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PRODUCTION AND COMPREHENSION OF ANALOGIES IN PRESCHOOL CHILDREN'S REFERENTIAL COMMUNICATION

Two experiments were run to show that specific communicative conditions lead preschoolers to produce analogies which prove effective in referential communication when the conventional label for the intended referent is lacking. In the first experiment, a group of four-year-old and a group of five-year-old children were presented a referential communication task with three stimulus sets of different nameability: i.e. "easy", "difficult-unusual" and "difficult-similar". As predicted, children produced more conventional messages for the "easy" stimuli, and more analogies for the "difficult-unusual" stimuli. In the second experiment, analogies referring to the same stimuli were divided into high- and low-frequency analogies and presented to two groups of five-year-old children who acted as listeners in a referential communication task. The results show that high-frequency analogies lead to the identification of the referent more frequently than low-frequency ones. This study shows that analogies may have a pragmatic value in directing the listeners' attention towards a given referent, and should not be considered as merely idiosyncratic expressions in referential communication.

Key words: children's referential communication, analogical messages, production of analogies, comprehension of analogies

This study investigates the use of analogical messages in preschool children's referential communication, an issue that can lead to a better understanding of pragmatic development.

Referential communication consists of communicative interactions in which some kind of information is transmitted between two speakers. A referential communication context requires the presence of a speaker, who has to produce an unambiguous message, a listener who has to understand that message, a referent associated with the produced message, and an array of further objects which have to be discriminated from the referent itself (Yule, 1997). This view focuses mainly on the speak-

er's cognitive processes. To produce a message, the speaker must perform the analyses both of the stimulus array in order to take into account those attributes of the referent which distinguish it from non-referents, and of the listener, in order to formulate a message compatible with the listener's knowledge and abilities. On the other hand, the listener has to understand the message and to evaluate whether further information is required (Camaioni, 2001). In the standard paradigm of referential communication, speaker and listener are separated by an opaque screen, and have in front of them two sets of identical objects, each with a different array. The speaker's task is to describe the target referent so that the listener can correctly identify it among the possible options (Glucksberg, Krauss, & Weisberg, 1966). In singling out the referent for the listener, the speaker relies on naming (e.g.: *that's an apple*) and/or description (e.g.: *it has a round shape, it is red, etc.*).

Preschool children often fail in referential communication tasks, and often their failures are due to the use of non-conventional expressions to describe a referent. These non-conventional messages have usually been considered as idiosyncratic, i.e. the expression of personal meanings that cannot be understood by the listener and render the message unsuccessful. Socio-cognitive perspectives of referential communication claim, in fact, that children develop from a social speech of "private meaning" to a speech provided with socially shared conventional meanings which characterize the social speech of "public meaning" (Girbau, 1996).

Many studies supported the presence of private meanings in preschoolers' speech whereby preschool children produce many idiosyncratic messages (Glucksberg *et al.*, 1966; Girbau e Boada, 1996; Iozzi, Di Sano, & Barbieri, 2004). These messages are better understood by the children who produce them than by their listeners.

However, in a study by Iozzi, Di Sano, & Barbieri (2004), a qualitative analysis of the messages produced by preschoolers in referential communication tasks showed a mixture of different types of non-conventional messages which includes completely idiosyncratic messages, referring to specific events in individual children's lives, as well as messages which, though non-conventional, are only apparently idiosyncratic and incomprehensible. These messages can gain meaning, and become understandable, if considered as forms of analogical language, i.e. implicit similes or analogies, such as when, for example, a child says *pizzetta* (small pizza) to indicate a particular flattened stone. If so, part of children's unconventional messages in referential communication should be reconsidered as to their meanings and purposes.

Hudson and Nelson (1982) define analogy as the extension of words to unconventional referents with the aim of making a comparison between the conventional and unconventional referents. This definition encompasses both explicit similes, such as *X is like Y* and implicit ones, such as *X is Y*, that is analogical renaming. According to the authors, although these forms are distinguishable in mature speech, they cannot be differentiated in children's early productions: to describe or name a referent, children can make use of analogical language by

using comparisons both explicit (i.e. similes) and implicit (i.e. analogies or analogical renaming).

Children's analogical renaming raised intriguing questions in the seventies in the studies of early language acquisition. This linguistic phenomenon was first interpreted as a form of incorrect generalization of newly acquired words, i.e. analogical renaming is the outcome of children's underdeveloped conceptual and lexical knowledge (Piaget, 1945; Chukovsky, 1968; Matter & Davis, 1975; Anglin, 1977). Therefore, children's non conventional lexical choices were considered as categorization mistakes, leading to wrong meaning attributions to words that occurred because children have a less complete representation of meanings than do adults and focus only on some aspects of the object referred to by that word. It is commonly reported that children tend to extend object names on the basis of sameness of shape, rather than size, color or material; this trend has been called the "shape bias" (Landau, Smith, & Jones, 1988, 1998; Smith, Jones, & Landau, 1996).

Contrary to this perspective, which maintains that children rename objects erroneously, Clark (1978) proposed a radically different approach to this phenomenon. Assuming that language is a tool for communication, Clark interpreted these productions as evidence of children's efforts to make use of the resources available to them in a specific communicative situation. Indeed, very young children may quite often lack the conventional term for a given referent, either because they have not as yet acquired it, or because they have simply forgotten it. In such cases, children can rely on strategies to circumvent the problem and still succeed in conveying a precise meaning for which they lack the matching conventional word (Clark, 1978). On the basis of the perceptual features shared by the conventional and unconventional referents, children "stretch" words already known to cover other things that appear sufficiently similar to the originals to justify the use of the same name (Clark, 1973). This communicative device is meant to direct the listener's attention to the specific referent whose label is unfamiliar to young speakers.

If the primary function of referential communication is to enable the listeners to univocally identify the referent among the alternatives, then any communicative strategy should serve the purpose; in other words, we should consider referential communication a pragmatic problem which cannot be solved merely by means of semantic/ conceptual abilities. In fact, in specific conditions, children as well as adults, seem to work out this pragmatic task by means of other devices.

In a previous study, Iozzi and Barbieri (2006) analyzed the production of analogical language in preschool children's referential communication. The results of that study showed that analogical messages, both in the form of comparison and renaming, occur when children are likely not to know the correct word for the referent. Children, however, are not mistaken as far as the correct category of the object renamed is concerned, and prove themselves able to group the objects previously analogically renamed according to the conventional criteria when presented with a forced classification task. Altogether, the results of this experi-

ment support the claim that analogical language can serve as a communicative strategy in contexts where the appropriate lexicon is lacking.

In this perspective, both the previous and the present study extend Clark's (1978) hypothesis, initially concerned with early word acquisition, to preschoolers' referential communication in order to better comprehend young children's communicative strategies. The aim of the present study is to extend the analysis of the conditions that lead to the production of analogical messages, and show that analogies are an effective communicative strategy. Therefore, analogical renaming is not a simple lexical mistake; rather it proves children's efforts to communicate in contexts where conventional labels are missing.

If language were simply a code in which every referent was denoted by one and only one reference and every reference was uniquely associated with a single referent, then speakers and listeners would have only to acquire and use the correct names for specific referents, and communicative failures could be attributed to the inability of the speaker and/or listener to associate an object with its name. However, in real life, matters are not so simple. A name, and sometimes a description, which is perfectly adequate to denote univocally a referent in one situation may not be available in the lexicon, either because the appropriate term has not yet been acquired, or because the singling out of the critical differences between the objects of a set requires elaborate descriptions that may lay beyond the speaker's ability. This happens, for example, when the referent belongs to a set of objects of the same type with shapes difficult to describe because unusual, abstract, unfamiliar to the speaker, or so similar to each other that it becomes problematic to be explicit as to how they differ. In all these cases there is a problem of *nameability*. Such difficult nameability conditions can lead to alternative communicative strategies such as to depict the whole referent's features by means of the immediate efficacy of images, rather than by means of literal language (Ortony, 1979). In fact, the main feature of analogical thinking in preschool children is that it is based on a superficial similarity between objects belonging to different conceptual domains.

Then, it's possible that, in referential communication contexts, the use of referents that are difficult to name leads the speaker to employ a communicative strategy based on analogical language.

However, a communicative strategy is such not only for its purposes, but also for its effectiveness. Therefore, if the use of analogical language is a communicative strategy common to preschool children, then it should be effective for the listener in the course of the communicative interaction. Consistently with Clark's hypothesis, we argue that analogical expressions, even if they are not conventional, have a pragmatic function which is to direct the listener's attention towards those salient features of the referent which make it identifiable among a set of alternatives. And so we hypothesize that, if preschoolers' use of analogical language is a communicative strategy, then it should be effective for listeners of the same age, because they presumably share the same level of cognitive develop-

ment and reasoning. The psychological literature on analogical reasoning provides many evidences of children's early ability to identify similarities among objects, events, emotions, etc... (Crisafi & Brown, 1986; Goswami & Brown, 1989,1990; Singer-Freeman, K. E., 2005).

In order to test these hypotheses, two experiments were performed. The first one analyzes the conditions that lead to the production of analogical language in referential communication, the second one checks if and how analogical language is understood in a similar context.

The first experiment investigates how referent nameability affects the types of messages produced by preschool children in a typical referential task. It is known that, in order to communicate about unfamiliar forms, children tend to develop particular nomenclatures, i.e. reference phrases which are not plainly descriptive and are considered idiosyncratic (Glucksberg *et al.*, 1966). Our main hypothesis claims that some of these descriptions are instances of analogical language which are often produced when referents do not match specific conventional labels and are therefore difficult to describe univocally. If this is a communicative strategy used when the speaker lacks the appropriate word, then its use should increase when stimuli are difficult to label. On the contrary, if this analogical language is the result of idiosyncratic, private, meanings, then its production will not be affected by the characteristics of the referent.

The second experiment tests the communicative effectiveness of the analogical language produced in the first task, on the basis of production frequency. In fact, the same analogical expressions often occur for the same stimulus. In this second experiment, the analogical expressions referring to the same stimulus have been divided into high- and low-frequency. The main hypothesis states that analogical expressions frequently produced match mental images largely shared among children of the same age, and therefore, referential messages based on them will be more easily understood. We assume that analogical messages mentioning a prototypical member of a category lead to an easy recall of the typical features of that category (Rosch, 1975); therefore the singling out of the intended referent will be facilitated, if these same features are also salient in the referent analogically described. For example, when a child says *disk* or ...*such as a disk* to indicate a particular flattened stone, s/he is assuming the disk is an object which is a prototypical member of the category including flattened, round shaped objects; so in saying *disk*, s/he wants to draw the listener's attention to that specifically featured stone.

Hence, in the second experiment we expected high-frequency analogical messages to be more comprehensible than the low-frequency ones.

On the whole, the significant issue of this study is that analogical messages, in both implicit and explicit forms, and even if expressed with non-conventional lexical choices, may rather have a precise pragmatic value which is to direct the listener's attention towards a given referent. Therefore they should not be considered as merely idiosyncratic expressions.

Figure 1. Difficult-unusual stimuli – *butterflies*

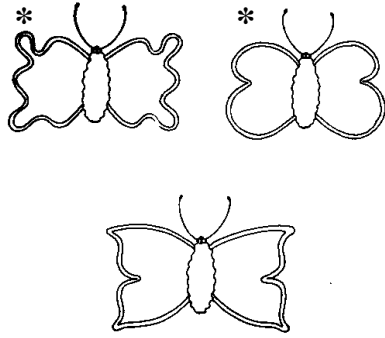


Figure 2. Easy stimuli – *fishes*

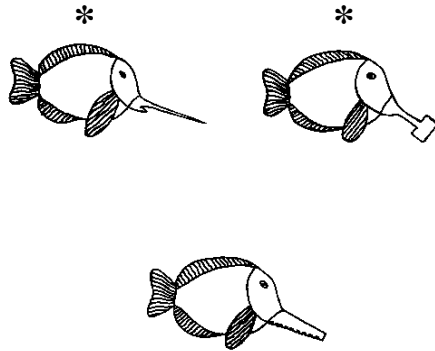
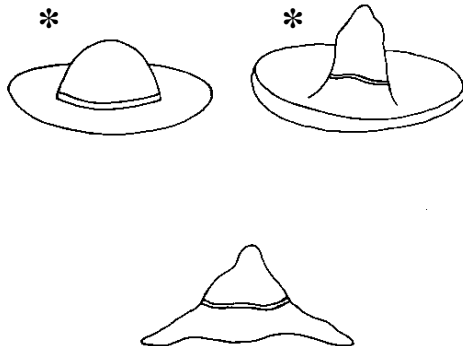


Figure 3. Difficult-similar stimuli – *hats*



Experiment 1

Method

Participants

60 preschoolers, Italian native speakers, participated in this study. 30 children were aged 4;2 (age range 42-59 months), and 30 were aged 5;9 (age range 60 to 77 months).

Material

Three types of sets were created, characterized by a different level of difficulty relative to stimuli nameability: *Easy-stimuli*, where the critical features which distinguished the items of the set had simple forms corresponding to conventional labels likely to be known by children; *Difficult-Unusual-stimuli*, in which the critical features distinguishing the stimuli of the set consisted of shapes difficult to be described univocally because they had abstract and unfamiliar forms that could not be coded in a single word; *Difficult-Similar-stimuli*, difficult to describe because the critical features distinguishing the stimuli were very similar to each other and their shapes varied gradually inside the set in such a way that children needed to make up an expression in order to code it in the message.

Each set was made up of three stimuli belonging to the same object category (for example, three different types of hats etc...). For each set, two stimuli served as the target referents. We used two stimuli as target referents because in this way children were forced to produce different referential phrases even if referents were very similar to each other. The material included two training sets, one easy- and one difficult-to-describe and 12 experimental sets, four easy, four difficult-unusual and four difficult-similar.

The stimuli were black and white bi-dimensional pictures on 10.5 by 15 cm cards, included in a catalogue, where each page portrayed a set. See Figures 1-3 for examples of sets.

Task and procedure

All children participated in a standard referential communication task, presented as a game. Children had to describe, in the most accurate possible way, the two target pictures of each set to the experimenter, who acted as listener. Speaker and listener had a catalogue each with the same pictures. In the catalogue given to the child, the target stimuli were marked with a sticker.

The children took part in the procedure individually in a quiet room of their school. The child and a female experimenter sat on opposite sides of the table, separated by an opaque screen. The experimenter asked the child to look at the page and describe, one at a time, in the best possible way, the stimuli marked by an asterisk so that she, by looking at her catalogue, could guess what picture

matched the description given by the child. In order to ascertain that children had no difficulty in recognizing or categorizing the objects represented in the pictures, they were first required to name the category to which the objects of the set belonged.

After the two training sets, intended to familiarize the children with the procedure and to check the task comprehension, the 12 experimental sets were administered. Children had to describe two stimuli for each set. So each child produced on the whole 24 descriptions, 8 for each type of stimuli. The order of presentation of the sets was randomized.

We expected different types of messages depending on the stimulus type: conventional labels or descriptions with easy-stimuli, and production of analogical expressions with difficult-stimuli (both unusual and similar).

Messages coding and analysis

The children's verbal productions were audio-taped and transcribed, and were coded according to the following five macro categories:

1. *No answer*: the subject does not produce any verbal reply, or uses semantically void expressions such as *I don't know*, *I don't remember*, *it has slipped my memory*, or deictic expressions (*this one here*).
2. *Idiosyncratic message*: the expression used to describe the referent is non-conventional, relates to an event in the child's life, and has a private, exclusive meaning for the child who produces it; it is then potentially incomprehensible to others (e.g.: *What I have seen in my garden*, to describe a butterfly)
3. *Conventional-literal message*: the linguistic expression used to describe the referent's shape and/or size employs socially shared terms and provides a conventional description of the object shape. For example, for a specific butterfly the child says *the one with round wings*.
4. *Analogical message*: the linguistic expression used to define the target referent consists of terms that are non-conventional because they refer to objects different from the referent; but some type of similarity, based on salient perceptual features of the stimulus, can be detected between the referent and the object mentioned by the child.

Analogical messages include both renaming and explicit similes. As for renaming, the linguistic form expresses an implicit analogy. The expression produced by the child consists of a noun (or a noun plus an adjective), which is different from the one conventionally attributed by the linguistic community to the target referent. For example, the child uses the word *mountain* to identify the most pointed and triangular of a set of hats. As for similes, the linguistic form expresses an explicit comparison and points out a relation between the target referent and another object. Children use sentences such as *it's like a....*, *it seems like a.... it resembles....* etc. For

example, the butterfly with each of the wings made up of two semicircles is referred to with the expression *The one with the wings like hearts*.

5. *Other*: any other type of message that does not belong to any of the previous categories. For example, specific nouns which are somehow inappropriate because they are ineffective at singling out the referent (e.g. for a specific hat, the child says "*The hat of the witch*" while in the set all the three hats have a conical shape), functional descriptions (e.g. for a fish, the child says "*The one to make holes*") etc.

The agreement between two judges on the coding was calculated on 20% of the messages and reached 97% for the five macro categories.

Results

The total number of messages for each group of 30 children, is 720, out of which 240 refer to the easy-to-define stimuli and 480 to the difficult-to-define ones. Table 1 shows the absolute and percent frequencies of the messages produced by the children in each age group and for each stimulus type.

The overall distribution of the messages produced by the children shows that the most frequent types of messages in both age groups are analogical and literal-conventional messages. Literal-conventional messages amount to 73% of the messages produced by 4;2-year-old children and 71% of those produced by 5;9-year-old children, while analogical messages amount to 19% of the messages produced by the 4;2-year-old children and to 24% of the messages produced by the 5;9-year-old children. On the other hand, in both age groups, the number of messages belonging to the categories of Idiosyncratic messages or No answer, is negligible.

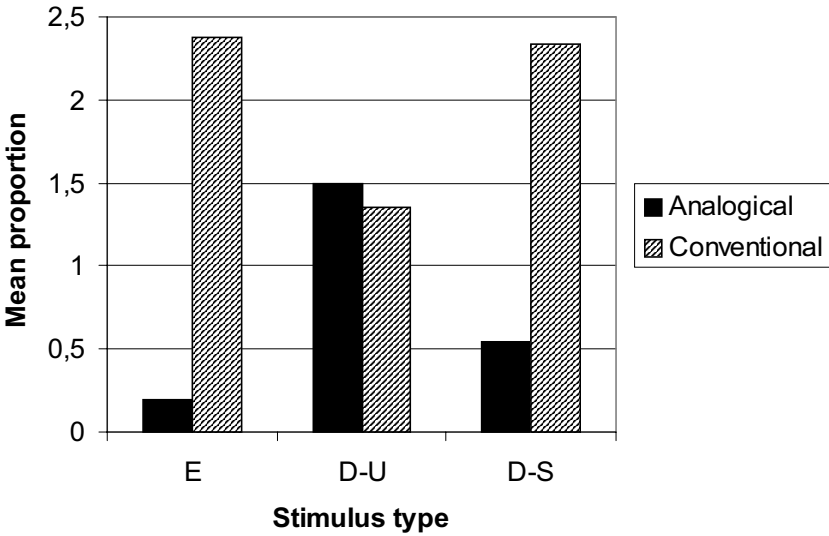
In order to examine the effects of the variables under study on the type of messages produced, the data were submitted to a 2 (Age) X 3 (Stimulus) X 2 (Type of message) MIXED ANOVA with Age at two levels: 4;2- and 5;9- year-olds; Stimuli at three levels: Easy, Difficult-unusual and Difficult-similar stimuli; and Type of messages at two levels: Analogical and Literal-conventional messages. Age was a between factor, while Stimulus and Type of message were within subject factors. As regards the type of messages, we chose to take into account for the analysis only the two types of messages most frequently produced by the children in this task, therefore we considered their proportion out of each child's total production, instead of raw frequencies. Consequently, the dependent variable was the proportion of messages, out of the total production of each child that fell in the categories of literal-conventional and analogical messages for each type of stimulus. For the purpose of the analysis, these proportions were submitted to the arcsin transformation: $2 \times \text{ARCSIN} [v (\text{prop.})]$.

The Stimulus x Type of messages interaction result was significant ($F_{2,116} = 152.96, p < 0.001$). This interaction clearly highlights that the stimulus type affects the type of message. In fact, conventional-literal messages are those most

Table 1. Frequencies of the types of messages in the two age groups for each stimulus type (percentages in brackets)

AGE	STIMULI	MESSAGES					TOTAL
		Analogical	Conventional- literal	Idiosyncratic	Other	No answer	
4 year- olds (N=30)	Easy	12 (5%)	218 (91%)	5 (2%)	5 (2%)	0 (0%)	240 (100%)
	Difficult-unusual	99 (41%)	106 (44%)	19 (8%)	4 (2%)	12 (5%)	240 (100%)
	Difficult-similar	24 (10%)	204 (85%)	7 (3%)	2 (1%)	3 (1%)	240 (100%)
	TOTAL	135 (19%)	528 (73%)	31 (4%)	11 (2%)	15 (2%)	720 (100%)
5 year- olds (N=30)	Easy	7 (3%)	231 (96%)	1 (0%)	1 (0%)	0 (0%)	240 (100%)
	Difficult-unusual	131 (55%)	89 (37%)	12 (5%)	3 (1%)	5 (2%)	240 (100%)
	Difficult-similar	37 (15%)	193 (80%)	5 (2%)	5 (2%)	0 (0%)	240 (100%)
	TOTAL	175 (24%)	513 (71%)	18 (3%)	9 (1%)	5 (1%)	720 (100%)

Figure 4. Mean proportion of analogical and conventional-literal messages by stimulus type



frequently produced, but their mean proportion is lowest with the difficult-unusual stimuli, and increases with the difficult-similar and the easy stimuli, whereas the mean proportion of analogical messages is highest with the difficult-unusual, and decreases with the difficult-similar and the easy stimuli (see Table 2).

Table 2. Mean proportions and standard deviations of analogical and conventional literal messages for each stimulus type

Stimulus	Analogical		Conventional-literal	
	Mean	SD	Mean	SD
Easy	0.19	0.37	2.83	0.43
Difficult-unusual	1.5	0.69	1.35	0.71
Difficult-similar	0.54	0.52	2.43	0.54

Also the three-way interaction Age x Stimulus x Type of message result was significant ($F_{2,116} = 3.52$; $p < 0.05$). At five years, the general production of messages increases, but it becomes also more stimulus specific. The mean proportion of conventional literal messages elicited by easy stimuli increases, as well as the proportion of analogical messages elicited by the difficult-unusual and difficult-

Figure 5. Mean proportions of analogies and conventional-literal messages in the two age groups for each stimulus type

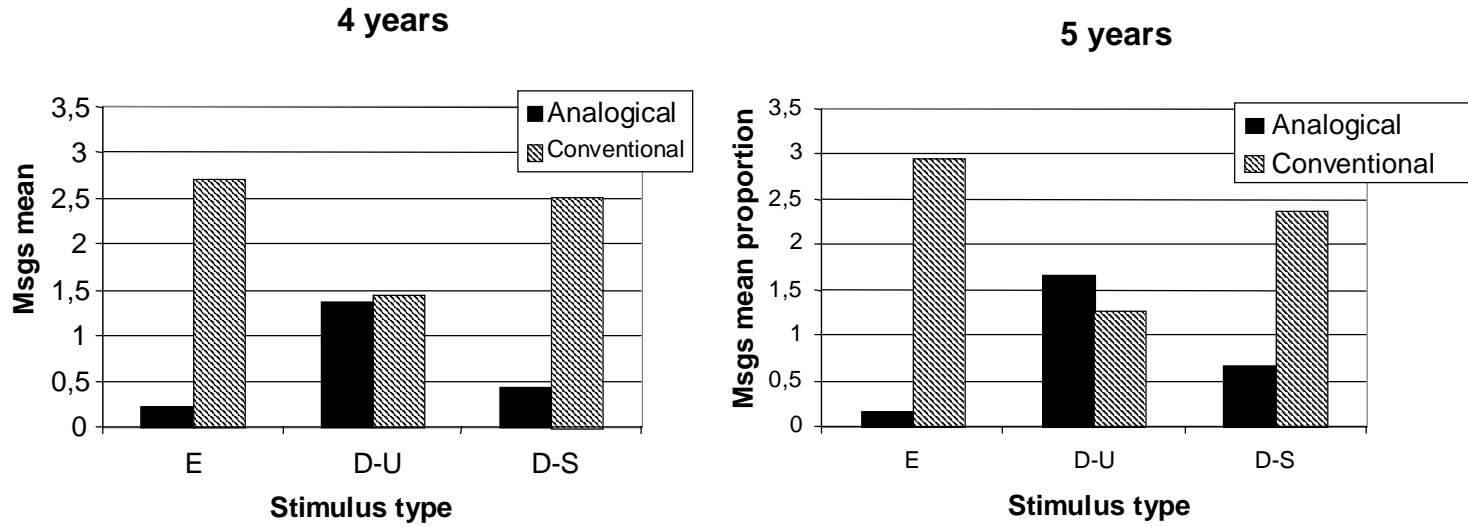


Table 3. Mean proportions and standard deviations of analogies and conventional-literal messages in the two age groups for each stimulus type

Age	Type of message	Easy stimuli		Diff.-unusual stimuli		Diff.-similar stimuli	
		Mean	SD	Mean	SD	Mean	SD
4	Analogies	0.23	0.42	1.35	0.59	0.44	0.51
5	Analogies	0.15	0.32	1.66	0.76	0.66	0.51
4	Conv.-literal	2.71	0.47	1.44	0.60	2.51	0.52
5	Conv.-literal	2.95	0.36	1.26	0.81	2.36	0.56

similar stimuli, with the analogical messages surpassing the literal conventional ones for the difficult unusual stimuli.

Conclusion of experiment 1

The aim of this study was to analyze preschool children's referential production in order to understand if, and how, it varied according to children's age and difficulty in referring the stimulus. The results of this experiment show that the referential messages of preschool children vary according to how difficult the stimulus is to describe: conventional messages are usually produced to refer to easy-to-define stimuli, while analogical expressions are used with difficult-to-define stimuli, as stated in the hypothesis. More precisely, as regards stimulus type, children produce more analogical messages with difficult-unusual stimuli, as predicted, whereas, with difficult-similar stimuli children produce analogical messages but also a large number of conventional-literal messages. This is a somewhat unexpected result as we thought that difficult-unusual and difficult-similar stimuli would elicit the same responses. However, this result might be explained by the hypothesis that children use an analytical descriptive strategy because they are not able to produce different analogies when stimuli are so similar in shape.

Regarding developmental differences, the results show that 5-year-olds' production of analogical and conventional-literal messages is greater than that of 4-year-olds, and more stimulus specific; older children, in fact, have a wider vocabulary than younger ones and they are likely to be more advanced in their use of language.

Moreover, the distribution of messages produced by the children shows that idiosyncratic messages are almost absent in both age groups.

The whole set of results points to children's great effort to make themselves understood in referential communication. In this context, children's production of analogical messages with difficult stimuli appears to be a communicative strategy used when lacking the lexicon.

In order to support our claim that the use of analogical messages in referential communication is a pragmatic strategy systematically adopted by children, we need also to test its effectiveness in the speaker-listener interaction. In fact, if speaker and listener share the same level of cognitive development and type of reasoning it is likely that a message based on a shared strategy may be effective.

To this end, a second experiment investigating comprehension of analogical messages was carried out. The main aim of this experiment is to test the effectiveness of analogical messages as a means of referential communication. A subsidiary hypothesis is that analogical messages most often produced will rely on mental representations common among children of the same age. Therefore, they will be more easily understood, and will be more effective in referential communication than those that rely on an individual representation and are produced by only a single child.

Experiment 2

Method

Participants

44 children aged 5;1 (age range 49-73 months), Italian native speakers, participated in this study. Children were randomly divided into two groups of 22 children, and each group was presented with a set of analogical messages.

Material

From the previous referential communication task, the five sets that had elicited the highest number of analogical messages were selected. Then, for each selected set, we chose the stimulus most frequently analogically described, and

Figure 6. *Butterflies*

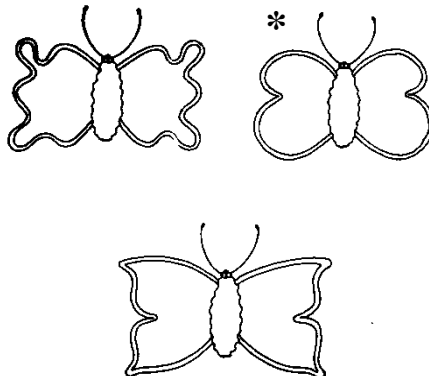


Table 4. Analogical descriptions selected for the second experiment. For each analogical description the source stimulus and the production frequency are indicated

Stimulus	High Frequency	Frq.	Low Frequency	Frq.
Leaf	As waves	11	Ghost	1
Glasses	As hearts	47	As a butterfly	1
Key	As a bear	13	As a steak	1
Hat	Mountain	12	As a hut	1
Butterfly	Wings as hearts	28	Wings as eyes	1

for this stimulus we singled out the most recurrent analogical description produced by children (high-frequency), and the least recurrent one, i.e. the analogical description produced only by a single child (low-frequency). For example, the *butterfly* marked with an asterisk in Figure 6, is the stimulus that elicited the most analogical messages in the set of the butterflies, and the most frequent description was *The one with the wings as hearts*, while only one child said *The one with the wings as eyes* (see Figure 6).

Table 4 shows the analogical descriptions selected for this experiment.

Task and procedure

All children participated in a standard referential communication task, presented as a game, in which they acted as listeners and the experimenter as speaker. Speaker and listener had a catalogue each containing the same pictures. The children took part in the procedure individually, in a quiet room of their school.

After a training intended to familiarize the children with the task procedure, the experimental task was carried out. The order of presentation of the sets was randomized. For each set, the experimenter extracted the three cards portraying the stimuli one at a time and arranged them on the table. The child was asked to look at the pictures carefully, to listen to the description given by the experimenter and to guess what picture matched the description. In order to ascertain that the children had no difficulty in correctly recognizing or categorizing the objects represented in the pictures, and therefore were understanding analogical messages as such, they were first requested to name the category to which the objects of each set belonged.

One group of children listened to five high-frequency analogical messages and the other one the five low-frequency ones.

Results and conclusion of experiment 2

Children were assigned 1 point for each correct referent choice and 0 for each wrong referent choice, so that the total individual score could range from 0 to 5.

Table 5. Means and standard deviation of children's correct referential choices for high and low frequency analogical messages

Analogical Messages	Mean	SD
High Frequency	4.14	0.94
Low Frequency	3.32	1.04

Comparing the mean scores (see Table 5) of the two groups it appears that the mean score of the group who listened to high-frequency analogical messages is significantly higher than the low-frequency ($F_{1,42} = 7.48$; $p < 0.01$).

As hypothesized, the results show that the most recurring analogical messages are also the most effective, maybe because they can direct the listeners' attention to some salient features of the referent which are prototypically represented by the object analogically mentioned.

General discussion

The aim of this study was to analyze preschool children's referential production in order to see if it varied according to stimulus nameability and children's age. Specifically, the analysis was aimed at showing that analogical expressions are more often produced to refer to stimuli that are difficult to describe than to stimuli that are easy to describe, and to show that analogies are not idiosyncratic expressions, but rather an effective communicative strategy systematically adopted by children.

The overall results of this study support this interpretation. Analogical messages are the outcome of a strategy adopted to overcome the lack of lexicon; this strategy is made possible by a form of thought available to children from the earliest age (Crisafi & Brown, 1986; Goswami & Brown, 1989,1990; Singer-Freeman, K. E. 2005).

In fact, preschool children's production of referential messages do actually change depending on the stimulus type: conventional messages are almost always produced with easy-to-describe stimuli whereas, in both age groups, children resort to non conventional referential expressions, especially analogical messages, when referring to difficult-to-describe stimuli. It is noteworthy that the number of analogical messages does not differ greatly in the two age groups; this shows that the use of this communicative strategy is not limited to the age of early word acquisition. The main difference between 4- and 5-year-olds consists in a general increase of conventional literal and analogical message production and in a higher stimulus specificity of these messages, presumably because older children have a wider vocabulary and are

also more aware of the requirements of the communicative context (Mendelsohn, Robinson, Winner, & Gardner, 1980; Deutsch & Pechmann, 1982; Camaioni & Ercolani, 1988).

In order to support the claim that the use of analogical messages in referential communication is a pragmatic strategy, systematically adopted by children, it was not sufficient to show that these productions appear in a context of referential communication, especially when children are likely not to know the correct word for the referent. We also needed to show that these messages, even if consisting of simple renaming, could be effective from a communicative point of view, provided that the listener is able to detect the features shared by the actual referent and the object analogically referred to. The results of the second experiment show the effectiveness of analogical messages for 5-year-old children; i.e. the oldest ones who acted as speakers in this study. In fact, it is most likely that children of the same age share the same pragmatic rules to produce and interpret messages as well as the same cognitive level and ways of representation. In particular, the effectiveness of an analogical message is based on how much children succeed in directing the listener's attention to some salient features of the referent by means of an implicit or explicit simile between the referent and the object analogically mentioned which, supposedly, is the prototypical exemplar portraying the same features. This leads to frequent occurrences of some analogical descriptions, and the more they recur the better they are understood because they match mental images that children of the same age largely share.

In other words, our data show the pragmatic function of analogical messages as a communicative strategy, and so imply that not all that is non-conventional is absolutely idiosyncratic.

One point deserving further discussion is the experimental method which characterizes this study. Our data were produced in a controlled context of referential communication, where the transfer of information from the speaker to the listener is the main object at play, and the results support the view of analogy as a form of referential strategy for communicative purposes.

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