

Conversion in Depictions of Anthropomorphic Animals in Picture Books

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Abstract: Picture books are familiar media for children and have a great influence on children's development. Particularly, narrative picture books contribute to the development of children's imagination and provide the basis of rich cultural life throughout their lives. There are many animals depicted in picture books. Animals in narrative picture books for children often appear anthropomorphized, and depictions of animals sometimes mix real and anthropomorphic characteristics. This study focused on conversions of animals in picture books between anthropomorphic and non-anthropomorphic forms. In 591 picture books, 1,930 cases of conversion were observed. In stories with human characters, many conversions involved cats and dogs and changes from non-anthropomorphic animals to anthropomorphic forms. The main triggers of temporary conversions were human or animal-like behaviors and emotions of the characters, while the main causes of long-term conversions were the structures of the stories and character movement to different worlds or into space. The backgrounds of the conversions were deeply related to the social image of animals and to human-animal interactions. Conversion highlights the boundaries between animals and humans and conveys impressive scenes to children which should stimulate child development. The depiction related to children's development in picture books would be one of the reasons why animal picture books are so popular among children.

Keywords: Anthropomorphic Animals, Child Development, Conversion in Depiction, Human-animal Interactions, Picture Books

1. Introduction

1.1. Children and Picture Books

Picture books are familiar media for children that promote various aspects of child development. For example, picture books have been shown to be effective in learning letters, words, and scientific concepts in biology and physics, in solving problems, and in moral development [1]. Researchers have studied how children acquire information from picture books and generalize this information to the real world [2]. Pictures are an important element of children's acquisition of information from picture books. During shared book reading, children predominantly watch the illustrations indicated by the spoken text [3].

Children come to use pictures referentially as a source of information by the age of 30 months [4]. The level at which they transfer information depends on the similarity between

the picture and the actual object [5]. Studies of children's ability to transfer real world information through stories have tended to focus on transferring information from realistic representations, and less on transferring information from unrealistic fiction [6]. However, picture books often include fictional descriptions, and children enjoy many fictional stories.

1.2. Development of Children's Imagination

Fictional stories provide children information that they cannot directly experience [6]. As children develop, they refine their imaginations and enjoy stories. As their language skills develop, children become able to express the imaginative worlds they have created [7], and imagination nurtured in childhood is effective in adulthood. As Vygotsky emphasized, imagination is a creative activity that preserves experience, combines elements previously experienced, recreates them, and generates new propositions and behaviors,

forming the basis of all creative activities in human cultural life [8]. Therefore, nurturing of children's imaginations through fictitious depictions in picture books can lead to the development of cultural experiences in their future lives.

1.3. *Animals in Picture Books*

A remarkable feature of picture books is the depiction of many animals. Animals in picture books are often depicted in unrealistic ways [9], for example, in anthropomorphic forms. Anthropomorphism can create a gap between fantasy and reality that makes it difficult for children to transfer information learned from picture books to the real world [1], and anthropomorphic animals in picture books have been shown to have negative impacts on biological learning in children compared with realistic forms of animals [10, 11]. Nevertheless, such depictions of animals are not necessarily bad, because fantastical animals in picture books can stimulate children's imaginations and promote other forms of cognitive development besides scientific learning [12].

2. Purpose of This Study

Animals in picture books can sometimes change between anthropomorphic and realistic depictions, and such conversions can be expected to have a variety of effects and impacts. This study focuses on these conversions, examining the types of depictions of anthropomorphic animals and quantifying the features of the depicted animals, and discusses their effects on child development.

3. Methods

This study defined three types of animal depictions in picture books based on the study of McCrindle and Odendaal: real, a state in which the animal has a realistic appearance; humanized, a state in which the animal has a realistic appearance but speaks or thinks like a human; and anthropomorphic, a state in which the animal stands upright and walks only on its hind legs [13]. For animals that can raise their upper bodies and support themselves using their lower bodies only, such as birds, mice, rabbits and bears, additional criteria must be adopted to judge if they have obvious human characteristics. These animals depicted in one of the following three ways were judged as anthropomorphic: (a) the tips of the forelegs were used to hold or grab something like a human and to make motions unrealistic for their species, (b) the forelegs were drawn in unrealistic orientations or balanced like a human, and (c) balance of the hindlegs and the position of the body's center of gravity when the upper body was raised were depicted unrealistically, like a human's [14].

It is an interesting feature of picture books that the way an animal is depicted can change within a given book. This study defines the phenomenon by which an animal changes its form to and from anthropomorphic and non-anthropomorphic (realistic or humanized) as a conversion. There are two types of conversion: a single stage conversion, which occurs independently; and a multi-stage

conversion, in which two or more conversions occur consecutively. A case in which a conversion occurs only in one picture (scene) is a temporary conversion, and a case in which a conversion occurs across multiple pictures (scenes) is a long-term conversion.

Data collection was conducted in 2019 on Japanese picture books on the open shelves of a city library in the suburbs of Tokyo, Japan. As of 2018, the municipal library had 981,493 books and 381,620 users and was rooted in the lives of the residents through regular events such as reading books to children, book talks, and various hands-on activities. The library was considered appropriate for research subject because of sufficient popular books and daily access by ordinary people. Books were purchased after the librarians selection based on recommendations from book organizations and requests from library users. Narrative picture books for 2- to 7-year-olds that contained anthropomorphic animals were surveyed. The age classification for each picture book was determined by the publishers or librarians. Excluded were picture books for infants; non-narrative picture books about words and poetry; picture books whose main purpose was intellectual education, such as science concepts; pop-up books; and picture books with collections of short stories. When there were four or more picture books in a series, we randomly selected three for sampling, in order to reduce bias.

Three types of information were recorded for each picture book. 1) Basic features. These included presence or absence of human characters and conversions between anthropomorphic and non-anthropomorphic depictions. 2) Anthropomorphic animals. The species (categories) were recorded. In many cases, it was difficult to accurately identify the species of animals based on biosensorics, due to the style of painting for children. Therefore, commonly used names were recorded, e.g., primates as "monkeys." 3) Conversion characteristics. The following items were recorded for each scene in which depictions changed: classification of the conversion (temporary/long-term and single/multi-stage), status of each conversion (e.g., from humanized to anthropomorphic), and the reason/situation of the conversion (e.g., when eating, a real animal changed the feature to an anthropomorphic one). When it was difficult to determine the classification, two judges consulted.

4. Results

4.1. *Species*

Of the 5,199 picture books that were identified, 1,386 books included anthropomorphic animals, and these were subjected to analysis. Among 591 picture books in which conversions of anthropomorphic animals occurred, 1,930 conversions were observed. The top 10 most frequently occurring anthropomorphized animals, irrespective of the presence or absence of conversion, were rabbits (415 cases), mice (388), bears (316), cats (289), foxes (234), dogs (198), pigs (174), squirrels (163), frogs (138), and raccoon dogs (110). Of the

animals who were depicted with conversions, cats were the most common in both scenes and number of books (Table 1). The chi-square analysis was significant for the number of picture books in which the conversion occurred (χ^2 (9,

$N=2424$)=123.339, $p<.001$). Residual analysis showed that the significantly frequent incidences of conversion occurred in cats and dogs and the significantly in frequent conversion incidences occurred in raccoon dogs, rats, and bears.

Table 1. Frequency of conversions in 10 animals.

| | Number of conversion scenes | Number of books with conversions | Number of books without conversions | <i>p</i> |
|-------------|-----------------------------|----------------------------------|-------------------------------------|----------|
| Cat | 279 | 118 | 171 | *** |
| Dog | 170 | 80 | 118 | *** |
| Fox | 120 | 64 | 170 | |
| Frog | 67 | 35 | 103 | |
| Rabbit | 191 | 101 | 313 | |
| Squirrel | 62 | 38 | 125 | |
| Pig | 57 | 32 | 142 | |
| Raccoon dog | 27 | 16 | 94 | * |
| Mouse | 83 | 60 | 328 | *** |
| Bear | 64 | 38 | 278 | *** |

*** $p<.001$, * $p<.05$.

4.2. Relationship Between Human Presence and Anthropomorphic Animals' Conversion

There were 690 books without human characters and 677 books in human characters appeared. Conversion occurred significantly often in less picture books with human characters (222 books) and significantly more often in picture books without human characters (359 books; χ^2 (1, $N=1364$)=62.02, $p<.001$).

4.3. Conversion Classification

For single stage conversions in all species, there were 1,275 cases of conversion to anthropomorphic forms and 556 cases of conversion to non-anthropomorphic forms (Table 2). Temporary conversions (83.1%) occurred more frequently than long-term conversions (16.9%), and conversions involving humanized types (90.4%) occurred more frequently than conversions involving real types (9.6%).

Table 2. Number of occurrences of single stage conversions.

| | Conversion | Temporary | Long-term | Total |
|---------------------|---------------------------|-----------|-----------|-------|
| Anthropomorphic | Real→Anthropomorphic | 123 | 32 | 155 |
| | Humanized→Anthropomorphic | 903 | 217 | 1120 |
| | Total | 1026 | 249 | 1275 |
| Non-anthropomorphic | Anthropomorphic→Real | 13 | 7 | 20 |
| | Anthropomorphic→Humanized | 483 | 53 | 536 |
| | Total | 496 | 60 | 556 |

Table 3. Causes and frequency of temporary anthropomorphic conversion.

| | Total | (%) |
|--|-------|--------|
| Cultural or human like behavior | 416 | (40.5) |
| Cultural action | 228 | |
| Tool use | 151 | |
| Clothing and outward appearance | 37 | |
| Emotion | 160 | (15.6) |
| Negative | 73 | |
| Neutral | 44 | |
| Positive | 43 | |
| Prosocial behavior | 123 | (12.0) |
| Dietary events | 107 | (10.4) |
| Conversation or utterance | 59 | (5.8) |
| Relating to humans | 57 | (5.6) |
| Love for the opposite sex, children, and friends | 33 | (3.2) |
| Aggressive behavior | 31 | (3.0) |
| Relating to five senses | 20 | (1.9) |
| Bad deed | 10 | (1.0) |
| Behavior relating to prey | 5 | (0.5) |
| Description specific to picture book | 5 | (0.5) |
| Total | 1026 | |

4.4. Causes of Single Stage Conversions

4.4.1. Temporary Anthropomorphic Conversion

Table 3 shows the causes and number of occurrences of conversions that resulted in temporary anthropomorphism. Of the cases in which animals that were in real or humanized states converted to anthropomorphism, 1,026 temporary conversions were observed. The causes of conversion that formed more than 10% of all conversions were as follows, in descending order: cultural or human like behavior, such as dancing (58 cases) and playing (32 cases); emotion, such as joy (31 cases), surprise and shock (18 cases); prosocial behavior, such as rescuing and cooperating (47 cases), bidding farewell or seeing off (10 cases); and a dietary event, such as eating (75 cases) and sitting at a dining table (13 cases). Eating was the most frequent trigger as a distinct cause. Conversion to temporary anthropomorphism often occurred when the animal behaved like a human during various actions and activities or during changes of emotion.

4.4.2. Temporary Non-anthropomorphic Conversion

Table 4 summarizes the 496 cases in which anthropomorphic animals temporarily converted to real or humanized animals. The causes of conversion that formed more than 10% of all conversions were, in descending order: locomotion, such as running (69 cases), fleeing and escaping (59 cases); emotion, such as fear (13 cases) and surprise (8 cases); and instinctive animal behavior, such as climbing (16 cases) and flying (7 cases). Running was the most frequent trigger as a distinct cause. Emotions were more likely to be causes of transitioning between anthropomorphism and non-anthropomorphism. Locomotion and behaviors associated with animal instincts triggered conversion from anthropomorphism to non-anthropomorphism.

Table 4. Causes and frequency of temporary non-anthropomorphic conversion.

| | Total | (%) |
|-------------------------------------|-------|--------|
| Locomotion | 164 | (33.1) |
| Emotion | 61 | (12.3) |
| Negative | 35 | |
| Neutral | 20 | |
| Positive | 6 | |
| Instinctive behavior as animals | 59 | (11.9) |
| Behavior relating to prey | 47 | (9.5) |
| Aggressive behavior | 43 | (8.7) |
| Play behavior | 33 | (6.7) |
| Prosocial behavior | 29 | (5.8) |
| Other behavior | 47 | (9.6) |
| Relating to humans and real animals | 11 | (2.2) |
| Others | 2 | (0.4) |
| Total | 496 | |

4.4.3. Long-term Anthropomorphic Conversion

Among the cases in which real or humanized animals converted to anthropomorphic animals, 249 cases of long-term anthropomorphism were observed (Table 5). The causes of conversion that formed more than 10% of all conversions were as follows, in descending order: the structure of the story, such as the beginning of the story (25 cases) and the happy ending of the

story (15 cases); movement to a different world or into space, such as coming into the human world (9 cases) and entering a magic world or other world (8 cases); relating to friends and friendship, including joining a group of animals (9 cases) and being involved in companionship and family harmony (6 cases); relating to humans, such as following humans (17 cases) and becoming friendly with humans (5 cases); and being in a space in which only animals exist, such as a discussion or gathering among animals (9 cases) and the animal world (4 cases). In a conversion at the beginning of a story, for example, an animal, depicted in real form on the first page or on the page where the characters were described at the beginning of the story, became anthropomorphized when the main story started. Long-term conversion to anthropomorphism often occurred due to the structure of the story and the relationship with human or animal characters.

4.4.4. Long-term Non-anthropomorphic Conversion

There were 60 cases of conversion to real or humanized representations in the long term (Table 6). The causes of conversion that formed more than 10% of all conversions were as follows, in descending order: instinct or ecology, being influenced by animals that follow their instincts (11 cases) and butterfly hatch out from cocoon (2 cases); relating to a human, such as standing in front of or beside a human (8 cases) and entering a human's house (2 cases); change in circumstance or feeling, parting from the group (2 cases) and returning to the family (2 cases); and movement to a different world or into space, or returning to nature (4 cases) and traveling from the human world to an animal world (3 cases). The instincts or ecology of animals were the main causes for long-term conversion to non-anthropomorphic form. Animals that related to humans, went to a different world, and moved around in space were likely to become human, resulting in long-term conversion in both directions to anthropomorphic and non-anthropomorphic animals. Thus, temporary conversion occurred mainly because of human/animal-like behaviors, activities, and emotions, while long-term conversion occurred mainly because of story structure, space, and relationships with other characters.

Table 5. Causes and frequency of long-term anthropomorphic conversion.

| | Total | (%) |
|---|-------|--------|
| Story structures | 55 | (22.1) |
| Movement to a different world or into space | 44 | (17.7) |
| Traveling across other dimension or imaginary world | 22 | |
| Traveling across space | 22 | |
| Relating to friends and friendship | 36 | (14.5) |
| Relating to humans | 32 | (12.9) |
| Spaces in which only animals exist | 25 | (10.0) |
| Spaces and activity that trace human life | 23 | (9.2) |
| Changes in mental or physical conditions | 21 | (8.4) |
| Encounter with new world | 6 | (2.4) |
| Magic | 4 | (1.6) |
| Conversion or utterance | 2 | (0.8) |
| Other | 1 | (0.4) |
| Total | 249 | |

Table 6. Causes and frequency of long-term non- anthropomorphic conversions.

| | Total | (%) |
|---|-------|--------|
| Instinct or ecology | 17 | (28.3) |
| Relating to humans | 16 | (26.7) |
| Changes in circumstance or feeling | 13 | (21.7) |
| Movement to a different world or into space | 10 | (16.7) |
| Story structures | 4 | (6.7) |
| Total | 60 | |

4.5. Causes of Multi-stage Conversion

Multi-stage conversion is the phenomenon in which transformations occur in a chain. The number of occurrences is shown in Table 7. The most frequent conversions were from non-anthropomorphic to anthropomorphic forms, and then to non-anthropomorphic forms again (80 cases). Overall, this was due to movement in space (38 cases) and to changes in condition or state of mind (30 cases). Despite the small number of occurrences, most of the conversions from anthropomorphism to non-anthropomorphism and then back to anthropomorphism occurred through interactions with humans or for human-related reasons (11 of 13 cases). There were 6 cases in which conversions from non-anthropomorphic to anthropomorphic forms occurred more than 3 times. Again, the small sample size should be considered, but 4 of these had human-related causes.

Table 7. Number of occurrences of multi-stage conversion.

| Conversion | Frequency |
|--|-----------|
| Cases via anthropomorphic forms | |
| Humanized → Anthropomorphic → Humanized | 47 |
| Real → Anthropomorphic → Real | 31 |
| Real → Anthropomorphic → Humanized | 1 |
| Real → Humanized → Anthropomorphic → Real | 1 |
| Cases via non-anthropomorphic forms | |
| Anthropomorphic → Humanized → Anthropomorphic | 13 |
| Cases in which anthropomorphic form is achieved in three or more stage | |
| Humanized → Anthropomorphic → Humanized → Anthropomorphic | 6 |

5. Discussion

5.1. Relationships Between Human Presence and Conversion

Animal conversions were suppressed in picture books in which humans appeared but readily occurred in picture books in which humans did not appear. For children learning through picture books, this is an important clue about the relationship between humans and animals. As previously observed, in picture books with human characters, anthropomorphic animals appear less often, and animals tend to be drawn realistically [14]. When humans appear, animals do not have to play the role of humans, and anthropomorphic conversions may be suppressed in order to distinguish between humans and animals. In picture books in which humans appear, the boundary between humans and animals is a stronger wall. On the other hand, in picture books in which no humans appear, it

is easy for animals to transition back and forth between humans and animals. In this way, the presence or absence of humans influences the depiction of animals in picture books.

5.2. Species

5.2.1. Cats and Dogs

Cats and dogs made frequent conversions. Cats and dogs are familiar companion animals that are kept at home, and children's empathy is nurtured through caring for them [15]. Cats were domesticated about 5,000 years ago [16], and dogs were domesticated about 12,000 years ago [17]. Their long history of living with humans suggests that cats and dogs create depth in picture book stories because they are nonhuman neighbors in daily life, and their atypical behaviors make readers feel they are in a different world.

Cats especially underwent many conversions, likely because of human images of cats. Cats are generally perceived as being capricious, free, or selfish [18, 19]. Cats have a history of being persecuted because of associations with magic and devilish beliefs in medieval Europe, and there are many folktales of monster cats in Asia. The characteristics of cats, half-domesticated (half-feral) and inherently independent, have influenced human attitudes toward cats historically and culturally [20]. Although cats are familiar to us, they are mysterious and potential objects of fantasy at the same time. The image of cats has been widely shared in society and has produced fantastical depictions that display aspects of both humans and animals.

5.2.2. Bears, Mice, and Raccoon Dogs

Bears, mice, and raccoon dogs converted less frequently. Morphologically, bears and mice are able to stand on their hind legs; therefore they can easily maintain anthropomorphic forms. Bears have two aspects: one is a realistic representation that is wild and violent [21], and the other is a representation of cuteness derived from the baby schema [22]. Because these two aspects enable bears to originally express a wide variety of features, it is likely that bears do not need to undergo conversion to change the impressions they make in picture books. By contrast, mice are small, weak animals in which children can easily see themselves reflected [23]. Therefore, children may be confused if mice frequently undergo conversion in picture books. The nature of child and mouse thus may lead the authors to fix the depictions of mice in picture books.

Raccoon dogs are naturally considered mysterious. They have been regarded as animals that deceive humans or play tricks on them [24]. Therefore, when raccoon dogs appear in picture books, they often act as distinct characters rather than biological animals, and their anthropomorphic form tends to be maintained, leading to infrequent conversions.

5.3. Causes of Conversion of Depiction Types

A number of causes of conversion could be identified. In temporary conversions, anthropomorphic behaviors and activities mainly triggered anthropomorphic conversions, and animal-like behaviors and activities mainly triggered

non-anthropomorphic conversions. Long-term conversions were less frequent than temporary conversions. However, many long-term conversions were related to the flow or structure of the stories, which implies that these played important roles.

5.3.1. Cultural or Human-like Behavior

Cultural or human-like behaviors were the most frequent causes of anthropomorphic conversions. Various activities of human life were impressively depicted in picture books along with conversions of anthropomorphic animals. This may provide a way that picture books can stimulate children's interest in scenes of daily life. Exposure to daily life events in picture books not only elicits empathy from children, but also provides them opportunities to learn new behaviors and knowledge from virtual experience. Animals are attractive to children [25, 26]. Therefore, Animals should expand children's perspectives on their everyday world by being depicted as acting out daily events just as child readers do.

Effective usage of clothing on animals can give children the sense that the animals are trustworthy and familiar although their nature as animals is not lost [23]. The scenes in picture books in which the animals are anthropomorphized to wear clothes or to pay attention to their appearance as humans are impressive for children, and they feel familiarity with animals wearing clothes. In this way, children should feel less resistance to interacting with animals, which have a different existence from their own, and can enjoy the feeling of integration with the world of the story.

The causes of cultural or human-like behavior classified as playing and dancing are discussed in later sections (prosocial behavior and dietary events, respectively).

5.3.2. Emotion

Various emotions, including negative, neutral, and positive ones, were related to the conversions. Negative emotions such as fear and sadness often triggered temporary conversions, irrespective of anthropomorphism and non-anthropomorphism.

The emotions of various characters were depicted as the stories progressed. This may provide a rich experience for children during their emotional development. Around the age of 5, children can read picture books while caring for the feelings of the characters in the stories [27]. The objects with which children empathize are not only humans who actually exist, such as their caregivers and peers, but also those who appear in picture books. When children read picture books, they guess the feelings of the characters and psychologically share their experiences in the stories. It is important for children to experience rich emotional expressions in the impressive ways shown in picture books.

It is noteworthy that many negative emotions were depicted in the scenes in the picture books. Children in the socialization period gradually expand their world from their home and gain experience through conflicts and trouble with peers [28]. Children face many negative emotions during this process. Anger and fear develop more slowly than joy and sadness in children's perception of other's emotions, which

implies that negative emotions are still undergoing differentiation [29].

The individual emotion that most frequently led to conversion was joy, suggesting that this emotion is easy for children to understand and is often used in picture books. On the other hand, negative emotions accounted for more than half of the conversions. It is likely that picture books enrich children's emotional experience by clearly presenting the emotions that children have had less experience with and by demonstrating the processes and situations in which negative emotions arise.

5.3.3. Prosocial Behavior

Prosocial behavior was the third most frequent cause of temporary anthropomorphic conversion. Children develop their social behavior through interactions with peers [30, 31]. Young children still cling to their own perspectives, but through playing with peers, they find that others have different perspectives, ways of thinking, and opinions, and they come to be able to coordinate and compromise. In this way, children come to show empathy or help for others [32].

Prosocial behavior is voluntary behavior intended to help or benefit others [33]. Prosocial behavior emerges at about age 2, when children come to understand the meaning of the emotions expressed by others and to react to them. Simultaneously, the opposite of prosocial behaviors, such as bullying others, begins, leading to conflict with others [34]. The picture books also revealed cases in which aggressive behaviors, such as fighting or attacking and quarreling with others, triggered anthropomorphism. Children are expected to resolve conflicts on their own, and through such experiences they can acquire social skills necessary for future life [32]. Impressive scenes in picture books that are strongly related to the socialization process might make it easier for children to project themselves and incorporate the stories into their own experiences. Scenes of both prosocial behavior and play behavior had fewer temporary non-anthropomorphic conversions. There were scenes in which animals became absorbed in play and the characteristics of animals emerged. Drawings of play behavior can exhibit the characteristics of both humans and animals and may be used differently depending on the situation. In the case of prosocial behavior, anthropomorphic animals that were bipedal resumed their original quadruped forms when helping others, taking advantage of their native abilities in their animal forms and suggesting that their characteristics are part of their identity.

5.3.4. Dietary Events

Dietary events were the fourth most frequently identified cause of temporary anthropomorphic conversion. These included not only scenes of eating, but also scenes of many characters sitting at dining tables together and having parties. The rationale for these scenes may be the same as for scenes with dancing, which were common as an individual cause of conversion to temporary anthropomorphism. These scenes occurred frequently because they are highly compatible with the narrative structure of the "happy ending" and because they

can also be used as a technique to express intimacy of the characters who are interacting with each other in the stories. The depiction of various animals forming a circle, dancing, dining, gathering, or forming a line, conjures up images of paradise, like the Garden of Eden, and expresses the feeling of supreme peace and harmony [23]. Happy elements of eating and dancing scenes in picture books may give children a sense of security and make their experiences in the fantasy world more familiar.

5.3.5. Locomotion

Moving-related behavior was the most identified cause of conversions of anthropomorphic animals into temporary non-anthropomorphic ones. The most common behavior was running. Animals are active, which is attractive to children. Curiosity and rapid activity effectively influence children to regard the characters as one with themselves when they encounter them in stories [35]. Even one-year-olds prefer animal-motor stimuli to inanimate stimuli. The visual ability of children to readily detect animate stimuli is related to identification of predators and prey, thus providing adaptive value in evolution [25]. Given the prevalence of visually active animals in picture books, it can be concluded that children like their appearance. There were also many cases in which conversions were caused by the need to escape. It is easy to imagine and understand that animals in desperation would return to their original forms. Many scenes of escape were impressively rendered. There were also many stories of poetic justice, in which good was rewarded and evil punished, with justice and evil clearly depicted, as well as stories in which big events occurred that created the feeling of danger. Movement behaviors were also important in scenes where the characters moved to different worlds or into space. Spatial movement is discussed in a later section.

5.3.6. Instinctive Behavior as Animals

The third most frequently observed temporary conversion, and the most frequently observed long-term conversion, involved animals showing instinctive characteristics and turning into non-anthropomorphic forms. Anthropomorphic animals appeared as if they were humans, but simultaneously they had some of the characteristics of animals. Children see anthropomorphic animals as animals, but at the same time, their anthropomorphic depiction conveys humanity to readers. Yano has argued that the answer to the question of what is human can be found in relationships with animals [23]. As children develop, they deepen their self-awareness and change their perceptions of themselves based on the existence of others and by contrasting themselves with others [36]. Children can have opportunities to become aware of themselves as humans by meeting animals in picture books.

5.3.7. Story Structures

Conversions by story structure were most often observed in long-term conversions to anthropomorphism. This method appears to be effective in representing the boundary between

the narrative world and the real world by the conversion of animals. Through this depiction, the story itself emerges as a different world from the reader's perspective. The narrative of folktales includes an opening phrase ("Once upon a time...") and a closing phrase ("... lived happily ever after") that have the effect of detaching the imaginary world from the real world [37]. If the same effect is provided not only by narration but also by the depiction of animals, then readers may be more easily guided to adopt the same or different perspective as the animal characters along with the conversion of their forms. By opening a picture book, the reader can enjoy the experience of the different world of the story, and when the reader finishes reading and closes the book, the reader can feel having been "there and back again" upon returning to the real world [38].

5.3.8. Movement to a Different World or into Space

Long-term conversions involving moving to another world or into space were found to be the second most common in cases of anthropomorphism and the fourth most common in non-anthropomorphism. The occurrence of these conversions reveals the strong force of space. Stories that step into a world dominated by animals or a world that does not exist in reality provide children experiences in different world. In stories that portray such movements to different worlds, children prefer structures in which they go somewhere and then return. This structure, "there and back again," is the most acceptable form of story for children who frequently exercise outside and return home, in accordance with the functioning of their developing brains and emotions [38]. It can also be explained from the concept of "secure base" in attachment theory [39]. A series of events in which children go to and return from an unreal fantasy expresses the dissolution of their anxiety and conflict as well as their ever-expanding desires and dreams in fantasy worlds [40]. Because children enjoy stories by superimposing themselves on animals, conversion in accordance with moving in space should enable children to have more fantastical experiences of going to different worlds and returning with a strong sense of closure. Conversions by spatial movement were not limited to movement to other or imaginary worlds. Long-term anthropomorphic conversions also occurred with small-scale mobility in the real world, such as going to an amusement park or going to the beach. The structure of the "there and back again" story can expand daily life by repeating the process of going to and returning from a new place. Also, children feel that safe and protected places are boring and restrictive and new areas are more attractive [41]. For children, the world beyond the sphere of daily life, centered around the home and under the protection of parents, is filled with many unknowns. The picture books provide narrative structures to stimulate the curiosity of children who are in the process of experiencing new areas one by one.

5.3.9. Friends and Friendship

The third most common conversions in long-term anthropomorphism were those related to friends and

friendship. In group childcare, the influence of friends becomes particularly strong in socialization after three years of age. Through experiences of conflict and trouble with peers, children become aware of different demands, make compromises and create diverse solutions, and acquire interpersonal skills [28]. In this process, children can read stories highly relevant to their lives while associating them with their experiences. Further, many animals in the picture books were shown becoming friends with members of different species, as well as their own, through interactions. The depiction of characters with different values and backgrounds becoming close to each other likely reflects the authors' intention to convey the diversity of society.

5.3.10. Humans, Spaces in Which Only Animals Exist, and Changes in Circumstance or Feeling

Conversions relating to humans were the fourth most common long-term anthropomorphic conversion and the second most common long-term non-anthropomorphic conversion. Conversions relating to space in which only animals exist were the fifth most common long-term anthropomorphic conversion. In some cases, anthropomorphism occurred when the animals were involved with humans, and in other cases, anthropomorphic animals became animal-like when the animals were involved with humans. There were also cases in which anthropomorphism was used to depict animals in a world unknown to humans. In picture books, different conversions were used to describe relationships between humans and animals.

The basis of these stories was that animals are different from humans. An example of a long-term anthropomorphic conversion in relation to humans was an animal that walked behind a human. Before the interaction, the animal was a stranger to the human, but as a result of the interaction, the animal and human became psychologically closer to each other, and they were no longer strangers; the animal became anthropomorphic. On the other hand, conversions in which the animal became non-anthropomorphic in the long term by relating to a human occurred when the animal was in front of or beside the human, which clearly marked a boundary between human and animal as different beings. Another example of anthropomorphism was an animal who had a discussion only with other animals in a place that had only animals; this gave depth to the animal characters in the story by demonstrating that animals have characteristics not common in humans. It was also observed that animals changed their behaviors and positions in relation to humans.

The third most common long-term non-anthropomorphic conversion was caused by changes in the surrounding conditions and emotions of animals that were identified as closely related in nature.

Picture book depictions have the function to visually express the inner changes of characters through various methods, such as conversion of different types. Picture book depictions are not only a way to show visible changes, but also a way to use those changes to make the storyline more impressive and to make it memorable for child readers.

6. Conclusion

This study clarified the features of conversions, or changes in form, of anthropomorphic animals in picture books. The conversions occurred frequently in cats and dogs. Temporary conversions were often caused by human/animal-like behaviors, activities, and emotions. On the other hand, long-term conversions frequently occurred because of the structure of the stories, space, and relationships with other characters of the stories. The conversions seemed to be deeply related to the social images of animals, their history with humans, and child development. This may be one of the reasons why animal picture books are loved by children.

Further studies are suggested according to this study. Species differences of animals in behaviors and roles in picture books should be examined in more detail. It is also required to scrutinize the flow of the story for each picture book as qualitative studies because this study extracted and analyzed the specific elements of the contents in many picture books as a quantitative study. In addition, children's responses should be observed when they read the picture books to clarify what they understand in the stories with conversions in depictions of anthropomorphic animals. Such studies would be beneficial for child development and the improvement of human-animal interactions.

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References

- [1] Strouse, G. A., Nyhout, A., and Ganea, P. A. (2018) The role of book features in young children's transfer of information from picture books to real-world contexts. *Frontiers in Psychology*, 9, art. 50.
- [2] Ganea, P. A., Ma, L., and DeLoache, J. S. (2011) Young children's learning and transfer of biological information from picture books to real animals. *Child Development*, 82 (5), 1421-1433.
- [3] Evans, M. A., and Saint-Aubin, J. (2005) What children are looking at during shared storybook reading: Evidence from eye movement, monitoring. *Psychological Science*, 16 (11), 913-920.
- [4] DeLoache, J. S., and Burns, N. M. (1994) Early understanding of the representational function of pictures. *Cognition*, 52 (2), 83-110.
- [5] Ganea, P. A., Pickard, M. B., and DeLoache, J. S. (2008) Transfer between picture books and the real world by very young children. *Journal of Cognition and Development*, 9 (1), 46-66.
- [6] Walker, C. M., Gopnik, A., and Ganea, P. A. (2015) Learning to learn from stories: Children's developing sensitivity to the causal structure of fictional worlds. *Child Development*, 86 (1), 310-318.

- [7] Uchida, N. (1994) *Sozo ryoku* [The imagination]. Tokyo: Kodansha (in Japanese).
- [8] Vygotsky, L. S. (2004) Imagination and creativity in childhood. *Journal of Russian and East European Psychology*, 42 (1), 7-97.
- [9] Marriott, S. (2002) Red in tooth and claw? Images of nature in modern picture books. *Children's Literature in Education*, 33 (3), 175-183.
- [10] Ganea, P. A., Canfield, C. F., Simons-Ghafari, K., and Chou, T. (2014) Do cavies talk? The effect of anthropomorphic picture books on children's knowledge about animals. *Frontiers in Psychology*, 5, art. 283.
- [11] Waxman, S. R., Herrmann, P., Woodring, J., and Medin, D. L. (2014) Humans (really) are animals: Picture-book reading influences 5-year-old urban children's construal of the relation between humans and non-human animals, *Frontiers in Psychology*, 5, art. 172.
- [12] Newman, C. (2014) Hey kids, all deer aren't like Bambi. *National Geographic*, Retrieved November 12, 2021, from <https://www.nationalgeographic.com/news/2014/3/140327-childrens-books-fantasy-animals-psychology>.
- [13] McCrindle, C. M. E., and Odendaal, J. S. J. (1994) Animals in books used for preschool children. *Anthrozoös*, 7 (2), 135-146.
- [14] Hara, K., and Koda, N. (2000) Quantitative analysis of anthropomorphic animals in picture books: Roles and features of animals. *International Journal of Literature and Arts*, 8 (6), 308-315.
- [15] Rost, D. H., and Hartmann, A. H. (1994) Children and their pets. *Anthrozoös*, 7 (4), 242-254.
- [16] Thorne, C. (1997) Evolution and domestication. In C. Thorne (Ed.), *The Waltham book of dog and cat behaviour* (pp. 1-30). Oxford: Pergamon Press.
- [17] Davis, S. J. M., and Valla, F. R. (1978) Evidence for domestication of the dog 12,000 years ago in the Natufian of Israel. *Nature*, 276 (5688), 608-610.
- [18] Serpell, J. A. (1996) Evidence for an association between pet behavior and owner attachment levels. *Applied Animal Behaviour Science*, 47 (1-2), 49-60.
- [19] Miklósi, Á., Pongrácz, P., Lakatos, G., Topál, J., and Csányi, V. (2005) A comparative study of the use of visual communicative signals in interactions between dogs (*Canis familiaris*) and humans and cats (*Felis catus*) and humans. *Journal of Comparative Psychology*, 119 (2), 179-186.
- [20] Turner, D. C., and Bateson, P. (1998). *The domestic cat*. Cambridge: Cambridge University Press.
- [21] Pastoureau, M. (2014) *The bear: History of a fallen king* (Hirano, T., Trans.). Paris: Le Seuil. (Original work published in 2007)
- [22] Lorenz, K. (1943) Die angeborenen Formen möglicher Erfahrung. *Zeitschrift für Tierpsychologie*, 5 (2), 235-409.
- [23] Yano, S. (2002) *Dobutsu ehon wo meguru boken* [Adventures over animal picture books]. Tokyo: Keiso Shobo (in Japanese).
- [24] Nakamura, T. (1990) *Tanuki to sono sekai* [The raccoon dogs and their world]. Tokyo: Asahi Sensho (in Japanese).
- [25] DeLoache, J. S., Pickard, M. B., and LoBue, V. (2011) How very young children think about animals. In P. McCardle, S. McCune, J. A. Griffin, & V. Maholmes (Eds.), *How animals affect us: Examining the influence of human-animal interaction on child development and human health* (pp. 85-99). Washington, DC: American Psychological Association.
- [26] LoBue, V., Pickard, M. B., Sherman, K., Axford, C., and DeLoache, J. S. (2013) Young children's interest in live animals, *British Journal of Developmental Psychology*, 31 (1), 57-69.
- [27] Imada, Y. (2013) *Ehon toha nanika: yoji to ehon* [What is a picture book? An infant and a picture book]. In basic in Usui, H. (2002). *Hito tono kakawari no syogai hattatsu* [Lifelong development of human relations]. In N. Uchida (Ed.), *Developmental psychology* (pp. 116-132). Tokyo: Foundation for the Promotion of The Open University of Japan. Trodution to picture books. Tokyo: Minerva Shobo (in Japanese).
- [28] Usui, H. (2002) *Hito tono kakawari no syogai hattatsu* [Lifelong development of human relations]. In N. Uchida (Ed.), *Developmental psychology* (pp. 116-132). Tokyo: Foundation for the Promotion of The Open University of Japan (in Japanese).
- [29] Lewis, M. (2008) The emergence of human emotions. In M. Lewis, J. M. Haviland-Jones & L. F. Barrett (Eds.), *Handbook of emotions* (pp. 304-319). New York: The Guilford Press.
- [30] Ginsburg, K. R., and the Committee on Communications, and the Committee on Psychosocial Aspects of Child and Family Health. (2007) The importance of play in promoting healthy child development and maintaining strong parent-child bonds. *American Academy of Pediatrics*, 119 (1), 182-191.
- [31] Parten, M. B. (1932) Social participation among pre-school children. *The Journal of Abnormal and Social Psychology*, 27 (3), 243-269.
- [32] Miyake, K. (1998) *Nyuyoji no shakai teki hattatsu* [Social development of infants and young children]. In H. Kojima & K. Miyake (Eds.) *Developmental psychology* (pp. 61-72). Tokyo: Foundation for the Promotion of The Open University of Japan (in Japanese).
- [33] Eisenberg, N, and Mussen, P., H. (1989) *The roots of prosocial behavior in children*. Cambridge: Cambridge University Press.
- [34] Miyake, K. (1998) *Nyuyoji no jocho teki hattatsu* [Emotional development of infants and young children]. In H. Kojima & K. Miyake (Eds.), *Developmental psychology* (pp. 73-82). Tokyo: Foundation for the Promotion of The Open University of Japan (in Japanese).
- [35] Matsuoka, K. (1987) *Ehon no sekai, kodomo no sekai* [Picture books' world: Children's world]. Tokyo: Japan Editor School Press (in Japanese).
- [36] Rochat, P. (2003) Five levels of self-awareness as they unfold early in life. *Consciousness and Cognition*, 12 (4), 717-731.
- [37] Uchida, N. (1986) *Gokko kara fantaji e: kodomo no sozo sekai* [From playing to fantasy: Children's imagination]. Tokyo: Shinchosha (in Japanese).
- [38] Seta, T. (1980) *Osanaiko no bungaku* [Literature of young children]. Tokyo: Chuokoron-shinsha (in Japanese).

- [39] Bowlby, J. (1988) A secure base: Clinical applications of attachment theory. London: Routledge.
- [40] Ikuta, Y. (2018) *E wo yomukoto: fantajiehon wo yomitokukodomo no kuusousekai no ehon hyogen* [The process of reading a picture: Read fantasy picture book-Picture book expression of children's fantasy world]. In T. Fujimoto & Y. Ikuta (Eds.), *Interpret a picture: Introduction to picture books* (pp. 27-34). Tokyo: Minerva Shobo (in Japanese).
- [41] Saito, J. (2006) *Yukite kaerishi monogatari* [There and back again]. Tokyo: Japan Editor School Press (in Japanese).