el tiempo sea de oro sino que el tiempo hay que aprovecharlo”).

After the discussion of the examples children were asked to perform the task: “Now everyone will receive one by one a number of texts, and has to underline the words that express a different meaning of what the text is about, as explained in the examples”. It was stressed that the task was different from the previous one by stating that: “you do not have to underline unknown words because this has already been done and we have already discussed and explained the meanings of

those words”. Clarification was reinforced by asking the children to tell to their peers what they had understood they had to do. Several of them gave good explanations to their classmates: “we are going to look for some different words, words that have a different meaning” (“vamos a buscar unas palabras diferentes, que tienen un significado diferente”); “we are going to underline sentences that ... let’s say that in the story are used for other issues” (“subrayar las frases que digamos que en la historia se utilizan para otras cosas”); “to look for words that may have another meaning” (“buscar palabras que pueden tener otro significado”). When needed additional instruction was provided.

As in the first step of the recognition task (unknown words), children were told that they were free to proceed with their underlining task at their own speed and when the task was done, they could return to their class.

6.3 Results

This section presents the results of the two tasks (underlining unknown words and underlining metaphors) performed by the children. The children’s underlinings in both tasks (unknown words and metaphor recognition) were checked and scored in parallel by a research assistant and the researcher. Their scores were then cross-checked by means of comparison. Very few differences were found, and these differences could easily be sorted out by going back to the original material.

Results from Task 1: Underlining unknown words

Out of the total of 1599 words in the ten texts from literature, children underlined eight unknown words on average (0.50% of the total number of words). For the somewhat shorter eight science texts comprising 1313 words, performance level was very similar, with on average seven underlined unknown words for the 6th graders. Underlined words in the literary texts included difficult terms, such as *daggers*, *hummingbirds*, *marchioness*, *beam*, and also strange names of some of the characters in the stories, such as *Tano*, *Eusebio* and *Eulalia*, which were not familiar to the children. In the science texts some unknown words were: *tartar*, *mitochondrion*, *seismologist*, *ecosystem* and *reefs*. The results of the underlining in the literary and science texts are presented in Table 6.4, showing the means and standard deviations for

the two school grades, the levels of reading comprehension and the combinations of these two factors for the literary texts.

Table 6.4

Underlined Unknown words (%) in Literature and Science by Grade and RC Level

Grade	RC	Literature	Science
4th (n=39)	low (n=20)	0.63 (0.61)	
	high (n=19)	0.33 (0.32)	
	total	0.48 (0.50)	
6th (n=59)	low (n=26)	0.67 (0.73)	0.69 (0.92)
	high (n=33)	0.38 (0.39)	0.35 (0.42)
	total	0.51 (0.58)	0.50 (0.70)
Total (n=98)	low (n=46)	0.65 (0.67)	
	high (n=52)	0.36 (0.37)	
	total	0.50 (0.55)	

Note: Means in percentages with Standard Deviation (SD) in brackets

For the analysis of underlined unknown words in literature and in science I used a two-way ANOVA with two between-subject factors: reading comprehension and school grade. The analysis of the original data showed, however, that equal variances could not be assumed, as the Levene’s Test was significant. The data were then transformed by taking the square root of the percentages, for which the Levene’s Test was not significant, implying that equal variances may be assumed and ANOVA can be applied.

The results in the literature condition show that:

- There was a main effect of reading comprehension on the percentage of underlined unknown words ($F(1,94) = 6.19, p < .05, r = .25$) with r being the effect size, an objective standardized measure of the magnitude of the observed effect, in which $r \leq 0.1$ indicates a small effect, $r \leq 0.3$ a medium effect and $r \leq 0.5$ a large effect (Field, 2009). Children with a higher reading comprehension level underlined significantly fewer words ($M = 0.36, SD = 0.37$) than those with a lower level ($M = 0.65, SD = 0.67$).
- There was no significant effect of school grade on the percentage of underlined unknown words ($F < 1$); results for 4th grade ($M = 0.48, SD = 0.50$) and for 6th grade ($M = 0.51, SD = 0.58$) were very similar.

- No significant interaction was found between reading comprehension level and grade ($F < 1$), which indicates that the significant effect of reading comprehension was statistically the same for 4th and 6th graders.

For science texts (only done with 6th grade) the results (Table 6.4) showed that:

- There was a marginally significant effect of reading comprehension on the percentage of underlined words ($F(1,57) = 3.08, p = 0.063, r = .23$). Despite the considerable difference in the percentage of underlined unknown words between children with high reading comprehension ($M = 0.35, SD = 0.42$) and low reading comprehension ($M = 0.69, SD = 0.92$), this difference was not significant at the 95% probability level, even though the results have a similar tendency as for literature.
- There was no difference between the percentage of underlined unknown words in science texts ($M = 0.50, SD = 0.70$) and in literature ($M = 0.51, SD = 0.58$).

Results from Task 2 Underlining metaphors in literature and science texts

In this section I present the results of the recognition task. Table 6.5 shows the results of the performance of the 4th and 6th graders in the recognition task with literary texts. It includes the means and standard deviations for the percentage of metaphors that was recognized, whilst differentiating between children with low and high reading comprehension levels and taking into account linguistic form (nominal *A is B* and verbal) and conventionality. In column 3, the table shows that, together, the 20 4th graders with low RC recognized 8.9% nominal *A is B* conventional metaphors, which implies that they recognized 16 out of the total of 180 (20x9) they could have recognized. By contrast, the 19 4th graders with high RC together recognized 24.6%, 42 of these nominal *A is B* conventional metaphors out of a total of 171 (19x9). Together the 4th graders therefore recognized 16.5% (58 cases) of these metaphors, whereas 6th graders recognized 25.6% (136) of the 531 (59x9) they could have recognized in total.

Table 6.5

Recognition of Metaphors in Literature per Grade and RC (in %)

Grade	RC	Nominal (A is B) (n=18)			Verbal (n=20)			Total (n=38)		
		Conv n=9	NC n=9	Total	Conv n=12	NC n=8	Total	Conv n=21	NC n=17	Total
4th n=39	Low n=20	8.9 (14.2)	5.6 (8.4)	7.2 (9.8)	4.6 (6.9)	2.5 (5.1)	3.8 (5.4)	6.4 (9.3)	4.1 (6.4)	5.4 (7.2)
	High n=19	24.6 (20.8)	22.2 (22.2)	23.4 (19.7)	10.1 (10.6)	8.5 (11.1)	9.5 (8.5)	16.3 (13.1)	15.8 (13.5)	16.0 (12.2)
	Total	16.5 (19.2)	13.7 (18.5)	15.1 (17.3)	7.3 (9.2)	5.4 (9.0)	6.5 (7.5)	11.2 (12.2)	9.8 (11.9)	10.6 (11.2)
6th n=59	Low n=26	17.9 (18.6)	13.7 (18.9)	15.8 (17.2)	10.3 (13.0)	13.9 (14.3)	11.7 (12.1)	13.6 (13.1)	13.8 (14.5)	13.6 (12.6)
	High n=33	31.6 (26.9)	37.0 (33.7)	34.2 (29.5)	29.3 (24.4)	28.8 (25.1)	29.1 (21.0)	30.3 (24.0)	33.0 (27.7)	31.6 (25.1)
	Total	25.6 (24.4)	26.7 (30.3)	26.1 (26.3)	20.9 (22.2)	22.2 (22.1)	21.4 (20.5)	23.0 (21.5)	24.5 (24.6)	23.7 (22.3)
4th + 6th n=98	Low n=46	14.0 (17.3)	10.1 (15.7)	12.1 (15.0)	7.8 (11.0)	9.0 (12.5)	8.3 (10.4)	10.5 (12.0)	9.6 (12.5)	10.1 (11.3)
	High n=52	29.1 (24.9)	31.6 (30.7)	30.2 (26.6)	22.3 (22.4)	21.4 (23.1)	21.9 (21.0)	25.2 (21.7)	26.7 (24.8)	25.9 (22.5)
	Total	22.0 (22.8)	21.5 (26.9)	21.7 (23.7)	15.5 (19.3)	15.6 (19.8)	15.5 (18.1)	18.3 (19.2)	18.7 (21.7)	18.5 (19.7)

Note: Means in percentages of the total number of each type of metaphors children could have recognized; Standard Deviation (SD) in brackets; Conv = Conventional; NC = Non Conventional

For the literary texts, based on a statistical analysis using a four-way mixed ANOVA to investigate the performance of 4th and 6th graders with low and high reading comprehension recognizing conventional and novel nominal (A is B) and verbal metaphors, the results are as follows:

- The main effect of reading comprehension was significant ($F_1(1,94) = 16.10, p < .001, r = .38$; $F_2(1,34) = 77.21, p < .0001, r = .83$; $minF'(1,122) = 13.32, p < .001, r = .31$). This implies that children with low reading comprehension overall recognized a lower percentage of the metaphors ($M = 10.1, SD = 11.3$) than those with high reading comprehension ($M = 25.9, SD = 22.5$)
- There was a significant main effect of school grade ($F_1(1,94) = 11.17, p < .001, r = .33$; $F_2(1,34) = 81.55, p < .001, r = .84$; $minF'(1,115) = 9.82, p < .01, r = .28$). This indicates that, on average, the percentage of metaphors recognized by children from 4th grade ($M = 10.6, SD = 11.2$) was lower than for 6th graders ($M = 23.7, SD = 22.3$).

- The interaction between school grade and reading comprehension was not significant, which implies that the effect of each of them is independent from the other.
- Conventionality was not significant ($F < 1$), indicating that there was no significant difference between the recognition of conventional and non-conventional metaphors.
- Linguistic form displayed a significant main effect ($F_1(1, 94) = 20.62, p < .001, r = .42; F_2(1,34) = 8.03, p < .01, r = .43; \text{min}F'(1,62) = 5,78, p < .05, r = .29$). On average, a higher percentage of nominal (A is B) metaphors ($M = 21.7, SD = 23.7$) was recognized than of verbal ones ($M = 15.5, SD = 18.1$).
- A significant interaction was found between linguistic form and reading comprehension for the results of the children (assuming the metaphors as a fixed factor) ($F_1(1,94) = 4.13, p < .05, r = .21$), but not for the metaphors ($F_2(1,34) = 3,91, p = .056, r = .32; \text{min}F'(1,97) = 2,01, p = .16, r = .14$). This suggests that the effect of linguistic form is not the same for poor and good readers, but that poor readers recognized more nominal A is B metaphors in comparison to verbal metaphors, whereas this effect was smaller for good readers (which may be generalized for the children but not for the metaphors).
- No other two-way or higher order interactions proved significant.

Underlining metaphors by 6th graders in literature and science texts -Task 2

Table 6.6 presents the results of the performance of the 6th graders in the recognition task. It includes the means and standard deviations for the percentage of metaphors that were recognized looking at levels of reading comprehension and differences in conventionality of nominal (A is B) metaphors in two domains of discourse (literature and science).

Table 6.6
Results of 6th Graders Looking at Conventionality, Domain of Discourse and RC

Grade	RC	Nominal (A is B) in literature (n=18)			Nominal (A is B) in science (n=18)		
		Conv n=9	NC n=9	Total	Conv n=10	NC n=8	Total
6th n=59	Low n=26	17.9 (18.6)	13.7 (18.9)	15.8 (17.2)	7.3 (7.8)	13.0 (14.8)	10.0 (9.5)
	High n=33	31.6 (26.9)	37.0 (33.7)	34.2 (29.5)	17.0 (17.0)	22.3 (18.9)	19.4 (16.3)
	Total	25.6 (24.4)	26.7 (30.3)	26.1 (26.3)	12.7 (14.5)	18.2 (17.7)	15.3 (14.4)

Note: Means in percentage of the total number of each type of metaphors children could have recognized; Standard Deviation (SD) in brackets Conv = Conventional; NC = Non Conventional

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Based on the statistical analysis, using a three-way mixed ANOVA to examine the performance of 6th graders in two domains of discourse and the possible influence of reading comprehension and conventionality, the following results were found:

- The main effect of domain of discourse was significant ($F_1(1,57) = 12.37, p < .001, r = .42$; $F_2(1,52) = 6.24, p < .05, r = .33$; $\text{min}F'(1,95) = 4.15, p < .05, r = .20$). This indicates that, on average, 6th graders recognized a higher percentage of (nominal *A is B*) metaphors in literature ($M = 26.1, SD = 26.3$) than in science texts ($M = 15.3, SD = 14.4$).
- Similar to the findings with literature in the previous analysis, there was a significant main effect of reading comprehension in science texts ($F_1(1,57) = 10.14, p < .01, r = .39$; $F_2(1,52) = 63.08, p < .001, r = .74$; $\text{min}F'(1,75) = 8.73, p < .01, r = .32$). This indicates that 6th graders with low reading comprehension ($M = 10.0, SD = 9.5$) recognized fewer (nominal *A is B*) metaphors in science texts overall than those with high reading comprehension ($M = 19.4, SD = 16.3$).
- Different from the findings in literature in the previous analysis, conventionality of nominal (*A is B*) metaphors in science texts reached a significant main effect for the results of the children (assuming the metaphors as a fixed factor) ($F_1(1,57) = 4.60, p < .05, r = .27$), but not for the metaphors ($F_2(1,52) = 1.35, p = .25, r = .15$; $\text{min}F'(1,81) = 1.04, p = .31, r = .11$). This indicates that non-conventional nominal (*A is B*) metaphors ($M = 18.2, SD = 17.7$) in this specific set of metaphors were recognized by 6th graders more often than conventional ones ($M = 12.7, SD = 14.5$).
- There were no significant interactions between any of the factors included in the analysis, which implies that all effects are independent.

6.4 Discussion

In this section I will discuss the findings of my behavioural study on metaphor recognition, starting with the discussion of the underlining of unknown words. Then I will reflect on the adjustment of my approach, where I adopted a two-step procedure in which children were first asked

to underline unknown words (task 1) and thereafter to underline metaphorically used words (task 2). I will end with the discussion with the results of metaphor recognition.

Discussion of the results from Task 1: Underlining unknown words

Starting the recognition study with an underlining task related to unknown words proved very useful, as it resulted in an important number of underlined words, showing that several words in the texts were difficult for quite a few children. The subsequent discussion of these words with the participants separated in four groups, two per grade, provided additional insight for the children into the meanings of these words. The results show that children with a higher reading comprehension level underlined significantly fewer unknown words in texts from literature than those with a lower level. This finding is in line with my expectation, as I anticipated that children with a higher reading comprehension level have a more advanced lexicon, but also will be better at using contextual information to solve problems they encounter in the text. This effect proved not to depend on school grade, as in both grades readers with a higher level of reading comprehension underlined fewer unknown words than those with lower comprehension levels.

When looking at differences in school grade and taking into account, for example, Berman (2007), Nagy (2007), and Nippold (2004), it could also be expected that children in 6th grade, having more experience with language and a more developed lexicon, would underline fewer unknown words than children from 4th grade. This, however, was not the case, as the average number of underlings was almost equal. One possible explanation might be that several of the underlined words concerned names and that some words such as *dagger* and *marchioness* are not part of the language normally used in Colombia and therefore may be unknown to both 4th and 6th graders. This difficulty seems to have a lesser effect on high readers (in both grades), who are likely to be better at inferring the meaning or function (names) of these words from the text.

For science texts (only done with 6th graders) results were very similar since, low reading comprehension readers underlined, on average, almost twice as many words as high comprehension readers. In this case, however, this was just not statistically significant at the 95% probability level, particularly because of the large standard deviation of low readers. The effect size ($r = 0.25$) was comparable to the statistically

significant effect size in the literature study ($r = 0.23$), though, which suggests that there is a comparable tendency in the data.

Discussion of the results from Task 2: Metaphor recognition by 4th and 6th graders

The results showed that children with low reading comprehension in both 4th and 6th grades recognized significantly fewer metaphors ($M = 10.1\%$) in texts from literature than those with high reading comprehension ($M = 25.9\%$) and this also applied to the recognition of metaphors in science text by poor ($M = 10.0\%$) and good readers ($M = 19.4\%$) from 6th grade. These findings confirm my prediction, as it may be expected that children with a higher level of reading comprehension have more developed metalinguistic skills, which allows them to better reflect on the meaning and uses of language and on using contextual information that enables them to recognize more metaphors (Nagy, 2007; Yuill, 2007, 2009; Zipke, 2007, 2008; Zipke et al., 2009). Furthermore, children with a higher level of reading comprehension adopt a higher standard of text coherence, which encourages them to find and resolve inconsistencies in the text, including those brought about by figurative language, instead of ignoring or not noticing them (Perfetti et al., 2005; Snowling et al., 2009). Better comprehenders are also likely to have more advanced domain knowledge that enables them to differentiate between conceptual domains.

On average, children from 4th grade recognized fewer metaphors ($M = 10.6\%$) in the literary texts than 6th graders ($M = 23.7\%$). This result is also in line with my expectation and is independent from reading comprehension levels. This finding supports the idea of the advance in linguistic and metalinguistic development of children between ages 7 and 12, as well as their increase in knowledge of conceptual domains, as discussed in Chapter 1. It is important to note, however, that the better performance of 6th graders was not confirmed by the results of underlining of unknown words, where both grades performed at the same level. This supports the point I raised in the discussion about unknown words, namely that this may be caused by the fact that several words, including proper names, were not known by quite a few 4th and 6th graders because these terms are not much used in Colombia.

The exploration of the effect of linguistic form showed that nominal (*A is B*) metaphors in literature were better recognized ($M = 21.7\%$) than verbal ones ($M = 15.5\%$). This finding is in line with my

expectation, as different researchers (e.g. Cameron, 2003; Goatly, 1997; Steen, 2004) have indicated that word class may influence metaphor recognition, and Cameron (2003) found in research with children that nominal metaphors were noticed more than verbal ones. This effect was similar for children both in 4th and 6th grade, as the only significant interaction that was found occurred between linguistic form and reading comprehension, assuming the metaphors as a fixed factor. Whereas both poor and good readers recognized fewer verbal than nominal (*A is B*) metaphors, the difference between the two is smaller for poor readers (3.9%) than for good readers (8.3%). The reason for the difference between poor and good readers cannot be explained without further research. It might come down to the fact that good readers benefit relatively more from their higher comprehension skills in the process of recognizing nominal metaphors than when recognizing verbal metaphors.

It is also important to note that the same result is, statistically speaking, likely to be obtained when giving the same set of metaphors to other children from the school population, but that this may not be the case with other metaphors. Hence, when a different set of nominal (*A is B*) and verbal metaphors is given to my research group, the interaction between linguistic form and reading comprehension may not be significant.

I also looked at the influence of conventionality and found that this had no effect on metaphor recognition in literature. In science texts conventionality did have a significant effect, as non-conventional metaphors ($M = 18.2\%$) were better recognized by 6th graders than conventional ones ($M = 12.7\%$). The effect was similar for both poor and good readers, as no statistically relevant interaction was found between conventionality and reading comprehension. This effect may be the result of teachers using novel nominal (*A is B*) metaphors in particular to compare two clearly distinct domains to help students grasp new concepts. Such metaphors may not only be novel, but also stand out more and hence are more easily recognized.

Statistically speaking, the effect of conventionality in science texts only applies to the current set of metaphors, which if given to other students is likely to produce the same outcome. It cannot be assumed that a similar effect will be obtained when providing a different set of conventional and non-conventional metaphors in science texts to the group of children that participated in the research. Other factors may play a role, too. Authors of science texts may also use, for example, a

conventional metaphor very deliberately to support a specific explanation of a concept. Such a metaphor will then stand out more, which may lead to better recognition.

This confirms my expectation that the issue of conventionality may not be straightforward, as discussed in Chapters 4 and 5. Conventionality is complex, as it cannot be ruled out, for example, that for the children some of the conventional metaphors may have been less conventional than judged by the adults that made the classification. In addition, some of the literature suggests that the processing of non-conventional metaphors may involve cross-domain mapping, whereas this is not the case for conventional metaphors, unless they are used deliberately (Steen 2011a). However, I am not aware of any study with children that has explored if and how this may affect metaphor recognition. It is possible that the deliberate use of some of the conventional metaphors made them more recognisable, which may have interfered with the findings. If some of the conventional metaphors included signs of being deliberately used, this might have triggered recognition by the reader in cases where they would not have been recognized, had these signs been absent. I will explore this potentially interfering factor below by looking at some of the conventional metaphors that were better recognized.

Finally I also explored the effect of domain of discourse. I found that 6th graders recognized more nominal (*A is B*) metaphors in the literary texts ($M = 26.1\%$) than in the science texts ($M = 15.3\%$). Even though I am not aware of any study that compares possible differences in recognition of metaphors in science and literature, I still anticipated this outcome, based on Steen's (1994) comparison of metaphors in literature and journalism and also on Gentner's (1982a) discussion about differences between metaphors in literature and science.

In this section I have discussed the findings of the underlining of unknown words and the metaphor recognition task by 4th and 6th graders in the literary texts and by 6th graders in science texts. One of the hypotheses raised in the discussion, based on Steen (2011a), is that deliberateness of metaphor may have an effect on metaphor recognition and may interfere with, for example, the effect of conventionality. To get further insight in this possibility I will now turn to an exploration of some characteristics of the best and worst recognized metaphors.

6.5 Exploring results with some of the metaphors

In the previous sections I have presented and discussed the findings of the study on metaphor recognition and have shown that, in literature, nominal (*A is B*) metaphors were better recognized by children than verbal metaphors and that conventionality did not generate significant differences. In science texts, however, conventionality did have a significant effect, in that non-conventional metaphors were better recognized than conventional ones. In trying to account for these findings regarding conventionality, I argued that other factors may have influenced the results of metaphor recognition. Based on Steen (2008, 2011a, 2013), I specifically mentioned deliberateness as a possibly interfering variable. In this section I will offer a further analysis of some of the features of the metaphors that were best recognized and those that obtained the lowest recognition scores, in order to gain insight into the possible role of deliberateness as an interfering variable in metaphor recognition.

Research on deliberateness by language researchers is at an early stage and a formal method of identification still needs to be developed (Steen, 2011a). It deals with the complexity of trying to identify, as an analyst, whether a metaphor can be taken as deliberately used, which relates particularly to the communicative dimension of metaphor in language use. This identification is not easy, given that it may be the result of the analysis of structural properties of the metaphor, but also involve judgement of content properties, as, according to Steen (2004), both may encourage metaphor recognition. Krennmayr (2011, p. 154) indicates that to establish deliberate use, that is, whether a metaphorical expression identified by an analyst is meant to change the perspective of the receiver on the topic of the text, it is necessary to check “whether there are any features present that make the reader aware of the intended metaphorical usage”. She lists eight features that may alert the reader to possible metaphorical use, but indicates that these features are just tools to search for deliberate metaphors. Krennmayr (2011) stresses that not all of them need to come together and sometimes just one may be sufficient, whereas in other cases more than one needs to be present to alert the receiver.

The latter seems to be confirmed by the wide spread in recognition among *A is B* as well as verbal metaphors in my findings. *A is B* is one of the features she mentioned as a sign for deliberateness, but apparently

in my best and worst metaphors this did not affect recognition in a similar way, in view of the low recognition of some A is B metaphors. I also found that, whereas, on average, nominal metaphors in the form A is B were better recognized than verbal ones, several of them were less recognized than verbal metaphors where the A is B feature of deliberateness is absent.

Figure 6.3 shows the features that I will use to explore the best and worst recognized metaphors in my research. It includes some features from the list presented by Krennmayr (2011, p. 154-155) and a few others based on my reflection on points raised by Cameron (2003), Paivio and Walsh (1993), and Steen (2004) about aspects that may promote metaphor recognition. These features may occur separately or in combination and are expected to positively influence metaphor recognition. It is important to mention, however, that this analysis concerns the interpretation of the analyst and does not necessarily imply that the children have indeed experienced those metaphors as deliberate. I will briefly discuss these features (except for A is B form which was discussed in Chapter 4) before presenting my analysis of the metaphors.

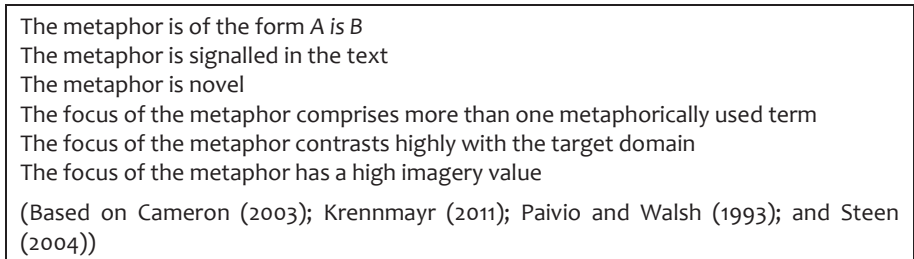


Figure 6.3 Some Features that May Make Readers Aware of the Intended Metaphorical Use

Signalling

The fact that some metaphors are signalled in text has been discussed by different authors in connection with deliberate metaphor use (e.g. Cameron, 2003, Goatly, 1997; Goddard, 2004; Krennmayr, 2011; Steen, 2010; Steen et al., 2010). Signalling comprises lexical signals that may inform the reader of a comparison or a form of contrast. This may include words such as *like*, *as*, *in fact*, *indeed*, *compare*, *metaphorically speaking*, *so to speak*, *sort of*, and *kind of*. Goatly (1997) also mentions other markers, such as orthographic devices (e.g. exclamation marks,

inverted commas), and verbs that refer to mental and verbal processes (e.g. *believe, think, say, refer*), which broadens the perspective of signalling. I expect that signalling is an important indication of deliberateness and will have a positive effect on recognition.

Novelty

Novelty is mentioned by several authors (e.g. Cameron, 2003; Goddard, 2004; Krennmayr, 2011; Steen, 2010; Steen, 2011a) in connection to deliberate metaphors. This, however, is not a straightforward connection because conventional metaphors, when deliberate, may also encourage recognition (Steen, 2011a; 2013). Hence I do expect that novel metaphors will be among the better recognized metaphors, but I anticipate that the same may be the case for some deliberate conventional metaphors.

Focus with more than one term

A focus term can be just one word, but may also be more complex and may consist of more than one metaphorically used word. Steen (2004) mentions this point and found better recognition of metaphors that contain more than one metaphorically used word. Accordingly, I expect that this may be a characteristic of the better recognized metaphors.

Contrast between focus and target domain

The difficulty to determine the ‘contrast’ or ‘incongruity’ between the focus and the target domain has been an issue widely discussed by researchers (see Chapter 2). This difficulty has much to do with contrast not being a structural property of the metaphor (for which several analytical tools exist), but rather a ‘content property’ that is harder to establish, as its analysis involves judgments and subjective decisions (Steen, 2004, p. 1297). In my analysis I will, therefore, not just give a value but present the reasoning for my judgment of the incongruity between the focus and target domain for each of the metaphors. I expect that this feature may alert readers to the metaphor and therefore will be more present in better recognized metaphors.

Imagery value of the focus term

Imagery value has been discussed by several authors (e.g. Blasko, 1999; Katz et al, 1988; Kearney, 1995; Marschark et al., 1983; Paivio & Walsh, 1993). As in the case of contrast, it is not a structural property, but a 'content property'. Imagery, according to Graesser et al. (1988) and Steen (2004), may influence metaphor recognition. The imagery value of the focus term relates to the ease with which the focus term generates a mental image. The imagery value of concrete words (e.g. *book*, *castle*) is more tangible and more likely to generate a clear image than abstract words (e.g. *ability*, *success*) (Clark & Paivio, 1991, p. 155). Such a visual image may help the receiver to realise the difference between the meaning given in a context and more basic meaning of a word. However, it is also important to realise that considerable diversity exists among individuals in their disposition and capacity to use imagery (Blasko, 1999; Clark & Paivio, 1991). Still I would expect that the imagery value of the best recognized metaphors will be higher than that of the worst recognized metaphors.

6.5.1 Best and worst recognized metaphors in literature

Recognition for nominal (*A is B*) metaphors ranged from 10.2 to 37.8% (mean 23.1%). Table 6.7 shows that the best recognized nominal (*A is B*) metaphor in literature was recognized by just over one out of every three children. For verbal metaphors recognition ranged from 1.0 to 26.5% (mean 14.8%). In this case, as presented in Table 6.8, the best recognized verbal metaphor in literature was underlined by just over one out of four children. I have combined the best and worst recognized metaphors in separate groups and will explore the main features for each group to identify possible arguments that may explain the considerable differences in metaphor recognition, looking at the features indicated in Figure 6.3. This analysis of individual metaphors, which is exploratory in nature, is summarized below. As I will show here, this analysis puts some perspective on the findings I discussed in the previous section and can be relevant for future research.

Nominal (A is B) metaphors in literature

The analysis of the deliberateness of the six metaphors shown in Table 6.7 gave the following results:

Table 6.7

Best and Worst Recognized Nominal (A is B) Metaphors in Literature

No.	Best recognized	%	No.	Worst recognized	%
17	For Tocatoc her smile was a <i>rainbow</i> (Para Tocatoc su sonrisa era un <i>arco iris</i>)	37.8	11	The glow-worms are <i>kings of the night</i> (Los cocuyos son <i>reyes en la noche</i>)	10.2
4	She said that the hands of Miguel Jose were a <i>pair of butterflies</i> (Ella decía que las manos de Miguel José eran un <i>par de mariposas</i>)	34.7	3	Our house is an <i>island!</i> (¡Nuestra casa es una <i>isla!</i>)	12.2
2	Their gazes are <i>pirate daggers</i> (Sus miradas son <i>dagas piratas</i>)	31.6	12	The glow-worms are the <i>children of the stars</i> (Los cocuyos son <i>hijos de las estrellas</i>)	12.2

- Form (A is B); all six metaphors are of this form
- Signalling; the metaphors do not comprise other lexical signals that suggest a comparison, such as *like*, *more*, and *sort of*. However, looking at other markers indicated by Goatly, (1997) it seems that two of the best recognized metaphors (No. 17 and 4) are signalled, as they are preceded by verbs that refer to mental and verbal processes that may have alerted the reader of the communicative intention of the metaphor. This concerns the words *For Tocatoc...* (*Para Tocatoc...*), which can be taken as a signal that indicates the perspective of a character in the story about the smile of the dressmaker. Something similar applies to the second best recognized metaphor: *She said that...* (*Ella decía que...*). This type of phrase, which may function as a signal, is not present in the other best recognized metaphor (No. 2) or in the poorly recognized ones (No. 11, 3, and 12).
- Novelty; only the second (No. 4) of the three metaphors that were best recognized was scored as novel by the teachers who assessed conventionality. For the worst recognized metaphors (No. 11, 3, and 12) the first and third were labelled as novel.
- More than one focus term; only the second metaphor from the group of the best recognized (No. 2) comprises two words (*pirate daggers*) that belong to the source domain.

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- Contrast between focus and target domain; it can be argued that the contrast between *smile* and *rainbow* and *hands* and *pair of butterflies* for the two best recognized metaphors (No. 17 and 4) is already considerable and the stories do not include any reference to the domains of *rainbow* and *butterflies* respectively, which makes them stand out more. This contrast is similar for *gazes* and *pirate daggers*, but in this case the story does provide some information related to the source domain. In the case of the worst recognized metaphor (No. 11) *glow-worms are kings of the night*, there is a contrast between *glow-worms* and *kings*, and in addition the story does not include references to the domain of *king*. However the contrast seems to be weakened by the addition of the *night*, which does belong to the target domain. In the case of *house* and *island* (No. 3) there is a contrast, but the words before the metaphor may have reduced its internal tension, as they talk about the forest being flooded because of heavy rain. In the third case (No. 12) the tension between *children* and *stars* is reduced by the fact that *stars* relates to the domain of *glow-worms* and to the story in general.
- Imagery value of the focus term; the three best recognized metaphors all are concrete and easily connected to an image (visualized): *rainbow*, *pair of butterflies* and *pirate daggers*. This seems to be different for two of the worst recognized metaphors because of the additional lexical item belonging to the target domain (respectively *night* and *stars* in *kings of the night* and *children of the stars*), which may reduce visualization, as it is not so easy to imagine a *king of the night* or a *child of the stars*. In the case of *island*, which can be easily visualized, several children may still not have had a clear perception of an island, given that in the session of the discussion of unknown words, they confused *island* with a place at the seaside.

Some of the children's³ answers that suggest visualization are shown in Figure 6.4.

³ All children's explanations and comments included in this thesis have been translated into English trying to keep as close as possible to the Spanish source. The original words of the children have not been edited to preserve what they expressed in the different moments of the research.

Answers suggesting that the children were imagining and visualizing the focus term of the metaphor include:

- [su sonrisa era un arco iris/her smile was a rainbow] “When she smiled her teeth were beautiful and were shining like the colours of a rainbow” (“Que ella cuando sonreía sus dientes eran bonitos y brillaban mucho y parecían un arco iris”) [JM, 4th grade]
- [las manos de Miguel José eran un par de mariposas/The hands of Miguel Jose were a pair of butterflies] “You know that the butterflies are delicate, don’t you? Then the hands of Miguel were delicate with the things he repaired. This is the reason for saying that the hands of Miguel Jose were a pair of butterflies, it means two little butterflies that repaired things without causing any scratch, because they were very delicate” (“Usted sabe que las mariposas son delicadas ¿no?, entonces las manos de Miguel eran muy delicadas con las cosas que él arreglaba, por eso dice que las manos de Miguel José eran un par de mariposas, o sea dos maripositas que arreglaban las cosas y las dejaban como nuevas, sin hacerles un rasguño ni nada porque son muy delicadas”) [NM, 4th grade]
- [El viento rugía/The wind was roaring] “Roared is when the lion roars. But here it is the wind. The wind was blowing heavily and it sounded like roaring” (“Rugía es cuando el león ruge. Pero aquí es el viento. El viento sopla muy fuerte y se escucha como un rugido”) [RV, 4th grade]
- [con en silencio florecían mejor los pensamientos/with the silence, the thoughts bloomed more] “Blooming is like when a very small flower opens [...]” (“Florecer es como cuando una flor esta chiquita y se abre [...]”) [DOT, 4th grade]

Figure 6.4 Some Answers of Children Showing the Imagery Value of the Focus Term

Verbal metaphors in literature

The three best and three worst recognized verbal metaphors in literature are shown in Table 6.8.

Table 6.8

Best and Worst Recognized Verbal Metaphors in Literature

No.	Best recognized	%	No.	Worst recognized	%
31	The wind was roaring (El viento rugía)	26.5	19	The wind enters (El viento se entra)	1.0
34	with the silence, the thoughts bloomed more (Con el silencio, florecían mejor los pensamientos)	25.5	29	A doubt settled in the mind of Anastasia (Una duda se instaló en la cabeza de Anastasia)	5.1
25	The birds flooded the environment with their warbles (Los pájaros inundaban con sus trinos el ambiente)	24.5	38	His letter had touched the heart of the dressmaker (Su carta había tocado el corazón de la costurera)	6.1

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The analysis of the deliberateness of these six metaphors (Table 6.8) gave the following results:

- Signalling; the six metaphors do not contain lexical signals that may alert the reader of the communicative intention, for example by presenting the conventional collocate (e.g. *the wind roars like a lion*) or by the use of preceding words, such as *she said ...*, as was found in some of the better recognized nominal (*A is B*) metaphors.
- Novelty; none of the metaphors was scored as novel by the teachers who assessed conventionality.
- More than one focus term; none of the six metaphors contain more than one focus term.
- Contrast between focus and target domain; it can be argued that the contrast in the three best recognized metaphors (No. 31, 34, and 25) is high because the conventional collocates of the verbs are very clear (*lions roar*, *flowers bloom* and *water inundates*) and contrast strongly with the collocates that are used (*wind*, *thoughts*, and *birds*). Furthermore, in all three cases the stories do not provide references to the source domain. In the case of the poorly recognized metaphors (No. 19, 29, and 38) it can be argued that, for the first two metaphors, the conventional collocates are fairly clear (*living beings enter*, *equipment is installed*), but a considerable difference seems to exist with the first three. This link is much weaker, as *to enter* and *to install* are used with a broader set of collocates (e.g. *rain enters the house*, *installing the memory in a computer*). In the third case, *touching the heart* changes the meaning of the verb *to touch*. It is no longer seen as a physical action and is well known by users of language as portraying a sentiment, which strongly reduces the contrast in the metaphor.
- Imagery value of the focus term; although some overlap may exist with the influence of the contrast, as, in the case of verbs, imagery requires the identification of the conventional collocates. In the three best recognized metaphors, all are connected to a very clear image that can be easily visualized: *a roaring lion*, *a blooming flower* and *an area inundated with water*, although in the second and third case the addition of *thoughts* and *warbles* respectively may reduce the tension between the two domains. In the worst recognized metaphors the imagery value seems considerably lower, as the link to a specific collocate is much weaker.

The difference between best and worst recognized nominal (*A is B*) metaphors in the texts from literature cannot be attributed to one single feature (Table 6.9). This implies that just the *A is B* feature by itself may not be sufficient, particularly because several verbal metaphors scored much higher in recognition than the worst recognized *A is B* metaphors.

Table 6.9

Some Features of Best and Worst Recognized Metaphors in Literature

Features	Nominal (<i>A is B</i>) metaphors						Verbal metaphors					
	Best recognized			Worst recognized			Best recognized			Worst recognized		
	17	4	2	11	3	12	31	34	25	19	29	38
Level of recognition	37.8	34.7	31.6	10.2	12.2	12.2	26.5	25.5	24.5	1.0	5.1	6.1
Form <i>A is B</i>	Yes	Yes	Yes	Yes	Yes	Yes	No	No	No	No	No	No
Signalled	Yes	Yes	No	No	No	No	No	No	No	No	No	No
Novel	No	Yes	No	Yes	No	Yes	No	No	No	No	No	No
Focus with more than one metaphorical word	No	No	Yes	No	No	No	No	No	No	No	No	No
Contrast focus and target domain	High	High	Fairly high	Fairly high	Fairly low	Fairly high	High	High	High	Fairly low	Fairly low	Low
Potential imagery value of the focus	High	High	High	Low	High	Low	High	Fairly High	Fairly High	Low	Low	Low

The three features that together seem to make the difference in level of recognition of nominal (*A is B*) metaphors are the contrast between focus and target domain, also taking into account whether the text provides information on the source domain, the imagery value of the focus term, and the potential signalling that may be related to the use of phrases such as *for TocoToc ...* and *she said that ...*. An important point is that these features together support the perception of deliberateness, which for, example, may change the effect of conventionality, as two of the best recognized metaphors were conventional. This seems to be in line with the point raised by Steen (2011a), namely that deliberateness may encourage metaphor recognition. Nevertheless, as pointed out by Krennmayr (2011), more features may be needed to increase the awareness of the addressee of the presence of a metaphorical use. This seems to be supported by my findings, which show that in the best recognized metaphors several features were present (Table 6.9), yet further analysis is needed, as some of the features were also present in the worst recognized nominal (*A is B*) metaphors. The best and worst

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verbal metaphors were not signalled, were all scored as conventional, and did not contain more than one focus term. The main difference that was found between them has to do with the 'relative strength' in terms of potential contrast between focus and target domain, and the imagery value of the conventional collocates of the focus term.

In sum, whereas my overall finding was that nominal (*A is B*) metaphors were significantly better recognized than verbal metaphors, I found that other features related to deliberateness seem to be at play as well. A strong contrast between focus and target domain and the imaginary value in particular seem to support recognition in both (*A is B*) and verbal metaphors. Signalling was also a feature that was present in two of the best recognized (*A is B*) metaphors, but was absent in the verbal metaphors, so it cannot be established whether this feature might also work for the latter. Findings seem to suggest that deliberateness does indeed influence recognition of metaphor in literature, but further research is needed to establish this with greater certainty.

6.5.2 Best and worst recognized metaphors in science text

The overall picture is that recognition of nominal (*A is B*) metaphors in science texts ranged from 1.7 to 50.8% (mean 15.3%). The best recognized nominal (*A is B*) metaphor in science texts (Table 6.10) was recognized by approximately one in two children.

Table 6.10

Best and Worst Recognized Metaphors in Science Texts

No	Best recognized	%	No	Worst recognized	%
5	Your mouth is a battlefield! (¡Tu boca es un campo de batalla!)		2	The circulation of the blood in human beings takes place through the circulatory system, which is a combination of paths or roads (La circulación de la sangre en el hombre se realiza por medio del aparato circulatorio que es un conjunto de caminos o vías)	1.7
7	The earth's crust that is the shell of our planet (La corteza terrestre que es la cáscara de nuestro planeta)	28.8	4	The heart is a provisional container (El corazón es un depósito provisional)	3.4
6	Plants are sophisticated living laboratories (Las plantas son sofisticados laboratorios vivientes)	25.4	8	The fuel that makes our body function is our food (El combustible para que nuestro cuerpo funcione y podamos realizar todo lo que nos propongamos son los alimentos)	3.4

For these six metaphors I have explored the same features used for the analysis of the metaphors in literature (Table 6.11).

Table 6.11

Some Features of Best and Worst Recognized Metaphors in Science

Features	Best recognized			Worst recognized		
	15	17	16	2	4	8
Level of recognition	50.8	28.8	25.4	1.7	3.4	3.4
Form A is B	Yes	Yes	Yes	Yes	Yes	Yes
Signalled	Yes	No	No	No	No	No
Novel	Yes	Yes	Yes	No	Yes	No
Focus with more than one metaphorical word	No	No	Yes	No	No	No
Contrast focus and target domain	Very high	Fairly High	Fairly High	Fairly low	Fairly low	Fairly low
Potential imagery value of the focus	High	Fairly High	Fairly High	Low	Low	Low

With respect to the features of these metaphors the following can be concluded:

- Form A is B; all six metaphors are of this form.
- Signalling; the best recognized metaphor (No. 15) has exclamation marks (;..!), which Goatly (1997) regards as a signal that may make readers look more carefully. The rest of the best and worst recognized metaphors are not signalled.
- Novelty; the three best recognized metaphors were scored as novel by the teachers who assessed conventionality. For the worst recognized metaphors this was only the case for one of them (No. 4), and the other two were labelled as conventional.
- Contrast between focus and target domain; the contrast between *mouth* and *battlefield* for the best recognized metaphor (No. 15) is high. Furthermore, several terms from both target and source domains (*tartar*, *teeth*, *gum*, *toothbrush*, *battlefield*, *enemy*, *army of acids*, *weapon*) are present in the short fragment. The comparison (contrast) between the two domains is also stressed throughout the text. This seems to provide considerable support for recognition and may explain why this specific metaphor was the best recognized of all, looking both at literary and science texts used in my study. In case of the second best recognized metaphor (No. 17) the contrast is

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important, but perhaps its effect is reduced because the focus word *shell* is combined with *planet*, a word belonging to the target domain of *earth's crust*, which may have made it stand out a little less. This, however, is counterbalanced by the point that the text does not provide additional information on the source domain, which makes the word *shell* stand out more. A similar situation applies to the third best recognized metaphor (No. 16), where the contrast is clear, but might be reduced because the adjective *living* is related to the target domain (plants).

The metaphor that is least recognized (No. 2) has a contrast between *combination of paths and roads* and *circulatory system*, and children in Colombia may be expected to be aware that a *circulatory system* relates to the movement of blood. Yet the contrast does not seem very strong, as *circulation* is related to movement and transport, which can easily be associated with *combination of paths and roads*. The more so because the text provides information related to the source domain which makes *combination of paths and roads* stand out less. In the second metaphor (No. 4) the term *provisional container* is used in contrast with *heart*. The term *container*, however, is a very general term that is used in quite a few different settings as something to hold liquids, for example, which seems to reduce the contrast, even though the text does not provide information on the source domain. In the third metaphor (No. 8) there is contrast between *food* and *fuel*, but this seems of lesser impact, as *food* is also used in combination with *energy* in the text (e.g. *if you do not eat you will not have enough energy to play, to study, to think*), which is closely related to the domain of *fuel*.

- Imagery; as in the case of nominal *A is B* metaphors in literature, a clear influence seems to be associated with the imagery value of the focus term. The concrete nouns *battlefield*, *shell* and *laboratories* generate a clear and strong image that can be easily visualized in the three best recognized metaphors. In the case of *shell* (No. 17) and *laboratories* (No. 16), however, the addition of the words *our planet* and *living* respectively reduces the imagery value. In the case of the least recognized metaphors, (No. 2) a *combination of paths or roads*, (No. 4) a *provisional container*, and (No. 8) *fuel*, the images are fuzzier. The first two may even be confusing in the image they portray, as the word *combination* (*conjunto*) is not used in relation to road infrastructure and the word *provisional* implies something temporary,

which seems to conflict with the concrete nature of the term of *container*. In the third metaphor, the structure of the metaphorical unit, which starts with *fuel* and then moves to the *body* before getting to the *food*, may also have made visualization more difficult.

The difference between best and worst recognized nominal (*A is B*) metaphors in science texts that I used cannot be contributed to one single feature either (Table 6.11). For all three best recognized metaphors the contrast between focus and target domain and the imagery value of the focus scored (fairly) highly, whereas this was not the case for the worst recognized metaphors. Furthermore, one of the best recognized metaphors is signalled by exclamation marks. In section 6.4 it was shown that conventionality had a statistically significant effect on recognition, with novel metaphors in science texts being better recognized. This is also the case for the three best recognized metaphors, which are all novel, yet it is remarkable that the second worst recognized metaphor was also rated as novel. Hence, as was also shown for nominal *A is B* metaphors in literature, a single feature such as novelty may not be sufficient to trigger recognition. In this poorly recognized novel metaphor all other features including the contrast between focus and target domain and the imagery value scored low, which may explain the low recognition level.

6.6 Conclusion

My study showed that children from 4th and 6th grade did not differ significantly in the underlining of unknown words in literature, possibly because several words were not familiar in the local context. Furthermore, there was no difference between the percentages of underlined unknown words in science and literary texts in 6th graders. The influence of reading comprehension, however, was significant, with children with a lower level of reading comprehension underlining significantly more unknown words than those with a higher reading comprehension level both in 4th and 6th grade.

In relation to the five research questions concerning metaphor recognition, I have been able to draw the following conclusions:

- In line with my expectation, grade had a significant effect on metaphor recognition in literature, with 6th graders recognizing more metaphors than 4th graders. This finding is consistent with the age-related progress widely shown in children metaphor studies and

with the specific improvement of 6- and 7-year-old children in metaphor recognition reported by Groot et al. (1995). The present study provides empirical evidence that this progress continues over the school years.

- The influence of reading comprehension was also significant for metaphor recognition, with good readers doing significantly better than poor readers. This was the case for metaphors in literature for both 4th and 6th graders, as well as for nominal *A is B* metaphors recognized by 6th graders in science. This finding stands out as very relevant, and has not been shown by other research. However, as stated in my expectation, it is very much in line with the higher metalinguistic competence of children with more advanced reading comprehension levels, as reported by different authors (Gombert, 1992; Nagy, 2007; Yuill, 2007, 2009; Zipke, 2007, 2008; Zipke et al., 2009). This finding clearly points to the importance of deepening the understanding about children metaphor recognition, in that the developmental factor (older children perform better than younger ones) is not the only one to take into account. Rather, one should also consider children's knowledge of language, and particularly their proficiency as comprehenders of written texts.
- Linguistic form had a significant effect, in that nominal *A is B* metaphors were better recognized than verbal metaphors. The effect was similar for 4th and 6th graders. This is in line with my expectation and with the finding of the only study I am aware of (Cameron, 2003), in which she showed that the two children involved in her research noticed more nominal than verbal metaphors. My study expands this finding, in that I show that this effect is present in 4th and 6th graders. This influence of linguistic form on recognition in both school grades supports the idea that word class is relevant for metaphor recognition (Cameron, 2003; Goatly, 1997; Graesser et al., 1988; Steen, 2004). It should be noted, however, that my finding is related to the specific set of metaphors used in the present study. Findings also showed a significant interaction between reading comprehension and linguistic form for the set of metaphors I used. Although both poor and good readers recognized fewer verbal than nominal (*A is B*) metaphors, the difference between the two is smaller for poor readers (3.9%) than for good readers (8.3%). Further research is needed to establish the reason for this difference.

- Conventionality did not have a significant effect on metaphor recognition in literature for 4th and 6th graders. This finding does not support my expectation that non-conventional metaphors would be more recognized than conventional ones. As discussed, this lack of effect may be the result of interplay between deliberateness and conventionality of the metaphors, which I have explored in more detail in the previous section. The effect of conventionality in science, however, is in line with my expectations, in that non-conventional nominal (*A is B*) metaphors were significantly better recognized by 6th graders than conventional ones. However, statistically, this difference only applies to the set of metaphors that I used, and may be different for other sets of metaphors. This finding cannot be compared with previous research because there is no study, to my knowledge, that has explored the effect of conventionality on metaphor recognition by children. The contradictory findings of this study point to the need to test the possible interplay between conventionality and deliberateness in metaphor recognition.
- In line with my expectations, class of discourse had a significant effect on metaphor recognition by 6th graders, in that nominal (*A is B*) metaphors in literature were more recognized than the same type of metaphors in science texts. Given the lack of similar studies with children, results cannot be compared with others, but are in line with the differences Steen (1994) found with adults. This finding points to the relevance of investigating metaphor processing in more authentic language, recognizing children as users of different types of discourse where metaphors have particular uses, functions, and distribution.

The exploratory analysis of the best and worst recognized metaphors in texts from literature and science is, to my knowledge, the first of its kind. Findings show that in this case nominal (*A is B*) metaphors on average were also significantly better recognized than verbal metaphors, but at the same time I found important differences between the best and worst recognized nominal (*A is B*) metaphors, with the latter being well outperformed by the best recognized verbal metaphors. This clearly shows that *A is B*, although being indicated as one of the features that suggest deliberateness, is not sufficient to explain differences in recognition by itself. Other features of metaphor clearly play a role, as shown by my analysis of 18 best and worst recognized metaphors in

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literature and science texts. These differences seem to be the result of a combination of features of the metaphors, including the form (*A is B*), novelty, contrast between source and target domain, imagery, and signalling. The influence of just novelty, however, could not be established for verbal metaphor in literature, because none of the best and worst recognized metaphors were novel. In the case of *A is B* form, only one of the best and two of the worst recognized metaphors were ranked as novel.

In science texts, all best recognized metaphors are novel and do well on contrast and imagery, with one of them also being signalled. For the worst recognized metaphors a similar situation was found as with the *A is B* metaphors in literature, with one of them being novel, but this metaphor also scored low on the other features. A word of caution is needed here, as it cannot be ruled out that, as mentioned in Chapter 5, some of the metaphors that were scored as conventional by the teachers were, in fact, novel for the children, which merits further research.

What clearly emerges is that the best recognized metaphors all scored high on some other features not related to novelty and particularly on the contrast between focus and target domain, the imagery value, and in several cases signalling, which can all be taken as an indication of deliberateness, as they aim to change the perspective of the reader. This supports the view of Steen (2011a) that conventional metaphors, when used deliberately, have a higher possibility of being recognized. The question arises, however, if the opposite may also apply, in that novel metaphors may stand a lower chance of being recognized, if they score low on other potential features of deliberateness. This possibility seems to be supported by my finding that three of the worst recognized *A is B* metaphors that were ranked as novel scored low on all or almost all other features.

The overall conclusion of the analysis of best and worst recognized metaphors is that the communicative dimension may play an important role in recognition. On the one hand, recognition seems to be supported by what can be seen as deliberateness of the metaphor (reflected by it being signalled and/or showing a strong contrast between focus and target domain and/or a high imagery value). On the other hand, however, non-deliberateness, or perhaps better said a low communicative strength of a metaphor seems to downplay the effect of, for example, the novelty of the metaphor. These findings, although based on a limited number of metaphors, seem to point to an interesting area for further research.

7. Interpretation of metaphors

7.1 Introduction

In this chapter I will address the results of my study on metaphor interpretation by the same four different groups of children, two from 4th grade and two from 6th grade with low and higher reading comprehension levels respectively. The goal of this study was to explore the effect of school grade, reading comprehension level, linguistic form, and conventionality on the interpretation of nominal (*A is B*) and verbal metaphors, using the linguistic materials presented in Chapter 5. The study addresses the following four research questions:

- (1) What is the influence of school grade on metaphor interpretation?
- (2) What is the influence of reading comprehension on metaphor interpretation?
- (3) What is the influence of linguistic form on metaphor interpretation?
- (4) What is the influence of conventionality on metaphor interpretation?

Unlike recognition studies, metaphor interpretation research with children has been more extensive, as shown in Chapter 2 and 3. Research with pre-schoolers and school-age children has explored, among others, development-related aspects such as the performance of different groups of age, but also, for instance, the knowledge of the conceptual domains involved in the metaphor, the type of metaphorical link (e.g. attributional, relational, psychological metaphors), the explicitness of the comparison (simile or metaphor), and, to a lesser extent, as noted in Chapter 4, conventionality and linguistic form. As pointed out in my earlier chapters, some preliminary conclusions seem to emerge from available research that interpretation of metaphors improves with age and school grade (e.g. Keil, 1986; Pollio & Pollio, 1979; Schecter & Broughton, 1991; Siltanen, 1989; and Waggoner & Palermo, 1989). At the same time some of these authors show that important differences exist between children within the same age group. In Chapter 2 I posited that reading comprehension is an important factor that could explain these differences. It may be expected that children with a higher level of reading comprehension are better at metaphor interpretation, as they are better at understanding the written language of which metaphors are part.

When individuals are asked to interpret metaphors, they get into the complex process of metaphor understanding, which may involve cross-domain mapping, categorization or lexical disambiguation (e.g. Gentner & Bowdle, 2008; Giora 2003, 2008; Glucksberg, 2008; Steen, 1994, 2008, 2011a). Metaphor processing may lead to more advanced language analysis for older children and better readers. As a result I do not only expect more correct interpretations (i.e., interpreting the meaning of the focus term(s) by making the link with the target domain), but also richer interpretations (i.e., with more verbal references to both target and source domain and their link in the metaphor; showing awareness of the metaphorical use indicating for example that the meaning is different from what is stated) from children in grade 6th and from those with a higher level of reading comprehension.

Furthermore, taking into account the research in the field (e.g. Bowdle & Gentner, 2005; Cameron, 1999a; 2003; Gentner & Bowdle, 2001; Steen, 1994, 2008, 2011a), I anticipate that metaphor properties will influence the process of interpretation. I particularly expect that linguistic form, in terms of the difference between nominal (*A is B*) and verbal metaphors, may affect interpretation. To my knowledge, only two studies (Cameron, 2003; Reyna, 1985) have explored differences in processing between nominal and verbal metaphors with children, with Reyna suggesting that verbal metaphors are more difficult to interpret than nominal ones, but, as discussed in Chapter 4, we cannot be sure about her findings. The study of Cameron (2003) uses natural discourse as linguistic material, which is in line with my research. She found that nominal metaphor triggered more discussion and processing. This difference may imply that nominal metaphors promote richer interpretations with more reflection on and references to both target and source domain, which suggests that the metaphor is understood as metaphor. For verbal metaphors, given the greater flexibility of the verb meaning, this seems to be more difficult. However, in terms of providing a fair interpretation of the implied meaning (of the focus term in relation to the target domain) verbal metaphors may be easier, precisely because of the wider number of senses of the verb, which may help to figure out what is intended (Cameron, 2003). I expect therefore that verbal metaphors will be better interpreted than nominal (*A is B*) metaphors, but will generate fewer rich interpretations in terms of the reference to the two domains. For novel verbal metaphors, however, these effects may be smaller because of their unconventional collocates.

Very few studies have explored the effect of conventionality, another metaphor related factor, on metaphor interpretation, and their results are not conclusive. Özçalışkan (2005) found no difference in interpretation between conventional and novel verbal metaphors, Waggoner and Palermo (1989) found a tendency that conventional metaphors were better interpreted, but this was not statistically relevant. Only Pollio and Pollio (1979) found statistical evidence that conventional metaphors were easier to understand than novel ones. As two out of three indicate a tendency in favour of conventional metaphors leading to better interpretation, I anticipate that I may find the same, whilst recognizing that the effect of conventionality may not be that straightforward. It can be argued that conventional metaphors may be easier to interpret, as they are more embedded in a particular linguistic community and have become part of the shared language resources of its members, which in turn may, however, lead to interpretations that are less rich. For novel metaphors this may work differently, because they involve more tension between the domains and encourage cross-domain mapping, which on the one hand may lead to more mistakes in interpretation (as the metaphor is not conventionalized). On the other hand, it may promote richer interpretations, provided that children have enough conceptual knowledge of the domains involved or have good skills of reading comprehension to be able to use the linguistic context of the metaphor appropriately.

Different methodologies have been employed to study metaphor interpretation, including forced-choice tasks, enactment, recall, elicited repetition, and verbal explanation. Metaphors in these studies have been presented without and with context, with the latter becoming more common over the years. Based on the review of different research methods (presented in section 2.3.1) I initially tried to develop a multiple choice task to explore the interpretation of metaphors. This, however, proved to be very difficult, as also mentioned by others, such as Pollio and Pollio (1979, p. 114), who indicate that they struggled a lot with developing proper literal answers for the multiple choice task in particular, as “metaphors are difficult to render in literal language”, and Winner (1988). For many of the metaphors in my linguistic material it was very difficult or even impossible to generate sufficiently realistic answers that would have provided a fair choice for the children. I therefore discarded this approach after the first trial.

Another option I have considered was the GITA procedure (Cameron, 2003), which is based on the registration of a guided dialogue between two children and has shown that it can provide valuable information about children’s reflections when they try to understand texts. This seems a relevant option to explore metaphor interpretation with children, but also may have some drawbacks. It is a resource intensive approach that would have taken considerable time and a large research team, in view of the size of the groups and the number of children I wanted to include in my research. The method may also involve a learning effect as a result of the dialogue, and it will be very difficult to isolate the results of the individual children, which thus made it less feasible for my purpose.

Therefore I decided to use a verbal explanation task, even though, as I have explained in section 2.3.2, this method has been criticized because of its metalinguistic demands that may lead to an underestimation of the metaphorical interpretation particularly of younger children (Vosniadou & Ortony, 1986). Other researchers (Cain et al., 2005; Nippold & Taylor, 2002; Schechter & Broughton, 1991; Waggoner et al., 1997; and Winner, 1988), however, are positive about verbal explanation as a way to find out how children make sense of figurative meanings. My decision was reinforced by the point that Nippold and Taylor (2002) and Schechter and Broughton (1991) have successfully used this task with children of comparable age to my research group.

An important advantage of verbal explanation indicated by several of these researchers is that it provides good insight into the ways metaphors are interpreted. In addition, when metaphors are embedded in stories, it also may provide insights in the information that children use. I will therefore analyse the answers of the children and explore if their explanation provides clues that allow establishing whether these answers are more concerned with the source or target domain or both (the latter showing a richer metaphorical interpretation).

The verbal explanation task was tested with six children from 3rd and 5th grade, using 11 story fragments from children’s literary books. This was done right after the pilot testing of the recognition task. The pilot testing provided valuable information to fine-tune the procedure and some of the research materials, as already discussed in the recognition task.

With two children in the pilot phase I also explored whether it helped if, instead of asking the child to explain the metaphorical sentence, you posed the question in terms of “how would you explain

this part to a younger child?”, a question I derived partly from the approach used by Cameron (2003). This, however, did not trigger more explanation, and even created confusion, as children did not talk about the metaphorical sentence but answered, for instance, “very slowly and carefully” or “I do not know because some young children will not understand these sentences”. The final procedure that I adopted is presented in the next section.

7.1 Method

Materials

The experimental materials were identical to the texts from literature used in the recognition study presented in section 6.2. The material consisted of ten fragments, which include a total of 38 metaphors, 18 nominal (*A is B*) and 20 verbal (as shown in Tables 5.6 and 5.7 of Chapter 5). I did not explore the interpretation of metaphors in science text for lack of resources, aggravated by the fact that the schools went on strike.

Participants

Because of logistical difficulties, the interpretation study was only done with children from one of the two schools, where 73 children had participated in the recognition study. These children were given a choice to participate and as a result eight did not continue, some because they did not want to miss school lessons, as the test, like in the previous study (recognition), had to be done in their school hours, others because their parents did not allow them to continue. The final group of participants comprised 65 children, 36 girls and 29 boys, in total. This included 32 children from 4th grade aged 9;2 (range 8;1 to 9;11) and 33 children from 6th grade aged 11;6 (range 10;6 to 14;6). All participants were Spanish native speakers. The group included 16 low comprehension readers in 4th and 16 low comprehension readers in 6th grade, and 16 high comprehension readers in 4th grade and 17 high comprehension readers in 6th grade.

Design

In this study I used four independent variables: school grade, level of reading comprehension, linguistic form and conventionality of

metaphors (Table 7.1). The dependent variable was the interpretation given for each metaphor.

Table 7.1

Independent Variables in Interpretation Study

Independent Variable	Levels
School grade	4th and 6 th
Reading comprehension level	Low and High
Linguistic form	Nominal (A is B) and Verbal
Conventionality	Conventional and Non-conventional

A simple categorization system was developed to classify the results of the interpretation task. It was based on Cameron (2003), Reinhart (1976), and Steen (1994), and on the analysis of the results of my pilot study. Four categories were established, as shown in Table 7.2. The first category of ‘correct interpretation’ comprises answers that show that the child has understood the meaning of the metaphor. It also includes a subcategory that I call ‘two-domain answers’. These are answers with richer explanations where children made clear references to both domains that are implied in the metaphor, suggesting awareness of the metaphor as metaphor. I also kept the records of the ‘two-domain answers’ separately for further analysis, and these results will be presented in this section as well. The second category concerns answers that give information about the source domain in particular. The third category contains answers that show that the child perceives an incongruity, but cannot explain it. The last category includes different types of answers, which all show that the metaphor is not understood (e.g. no answer, repetition).

Metaphor interpretations were checked and scored independently by a research assistant and the researcher. The pilot test was used to initiate this process and results were compared and discussed. This helped to create a better common understanding between the analysts and to fine-tune the definitions of the categories. Thereafter the results of the 65 children were rated by the two analysts and differences were discussed and agreed upon. Agreement between the scores between the two analysts before discussion was 83%, with a Kappa score of .71 at $p < .000$, which implies that the agreement is substantial (Kappa between .61 and .80) (Landis & Koch, 1977).

Table 7.2

Categories for the Classification of the Metaphor Interpretation Task

Category	Description
Correct interpretation of the metaphor	<p>The response makes sense and shows that the ‘focus’ term (the metaphorically used part) is interpreted in such a way that its meanings are linked to meanings of the target domain. Several of these answers comprised a rich interpretation of the metaphor and included meanings or ideas related to both the target and source domain. These I have marked as a subcategory called ‘two-domain answers’. Some examples include: [<i>Eusebio’s paintings are a feast of colours/Las pinturas de Eusebio son una fiesta de colores</i>]; ‘focus answer’: “Eusebio’s paintings are colourful” / “Las pinturas de Eusebio son coloridas”; ‘two-domain answer’: “Like a feast of colours it is like those streamers that people throw in parties, therefore the paintings are yellow, green, then it is a party, the paintings are like that” / “Como una fiesta de colores es como esos papelitos que tiran así, entonces que las pinturas son amarillo, verde, así, entonces es una fiesta, entonces son así las pinturas”;</p> <p>[<i>David fights with his tears/David lucha contra sus lágrimas</i>]; ‘focus answer’: “David wants to cry but tries not to cry and endure the sadness” / “David tiene ganas de llorar pero trata de no llorar trata como de aguantarse la tristeza”; ‘two-domain answer’: “That he fights but it is not like fighting but it is like if he is trying not to cry” / “Que lucha no como peleando, sino que así como que está intentando no llorar”</p>
Vehicle interpretation	<p>The response is primarily concerned with the source domain, the metaphorically used part with answers reflecting the basic or literal meanings related to the focus term.</p> <p>[<i>Eusebio’s paintings are a feast of colours/Las pinturas de Eusebio son una fiesta de colores</i>] “It is party with the colours lilac, red, and white, these are colours of a party” / “Es fiesta con el color lila, rojos el blanco, de colores, colores de fiesta”</p>
Identification of tension	<p>The response of the child shows that the tension or incongruity is perceived, but cannot be explained (e.g. [<i>The wind was roaring/El viento rugía</i>] “But how can the wind roar?” / “Pero ¿cómo va a rugir el viento?”; “Only the lions roar... ‘grrrrr’ and the tigers, and all wild animals” / “Solamente los leones rugen ‘grrrrr’ y los tigres, todo animal salvaje”</p> <p>[<i>A beam of sunlight that was walking through her bedroom/Un haz de sol que caminaba por su habitación</i>] “A beam of sunlight cannot walk, here it would be a lie” / “Un haz de sol no puede caminar, ahí eso sería mentira”</p>
Other answers showing lack of understanding or no answer at all	<p>Responses that show that the metaphor is not interpreted or not understood. This category includes: no answer, repetition of the metaphorical sentence, re-telling of a part of the story, an interpretation based on other meanings. Some examples are: [<i>Eusebio’s paintings are a feast of colours/Las pinturas de Eusebio son una fiesta de colores</i>] “That the painting is like a feast of colours” / “Que la pintura es como una fiesta de colores”; [<i>David fights with his tears / David lucha contra sus lágrimas</i>] “David fights his tears because his friends do not want to play with him” / “David lucha contra las lágrimas porque sus amigos no quieren jugar con él”; [<i>The last beams of sunlight were setting some little cloud on fire / Los últimos rayos del sol incendiaban alguna nubecilla</i>]; “This is the part I do not understand” / “Esa es la parte que no entiendo”</p>

For the analysis of the results I used a four-way mixed ANOVA with two between-subject factors: reading comprehension and school grade and two within-subject factors (linguistic form and conventionality). To explore the statistical relevance of the findings I collapsed the data base for the children and the metaphors respectively, and used this to calculate the F_1 and F_2 and the minimal value of the quasi F ratio (min F'), which is the same procedure as used in Section 6.2.

Procedure

First the children were reminded of the earlier activities in which they had been involved: underlining unknown words, discussion and explanation of meanings of the unknown words, and underlining the parts of the texts that expressed a different meaning from what the text is about (metaphorically used words). Thereafter they were informed that the next step involved their reading of the 10 fragments of literary text again, after which they would be asked to explain some parts with a different meaning, in three or four individual interviews. It was explained that this was just to find out whether and how they had understood those parts of the stories and not to test which child gave better answers. It was also restated that their teachers and parents would not get any information from the research team about their answers and explanations (which was true), to avoid as much as possible that the children would see it as a test for school, but also to maintain the feeling of confidentiality about the internal aspects of the work they were doing with our team. Then a schedule was agreed upon with each child and their teachers for the individual interview sessions, in order to avoid that children would miss lessons in subject areas where they might have more difficulties, but also taking into account the lessons that the children themselves had expressed they did not want to miss.

In the interviews the children received a text fragment (randomly taken from the ten fragments) which included the underlined metaphors. They then completed the interpretation process of all the metaphors in this text, before receiving the next text fragment, until they had finished with all ten fragments. The process per text consisted of two components:

- *Reading and exploring the general comprehension of the story.* Children were told that they could take their time, as it was not a test to show how fast and accurately they could read. It was

mentioned that the most important point was to try to understand and be able to explain the underlined parts. They were asked to read the text, leaving the choice to them whether to do this silently or out loud, using whatever was most convenient for them in their experience. After having read the story, they were asked whether they had understood it, and when children expressed doubts they were allowed to read it again. Some hints about the general topic of the story were given when needed.

- *Exploration of metaphor understanding.* After the text was read, the metaphorical sentences were presented one by one on a separate page and in the same order as they appeared in the story. This was done to help the children focus on these sentences, but they had the page with the story on the table and could consult it when needed. For each of the metaphorical sentences the question was asked: “How do you understand this part?”

The answers of the children were tape recorded. When children indicated that they were not able to give an answer (e.g. “I do not know”, “I do not understand this part”, “this is precisely the part I do not understand”, etc.), they were encouraged to provide an interpretation by saying to them “I would like you to read and think about it again and then try to tell me what you understand”. In case a child just repeated the metaphor, they were told that was precisely the part they would need to explain. These forms of encouragement were only provided once in each instance they occurred. If a child repeated the metaphor or indicated that they did not know again, they were reassured that their answer was fine and were told that it can be difficult to explain your thoughts sometimes, and that they could try again with other stories.

7.2 Results

In this section I present the results of the interpretation of metaphors by the children. The answers varied considerably from no plausible explanation to very rich interpretations of the metaphors that showed not only that they understood and were able to explain the metaphor, but also that they could provide a considerable number of answers that also included a reference to both the source and target domain (Figure 7.1).

[El silencio envolvió las calles y el campo/The silence enfolded the streets and the field] “O sea que no envolvió las calles o sea como una banana se envuelve sino que lo envolvió así en silencio las calles solas sin niños jugando, sólo silencio, las calles deshabitadas sin nada de diversión” (“That is to say that it did not enfold the streets like wrapping a candy, but it enfolded like this, silently, the empty streets without children playing, only silence, the streets without people and no enjoyment”) [JPQ, 6th grade]

[El viento rugía/ The wind was roaring] “El viento rugía, era como si un león estuviera rugiendo o soplando, soplando el viento que suena como así (el niño sopla haciendo ruido), pero más duro, porque el viento tiene más fuerza que uno soplar así” (“The wind was roaring; it was as if a lion was roaring or blowing, the wind was blowing sounds like this [the boy blows producing noise], but this was louder because the wind is stronger than me blowing like this”) [CIR, 4th grade]

[Con en silencio florecían mejor los pensamientos/with the silence, the thoughts bloomed more] “o sea que con el silencio uno piensa mejor uno como que los pensamientos florecen más no como matas sino que florecen, se piensa mejor porque con el ruido dicen una cosa usted se confunde así, en cambio con el silencio usted no se confunde ni nada” (“that means that with the silence one thinks better it is like the thoughts bloom but not like plants but one thinks better because with the noise [they] say something and you become confused, however with the silence you do not become confused”) [JPQ, 6th grade]

[Un haz de sol que caminaba por su habitación/A beam of sunlight that was walking through her bedroom] “Yo entendí que un haz de sol, es el rayo de sol que aparece por toda la ventana, que aparece como una persona pintada de amarillo, toda luminosa, toda así contenta, feliz. Así como una persona paseando por allí, por una pieza, por cualquier parte, como una persona toda luminosa que alegra el día” (“I understood that a beam of sunlight is the beam of sun that appears along the window like a person painted in yellow, shining, very happy. It is like a person that is walking around, in the bedroom or anywhere, like a ‘shining’ person that radiates happiness to your day”) [RB, 4th grade]

Figure 7.1 Examples of Rich Interpretations of Metaphors (‘Two-Domain Answers’)

In several occasions children also made remarks that suggest that they were aware of the communicative intention of the metaphor (Figure 7.2)

[Su sonrisa era un arco iris/her smile was a rainbow] “Como si fuera un arco iris así, como decir una palabra para ponerlo más bonito, ella se está riendo cierto, entonces para decir su sonrisa es como un arco iris, es para decir que es bonita” (“it is like this was a rainbow, like saying a word to make it more beautiful. She is smiling, isn’t she? Then it is in order to say that her smile was beautiful”) [DOT, 4th grade]

[Su sonrisa era un arco iris/her smile was a rainbow] “Ahora las mujeres se echan como brillo, entonces queda como bonito, queda brillante. Entonces se puede decir que era como un arco iris, bueno los arco iris son bonitos, entonces se puede decir que los labios de la costurera eran bonitos y además que eran por decir brillantes” (“Nowadays women use a sort of brilliant lipstick, so they become beautiful and brilliant. Then it can be said that the lips of the dressmaker were beautiful and this is also used to imply brilliant lips”) [RM, 6th grade]

[Las manos de Miguel José eran un par de mariposas/The hands of Miguel Jose were a pair of butterflies] “pues ella las veía como si fuera algo apreciable, que él arreglaba todo y le quedaba como nuevo, ella le veía hermosas las manos, por eso tenía una expresión hermosa para él” (“well, she [the marchioness] perceived [his hands] like something valuable, he repaired everything and everything became new again. She saw his hands as beautiful, this is why [she] had a lovely expression for him”) [LMH, 6th grade]

[Sus cabellos eran una bandada de chupaflores/her hair that was a flight of hummingbirds] “Que el pelo era tan bonito que se le llama así, que sean muy bonitos que se le diga un nombre para poder mejorar los sentimientos que ella siente” (“That the hair was very beautiful that it was called like this, it is like it [her hair] is beautiful and a name [flight of hummingbirds] is used to make her [princess Filomena] feel better”). [DOT, 4th grade]

Figure 7.2 Examples of answers suggesting some degree of awareness of a communicative intention

It is worth noting that in a few cases children were not able to give an explanation, but showed that they were aware of the tension that was entailed in the metaphor (see Figure 7.3).

[El sol es el mejor despertador del mundo/The sun is the best alarm-clock around the world] “Yo no creo que sea un reloj, porque un sol como va a ser un reloj, yo no creo” (“I do not believe that it is an alarm-clock, because how can the sun be an alarm-clock. I do not think this is possible”) [AVM, 4th grade LRC]

[El viento rugía/The wind was roaring] “¿cómo va a rugir el viento?” (“How can the wind roar?”) [AVM, 4th grade]

Figure 7.3 Examples of answers of identification of the tension

Based on the results I revisited the categorization system (shown in Table 7.2). The findings showed that the category 'vehicle interpretation' and 'identification of tension' together made up less than 1% of all the answers. Therefore these categories were collapsed with the category of other answers, together forming the category of answers showing lack of understanding or no answer at all. This simplified the statistical calculations, as I had to deal with only two categories, the other being the category of 'correct' interpretation, which includes what can be established as 'focus interpretation', as well as the subcategory of 'two-domain answers', answers with richer explanations, which suggest a clear understanding that two domains that are implied. In total 54.8% of the received answers were 'correct interpretations', including 8.6% of 'two-domain answers'. The latter were also kept separately for further analysis, which will be presented in this section as well.

Table 7.3 shows the results of the 4th and 6th graders with low and high reading comprehension levels in the 'correct interpretation' of metaphors in literary texts differing in linguistic form and conventionality.

Table 7.3

Correct Interpretation (CI) of Metaphors per Grade and RC Level

Grade	RC	Nominal (A is B) (n=18)			Verbal (n=20)			Total (n=38)		
		Conv n=9	NC n=9	Total	Conv n=12	NC n=8	Total	Conv n=21	NC n=17	Total
4th n=32	Low n=16	38.9 (18.2)	31.2 (22.3)	35.1 (19.1)	38.0 (18.5)	33.6 (18.1)	36.1 (16.1)	38.4 (16.6)	32.4 (17.9)	35.7 (16.4)
	High n=16	50.7 (19.5)	52.1 (23.2)	51.4 (19.5)	66.7 (15.8)	64.1 (18.8)	65.6 (16.3)	59.7 (15.4)	57.8 (18.0)	58.9 (15.8)
	Total	44.8 (19.5)	41.7 (24.8)	43.2 (20.7)	52.3 (22.3)	48.8 (23.8)	50.9 (21.8)	49.1 (19.1)	45.1 (21.9)	47.3 (19.7)
6th n=33	Low n=16	45.1 (23.5)	36.8 (21.4)	41.0 (18.3)	56.2 (23.3)	36.7 (18.5)	41.0 (18.3)	51.4 (20.8)	36.7 (18.2)	44.9 (17.3)
	High n=17	70.0 (9.4)	70.0 (19.9)	69.9 (11.1)	87.7 (9.8)	83.1 (15.9)	85.9 (9.9)	80.1 (7.0)	76.0 (13.9)	78.3 (8.5)
	Total	57.9 (21.5)	53.9 (26.4)	55.9 (20.9)	72.5 (23.6)	60.6 (29.0)	67.7 (23.8)	57.0 (25.5)	57.0 (25.5)	62.1 (21.5)
4th + 6th n=65	Low n=32	42.0 (20.9)	34.0 (21.7)	38.0 (18.7)	47.1 (22.6)	35.2 (18.1)	42.3 (18.1)	44.9 (19.7)	34.6 (17.9)	40.3 (17.2)
	High n=33	60.6 (17.8)	61.3 (23.1)	60.9 (18.1)	77.5 (16.7)	73.9 (19.6)	76.1 (16.7)	70.2 (15.6)	67.2 (18.3)	68.9 (15.8)
	Total	51.5 (21.4)	47.9 (26.1)	49.7 (21.6)	62.6 (25.0)	54.8 (27.0)	59.5 (24.2)	57.7 (51.7)	51.1 (24.3)	54.8 (21.8)

Note: Means in percentages; Standard Deviation (SD) in brackets; Conv = Conventional; NC = Non Conventional

Based on statistical analysis, using a four-way mixed ANOVA to review the performance in metaphor interpretation in literature of 4th and 6th grade with low and high levels of reading comprehension, the findings are as follows:

- There was a significant main effect of grade ($F_1(1,61) = 14.23, p < .000, r = .43$; $F_2(1,34) = 54.27, p < .000, r = .78$; $minF'(1,87) = 11.27, p < .01, r = .34$) indicating that, on average, the percentage of metaphors that were correctly interpreted by children from 4th grade ($M = 47.3, SD = 19.7$) was lower than for 6th graders ($M = 62.1, SD = 21.5$).
- The main effect of reading comprehension was also significant ($F_1(1,61) = 59.75, p < .000, r = .70$; $F_2(1,34) = 185.45, p < .000, r = .92$; $minF'(1,90) = 45.19, p < .001, r = .58$). Children with a low reading comprehension level interpreted a lower percentage of the metaphors correctly ($M = 40.3, SD = 17.2$) than those with a high reading comprehension level ($M = 68.9, SD = 15.8$).
- The interaction between grade and reading comprehension was not significant, which implies that the effect of each of them is independent from the other. This provides important support for my position that, in addition to age, reading comprehension should be taken as a relevant indicator in relation to metaphor interpretation.
- Assuming the metaphors as a fixed factor, a significant main effect was found for linguistic form for metaphor interpretation by the children: $F_1(1,61) = 27.0, p < .000, r = .55$. As Table 7.3 suggests, verbal metaphors ($M = 59.5, SD = 24.2$) are better interpreted than nominal A is B metaphors ($M = 49.7, SD = 21.6$). This, however, does not apply to the metaphors as a random factor ($F_2(1,34) = 1.99, p = .17, r = .23$; and $minF'(1,39) = 1.85, p = .18, r = .21$). Statistically speaking, the same effect is likely to be obtained when the set of metaphors is given to other children from the school population, but this cannot be extended to other metaphors. Giving a different set of nominal A is B and verbal metaphors to my research group may lead to a different result.
- Assuming metaphors as a fixed factor, a significant main effect was found for conventionality for metaphor interpretation by the children: $F_1(1,61) = 11.1, p < .001, r = .39$. As is suggested by Table 7.3, this implies that conventional metaphors ($M = 57.7, SD = 57.1$) are better interpreted than non-conventional metaphors ($M = 51.1, SD =$

24.3). This, however, does not apply to the metaphors as a random factor ($F_2(1,34) = 0.82, p = .37, r = .15$; and $\text{min}F'(1,39) = 0.76, p = .39, r = .14$), which indicates that the effect may not be the same if a different set of metaphors were provided to my group of participants.

- A significant interaction was found between linguistic form and reading comprehension ($F_1(1,61) = 11.71, p < .001, r = .40$; $F_2(1,34) = 7.72, p < .009, r = .43$; $\text{min}F'(1,75) = 4.60, p < .05, r = .24$). This indicates that the main effect of linguistic form is not equal for poor and good readers. The tendency that verbal metaphors are better comprehended than nominal *A is B* metaphors interacts with reading comprehension, in that the difference between poor and good readers is somewhat stronger for verbal metaphors (Low RC, $M = 42.3, SD = 18.1$; High RC, $M = 76.1, SD = 16.7$) than for nominal *A is B* metaphors (Low RC, $M = 38.0, SD = 18.7$; High RC, $M = 60.9, SD = 18.1$).
- A significant interaction was found between conventionality and reading comprehension ($F_1(1,61) = 6.16, p < .016, r = .30$; $F_2(1,34) = 4.15, p < .049, r = .33$). The tendency that conventional metaphors are better comprehended than non-conventional metaphors interacts with reading comprehension, in that the difference between poor and good readers proved to be somewhat larger for non-conventional metaphors (Low RC, $M = 34.5, SD = 17.9$; High RC, $M = 67.2, SD = 18.4$) than for conventional metaphors (Low RC, $M = 44.9, SD = 19.7$; High RC, $M = 70.3, SD = 15.6$). This finding, however, only applies to the set of metaphors I have used as the $\text{min}F'(1,76) = 2.48, p = .12, r = .18$. Hence, if I used a different set of metaphors, findings may be different.
- No other significant interactions were found.

Exploring ‘two-domain answers’

The answers of the children are an important source of information. They show considerable variation in richness, with some of them demonstrating that it was reasonable to assume that the child understood and activated the two domains that were involved in the metaphor (see Figure 7.1 for examples). The analysis of the results of two-domain answers is shown in Table 7.4.

Table 7.4

Overview of Answers Showing Richer Interpretation (Two-Domain Answers)

Grade	RC	Nominal (A is B) (n=18)			Verbal (n=20)			Total (n=38)		
		Conv n=9	NC n=9	Total	Conv n=12	NC n=8	Total	Conv n=21	NC n=17	Total
4th n=32	Low n=16	5.5 (9.8)	4.8 (8.0)	5.3 (8.6)	3.6 (9.1)	0.8 (3.2)	2.5 (6.6)	4.5 (8.7)	3.0 (5.4)	3.8 (7.0)
	High n=16	17.2 (21.0)	11.1 (18.2)	14.4 (18.3)	8.8 (22.7)	8.7 (23.3)	8.7 (22.5)	12.6 (21.2)	9.9 (19.7)	11.4 (20.1)
	Total	11.4 (17.2)	7.9 (14.2)	9.8 (14.8)	6.2 (17.2)	4.7 (16.8)	5.6 (16.6)	8.6 (16.5)	6.5 (14.7)	7.6 (15.3)
6th n=33	Low n=16	1.4 (3.8)	2.0 (4.4)	1.8 (2.9)	1.0 (2.7)	0 (0)	0.6 (1.7)	1.2 (2.9)	1.1 (2.4)	1.2 (1.7)
	High n=17	17.5 (16.7)	19.5 (19.1)	18.8 (16.8)	16.6 (22.6)	15.5 (22.7)	16.2 (22.3)	17.2 (18.8)	17.8 (18.8)	17.5 (18.5)
	Total	9.7 (14.6)	11.1 (16.5)	10.6 (14.8)	9.0 (18.0)	8.0 (17.9)	8.6 (17.7)	9.5 (15.7)	9.7 (15.9)	9.6 (15.5)
4th + 6th n=65	Low n=32	3.4 (7.6)	3.4 (6.5)	3.6 (6.5)	2.3 (6.7)	0.4 (2.3)	1.6 (4.8)	2.9 (6.6)	2.1 (4.2)	2.5 (5.2)
	High n=33	17.4 (18.6)	15.4 (18.9)	16.6 (17.4)	12.8 (22.7)	12.2 (22.9)	12.6 (22.4)	15.0 (19.8)	14.0 (19.4)	14.5 (19.2)
	Total	10.5 (15.8)	9.5 (15.3)	10.2 (14.7)	7.6 (17.5)	6.4 (17.3)	7.1 (17.1)	9.0 (15.9)	8.1 (15.2)	8.6 (15.3)

Note: Means in percentages with Standard Deviation (SD) in brackets; Conv = Conventional; NC = Non Conventional

Based on statistical analysis using a four-way mixed ANOVA the following results were obtained for the review of the percentage of 'two-domain answers' (rich interpretations) given by 4th and 6th grade with low and high levels of reading comprehension respectively:

- Reading comprehension produced a significant effect for the percentage of two-domain answers. ($F_1(1,61) = 11.65, p < .001, r = .40$; $F_2(1,34) = 75.58, p < .000, r = .83$; $minF'(1,78) = 10.10, p < .001, r = .34$). Children with low reading comprehension gave fewer two-domain answers ($M = 2.5, SD = 5.2$) than those with high reading comprehension ($M = 14.5, SD = 19.2$).
- Even though a tendency exists that 6th graders did better than 4th graders, the difference is not statistically significant, which is different from the finding with all correct interpretations, where the better performance of 6th graders was statistically significant.
- The effect of linguistic form was significant ($F_1(1,61) = 6.56, p < .013, r = .31$). The effect proved to be stronger for nominal A is B metaphors

($M = 16.4$, $SD = 19.8$) than for verbal metaphors ($M = 9.0$, $SD = 19.3$) (Table 7.4). This effect, however, only applies to the current set of metaphors, as ($F_2(1,34) = 3.25$, $p = .08$, $r = .29$; and $minF'(1,67) = 2.17$, $p = .14$, $r = .18$). Hence, if I used another set of metaphors, findings might be different.

- No other effects or interactions proved significant.

7.3 Discussion

In this section I will discuss the findings of the behavioural study on metaphor interpretation, but I will first present some observations concerning possible interferences in the results. The approach involved allowing children to read the text with metaphors once more if they felt that they had not understood the story. Several children used this option, but only reread a few stories. Of the poor readers some 75% in 4th grade read an average of 2 out of ten stories for a second time. For 6th graders this was even 80%. For good readers in 4th grade, some 37% read an average of 1.8 stories again, and for 6th graders this was only 23% with an average of 1.2 stories. This is a possible confounding factor in the study, which may have benefitted children with lower reading skills to some extent. However, without having a basic understanding of the text metaphor, interpretation would be even more demanding or simply too complex for a child.

In the procedure we tried to avoid introducing confounding factors by handing out the text randomly to limit the effect of higher scores in stories received later, as a result of children becoming more proficient with the process, or lower scores because of reduced attention. Different sessions were held on different days to complete the whole task. This was done to avoid that children would become tired and would no longer be able to pay sufficient attention to the task. Hence this reduced the possible influence of children being tired, but may have resulted in children talking about the task with other participants. This risk, however, was reduced, as we agreed with the children not to talk about the texts with their classmates in the same way as we agreed with them that their performance would not be shared with others such as their teachers. Yet it cannot be ruled out that some still talked with others and that this may have led to some better results. Still, I expect that this possible influence is small, as information sharing was not that easy in

view of the considerable number of texts and the fact that children came from 11 different classrooms (six in the case of 4th grade and five in the case of 6th grade).

Another point to mention is that some of the children were encouraged to respond to the question to interpret the metaphor if they did not provide an answer or just repeated the metaphorical sentence. I do not expect that this encouragement has had an important influence on the results, as it was done only once, when needed, and without giving any clues about the meaning of the metaphor. It is relevant to mention that, for the research team, taking care of methodological issues was equally important as the creation of a trusted and warm environment, where children were challenged and motivated at the same time, whilst showing that the team believed in their capabilities.

I will now proceed with the discussion of the results, first in relation to 'correct interpretations' and thereafter will discuss the performance with the 'two-domain answers'. The initial classification for the answers of the interpretation study comprised four categories and one subcategory based on Cameron (2003), Reinhart (1976), and Steen (1994) and on the analysis of the results of my pilot study. The findings showed, however, that less than 1 % of the answers concerned a response focusing only on the source domain, or indicated the existence of tension (see Table 7.2 and Figure 7.3 for examples), whereas for 'correct interpretation' this was 54.8%, including 8.6% of 'two-domain answers'. Hence, to facilitate statistical analysis it was decided to collapse these two categories ('vehicle interpretation' and 'identification of tension') with the category of 'other answers showing lack of understanding or no answer at all'. In view of the low percentage it is fair to assume that this will not influence my findings in a significant way.

Looking at the category 'correct interpretation', comprising answers indicating that the participants have understood the meaning of the metaphor ('two-domain answers'), the results show that children from 4th grade correctly interpreted fewer metaphors on average ($M = 47.3$, $SD = 19.7$) than those from 6th grade ($M = 62.1$, $SD = 21.5$). This is a plausible result, taking into account my main conclusion from Chapter 2, namely that children in higher grades are expected to be better at interpretation because they have more knowledge of conceptual domains and more advanced metalinguistic competence and metalexical awareness than children from lower grades. This finding is in line with results of the studies I have reviewed in the same chapter (e.g. Keil, 1986;

Pollio & Pollio, 1979; Schecter & Broughton, 1991; Siltanen, 1989; Waggoner & Palermo, 1989).

The finding that children with a low reading comprehension level correctly interpreted a lower percentage of the metaphors ($M = 40.3$, $SD = 17.2$) than those with a high reading comprehension level ($M = 68.9$, $SD = 15.8$) is also in line with my expectation. In Chapter 3 I concluded that, whereas metaphorical competence increases with age or school grade, I expected to find a positive correlation between reading comprehension and the interpretation of metaphors, as better readers are likely to be more able to use contextual information and may have a stronger knowledge base. This expectation is supported by the two studies I found on metaphor interpretation with children (Pickens et al., 1985; Ripoll-Salceda & Aguado-Alonso, 2007) and studies with idioms (Cain et al. 2005; Cain & Towse, 2008), where high comprehension readers did considerably better on interpretation tasks than low comprehension readers. It is also supported by the point raised by Cain and Oakhill (2007), Nation (2005), and Snowling et al. (2009) that low comprehenders have difficulties with higher-level language skills, including inference generation and understanding of figurative language.

A related finding is that the effect of reading comprehension and school grade are independent from each other (no interaction). This reinforces the idea that, in addition to school grade, reading comprehension should be taken as a relevant indicator in relation to metaphor interpretation.

Verbal metaphors ($M = 59.5$, $SD = 24.2$) were correctly interpreted more frequently than nominal (*A is B*) metaphors ($M = 49.7$, $SD = 21.6$), but statistically this effect only applies to the current set of metaphors and cannot be extended to other metaphors. Giving a different set of *A is B* and verbal metaphors to my research group may lead to a different result. The finding is in line with my expectation based on Cameron (2003), who found that verbal metaphors differed from nominal metaphors in her protocols, in that they did generally not become a topic of discussion and were either repeated or relexicalized (replaced by words with a similar meaning). Interpretation of verbal metaphors may be easier because verbs are often used in different contexts and their meaning is extended by using new collocates.

A related finding is that the effect of linguistic form is not equal for low and high comprehension readers. The tendency is the same for both types of metaphors, but the difference between poor and good readers is somewhat stronger for verbal metaphors (Low RC, $M = 42.3$, $SD = 18.1$;

High RC, $M = 76.1$, $SD = 16.7$) than for nominal (*A is B*) metaphors (Low RC, $M = 38.0$, $SD = 18.7$; High RC, $M = 60.9$, $SD = 18.1$). This indicates that for poor readers the difference between interpreting verbal and *A is B* metaphors is small in this set of metaphors but still they correctly interpret more verbal metaphors; by contrast, children with a higher level of reading comprehension correctly interpret considerably more verbal than *A is B* metaphors, which is in line with the idea of verbal metaphors being easier to interpret.

Conventional metaphors ($M = 57.7$, $SD = 57.1$) proved to be better interpreted than non-conventional metaphors ($M = 51.1$, $SD = 24.3$), but statistically this effect only applies to the current set of metaphors and cannot be extended to other metaphors. This finding points to the same tendency as shown by Pollio and Pollio (1979) and Waggoner and Palermo (1989), but not by Özçalışkan (2005). It also seems to be in line with the Career of Metaphor Theory, which states that conventional metaphors do not necessarily involve cross-domain mapping and hence it can be argued that they may be easier to be interpreted. Still the point that the effect may not be the same for another set of metaphors indicates that other factors may interfere with the results.

A related finding is that the effect of conventionality goes in the same direction, but is not equal for low and high readers. The result for non-conventional metaphors (Low RC, $M = 34.5$, $SD = 17.9$; High RC, $M = 67.2$, $SD = 18.4$) and conventional metaphors (Low RC, $M = 44.9$, $SD = 19.7$; High RC, $M = 70.3$, $SD = 15.6$) shows a ratio for poor readers of 1.30 in favour of conventional metaphors, whereas for good readers this is 1.05. This seems to suggest that good readers benefit more from their better skill set and more advanced domain knowledge, which allows them to derive more information from the text and to better establish the reference implied in the novel (*A is B*) metaphors.

Two-domain answers

As mentioned before, the category of ‘correct interpretation’ includes a subcategory called ‘two-domain answers’, which are richer in explanation, where children made clear references to both domains that are implied in the metaphor. My reason to explore this category separately is that when children talk about the two domains, they are providing a more elaborate interpretation than when just explaining the implied meaning. Following Steen (1994, 2011a), it can be argued that these ‘two-domain answers’ may indicate different levels of explicit

recognition, from being aware of the presence of the distinct conceptual domains to different degrees of awareness of a communicative intention (see Figure 7.2 for examples). In the case of a 'focus interpretation', what we know is that children understood the meaning of the metaphor, but we cannot be sure whether they were aware of the metaphorical use (although not necessarily with that label in their mind). Thus, it cannot be ruled out that more children that provided a 'focus interpretation' were aware of the metaphor as metaphor, but simply did not mention this in their answer to the question that was posed: "How do you understand this part?"

In the case of 'two-domain answers' I did not find a statistically relevant difference between 4th graders ($M = 7.6$, $SD = 15.3$) and 6th graders ($M = 9.6$, $SD = 15.5$). This finding is not in line with my reflection in Chapter 2 that children in higher school grades are expected to be better at interpretation because they have more knowledge of conceptual domains and more advanced metalinguistic competence and metalexical awareness than children from lower school grades. The lack of statistical significance is caused by the large standard deviations, but when looking at the means it is interesting to note that the mean of 6th graders was higher than the one of 4th graders, with a ratio between them of 1.26. This ratio is only slightly lower than the ratio of 1.31, which I found in the statistically significant difference in all correct interpretations between 6th graders ($M = 62.1$, $SD = 21.5$) and 4th graders ($M = 47.3$, $SD = 19.7$). Hence it seems reasonable to assume that my expectation that 6th graders are better also at two-domain interpretation than 4th graders is still plausible, although it has not been statistically confirmed.

Children with low reading comprehension gave fewer 'two-domain answers' ($M = 2.5$, $SD = 5.2$) than those with high reading comprehension ($M = 14.5$, $SD = 19.2$). This is in line with my expectation, as better readers have a broader language skill set that will allow them to better use the linguistic context and have a stronger knowledge base that will help them to provide more comprehensive answers. This pattern is similar to the one for 'correct interpretation', with results for poor readers being ($M = 40.3$, $SD = 17.2$) and for good readers ($M = 68.9$, $SD = 15.8$). However, the ratio in the case of 'two-domain answers' is much more in favour of the high readers. On average, good readers gave 1.7 correct interpretations for every correct interpretation of the poor readers, but for 'two-domain answers' this difference was 5.8. This finding strongly supports the point that the higher skill set of better readers allows them

to produce richer interpretations of metaphors than children with a lower level of reading comprehension.

Nominal (*A is B*) metaphors ($M = 10.2$, $SD = 14.7$) triggered more 'two-domain answers' than verbal metaphors ($M = 7.1$, $SD = 17.1$). Even though this effect is only statistically significant for the current set of metaphors, it confirms my expectation, based on Cameron (2003) and Goatly (1997), that it may be easier to identify the two domains in nominal metaphors, which therefore would generate more 'two-domain answers'. Furthermore, Cameron (2003) found that, different from nominal metaphors, children did not talk about the vehicle terms in verbal metaphors. This lack of the vehicle term being noticed would generate fewer two-domain answers.

My findings show a slight tendency that conventional metaphors triggered more two-domain answers whereas the opposite would seem more plausible. It can be argued that, because nonconventional metaphors encourage cross-domain mapping, children would be more aware of the two domains. Yet it cannot be ruled out that deliberateness of the metaphor has interfered with results, as this may have stimulated cross-domain mapping in some of the conventional metaphors. Further study seems relevant in this respect.

7.4 Conclusion

In this chapter I have presented the results of the behavioural study of metaphor interpretation by 4th and 6th graders in literature. In this section I will address the main conclusions of this study, but first I will make two remarks concerning the methodology.

In the classification of the answers I initially used four categories, where I also included 'vehicle interpretation' and a category of answers (named 'identification of tension') that did not provide a correct interpretation, but showed that the 'tension' in the metaphor was captured. These two categories together, however, proved to be only 1% of the total number of answers. To facilitate statistical analysis I therefore collapsed these two categories with the category of 'other answers showing lack of understanding or no answer at all', leaving me with two main categories: 'correct interpretation' and 'other answers showing lack of understanding or no answer at all'. In view of the low percentage it is fair to assume, however, that this adjustment will not

have influenced my findings in a significant way. In addition, I defined a subcategory of correct answers that showed a rich interpretation, referring to the two domains involved in the metaphor which I called 'two-domain answers'.

I also discussed some possible confounding factors in relation to the methodology. Children were allowed to read the story once more, if they felt they did not understand it. This, in a way, may have favoured some poor readers, implying that the effect of reading comprehension may be even stronger. Different sessions were organized on different days, where children completed part of the assignments on randomly handed out texts. Children were informed that it was important not to talk about the texts with the other participants in between sessions. Even though children agreed to follow the rules we established, it cannot be ruled out, however, that some still may have done so. Nevertheless, I do not expect that this has had a significant influence, in view of the large number of texts, which children were not allowed to take away after the sessions, and the spread of children over different school groups.

In relation to the four research questions concerning metaphor interpretation I have been able to draw the following conclusions:

- The influence of school grade was significant, with, as I expected, 6th graders being better at metaphor interpretation than 4th graders. The same tendency was found for 'two-domain answers', although the latter was not statistically significant. The finding that older children on average are more competent at understanding metaphors is in line with the results of children metaphor comprehension research (e.g. Keil, 1986; Piquer-Píriz, 2010; Pollio & Pollio, 1979; Reynolds & Ortony, 1980; Ripoll-Salceda & Aguado-Alonso, 2007; Schechter & Broughton, 1991; Siltanen, 1989; Waggoner et al., 1985; Waggoner & Palermo, 1989). Children from 6th grade providing richer interpretations, making explicit reference to the source and target domain ('two-domain answers'), even though it was not statistically significant, is also plausible, as it matches an age-related progress that is reasonable to expect, as children grow in their cognitive and linguistic knowledge during their lifespan and particularly along their school age. This finding is consistent with the only study (Schechter & Broughton, 1991) I am aware of that explicitly explores children's explanations, differentiating between the two domains involved in psychological metaphors. My study seems to show that the age relation they find is not restricted to psychological

metaphors, but it cannot be ruled out that the lack of statistical significance of my finding related to richer interpretation is the result of, for example, differences in reading comprehension.

- The influence of reading comprehension on metaphor interpretation was significant. Children with higher reading comprehension levels provided, on average, 1.7 times more correct interpretations than those with lower level. For the ‘two-domain answers’ a similar, but stronger significant effect was found, as the good readers provided 5.8 times more ‘two-domain answers’ than the poor readers. These data support my expectation that reading comprehension would have a positive effect on metaphor interpretation and also on providing richer explanations that refer to both the target and the source domain of the metaphor. The finding that skilled comprehenders are better than less skilled comprehenders in metaphor interpretation is consistent with the conclusions of Ripoll-Salceda and Aguado-Alonso (2007), and Pickens et al. (1985), but my results give much stronger evidence, because their approach, as discussed in Chapter 3 and in this chapter, had some limitations. My study also shows that the effect of reading comprehension on idioms established by Cain et al. (2005) and Cain and Towse (2008), with higher comprehenders having better results, works in a similar way for the interpretation of metaphors.
- No significant interaction was found between reading comprehension and school grade, either in the analysis of ‘correct interpretations’ or in the ‘two-domain answers’. This finding is not reported anywhere in literature and, in combination with the previous two findings, strongly supports the suggestion to add reading comprehension as a factor in metaphor interpretation in addition to age or school grade.
- In line with my expectation, linguistic form had a significant effect. Verbal metaphors were better interpreted than nominal (*A is B*) metaphors, but this was only statistically significant for the specific set of metaphors that was used. Furthermore, an interaction exists, which indicates that, whereas the tendency is the same, for poor readers the difference between interpreting verbal and *A is B* metaphors was considerably smaller in this set of 18 metaphors than for children with a higher level of reading comprehension. The latter suggests that poor readers struggle more with the interpretation of verbal metaphors than good readers, and because of that their

results are closer to their interpretation of (*A is B*) metaphors. My finding goes against the suggestion of Reyna (1985) that nominal (*A is B*) metaphors may be easier to interpret, but, as discussed in Chapter 4, we cannot be sure about her findings. A possible reason for easier verb interpretation is that the flexibility of the verb may facilitate identification of the intended meaning. This seems in line with the analysis of Cameron (2003), namely that, in relation to verbal metaphors, children talked much more about the topic, also making it plausible that verbal metaphors restrain a richer interpretation. This is confirmed by my results with the 'two-domain answers' where I found, as expected, that *A is B* metaphors were better interpreted than verbal ones for the specific set of metaphors that was used. This also seems to be supported by the finding of Cameron that for nominal metaphors children made the link between topic and vehicle in her study.

- As I anticipated, conventional metaphors were better interpreted than non-conventional metaphors, although this is only statistically significant for the specific set of metaphors I used. In this case an interaction also existed between reading comprehension and conventionality. Whereas the tendency was similar for poor and good readers, the ratio for poor readers was 1.30 in favour of conventional metaphors, whereas for good readers this was 1.05. This suggests that poor readers, having less language skills, have more difficulty with interpreting non-conventional metaphors and are more at ease with conventional metaphors, whereas good readers have less difficulty with interpreting non-conventional metaphors, which means that their results of interpreting both types of metaphors are closer together. My finding contributes to clarifying the influence of conventionality, which only Pollio and Pollio (1979) reported as significant, whereas Waggoner and Palermo (1989) found a tendency in favour of conventional metaphors, and Özçalışkan (2005) found no difference in interpretation. My study did not show a significant effect of conventionality on two domain answers, which is less plausible, as non-conventional metaphors are more likely to involve cross-domain mapping. I therefore argued that deliberateness may have been a confounding factor by encouraging cross-domain mapping in conventional metaphors, but that further research would be needed.

In sum, my findings confirm that both school grade and reading comprehension have an independent significant effect on the interpretation of nominal (*A is B*) and verbal metaphor in literature, which can be generalized for both children and metaphors. I also found a significant effect of linguistic form, with verbal metaphors being better interpreted than nominal (*A is B*) metaphors. I also found that conventional metaphors were interpreted better, but these effects can only be generalized for the specific set of metaphors.

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8. Discussion and conclusion

This chapter concludes my quest to explore the recognition and interpretation of nominal (*A is B*) and verbal metaphors selected from a sample of literature and science textbooks for children by school-age children of 4th and 6th grade from Cali, Colombia. Metaphor in this research was approached from a symbolic and behavioural perspective, attending to its three dimensions of language, thought, and communication (Steen, 2011a). The symbolic analysis, which was carried out to identify the linguistic material for the behavioural studies, pertained to the linguistic dimension by looking for nominal (*A is B*) and verbal metaphors in two types of discourse. Informants were used to establish the conceptual dimension of conventionality of the mapping, and analytical criteria were used again to determine communicative aspects of deliberateness. At the behavioural level, metaphor processing was investigated by exploring the influence of some child-related factors and some metaphor properties on explicit recognition and interpretation. I looked particularly at the effects of linguistic dimension (nominal *A is B* versus verbal) and the conceptual dimension (conventional versus nonconventional). In addition, the communicative perspective was considered by comparing the recognition of metaphors in written texts from two types of discourse, literature and science. A further exploratory analysis was made looking at some of the best and worst recognized metaphors, which provided valuable insights into one communicative aspect, deliberateness, which may play a role in metaphor recognition.

The main goal in developing this research was to gain a better understanding of children's processing of metaphors, particularly in written texts, by adopting a comprehensive framework of analysis that takes into account recent developments in discourse approaches (e.g. Cameron, 2003; Goatly, 1997; Steen, 2008, 2011a) and psycholinguistic approaches to metaphor (e.g. Bowdle & Gentner, 2005; Gentner & Bowdle, 2001, 2008; Gibbs, 1993; 1999; Giora, 1997; 2008). Furthermore, it regards metaphor recognition and interpretation in written language as part of the reading comprehension process, which involves interaction between the reader, the text, and the activity (NAGB, 2008; RAND, 2002).

In the first chapter I argued that metaphor recognition and interpretation in school-age children is influenced not only by their linguistic and cognitive development, but is also related to the

instruction given to children in their formal education system, especially in the area of Language. I explained that the legal context and educational guidelines in Colombia promote a comprehensive approach (e.g., strong orientation to textual analysis, language analysis in different discourse contexts, in-depth comprehension and also production of different types of texts), which would provide a good basis for metaphor processing. In practice, however, this approach is hardly implemented by language teachers. This suggests that the metaphor recognition and interpretation tasks developed for my research were in general challenging for the children as their curriculum activities do not provide much support for reflection on the metaphorical uses of language.

In Chapter 1 I also presented some of the relevant characteristics of, and factors that promote, 'later language development', the label that refers to the period from elementary to high school. Later language development is characterized by an advance in different aspects: lexical, syntactic, metalinguistic and discursive, and is fostered by cognitive development, social life, schooling, and reading and writing. Later language development demands the interaction between a higher level of cognitive and linguistic knowledge and an increasing understanding of different types of texts, and communicative contexts and purposes (Berman, 2004, 2007, 2009; Berman & Ravid, 2009; Karmiloff-Smith, 1986; Nippold, 1998). This set of linguistic attainments creates the conditions for enhancing comprehension and recognition of metaphorical uses of language.

The discussion developed in Chapters 2, 3 and 4 provides the theoretical basis for understanding the complexities of metaphor recognition and interpretation. In Chapter 2 I discussed the different ways in which metaphors can be processed in the mind and the cognitive products resulting from these processes. I indicated that I adopt the three-dimensional framework proposed by Steen (2008, 2011a) for my research. This framework comprises a linguistic and a conceptual dimension, the two dimensions underpinning the Career of Metaphor Theory (Bowdle & Gentner, 2005; Gentner & Bowdle, 2001, 2008), to which Steen adds a communicative dimension in order to explain why many metaphors may not be processed by cross-domain mapping. This is relevant for my research, as it may be expected that recognition and interpretation are influenced by the way metaphors are processed. I have shown that much more research has been carried out with children in metaphor interpretation than in metaphor recognition and that only very few studies use metaphors embedded in naturalistic discourse.

In Chapter 3 I discussed child-related factors that have been shown to influence metaphor interpretation (knowledge of conceptual domains, and use of linguistic context) and other factors that may have influence as well (i.e., metalinguistic competence and metalexical awareness, ways of reading and reading comprehension). I have suggested that these factors may also play a role in metaphor recognition but this has not been confirmed by research. These factors include: knowledge of conceptual domains, metalinguistic competence and metalexical awareness, use of linguistic context, reading comprehension and ways of reading. Important changes in these aspects occur in children in their school years which in turn affect metaphor recognition and interpretation. Considerable differences, however, exist even among children in the same school grade. I have therefore also posited that reading comprehension is expected to have an important influence on metaphor recognition and interpretation.

Child-related factors are only one part of the story. The picture is more complex, because metaphor-related factors may also be of influence as differences exist between metaphors, as presented in Chapter 4. In terms of properties of metaphors I have explored their linguistic form, looking in particular at nominal (*A is B*) and verbal metaphors. I also discussed the aspect of metaphor conventionality that underpins the Career of Metaphor Theory (Bowdle & Gentner, 2005; Gentner & Bowdle, 2001, 2008), which posits that metaphors are not stable entities, but may proceed over time from novel, through conventional, to dead metaphors. This in turn may affect recognition and interpretation. I have shown that this possible effect has hardly been studied with children and that existing results are not conclusive. I also presented the idea that the communicative dimension of metaphor is a factor that needs to be explored, following Steen's (2008, 2011a) reflection that a deliberate metaphor may be better recognized.

Metaphors do not occur in a vacuum but in a particular discourse context, for which reason I chose to use more authentic materials from the environment of the children. Recent developments have shown relations between the characteristics of metaphors and the class of discourse in which they are present. In Chapter 5 I reported that some psychological studies indicate that class of discourse has influence on metaphor processing. In that chapter I also present my exploratory study on metaphor identification in children literature and science textbooks, which indicates differences in metaphor distribution in terms of linguistic form and class of discourse.

The effect and interaction of some of the child-related and metaphor-related factors discussed in the theoretical chapters, as well as the class of discourse, were explored in two behavioural studies on metaphor recognition and interpretation, presented in Chapters 6 and 7. In the rest of this chapter I will discuss the main findings of these studies, present the contributions and limitations of my research on metaphor at the behavioural and symbolic level, as well as the implications for further study.

8.1 Main research findings and discussion

8.1.1 Selection of participants and development of experimental materials

The selection of participants was based on their school grade and level of reading comprehension. The latter is particularly relevant given that metaphorically used words in written language are part of the texts that readers are trying to understand. As discussed in Chapters 1 and 3, linguistic and cognitive development of children is important in this process and improves during their school period, but not in a uniform way. Some children develop stronger linguistic skills and acquire more word knowledge than others, which may have an impact on metaphor recognition and interpretation.

The decision to work with 4th and 6th grade was based on two criteria of a different nature. The first criterion was conceptual, based on the shift in language skills around the age of 10 (Nippold, 1998) and on differences in metalexical awareness between 8 to 10 and 12 to 14-year-olds (Schechter and Broughton, 1991). The second criterion was methodological: verbal explanation is suitable to use with older children and allows one to gain more insight into their reflection about metaphor. In addition, choosing these two groups, which are different, but not very far apart, allowed me to use the same linguistic material.

For successful reading comprehension both word reading and linguistic comprehension are needed (Hoover & Cough, 1990), but the influence of word reading reduces with age and may already be quite small by 4th grade and even smaller in 6th grade (Adlof et al., 2006, 2011). I have therefore assumed that reading comprehension for the children involved in my research groups primarily relates to linguistic comprehension, which implies that I only needed to use a reading

comprehension test. Such tests, however, are not uncontroversial and several limitations are mentioned in literature (Kendeou et al., 2012; McNamara & Kendeou, 2011; RAND, 2002; Snowling et al., 2009), as summarized in Chapter 5. As Colombia does not have an official reading comprehension test I used the comprehensive ACL (Análisis Comprensión Lectora) test developed by Català et al. (2001) for children in Spain. This has also been used in different countries in Latin America (Duarte, 2005; Vázquez-Pérez, 2006; Young Steindl, 2010). Most limitations mentioned in the literature do not apply to this test, with the exception of the conflation of comprehension and word reading (which, as indicated above, may have been limited in my case) and the fact that the focus of the test is on the product and not the process of reading comprehension. Understanding of a text does indeed involve a process and a product (the (lack of) comprehension as end result). My goal, however, was not to assess the process but to differentiate between reading comprehension levels of participants, that is to establish the overall achievement of reading comprehension, for which the assessment of the product is enough (van den Broek, 2012). The identification of these levels allowed me to select the participants for the behavioural metaphor studies.

The ACL test includes different components related to language, mathematics, social and natural sciences and comprises a variety of types of genres (called narrative, informative, and poetic). Furthermore, as indicated by the authors, the ACL test questions were developed in such a way that they did not require previous knowledge, providing all necessary information within the texts, whilst also avoiding questions that could be solved just on the basis of background knowledge. This is a positive point, as according to Snowling et al. (2009) it is common that test questions can be solved correctly by using previous knowledge and therewith do not explore text comprehension.

I had to adjust the ACL test to reflect the socio-cultural context of Colombia as it was developed for use in Spain. Adjustments included, for example, changing words, names, and settings, which were not familiar to children in Cali, the city where the studies were carried out. These adjustments were limited and in my view did not result in any changes that threaten the validity of the test.

With the help of this test I analysed the reading comprehension levels of a total of 469 children, 233 girls and 236 boys, at the end of 3rd and 5th grade of two schools in Cali. I then used these data to select participants with low and high levels of reading comprehension for my

studies in metaphor recognition and interpretation. There was no statistical difference between the two schools for the reading comprehension levels in the two grades, which allowed me to combine the results of the two schools in my research. The standard deviation in age of the two groups was 8 and 9 months respectively, which is considerable, but I did not find statistically significant age related differences in reading comprehension within the two grades. This seems to suggest that schooling may be more important than age for reading comprehension, and underscores the need to look at reading comprehension in addition to age or school grade when investigating text comprehension and metaphor processing.

The results confirm that there is considerable variation in reading comprehension levels among the participants in both grades. This supports the idea that substantial differences exist among children of the same grade in their cognitive development, knowledge, skills, and experience with language (e.g. Adlof et al., 2011; Magliano et al., 2007; McNamara & Kendeou, 2011; RAND, 2002). Differences between children are a result of differences in their capacities, but may also be influenced by out of school activities, including support in the home environment (e.g. Finn, 1998; RAND, 2002). From the ACL test results I established four groups of children, two per school grade, with children that had low and high reading comprehension levels.

To study children's metaphor processing in more naturalistic texts implied selecting books available to the participants, exploring the presence of metaphors following an explicit procedure of identification, and developing the linguistic materials to be used in the research. I therefore first explored the presence of nominal (*A is B*) and verbal metaphors in a sample of 34 children's literature and science textbooks from the school libraries of the children. This type of small-scale corpus research is the first of its kind to explore texts for children in Spanish. I used this analysis to select research materials for my behavioural studies, which focus on these two types of metaphors, because of potential differences in their processing (Cameron, 2003; Goatly, 1997). I looked at both literature and science textbooks commonly used in schools as research suggests that metaphor density may differ between different types of discourse for children (Colston & Kuiper, 2002) and also because the type of discourse may influence metaphor processing (Steen, 1994).

For my analysis I combined elements of two methods for manual metaphor identification, the MIV (Cameron, 2003, 2006), which I used to search for metaphors, and the MIP (Pragglejaz Group, 2007) to confirm

the metaphor by comparing the contextual meaning with the more basic meaning. A total of 34 publications, 20 from children's literature and 14 from science textbooks, were reviewed each by two researchers. Results for inter-rater agreements were close to substantial and substantial respectively (Landis & Koch, 1977), which is relatively low and therefore merits some caution in the interpretation of results. Final agreements were reached based on discussion among the researchers using two Spanish language dictionaries from Spain. Results between analysts were better for nominal metaphors of the type (*A is B*), which suggests that these are more easily identified. This seems to confirm Cameron's (1999b) view that verbal metaphors are more complex, as it requires establishing the meaning of verbs and of the conventional collocates as well as their meaning in the discourse context. The findings from her exploratory study showed that raters had more difficulties with the identification of verbal metaphors (Cameron 2003).

In literary books I found a distribution of verbal metaphors of 3.92 per 1000 words whereas this was 0.42 for nominal (*A is B*) metaphors. Hence the density of verbal metaphors is approximately 9 times higher than that of nominal (*A is B*) metaphors. For the science books the distribution of verbal metaphors was 1.82 per 1000 words against 0.58 for nominal (*A is B*) metaphors, implying that verbal metaphors were approximately 3 times more frequent. In both classes of discourse verbal metaphors are significantly more present than nominal (*A is B*) metaphors, which is in line with the findings of Broderick (1992) with respect to nominal (*A is B*) metaphors in child literary books and of Cameron (2003) in relation to science texts. This finding underscores the need that to understand metaphor a broader research perspective is needed that goes beyond the narrow focus on nominal (*A is B*) metaphors used in most of the previous studies with children.

Comparing between literature and science shows that science texts on average contained somewhat more nominal (*A is B*) metaphors than literature, whereas the result for verbal metaphors was the opposite. Both findings, however, are not statistically significant but still the slightly higher presence of *A is B* metaphors seems plausible taking into account that metaphors play a prominent role as educational tools to explain concepts and phenomena in science (Cameron, 2003; Semino, 2008). Taken together, the average density of the two types of metaphors is 1.9 times higher in literature than in science texts, which seems to be in line, for example, with the results of a study by Colston and Kuiper (2002) who identified more metaphors in fiction than in

nonfiction books intended for children. Unfortunately, however, they do not provide detailed information on the word class of the metaphors they found.

Although I only looked at two types of metaphors, the average metaphor densities I encountered were still relatively low in comparison to other studies. For this combination of nominal (*A is B*) and verbal metaphors I found an average of 4.3 and 2.4 per 1000 words in literary and science texts respectively, with important differences in metaphor densities between the texts. A fair comparison with others is not really feasible and would have to be with texts for children as it may be expected that these are different from texts for adults. I only found information from two science texts for children used by Cameron (2003) with a presence of respectively 47 and 49 of these two types of metaphors per 1000 words. Other studies she mentions which use texts with children show ranges from 10 to 25 metaphors per 1000 words but may have included other types of metaphors such as adjectives and other types of nominal metaphors.

A main factor in literature that accounts for a lower metaphor density is the adoption of the approach of Levin (1993), which suggests that authors create a fantasy world where animals and abstract entities can adopt human behaviour. Verbs portraying human action used in this context are not, then, to be taken as used metaphorically. This makes a vast difference in the number of metaphors as in one text, for example, I found an average of 10 verb metaphors per 1000 words, which would have increased to 100 if I had not adopted Levin's approach. Other factors may also have had an influence, including the age category that was used for book selection, where authors may on purpose restrict the use of metaphor or have simplified the books to make them more accessible to younger children. Another point of potential influence may be the translation from another language into Spanish, as metaphor density was particularly low in the translated books, but different views exist about whether this indeed is an issue in literature.

From the publications I selected a total of ten text fragments of ten children's literary books and eight text fragments from seven science textbooks. It proved feasible to find a good variety of reasonably short texts, but several of them needed some adjustments, including shortening without losing coherence. A more important adjustment was the addition of eight nominal (*A is B*) metaphors and two verbal metaphors to the literary texts to ensure that we had enough nominal and verbal metaphors in the text fragments to allow for statistical

comparison. For science texts the situation was even more complex as we had several fragments with a sufficient number of *A is B* metaphors, but just a few verbal metaphors and these were highly conventionalized. Therefore instead of trying to include a larger number and a wider variety of verbal metaphors the decision was taken to concentrate just on nominal (*A is B*) metaphors in these texts. The conventionality of these metaphors was established by 16 teachers from the schools, who ranked each metaphor on a scale from 1 to 7. The results had a Cronbach's alpha of 0.84, indicating a good correlation in the scoring of the raters. The final set of literary texts comprised 18 nominal (*A is B*) metaphorical sentences including nine being classified as conventional and 20 verbal metaphorical sentences, 12 of which were scored as conventional. The eight fragments from science texts included 18 nominal (*A is B*) metaphors, ten of which were established as conventional.

In the next two sections I will discuss the behavioural studies of metaphor recognition and interpretation, where I explored the effect and interaction of both child and metaphor related factors. I have taken a more comprehensive approach than most studies with children by exploring metaphors in more naturalistic texts and looking at metaphors as part of reading comprehension.

8.1.2 Metaphor recognition

My study showed that metaphor recognition is a complex task for children as 4th and 6th graders only recognized 10.6% and 23.7% respectively of the *A is B* and verbal metaphors in literature and 6th graders recognized 15.3% of the *A is B* metaphors in science. Findings also show considerable variation in recognition among children.

Findings indicate that both child-related factors (school grade and reading comprehension) influence metaphor recognition and that these effects are independent. As expected 6th graders were significantly better at metaphor recognition than 4th graders and this clearly points to the relevance of schooling and advanced metalinguistic abilities that support the recognition of figurative language.

School-age children advance considerably in their vocabulary, and in learning more complex figurative meanings, and more abstract concepts (Nippold, 1998). They also enhance their metalinguistic awareness, which makes them better at reflecting upon language. The increasing complexity and diversity of language assignments in classroom activities

and the use of new words and linguistic constructions stimulate this metalinguistic competence of children (Berman, 2007; Nippold, 2004), which becomes more explicit and conscious as they become older (Homer, 2009; Ravid & Tolchinsky, 2002). This ability to reflect upon language is particularly important for metaphor recognition (Winner & Gardner, 1993) and (richer) interpretation (Nippold, 1998). The latter is shown in the study by Schechter and Broughton (1991), who found a clear improvement in children's capacity to reflect on language, with 8 to 10-year-olds showing an initial differentiation of and an ability to provide explanations about physical and non-physical (figurative) meanings of polysemous words (*cold, warm, sharp*) whereas 12- to 14-year-olds were able to give an abstract reflection over these meanings. A more recent study (Piquer-Píriz, 2010) with children of 6, 8, and 10 years supports this trend. The ability to reflect upon language and a degree of awareness of the communicative dimension is exhibited in some of the answers of the children in the interpretation task which I presented in Chapter 7. Several answers also show that there is some variation in the level of recognition, which is in line with the suggestion by Steen (2011a) that people have different levels of awareness of metaphors as metaphors.

The finding that reading comprehension has a major influence on metaphor recognition by children, with some better readers in 4th even doing better than several poor readers in 6th grade, has not been shown before. It is a plausible finding when one takes into account that children with a higher reading comprehension level are also expected to have better text skills and to be more capable of understanding that words and sentences may have different meanings. Moreover, reading comprehension is strongly influenced by metalinguistic awareness (Nagy, 2007; Yuill, 2007, 2009; Zipke, 2007, 2008; Zipke et al., 2009).

In the recognition study I found that linguistic form had a significant effect in that nominal *A is B* metaphors were better recognized than verbal metaphors by both 4th and 6th graders and the effect was slightly stronger for poor readers. Linguistic dimension is one of the three pillars of the framework proposed by Steen (2008, 2011a). The finding that nominal (*A is B*) metaphors are better recognized than verbal metaphors seems to support the view of different authors (e.g. Cameron, 2003; Goatly, 1997) that the word class of the linguistic items influences metaphor recognition, although it is important to note that they refer to different types of nominal (not just *A is B*) and verbal metaphors. Nouns related to concrete things more easily create richer images (Clark &

Paivio, 1991; Goatly, 1997; Reyna, 1987), and facilitate mappings from one concept domain to another (Cameron, 2003).

Recognition of metaphorically used verbs not only requires understanding of the lexical meaning of the verb but the reader must also move to the domain of the basic collocates and juxtapose these with the domain of the collocates used in the context, which seems more complex (Cameron, 2003). This also is in line with my finding that differences in recognition of nominal (*A is B*) and verbal metaphors is larger for poor readers as the higher level of complexity in the process of recognizing metaphorically used verbs is related to the language skills involved in reading comprehension such as vocabulary and comprehension monitoring, in which poor readers have disadvantages. The empirical evidence of other studies about the effect of linguistic form however is not conclusive. Some studies with adults show a tendency that nominal metaphors were better recognized than verbal metaphors, but these findings were not statistically confirmed (Graesser et al., 1988; Steen, 2004). The inconclusiveness of these studies suggests that, as I already pointed out in Chapter 4, differentiating just between nominal and verbal metaphors may be too much of a simplification, as other intervening factors may play a role.

Conventionality did not have a significant effect on the recognition of metaphors in literature for 4th and 6th graders. I did, however, find a significant effect of conventionality for nominal (*A is B*) metaphors in science, but this applies only to the set of metaphors that I used and may be different for other sets of metaphors. Unfortunately for a lack of studies with children these findings cannot be compared with others because as discussed in Chapter 6 it seems more plausible that novel metaphors would be better recognized than conventional ones. In the case of novel verbal metaphors, for example, it can be argued that when the collocates used in the context are novel, the difference between them and the basic collocates may be more noticeable and therewith trigger a higher chance of recognition than when they are conventionalized.

However, it cannot be ruled out that intervening factors may be at play. The conventionality ranking by adults, for example, may not be fully reflecting the reality for the children. Some of the conventional metaphors may in fact be novel for them and this may have positively affected metaphor recognition. Another possible intervening variable may be the deliberateness of a metaphor, which according to Steen (2011a) may entail a better chance of the metaphor being recognized.

This would favour for example the recognition of a deliberate conventional metaphor, which might be another reason for not finding a clear difference in relation to conventionality. The finding that two of the best recognized nominal (*A is B*) metaphors were conventional also seems to support this suggestion. What clearly emerged from the detailed analysis of best and worst recognized metaphors is that all of the best recognized metaphors scored high on some of the features related to deliberateness and particularly on contrast between focus and target domain, imagery value of the focus term and in several cases on signalling. Yet the relative importance of these and other features including *A is B* and novelty need further analysis taking into account that only one novel metaphor was among the three best recognized in literature, whereas the worst recognized included two novel metaphors but the latter for example scored very low on other features. In case of verbal metaphors all were ranked as conventional and the difference between best and worst recognized seems related to contrast and imagery value in particular. For the science texts it can be argued that although conventionality had a statistically significant effect in terms of recognition with novel metaphor in science texts being better recognized, the other features also play a role. The second worst recognized metaphor was rated as novel but scored fairly low in the contrast between focus and target domain and low in imagery value, which is the same for the other two worst recognized, whereas the best recognized metaphors scored high on these two features.

The finding that 6th graders recognized significantly more nominal (*A is B*) metaphors in literature (26.1%) than in science texts (15.3%) cannot be compared with other studies. It confirms, however, the point raised by Steen (1992b; 1994) that a difference in class of discourse may have an important influence on the perception of readers, and that this perception may not only depend on the type of discourse but also on other aspects, such as the type of reading (e.g. quick reception, repeated reading, in-depth study). Statements made by several of the children suggest that they indeed perceive differences between finding metaphors in the two classes of discourse (“it was more difficult in science texts because they are not stories, they are what teachers teach us”; “it was more complicated in the stories”; “it was easier to find [the words with a different meaning] in the stories. In science it is more an information, and then it is more difficult to find those words”).

8.1.3 Metaphor interpretation

This section presents the main findings of the behavioural study of metaphor interpretation where, as in the case of recognition, I explored both child and metaphor-related factors. Metaphor interpretation seems to be less complex than metaphor recognition for children as 4th and 6th graders showed that they understood respectively 47.3% and 62.1% of the *A is B* and verbal metaphors in literature. These percentages are considerably higher than those obtained in metaphor recognition (10.6% for 4th and 23.7% for 6th graders).

Findings indicate that both child-related factors (school grade and reading comprehension) influence metaphor interpretation and that these effects are independent, which is in line with the results in metaphor recognition. The increase of metaphor interpretation with age is not surprising as it is widely supported by research with children (e.g. Keil, 1986; Piquer-Píriz, 2010; Pollio & Pollio, 1979; Reynolds & Ortony, 1980; Schechter & Broughton, 1991; Siltanen, 1989; Waggoner & Palermo, 1989). My study confirms that this trend also applies to metaphor interpretation in texts that reflect the situations children encounter in real life. For two-domain answers, which comprise a richer interpretation and suggest a better understanding of the metaphor as metaphor, a similar tendency was found; even though this was not statistically confirmed it is plausible that, in general, 6th graders are also better at this more advanced level of interpretation. Their greater knowledge of conceptual domains and linguistic skills allows them to better use their previous knowledge and to integrate information from the text than children from lower grades.

The significant influence of reading comprehension on metaphor interpretation and richer explanation is one of the more important findings in my research, as earlier studies (Pickens et al., 1985; Ripoll-Salceda & Aguado-Alonso, 2007) show considerable limitations as discussed in Chapter 3. The strong influence I found clearly points to the advantage high comprehension readers have over poor readers, as they will be able to extract more information from the context in which metaphors are embedded (Cain et al., 2003, 2004; Cain & Oakhill, 2004; Cain & Towse, 2008) and to use their metalinguistic knowledge to reflect over the two domains and the communicative intention of the metaphor. My findings also show that it is very relevant to look at reading comprehension as a separate indicator in metaphor studies, because its effect was independent from the effect of school grade.

The fact that verbal metaphors were better interpreted (59.5%) than nominal (*A is B*) metaphors (49.7%), although only being statistically significant for the specific set of metaphors that were used, seems to confirm that interpretation of verbal metaphors may be easier as suggested by different researchers because verbs are often used in different contexts and their meaning is extended by using new collocates (e.g. Cameron, 2003; Gentner, 1982b; Goatly, 1997). Hence readers may indeed have a larger repertoire of collocates, which may make it easier to explain the metaphor.

For the 'two-domain answers' findings were different in that nominal (*A is B*) metaphors were better interpreted (10.2%) than verbal ones (7.1%) for the specific set of metaphors that was used. This seems to be in line with the finding of Cameron (2003) that in her protocols the vehicle terms in verbal metaphors did not become the theme of the talk by children, which was different for her nominal metaphors. When the meaning implied in the verbal metaphor is one of the extended meanings of the verb it seems unlikely that a realization of the presence of two different domains takes place in order to make sense of the metaphor. This implies that vehicle terms in verbal metaphors are likely to be noticed less and therefore would generate fewer 'two-domain answers', unless other factors (novelty, deliberateness) which draw attention to the source domain are at play.

Cameron (2003) and Goatly (1997) also suggest that it is easier to identify the two domains in nominal metaphors (and perhaps particularly for *A is B* metaphors although the authors do not restrict their analysis to this structure). It is plausible that the detection of the domains facilitates the construction of a richer interpretation that includes the reflection about each domain and the connection between the two. To provide 'two-domain answers' for verbal metaphors children would need to think of the conventional collocates of the verb in addition to the ones used in the context, which adds a level of complexity that is less likely to apply to nouns.

My finding that conventional metaphors were better interpreted than nonconventional metaphors is in line with the tendency shown by Pollio and Pollio (1979) and Waggoner and Palermo (1989). Although only statistically significant for the specific set of metaphors I used, this result seems plausible when one takes into account that conventionality implies that the base terms of conventional metaphors are more present in the linguistic community than those of non-conventional metaphors, and may thereby be easier to explain. However, other factors may be at

play, which was confirmed by the interaction between conventionality and reading comprehension. Whereas both poor and good readers were better at interpreting conventional metaphors, the difference was considerably smaller for good readers. This finding seems to suggest that better readers benefit more from the clues in the text and their advanced understanding of language, which allows them to interpret relatively more nonconventional metaphors than poor readers. I did not find a significant difference related to conventionality for the ‘two-domain answers’ which may be the result of the influence of deliberateness of some of the conventional metaphors.

When comparing the levels of recognition and interpretation, the latter are much higher, which confirms that metaphors can make perfect sense to readers, but may not be explicitly recognized as such, as suggested by different authors (Gibbs, 1993, 1994, 2002; Glucksberg & Keysar, 1993; Glucksberg, 2008; Steen, 1994, 2007, 2011a). In general it can be concluded that my findings support that recognition is more difficult than interpretation and that, as discussed in Chapter 2, comprehension and recognition of metaphor are two different and independent processes that may or may not go together. A reader may be very able to understand a metaphor, but this does not mean that it is recognized as a metaphorical use of language.

8.2 Contributions and limitations

8.2.1 Selection of participants and development of experimental materials

What clearly emerges as an innovative finding from this study is the importance of using reading comprehension as an indicator to differentiate between children of the same school grade or age group when investigating metaphor processing in written text. My study has shown considerable differences in reading comprehension among children of the same school grade, which are not age-related. This aspect has not received much attention in literature other than the general observation that individual differences exist among children.

I needed to make adjustments to the ACL test that was developed in Spain as this contained several words and settings that are not familiar in the local linguistic environment in Cali, Colombia. By adapting the

context specificity of the test I reduced a possible limitation, in that children would not be able to respond not because of limitations in reading comprehension but because of a lack of knowledge of the Spanish context. In making adjustments, however, I have been very careful not to change meaning. Adapting the test to the local context may also have contributed to children being more motivated to complete the test as Kintsch (2012), for example, has indicated that motivation is closely related to prior knowledge and for that reason the test must be fairly familiar to the children to generate good results. It would indeed seem that children are more encouraged and motivated to proceed with a test if they understand the texts and the questions (van den Broek, 2012).

A limitation is that the reading comprehension test results are generic and do not differentiate between specific sub-skills of readers, such as integration and inference making, knowledge of story/text structure or comprehension monitoring. This implies that, as pointed out by Cain and Oakhill (2006b, 2012), children with similar reading comprehension levels are not a homogeneous group, but may have different strength and weaknesses. This is confirmed in my findings that children with similar reading comprehension levels performed differently with respect to metaphor recognition and interpretation.

Another issue that can be seen as a limitation is that I did not carry out a word reading test with the children. In this I based myself on Adlof et al. (2006), who indicate that the effect of word reading in reading comprehension reduces with age, and is already quite small in 4th grade. Nevertheless, it cannot be ruled out that low reading comprehension scores of some of the 4th graders resulted in part from limitations in word reading. This, however, is not expected to have an effect on the outcome of my research.

Even though the study that was used to select the materials only comprised 34 books, it is the first that explores the presence of metaphorical uses (*A is B* and verbal metaphors) in books in Spanish intended for children including both books originally written in Spanish and books translated from other languages. Similar to Broderick (1992) I found that the publications contained more verbal than *A is B* metaphors, which can be taken as a confirmation of the validity of the results.

A limitation of the study was the focus on just nominal (*A is B*) and verbal metaphors and the method used for metaphor identification which was a combination of some elements from the MIV and the MIP instead of a systematic analysis of every word in the text. This had the

major advantage of requiring fewer resources, but in the process it is possible that some metaphors were overlooked. On the other hand the risk that this has happened was reduced by the fact that each text was reviewed independently by two researchers.

The importance of applying a systematic procedure as applied in the MIP with the use of a dictionary to solve unclear cases is essential. A convincing example was that one of the teachers, in a discussion about a conventionalized verbal metaphor in science text, indicated that she felt that this was not a metaphor as for her there was no other way of saying it. Yet when identifying the basic meaning in the dictionary and comparing this with the contextual sense of the term she could be convinced that it was indeed a metaphorical use.

As there is no specific dictionary for Spanish in Colombia, I used the official dictionary of the Spanish Language Academy and a second dictionary particularly for verbs in those cases where the meanings did not provide sufficient clarity. Still some differences may exist between the interpretations of Spanish in Colombia that are not reflected in these two dictionaries, which may have had some influence particularly in establishing the basic meaning. This potential limitation was reduced by the fact that the analysis and discussion was carried out by native language speaking raters from Colombia.

In terms of findings it is very clear that the metaphorical used words that I identified were not evenly distributed. Some texts contained considerably more metaphors than others, a finding that is also reported by others (Koller, 2003; Krennmayr, 2011). Even if the sample were not fully representative the main finding that the presence of verbal metaphors is higher than of nominal (*A is B*) metaphors is still very plausible as this was found in most publications that were reviewed.

The modest corpus study allowed me to select authentic text for the research, which is quite different from most other studies with children which are based on constructed materials. This, however, also has its limitations, as I needed to adjust the materials and to add some metaphors to ensure that the texts were sufficiently brief but still informative, whilst comprising enough metaphors to allow for statistical analysis. I do not expect that these adjustments have implications for the validity of my research, as the changes were limited and checked with a colleague to ensure that text coherence was not affected.

8.2.2 Metaphor recognition and interpretation

As far as I know my study is the first that explores metaphor recognition by children in naturalistic language in Spanish and to my knowledge there is no study of this nature and magnitude in English. I am only aware of two metaphor recognition studies with children. The first is Cameron (2003), who explored metaphor processing with two children (nine and ten years old) based on the analysis of their interactive and collaborative process of talking-and-thinking while they read and discussed two different texts. The other is Groot et al. (1995), who tested whether children were aware of metaphors placed as the last line in short stories developed for the study. My study is broader and has advanced the insight in children's recognition of metaphors including in the analysis some metaphor properties, and also using more naturalistic discourse than Groot et al. (1995). Other innovative elements include the systematic analysis of the influence of reading comprehension, as well as the exploration of the influence of the communicative dimension by comparing some features of some of the best and worst recognized metaphors in literature and science texts, which may make readers aware of the intended metaphorical use.

Studies on metaphor interpretation with children are more common, but very few with native Spanish speakers and none using naturalistic discourse in Spanish. The exploration of the possible influence of the linguistic dimension and conventionality in the interpretation of metaphors by children has also been subject to very limited research. My comprehensive study confirmed that metaphor interpretation increases with age, but in addition showed the relevance of the innovative aspect of reading comprehension. It also showed that verbal metaphors were easier to interpret than nominal (*A is B*) metaphors and confirms the trend found in two studies that conventional metaphors were better interpreted than non-conventional ones.

Most of the children participated actively in the three behavioural studies and several of them were even sad that the process ended. This clearly shows their interest in this type of tasks that include more careful reading. Several children stressed that they very much liked the process and had learned to look at a text in a different way, that they had learned that words could have different meanings in different settings, that they were allowed to make mistakes (referring to the nature of the set of tasks children perform within the research) and one girl from 6th grade

even indicated that she had “learnt to read” implying that she learnt how to read in-depth, which allowed her to have a better understanding of the text and its linguistic features. I find this very promising as it seems very possible to develop some of the research methodology into a process that can be used in the context of language learning at schools.

For metaphor recognition I used an underlining task which has some limitations, as children also underlined other words that were not related to metaphors. In the pilot test I just used a one-step approach, where I asked children to underline “words that express a different meaning than what the text is about”. When discussing the results it turned out that children had also underlined a lot of words that they were not familiar with. I therefore adjusted the test, adopting a two-step approach in which I first asked children to underline words they did not know (unknown words) which were subsequently explained to them and in a following session they were asked to underline words with a different meaning, as shown in the examples. Although this adjustment over the pilot test brought about a vast improvement, the underlining task still proved difficult, as children also underlined several other words in this task. Hence it would have been useful to explore the reason for underlining in more detail to reduce this limitation. But whereas adding such a task to the study would have given more insight, this was not feasible as this would have required a lot of time not only of the researchers but also of the children who in the current study already spent between ten to 12 sessions in the time of their normal lessons. Furthermore it might also have influenced the interpretation task as particularly low readers who underlined twice as many unknown words would have had more exposure to the texts and would have spent more time with the researchers than high readers prior to the interpretation task.

Another point that needs to be made is that in the recognition task children were allowed to work at their own speed and leave when they had finished. In 4th grade the group was even divided into two (poor and good readers) and it showed that good readers were in general faster, which is a confounding factor as poor readers could benefit from having more time. This however does not have any negative implications for my findings, as it may be expected that if the poor readers would have had less time the difference in metaphor recognition with good readers would have been larger.

I have shortened some of the longest texts without changing their essence and by making some changes in consultation with a colleague to

improve the potential comprehensibility and clarity for the children. Furthermore, I gave the texts to the children one by one in random order. I also had to add some metaphors but as these came from other materials available to the children I kept close the naturalistic written texts. Still it can be seen as a limitation that I have not done more to control the possible influence of the differences between the texts used in the studies, for instance in terms of metaphor density, but also in terms of other characteristics, such as coherence and cohesion. The last two have been mentioned by some authors (Best et al., 2006; McNamara et al., 1996; McNamara et al., 2011) as having an effect on text comprehension and even generating an interaction with reading comprehension level and world knowledge of the readers. I also did not explore the possible influence of background knowledge on metaphor processing. This can be seen as a limitation given that differences in text comprehension may occur between narrative and informational text, for example, due to the characteristics of the text genre (Best et al., 2006; McNamara et al., 2011; RAND, 2002). In future studies such limitations may be circumvented by adding an assignment that checks the background knowledge of the children in relation to the domains involved in the metaphors. It needs to be taken into account, however, that this would add to the time required by the children to participate in the research. As background knowledge can be tested separately, it may be an option to explore whether this can be integrated as a task that would fit into the normal school routine.

8.3 Further research

Several issues for further research emerge from this study, the most important of which relate to the presence of metaphors in children's literature and science textbooks, and obtaining more detailed insight into the relation between reading comprehension and metaphor recognition and interpretation. This includes the development of a longitudinal study, exploring options to further improve the underlining task in metaphor recognition, taking a more in-depth look at the awareness of the two domains answers in metaphor interpretation, and generating further insight into the effect of the communicative dimension on metaphor recognition and interpretation. In this section I will develop three of these ideas in some more detail.

In-depth assessment of metaphor presence in child literature and science texts

In my study I have only explored the presence of verbal and nominal (A is B) metaphors and found relative low metaphor densities. I mentioned some possible reasons including the point that authors may limit metaphorical language for younger children in particular. Hence a more comprehensive analysis of the presence of different metaphorically used linguistic forms (nouns, verbs, adjectives, adverbs, etc.) in children's literature and science textbooks would be relevant. This research can benefit a lot from the MIPVU procedures, but can also be extended by also looking at features that facilitate promoting awareness of the metaphorical use.

More detailed analysis of the influence of reading comprehension

Whereas I have established the importance of reading comprehension in the exploration of metaphor processing studies using more naturalistic discourse, this issue deserves further empirical study that looks particularly at different subskills involved in the assessment of reading comprehension. I found considerable differences in the performance of children with similar levels of reading comprehension in both recognition and interpretation of metaphors (Table 8.1). This confirms, as mentioned in Chapter 5, that the overall score for the reading comprehension test seems to mask specific subskills as not all children have the same pattern of strength and weaknesses (Cain & Oakhill, 2012).

Table 8.1

Examples of differences in metaphor processing of children with similar RC levels

School grade	RC level	RC score	Recognition %	Interpretation %
4th	Low	5	0 – 7.9	31.6 – 55.3
4th	High	16	5.3 – 28.9	44.7 – 65.8
6th	Low	7	0 – 26.3	44.7 – 60.5
6th	High	28	28.9 – 65.8	81.6 – 86.8

Further research would be relevant to better understand individual strength and weaknesses by testing a range of discourse processing skills, including for example metalinguistic awareness, inferential skills, comprehension monitoring and knowledge about genre as these may be particularly important for metaphor processing. A related issue is the development of a longitudinal study to explore progress in reading

comprehension over time, as the current tests use different materials for different grades which do not allow for direct comparison. This could provide more insight into the development patterns of children and show in particular whether low reading comprehension levels in lower grades are a prediction for low levels in higher grades.

More detailed analysis of the effect of the communicative dimension

Perhaps the most challenging area for further research concerns the implications of the communicative dimension in metaphor recognition and interpretation, as well as in providing 'two-domain answers'. My research points to the importance of this communicative dimension in that several features of deliberateness seem to play a role in recognition but their level of influence and interaction is unclear. This would require further analysis which I will not address in detail here, but further research may include presenting the same metaphor with and without different signals. It may also include exploring differences in metaphor recognition of a selection of metaphors with clear differences in some of the potential features (i.e., contrast, novelty, and imagery strength).

8.4 Final remarks

I hope that my study will contribute to enhancing the interest in the research of metaphor processing with children. Metaphor research with children has particularly focused on metaphor being used as a vehicle for knowledge acquisition, as a tool to understand new knowledge and new phenomena, and to reorganize existing knowledge as mentioned by Vosniadou (1987a), for example. Metaphors have mainly been studied as a mechanism to compare things and to transfer knowledge from one conceptual domain to another. This explains the emphasis of the research on metaphor interpretation at the expense of metaphor recognition, analysing the type of mappings that are needed to make sense of the metaphor, and exploring knowledge of conceptual domains. This earlier research is well established and has contributed to an important increase in the knowledge and theory about metaphor comprehension by children.

Most of this development however is not recent and most of the theory is based on studies with *A is B* metaphors, even though this type of metaphor is, as I have shown in my research, not the most frequent type in authentic texts for children. Another characteristic of earlier

research with children is that it mostly compared age groups or school grades. The important influence of reading comprehension in metaphor recognition and interpretation shown in my research clearly underscores the relevance of individual differences, which need much more attention in the future, in terms of their implications both for metaphor theory and for the development of child-specific approaches to language learning.

My research also points in the direction of a promising new area of metaphor research with children in relation with what can be called a higher level of language understanding and the communicative dimension of metaphor. It seems imperative that much more can be learnt about the role metaphors can play in improving reading comprehension, text production, and in understanding that language is an act of communication with purposes, intentions, and types of discourse intended for a particular audience.

Such research can also contribute to developing methods to promote what Olson (1997) calls critical reading and thinking. Some of my research methods already point towards possibilities to work with children and help them to reflect on the structure and the purpose of a text and the language used. This new orientation for metaphor research with children would need to explore the use of metaphor in different types of discourse and embrace its communicative dimension in particular. It is relevant in this context to look at metaphor processing and to particularly study factors that influence and boost metaphor recognition and richer interpretation by children. This needs to be explored both at the theoretical level, in order to enhance the knowledge about metaphor and children, but also we must remember its educational implications for reading comprehension and text production. In view of the function of metaphors to invite the reader to look at an issue from a different perspective it seems obvious that metaphor can play an important role in helping children to become better readers, comprehenders, and producers of language.

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Summary

Looking for and making sense of 'special' words

Metaphor recognition and interpretation by schoolchildren

Metaphor research with children became popular in the 1970s, with psychologists in particular exploring children's comprehension of metaphors of the form *A is B* as well as of some other forms, such as adjectives. The main conclusion was that the ability to understand metaphor develops later in childhood. In the following 20 years the main focus remained on the analysis of children's cognitive abilities of children, but research methodologies became more suitable for younger children and also started to include metaphors in short stories developed for the research. These new studies changed the overall perspective, indicating that young children, too, were able to understand metaphors, provided they had the necessary domain knowledge and the task did not exceed their linguistic abilities. This research confirmed that metaphor comprehension increases with age and domain knowledge, and also pointed to the positive influence of a supportive linguistic context. In recent years it seems that the interest in research of metaphor with children has fallen away, as fewer studies have been published than in earlier periods.

What can be concluded is that metaphor research with children has focused particularly on metaphor being used as a vehicle for knowledge acquisition, as a mechanism to compare things and to transfer knowledge from one conceptual domain to another. This is supported by the emphasis on metaphor interpretation, which involves analysing the types of mapping that are needed to make sense of the metaphor and exploring knowledge of conceptual domains. This earlier research has contributed to an important increase in the knowledge and theory about metaphor comprehension by children, but has not sufficiently taken into account that metaphor is a phenomenon of language. This is shown, for example, by the striking point that metaphor recognition has hardly been explored with children and that even less is known about a possible relationship between children's language development, metaphor understanding and metaphor properties. Another gap is that there are no studies that have explored metaphor recognition with native Spanish speakers and very few that have analysed metaphor interpretation in this language.

This dissertation seeks to address these gaps by exploring the recognition and interpretation of metaphor in written language by school-age children in 4th and 6th grade from Cali, Colombia. It explores the influence of the child-related factors school grade and reading comprehension. This analysis takes into account that the school period is crucial for language development and leads to important changes that allow children to better reflect upon language and to become better at understanding figurative language; but also that this progress is not uniform and important differences even exist between children of the same school grade. Following Steen's three-dimensional model that situates metaphor in language, thought and communication, this research also looks at the effect of the linguistic dimension (nominal *A is B* versus verbal metaphors), the conceptual dimension (conventional versus nonconventional) and the communicative dimension by exploring the influence of two types of discourse, literature and science, and the deliberateness of metaphor.

The identification of reading comprehension levels of 469 children from two school grades confirmed that important differences exist among children within these two grades which allowed establishing four groups of participants for the research with respectively lowest and highest reading comprehension levels from each of the two school grades. A symbolic analysis of the presence of nominal (*A is B*) and verbal metaphors in 34 children's literary books and science textbooks was made to identify the linguistic material for the behavioural studies. Two methods for manual metaphor identification were taken into account: metaphor identification through vehicle terms -MIV- and the metaphor identification procedure -MIP. This analysis confirmed that the density of nominal (*A is B*) metaphors, which are widely used in research with children, is significantly lower than the density of verbal metaphors and that the presence of both types of metaphors was higher in literature texts than in science texts.

The behavioural studies on metaphor recognition, using an underlining task, and metaphor interpretation, using a verbal explanation task, confirmed age-related progress in that in general children from 6th grade were significantly better at both than children from 4th grade. This finding shows the relevance of schooling and advanced metalinguistic abilities that support the recognition and interpretation of figurative language. However, results also show that children with higher reading comprehension levels are significantly better at both recognition and interpretation, with several good readers in 4th grade doing better than

poor readers in 6th grade. This finding is plausible, but has not been shown before. It relates to the differences that exist in language development of children of the same school grade. Findings also show that the levels of interpretation are much higher than those of recognition, which indicates that comprehension and recognition of metaphor are two different and independent processes that may or may not go together. A reader may be very able to understand a metaphor, but this does not mean that it is recognized as a metaphorical use of language.

Findings indicate that the linguistic dimension may affect metaphor recognition, as nominal (*A is B*) metaphors were considerably better recognized than verbal metaphors. Results also show that the opposite is the case for interpretation, with verbal metaphors being better interpreted than nominal (*A is B*) metaphors. Although this was only statistically significant for the specific set of metaphors that were used, it seems to suggest that interpretation of verbal metaphors may be easier than nominal (*A is B*) metaphors.

The effect of the conceptual dimension was ambiguous, in that there was no difference in recognition of conventional and nonconventional metaphor in literature, but the latter were better recognized in science. It cannot be ruled out that intervening factors may be at play. The conventionality ranking by adults, for example, may not fully reflect the reality for the children. Some of the conventional metaphors may in fact be novel for them and this may have positively affected metaphor recognition of some of the conventional metaphors. Another intervening variable may have been the deliberateness which may have enhanced the chance of recognition. The finding that two of the best recognized nominal (*A is B*) metaphors were conventional also seems to support this suggestion. The research showed that conventional metaphors were better interpreted than nonconventional metaphors, although this was only statistically significant for the specific set of metaphors I used. This result seems plausible when one takes into account that conventionality implies that the base terms of conventional metaphors are more present in the linguistic community than those of non-conventional metaphors, and may thereby be easier to explain.

The effect of communicative dimension is confirmed in that 6th graders recognized significantly more nominal (*A is B*) metaphors in literature than in science texts. This suggests that a difference in class of discourse may have an important influence on the perception of metaphorical use by readers. More important, however, are the results

from the analysis of some of the best and worst recognized metaphors, which suggest that deliberateness seems to play a role in metaphor recognition. All of the best recognized metaphors scored high on some of the proposed features related to deliberateness, and particularly on contrast between focus and target domain, imagery value of the focus term and in several cases on signalling. However, the relative importance of these and other features including *A is B* and novelty needs further analysis.

Results presented in this dissertation advance the understanding of metaphor recognition and interpretation from written texts by school-age children and show the need to take language development aspects and particularly reading comprehension into account. This issue deserves further empirical study that looks particularly at the effect of different subskills involved in reading comprehension including for example metalinguistic awareness, inferential skills, comprehension monitoring and knowledge about genre as these may be particularly important for metaphor processing. The overall score for the reading comprehension test may mask strengths and weaknesses in these skills among children.

Findings also clearly point in the direction of a promising new area of metaphor research with children in relation with what can be called a higher level of language understanding and the communicative dimension of metaphor. Much more can be learnt about the role metaphors can play in improving reading comprehension, text production, and in understanding that language is an act of communication with purposes, intentions, and types of discourse intended for a particular audience. This requires further exploration both at a theoretical and empirical level. Some of the methods used in this study already draw attention towards possibilities to help children to reflect on the structure, use and the purpose of a text, which in turn may contribute to them becoming better readers, comprehenders, and producers of language.

Samenvatting

Zoeken naar en leren begrijpen van ‘speciale’ woorden

Herkenning en de interpretatie van metaforen door schoolkinderen

Onderzoek naar het gebruik van metaforen door kinderen werd populair in de zeventiger jaren. Met name psychologen onderzochten het begrip van kinderen van metaforen die zelfstandige naamwoorden met elkaar vergelijken (een A is een B) en een beperkt aantal andere metafoorvormen zoals adjectieven. Een belangrijke conclusie van dit onderzoek was dat het vermogen om metaforen te begrijpen zich later in de kindertijd ontwikkelt rond de leeftijd van 10 jaar. In de volgende 20 jaar bleef de nadruk gericht op de analyse van de cognitieve vaardigheden van kinderen, maar onderzoeksmethodieken werden meer geschikt gemaakt voor jongere kinderen en in een deel van het onderzoeksmateriaal werden metaforen opgenomen in korte teksten. Deze nieuwe studies veranderden het beeld en bevestigden dat ook jonge kinderen in staat waren om metaforen te begrijpen, op voorwaarde dat ze over de nodige kennis van de metaforisch vergeleken conceptuele domeinen beschikten en de taak hun taalkundige vaardigheden niet te boven ging. Dit onderzoek bevestigde dat het begrip van metaforen toeneemt met de leeftijd en met een toename van domeinkennis. Ook werd de positieve invloed van een ondersteunende linguïstische context bevestigd. Een belangrijke conclusie is dat het onderzoek naar metafoorgebruik door kinderen zich vooral heeft gericht op het gebruik van metaforen voor kennisverwerving, als een mechanisme om kennis van het ene conceptuele domein te vergelijken met dat van een ander domein. Deze conclusie wordt ondersteund door de nadruk in de verschillende studies op de analyse van de interpretatie door kinderen van metaforen en de daaraan gerelateerde kennis van kinderen van conceptuele domeinen. Dit onderzoek heeft bijgedragen tot een belangrijke toename in kennis over en de theoretische grondslag voor de interpretatie van metaforen, maar heeft niet voldoende rekening gehouden met het feit dat de metafoor een conventioneel onderdeel van de taal is. Dit blijkt bijvoorbeeld uit het opvallende feit dat de herkenning van metaforen door kinderen nauwelijks is onderzocht en dat nog minder bekend is over een mogelijke relatie tussen taalontwikkeling, de eigenschappen van metaforen, en metafoorbegrip. Een andere lacune is dat er heel weinig studies over het interpreteren van metaforen en geen over metafoorherkenning zijn gedaan met Spaanstalige kinderen.

Dit proefschrift richt zich op de aanpak van deze lacunes door het verkennen van de herkenning en de interpretatie van metaforen die onderdeel uitmaken van geschreven taal door schoolgaande kinderen uit groep 4 en 6, in Cali, Colombia. Het onderzoekt de invloed van twee factoren gerelateerd aan de kinderen: hun schoolgroep en hun leesbegrip. In deze analyse wordt rekening gehouden met het feit dat de schoolperiode cruciaal is voor taalontwikkeling en leidt tot belangrijke veranderingen die het voor kinderen mogelijk maken om beter na te denken over taal en meer begrip te ontwikkelen over figuratief taalgebruik. Deze vooruitgang is echter niet uniform en belangrijke verschillen bestaan tussen kinderen, zelfs in dezelfde schoolgroep. Het onderzoek maakt gebruik van het drie-dimensionale model van Steen (2008) dat de metafoor situeert in taal, denken, en communicatie. Het richt zich op zowel het effect van de talige dimensie (metaforen die twee zelfstandige naamwoorden vergelijken (een *A is een B*) versus het gebruik van metaforische werkwoorden), de conceptuele dimensie (conventionele versus niet-conventionele metaforen) en de communicatieve dimensie (het al dan niet opzettelijke gebruik van de metafoor als metafoor). Dit vindt plaats in twee verschillende communicatiedomeinen: literatuur en teksten over de exacte wetenschap.

Een toets van de leesvaardigheid van 469 kinderen uit twee verschillende school bevestigde dat belangrijke verschillen bestaan tussen de groepen maar ook tussen kinderen binnen iedere groep. Dit maakte het mogelijk om vier groepen deelnemers te selecteren voor het onderzoek met respectievelijk een lage en hoge leesvaardigheid in ieder van de twee groepen. Om het materiaal voor het metafooronderzoek met kinderen te identificeren werd een analyse verricht van de aanwezigheid van metaforen die een vergelijking maken tussen twee zelfstandige naamwoorden (een *A is een B*) en metaforisch gebruikte werkwoorden in 34 kinderboeken (literaire en wetenschappelijke boeken). Hierbij is gebruik gemaakt van een combinatie van twee identificatie methoden: de MIV en de MIP. Deze analyse bevestigde dat er aanzienlijk meer metaforisch gebruikte werkwoorden in deze boeken voorkwamen dan metaforen waarbij zelfstandige naamwoorden worden vergeleken, terwijl de laatste groep op grote schaal is gebruikt voor onderzoek met kinderen. Bovendien werd vastgesteld dat een groter aantal van de twee onderzochte typen metaforen voorkomen in literaire teksten dan in wetenschappelijke teksten.

De gedragsstudies naar de metafoorherkenning werden uitgevoerd met behulp van onderstreping en metafoorinterpretatie met behulp van een mondelinge toelichting. De resultaten bevestigden een leeftijdsgebonden vooruitgang waarbij kinderen uit groep 6 beter presteerden dan kinderen uit groep 4. Deze bevinding toont het belang aan van scholing en van de geavanceerde metalinguïstische vaardigheden die de herkenning en de interpretatie van figuratieve taal ondersteunen. Maar de resultaten tonen ook aan dat kinderen met een betere leesvaardigheid significant beter zijn in metafoorherkenning en -interpretatie, waarbij een aantal betere lezers uit groep 4 het zelfs beter doen dan mindere lezers uit groep 6. Deze bevinding is aannemelijk vanwege de ook meegenomen verschillen in taalontwikkeling binnen de twee schoolgroepen, maar is niet eerder aangetoond. De resultaten laten ook zien dat metaforen vaker goed worden geïnterpreteerd dan als zodanig herkend en dat dit twee verschillende en onafhankelijke processen zijn die al of niet samen gaan. Een lezer kan zeer goed in staat zijn om een metafoor te begrijpen, maar dit betekent niet dat deze ook wordt herkend als metaforisch taalgebruik.

De bevindingen wijzen er ook op dat de talige dimensie van invloed is op de herkenning van metaforen. Metaforen die gebruik maakten van zelfstandige naamwoorden (een *A is een B*) werden vaker herkend dan metaforisch gebruikte werkwoorden. Het tegenovergestelde is het geval voor de interpretatie van deze twee soorten metaforen, maar dit laatste is alleen statistisch significant is voor de specifieke set metaforen die in dit onderzoek gebruikt werden en mag niet worden gegeneraliseerd zonder vervolgonderzoek.

Het effect van de conceptuele dimensie van de metaforen is niet eenduidig. Er was geen verschil in de herkenning van conventionele en niet-conventionele metaforen in literaire teksten, maar in wetenschappelijke teksten werden niet-conventionele metaforen wel beter herkend. Bij dit deel van het onderzoek kan niet worden uitgesloten dat er interveniërende factoren in het spel zijn. Het is goed mogelijk dat volwassenen een metafoor als conventioneel waarderen maar dat sommige van deze metaforen voor kinderen in feite nieuw zijn wat daarmee de resultaten van het onderzoek kan beïnvloeden. Een andere factor kan de opzettelijkheid van de metafoor zijn, wat de kans op herkenning vergroot. Dit soort factoren lijken inderdaad van invloed te zijn geweest want twee van de best herkende (*A is B*) metaforen waren conventioneel maar ook opzettelijk.

Het onderzoek toonde ook aan dat conventionele metafoeren beter werden geïnterpreteerd dan niet-conventionele metafoeren maar dit was alleen statistisch significant voor de specifieke set van metafoeren gebruikt in de studie. Dit resultaat lijkt plausibel rekening houdend met het feit dat de basis termen van conventionele metafoeren meer aanwezig zijn in de taalgemeenschap dan die van niet-conventionele metafoeren. Dit maakt het aannemelijk dat het voor kinderen gemakkelijker is om conventionele metafoeren uit te leggen.

Het effect van de communicatieve dimensie wordt bevestigd door de resultaten van de analyse van enkele van de best en slechtst herkende metafoeren, die suggereren dat de opzettelijkheid van de metafoer een rol lijkt te spelen in metafoer herkenning. Alle best herkende metafoeren scoorden hoog op een aantal van de voorgestelde kenmerken van doelbewuste metafoeren en met name op: het contrast tussen de domeinen, de kracht van de beeldspraak, en in een aantal gevallen op het aanwezig zijn van signalen die de metafoer aankondigen. Het relatieve belang van deze en andere kenmerken waaronder *A is B* en de nieuwheid van een metafoer verdient zeker verdere studie.

Een ander aspect betreft de tekstsoort want kinderen uit groep 6 herkenden aanzienlijk meer (*A is B*) metafoeren in literaire teksten dan in wetenschappelijke teksten. Er zijn geen vergelijkbare onderzoeken die dit bevestigen, maar Steen (1992b, 1994) geeft aan dat verschillen in tekstsoort een belangrijke invloed op de perceptie van lezers van metafoorgebruik kunnen hebben. In dit onderzoek gaven kinderen aan dat ze het lastiger vonden om metafoeren in wetenschappelijke teksten te vinden omdat dit volgens hen geen 'verhalen' waren.

De resultaten gepresenteerd in dit proefschrift leveren een bijdrage aan ons begrip van metafoerherkenning en -interpretatie in geschreven teksten door schoolgaande kinderen en tonen de noodzaak aan rekening te houden met taalontwikkeling en vooral de leesvaardigheid van kinderen. Dit verdient verder empirisch onderzoek waarbij het van belang is om te kijken naar het effect van verschillende subvaardigheden die besloten zijn in de term leesvaardigheid, zoals metalinguïstisch begrip, capaciteit om interferenties te maken, begripscontrole en kennis van verschillende genres omdat deze van groot belang kunnen zijn voor metafoerverwerking. De totale score van de in deze studie gebruikte samengestelde leesvaardigheidstoets kunnen sterktes en zwaktes maskeren in deze verschillende vaardigheden bij kinderen.

De studie wijst ook in de richting van een veelbelovend nieuw onderzoeksgebied van metaforiek en kinderen in relatie tot taalbegrip

en de communicatieve dimensie van metafoor. Veel meer kan worden geleerd over de rol die metaforen kunnen spelen in het verbeteren van de leesvaardigheid, tekstproductie, en in het begrijpen dat taal communicatie betreft met doeleinden, intenties en soorten teksten bestemd voor een bepaald publiek. Dit vereist verdere exploratie op theoretisch en empirisch niveau. Enkele van de in deze studie gebruikte werkwijzen duiden op mogelijkheden om kinderen te laten reflecteren over de structuur, het gebruik en het doel van een tekst en deze kunnen daarmee een bijdrage leveren aan hun ontwikkeling als betere lezers, begrijpers en ontwikkelende taalgebruikers.

Curriculum vitae

Patricia Pineda studied Psychology at the University of Valle, Cali, Colombia and obtained a DEA (equivalent to an MA) from the Department of Linguistics of the University of Barcelona in Spain. She has worked as a lecturer and as member of the 'Language, Cognition and Education' team of the University of Valle and has participated in research and training programmes for teachers from preschool and primary education. In 2006 she became co-director of a research and development project for language and child development focused at children in disadvantaged socio-economic conditions, their families, and their teachers in Cali. Working on a part-time basis in this project she started her PhD as an extramural student at VU University Amsterdam in 2007. Her research interests include basic and applied empirical study of language and child development with an emphasis on metaphor and school-age children, and metaphor in reconciliation processes.