Understanding Metaphors:
A Study with Portuguese 4-6 Year-old Children

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We present the first metaphor comprehension data from 36 Portuguese children aged 4, 5 and 6, using the TCM Júnior, a metaphor comprehension test for young children, in its European Portuguese version. This is an exploratory descriptive study, with a view to collecting data, contributing to the measurement and standardization of the resource used. TCM Júnior is an adaptation of its corresponding Italian acronym, which is in the process of being validated for the Portuguese population in this age group (4 to 6 years old). We describe the resource used, the TCM Junior, Metaphor Comprehension Test for 4-6 years old and the results obtained with a sample. The instrument used is in the process of gauging, or external validation that is, meeting normative data, although it is already subject to adaptation procedures, as it is an original test in Italian. In this study, 36 participants of both sexes participated. Although still incipient, because there are still few data, with groups by age and sex that are not equitable and significant, the results are promising. We will report on the data obtained and analyzed. Although still preliminary and exploratory, with a sample that is still not very representative and significant, the results appear to be not very distant from the averages obtained by their Italian counterparts.

Keywords: *metalinguistic awareness, understanding, figurative language, metaphors, TCM junior*

Introduction

As part of a more comprehensive project, to validate assessment resources and intervention in terms of understanding figurative language, metaphors, we carried out an exploratory study, using the tool, already adapted for European Portuguese, the TCM junior, for children from 4 to 6 years old, instrument validated in Italian, its origin. In fact, we believe that work in this area is justified for two reasons:

- absence of valid assessment and intervention resources, on this dimension, for European Portuguese;
- relevance of investigating and intervening at the level of understanding, or metalinguistic ability, in general, and, in general, and, in this case, the understanding of figurative, metaphorical language.

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We assume that metalinguistic ability can be defined as the ability to reflect on language as an object of thought and intentional manipulation of language (Garton and Pratt 1989). According to Figueira et al. (2019), metalinguistic awareness or metalinguistic capacity is the ability to reflect and elaborate analyzes on language.

As for figurative language, such as metaphors, we consider that it evokes comparisons and distances itself from the literal meaning of words (Figueira et al. 2019). Figurative language differs, therefore, from literal language, since the latter uses words with their true meaning, while figurative language "expresses an idea using other terms, thus appealing to a similarity, whether real or imaginary" (Figueira et al. 2019).

For Black (2019), figurative language consists of any figure of speech that involves a semantic change, transforming the literal meaning of the word/ expression. Some examples of figures of speech are irony, where the opposite meaning is used, and hyperbole, exaggeration of meaning. Metaphor is also inscribed in figurative language due to its ability to change the perception/meaning we give to the word or phrase. The metaphor brings together two distinct meanings through an analogy or similarity, and can be described as two ideas in a sentence (Black 2019). According to Black (2019), the metaphorical use of an expression consists of the use of that expression in a non-literal sense and in a context that allows the reader to decipher the transformed meaning. Thus, metaphor processing is the result of an association between two domains in the conceptual framework – the abstract domain, which is beyond direct experience, and the concrete domain, which is easily accessible through sensory experiences. Still, Lakoff and Johnson (2008) consider metaphor as a natural phenomenon embedded in our daily communication and thoughts, "metaphor is predominant in everyday life, not just in language, but in thought and action" (Lakoff and Johnson 2008).

The metaphor has been analyzed in various ways over the last few decades. It began to be seen as a resource to embellish the text very typical of the Aristotelian vision and, more recently, it has been seen beyond language, as a process that influences the way of thinking, acting and perceiving reality.

Methodology

Sample

The sample used in the present study was found using a non-probabilistic convenience or accidental sampling (Hill and Hill 2005). Sample found and used in 2021 (January and April), meaning that the chronological ages correspond, 4 years (range 4-4.11 months), 5 years (range 5-5-11 months) and 6 years (range 6-6.11 months). The sample was selected based on their age and authorization from their guardians and randomly. However, the signaling of weaknesses in terms of development was a criterion for non-inclusion.

The sample consists of 36 participants, 24 males and 12 females, aged between 4 and 6 years: 14 4-year-olds, 17 5-year-olds and 5 6-year-olds (cf. Table

1). All participants in the sample speak European Portuguese as their mother tongue, and no diagnosis of cognitive or other weaknesses is mentioned, according to the information obtained by the educators.

Table 1. *Sample Distribution by Age and Sex*

Age	Male	Female	Total
4	10	4	14
5	10	7	17
6	4	1	5
Total	24	12	36

Resource(s)/Instrument(s)

Although, for reasons of validation, we also used a reduced version of Raven's progressive matrices (Amaral 1966) and treated the data, in its version with raw data, for reasons of context, we do not present them in this space.

Thus, TCM Júnior, in its original Italian version (Pinto et al. 2008), is an instrument that allows analyzing the understanding of figurative language, metaphors, of the ages targeted by the test, from 4 to 6 years of age. To date, it is in the process of being measured, having gone through all the adaptation phases.

TCM Júnior is an individual, oral administration resource, consisting of 25 items, metaphors, of which 12 are presented in the form of simple sentences (M-S) and the remaining (13) are presented in the context of short stories, in that, for each story, there are 3/4 questions about the narratives (M-SS).

From the perspective of the original authors (Pinto et al. 2008), when the metaphorical expression is used in the context of history, it can facilitate its understanding, since the context in which it is inserted provides the antecedents from which it is possible to approximate the meanings in metaphor. It is interesting to try to analyze this possible variability.

The administrator must have a protocol for each child, where he transcribes the answers given, and may have the help of a recorder so that the answers can be transcribed later.

The instrument should start with metaphors in the form of a simple sentence (M-S), where it is explained to the child that he will hear some phrases, with different words, which may seem "weird" and he must say what he thinks they mean, what they think it means. The examiner and the child analyze two sample items together – "The sun is a ball", "The sun has arms" – in order to become familiar with the instrument. For each item, the child should explore the metaphor presented and will be evaluated by the approximation made between the two terms of the metaphor and understanding of it.

For the analysis and rating of TCM Júnior (Figueira et al. 2023), each item is analyzed according to three levels of semantic conflict resolution, thus the maximum test score is 50 points, or that is, the potentials to be reached can vary between 0 and 50 points. The three levels are: level 0 - deficient or null understanding of the metaphor, no understanding; level 1 - partial understanding of the metaphor; and level 2 - full understanding of the metaphor.

Level 0 corresponds to a score of 0 points, where the answer reveals a misunderstanding of the conflict and the metaphor. At this level, it is possible to analyze responses ranging from rejection or denial of the metaphor ("I don't know") to its acceptance for inappropriate reasons. Regardless of the type, the answer remains distant from the semantic conflict that constitutes the metaphor. They therefore characterize the lowest level of elaboration/understanding. According to the authors, the various reasons can be categorized as:

Zero level:

a. Global rejection: the association is denied, alleged to be false. Example of response, "It is not true, the moon is not a lamp", "It is a lie";
b. Illusion/deception: search for common ground between T and V,
        1. Total illusion/deception: e.g., "The house has a hat"; response: "I don't know";
        2. Illusion/deception by partial centering: the focus is exclusively centered on T or V, for example, "The house has a hat"; answer: "The house is big and the hat is small";
c. Literal interpretation: elaboration of an alternative context where the metaphor is plausible. Example response, "The other day I had a dream about a house with my eyes closed at night";
d. Magical interpretation: a supernatural force turned one term into the other. Example response, "With a magic wand she had turned her house into a cage"; and. Metonymic interpretation: the meanings of the two words are related to spatial or temporal proximity. For example, "My father is the car doctor"; answer: "It means that he goes and injects people inside the cars".

At level 1, responses are assigned 1 point. At this level, there is a medium level of understanding and a partial recognition of the conflict and a focus on the commonality between T and V. At this level, there is no exhaustive exploration of the common ground for approximation between the two terms. For example, to the metaphor "The moon is a lamp", a response of the kind "Send light" is expected, demonstrating an approximation between the two terms of the metaphor, however, in a partial way.

The last level, level 2, with a score of 2 points, corresponds to a total identification of the conflict and an elaboration on the common ground between T and V, identifying not only the similarities but also the differences between the two terms of the metaphor. If we use the example of the previous metaphor, "The moon is a lamp", it is expected that the child will be able to elaborate a more complete answer, both linguistically and cognitively, for example, "Do you mean that the moon illuminates and emits light like the lamp, but the lamp also illuminates during the day, while the moon only illuminates the sky at night", showing a higher level of understanding.

The items are presented to the participants, asking themselves if they know what it means, giving these their narrative (Table 2).

Table 2. *Potential Raw Data (Range of Potential Points)*

Age	Range items in sentences 12 items	Range items in stories 13 items	Total range 25 items
4/5/6 years	0-24	0-26	0-50

Procedures

Before administering the instruments, a statement of informed consent was requested from the guardians of each child. The instrument application sessions were scheduled with the educators of the different Childhood Centers, which took place between January and April 2021. Individually, the TCM Júnior was applied.

Before the administration of TCM Júnior, the instrument is explained, in the form of a game, "joke", and an example of a sentence and response is given so that the subject becomes familiar with the resource. After the brief introduction to the test, it starts with 12 simple sentences and 4 short stories, each story having 3/4 questions about the narrative sentences.

Throughout the entire process of data collection and processing, conditions of anonymity and confidentiality were guaranteed for all participants, respecting the ethical principles underlying the conduct of investigations.

After collecting the data, they were inserted into a database of the SPSS version 25.0 program and subsequently analyzed.

Results

The data obtained are presented as a percentage, item by item, from TCM Júnior, and as a function of age. We will also provide examples of responses, depending on the 3 categorized levels (Tables 3 & 4).

Table 3. *Results (Percentages) for the 25 Items, According to Age, and by Response Levels (L0, L1 and L2)*

Item	4 years (N=14)			5 years (N=17)			6 years (N=5)		
	%L0	%L1	%L2	%L0	%L1	%L2	%L0	%L1	%L2
Items in sentences									
MS1	21.4	57.1	21.4	17.6	82.4	0	20	80	0
MS2	28.6	50	21.4	23.5	64.7	11.8	20	40	40
MS3	71.4	28.6	0	41.2	52.9	5.9	80	20	0
MS4	85.7	0	14.3	52.9	47.1	0	80	0	20
MS5	100	0	0	100	0	0	80	20	0
MS6	57.1	35.7	7.1	47.1	41.2	11.8	20	60	20
MS7	42.9	57.1	0	35.6	64.7	0	40	60	0
MS8	35.7	64.3	0	58.8	35.3	5.9	80	20	0
MS9	50	50	0	47.1	52.9	0	20	80	0
MS10	64.3	35.7	0	52.9	47.1	0	80	20	0
MS11	71.4	28.6	0	70.6	29.4	0	80	20	0
MS12	92.9	7.1	0	76.5	23.5	0	80	0	20

Items in stories									
MSS1.1	57.1	21.4	21.4	47.1	35.3	17.6	80	20	0
MSS1.2	42.9	57.1	0	23.5	76.5	0	60	40	0
MSS1.3	64.3	28.6	7.1	11.8	82.4	5.9	80	20	0
MSS2.1	57.1	21.4	21.4	41.2	47.1	11.8	40	60	0
MSS2.2	50	50	0	17.6	82.4	0	20	80	0
MSS2.3	92.9	7.1	0	100	0	0	100	0	0
MSS2.4	71.4	28.6	0	41.2	58.8	0	40	60	0
MSS3.1	85.7	14.3	0	88.2	11.8	0	80	20	0
MSS3.2	100	0	0	88.2	11.8	0	20	80	0
MSS3.3	42.9	57.1	0	58.8	41.2	0	60	40	0
MSS4.1	78.6	21.4	0	70.6	23.5	5.9	80	20	0
MSS4.2	71.4	28.6	0	41.2	52.9	5.9	60	40	0
MSS4.3	78.6	21.4	0	70.6	29.4	0	100	0	0

Table 4. *Averages Obtained by this Sample*

Age/N	Average items in sentences [Potential sum (0-24), average (12)]	Average items in stories [Potential sum (0-26), average (13)]	Total average [Potential sum (0-50), average (25)]
4 years (14)	5.43	4.57	10.00
5 years (17)	6.12	6.47	12.59
6 years (5)	6.40	4.20	10.40

Analysis of the most salient data, regardless of the age of the participants:

The total averages, and even the partial ones (depending on the type of metaphor) are below the potential average.
The item averages in sentences fall short of the potential average.
Item averages in stories fall short of potential average.

Also, and yet

There is an increase in the average, as a function of age, for items in sentences.
There is an increase in average for items in stories, from 4 to 5 years old, not happening for 6 years old.

Discussion

In fact, generally speaking, our small sample presents results that, under the comparative prism, with the data from Italian samples, can be considered negative. However, they are not to be neglected because, when we compare the total results of the TCM Junior of this investigation with the original study (Pinto et al. 2008), we can see that, considering a potential average of 25 points, the age range of the 4 years has a higher average (M=10) compared to the Italian version (M=8.98). However, the data for 5 and 6 years are lower than expected. The average for 5

years is M=12.59 and for 6 years is M=10.40, while the results of the original version show an average of M=16.75 for 5 years and an average of M=21.71 for 6 years (see Table 5). However, let us not forget that the sample of the present study is too small.

Table 5. *Averages Obtained by this Sample Compared with the Italian Sample, for Total Average*

Age/N	Portuguese	Italian
4 years	10	8.98
5 years	12.59	16.75
6 years	10.40	21.71

In fact, these results obtained by us suggest the need to continue applying and using this resource. The averages found are below those obtained by Italian counterparts and, equally, below the potential averages; we attribute the sample to being small, unrepresentative and significant. However, we do not neglect the discriminatory tendency, in which younger children obtain lower results.

Conclusion

Metalinguistic awareness was described in this work as the ability to reflect and compare the meanings of language. The development of instruments that aim to assess metalinguistic awareness is a complex process and it is necessary to consider the translation and adaptation of instruments originally constructed in other languages and in other cultural contexts to the national context (Mota 2012).

In fact, given the scarcity, in the national context, there is a need to develop and validate tools for assessment and even intervention of metalinguistic awareness, metalinguistic skills, in Portugal. In the present exploratory study, the main objective was to contribute to the Portuguese validation and measurement of the TCM Júnior (Figueira et al. 2023).

The main limitation of this investigation will be, therefore, the small size of the sample (N=36). However, the acceptance of the resource by the children is quite good and even the results are promising. In this sense, it will be necessary to use more representative and significant samples, so that there is equity in relation to age groups, which will allow us to carry out more sophisticated analyses. However, the results, as described above, should not be underestimated, since the study constitutes a test for the use and validation of the TCM Junior, until confronted with the studies with its original Italian version (Pinto et al. 2008).

We also consider, given the characteristics and procedures used in its adaptation, that the TCM Junior resource can and should continue to be used, either in the context of dynamic, universal assessment, or in the context of psychological intervention, initiating studies leading to its validation psychometric.

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