

Towards a Cognitive Theory of Picturebooks

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Growing scholarly interest in picturebooks requires a sound theoretical basis. While various seminal approaches to picturebook theory exist, the fundamental relatedness of picturebooks to the cognitive development of children has not been focused so far. In this article, it is argued that a cognitive theory of picturebooks is needed. Picturebooks, prototypically consisting of picture–text relations, are systematically engaged with the child’s maturing cognitive abilities. In fact, picturebooks foster these abilities through being used in situations of joint reading and attention. The relatedness of picturebooks to the child’s cognitive development is sketched with respect to three types of picturebooks: early-concept books, picturebooks telling stories of lying, and picturebooks displaying maps.

Key words: *cognitive development, early-concept book, language acquisition, literature acquisition, lying, maps, picturebooks*

INTRODUCTION

When a child looks at the front cover of Diana Ross’ and Leslie Wood’s classic picturebook *The Story of the Little Red Engine* (1945), she will see the protagonist – the little red engine – with a face, its eyes/lamps looking curiously in the direction of a curve. While children know much about human faces from early on, it is definitely not part of their knowledge that things – let alone engines – have faces. However, the picture tells the child reader that there are exceptions, at least when it comes to fictional worlds. This simple example shows that learning from picturebooks – for example, understanding that engines may share human traits – is by no means a trivial task. Quite the contrary, it shows that how to describe and explain the growth and development of children’s abilities with respect to understanding how picturebooks work is a genuine research question. As we will show, this research cannot successfully be done when abstracting away from children’s cognitive development.

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By ‘cognitive’ development, we understand development related to language, thinking, emotion, and vision.¹ While children’s development is the focus of developmental psychology, there are disciplines such as linguistics, epistemology, and the study of emotion and vision that contribute to a comprehensive theory of children’s cognitive development. Quite often, when frameworks such as cognitive poetics, literary linguistics, cognitive literary studies, and so on are applied to children’s literature, there is a restriction on certain aspects of cognition to be observed—for example, metaphor or frames and scripts. In contrast to these approaches, we maintain that the best way to connect cognitive studies to picturebooks is to stick to the results of those sciences which devote themselves to the study of children’s cognitive development.

As we will show in more detail in the course of this contribution, picturebooks are objects well suited to the overall purpose of studying the relation between cognitive development and literature acquisition.² However, it should be stressed from the beginning that cognitive development is connected to children’s literature in general. Hence, a cognitive theory of literature acquisition should roughly cover the age between 10 months and 18 years, considering all literary genres children and young adults come in contact with during this age span.

Focusing on language acquisition as an important part of early cognitive development, we may say that language acquisition is a precondition of literary acquisition, and that literature is a specific input to language acquisition.³ By and large, this connection has been overlooked by theoreticians of both children’s literature and language acquisition. It is important to note that with the first picturebooks children are led to basic concepts of literature—for example, sequentiality. This happens in a situation of joint attention, where the pointing and naming game is essential. In the course of literature acquisition, pictures—providing a context for the text—lose their importance, and the child’s reading becomes more self-directed and thus gains autonomy. Although there is some research focusing on the early reading situation (‘reading’, somewhat metaphorically, includes pointing and naming), this complex and open-ended acquisitional process is still not well understood, and, most importantly, a comprehensive model allowing for plausibly putting together the pieces of the puzzle is still lacking.

A cognitive theory of picturebooks should address the question of how language acquisition and literature acquisition interact, and how these interactions may be related to other cognitive processes, such as vision or emotional development. It goes without saying that this is a big task, demanding interdisciplinary cooperation and work for many years to come. Here, in order to further illustrate the programme of developing a cognitive theory of picturebooks, we will focus on three relevant aspects of this enterprise. These are, in turn, 1) the acquisition of conceptual domains on the basis of descriptive picturebooks—that is, those picturebooks that contain no story but show pictures of everyday objects, such as toys, animals, and cars—presupposing categorising and lexical learning; 2) the acquisition of moral concepts such as lying, presupposing abilities related to the child’s theory of mind (Wellman; Astington);

and 3) the impact of maps for the understanding of picturebook narratives, presupposing early abilities related to space and time. Before entering into these issues, however, we would like to describe in more detail how we conceptualise the relation between picturebooks and cognition, and develop three theses on the relation between language acquisition and literature acquisition.

PICTUREBOOKS AND COGNITION

Suppose that picturebooks are basically sequences of picture–text relations.⁴ Then the developmental task for the child is to acquire 1) the ability to understand the pictures—that is, to build up a pictorial representation; 2) the ability to understand the text—that is, to build up a textual representation; and 3) the ability to integrate these representations—that is, to understand or interpret the picture–text relations. It is safe to say that these abilities are connected to the child’s visual development and language development—that is, developmental processes that happen between 10 months and the first school years. It is important to notice that the developmental processes specific for picturebooks are embedded into a special learning situation, namely 4) joint attention to picturebooks in a reading situation. Through the detailed study of this situation, one could hope to find out what exactly happens with respect to 1)–3).

As for 1), the ability to understand pictures, we know that this ability matures over the years. Infants perceive pictures and are able to distinguish between simple two-dimensional forms (Slater, Rose and Morison 286). By five months, they recognise familiar persons and toys (DeLoache, Strauss and Maynard 80). However, during the first year they appear to be unsure with respect to the status of pictures—for instance, when they try to grab an apple shown in a picture. By 18 months, this behaviour does not occur any more. Now children know that they can point to the pictures in order to show things they are interested in. In addition, they learn that names given to pictures of unfamiliar objects relate to the corresponding real objects. However, the insight that pictures are symbolic in nature and that they possess a dual nature (they are things themselves, yet represent things) seems to emerge later, that is, roughly, at 30 months. Furthermore, between two and three years, children acquire the idea that pictures are intentional (for instance, spilled colour on a sheet of paper is not called a picture—see Gelman and Ebeling). While young children are more tolerant towards the concept of picture (abstract pictures, patterns, letters, and numbers are accepted as pictures), children between six and eight years react differently. For them, patterns are not pictures, and even 10-year-olds object to abstract pictures as kinds of picture (Thomas et al. 480). Besides that, it has been shown that colour is an important aspect of children’s visual experience. One-month-old infants spontaneously prefer coloured pictures over gray stimuli (Adams 144). Since very young children’s visual systems are still immature, the significance of colour in picturebooks, the colour preferences of children, and

how coloured pictures (in contrast to black-and-white drawings and photos) are perceived are relevant issues for picturebook research; yet there is a lack of research on these topics (Koerber 33; Werner 48–51). In addition, the images in picturebooks require knowledge of visual codes, such as the distinction between figure and background, the comprehension of ‘negative space’, the recognition of lines, points, and colours as inseparable parts of the depicted objects, and the insight that two-dimensional pictures stand for three-dimensional objects (DeLoache, Strauss and Maynard; Nodelman 26). These visual codes must be learned in order to make sense of pictures (Kress and van Leeuwen 3). By attentively looking at picturebooks, children are encouraged to acquire these conventions that constitute a sort of ‘visual grammar’, which is perpetually complemented by increasingly elaborated visual codes.

With respect to 2), we may assume that the child’s ability to understand a text–picture relation depends on her mastery of her mother tongue. At four years of age, most children master complex sentences, and they have even acquired the ability to produce simple narratives of their own. In contrast, first words are usually acquired by the age of 12 months. We will show in more detail how joint attention to early-concept books is connected to the child’s lexical acquisition, and we will also demonstrate how the demands of this task constitute types of early picturebooks. Here it must suffice to say that not much is known about the early steps of constructing a text–world model – that is, how textuality of simple descriptive as well as narrative picturebooks is acquired.

This holds all the more for 3), the child’s ability to construct an integrated representation of a sequence of pictures and sentences, thus constituting a text. The typical method to find out what this integrative level might look like is to ask children about their interpretations. This reader-response methodology, however, is not sufficient to give us insight into ongoing cognitive processes. Hence, we have to construct models of these processes based on findings in experimental psychology that analyse how children acquire and transfer new knowledge from picturebooks and how the relationship between pictures and text constitutes meaning (Ganea, Pickard and DeLoache 48–55).

Most research has been done with respect to 4), the situation of joint picturebook reading of children and adult mediators (parents, caregivers, and teachers). Scholars found that this situation encourages verbal interaction and that a strong connection exists between early book usage and later skills in reading and writing (Hall; Jones; Ninio and Bruner 4–10; Snow and Goldfield 560; Whitehead 25–30). The early reading situation is ideally supported by adults encouraging children to verbalise their experiences, which fosters a process of ‘dialogic reading’ (Whitehurst et al. 552–9). Numerous case studies have shown that the early reading situation (up to 18 months) encourages a pointing and naming game that functions as a vocabulary acquisition device. When children grow older, the dialogic reading situation is dominated by a question–answer structure, which supports the child’s acquisition of sentence structures such as the structure of *wh*-questions (Blewitt et al. 298–300). It also stimulates mini-dialogues between children and adults, thus improving and extending children’s

conversational and narrative skills (Bamberg; Boueke et al.; Torr and Clugston 30–40). Moreover, this interactional process facilitates the child's acquisition of pragmatic capacities—for example, to understand that questions are clues to starting a communication process. Moreover, several scholars indicate that picturebooks decisively contribute to the acquisition of meta-linguistic and meta-literary abilities, such as the comprehension of metaphor and irony and the appreciation of intertextuality and interpictureoriality (Kümmerling-Meibauer 'Metalinguistic Awareness' 167–76; Rau 146–53).

Nevertheless, these theoretical approaches are still in a fledgling stage, since a comprehensive cognitive framework is lacking. Furthermore, scholars working in the realm of children's literature and picturebook research hardly touch upon these fascinating topics. More frequently, these ideas are considered by developmental psychology, cognitive psychology, and literacy studies—which admittedly often abstract away from individual children and individual picturebooks. So there is ample room for truly interdisciplinary investigations.

SOME BASIC ASSUMPTIONS

We take it for granted that there is a complex, yet systematic cognitive relationship between language acquisition and literature acquisition. As for all time-bound developmental processes, it is useful to set up phases or stages of development. Roughly, one may distinguish preschool years (from 1 to 6 years), primary-school years (from 6 to 10) and secondary-school years (from 10 to 18), or early childhood, pre-adolescence, adolescence, and so on. Note, however, that these phases or stages, imposed on children from an external point of view such as educational systems or biological maturation, need not constitute plausible phases or stages from an internal perspective—that is, development with respect to progress in the language–literature interface. Such phases still have to be constituted on the basis of empirical research into children's development. For instance, we know that children around three years of age begin telling little stories, and we assume that input from picturebooks serves, at least for some children, as a model for their own narrations. There is some research on narrative acquisition (see Bamberg), yet one does not know whether the acquisition of narration (which has, as all cognitive processes, a production and comprehension side) constitutes a separate developmental phase: when it begins, how it is structured, what its milestones are, whether there are plateau stages or acquisitional spurts, how parental input matters, when and how it ends, and so forth.

Before we go more closely into three case studies of picturebooks, we would like to point out that a cognitive approach to children's literature in general, as envisaged in this paper, has broader implications, not only for general literary studies, but also for linguistics. To make these assumptions more precise, we present three hypotheses and shortly comment on them (Meibauer, 'Spracherwerb' 14–16).

Assumption 1

Children's literature is a specific input in language acquisition. A theory of language acquisition has to consider the influence of this input on this developmental process.

The first assumption is directed against nativist theories of language acquisition, namely those theoretical approaches that refrain from the idea that languages are learnt in rich interactional situations (Lightfoot 30–47). Popular key words in this regard are 'poverty of stimulus' and 'missing negative evidence'. However, we know of numerous proofs showing the impact of early context-dependent learning processes on children's increasing verbal proficiency. Joint picturebook reading influences and promotes language acquisition. For this reason our first assumption is rather compatible with cognitivist and interactionist approaches to language acquisition (for example, Tomasello). Both approaches converge on the assumption that all learning situations are strongly connected to children's cognitive and linguistic development.

Assumption 2

Children's literature plays an important role in literature acquisition. A theory of literature acquisition has to determine the impact of children's literature on this developmental process.

The second assumption is tied to previous findings in literacy studies (see, for instance, Dickinson and Neumann; Evans; Hall 'Emergence'; Jones; Kümmerring-Meibauer 'Emergent Literacy'; Nikolajeva), but extends their scope as it also implies emergent literacy – that is, literacy experiences of children younger than three years of age – on the one hand and advanced literacy – that is, literacy experiences of adolescents and adults – on the other. In addition, only by considering theoretical and empirical findings of cognitive psychology and research in language acquisition might scholars be able to get a clear view of this complex learning situation and the different levels of acquisition processes.

Assumption 3

An essential feature of children's literature consists of the consideration of children's cognitive and linguistic capacities. A theory of children's literature should be able to explain this relationship.

The third assumption seems to be trivial at first glance but, in fact, emphasises that a prominent feature of children's literature in general, and picturebooks in particular, consists in considering children's cognitive and linguistic abilities. Accordingly, if scholars are interested to appreciate the peculiar features of children's literature, they have to explain how these processes are mirrored in literature for children.

Somewhat surprisingly, what has not been well understood in the past is the theoretical implication that children's literature is connected to literature

for adults *in the same manner* as child's language is connected to adult's language, namely as a key for a better understanding of the phenomena of literature and language in general. To go a step further, there is a peculiar asymmetry in the history of science as far as linguistics and literary studies are concerned. The appreciation of child language as a separate field of research has been promoted by developmental psychology since the end of the nineteenth century. Prior to that, the idea of the imperfection and deficiency of child language was persistent. However, this attitude was replaced by the conceptualisation of child language as a sequence of developmental stages that finally leads to adult language. The underlying idea – exploring the 'miracle of language acquisition' by taking children's seemingly imperfect behaviour seriously – initiated a shift in perspective: language acquisition is regarded as prototypical human ability that is fundamental for the human self-concept.

By contrast, children's literature was mostly characterised as a predominantly didactic vehicle that serves educational purposes. Comparison of its apparent imperfection to the high aesthetic qualities of literature for adults occasionally resulted in romantic transfiguration, smiling at the 'simple' linguistic, narrative, and aesthetic strategies prevalent in children's literature, and leading to a bifurcation between children's literature research on the one hand and literary studies on the other. However, if one considers the diversity of children's literature and how it evokes children's cognitive, emotional, and social maturation, it should be apparent that children's literature is an especially important key to an appreciation of literature for adults, in the same way as the achievement of adult language cannot be understood without the consideration of child language.

In the following sections we intend to show how an interdisciplinary approach towards the investigation of children's literature that considers children's developing acquirement of linguistic, narrative, and cognitive skills might cross-fertilise children's literature research, language acquisition, and developmental psychology by focusing on three topics: 1) How do picturebooks influence the development of conceptual domains? 2) What is the interconnection between acquisition of lying and picturebook stories with lying characters? 3) How do maps in picturebooks enhance children's developing understanding of space and time?

PICTUREBOOKS AND CONCEPTUAL DEVELOPMENT: EARLY CONCEPTS

The child's task of lexical acquisition is about learning not only the lexemes of their mother tongue, but also the concepts underlying them. Conceptual development is about learning the cognitive categories that structure the world as perceived by us. Take the English lexeme *apple* as an example. This lexeme serves to identify all the referents one can refer to by using this item. Thus by uttering *This is an apple* one can refer to all kinds of apples – red ones, green ones, yellow

ones, apples with a stem or without, and so on. A child has not yet captured the concept of an apple when she uses the lexeme *apple* exclusively for reference to red apples ('underextension') or when she uses this lexeme to refer to apples, pears, and oranges ('overextension'). In general, conceptual knowledge allows us to categorise things, as well as actions and properties. However, conceptual development develops gradually and is an important step for understanding the connection between words and sentences and their referents (Clark; Murphy).

Somewhat surprisingly, from the perspective of someone not taking 'baby books' as a serious object of investigation, there is a special type of picturebook called an 'early-concept book' (Kümmerling-Meibauer and Meibauer 'First Pictures', 327–30; 'Early-concept books', 93–8) which serves the function of teaching early concepts to the child. Early concepts belong to the young child's lexicon and are acquired between 12 and 18 months of age. These early concepts are related not only to nouns, but also to verbs and adjectives (Clark 50–72). Take Dick Bruna's *Erste Bilder* [First pictures] (1969) as an example. Here we find pictures such as a ball, a dog, a flower, and a bucket surrounded by thick black lines on a single-coloured background. But there is no text at all. The idea of joint looking at these pictures invites the child to reflect on the categorical identity of the depicted object and to find a name for it. This happens in close interaction with an adult mediator who stimulates the child by a pointing and naming game ('Look at this. This is an apple!' or 'Show me the apple!'), and by posing *wh*-questions ('What is this?'), to point to and label the depicted object.

While this type of picturebook has deeply respected ancestors, for instance Johann Amos Comenius' *Orbis sensualium pictus* (1658), that display pictures of everyday objects in order to convey encyclopaedic knowledge of the world to schoolchildren, the idea of confronting children about 12 months of age, when their lexicon starts to grow, with early-concept books is quite modern. But how could it happen that these simple books, sold in millions of copies, have been completely disregarded from picturebook research (with the notable exception of Nodelman)? The answer is that one was not aware of the cognitive underpinnings of this book type.

Since these picturebooks most often do not have any text and display everyday objects in a seemingly blatant manner, they are not regarded as prototypical picturebooks, which are distinguished by a more or less complex picture–text relationship (see also Torr and Griffith 8–15). However, it is our contention that early-concept books foster not only lexical acquisition but also the acquisition of visual literacy and young children's literature acquisition. It is quite obvious that early-concept books support the child's acquisition of an early lexicon. So it is not a mere coincidence that the objects depicted in early-concept books are labelled through nouns. Nouns play an important role in the early lexicon: approximately 45 per cent of the first 50 words learned by children are nouns (see Bloom 39–43). However, the acquisition of the meaning of words is not quite as simple as it seems at first glance. In this regard, prototype theory is of particular interest, since children have to learn the prototypical features that

constitute a concept. Research in language acquisition has shown that prototypes are crucial for categorisation and are relevant for conceptual development and lexical acquisition. Basically, early-concept books show prototypical objects from the child's immediate surroundings, such as food, toys, animals, and clothes. Moreover, the names of the depicted objects typically belong to the child's early lexicon.

In comparison to the natural, not guided learning situation, where children learn new words by overhearing people's talk, the learning situation with early-concept books is different. When attentively looking at the images, children are exposed to a new task, namely to acknowledge that pictures are two-dimensional visual representations of referents. Furthermore, they have to learn several basic skills of perception in order to recognise the depicted object, such as the distinction between figure and ground and other visual codes already referred to at the beginning of our article. Children have to grapple with images in early-concept books that often depict the objects in a quite abstract and reduced manner, due to the thick black outline, the preference for primary colours without hue, the lack of shade, and the deployment of negative space (see also Kress and van Leeuwen 21–33). It follows, then, that children may learn a lot from looking at early-concept books. They are introduced to basic visual codes, they are told that there is a conventional, adult usage of words and pictures that they should adopt, and they are supported in the correct assignment of concepts (see also Stephens 159–62).

An important aspect in this regard is that the encounter with early-concept books entices the child to learn the basic 'rules of book behaviour' (Lewis 135), including sitting still, turning the pages, looking, and pointing at the pictures. In addition, children are introduced to sequentiality (books and text have to be read in a predetermined order, and children should be sensitive to 'pageturners', as Gressnich demonstrates), and they are prepared for a basic understanding of the concept 'story', since the objects in early-concept books are usually related to each other, thus stimulating the reader not only to label the depicted objects, but also to tell a short narrative in order to build coherence. These are first steps towards an understanding of fictionality that demands the capacity to produce mental pictures – that is, a mental pictorial representation. When naming depicted objects, such as apple, ball, or doll, young children gradually comprehend that real objects and images of these objects can be denoted by these words. Furthermore, this process is accompanied by a growing ability to produce mental images of the objects, an ability that is essential for a full appreciation of literature.

Although the majority of early-concept books focus on nominal concepts, there also exist early-concept books that focus on verbs, adjectives, and onomatopoeic words. Interestingly, in order to depict these word types, the presence of objects is essential, since it is quite impossible to depict verbs and adjectives as such. Moreover, several of these books contain full sentences, such as 'Baby plays with the ball' and 'I see my ball. I throw,' thus preparing the child to understand and produce simple sentences, which constitute an important

step in language acquisition (see Kümmerling-Meibauer and Meibauer 'Early-concept books', 104–10).

Since many words depicted in these picturebooks still belong to the child's early lexicon, they present a transition from the early-concept book to another book type that might be characterised as 'concept book'. Concept books go a step further, as they show objects that belong to conceptual classes or domains, such as food, animals, furniture, and vehicles. Picturebooks that display abstract conceptual domains, for instance colours, numbers, and shapes, can also be assigned to the category 'concept book'. Although this book type also depicts objects that are denominated by nouns, the words expressing the respective concept most often do not belong to the child's early lexicon but are acquired later, when children are about 24 to 36 months old, and perhaps even older. Hence, concept books not only enrich young children's lexicons, but also support their world knowledge (Ganea, Pickard and DeLoache 50–64; Siegal). This is also true of wordless 'wimmelbooks' that challenge the child's cognitive abilities in specific ways (see Rémi 120–33).

This short survey hopefully illustrates that early-concept books are not an isolated phenomenon. Quite on the contrary, they are closely related to other picturebook types that further develop young children's apprehension of concepts and conceptual domains. Taking up this trace, we become aware that the teaching and structuring of conceptual domains is quite typical of picturebooks for children under three years of age. To work out appealing taxonomies and to explain how these books are actually used and interpreted is a task for many years to come.

PICTUREBOOKS AND THEORY OF MIND ABILITIES: LYING

Since lying is a fundamental human behaviour (Meibauer 'On Lying'), all children have to acquire the skill of lying. If they do not, they are probably pragmatically impaired.⁵ The ability to lie goes together with the acquisition of metalinguistic abilities: for instance, lies must be differentiated from ironies, metaphors, and jokes (Leekam 162–5), and this presupposes an ability to reflect upon language and its functions. A precondition for the child's acquisition of lying is the 'theory of mind', understood as the ability to consider the thoughts, imagination, and feelings of others and respect them when acting (Marraffa). Experimental research has shown that these abilities are usually acquired by four years of age. Precursors of the theory of mind are the imitation of intended actions at 18 months of age, the distinction between one's own and another's feelings or goals, and the onset of symbolic and fictional play. By age two, the ability to ascribe feelings and wishes to others (independently of one's own feelings and wishes) develops.

Usually a distinction between first-order beliefs and second-order beliefs is made. First-order belief is related to the understanding that one can have a false belief about reality (appearance–reality distinction) (ca. age three-and-a-half to

four), while second-order belief is connected to the understanding that one can have a false belief about the belief of another person (by age six). The insight that different perspectives about a belief of another person are possible is a late achievement in the development of children and young adults (between ages 12 and 17).

Research into children's lying is an old and important topic of developmental psychology (Lee and Talwar). For lack of space, we cannot go into detail here. What matters is the insight that the acquisition of lying is intimately connected to the acquisition of the theory of mind: this has been shown in a series of studies basically building on the famous Sally-Anne Task (Wimmer and Perner). Another influential research method is the Temptation Resistance Paradigm. Children are told that they should not spy or play with a toy. If later asked whether they spied or did play with the toy, they could either tell the truth or lie. Already 36 per cent of the three-year-olds tend to lie, while this behaviour is evaluated as very bad by most of the four-year-olds (Talwar and Lee 875). Later in their moral development, children will detect that prosocial lies or white lies are different (Broomfield et al. 58–65). When lying for reasons of politeness or to protect others, lying is rated as acceptable or even welcome social behaviour.

In the course of lying acquisition, the distinction between lying, mistakes, over- and understatements, and ironies is hard to grasp for most children. Until six years of age, many children mistake irony for lying, and even nine- to thirteen-year-olds have difficulties understanding the concept of irony (Winner 141; Creusere 412–15). It is plausible, then, to assume that children can learn about lying from stories of lying (Kümmerling-Meibauer and Meibauer 'Lügengerwerb').

Given the intricacies of the concept of lying, one would not suspect that there are picturebooks dealing with lying. Yet one finds such books, for instance Laura Rankin's *Ruthie and the (Not So) Teeny Tiny Lie* (2007) or *Thomas Tells a Lie* (2001) by Richard Courtney, based on the *Railway Series* by W. Awdry. Both books are pedagogically inspired. The fox-girl Ruthie detects a teeny tiny camera in the playground. When her comrade Martin says that the camera belongs to him, Ruthie denies this: "It's mine!" she yelled. "I got it for MY birthday!" Well, that wasn't true at all. Not one teeny tiny bit.' Plagued by her bad conscience, Ruthie accepts that she has made a mistake and apologises to Martin. In *Thomas Tells a Lie*, Thomas the Tank Engine goes to a carnival instead of checking all the warning signals on the new branch line. He then lies about it and his friend Percy nearly derails. In this narration, it is made clear that lying to others might bring them in danger and thus is a severe breach of trust. As a consequence, part of the story is that the protagonists learn to apologise for their behaviour. Note that the concept of an apology is by no means self-evident for pre-school children.

The pictures of Ruthie and Thomas impressively show the emotional states of the protagonists, thus giving the child reader additional clues to the understanding of the plot. While these books certainly can teach something about

lying, children without any initial concept of lying – that is, without theory of mind – would not be able to understand these picturebook stories. Furthermore, it has been shown that it is not easy to derive a moral lesson from stories (Narvaez et al. 479), and in this sense apparently simple picturebooks like the aforementioned appear to be more demanding than one would suspect at first sight.

It is no mere coincidence that lying characters appear on the scene when children are entering school. For instance, Pippi Longstocking and Pinocchio are such classic characters. In the early school years, children develop their ideas on lying, having the insight that lying is basically connected to the intention to deceive, not necessarily to a falsity. Moreover, since they gradually become members of complex social groups, social, moral, and emotional aspects of lying also come in focus. For instance, it is important that children learn the distinction between antisocial and prosocial lying. We cannot go into these issues here, since our focus is on picturebooks. However, what we want to show is that picturebooks lay the groundwork for later understanding of lying characters and, with our above assumptions 1)–3) in mind, that the relevance of cognitive development for an understanding of children's literature extends to literature for young adults.

PICTUREBOOKS AND THE MENTAL REPRESENTATION OF SPACE AND TIME: MAPS

Many children's books, ranging from picturebooks to children's novels, contain maps. In many cases, these maps are not merely illustrations, since they constitute certain aspects of the overall narration – for instance, which points in time and space are relevant for the story. Famous examples are the maps in *The Wind in the Willows* (1908) by Kenneth Grahame and *Treasure Island* (1883) by Robert Louis Stevenson, but they also appear in picturebooks such as *The Little Train* (1946) by Graham Greene and Dorothy Craigie.

Although there is much research on the mental concepts connected to maps and their acquisition and use (Downs and Stea; Liben; Liben and Yekel; MacEachren), there is – with the notable exception of Honeyman; Pavlik; and Druker – virtually no investigation into the interrelation of maps as parts of children's books and children's understandings of the mental concept of a map at a certain developmental stage. A typical example is the aforementioned *The Story of the Little Red Engine* (1945), which contains a map in the beginning of the picturebook story. The map provides an aerial view of the railway section the little red engine is taking every day, going from its home shed to the destination station and back. The full-colour map shows all important landmarks, such as a farmyard, a small wood, a lake, and a small village, which are additionally denominated, thus making clear that the map does not reproduce a real landscape but a fictional place. In contrast to maps in atlases and geographical books, this map does not solely have abstract symbols and signs but presents a hybrid form, consisting of pictorial representations of single items, such as trees,

cottages, cows, and a caravan, and of abstract symbols, such as a wind rose, and a map title, thus belonging to the category 'pictorial map' (Holmes).

From a cognitive perspective, maps are highly demanding, since they presuppose the development of cognitive abilities and the comprehension of complex visual codes. As studies in the realm of cartography studies, cognitive psychology, and geography literacy have shown, a consistent understanding of maps requires the acquisition of spatial concepts that play a crucial role by influencing the process involved in acquiring information from the environment (Downs and Stea). Subsequently, spatial concepts affect the nature of spatial representation – for instance, in maps that support human spatial orientation. As a consequence, a child who has not mastered the concept of projective space will not succeed on a mapping task that concerns correspondences across change in point of view and viewing azimuth. The comprehension and production of maps necessitate all cognitive skills that are central to the understanding of graphic representation, such as pattern recognition, scale transformation, reduction of information, and comprehension of symbols and notational systems that represent landscapes and cityscapes (Downs and Liben). Moreover, the interpretation of maps requires the ability to take distinct perspectives (eye level versus bird's eye view), and to master proportions and map colour specification. This list of constants apparently reveals that a full-fledged understanding of maps presents a complex cognitive task. Experimental studies have demonstrated that four- to five-year-olds have map concepts – that is, they have a basic knowledge of what a map is and they are able to recognise prototypical maps – although these studies also indicate that preschool children usually have problems with map identification and map utilisation. While the first category refers to the identification of map contents, the latter corresponds with the capacity to handle maps in a competent manner. In this regard, it has been proved that children, even in the primary-school years, are prevalently confused about geometrical relationships such as scale and perspective. Very often they show a tendency to reify symbols – for instance, taking the pictogram of an airplane (as a symbol for airport) as an indicator that a single airplane is located at this place (Downs and Liben 206). This short survey obviously makes clear that map comprehension has to be learnt and that this learning process involves cognitive strategies. Moreover, maps are important means of supporting children's learning of multiple relations between objects and figures by providing a single image of how space is organised (Uttal 250–6).

Coming back to the picturebook *The Story of the Little Red Engine*, the question arises of what children may learn from attentively looking at the map and whether they are able to cope with this demanding graphic representation. Maps as mental representations of places offer an abstract context for the picturebook's narrative. While the pictures in picturebooks present a context for the accompanying text, the underlying temporal–spatial context is given not only by textual information, but also by the map's graphic representation. Therefore, maps represent mental spatial concepts and presuppose knowledge of visual symbols and elaborated narrative capacities – namely the transfer of

the information rendered by the map to the textual and visual presentation of space in the picturebook story. The comparison between the picturebook story and the map fosters the child's developing sense of space and of movements of characters in space over a specific time span. By moving back and forth between single picture and map, children learn to store relevant information in memory and also to develop their cognitive mapping skills. Many researchers refer to this formatted information as cognitive map – that is, the human ability to generate a general map schema (MacEachren). In this regard, the hybrid mixture of abstract symbols and pictorial devices might support the young child's increasing ability to grapple with the map concept, which also includes identification of map contents and comprehension of its specific function.

By a thorough investigation of these different issues, it seems obvious that maps in picturebooks might be regarded as precursors of more elaborate maps that appear in children's novels targeted at schoolchildren.

EPILOGUE

In much contemporary cognitive-literary work inspired by the cognitive sciences, there is a preoccupation with concepts such as metaphor, scripts, blending, and frames. There is a common understanding, for instance, that metaphor is a cognitive as well as literary concept. In so far as metaphor matters to literature, an interpretation of metaphor in a work of literature is conceived of as being *simultaneously* an exercise in cognitive-literary research. We do not deny that this is a fruitful research strategy. However, a deeper understanding of picturebooks (and children's literature in general, as we venture) might be achieved when the total cognitive development of children is related to the works of art created for them. Why don't we read Shakespeare to two-year-olds, and why can an eighty-year-old still enjoy children's poetry? The answer is so simple that it is hard to see why it has been so overlooked in the past: it all depends on cognitive abilities that develop over the course of time.

NOTES

1. Thus we assume a very broad notion of cognition, while being aware that each of these fields may be autonomous to a certain degree (for example, Pessoa; Izard). Our focus is on the interaction of these resources with respect to the interaction of child development and the picturebook.
2. By 'literature acquisition', we understand children's acquisition of abilities that enable them to comprehend and produce literature.
3. When we speak of 'language acquisition', we focus on the natural acquisition of a first language in early childhood. It goes without saying that there are many different types of acquisition scenarios, for example bilingual or multilingual acquisition.
4. An apparent exception to this rule is wordless picturebooks that tell stories by picture sequences only. While there is no explicit text, there must be an implicit text that has to be constructed by the individual reader. A specific type of wordless picturebook is the early-concept book that will be discussed later.

5. For example, in Mark Haddon's *The Curious Incident of the Dog in the Night-Time* (2003), the protagonist Christopher, suffering from Asperger syndrome, says: 'I do not tell lies. Mother used to say that this was because I was a good person. But this is not because I am a good person. It is because I can't tell lies.' (25)

WORKS CITED

Primary Sources

- Bruna, Dick. *Erste Bilder*. Ravensburg: Ravensburger Buchverlag, 1969.
- Comenius, Johann Amos. *Orbis sensualium pictus*. Nürnberg: Michael Endter, 1658.
- Courtney, Richard and W. Awdry. *Thomas Tells a Lie*. New York: Random House, 2001.
- Grahame, Kenneth. *The Wind in the Willows*. London: Methuen & Co, 1908.
- Greene, Graham and Dorothy Craigie. *The Little Train* [1946]. London: Eyre and Spottiswoode, 1957.
- Haddon, Mark. *The Curious Incident of the Dog in the Night-Time*. London: Jonathan Cape, 2003.
- Rankin, Laura. *Ruthie and the (Not So) Teeny Tiny Lie*. New York: Bloomsbury, 2007.
- Ross, Diana and Leslie Wood. *The Story of the Little Red Engine* [1945]. London: André Deutsch Classics, 1999.
- Stevenson, Robert Louis. *Treasure Island*. London: Scholastic, 1883.

Secondary Sources

- Adams, Russell. 'An Evaluation of Color Preference in Early Infancy'. *Infant Behavior and Development* 10 (1987): 143–150.
- Astington, Jane Wilde. *The Child's Discovery of the Mind*. London: Fontana, 1994.
- Bamberg, Michael (ed.). *Narrative Development – Six Approaches*. Mahwah, NJ: Lawrence Erlbaum, 1997.
- Blewitt, Pamela, Keiran. M. Rump, Stephanie E. Shealy and Samantha Cook. 'Shared Book Reading: When and How Questions Affect Young Children's Word Learning'. *Journal of Educational Psychology* 101 (2009): 294–304.
- Bloom, Paul. *How Children Learn the Meaning of Words*. Cambridge, MA: The MIT Press, 2000.
- Boueke, Dieter et al. *Wie Kinder erzählen. Untersuchungen zur Erzähltheorie und zur Entwicklung narrativer Fähigkeiten*. Munich: Fink, 1995.
- Broomfield, Kimberley Anne, Emma J. Robinson and Wendy P. Robinson. 'Children's Understanding about White Lies'. *British Journal of Developmental Psychology* 30 (2002): 47–65.
- Clark, Eve. *The Lexicon in Acquisition*. Cambridge: Cambridge University Press, 1993.
- Creusere, Marlena A. 'A Developmental Test of Theoretical Perspectives on the Understanding of Verbal Irony: Children's Recognition of Allusion and Pragmatic Insincerity'. *Irony in Language and Thought: A Cognitive Science Reader*. Eds. Raymond W. Gibbs and Herbert L. Lang. New York: Erlbaum, 2007. 409–24.
- DeLoache, Judy S., Mark S. Strauss and Jane Maynard. 'Picture Perception in Infancy'. *Infant Behavior and Development* 2.1 (1979): 77–89.
- Dickinson, David K. and Susan B. Neumann (eds.). *Handbook of Early Literacy Research*. Vol. II. New York: The Guildford Press, 2007.
- Downs, Roger M. and Lynn S. Liben. 'Children's Understanding of Maps'. *Cognitive Processes and Spatial Orientation in Animal and Man: Vol. 2, Neurophysiology and Developmental Aspects*. Eds. Paul Ellen and Catherine Tinus-Blanc. Dordrecht: Martinus Nijhoff, 1987. 202–19.
- Downs, Roger M. and David Stea. *Maps in Minds*. New York: Harper & Row, 1977.
- Druker, Elina. 'Mapping Absence: Maps as Meta-artistic Discourse in Literature'. *Visualizing Law and Authority: Essays on Legal Aesthetics*. Ed. Leif Dahlberg. New York: de Gruyter, 2012. 114–25.
- Evans, Janet (ed.). *Talking beyond the Page: Reading and Responding to Picturebooks*. London: Routledge Falmer, 2009.

- Ganea, Patricia, Megan Pickard and Judy S. DeLoache. 'Transfer between Picture Books and the Real World by Very Young Children'. *Journal of Cognition and Development* 9 (2008): 46–66.
- Gelman, Susan A. and Karen S. Ebeling. 'Shape and Representational Status in Children's Early Naming'. *Cognition* 66.2 (1998): 35–47.
- Gressnich, Eva. 'Verbal and Visual Pageturners in Picturebooks'. *International Research in Children's Literature* 5.2 (2012): 167–83.
- Hall, Nigel. *The Emergence of Literacy*. London: Hodder & Stoughton, 1987.
- Hall, Nigel, Jackie Larson and Joan Marsh (eds.). *The Handbook of Early Childhood Literacy*. Thousand Oaks: Sage, 2003.
- Holmes, Nigel. *Pictorial Maps*. London: The Herbert Press, 1992.
- Honeyman, Susan E. 'Childhood Bound: In Gardens, Maps, and Pictures'. *Mosaic: A Journal for the Interdisciplinary Study of Literature* 34.2 (2001): 117–32.
- Izard, Carroll E. 'Emotion Theory and Research: Highlights, Unanswered Questions, and Emerging Issues'. *Annual Review of Psychology* 60 (2009): 1–25.
- Jones, Rhian. *Emerging Patterns of Literacy: A Multidisciplinary Perspective*. London: Routledge, 1996.
- Koerber, Susanne. 'Welche Rolle spielt das Bildersehen des Kindes aus der Sicht der Entwicklungspsychologie?' *Neue Impulse der Bilderbuchforschung*. Ed. Jens Thiele. Baltmannsweiler: Schneider Verlag Hohengehren, 2007. 31–47.
- Kress, Gunter and Theo van Leeuwen. *Reading Images: The Grammar of Visual Design*. London/New York: Routledge, 1996.
- Kümmerling-Meibauer, Bettina. 'Metalinguistic Awareness and the Child's Developing Sense of Irony: The Relationship between Pictures and Text in Ironic Picture Books'. *The Lion and the Unicorn* 23 (1999): 157–83.
- (ed.). *Emergent Literacy: Children's Books from 0 to 3*. Amsterdam: John Benjamins, 2011.
- Kümmerling-Meibauer, Bettina and Jörg Meibauer. 'First Pictures, Early Concepts: Early Concept Books'. *The Lion and the Unicorn* 29 (2005): 324–47.
- . 'Early-Concept Books: Acquiring Nominal and Verbal Concepts'. *Emergent Literacy: Children's books from 0 to 3*. Ed. Bettina Kümmerling-Meibauer. Amsterdam: John Benjamins, 2011. 91–114.
- . 'Lügengerwerb und Geschichten vom Lügen'. *Zeitschrift für Literaturwissenschaft und Linguistik* 162 (2011): 118–38.
- Lee, Kang and Victoria Talwar. *Children and Lying: A Century of Scientific Research*. Oxford: Blackwell, 2014.
- Leekam, Susan. 'Jokes and Lies: Children's Understanding of Intentional Falsehood'. *Natural Theories of Mind*. Ed. Andrew Whiten. Oxford: Blackwell, 1991. 159–74.
- Lewis, David. *Reading Contemporary Picturebooks: Picturing Texts*. London: Routledge Falmer, 2001.
- Liben, Lynn S. 'Thinking through Maps'. *Spatial Schemas and Abstract Thought*. Ed. Meredith Gattis. Cambridge, MA: The MIT Press, 2001. 45–78.
- Liben, Lynn S. and Roger M. Downs. 'Understanding Maps as Symbols: The Development of Map Concepts in Children'. *Advances in Child Development and Behavior*. Vol. 22. Ed. Hayne Waring Reese. New York: Academic Press, 1989. 145–201.
- Liben, Lynn S. and Candice A. Yekel. 'Preschoolers' Understanding of Plan and Oblique Maps: The Role of Geometric and Representational Correspondence'. *Child Development* 67 (1996): 2780–96.
- Lightfoot, David. *The Development of Language: Acquisition, Change, and Evolution*. Oxford: Blackwell, 1999.
- MacEachren, Alan M. *How Maps Work*. New York: Guildford Press, 1995.
- Marruffa, Massimo. 'Theory of Mind'. *Internet Encyclopedia of Philosophy*. 11 November 2011. 1 April 2013. <http://www.iep.utm.edu/theomind>.
- Meibauer, Jörg. 'Spracherwerb und Kinderliteratur'. *Zeitschrift für Literaturwissenschaft und Linguistik* 162 (2011): 11–28.
- . 'On Lying: Intentionality, Implicature, and Imprecision'. *Intercultural Pragmatics* 8.2 (2011): 277–92.
- Murphy, Gregory L. *The Big Book of Concepts*. Cambridge, MA: The MIT Press, 2002.
- Narvaez, Darcia, Tracy Gleason, Christyan Mitchell and Jennifer Bentley. 'Moral Theme Comprehension in Children'. *Journal of Educational Psychology* 91 (1999): 477–87.

- Newman, Susan B. and David K. Dickinson (eds.). *The Handbook of Early Literacy Research*. Vol. 1. New York: Guilford, 2003.
- Nikolajeva, Maria. 'Verbal and Visual Literacy: the Role of Picturebooks in the Reading Experience of Young Children'. *Handbook of Early Childhood Literacy*. Eds. Nigel Hall, Joanne Larson and Jackie Marsh. London: Sage, 2003. 235–48.
- Ninio, Anat and Jerome Bruner. 'The Achievement and Antecedents of Labelling'. *Journal of Child Language* 5 (1978): 1–15.
- Nodelman, Perry. *Words about Pictures: The Narrative Art of Children's Picture Books*. Athens, GA: Georgia University Press, 1988.
- Pavlik, Anthony. "'A Special Kind of Reading Game": Maps in Children's Literature'. *International Research in Children's Literature* 3.1 (2010): 28–43.
- Pessoa, Luiz. 'On the Relationship between Emotion and Cognition'. *Nature Reviews Neuroscience* 9 (2008): 148–58.
- Rau, Marie Luise. 'Metaphors in Picturebooks from 0 to 3'. *Emergent Literacy: Children's books from 0 to 3*. Ed. Bettina Kümmerling-Meibauer. Amsterdam: John Benjamins, 2011. 141–60.
- Rémi, Cornelia. 'Reading as Playing: The Cognitive Challenge of the Wimmelbook'. *Emergent Literacy: Children's books from 0 to 3*. Ed. Bettina Kümmerling-Meibauer. Amsterdam: John Benjamins, 2011. 115–40.
- Siegel, Michael. *Marvelous Minds: The Discovery of What Children Know*. Oxford: Oxford University Press, 2008.
- Slater, Alan, Victoria Morison, and David Rose. 'New-born infants' perception of similarities and differences between two- and three-dimensional stimuli'. *British Journal of Developmental Psychology* 2 (1984): 287–94.
- Snow, Catherine and Beverly Goldfield. 'Turn the Page Please: Situation-Specific Language Acquisition'. *Journal of Child Language* 10 (1983): 551–69.
- Stephens, John. *Language and Ideology in Children's Fiction*. London and New York: Longman, 1992.
- Talwar, Victoria and Kang Lee. 'Social and Cognitive Correlates of Children's Lying Behavior'. *Child Development* 79 (2008): 866–81.
- Thomas, Graham et al. 'What Is a Picture? Children's Conceptions of Pictures'. *British Journal of Developmental Psychology* 19 (2001): 475–91.
- Tomasello, Michael. *Constructing a Language: A Usage-Based Theory of Language Acquisition*. Cambridge, MA/London: Harvard University Press, 2003.
- Torr, Jane and Lynn Clugston. 'A Comparison between Informational and Narrative Picture Books as a Context for Reasoning between Caregivers and 4-year-old Children'. *Early Development and Care* 159.1 (1999): 25–41.
- Torr, Jane and Kathlyn Griffith. 'An Analysis of Children's Alphabet Books: Exploring the Role Played by Nonsense in the Construction of Meaning between Text and Implied Reader'. *Cinderella Transformed: Multiple Voices and Diverse Dialogues in Children's Literature*. Eds. John McKenzie, Doreen Darnell and Anna Smith. Christchurch: Centre for Children's Literature, 2003. 8–15.
- Uttal, David H. 'Seeing the Big Picture: Map Use and the Development of Spatial Cognition'. *Developmental Science* 3 (2000): 247–86.
- Wellman, Henry M. *The Child's Theory of Mind*. Cambridge, MA: The MIT Press, 1990.
- Werner, Annette. 'Color Perception in Infants and Young Children: The Significance of Color in Picturebooks'. *Emergent Literacy: Children's books from 0 to 3*. Ed. Bettina Kümmerling-Meibauer. Amsterdam: John Benjamins, 2011. 39–54.
- Whitehead, Marian. *Language and Literacy in the Early Years*. Thousand Oaks: Sage, 2004.
- Whitehurst, Graver J., Francine L. Falco et al. 'Acceleration Language Development Through Picture Book Reading'. *Developmental Psychology* 24.4 (1988): 552–9.
- Wimmer, Heinz and Josef Perner. 'Beliefs about Beliefs: Representation and Constraining Function of Wrong Beliefs in Young Children's Understanding of Deception'. *Cognition* 13 (1983): 102–28.
- Winner, Ellen. *The Points of Words: Children's Understanding of Metaphor and Irony*. Cambridge, MA: The MIT Press, 1988.

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