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The creation of new figurative expressions: psycholinguistic evidence in Italian children, adolescents and adults*

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ABSTRACT

According to a developmental model of figurative language acquisition – the GLOBAL ELABORATION MODEL (Levorato & Cacciari, 1995) – the metalinguistic awareness necessary to use figurative language in a creative way is acquired late, and is subsequent to the ability to comprehend and produce figurative expressions. One hundred and eight children aged 9;6, one hundred and twenty-four children aged 11;3, one hundred and twelve adolescents aged 18;5 and one hundred adults participated in Experiment 1 which studied the development of metalinguistic awareness through an elicitation task. The subjects produced a high percentage of figurative expressions with a clear developmental trend that is concluded in adolescence. In addition, Experiment 2 showed that the production of comprehensible, appropriate and novel metaphors, as they were rated by adult judges, also increased with age. These results show that the ability to use figurative language in a creative and sensible way requires a long developmental time span and is strictly connected with the ability to reflect on language as a complex cognitive and interpersonal phenomenon.

INTRODUCTION

Many language researchers presume that figurative language is relatively rare as compared with literal language. On the contrary, figurative speech is not

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so uncommon: by an estimation made some years ago in the USA (Pollio, Barlow, Fine & Pollio, 1977), about 5·9 non-literal expressions (metaphors, idioms, proverbs, and so forth) are uttered per speaking minute of free discourse. Assuming that people engage in conversation an average of two hours a day, we would utter 26·1 million figurative expressions over a 60-year average life span. The same is true for the language directed to children: according to Nippold (1991), 6·7% of the sentences of the reading programmes for the primary school in the United States contained an idiomatic expression. No quantitative estimates analogous to those concerning American-English are available on the exposure of Italian speakers to figurative language. Nonetheless, natural discourse observation (Lapucci, 1984) and qualitative results concerning the use of figurative language in the Italian media (Cacciari & Micciancio, 1999), allow us to presume that figurative language (particularly in its more conventionalized forms) is widely used across discourse settings and ages. Children are as exposed to metaphorical language as anyone who listens to radio programmes, watches a TV programme or reads a textbook, a storybook or comics. Moreover, some findings suggest that the processes underlying acquisition of figurative language are scarcely affected by exposure, even though the rate of acquisition may be (Levorato & Cacciari, 1992).

Despite this frequency, there are surprisingly few studies on why and how children and adults produce figurative language. The surge of interest in the psycholinguistic and developmental literatures on figurative language has primarily concerned the comprehension processes (for a review on the literature on adults, see Gibbs, 1994; Cacciari, 1998; on children, see Winner, 1988).

Levorato & Cacciari (1995) recently proposed a model of the acquisition of figurative language, the Global Elaboration Model (henceforth GEM), that takes production into account as well. According to the GEM, in order to comprehend and produce figurative language no special procedure or source of knowledge should be presupposed with respect to what children ordinarily do with literal language. Figurative language is acquired on the basis of the processes underlying lexical and semantic development, and as part of the abilities children develop in order to acquire and process language in general. The comprehension and production of figurative meanings primarily derive from the ability to go beyond a local, piece-by-piece elaboration of a portion of discourse to search for a global, coherent meaning. Insofar as a sentence is comprehended constituent by constituent, instead of by integrating different sources of information, the outcome of a comprehension process will most likely reflect the literal interpretation assigned to each constituent. The crucial questions the GEM addressed might be summarized as follows: (a) how and when does the child go beyond a local interpretation and processes a text (be it literal, idiomatic, metaphorical, ironical, and so forth)

as a whole; (b) what cognitive and linguistic abilities characterize the figurative competence necessary to allow children to process language in non-literal ways. We identified this set of abilities as follows:

1. The ability to comprehend the dominant as well as the peripheral meanings of a word, and its position in a given semantic domain;
2. The ability to go beyond a literal strategy of language interpretation. This is a prerequisite necessary to cope with most of the linguistic repertoire not only with figurative language;
3. The ability to use contextual information to construct a coherent semantic representation of a text by integrating different sources of information;
4. The awareness that what is said and what is meant does not always coincide.

The development of figurative competence can be conceived in terms of phases where the capacity to process language and the levels of knowledge acquired qualitatively differ. These phases are not necessarily sequential and can sometimes overlap, depending upon the knowledge of the semantic domain to which the figurative expression belongs, on the cognitive complexity of the expression and so forth. The five developmental phases postulated by the GEM (for a detailed presentation of the evidence supporting them, see Levorato & Cacciari, 1992, 1995, 1999) can be summarized as follows:

Phase 1. A primitive type of processing is carried out consisting of a piece-by-piece elaboration of the linguistic input; children process language literally even when it does not make sense in the linguistic context (see for instance Cacciari & Levorato, 1989 for evidence on idioms; Honeck, Sowry & Voegtle, 1978 on proverbs; Vosniadou, 1987 on metaphors). Phase 1 is prevalent at approximately up to seven years of age.

Phase 2. Children start searching for the clues which could lead to a non-literal interpretation of the linguistic input. An acquired sensitivity toward the contextual information leads children from eight to nine years old to activate the world knowledge necessary to recover a meaning which might differ from the literal one. During this phase children realize that a discrepancy between what is said and what is expected on the basis of context should not always be interpreted as a communicative error.

Phase 3. The child acquires the knowledge that the same communicative intention can be realised through different sentence forms (literally, idiomatically, metaphorically, and so forth). While in Phase 2 children only use world knowledge to make sense of a text, in Phase 3, that characterizes ten to twelve-year-olds, the internal state of the speaker, his/her intentions and knowledge, are taken into consideration.

Phase 4. An ability to use the conventional repertoire of figurative

expressions is achieved by fifteen-year-olds. The developmental gap between the ability to comprehend and to produce figurative language, still present in Phase 3, is progressively reduced, particularly as far as idiomatic expressions are concerned (Clark & Hecht, 1982; Gibbs, 1987).

Phase 5. An adult-like figurative competence is reached that is characterized by the ability to use figurative language in a creative way and based on a metalinguistic and metasemantic awareness (Gombert, 1992) which represents the most mature acquisition.

The evidence so far collected on these two latter developmental phases is scarce and restricted to the comprehension and interpretation of idiomatic expressions. For instance, in a previous study (Levorato & Cacciari, 1999), we investigated children's ability to attribute a rationale for the meaning of idioms, by using expressions characterized by different levels of semantic transparency. We showed that ten and eleven-year-old children had a remarkable metalinguistic ability to provide an interpretation of the figurative meaning especially when the link between literal and idiomatic meanings was semantically motivated (e.g. 'to cry over spilt milk', 'to skate on thin ice') (see also Gibbs, 1987; Nippold & Rudzinski, 1993).

The present investigation integrates the GEM, as far as the development of the fifth phase is concerned studying the development of metalinguistic and metasemantic awareness in the creation of figurative expressions. We used an elicitation task in which we asked subjects of different age levels (nine-year-old children, eleven-year-old children, adolescent and adults) to create new expressions to denote common actions (e.g. telling a lie, revealing a secret) and common emotions (e.g. being happy, being ashamed) that already have a name of their own. We expected to find significant improvement in the production of figurative language from childhood, to adolescence, and adulthood. The hypothesis of a long lasting development is supported by the results obtained by Nippold and co-workers (Nippold, 1991; Nippold & Rudzinski, 1993; Nippold & Taylor, 1995) who found that adolescents still did not show a complete ability to explain the semantic motivation for idiomatic expressions when presented out of context.

This study indirectly addressed the problem of language creativity as well. The extent to which the figurative expressions commonly used in everyday conversations are linguistically and conceptually creative is an open and fairly neglected question. At the same time, it is generally acknowledged that figurative language, and particularly metaphor, is the most powerful source for linguistic innovation. The elicitation task we used can provide interesting materials to explore one aspect of linguistic and conceptual creativity, that is, the extent to which children, adolescents and adults would use figurative language to create new expressions.

According to Eve Clark (1981; Clark & Hecht, 1982), children's lexical creativity is a resource they use in order to fill a gap in their lexicon, a

linguistic strategy that is employed when the appropriate word is not available. But the very young children tested in these studies do not yet possess the metalinguistic awareness necessary to intentionally coin a new expression. This has raised the question of the extent to which these productions reflect a developmental acquisition process or a simple play with words. Other studies have shown that children as young as three or four years old produced new metaphors but, again, these children possess neither an extended lexicon nor the ability to recognize that a single linguistic expression might convey several different meanings (Winner, 1988).

One of the domains where figurative language, and particularly metaphor, served its function best is that of giving a detailed picture of our subjective experiences, in particular for describing the quality of emotional states (cf. Ortony & Fainsilber, 1987; Ortony, 1988; Besnier, 1990; Fussell, 1992, Gibbs, 1994; Cacciari, 1998). For instance, Ortony & Fainsilber (1987) argued that emotional states have an 'elusive, transient quality' (p. 181) difficult to express in literal language (although we label emotions literally). Metaphorical language might well be suited to express the quality and intensity of such states. In their study, they had adult participants describe linguistically either how they felt when they experienced certain emotions, or what they did when they experienced them. Ortony & Fainsilber (1987) measured the extent to which people used metaphors or literal language in either one of the two conditions and found a significantly greater proportion of metaphors in the descriptions of feelings than of actions, and more metaphors for intense than for mild emotions.

Based on these findings, we decided to contrast two types of targets (Common Actions vs. Common Emotions) predicting a more extended use of figurative language for expressing emotion targets than action targets.

We also devised two types of instructions: one in which participants had no constraint as to the linguistic structure of the created expression provided that a nominal structure was employed (e.g. 'Target is …'), and one in which they were asked to use a comparative structure (e.g. 'Target is like …'). On the basis of the literature concerning the difference between metaphors and comparisons (cf. Glucksberg & Keysar, 1990; Cacciari, 1998), we hypothesized that the nominal and the comparative structures might elicit different strategies of search for similarity between the target and the source domains: more specific and presumably more complex strategies with the nominal structure, and more generic and less constrained ones with the comparative structure (we return to this point later on in the discussion).

EXPERIMENT 1

In this experiment the ability of Italian nine- and eleven-year-old children, adolescents and adults to create new expressions for denoting common

actions and common emotions was studied. Previous studies showed that at around nine years of age children begin to produce conventionalized figurative expressions (Winner, 1988, Levorato & Cacciari, 1992). We chose this age level for our younger participants, since we expected them to be able to produce new figurative productions intentionally created in order to express familiar domains of meaning (Levorato & Cacciari, 1995). More specifically, we investigated: (a) the extent to which the participants of different age groups would use a literal or a figurative expression, and (b) whether such a choice would be differentiated according to the nature of the instruction and of the target.

METHOD

Subjects

One hundred and eight children with a mean age of 9;6 (age range from 8;7 to 9;8); one hundred and twenty-four children with a mean age of 11;3 (age range from 10;3 to 11;8) of two schools of Padua (Italy), one hundred and twelve adolescents of a high school in the same town (mean age 18;5, age range from 14;1 to 19;7), and one hundred university students of the Faculty of Psychology of the University of Padua, participated in this experiment. An approximately equal number of males and females participated.

Materials and procedure

In order to induce participants to produce new expressions, an elicitation task was used. A list of nine common actions and of nine common emotions was prepared; the actions were both individual and interpersonal and were chosen so that they would be familiar to children; the emotions were selected so as to include basic emotions commonly experienced by children too.

Stimuli

Actions:

(a) *Rivelare un segreto* (Revealing a secret).
(b) *Dire una bugia* (Telling a lie).
(c) *Fare male a qualcuno* (Hurting someone).
(d) *Tradire un amico* (Betraying a friend).
(e) *Commettere un errore* (Making a mistake).
(f) *Dormire troppo* (Sleeping too much).
(g) *Disturbare i compagni* (Bothering friends).
(h) *Spendere tutti i risparmi* (Spending all one's savings).
(i) *Fare qualcosa di inutile* (Doing something useless).

Emotions:

1. *Essere felici* (Being happy).
2. *Vergognarsi* (Being ashamed).

3. *Essere tristi* (Being sad).
4. *Avere paura* (Being afraid).
5. *Essere arrabbiati* (Being angry).
6. *Essere gelosi* (Being jealous).
7. *Essere sorpresi* (Being surprised).
8. *Essere interessati* (Being interested).
9. *Essere invidiosi* (Being envious).

The participants were tested in small groups in quiet rooms of the schools and University they attended. They were given a booklet in which, on the top of each page, a target sentence was printed that could either be an emotion or an action (the order of presentation of the targets was randomized). The task was to create and write down a new way of expressing the meaning of the sentence. In order to encourage the participants to create a new expression, and not simply paraphrase the target, the task was phrased as follows: 'We ask you to create and write down a new expression, which is more comprehensible within your peer group than outside it'. Two different instructions were used. Participants were either asked to form a new expression with no constraint as to the syntactic form they should use ('Target is …') (henceforth NOMINAL instruction) or they were asked to use the 'is like' form (e.g., 'Target is like … .') (henceforth COMPARATIVE instruction). This procedure was aimed at investigating whether the availability of the linguistic constraint 'is like' would have an effect on the production of figurative expressions.

Four experimental conditions were therefore obtained that reflected the type of target (actions vs. emotions) and the type of instruction (nominal vs. comparative). The participants of each age level were divided into four groups and randomly assigned to one of these four experimental conditions.

Coding procedure

Six adults independently coded the productions obtained. They had first to decide whether each production was literal or figurative, and then to assign it to either one of the categories of literal or figurative language that were devised on the basis of the production obtained (The Appendix contains a set of examples for two targets, one action and one emotion.)

The literal expressions were coded as:

PARAPHRASES: the target was paraphrased, or simply re-coded linguistically, e.g. telling a lie (common action): 'saying something which is not true' (created by a nine-year-old).

EXAMPLES: an instance was provided, or a case from the class of actions described in the target sentence, e.g. (i) telling a lie: 'being like Pinocchio', 'cheating friends' (nine-year-olds); (ii) making a mistake (common action): 'writing down *gato* instead of *gatto*' (nine-year-old).

CAUSES/CONSEQUENCES: a cause or a consequence of the action or emotion was referred to, e.g. being afraid (common emotion): 'I run away' (adolescent), 'being in the dark', 'being away from mummy' (nine-year-olds), 'having an awful dream' (adult).

The figurative expression were coded as:

SYNECDOCHES/METONYMIES: when the part for the whole was referred to, or the opposite, e.g. being ashamed (common emotion): 'having the shivers', 'having a red face' (nine-year-olds), 'warming one's face', 'walking with lowered head' (teenagers).

TRANSPARENT METAPHORS: when the conceptual relation between the target and the new expression was easily inferrable e.g. revealing a secret (common action): 'to be a speaking letter', 'to be a musical instrument' (eleven-year-olds), 'breaking the egg' (adult). e.g. sleeping too much (common action): 'putting glue in the pyjamas', 'seeing the entire sky', 'being like a stone on the ground', 'to be a boiled potato' (eleven-year-olds).

OPAQUE METAPHORS: when a more complex mapping from source to target is required than for transparent metaphor, betraying friends (common action): 'being like the days that change', 'being like a wheel that keeps turning even when you slow down', 'destroying a thread' (eleven-year-olds), e.g. being jealous (common emotion): 'being like a sour lemon', 'being like an ice-lolly' (eleven-year-olds), 'being like glue', 'being like a blanket of snow that prevents life' (adolescents).

CONVENTIONAL IDIOMS: when the subject used existing idiomatic expressions or slight variants, e.g. being happy (common emotion): 'being on top of the sky' (Italian idiom: being in the seventh sky) (adolescent).

A string was classified as an opaque metaphor (instead of nonsensical) whenever the figurative meaning made sense, although it required a more complex mapping from source to target. In the case of transparent metaphors the conceptual relation between the target and the new expression was easily inferable. This way of differentiating between opaque and transparent metaphors is analogous to that posited by Ortony (1980) between metaphors that introduce predicates not yet part of the mental representation of the target (i.e. 'predicate introduction metaphors'), and metaphors that highlight the salience of already existing predicates (i.e. 'predicate promotion metaphors'). We differentiated between levels of semantic transparency since it has proved to be a factor affecting the comprehension of idiomatic expressions in children (Cacciari & Levorato, 1998; Levorato & Cacciari, 1999). Intercoders' agreement ranged from 84% to 94%. Any case of disagreement was discussed by all the coders together.

RESULTS AND DISCUSSION

Tables 1a–d show the percentages of literal and figurative productions, according to the categories used, in the four age levels for the target type

TABLE 1. *Percentages of literal and figurative expressions for : (a) actions targets – nominal instruction, (b) actions targets – comparative instruction, (c) emotions targets – nominal instruction, (d) emotions targets – comparative instruction*

	Figurative expressions					Literal expressions				
	SM	TM	OM	ID	Total	EX	PAR	C/C	Total	NC
(a) Actions – nominal instruction										
9-yr-old	1·1	9·0	5·4	6·5	22·0	38·2	30·3	9·5	78·0	0·0
11-yr-old	6·6	3·7	17·8	9·2	37·3	20·3	23·1	9·7	53·1	9·6
Adolescents	1·7	19·8	27·6	9·8	58·9	15·8	8·1	10·4	34·3	6·8
Adults	2·2	17·8	14·0	18·5	52·5	18·9	13·0	8·9	40·8	6·7
(b) Actions – comparative instruction										
9-yr-old	0·4	31·8	7·9	5·9	46·0	23·1	27·3	1·7	52·1	1·9
11-yr-old	1·0	27·9	12·4	8·8	50·1	21·5	19·4	0·0	40·9	9·0
Adolescents	0·4	18·1	25·5	21·6	65·6	27·8	0·8	0·0	28·6	5·8
Adults	0·4	29·0	28·7	6·4	64·5	26·0	7·3	1·0	34·3	1·2
(c) Emotions – nominal instruction										
9-yr-old	2·1	15·1	5·9	3·6	26·7	32·4	18·9	15·3	66·6	6·7
11-yr-old	2·9	11·8	9·0	3·4	27·1	30·3	14·9	26·9	72·1	0·8
Adolescents	8·4	22·1	15·1	15·5	61·1	9·3	14·2	13·3	36·8	2·1
Adults	1·7	14·9	16·5	32·9	66	13·2	5·2	15·0	33·4	0·6
(d) Emotions – comparative instruction										
9-yr-old	2·4	20·9	21·8	2·0	47·1	17·5	21·2	9·0	47·7	5·2
11-yr-old	0·1	26·6	23·2	5·1	55·0	21·3	11·8	8·4	41·5	3·5
Adolescents	0·4	42·3	39·1	3·1	84·9	12·4	1·3	0·9	14·6	0·5
Adults	0·0	39·4	22·2	6·6	68·2	24·7	2·2	2·7	29·6	2·2

SM: synecdoches and metonymies; TM: transparent metaphors; OM: opaque metaphors; ID: idioms and variants; EX: examples; PAR: paraphrases; C/C: causes/consequences; NC: non-classified

(Tables 1a and 1b concern the action targets and Tables 1c and 1d the emotion targets), the instructions type (nominal vs. comparative: tables 1a and 1c concern nominal instruction; tables 1b and 1d concern comparative instruction).

The task did not explicitly ask participants to use a figurative expression. Despite this, more than half the creations produced were figurative (52·1 %). Even younger children produced a remarkably high percentage of figurative expressions (37 % and 42·4 %, for nine- and eleven-year-olds respectively), that increased for adolescents (67·5 %) but, interestingly, not for adults (61·3 %).

The percentages of figurative productions relative to each of the targets in each condition were submitted to an arc-sine transformation and an ANOVA was carried out with the target type (actions vs. emotions) as a between-subjects factor, the type of instruction (nominal vs. comparative) and the age level (nine- and eleven-year-olds, adolescents and adults) as within-subjects factors.

The ANOVA showed a main effect of the type of instruction factor [$F(1, 16) = 57{\cdot}21$, $p < 0{\cdot}0001$], in that the comparative instruction elicited more figurative productions than the nominal instruction, and a main effect of the age factor [$F(3, 48) = 54{\cdot}23$, $p < 0{\cdot}0001$]. Newman–Keuls *post hoc* test ($p < 0{\cdot}01$) indicated that the production of figurative expressions significantly increased with age only up to adolescence (that is, adolescents and adults did not differ). The age and the type of instruction factors interacted [$F(3, 48) = 5{\cdot}14$, $p < 0{\cdot}004$] in that more figurative expressions were produced with the comparative instruction than with the nominal instruction among nine, eleven-year-olds and adolescents but not among adults. While the linguistic operator 'like' made the search for similarities easier for children and adolescents, this cue was no longer necessary for adults who found figurative language a well suited means of expression even in the nominal instruction.

Figurative productions were not all alike, in that some were more creative and some contained, instead, less conceptual innovation: mentioning an idiom, or slightly varying an already existing one, is certainly easier and less creative than producing a new expression. Our main interest was to assess whether participants would produce innovative expressions rather than relying on an existing linguistic formula. Hence we did not consider the production of idioms (overall 10·1 % of the figurative productions) in the subsequent analyses, focusing instead on the production of opaque and transparent metaphors. Just to recall, by transparent metaphor we mean an expression that conveys properties of the source domain that are already part of the semantic representation of the target domain. On the contrary, in the case of opaque metaphors new properties borrowed from a source domain might contribute to enriching the representation of the target domain.

An ANOVA was carried out on the arc-sine percentages of opaque and

transparent metaphors obtained by each target with the target type (actions vs. emotions) as a between-subjects factor, and the following three within-subjects factors: the metaphor type (transparent vs. opaque), the instruction type (nominal vs. comparative) and the age level (nine and eleven-year-olds, adolescents and adults). Metonymies and synecdoches on average were very few (2·0 %); since these tropes are very similar to metaphors (Gibbs, 1994) they were pulled together with transparent metaphors.

The ANOVA showed the following main effects:

(a) the type of instruction factor [$F(1, 16) = 144{\cdot}66$, $p < 0{\cdot}0001$] in that the highest percentages of both transparent and opaque metaphors were produced in the comparative instruction;

(b) the type of metaphor factor [$F(1, 16) = 7{\cdot}79$, $p < 0{\cdot}01$] in that more transparent than opaque metaphors were produced overall;

(c) the age factor [$F(3, 48) = 30{\cdot}43$, $p < 0{\cdot}0001$]. Newman–Keuls *post hoc* test ($p < 0{\cdot}01$) indicated that each age level was significantly different from the others. Moreover, the four age groups differed as far as the metaphor type factor was concerned [$F(3, 48) = 2{\cdot}84$, $p < 0{\cdot}04$]: simple effects analyses indicated that the four age groups gave a significantly different number of opaque metaphors [$F(3, 48) = 30{\cdot}14$, $p < 0{\cdot}001$]: Adolescents produced the highest percentage, followed by adults, by eleven-year-olds and finally by nine-year-olds. The four age groups were different also as far as the transparent metaphors were concerned [$F(3, 48) = 4{\cdot}74$, $p < 0{\cdot}006$], with the highest percentage again produced by adolescents, followed by adults and then by children. More specifically, only younger children produced significantly more transparent than opaque metaphors [$F(1, 16) = 16{\cdot}54$, $p < 0{\cdot}0001$].

The results obtained in this experiment can be summarized as follows:

(1) The ability to produce new figurative expressions had a clear developmental trend that almost terminated with adolescence. In fact, the adults' performance was similar to that of the adolescents. In turn, adolescents behaved differently from primary school children. Also nine-year-olds and eleven-year-olds differed as to their ability to produce new metaphors. The metalinguistic competence necessary to produce new metaphors is achieved during primary school age up to adolescence.

(2) The linguistic structure had an effect in that the presence of the operator 'like' favoured figurative productions for all age levels except adults. In a study on the comprehension of metaphorical descriptions referring to individuals, Cacciari (1998) found an effect of the comparative structure (i.e. 'is like a …') on the ease of comprehension that might support our results. She claimed that the function of the nominal structure (i.e. 'is a …') is to alert the listener that a specific relation is intended between the domains to which the source and target belong. The comparative structure, instead, conveys a general assertion of similarity (Glucksberg & Keysar,

1990) that leaves the specific properties intended unspecified in the comparison and is, therefore, easier to comprehend. This can be taken to imply, for our study, that the comparative instruction favoured the search for some generic cross-domain similarity which was easier to identify than higher order similarities.

(3) Semantically transparent metaphors were easier to produce than opaque metaphors as was suggested by the striking difference obtained with children. The preference to produce transparent metaphors suggests that participants looked for properties already existing in the semantic representation of the domains, instead of introducing new similarities. Transparent metaphors were also more frequent with the comparative instruction than with the nominal instruction. This is not surprising if it is true that the former signals a generic form of figurative resemblance between semantic domains.

Figurative productions represent only a part, although a large one, of all the productions: even the older participants still produced literal expressions. We suggest that the linguistic and conceptual strategies used in the production of literal and figurative expressions partly differ: the production of a literal expression such as a paraphrase is based on the rephrasing of the meaning of the target into slightly different terms. In this case, the task was interpreted as if it were 'say the same thing in different words'. Unsurprisingly, paraphrases were more frequent among children than among adolescents and adults.

In the category of examples, which was very frequent in children and less so in adolescents and adults, the new expression was a good instantiation of the target within the same conceptual domain. The case of the productions belonging to the causes/consequences category is different: a further elaboration is involved with respect to the previous cases, based on a representation of the event to which the action or emotional state belongs. This type of production was rather constant across ages.

Transparent metaphors exibit clearer conceptual similarities between the target and source domains than opaque metaphors. Transparent metaphors can exemplify, as Quinn noted (1991, p. 79), the fact that 'the invention of new metaphorical expressions is constrained (...) by the necessity of finding metaphors that make sense in terms of the cultural models and by preference for metaphors that do a particularly good job of this'. Our transparent metaphors, presumably represent what she calls 'satisfying instantiations' of culturally shared models. On the other hand, the opaque metaphors forming our corpus might be based on more creative but, at the same time, more idiosyncratic, processes that lead to the identification of the conceptual domain used to express the target's meaning. However, the possibility exists that they were simply more ambiguous than transparent metaphors, deprived of clarity and pragmatic appropriateness. The next experiment was aimed at

distinguishing between these two different interpretations by testing the comprehensibility, appropriateness and novelty of transparent and opaque metaphors.

EXPERIMENT 2

When a speaker produces a new expression to denote an object or an event, a sound equilibrium among novelty, referential appropriateness and communicative needs must be reached. In Experiment 2 we investigated the extent to which the new figurative expressions obtained in Experiment 1 fulfilled these goals. Since the corpus of production was far too numerous to be tested (in fact the sum of transparent and opaque metaphors equals 1,746), we randomly selected a large sample (almost 50%) of them and asked a group of adults to rate their comprehensibility, appropriateness and novelty. These three rating scales have been extensively used in the literature on figurative language comprehension (see Katz, Paivio, Marschark & Clark, 1988; Tourangeau & Rips, 1991; Cacciari, 1998). In general the results obtained suggest that good metaphors are those that can easily be understood (Marschark, Katz & Paivio, 1983; Katz *et al.*, 1988; Tourangeau and Rips, 1991; Cacciari, 1998).

Based on this literature, we might predict a positive correlation between comprehensibility and appropriateness and a negative correlation between comprehensibility and novelty, in that novel expressions might be rated as less comprehensible (as in Cacciari, 1998). Transparent metaphors should be judged as more comprehensible than opaque ones, but the relations of comprehensibility with novelty, on the one hand, and with appropriateness, on the other, are less obvious. Moreover, Experiment 2 tested the role of the variables investigated in Experiment 1, that is the instruction type, the target type and the age level, on the three scales. Our hypotheses can be summarized as follows:

(a) The perceived appropriateness of a figurative production should improve according to the age level of the producer: Children's metaphorical expressions should be judged as less appropriate than those produced by adolescents and adults.

(b) The metaphors referring to emotions should be perceived as more appropriate than those referring to actions, since figurative language is more often used to describe abstract concepts and psychological states than concrete actions.

(c) The expressions produced in the comparative instruction should be judged as more comprehensible than those created in the nominal instruction, that, in turn, should elicit more innovative expressions.

METHOD

Subjects

Two hundred and forty adults participated in the experiment. They were voluntarily recruited among the teachers of secondary schools of Ferrara (Italy). We chose teachers as judges because they are familiar with the task of judging pupils' expressions.

Material and procedure

Experiment 1 had 32 conditions, namely: two types of metaphors (transparent and opaque) produced by four age groups, with two types of target (emotions and actions), and two instructions (nominal and comparative). Twenty-seven metaphors for each condition were randomly extracted from all those produced in Experiment 1. Hence, the experimental material of Experiment 2 amounted to 864 metaphors (49·5 % of the metaphors produced in Experiment 1). They were divided into twelve lists, each of which was formed by 72 metaphors: four metaphors for each of the nine common actions and nine common emotions used in Experiment 1. Each judge was presented with four new expressions for each target, randomly chosen from those produced in the 32 conditions (an example of an expression to be rated might be a transparent metaphor produced by a nine-year-old, for an emotion, in the comparative instruction). Each judge knew that the expression might have been produced by a nine-year-old, an eleven-year-old, an adolescent or an adult. Each page of the list contained a target (e.g 'being afraid') and four expressions. The task of the judges was to rate on a seven-point scale (reported under each expression) the extent to which each expression was comprehensible (the scale went from 1: Not at all comprehensible to 7: extremely comprehensible), appropriate (from 1: not at all appropriate to 7: extremely appropriate) and novel (from 1: not at all novel to 7: extremely novel). Each list was presented to twenty judges so that each expression received twenty scores.

RESULTS AND DISCUSSION

We computed the mean scores of comprehensibility, appropriateness and novelty for each expression (they are reported in Tables 2–4, respectively). A significantly high correlation between comprehensibility and appropriateness was obtained ($r = 0{\cdot}66$), that confirms what was found in the literature, and between novelty and appropriateness ($r = 0{\cdot}64$), and a low correlation between comprehensibility and novelty ($r = 0{\cdot}33$). These results suggest that our judges appreciated to a similar extent both comprehensible and novel metaphors, a result that differs from that of Cacciari (1998) where

conventionalized metaphors were rated as more appropriate than non-conventional metaphorical descriptions.

In order to explore the effect of the factors investigated in Experiment 1, three multivariate analyses of variance were performed, one for each scale, with four within-subjects factors: the age level (nine and eleven-year-olds, adolescents and adults), the type of instruction (nominal vs. comparative), the type of target (action vs. emotion) and the type of metaphor (transparent vs. opaque).

Comprehensibility

All the main effects were significant. As expected, the type of metaphor factor [$F(1, 539) = 2048$, $p < 0{\cdot}0001$] was significant since transparent metaphors were judged as more comprehensible than opaque ones (mean ratings 4·7 and 3·4, respectively). This confirms that the distinction we made between transparent and opaque metaphors corresponded to that used by the judges.

As far as the age level was concerned [$F(1, 539) = 65{\cdot}1$, $p < 0{\cdot}0001$], the planned multiple comparison by Sheffé showed that the mean comprehensibility of the expressions increased according to the age level of the producer, from childhood to adolescence to adulthood, with a significant difference between the ratings relative to the expressions of each age level.

As for the type of target factor [$F(1, 539) = 51{\cdot}99$, $p < 0{\cdot}0001$], the expressions concerning emotions were judged as more comprehensible than those concerning actions (mean ratings of 4·1 and 3·9, respectively).

As far as the type of instruction factor was concerned [$F(1, 539) = 55{\cdot}77$, $p < 0{\cdot}0001$], the metaphors produced in the nominal instruction were rated as more comprehensible than those produced in the comparative instruction (mean ratings 4·1 and 3·9, respectively).

The interactions which yielded significance were those involving the type of metaphor factor, that is: transparent metaphors were judged as more comprehensible than the opaque ones at each age level, with both instructions and for both targets. Moreover, transparent metaphors created for emotions were judged as more comprehensible than those for actions (see Table 2).

In sum, the most comprehensible metaphors were the transparent ones produced by older speakers, in the nominal instruction and for the targets referring to emotions.

Appropriateness

All the main effects reached significance. For the age factor [$F(3, 1617) = 65{\cdot}33$, $p < 0{\cdot}0001$] the Sheffé test showed that the ratings of appropriateness improved as the age level of the producer increased, each age level being different from all the others (see Table 3).

TABLE 2. *Mean ratings of comprehensibility for transparent and opaque metaphors* (*the rating scale went from 1 : not at all comprehensible to 7 : extremely comprehensible*)

Metaphor	Target	Instruction	Age level			
			9-yr-old	11-yr-old	Adolescents	Adults
Transparent	Actions	Nominal	4·4	4·6	4·1	4·7
		Comparative	4·4	4·2	4·5	4·7
	Emotions	Nominal	4·9	4·7	5·2	5·4
		Comparative	4·8	5·0	5·2	5·0
Opaque	Actions	Nominal	3·4	3·5	3·7	3·7
		Comparative	2·7	3·2	3·2	3·5
	Emotions	Nominal	3·2	3·5	3·5	3·7
		Comparative	2·7	3·2	3·5	3·7

Concerning the target type factor [$F(1, 539) = 51{\cdot}99$, $p < 0{\cdot}001$], the metaphors referring to emotions were judged as more appropriate than those referring to actions (mean ratings 3·8 and 4·0, respectively).

The nominal instruction induced the production of metaphors judged to be of a better quality than the comparative instruction (4·0 and 3·8, respectively) [$F(1, 539) = 55{\cdot}77$, $p < 0{\cdot}001$].

Transparent metaphors were rated as better than opaque ones [$F(1, 539) = 20{\cdot}48$, $p < 0{\cdot}001$], (mean ratings 4·2 and 3·6, respectively).

The interactions which yielded significance were those involving the type of metaphor factor, confirming that this is a crucial factor. They were as follows.

(1) Age level × metaphor type [$F(3, 1617) = 7{\cdot}54$, $p < 0{\cdot}0001$]: The Sheffé test showed that the transparent metaphors were judged to be of a better quality than the opaque ones at each age level.

(2) Target type × metaphor type [$F(1, 539) = 80{\cdot}09$, $p < 0{\cdot}0001$]: The Sheffé test indicated that the transparent metaphors were judged better than the opaque ones for both targets. Moreover, transparent metaphors for emotions were rated as better than those for actions (see Table 3).

In sum, the most appropriate metaphors were the transparent ones produced by older speakers, in the nominal instruction, for emotion targets.

Novelty

The main effect which yielded significance was age [$F(3, 1617) = 28{\cdot}7$, $p < 0{\cdot}001$). The planned multiple comparison by Sheffé showed that the ratings of novelty improved as the age level of the producer increased: nine-year-olds obtained the lowest score, followed by eleven-year-olds, adolescents and adults (see Table 4).

TABLE 3. *Mean ratings of appropriateness for transparent and opaque metaphors (the rating scale went from 1 : not at all appropriate, to 7 : extremely comprehensible)*

			Age level			
Metaphor	Target	Instruction	9-yr-old	11-yr-old	Adolescents	Adults
Transparent	Actions	Nominal	4·0	4·2	4·2	4·4
		Comparative	3·7	3·7	3·8	4·1
	Emotions	Nominal	4·2	4·4	4·5	4·6
		Comparative	4·4	4·4	4·7	4·5
Opaque	Actions	Nominal	3·4	3·6	3·9	4·0
		Comparative	3·1	3·4	3·4	3·8
	Emotions	Nominal	3·5	3·7	3·5	3·9
		Comparative	3·0	3·4	3·9	4·0

The interaction which yielded significance was target type × metaphor type [$F(1, 539) = 10{\cdot}67$, $p < 0{\cdot}001$]. The Sheffé test indicated that transparent metaphors given for emotions were more innovative than those for actions, with no difference between transparent and opaque metaphors for actions. This result differed from that obtained in the other scales where transparent metaphors always obtained higher scores than opaque ones, both for actions and for emotions. The mean scores clearly show that whereas it is difficult to produce novel metaphors for actions, it is less so for emotions.

Two further interactions involving the age factor were significant: the first, target type × age level [$F(3, 1617) = 5{\cdot}96$, $p < 0{\cdot}001$], showed that the metaphors produced for emotions were rated as more novel than those produced for actions for all age groups. The second interaction, Instruction type × age level [$F(3, 1617) = 5{\cdot}96$, $p < 0{\cdot}001$], showed that the metaphors produced in the nominal instruction were judged as more novel than those produced in the comparative instruction.

The results of the three MANOVAS can be summarized as follows:

(1) The age factor affected the results obtained in all three scales: as the producers' age increased, the expressions were judged as more comprehensible, novel and appropriate. Although the age difference between nine and eleven-year-olds was very small, it was large enough to affect the child's ability to produce new metaphoric expressions. As we expected, adolescents were more skilful than children. Less expected was that the quality of metaphoric expressions evolved between adolescence and adulthood, at least if one considers the results obtained in Experiment 1 where the two groups did not differ overall. Although adolescents were as able to produce new expressions as adults were, their creations were less apt, at least as far as the adult judges rated them. This result suggests that the

TABLE 4. *Mean ratings of novelty for transparent and opaque metaphors* (*the rating scale went from 1 : not at all novel, to 7 : extremely novel*)

			Age level			
Metaphor	Target	Instruction	9-yr-old	11-yr-old	Adolescents	Adults
Transparent	Actions	Nominal	4·1	4·4	4·1	4·5
		Comparative	3·7	3·9	3·9	4·3
	Emotions	Nominal	4·1	4·3	4·3	4·1
		Comparative	4·3	4·4	4·7	4·4
Opaque	Actions	Nominal	3·9	4·0	4·4	4·5
		Comparative	3·8	3·9	4·1	4·3
	Emotions	Nominal	4·2	4·2	3·9	4·2
		Comparative	3·7	4·0	4·3	4·5

competence underlying the production of a new expression is complex, develops over a long time span and, presumably, involves a set of linguistic and conceptual abilities that are only gradually achieved and integrated.

(2) The highest scores in all three scales were obtained in the nominal instruction. This result was unexpected since we hypothesized that the comparative instruction would have favoured the production of comprehensible metaphors more than the nominal instruction. In Experiment 1, the presence of the comparative structure indeed induced the production of metaphoric expressions much more than of literal ones. In Experiment 2, on the contrary, the comparative structures seemed to limit the creation of appropriate expressions.

(3) The hypothesis that metaphoric expressions were more suitable to express emotional states was confirmed. The figurative expressions for emotions obtained higher scores than those referred to actions in all three scales.

(4) As expected, the differences between transparent and opaque metaphors again proved to be crucial. The former obtained higher scores for appropriateness but not for novelty, at all ages for both emotional states and concrete actions.

GENERAL DISCUSSION

The two experiments carried out in this study explored the linguistic creativity of children, adolescents and adults, as reflected in the creation of new expressions. In Experiment 1, the capacity to produce new expressions at different age levels, for different targets, and under two different instructions, was studied. In Experiment 2, the newly created expressions were judged for their comprehensibility, appropriateness and novelty. Based on the GEM (Levorato & Cacciari, 1995), we made the following hypotheses:

(a) A developmental change occurs in the quantity and quality of figurative language when passing from childhood to adolescence and to adulthood based on the more complex metalinguistic abilities and knowledge base possessed by older speakers.

(b) A more extended use of figurative language takes place for emotion targets than for action targets due to the difficulty in expressing subjective experiences and mental states with literal language.

Our results confirmed that the two types of target (actions and emotions) behaved differently, with the metaphors produced for the emotions rated as more appropriate than those relative to actions. This is not surprising if it true that metaphors are used more frequently to describe psychological states than concrete actions: whereas literal language is generally well suited to refer to concrete actions, figurative language seems to be more appropriate for less determinate meanings such as those concerning mental and emotional states. As Reider (1972, p. 469) noted, metaphor is 'the most economic condensation of understanding of many levels of experience, several fixations, symbolic connotations, and an aesthetic ambiguity, all in a phrase'. Metaphor, in fact, 'gives word', so to speak, to relevant parts of our subjective experience of the world that otherwise would be difficult to express.

The comparative instruction facilitated the production of metaphors especially for children, presumably because the structure 'is like' was a trigger for the comparison of different domains also when children were not able to find an appropriate ground of similarity. This is suggested by the higher ratings of appropriateness obtained by the metaphors produced in the nominal instruction. Further investigation should explore this phenomenon more deeply.

In Experiment 1 we found that the use of figurative language to create new expressions increased from childhood to adolescence, but not from adolescence to adulthood. Experiment 2 showed that adults' creations were judged as more appropriate that those of adolescents. This suggests that these two age levels differ from a qualitative and not a quantitative point of view, since the adults were more able to create comprehensible, appropriate and novel expressions than adolescents. This confirms that, as predicted by the GEM, the abilities involved in this task are complex and continue to evolve after adolescence.

Many children's expressions went beyond a simple paraphrase of the targets' names. This finding supports the idea proposed by the GEM that children of these age levels are able to go beyond literality. At the same time, it questions the view that, after a very early phase of creative linguistic behaviour, children enter into a 'literalization' phase in school age characterized by a decay in the production of figurative language and an increase in their literacy (Winner, 1988). The ability to produce innovative expressions, and the metalinguistic knowledge necessary to make them communicatively

appropriate and conceptually sensible, develops during the fifth phase postulated by the GEM, that is during the same age period in which children are already able to understand and produce some form of figurative expressions (particularly idioms) (Cacciari & Levorato, 1989; Levorato & Cacciari, 1992, 1995). This metalinguistic ability evolves up to adulthood, as was suggested by the fact that children differed from older participants both quantitatively, since they produced fewer figurative expressions, and qualitatively, since their expressions obtained lower scores in all three scales.

Several reasons might explain the differences between children and older subjects. First of all, as suggested by the GEM, developmentally the ability to produce figurative expressions, even conventional ones such as frozen metaphors or idioms, is acquired later than that of comprehending them. The elicitation task required subjects to propose a new designation for an action or an emotion which already had a literal name of its own. Therefore subjects should have been able to abandon the use of literal-referential language as a default case and modulate their literal and figurative linguistic repertoire according to communicative need. Children might also have been uncertain of the pragmatic appropriateness of producing a figurative expression, not dissimilarly from what happens to second language learners.

To be able to create an expression, one should possess the abilities to design the sentence so that the listener might compute the intended meaning; to identify a source domain appropriate to express the intended meaning; and to express the intended meaning according to the morphosyntactic rules of the language. The diverse mastery of these levels of knowledge accounts for the differences between primary school age children and adolescents: The conceptual level, because the world knowledge of children is more restricted; the linguistic level, because the repertoire of linguistic structures available is less extended; and the pragmatic level, because of the difficulty in taking into account aspects such as the common ground with the addressee. Children might have an insufficient ability to monitor the three levels together, since their metacognitive and metalinguistic abilities are still evolving.

An interesting result of Experiment 1 is the different semantic transparency of the metaphors created. We divided the metaphors into transparent and opaque ones even though we are aware that, more than a true dichotomy, there is a continuum between the metaphors in which there is a discernible relation between the target's and the vehicle's domains and those in which such a relation is more obscure or idiosyncratic. Experiment 2 showed that, as was easily predictable from the criterion used to split the metaphors into these two groups, transparent metaphors were judged as more appropriate than opaque metaphors even though, obviously, less innovative.

More transparent than opaque metaphors were produced at all age levels. The judges overall preferred transparent metaphors which is consistent with Bever's view (1986) that ambiguous stimuli are not necessarily more aesthetic

than unambiguous ones, neither are those in which a representation is merely replaced with another. In Bever's view the condition for an aesthetic product is the existence of a superstructure where pre-existing representations might simultaneously co-exist. An aesthetically interesting experience can be considered as having a representation that integrates two distinct representations within a unique framework. This can apply to the creation of metaphors as well: a new ground is established which makes a relationship between two different domains apparent. The preference for transparent metaphors could reflect the fact that the stimuli which are generally preferred are those in which an optimal discrepancy between what is expected and what is observed is reached (Berlyne, 1970).

Extending the analysis proposed by Sternberg (1986, 1988), one might argue that the production of a new expression includes planning, monitoring and evaluating possible linguistic alternatives, which require a level of cognitive development like that proposed in Phase 5 of the GEM (on the role of metacognition on creative behaviour, see Armbruster, 1989).

The choice of naming an action or an internal state literally or metaphorically raises the interesting and so far unanswered question of why a speaker selects a figurative expression (e.g. a metaphor, an idiom, or a proverb) instead of a 'corresponding' literal expression. A speaker's choice of a figurative expression over a literal one is not simply a matter of style or preference; metaphor is not only a fancy way to say something that could have been said literally. Metaphors, in fact, convey a way of conceptualizing and categorizing the everyday world as an essential part of how each of us reasons, thinks and understands. Future work should explore the kinds of ontological knowledge children, adolescents and adults use to denote actions and mental states in a figurative way.

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APPENDIX

EXAMPLES OF LITERAL AND FIGURATIVE CREATIONS IN ITALIAN (WITH WORD-BY-WORD ENGLISH TRANSLATIONS). THE AGE LEVELS OF THE SUBJECTS WHO PRODUCED THEM ARE SPECIFIED IN BRACKETS

Figurative expressions

(1) SYNECDOCHES OR METONYMIES

TARGET: Vergognarsi (being ashamed): 'avere i brividi' (having the shivers), 'avere la faccia rossa' (having a red face), 'scaldare la faccia' (warming one's face), 'camminare a testa bassa' (walking with lowered head) (nine and eleven-year-olds).

(2) TRANSPARENT METAPHORS

The conceptual relation between the target and the new expression is easily inferable due to a high degree of similarity between the two domains.

TARGET: Vergognarsi (being ashamed): 'volere alzarsi un muro di fronte' (wishing a wall would rise up) (eleven-year-old); 'essere come un libro che non vuole essere letto' (to be like a book that does not want to be read) (adolescent), 'entrare in una fosso pieno di fango' (going into a ditch full of mud) (adult).

TARGET: Dire bugie (telling lies): 'Essere come un dollaro falso' (to be like a false dollar) (eleven-year-old), 'Aprire il rubinetto dove non scorre mai la verità' (to turn on a tap where truth never flows from) (adolescent).

(3) OPAQUE METAPHORS: A more complex mapping from source to target domain than in the case of a transparent metaphor is required.

TARGET: Vergognarsi (being ashamed): 'Una lumaca che quando la tocchi si tira dentro' (a snail which withdraws when you touch it) (adolescent), 'Essere come una palla rovente' (to be like a redhot ball) (eleven-year-old), 'essere un mostro che ha paura del suo viso' (being a monster who is afraid of his own face), 'essere tagliati a metà' (being split down the middle) (adults).

TARGET: Dire bugie (telling lies): 'Fare uscire di bocca dei rospi' (to let the toads out of your mouth) (adult), 'Mettersi qualche parrucca di troppo' (to put on too many wigs) (eleven-year-old), 'Avere voglia di giocare a nascondino' (to feel like playing hide and seek) (nine-year-old).

(4) CONVENTIONAL IDIOMS (or slight variants)

TARGET: Vergognarsi (being ashamed): 'sentirsi come un peperone' (to feel like a pepper), 'essere uno struzzo' (to be an ostrich) (adolescents).

TARGET: Dire bugie (telling lies): 'Essere come un serpente dalla lingua biforcuta' (to be like a snake with forked tongue) (adolescent).

Literal expressions

(1) PARAPHRASES (or linguistic recoding)

TARGET: Vergognarsi (being ashamed): 'essere timido' (to be shy), 'essere vergognoso' (to be shameful) (nine-year-olds).

TARGET: Dire bugie (telling lies): 'dire qualcosa che non è vero' (saying something which is not true) (nine-year-old).

(2) EXAMPLES: an instance of the state or of the behaviour described in the target.

TARGET: Vergognarsi (being ashamed): 'essere come un ladro scoperto in flagrante' (to be like a thief caught in the act) (adult), 'scappare dopo una sgridata' (to run away after a telling off) (eleven-year-old).

TARGET: Dire bugie (telling lies): 'essere come Pinocchio' (being like Pinocchio), 'ingannare gli amici' (cheating friends) (nine-year-olds).

(3) CAUSES/CONSEQUENCES: a state or behaviour causally connected to the one expressed by the target.

TARGET: Vergognarsi (being ashamed): 'andarsi a nascondere' (to go and hide) (adult), 'avere paura' (to be afraid) (eleven-year-old).