Children's acquisiton of primary metaphors: a crosslinguistic study

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Resumo: *This paper describes the results of a large study examining children's (age 3 to 10) and adults understanding of primary metaphors in two different cultures. Primary metaphors reflect enduring correlations in embodied experience, such as the idea that MORE IS UP and SEEING IS KNOWING. The results obtained from two tasks (verbal and non-verbal) revealed several common patterns as good candidates to universals, as well as a few unusual language-specific patterns in primary metaphor comprehension, at different age-spans. These findings corroborate the idea that primary metaphors do not depend on cultural influences, and may reflect universal patterns in embodied experience.*

Palavras-chave: *Metáfora Conceitual; Metáfora Primária, Aquisição de Linguagem.*

1. Introduction

Conceptual Metaphor Theory (LAKOFF and JOHNSON, 1980) postulates that the human conceptual system is, to a large extent, metaphorical, in the sense that many abstract concepts are typically understood in terms of familiar, often bodily knowledge (e.g., LIFE IS A JOURNEY, KNOWING IS SEEING, ANGER IS HEAT). These metaphoric mappings are not arbitrary, but are primarily motivated in terms of people's bodily experiences interacting with the physical world. Conceptual metaphor theories differs from most theories of metaphor in positing a connection between embodied experience, thought, and language, and in assuming that many conventional aspects of language are not literal or clichéd,

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but indeed reflect enduring conceptual metaphors (e.g., "I am off to a good start in school" refers to LIFE IS A JOURNEY).

A hypothesis for the emergence of some conceptual metaphors is that these grow from correlations among distinctive dimensions of recurrent and co-occurrent basic experiences, potentially independent of cultural influence (e.g., MORE IS UP, KNOWING IS SEEING) (GRADY, 1997). Most studies on conceptual metaphors are based on data collected from the English language, something that renders difficult both a generalization and the substantiation of the primary metaphor universality hypothesis. Our aim in this paper is to provide crosslinguistic experimental evidence on children's acquisition of primary metaphors in two cultures and two languages, Brazilian Portuguese and American English native speaker subjects.

2. Primary metaphors

To understand a metaphor is to understand systematic mappings established between a source (e.g., JOURNEY) and a target (e.g., LIFE) domain. Such mappings are mostly asymmetric, as they occur in a single direction, from the source domain to the target, i.e., information gathered about the source, a mostly physical and sensorially perceived domain (or more psychologically outstanding), is being consistently transferred into the target, a less physical and less outstanding domain. In the case of primary metaphors, however, the source domain involves bodily experience-related contents and constructs itself as an inference-rich source of information that is projected upon the target (GRADY, 1997a). There are some basic scenes and events that occur regularly in our daily experience within several contexts. Given our cognitive apparatus and the kinds of recurrent events, the cognitive result is our subjective understanding of basic events. Grady (1997) calls this subjective experience the 'primary scene', a concept that includes both our perception and our answer to any such basic event. The most fundamental characteristic of primary scenes is the correlation existing between two distinctive dimensions – the physical and the psychological – of our experience. Primary scenes are made up of experiential pairs (like physical closeness and intimacy), called sub-scenes. We acquire the metaphoric mode of thought in an automated and unconscious fashion by means of those correlations perceived along our daily experiences, which bind such sensory experiences and our own judgments to our motor experience (LAKOFF and JOHNSON, 1999).

According to Grady and Johnson (1997), little children show a tendency to map linguistic forms in such aspects of the learning context that can be described in terms of sub-scenes. They tend to associate linguistic constructs both with

primary scenes and with sub-scenes taken individually. There is initially a conflation of two aspects (typically physical and mental and/or emotional) both in literal and metaphorical meanings. This superimposal of interpretations is fostered by the fact that there is a primary scene associating both interpretations (Johnson, 1999). The learning process of the metaphorical use of such expressions is more a question of differentiation of perceptual cognitive sub-scenes within their semantic interpretation than an extension of their expression departing from a complex mapping.

The question we examined was whether primary metaphors are universal or shaped by culture. Kövecses (2002) states that primary metaphors are potentially universal, precisely because of the universal nature of much bodily experience. We explored this issue in greater detail by investigating children's understandings of primary metaphors, both when these are presented in verbal and non-verbal form, as well as adults' understandings of the same stimuli, in very different cultures, the United States and Brazil. Our expectation was that similar developmental trends should be observed in both cultures.

3. Method

3.1 Participants
The sample included 104 native speakers of English and 106 native speakers of Portuguese. The English data were collected in Santa Cruz, CA; and the Brazilian Portuguese data were gathered in Porto Alegre, RS. The children attended private kindergarten and elementary schools.

3.2 Stimuli and design
Two instruments were developed for this research, which consisted of a verbal task and a non-verbal task. The verbal task had a version in Portuguese and another in English. In both versions the length of the sentence and the pragmatic aspects involved in the meaning were controlled. Three referees for each language assessed the instrument regarding the above-mentioned aspects.

The verbal comprehension instrument was elaborated from eight primary metaphors, selected from Grady's dissertation (1997a), namely: HAPPINESS IS UP, INTENSITY OF EMOTION IS HEAT, GOOD IS BRIGHT, DIFFICULTY IS HEAVINESS, ACQUIESCING IS SWALLOWING, EMOTIONAL INTIMACY IS PROXIMITY, IMPORTANCE IS SIZE, and SYMPATHY IS SOFTNESS. To each of these conceptual metaphors two sentences were constructed. The first represents a linguistic instanciation of a primary conceptual metaphor (henceforth PM) and the second is a literal paraphrase of the former, that is, the literal utilization of the

target (from now on LT). In the case of the conceptual metaphor HAPPINESS IS UP, for example, the PM generated was "Lucy is feeling uplifted after seeing Tom" and the LT was "Lucy is happy after seeing Tom", both followed by the same questions: "How is Lucy feeling?" and "Did Tom give her good or bad news?".

We had two reasons for using metaphoric sentences and literal sentences. When presenting a PM to the subject, the intention was directly related to the major goal of the empirical research, that is, the investigation of primary metaphor comprehension. The target concept (LT) was used to assess whether the subjects – particularly the youngest ones – actually understood the most abstract conceptual domain (the target domain) involved in each primary metaphor.

Both sentences [PM and LT] in the same block were matched so as to correspond to approximately the same sentence size. Identical questions were presented to the subjects after the PM's and LT's referring to each conceptual metaphor.

The 16 sentences thereby formed were then placed into four blocks so that to each subject wass presented a total of four sentences only. Therefore, from a 16-sentence listing, participants was presented to an equal number of PM's and LT's. The same subject would only listen to a single sentence generated from each kind of conceptual metaphor, one PM or one LT.

Eight pictures were designed to represent the primary metaphors used in the first instrument. In the non-verbal comprehension instrument, the task consisted in looking at and/or touching the dolls, nicknamed Dunies, and then choosing one out of two possibilities.

Our study employed a mixed design (5 x 2 x 4 x 2 x 2) in order to investigate developmental and cross-linguistic effects on the understanding of primary metaphors. The first independent variable refers to Age (3 to 4, 5 to 6, 7 to 8, 9 to 10 years old, and adults); the second variable refers to language (English or Portuguese); and the third variable refers to the block of questions (Tapes l, 2, 3 or 4). The fourth variable considered the type of sentence presented (primary metaphor and literal target), while the fifth one refers to the task type (verbal or non-verbal). Dependent variables were the subjects' replies to both task types.

4. Procedure

All tasks were carried out in a room set apart by the schools. During the verbal task, the subject listened to a tape recorded by a native speaker of each language, containing both the sentences and the questions. Participants replied immediately after listening to each sentence. In the non-verbal task, the researcher showed the

picture and read the instructions to the subjects. After choosing one out of the two options, the subject was stimulated to explain his/her choice.

Data were evaluated quantitatively and qualitatively. Quantitative analysis was done by taking into consideration the individual performance of every participant, assigning l (one) point to each expected answer and 0 (zero) to any other sort of reply. Subjects could achieve an individual score of 0, l or 2 points relating to each PM or LT, for two questions followed each kind of sentence. Criteria for evaluation of each participant's individual performance were the same for the eight PM's and LT's.

On the non-verbal comprehension task, subjects received a score of l (one) for expected answers or 0 (zero) for other, unexpected ones on the forced choice questions. Follow-up answers were also graded as l (one) or 0 (zero) when participants wouldn't explain out their choices or whenever a given justification would not correspond to the cartoons' physical features relevant for the understanding of the metaphor in question. Therefore, subjects could get a maximum score of 2 (two) points in the verbal comprehension instrument and in the non-verbal one.

5. Results

5.1 Quantitative Analysis

The understanding of metaphors was assessed through subject performance in the verbal and non-verbal comprehension tasks both. Results of the two stacks of tasks were verified by means of variance analysis. In all statistical analyses a significance level of 0,05 was considered.

For the verbal task a T-test evidenced a significant difference in the comprehension of PM's and LT's, with $t(209) = -2.667$, $p<0,01$. General averages obtained for the PM's were 1,53 (0,59) and for the LT's it was l,64 (0,52). It is possible that such averages point towards a greater easiness on the understanding of literal sentences as compared to the presented metaphors. Standard deviation differences between the two kinds of sentences, though small, point towards a minor variability in the case of literal sentences. We did not explore these variations further because, again, the inclusion of literal sentences as paraphrases of the primary metaphors were simply there to verify subjects understanding of the concepts.

No significant effect of language on the comprehension of primary metaphors or literal sentences was identified, with $F(1,208) = 0,332$, $p>0,05$, as evidenced by an ANOVA. There were also no evidence of a significant interaction between the kind of sentence and language are shown on Table I.

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Varible	Label	Description	(N)	Mean	SD
Sentence Type	PM	Primary Metaphor	210	1,53	(0,59)
	LT	Literal Target	210	1,64	(0,52)
Language	AE	American English	104	1,56	(0,38)
	BP	Brazilian Portuguese	106	1,61	(0,38)
Age Range	1	3 to 4 years of age	41	0,99	(0,33)
	2	5 to 6 years	44	1,48	(0,30)
	3	7 to 8 years	41	1,72	(0,21)
	4	9 to 10 years	44	1,86	(0,67)
	5	Adults	40	1,88	(0,17)
Task	V	Verbal	210	1,53	(0,59)
	NV	Non-verbal	210	1,52	(0,38)
Question Block	1	Tape 1	53	1,45	(0,44)
	2	Tape 2	52	1,65	(0,42)
	3	Tape 3	53	1,71	(0,42)
	4	Tape 4	52	1,54	(0,49)

Table 1: General descriptive statistics.

These results point towards the possibility of a universal character on the understanding of the different kinds of sentences studied. This, in itself, does not mean that Brazilian should equally understand an instantiation of a given metaphor as did American subjects, for the linguistic realizations that actualize conceptual metaphors are somewhat peculiar to each community.

Results on Table II show a trend towards homogeneity on the normal usages of subjects belonging to both these language communities, as long as it refers to the comprehension of the different kinds of sentences considered (PM's and LT's).

Table 2: Means (standard deviations) per language

Language	Subjects (N)	Type of Sentence	Mean
AE	104	PM	1,49 (0,61)
BP	106		1,57 (0,57)
AE	104	LT	1,58 (0,56)
BP	106		1,70 (0,46)

A T-Test comparing both instruments used to assess the comprehension of primary metaphors has not pointed towards a significant effect produced by the type of instrument that was employed. Subjects' averages for verbal and non-verbal primary metaphor task understanding were practically the same, respectively, 1,53 and 1,52 over a maximum score of 2.0 points.

As primary metaphors have a potentially universal status it is expected that an interaction between variables 'age' and 'type of task' would occur and that no such interaction would happen between the variables of 'language' and 'type of task'. To check for this possibility, two further ANOVAs were performed. In both cases, the within-subject variable is 'type of task', but while one analysis took for between-subject factor the variable 'age', the latter had 'language' as its between-subject factor.

Both analyses showed a significant effect of 'type of task' in four out of the eight primary metaphors under study, namely, in PM 3, GOOD IS BRIGHT, where ($p<0.05$); in PM 4, DIFFICULTY IS HEAVINESS, where ($p<0,05$); in PM 5, ACQUIESCING IS SWALLOWING, where ($p<0,0l$); and in PM 7, IMPOR-TANCE IS SIZE, where ($p<0.05$). In three of the mentioned cases (PM 3, PM 5, and PM 7) the subjects' performance was better in the verbal task.

The effect of the question block variable on the understanding of the different kinds of sentences was tested. As a major effect of this variable was observed ion the averages of PM's, where $F(3,170) = 8,331, p<0,001$, data were afterwards analyzed under a filter for the different tapes that had been presented to the subjects. The same interactions occurred in relation to literal sentences. Therefore, it has not been possible to perform a general analysis of the results, without taking into consideration the block of questions the subjects had listened to.

These results suggest the existence of several levels of primary metaphors, with some being more primary than others. In terms of literal sentences, it is not possible to think of primarity levels but rather on degrees of conventionality. Indeed, both literal and metaphoric expressions may vary as to their degree of conventionality within a given linguistic community and such a degree of conventionality may tamper with the subjects' understanding of the several types of sentences.

An ANOVA repeated measures for language and age as between-subject factors and type of sentence as within-subject factor has pointed towards a major effect of sentence type ($p<0,05$) and a major effect of age where $F(4.200) = 59.96l, p<0,0l$ in the verbal instrument. A positive correlation between age and score averages was verified in both languages. No major effect of language was verified ($F(l.200) = l.602, p>0,05$), nor interactions between language and age or between language and type of sentence. The non-verification of a major effect of the language variable in combination with the absence of interaction between 'language' and 'age' reenforces the assumption that there is a universal developmental character in children and adults' understanding of primary metaphors.

For the non-verbal instrument, two independent analyses were made. The first comprises both subjects' answers for those questions referring to each PM (that of forced choice and the follow-up), while the second considers only those replies offered to the forced choice question. This latter analysis was performed

because these justifications involved a meta-ability, that is, a somewhat different skill from a mere option between two alternatives.

Considering both answers – the forced choice and the follow-up – the most general results point towards both a main effect of language, where F(8.193) = 3.484, p<0,00l and a major effect of age, where F(32.784) = 4.260, p<0,0l. The age main effect was expected and corroborates the hypothesis that there is a developmental factor at play over the comprehension of primary metaphors. The effect of language type on the understanding of primary metaphors, nevertheless, opposes the expectations as, according to the hypothesis, primary metaphors are independent of the culture in which the subject is inserted, particularly if such comprehension be assessed by means of a non-verbal task.

As to the age variable, there was a significant difference in the comprehension of six primary metaphors. Only in the PM's INTENSITY OF EMOTION IS HEAT and IMPORTANCE IS SIZE no statistically significant differences were found for the several age ranges. There is no interaction effect between age and language, except in the case of PM 7, IMPORTANCE IS SIZE, where (F(4) = 2.910, p<0,05).

For the language variable, when the subjects' answers are considered along with their justifications for such replies, there was a significant difference in two out of the eight primary metaphors, namely, HAPPINESS IS UP, where F(1) = 9.404, p<0,01 and DIFFICULTY IS HEAVINESS, where F(1) = 15.010, p<0,01.

The second analysis of the non-verbal instrument, in which was not considered the justification for the induced choice, revealed rather similar general results to those of the first analysis. In this case, a significant effect of the variables 'age' and 'language' was also found, which was F(32.784) = 2.348, p<0,05 for the variable age and F(32.193) = 2.301, p<0,01 for the variable language.

As to the age variable, no significant differences on the comprehension of two more of the primary metaphors were found. Besides the PM 5, INTENSITY OF EMOTION IS HEAT, and the PM 7, IMPORTANCE IS SIZE, there was no statistically significant difference for the several ages in either the primary metaphors AQUIESCING IS SWALLOWING and SYMPATHY IS SOFTNESS. When considered together the variables age and language, no statistically significant interaction between any of the metaphors was found. Such results lead us to believe that the differences between ages do get smaller when subjects' justifications are not considered; an element that actually constitutes a meta-ability.

For the language variable, when considered only the subjects' answers, without the justification for such, a significant difference was found in one primary metaphor, i.e., HAPPINESS IS UP, where F(l.200) = 8.263, p<0.01. Likewise that which had happened in relation to the age variable, it was detected that the difference between languages gets smaller when the subjects' justifications are not taken into consideration.

These results indicate that, even if in the vast majority of the analyzed primary metaphors no major effect of the language spoken by the subjects was verified, we must take into consideration the possibility that cultural factors may influence the conceptualization of certain primary metaphors.

As to the comprehension of the eight primary metaphors, an interaction effect was found only for language and metaphor PM l (HAPPINESS IS UP), F(53) = 4.429, p<0.05. In this item, Brazilian subjects achieved an average of 1.38 in the verbal comprehension task and 1.10 in the non-verbal comprehension task, while American subjects obtained averages of 1.04 and 1.46. In the other seven primary metaphors, no major effect of language was found nor any interaction between language and PM.

Nevertheless, there were several differences in subjects' understandings of specific primary metaphors. For PM 2, INTENSITY OF EMOTION IS HEAT, both Brazilian and American subjects obtained statistically equivalent averages, with a non-significant alternance between scores achieved on the verbal and non-verbal comprehension tasks. For PM 3, GOOD IS BRIGHT, both Brazilian and American subjects achieved statistically equivalent averages, with a significant difference between the scores obtained in the verbal comprehension task and those obtained in the non-verbal comprehension task (averaging 1.77 and 1.44, respectively) in the two groups of subjects. For PM 4, DIFFICULTY IS HEAVINESS, a statistically significant difference was also observed (F(1.49) = 8.442, p<0.05) between general scores obtained in the verbal and non-verbal tasks. The highest scores were obtained in the non-verbal task by both groups of subjects.

The results concerning PM 5, ACQUIESCING IS SWALLOWING were discarded from the study due to the difficulty in representing an internal movement such as that of swallowing in a picture, which made this item flawed.

The scores for PM 6, EMOTIONAL INTIMACY IS PROXIMITY were very high indeed: 1.9 in the verbal comprehension task and 1.8 in the non-verbal one. For PM 7, IMPORTANCE IS SIZE, a significant difference (F(1.52) = 7.798, p<0.0l) between general scores obtained in the verbal and non-verbal comprehension tasks was observed, with a clear superiority of scores obtained in the verbal task, for both Brazilian and American subjects. For PM 8, SYMPATHY IS SOFTNESS, both Brazilian and American subjects earned equivalent averages (1.62 in the verbal comprehension task and 1.74 in the non-verbal one).

An ANOVA with language as the between-subject and type of sentence as the within-subject element has only pointed to a single major effect for sentence types (F(2.207) = 3.543, p<0.05). No major effect of language was verified, nor any interaction between language and type of sentence, a result that indicates that the metaphoric and literal sentence understanding patterns presented by the participants do not depend on of the language they speak or on the linguistic community to which they belong.

5.2 Qualitative analysis

Qualitative analysis was based mainly on the replies obtained by means of the non-verbal task because this task includes an open question about each primary metaphor, something that afforded a greater variety in the informers' answers.

PM l: This was the only item that generated an interaction between the variables 'language' and 'primary metaphor' in the verbal instrument. Such result can be related to the expression (uplifted) used for the task in English, especially in the case of the youngest children. During the interviews, several small American children mentioned they did not know the meaning of that word. In Portuguese, the expression used (*para cima*) is well-known, even by very young children.

In the non-verbal task, justifications of those subjects who scored the question were practically the same in both languages: the cartoon's position or upward movement. Subjects manifested a perception of the co-occurrence of both sub-scenes (i.e., the feeling of happiness and the physical action of jumping) that compose the primary metaphor HAPPINESS IS UP.

(Subject 23, 10 yrs old) – 'He is jumping up. Sometimes when I'm happy, I jump up in the air.'
(Subject 156, 8 yrs old) – *'Porque quando a gente tá feliz, a gente pula de alegria.'* (Because when you feel happy, you jump up for joy).

PM 2: In the non-verbal task, subjects were invited to choose between a hot and an icy Dunie and show which one presented the strongest feelings. Most subjects chose directly the hot one, justifying their choices by simply stating that it showed stronger emotions because it was warmer or hotter. Those subjects have shaped up a general relationship between heat and feeling intensity without specifying the kind of emotion involved. Other subjects bound heat to given feelings. Although emotions can be both negative and positive, the examples indicate that it is the correlation experienced between bodily temperature and strong emotional moments that will motivate the conceptual metaphor INTENSITY OF EMOTION IS HEAT.

(Subject 6, 5 yrs old) – 'Because it is hot. Strong feelings means hot.'
(Subject 189, adult) – *'O quente passa mais sensações. O frio te amortece.'* (Heat communicates more feeling. Cold deadens you down).
(Subject 65, 9 yrs old) – 'Sometimes I say that someone is as cold as ice, it means he doesn't care about others. If you are warm you have good feelings, now I know why.'
(Subject 120, adult) – *'Porque é quente. Tudo que é quente, é melhor, dá prazer.'* (Because it's warm. All that's warm is better and gives you pleasure).

PM 3: Drawings representing the metaphor GOOD IS BRIGHT elicited replies connected to social issues by the adults. Children, on the other hand, gave straight-forward answers, fully mindless of racial issues, as demonstrated by the ex-amples. Subject 81 suggests that dark is bad and mysterious. It's not for an arbitrary choice that people relate darkness to mystery; this is due to the fact that people will not have the same visual control in dark environments as compared to lighter ones. The brighter the visual outlook, the most explicit and less mysteri-ous becomes its content. Probably the blending of the sense of vision with the psychological feeling of environment control generates that conceptual meta-phor. Subjects' 108 statement reinforces this idea.

Another possible motivation is related to sanitary matters. It is presumed that the dirtier the person or the object, the more he/she/it is liable to propagate disease. That which is visibly cleaner, therefore 'brighter', is taken to be healthier and better. Subject 144 supplies a motivation for the metaphoric connection between bright and good and updates such a connection through another linguistic metaphor: "he has a clean slate".

(Subject 81, adult) – 'People refer to light as being good, dark as being bad, mysterious.'
(Subject 62, 7 yrs old) – 'It's the lighter. Darker is always the bad guy.'
(Subject 108, 6 years old) – *'Esse é o melhor porque ele é mais claro, dá para ver melhor a cara dele.'* (This is the best guy because he is lighter: you can watch his face better).
(Subject 144, 10 yrs old) – *'Porque ele é mais claro, mais limpo. Ele tem a ficha limpa.'* (Because he is lighter, cleaner. He has a clean slate).

PM 4: Subjects who provided the expected answers in both languages were unanimous into justifying their choice of the *Dunie* portrayed with bent legs on account of a heavy weight it appeared to be carrying. Subjects deduced the weight of the bent cartoon's box was greater, because they have observed prior situations in which a person's body bends under the weight of a heavy burden. On the verbal task item, in which participants (e.g. subject 60 and 115) were supposed to inform how the person dragging a heavy suitcase was feeling, the relationship detected between weight and physical discomfort and/or psychological disconfiture was made explicit. It follows that experiences involving the dragging of a heavy weight and the perception of difficulty with the accompaniment of physical and psycho-logical discomfort foster the comprehension of the conceptual metaphor DIFFI-CULTY IS HEAVINESS.

(Subject 115, 8 yrs old) — *'Porque as pernas tão dobradas: o que ele tá segurando é pesado.'* (Because his legs are bent; it shows that what he is holding is heavy).

(Subject 60, 10 yrs old) – 'Difficult. Frustrated.'

(Subject 115, 8 yrs old) – *'É difícil. Ela queria uma coisa mais leve. As pessoas não gostam de segurar coisas pesadas.'* (It is hard on her. She wanted to carry something lighter. People do not like to drag heavy things).

PM 5: The illustration shows two *Dunies*, one holding an ice cream cone in its hand while another has the ice cream already into his mouth. Concerning such subjects who were graded '0' (null), some of the groundings supplied for the answers gravitated around the courtesy due to the others. Though those answers (e.g. subject 85 and 146) are appropriate, they were not the expected ones. They reiterate the impression that this particular picture was misdesigned and did not helped into measuring the understanding of the conceptual metaphor ACQUI-ESCING IS SWALLOWING.

In relation to such subjects who were graded '1' (one) in this item, two similar types of groundings were given. The first type is more directly related to the act of eating. The second is more closely related to the act of taking for oneself another's offering. Although subjects 167 chose the right cartoon, he did not score in the follow-up, as he did not explicit the relationship between acquiescing and swallowing. He gave grounds to his reply on account of a different metaphor, ACCEPTING IS TAKING FOR ONESELF, what reinforces the idea that there is a bonding link between the several conceptual metaphors.

(Subject 146, 10 yrs old) – *'Porque parece que ele está ouvindo, ao invés de comer o sorvete.'* (Because it looks like he is listening, instead of eating his ice cream).

(Subject 100, adult) – 'Because his friend gave him the ice cream and he is eating it, forgiving him.'

(Subject 167, 8 yrs old) – *'Porque o amigo deu como desculpas o sorvete e ele está comendo.'* (Because his friend gave him the ice cream cone as a sort of an apology and he is eating it).

PM 6: In the non-verbal task, the expected answer for justifying the choice of those cartoons that were best friends was their very physical closeness. Although replies are not too enlightening, the high scoring in this item can be related to the frequency with which sub-scenes involve emotional intimacy and physical near-ness co-occur, generating the metaphor EMOTIONAL INTIMACY IS PROXIM-ITY. As a result of their social nature, human beings daily experience simulta-neously the relationship between being emotionally intimate with somebody and being physically close to this person.

(Subject 57, 5 yrs old) – 'They are next to each other.'

(Subject 172, 6 yrs old) – *'Porque tão mais juntinhos.'* (Because they are very close together).

PM 7: The task was to choose which figure between a small cartoon and a big one was the most important. Some children chose the smallest because they identified themselves with it, while some adults made the very same choice because they matched their own children with the smaller picture, as revealed the answers of subjects 58 and 4, graded '0' (null). Interestingly, most subjects (e.g. subject 104) replied in the expected way to this question for the very same reason, namely, for identification. Some of the participants who pointed at the biggest cartoon as being the most important identified it with their parental figure. These answers indicate a relationship between the interaction parents/children and the metaphoric connection established between size and importance. Others pointed towards a correlation between the relative size of people and those impositions that are determined by their personal strength. The answers reiterate the idea that it is the correlation experienced between object or people size and the difficulty this represents into the interaction with them that propitiates the IMPORTANCE IS SIZE metaphor. This correlation is daily present in children's lives along their interactions with bigger people, who are able to dominate over them both physi-cally and psychologically.

(Subject 58, 5 yrs old) – 'Because it is little. My Dad says I am the most important thing.'

(Subject 104, 4 yrs old) – 'He is big. The big is the Daddy.'

(Subject 186, adult) – *'Ele está em mais destaque, pois é maior.'* (He is standing out because he is the biggest).

PM 8: Most of the subjects have opted for the Dunie sporting a velvety covering as being more sympathetic and have grounded their choice on the softness of that cartoon. Children from seven years age on and adults rendered better perfor-mances on the verbal task. These results are probably related to the convention-ality of certain metaphoric expressions. Some phrases are conventionally ac-cepted by the subjects in such a way that they linguistically associate the two concepts with the utmost naturalness, all the while they feel foreign to the pictorial association of same concepts. Other subjects, contrariwise, justified their choices based on their own understanding of the word 'soft'. The primary scene corre-sponds in this case to the correlation between a pleasant physical sensation gen-erated by the touch on a soft object and a positive psychological judgement corresponding to the same pleasure-bringing sensation. Statements explicit the association that generates the metaphor SYMPATHY IS SOFTNESS.

(Subject 66, 9 yrs old) – 'Soft is another way to say really nice. And hard is another way to say really mean.'

(Subject 116, adult) – *'Porque uma pessoa que é carinhosa dá a impressão de tratar as pessoas com maciez.'* (Because a caring, tender person gives you a feeling that person deals with other people with softness).

6. Discussion

One expectation for this research was that the understanding of primary metaphors would be demonstrated as an emerging ability starting in early childhood. Another expectation was that the comprehension of those primary metaphors would be similar in both English and Portuguese. Our results generally suggest that for there are three main stages in semantic development of children from both cultures. At 3 to 4 years of age, children presented only a fair performance; at 5 to 6 years of age, they rendered a good performance, from seven years of age and beyond, children reached a degree of comprehension equal to that of adults. We more specifically demonstrated in this study that these conclusions are consistent across both verbal and non-verbal experimental tasks. Once more, the same patterns were observed for the Portuguese and English languages.

Overall, compared to adult performance, the 3- to 4-year old children are still acquiring the metaphoric competence and that the capacity for conceptual metaphors understanding is more evident when children are tested with pictures as opposed to being tested verbally. Five-year-old children demonstrated a good perception of primary metaphors that were presented out of context. It is probable that the 5- and 6-year- old children's detected superiority in relation to 3- and 4-year-old children involve not only linguistic and cognitive factors, but also those features that are pertinent to their own experiences with the conceptual domains. Moreover, as suggested by the Conflation Hypothesis, that 3- to 4-year old children perceive, through their daily experiences, the co-occurrence of both source and target domains involved with the chosen eight metaphors, but that they may not always distinguish completely the source from the target domain. This provides a possible explanation for the youngest children's poorer performance on both tasks.

The expectation that the understanding of the analyzed metaphors were similar for the Portuguese- and English-speaking subjects is closely connected to the universal character of primary metaphors. The issue of universality is not yet fully explained in terms of the Conceptual Metaphor Theory. According to Lakoff (1993), metaphoric mappings vary in terms of universality, i.e., some seem to be universal while others are broadcast in a widespread fashion, and still others are specific to a given cultural environment. Primary metaphors, by their own nature, are derived from potentially universal mappings.

Some crosslinguistic studies (YU, 1998; LIMA *et al.*, 200l; KÖVECSES, 2002; OZÇALISKAN, 2002), have compared English metaphors with those found in Chinese, Portuguese, Hungarian, and Turkish and generally showed tremendous universality for at least some conceptual metaphors. Metaphoric mapping of the source domain UPWARD ORIENTATION for the target domain HAPPINESS,

for instance, was verified in the English, Chinese, and Hungarian languages. Such studies also point to differences within the same primary metaphor among the researched languages. Such differences, in some cases, are a simple question of lexicalization, departing from the same metaphoric mapping. In other cases, the changes are to be found in the very metaphoric mappings. It is probable that the two types of differences, either lexical or in the mappings, which are evidenced in the primary metaphors of the several languages, are based more on cultural than on physiological grounds.

The concept that human physiology and bodily experiences are propitiating factors for metaphoric mappings of universal potentiality is consensual in the researches of Yu (1998), Lima *et al.* (2001), Kövecses (2002), Ozçaliskan (2002) and Gibbs (2006). Given that human reason is connected to bodily experiences and considering that basic bodily experiences are common to all human beings, it becomes feasible to think about the existence of linguistic and cognitive universals brought forth by basic event perception closely bound to human physiology.

On the other hand, all bodily experiences depend upon their interactions with specific physical, social, and cultural environments. Consequently, it is to be expected that cognitive varieties may be found among cultures and languages (KOVECSES, 2005; YU, 1998). Those metaphors that are embased upon bodily experiences arise not only from the body itself and its representations within people's minds, but from bodily interactions broadly defined by their culture (GIBBS, 1999). Sinha and Jensen de López (2000) also emphasized the need to amplify the notion of bodily experiences within the context of the Conceptual Metaphor Theory, so as this theory may take into account the influence of cultural factors on semantic acquisition. According to these authors, daily used artifacts are not 'culturally neutral', but rather embody different kinds of conceptualizations, or 'cultural schemes', and work out as an extension of all bodily experiences. Such cultural schemes end up by manifesting themselves upon the natural languages' structures, leading children to acquire metaphoric mappings that are specific to their native language.

In the present research, few crosslinguistic differences were found. These results are probably related to the type of metaphors we selected for the study, i.e., primary metaphors, as well as to the fact that the research subjects are inserted into very similar cultural practices. Some adults' responses pointed at social issues' influence upon primary metaphors conceptualization. The topics evidenced were parenthood and the observation of physical differences among people (like skin color or texture). The replies including such topics in the non-verbal task, however, have not characterized any differentiated understanding of the researched conceptual metaphors, as these subjects also replied according to the expected mapping in the verbal task. In other words, the same participant mentioning that the smaller cartoon was the most important (grounding his response on his own

parental care) in the non-verbal task, stated that a 'big event' was 'an important event' when replying to the verbal task. This sort of interference occured only a few times, always in a very similar fashion, as much in terms of motivation as of frequency, in both languages studied in this research.

While most cultural variance in conceptual metaphors occurs at more specific levels, the universality can also be detected at more generic levels (KÖVECSES, 2005). The question at this point is: how can we establish generality levels for conceptual metaphors? In some cases it becomes easy to define which is the most general conceptual metaphor. ANGER IS A HOT SUBSTANCE IN A CONTAINER presents a more general mapping than ANGER IS A HOT LIQUID IN A CONTAINER, for the last specifies the kind of substance that is being mapped. In some other cases, however, the mapping hierarchy is not that obvious. In the analysis of the metaphor ACQUIESCING IS SWALLOWING some participants did not explicit the relationship between the domains ACQUIESCING and SWALLOWING, and justified their responses by taking into account the metaphor ACCEPTING IS TAKING TO ONESELF. Here the difficulty lies both in establishing the generality level of these two conceptual metaphors and in establishing a connection between them.

Ozçaliskan (2002), in a footnote, points out the lack of definition both in the studies developed by Grady and in those performed by Lakoff as to the nature of the bonding between basic actions and primary metaphors. Lakoff (1987) states that the same way we categorize objects, actions and properties are also sorted into categories defining more basic or less basic levels. Running, walking, and drinking would be instances of basic level actions; while moving and ingesting would be 'super-ordinated' actions; and wandering or sucking would be 'sub-ordinated' actions.

Grady (1997), however, states that all basic actions, like walking or running, are little defined or very generical and therefore do not show up as good candidates for the source of primary metaphors. He emphasizes the primary scene's specificity aspect. Primary metaphors, therefore, do not involve correlations between two broad events (e.g., love and travel), but between more limited events (e.g., difficulty and heaviness). On the other hand, Grady considers actions like self-generated movements as good sources for primary metaphor mappings, something that still leaves open the issue of the bonding link between basic actions and primary metaphors.

For instance, the conceptual metaphors ACCEPTING IS TAKING TO ONESELF and ACQUIESCING IS SWALLOWING both reflect the idea that the subject actually wants something and is not being forced to take in anything against his/her own free will. We could, however, think of a third primary metaphor underlying both mentioned above, namely, ACCEPTING IS RECEIVING. Kövecses (personal communication) understands that 'taking into oneself' stands

on the same generality level as 'eating'. In this case, 'swallowing' would be more specific than 'eating' and would not be hierarchically subjected to 'taking into oneself'. Therefore, both ACCEPTING IS TAKING TO ONESELF and ACQUI-ESCING IS SWALLOWING would represent different metaphors with the same target domain, ACCEPTING.

Both Brazilian and American subjects have deviated from the metaphor, ACQUIESCING IS SWALLOWING, and presented statements licensed by related conceptual metaphors, namely, ACCEPTING IS TAKING TO ONESELF, ACCEPTING IS RECEIVING and ACCEPTING IS EATING. These are not random answers, particularly because they replied to the same mappings both in the Portuguese and the English languages. This sort of "standardized devia-tion" from the expected metaphor reveals there is a coherent conceptual system underlying the responses of both Brazilian and American subjects. The results found were consistent in the two languages for the several conceptual domains and this is due not only to the universality of some experiences but rather to the existence of an organized, general conceptual system.

Finally, we have raised the issue of whether primary metaphors may differ in just how primary each one is. Grady again notes that primary metaphors are made up by particular recurrent features of the primary scenes in human lives. It is possible that individuals can perceive some of these sub-scenes as being more strongly connected than others, as a function of the frequency with which they co-occur in their daily life events and on the easiness with which they are perceived. The metaphor that received the highest score in this study was EMOTIONAL INTIMACY IS PROXIMITY. The high averages presented on this metaphor were consistent for the different ages, languages, and tasks. These results may indicate that the connection between the two sub-scenes that motivate this particular metaphoric mapping is more outstanding than those of the other primary scenes in this study, as a function of its early, constant occurrence in the life of every person.

In contrast, the metaphor ACQUIESCING IS SWALLOWING is that which afforded the lowest score in every age range, both in the verbal and the non-verbal tasks. In spite of the inadequacy in the cartoon for the non-verbal task, it is probable that these results indicate that the pertinent connection between the two sub-scenes that motivate this metaphoric mapping can be less salient than those which bond together other primary scenes. The act of deglutition is primarily involuntary and it is repeated many times a day. When someone is swallowing some sort of food he/she is accepting it. Therefore, this primary scene is a recurrent one, as much as or more than the primary scene involved in the metaphor EMOTIONAL INTIMACY IS PROXIMITY, although, for some reason, it does not show up in such an outstanding way. The very difficulty in reproducing the source domain, DEGLUTITION, in the non-verbal task was due to the fact that

swallowing constitutes an internal, non-visible movement. The fact that deglutition is an inner and often involuntary process may decrease the salience of the primary scene involved in the primary metaphor ACQUIESCING IS SWALLOWING.

This brief analysis of the two metaphors that generated the highest and the lowest averages in this research is not sufficient to address such metaphors as more primary or less primary, especially because no criteria were previously stablished for this classification. But we raise this issue as an important challenge for future research on primary metaphors and ask what would be the criteria to establish the degree of primarity of a given metaphor?

Overall, our study has offered important experimental evidence in favor of primary metaphor theory and supports the idea that some aspects of metaphor are universal because of similarity in people's recurring bodily experiences.

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