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Metaphors as Second Labels: Difficult for Preschool Children?

Paula Rubio-Fernández[1] · **Susanne Grassmann**[2]

Abstract This study investigates the development of two cognitive abilities that are involved in metaphor comprehension: implicit analogical reasoning and assigning an unconventional label to a familiar entity (as in Romeo's 'Juliet is the sun'). We presented 3- and 4-year-old children with literal object-requests in a pretense setting (e.g., 'Give me the train with the hat'). Both age-groups succeeded in a baseline condition that used building blocks as props (e.g., placed either on the front or the rear of a train engine) and only required spatial analogical reasoning to interpret the referential expression. Both age-groups performed significantly worse in the critical condition, which used familiar objects as props (e.g., small dogs as pretend hats) and required both implicit analogical reasoning and assigning second labels. Only the 4-year olds succeeded in this condition. These results offer a new perspective on young children's difficulties with metaphor comprehension in the preschool years.

Keywords Metaphor · Second labels · Analogy · Pretense · Overextensions

Introduction

The acquisition of a *figurative competence*—the ability to comprehend and use figurative language—has been characterized as a long-lasting process that begins in early childhood and continues throughout the school years, adolescence and even adulthood (Cacciari and Padovani 2012). Young children's difficulties with figurative language have been given numerous explanations since research on metaphor development started in the 60s. Some researchers have pointed at young children's limited vocabulary and world knowledge (e.g., Keil 1986; Vosniadou 1987a), young children's difficulties with category formation

✉ Paula Rubio-Fernández
   paula.rubio-fernandez@ifikk.uio.no

[1] Centre for the Study of Mind in Nature, University of Oslo, Georg Morgenstiernes Hus, Blindernveien 31, 0371 Oslo, Norway

[2] Psychology Institute, University of Zurich, Zurich, Switzerland

(e.g., Billow 1975; Cometa and Eson 1978), a lack of understanding of the literal/non-literal distinction (e.g., Vosniadou and Ortony 1983; Marschark and Nall 1985) and a reliance on contextual cues at the expense of mastering linguistic complexity (e.g., Vosniadou 1987b, 1989). Other researchers have blamed young children's failure to understand figurative language on the unnecessarily difficult tasks that were used in the early studies, often requiring meta-linguistic judgments (Vosniadou et al. 1984; Gibbs 1994; Pouscoulous 2011). These arguments are not incompatible, however, and Vosniadou (1987a) summarized the early findings as follows: 'the development of metaphor comprehension is constrained primarily by limitations on children's conceptual knowledge, linguistic skill, and information processing ability' (p. 880).

In this study we will propose a different reason why preschool children may have problems understanding nominal metaphors of the form *X is a Y*; namely, their limitations with assigning *second labels*: when Romeo says 'Juliet is the sun', he states that Juliet is a star, even though Juliet is obviously a person. This, we will argue, could be a source of difficulty for young children, who have been found to have problems with assigning second labels in a variety of tasks (see, e.g., Markman 1990; Doherty and Perner 1998; Grassmann and Tomasello 2009). The first aim of the study reported in this paper was to investigate preschoolers' capacity to accept an unconventional label for a familiar entity. For this purpose, we used a pretend-play task that only involved literal language and hence avoided the methodological difficulties inherent in testing children's metaphor comprehension (see Gibbs 1994).

The second aim of the study was to test preschoolers' analogical reasoning in referential communication (e.g., figuring out what the relationship is between Juliet and the sun; Ortony 1993; Paivio and Walsh 1993). Analogical reasoning is a key component of metaphorical competence, and children have been shown to be sophisticated analogical reasoners (see, e.g., Goswami 2001). However, whereas in analogical reasoning tasks the analogy is normally spelled out for the child, in metaphor comprehension the underlying analogy is left implicit, hence being potentially less accessible for young children. The present study is the first to investigate implicit analogical reasoning in preschool children.

In what follows we will briefly review the literature on children's abilities to reason analogically and to assigning second labels. We will also discuss the kind of labels that children use in object substitution pretense.

Analogical Reasoning in Referential Communication

Understanding a nominal metaphor requires understanding the *metaphor's ground* (i.e. the speaker's reasons for using the figurative label). Consider in this respect the following examples:

 (1) Fred has a problem with physical contact. He is a cactus.
 (2) Wilma can go without water for a whole day. She is a cactus.

While Fred and Wilma can both be metaphorically referred to as 'a cactus', it seems clear from the above examples that they make for very different types of cacti. Therefore, interpreting the above examples requires understanding which properties of Fred and Wilma resemble a cactus.

Grasping the relationship between a metaphor topic (e.g., Fred) and a metaphor vehicle (e.g., the concept CACTUS) is such a key aspect of metaphor comprehension that it has been argued, by some researchers, that analogical reasoning underlies metaphorical language (Gentner 1988; Bowdle and Gentner 2005; cf. Glucksberg and Keysar 1990; Glucksberg

2001). Analogical reasoning has been defined as the process of identification and transfer of a relational structure from a known system (e.g., the solar system) to a less known system (e.g., the structure of the atom; Vosniadou 1995).

Analogical reasoning has been extensively studied in children (see, e.g., Goswami 1991, 2001; Vosniadou 1995 for reviews). Experimental studies have normally used picture matching tasks that have shown that 3-year old children can perform analogies of the form 'Chocolate is to melted chocolate as snowman is to _____?', with performance improving between ages 3 and 6 (Bullock et al. 1982). More recent studies using suitably adapted tasks looking at the transfer of solutions from one problem to another have revealed that even infants possess basic analogical skills (Chen et al. 1997).

It must be noted, however, that the type of 'A is to B as C is to D' tasks that have been used in analogical reasoning research fall short of testing children's ability to recognize a metaphor's ground in as far as these tasks spell out the analogy for the young child. By contrast, identifying a metaphor's ground normally requires drawing an implicit parallel between the topic and the vehicle of the metaphor. Compare in this respect Romeo's 'Juliet is the sun' with the analogy 'Juliet is to me as the sun is to the universe'. One of the aims of the present study was therefore to test children's implicit analogical reasoning, as that is required for metaphor comprehension.

Assigning Second Labels

Interpreting metaphors also requires accepting two different labels for an entity: a given, literal label and a new, figurative label. For example, Romeo's 'Juliet is the sun' requires understanding that Juliet is still a person, even though for Romeo she is 'the sun'. Importantly, the given label ('person') and the figurative label ('sun') are often in contradiction since most nominal metaphors involve a category violation and would be mutually exclusive in their literal meanings.

Research on word learning has repeatedly shown that young children treat category terms as mutually exclusive, hence avoiding second labels. Toddlers and preschoolers tend to exclude familiar objects for which they already have a label as possible referents of novel words (e.g., they understand that the made-up word 'modi' must refer to a novel object, rather than a spoon; see, e.g., Markman and Wachtel 1988; Markman 1990; de Marchena et al. 2011). Of course, young children are able to learn a second label for an object, but second labels are somewhat harder than first labels (see, e.g., Liittschwager and Markman 1994; Markman et al. 2003; Matthews et al. 2010).

Children's difficulty with multiple labels is apparent even in cases when children indeed know more than one term for an object but have to accept the two labels simultaneously. Thus, in alternative naming tasks, children have to refer to a depicted rabbit as 'rabbit', for example, if a puppet refers to it as 'bunny', or vice-versa. Children under 4 years tend to fail this type of task (see, e.g., Doherty and Perner 1998; Perner et al. 2002, 2007). Doherty, Perner and colleagues have argued that young children's severe difficulties with alternative naming tasks stem from their limitations with alternative perspectives, as further revealed by their comparably low performance in false-belief tasks (where 3-year old children fail to take the perspective of a mistaken protagonist; Baron-Cohen et al. 1985).

While studies on mutual exclusivity and alternative naming investigate young children's ability to assign two different labels to the same entity, they differ in crucial ways from the production and interpretation of metaphors. First, unlike alternative naming tasks, metaphor

does not require alternating labels but assigning a second label to a familiar entity. Second, unlike alternative naming and mutual exclusivity tasks, metaphor requires assigning a familiar label to a familiar entity in a non-standard way (e.g., the expression 'the sun' doesn't readily apply to Juliet). A closer parallel with metaphors as second labels may therefore be drawn with a referential communication study by Grassmann and Tomasello (2009).

In Grassman and Tomasello's study, the Experimenter pointed at an object but referred to it using an inappropriate label, which would be an appropriate label for a second object on the table. Thus, the children could chose between accepting the label as a second label for a familiar object or interpreting it the literal way (ignoring the Experimenter's pointing gesture). Importantly, children's difficulty with accepting a second label differed with the relative familiarity of the labels and the objects.

In one condition, children were asked for 'the modi' (a novel word) as the Experimenter pointed at a toy car. In almost 100 % of the trials both 2- and 4-year-olds gave the car to the Experimenter and disregarded a novel object on the table, showing an ability to accept a second, new label for a familiar object. In the second condition, the Experimenter asked the child for 'the car' while she pointed at a novel object and disregarded a toy car. In this condition, 2-year old children followed the pointing 70 % of trials while 4-year olds did the same 77 % of the time, both groups showing a lesser ability to extend a familiar label to a novel object. Finally, in the third condition, the children were asked for 'the ball' as the Experimenter pointed at a toy car and disregarded a ball. In this condition, both the 2-year olds and the 4-year olds experienced difficulties accepting a second, inconsistent label for a familiar object, and chose objects at chance level.

Note that, despite the obvious differences between Grassmann and Tomasello's referential communication task and metaphor comprehension, understanding 'Juliet is the sun' is similar to the third condition in their study in so far as it involves assigning a familiar label to Juliet, which is inconsistent with what we know about her (namely, that she is a person). In sum, developmental research on mutual exclusivity, alternative naming, and seemingly contradictory pointing and labeling suggests that preschool children may have problems with second labels that could extend to metaphor development. This is compatible with results in the early metaphor literature, where children have been reported to 'resist metaphors' (Asch and Nerlove 1960) as well as with the more general tendency of young children to interpret metaphorical language literally (see Vosniadou 1987a).

Second Labels in Object Substitution Pretense

Early studies by Winner et al. included instances of object-substitution pretense among their measures of figurative language use (e.g., Winner 1979; Winner et al. 1979, 1980). For example, Adam, one of the children in their study, called a cork a 'horn' and then pretended to blow on it, saying 'toot toot' (Winner 1979: 477). The later consensus has been that the criteria used in these early studies to identify children's first metaphors may have been too broad (see Vosniadou 1987a; Gibbs 1994), although pretend labels are still considered 'non-literal labels' in the recent literature (Pouscoulous 2011: 71). Here we want to argue that pretend play does not involve figurative language and therefore, the labels that are applied in object-substitution pretense are literal labels.

While object-substitution pretense is undeniably an act of imagination, it is not one of figurative language use. When Adam pretends that a cork is a horn that makes 'toot toot', he pretends that the cork is a real horn, a literal one. Hence, the speech acts by which children come to imaginarily change the identity of the objects they play with are not metaphorical utterances. Consider in this respect Searle's famous metaphor:

(3) Sally is a block of ice.

Used figuratively, this expression would normally communicate that Sally is emotionally cold and unresponsive (Searle 1979). However, if a child used the same expression to imaginarily turn their doll, Sally, into a block of ice, then the child wouldn't be using the expression 'block of ice' non-literally. Instead, the child would be communicating that Sally has become a real block of ice in the context of their pretend play.

Given the fundamental difference between metaphors and the second labels that children apply in object substitution pretense, we understand that the pretend game that we used in our study only involved literal language. The relationship between pretend play and metaphor development will be further discussed in the final section of the paper.

Rationale of the Study

The main goal of the present study was to test how preschool children's abilities with analogical reasoning and assigning unconventional labels interact in a literal referential-communication task. The rationale was that since the integration of both skills is necessary for metaphor comprehension, it would be informative to test preschoolers' ability to simultaneously reason analogically and assign second labels in literal language comprehension. By using a task that involves literal language comprehension but taps two abilities that are involved in metaphor comprehension, we expect to observe clearer results than previous metaphor studies, which have been repeatedly criticized for being too difficult for young children (see, e.g., Vosniadou et al. 1984; Vosniadou 1989; Pouscoulous 2011).

More specifically, the study investigated young children's analogical reasoning abilities with familiar spatial relationships. One type of analogy that children are able to master at a young age is spatial analogies about body parts. In an early study, Gentner (1977) showed children pictures of a tree or a mountain and asked them 'If the tree/mountain had a knee/head/stomach, where would it be?' By age 4 years, children were able to pass this task.

The present study required 3- and 4-year olds to perform an implicit spatial analogy. For this purpose, we adapted a referential communication task previously used by Hudson and Nelson (1984) and Pouscoulous and Tomasello (2011), where children were asked to identify a pretend object from an array of objects with different attributes.[1] In one of the trials children were asked 'Give me the train with the hat', for example, and were given a choice between a train with a Lego block on top of the front of the engine and a train with a Lego block on top of the rear of the engine (see Fig. 1 for photographs of the materials). In order to solve this task, children would therefore have to implicitly reason: where would a train wear a hat?

As we previously argued, this kind of implicit analogical reasoning is closer to the processes involved metaphor interpretation than direct tests of analogical reasoning. The results of the present study should therefore extend those of Gentner (1977) by showing whether 3- and 4-year olds are able to perform an implicit spatial analogy as part of the process of assigning reference to a nominal expression (e.g., 'the train with the hat').

Lastly, the study tried to determine whether interpreting the requests in reference to familiar objects may hinder children's performance compared to referring to neutral objects. In other words, how much harder is it for a 3- or a 4-year old to interpret the request 'Give me the train with the hat' when a small toy dog rather than a Lego block is placed on top of the engine?

The condition with the toy dog may be harder than the condition with the Lego block because Lego blocks are multi-functional objects, whereas toy dogs are not. However, 3- and

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[1] It is worth noting that Pouscoulous and Tomasello (2011) interpret the results of this task as evidence of metaphor understanding.
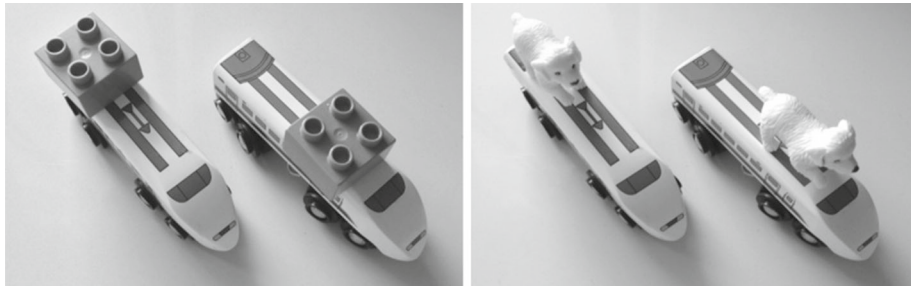
Fig. 1 Sample pair of target objects and pretense props in the first trial ('The train with the hat'). The *left panel* illustrates the Baseline/ Analogy-only Condition and the *right panel* illustrates the Critical/ Second-label Condition. In both conditions the correct choice is the object on the right hand side

4-year-old children are already at a developmental stage where they are capable of engaging in highly flexible pretend play where almost anything can serve any given function (see, e.g., Winner et al. 1979; Tomasello et al. 1999; Rakoczy et al. 2005). Therefore, the two conditions may be comparable for children this age.

Another reason why the condition with the toy dog may be harder than the condition with the Lego block is that the given label 'dog' may clash with the second label 'hat' more strongly than the given label 'block'. This hypothesis is based on the study by Grassmann and Tomasello (2009), in which a familiar label was harder to apply to a different familiar object than to a neutral novel object. In this view, if children have problems accepting a second label for the props (e.g., understanding that a dog can be 'the hat'), they may have more difficulty drawing the spatial analogy and selecting the correct object in that condition than in the baseline condition (where a Lego block represents the pretend hat).

Method

Participants

Fifty-two Spanish children were recruited from a local nursery in Salinas (Asturias, Spain). The nursery is part of a public primary school and serves middle-class families. Children were divided in two groups, depending on whether they were in their first year of preschool (3-year olds) or in their second year (4-year olds). The 3-year-old group consisted of 14 girls and 10 boys, and their mean age was 3; 6 years (range = 3; 1–4; 0). The 4-year-old group consisted of 15 girls and 13 boys, and their mean age was 4; 5 years (range = 3; 11–4; 9).

Materials and Design

Six trials were constructed with pairs of two identical familiar toys (i.e. train, feeding bottle, crocodile, doll, box and Thomas the Tank Engine) and two identical props. In the Baseline/Analogy-only Condition pairs of identical Lego blocks were used as props (as Lego blocks are neutral types of objects). In the Critical/Second-label Condition the props were familiar objects with common names known by the children [i.e. dog, girl, car, book, spoon and (tree) branch]. The two toys in each pair differed from one another with respect to the position of the prop. See Fig. 1 for a sample item and Table 1 for a description of all the materials.

Table 1 Instructions (in English and Spanish) and descriptions of the materials in each trial and condition

Trial	Instruction (Give me.../ Dame...)	Target object	Pretense props		Position Correct/ incorrect
			Analogy only	Second label	
1	The train with the hat/ El tren con sombrero	Toy train	Square blocks	Toy dogs	Top front/top rear
2	The feeding bottle with food in the tummy/ El biberón con comida en la barriga	Feeding bottle	Square blocks	Girl figures	Inside bottle/inside teat
3	The crocodile with the backpack/El cocodrilo con mochila	Toy crocodile	Long blocks	Toy cars	On back/on tail
4	The girl with the blanket/La niña con una manta	Girl figure	Long blocks	Small books	Over body/under body
5	The box with feet/La caja con pies	Plastic box	Long blocks	Toy spoons	Under/inside
6	The Thomas with the wagon/El Thomas con vagón	Thomas the tank engine	Long blocks	Toy branches with leaves	Behind/on top

The original instructions were in Spanish

Note that in Spanish it is natural to use a null or indefinite article in the prepositional phrases used in the instructions (e.g., 'El tren *con sombrero*'), while in English it may be more natural to use a definite article (e.g., 'The train *with the hat*')

Children participated in both conditions. Two lists of materials were constructed, with half the trials being presented in each condition in an alternating order. List 1 started with the Second-label Condition and List 2 started with the Analogy-only Condition. The order of the items was the same in both lists (see Table 1).

Procedure

Children's receptive vocabulary was assessed in a picture identification task where they had to point at a picture of those objects that would later be used in the actual test from among an array of four pictures (e.g., 'train', 'dog' and 'hat' were tested in three separate trials).

A few days after the pre-test session, children were randomly allocated to one of the two lists of materials and tested individually on all six items. The Experimenter told the child that they were going to pretend play with some toys, and that the child had to help the Experimenter choose some of the toys she wanted to play with. The Experimenter then placed the pairs of toys and props on the table, one pair at a time and always facing the child, and asked the child for one particular toy in each trial (see Table 1 for the instructions).

Adult Pre-test

In normal pretend play situations, children often establish the new identities of the objects that they play with by making normative statements (e.g., 'In our game these clothespins are carrots'; Rakoczy 2008). We couldn't do this in our pretense task, however, as establishing the new identity of the props a priori (e.g., 'This dog is a hat') would ruin the test. Nonetheless, in order to pre-test the validity of our procedure, we ran a control task with adults. We predicted that if the format of the task was felicitous, fully-mature participants should be able to perform at ceiling in the Second-label Condition.

The control task was distributed by email among 14 students of the University of Oviedo (Asturias, Spain). Participants were told that they were a control group in a developmental study investigating pretend play. Photographs were taken of the six pairs of toys used in the Second-label Condition (see Fig. 1 for an example), which were then inserted into a PowerPoint presentation. Each slide contained one photograph and the instruction that was given to the children in that trial (e.g., 'Give me the train with the hat'). The toys on the photographs were labelled A and B, and participants were asked to write down their choices and email them back to the Experimenter. As predicted, the 14 adults who took part in the control task gave the correct response in all six trials (i.e. 100 % accuracy).

Results

All children passed the vocabulary pre-test and were tested in the actual experiment. The mean proportions of correct object-selections and standard deviations for each condition and age group are reported in Table 2. The mean proportions of correct responses were entered into a mixed-design 2 × 2 ANOVA (Condition × Age), which revealed a significant main effect of Condition, $F(1, 50) = 38.302$, $p < .001$, $\eta^2 = 0.77$; and a marginally significant effect of Age, $F(1, 50) = 3.843$, $p = .056$, $\eta^2 = 0.08$. The Condition x Age interaction was significant, $F(1, 50) = 5.813$, $p = .020$, $\eta^2 = 0.12$.

We followed up with four pairwise comparisons, applying a Bonferroni correction to our interpretation of the significance levels (protected alpha level .0125). Paired t-tests revealed that children chose the correct object significantly more often in the Analogy-only Con-

Table 2 Mean proportions of correct object-selections and standard deviations (in parentheses) in each age group and condition

Condition	3-year olds (N = 24)	4-year olds (N = 28)
Analogy only	0.82* (.216)	0.84* (.183)
Second label	0.48 (.338)	0.69* (.242)

Asterisks indicate that the children's performance differed from chance level [two-choice Binomial tests (two-tailed); $p < .01$]

dition than in the Second-label Condition, both in the 3-year-old group, $t(23) = 5.000$, $p < .001, d = 2.09$; and in the 4-year-old group, $t(27) = 3.367, p = .002, d = 1.3$. Independent samples t tests revealed that 3-year olds and 4-year olds performed comparably in the Analogy-only Condition, $t(50) = .344, p = .732, d = .097$; while 4-year olds performed marginally significantly better than the 3-year olds in the Second-label Condition, $t(50) = 2.548, p = .014, d = 0.72$.

Comparisons against 50 % chance-level using two-choice Binomial tests (two-tailed) revealed that the 3-year olds performed significantly above chance level in the Analogy-only Condition ($p < .001$), but were at chance in the Second-label Condition ($p = .839$). In contrast, the 4-year olds performed significantly above chance level in both the Analogy-only Condition, ($p < .001$), and in the Second-label Condition ($p = .005$).

Item Analyses

We expected the analyses per item to parallel those by subject, albeit more weakly since we only had six items. The mean proportions of correct responses for each item in each age group and condition are reported in Table 3 together with individual comparisons against 50 % chance-level using two-choice Binomial tests (two-tailed).

The mean proportions of correct responses were entered into a repeated-measures 2×2 ANOVA (Condition $\times$ Age), which revealed significant main effects of Condition, $F_2(1, 5) = 15.973, p = .010, \eta^2 = .025$; and Age, $F_2(1, 5) = 41.005, p = .001, \eta^2 = .023$. Unlike in the analyses per subjects, the Condition $\times$ Age interaction was not significant, $F_2(1, 5) = 1.292, p = .307, \eta^2 = .002$.

General Discussion

The present study investigated preschoolers' integration of two cognitive abilities involved in metaphor interpretation; namely implicit analogical reasoning (e.g., understanding Romeo's grounds for referring to Juliet as 'the sun') and assigning second labels (i.e. accepting that Juliet can be referred to as a star, even though she is a person). The results of the baseline condition (which used Lego blocks as pretense props) showed that 3- and 4-year old children are able to draw implicit spatial analogies when interpreting referential expressions (e.g., 'Give me the train with the hat' predicated of a train engine with a Lego block on top of the cabin). These results extend previous evidence that 4-year olds are able to derive explicit spatial analogies (e.g., 'If this tree had a knee, where would it be?'; Gentner 1977) and make for a more accurate assessment of those analogical abilities that are involved in metaphor interpretation, where the underlying analogy is normally left implicit.

Regarding children's ability to assign a second label to a familiar entity, both 3- and 4-year olds performed significantly worse in a critical condition that used props with familiar names

Table 3 Mean proportions of correct object-selections for each trial in each age group and condition

Trial	Instruction (Give me…/ Dame…)	Mean proportions of correct object-selections			
		3-year olds		4-year olds	
		Analogy only	Second label	Analogy only	Second label
1	The train with the hat/	0.86	0.36	0.79	0.79
	El tren con sombrero	(.000)	(.774)	(.057)	(.057)
2	The feeding bottle with the food in the tummy/	0.71	0.43	1.00	0.43
	El biberón con comida en la barriga	(.039)	(1.00)	(.000)	(.791)
3	The crocodile with the backpack/	0.57	0.50	0.71	0.57
	El cocodrilo con mochila	(.388)	(.774)	(.180)	(.791)
4	The girl with the blanket/	0.71	0.43	0.93	0.86
	La niña con una manta	(.039)	(1.00)	(.002)	(.013)
5	The box with feet/	0.71	0.50	0.79	0.86
	La caja con pies	(.039)	(.774)	(.057)	(.013)
6	The Thomas with the wagon /	0.57	0.29	0.71	0.57
	El Thomas con vagón	(.388)	(.388)	(.180)	(.791)

The values in parentheses represent the p value of a two-tailed Binomial test (two-tailed) comparing children's performance to 50 % chance-level

(e.g., interpreting 'the train with the hat' as referring to a train engine with a small dog on top of the cabin). Only the 4-year olds, but not the 3-year olds performed above chance level in this critical condition. The 3-year olds' poor performance in the second-label condition is also in contrast with the ceiling performance of the adult participants in the control task. These results are in line with previous studies showing that young children have difficulties assigning second labels to familiar entities (e.g., Markman 1990; Doherty and Perner 1998; Grassmann and Tomasello 2009).

One last pattern of results that is worth discussing is the performance differences observed between items. Research on early semantic categories suggests that children have a *shape bias*; that is, they overextend words on the basis of shape similarity among different objects (see Diesendruck and Bloom 2003; Samuelson and Smith 2005). It is therefore possible that the shape of the props used in the critical condition may have influenced children's performance to some extent. It is important to note, however, that a shape bias alone cannot explain the results of the present study since all trials included pairs of identical props placed in different positions. Nonetheless, we assume that in addition to the potential difficulty of having to assign an unconventional label to a familiar object, the actual props used in the second-label condition may have helped or hindered children's ability to draw spatial analogies. For example, for the item 'Give me the box with feet', the shape of the spoons used in the second-label condition may have helped drawing the spatial analogy (with the handles of the spoons resembling legs and the wider part being the actual feet), at least in the 4-year old group.

In conclusion, the contrasting results observed in the baseline and critical conditions suggest that while analogical reasoning may be sufficiently mature at age 3 years to be used implicitly in referential communication (at least when the analogy is of basic spatial relations), having to simultaneously assign a second label is taxing, even for 4-year-old children. This supports our starting hypothesis that children's relative difficulty with assigning second labels may compromise their metaphor comprehension in the preschool years.

A possible counterargument to this conclusion is that metaphors are expressive uses of language: when Romeo says 'Juliet is the sun', for example, he is expressing a deep, figurative meaning, while the Experimenter in our study did not have any poetic reason to refer to a dog as a hat. While the expressive power of metaphors is undeniable (and the difference with our experimental design obvious), our conclusion still holds: the figurative meaning of a metaphor may not be accessible to young preschool children if their basic pragmatic and analogical abilities are in place but their cognitive development is not enough to flexibly assign a second, unconventional label to a familiar entity.

Overextensions, Pretense and Metaphor Development

Our results are relevant to the literature on overextensions; more specifically to the argument that when toddlers extend their limited vocabularies in unconventional ways (e.g., referring to a dial as 'moon' for lack of a better word), they are already revealing metaphorical abilities (see Winner 1988; Pouscoulous 2011; Wałaszewska 2011). While overextensions may indeed reveal a very basic yet fundamental capacity for analogical reasoning (that of finding similarities across categories), it nonetheless falls short of counting as a genuine metaphor in so far as it does not require assigning a second label to a familiar object for which the child already has a word (see Vosniadou (1987a) for a related argument). In our view, this is a critical argument since assigning second labels is essential to metaphor and is moreover a potential problem for young children (hence being a more stringent test of their figurative competence).

The present study is also relevant to the debate on the relationship between pretend play and metaphor development. We have argued that pretend play does not involve figurative language. However, there is a fundamental parallel between object-substitution pretense and figurative language, which nonetheless suggests a possible relation between the two: object-substitution pretense requires giving a new, unconventional function to a familiar object, while metaphor involves giving a new, unconventional name to a familiar entity. It is important to note, however, that this is not an argument for the view that early metaphorical abilities emerge together with pretense (cf. Pouscoulous 2011).

Rakoczy et al. (2005) report that mature pretend play is characterized by great flexibility (with familiar objects often being assigned fictional identities), while early pretense does not yet reveal the same great degree of flexibility, centring around replica objects that are always used in one specific way (e.g., toy cups and pots for pretend tea-parties). Moreover, various studies suggest that 2-year old children have difficulty using objects with conventional uses as symbols for other objects with other conventional uses (e.g., using a paper cup as a hat; Tomasello et al. 1999; see also Elder and Pederson 1978; Killen and Uzgiris 1981; Hudson and Nelson 1984; Striano et al. 2001; Bigham and Bourchier-Sutton 2007). Two-year-olds' difficulty with assigning new functions to familiar objects in pretend play has been related to their failure in experimental tasks that require seeing one object has having two different identities (e.g., the appearance-reality task, visual and conceptual perspective-taking tasks, and referential communication tasks, to name just a few; see Lillard 1993; Lillard et al. 2011 for discussion).

In our view, and contrary to the argument recently defended by Pouscoulous (2011: 69–71), the fact that pretending that a paper cup is a hat is harder for a 2-year-old than pretending that a toy teapot is a real teapot filled with tea suggests that, at an early stage, metaphor must be harder than pretense (which starts with replica toys that do not require giving a new function to a familiar object). Therefore, while pretend play might be related to metaphor development, early pretend play does not yet reveal a figurative competence.

In conclusion, a fair assessment of young children's metaphorical abilities requires a careful evaluation not only of children's early pragmatic skills, but also of the demands posed by metaphorical language in relation to children's general cognitive development. Hence, children's limited vocabulary, world knowledge and meta-linguistic awareness may not be the only factors that hindered young children's performance in early metaphor studies (cf. Vosniadou et al. 1984; Vosniadou 1989; Gibbs 1994). Difficulties in accepting an unconventional label for a familiar entity may also underlie preschoolers' limitations with figurative language. A closer analysis of what's in a metaphor—and not only of what's in a child—should therefore give us a better understanding of the development of figurative language.

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