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Do children understand metaphors?: Study with TCM

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Abstract

The objective is to present data from a study that aims to contribute to the adaptation and validation of the Metaphor Comprehension Test (TCM),[1] an instrument for assessing the ability to understand metaphors, aimed at subjects between 9 and 14 years old. Ultimately, the instrument intends to have two sides: an evaluation and intervention resource that, to date, has content and construction validity, its original version being in Italian, already with immense research produced and evidence given. In Portugal and with the Portuguese version, this investigation is the second carried out. We still haven't obtained enough results to allow us sophisticated statistics, nor the presentation of normative or standardized data. However, investigations continue and the answers obtained are promising. Although we assume the need for further investigation, we believe that the resource, as it stands, can and should be used, without constraints, as a resource for intervention/development of metalinguistic awareness, of understanding metaphorical language. The present study was carried out with 97 students, with individual and group applications, depending on their availability. There are no differences, considering the procedures. It is noted that there is a more significant performance as a function of age, as seen with the original Italian sample, and it was not possible for us to ascertain with certainty the differences between understanding, considering the type of metaphors, conceptual and/or physico-psychological, components of the used resource. However, the acceptability of the instrument is quite high.

Keywords: Figurative language; Metalinguistic awareness; TCM; Metaphors

Introduction

As already mentioned in multiple contexts, since, at this moment, our main line and concern of investigation is metalinguistic awareness, the understanding of language, whether literal or metaphorical, we assume that metaphor has been analyzed in various ways over the last few years. decades. It began by being seen as a resource to decorate the text, very typical of the Aristotelian view[2] and, more recently, it has been seen beyond language, as a process that influences the way of thinking, acting and perceiving reality.[3] In fact, the metaphor has been analyzed in various ways over the last few decades. It began by being seen as a resource to decorate the text, very typical of the Aristotelian view[2] and, more recently, it has been seen beyond language, as a process that influences the way of thinking, acting and perceiving reality.[3]

In fact, the metaphor has been thought and conceptualized in different ways, however, in this context, we follow the definition of Pinto et al.,[4] considering it as a form of semantic conflict induced by the anomalous combination of the conventional meanings of its main constituents–tenor (tenor) and vehicle–with metaphor understanding framed as a

meta semantic skill, based on the analysis of these meanings.[4] In this sense, in a metaphor, the vehicle is the linguistic figure itself, that is, the immediate image that embodies or "carries" the tenor (the theme or content of the metaphor). The interplay of vehicle results and content gives meaning to the metaphor. According to some authors, a metaphor is a sentence with two ideas with no apparent connection, but that united in a certain way allows a comparison.[5] The metaphor can be of a Physical-Psychological character, that is, it contains two terms, one of which belongs to human beings and the other related to physical objects or animals (e.g. "That child is a top/wheel."); and of a Conceptual nature, that is, it has information with a view to its transmission through ideas considered to be functional for a given object (e.g. Friendship is a mantle/cloak").[6]

A metaphor is a figure of style composed of a subject to which it applies, Tenor (T), and a predicate, Vehicle (V). These two concepts have common ground that justifies their approximation. In an example provided above, in the physical-psychological metaphor "That child is a top/wheel" the T is the "child" and the V is the "top/wheel".[6] In this way, the meaning of words is "distorted", as there is a substitution of one word for another, where the meaning is transferred from the concept used to what one wants to refer to. However, this exchange of one word for another makes it a superfluous communication method, not being considered as a serious use.[7] Metaphor, according to Aristotle, was a tool used in persuasion and in transforming a complex idea into something simple and attractive.[8] For psychologists, metaphor plays a fundamental role not only because of its communicative nature, but also because of its emotional and cognitive nature.[6] Thus, the need to assess the understanding of metaphors by the subjects emerges. The TCM thus appears to fill this gap, however, it is necessary, to consider, that it is a test designed for the Italian population, from which one cannot expect only a literal translation of the items. Although figurative language is in current use around the world, the truth is that its investigation requires special consideration of the surrounding culture, since the reality is that there are several examples of metaphors that are similar in different languages and cultures, however, there is the other side, in which very recurrent metaphors in some countries are not understood in others.[9] The authors, our references,[4] propose a Piagetian functionalist framework, based on Piaget's last equilibrium model,[4] to analyze how this semantic conflict can be faced and solved by children in the considered period of development. Thus, they question whether "Understanding metaphors is a "thing for kids" or not?". Pinto et al.[4] consider that yes, as long as metaphors similar to those that children at this age produce spontaneously are presented and that a "game" is established with them. Understanding and knowing how to explain the meaning of metaphors is a complex skill, whose relevance has been perceived by several sectors of psychology (cognitive psychology, psycholinguistics, developmental psychology, psychoanalysis and other theoretical currents of clinical psychology, social psychology, sports psychology, etc.), generating, for more than forty years, a vast scientific literature.

As educational psychologists, in order to promote these skills, assessing and intervening, we consider it necessary to have valid resources. And it is under these aspects that we find ourselves validating an instrument for evaluating the understanding of metaphors, originally Italian, called the Metaphor Comprehension Test (TCM; FIGUEIRA, ANDRADE, PINTO & MELOGNO, in press), which is intended for children/young people between 9 and 14 years old. We assume that language is essential and indispensable in the life of human beings, allowing communication and interaction with others to occur.[10] As important as the act of communicating, in the sense of using language, whatever it may be, to express ideas, feelings, or emotions, is the act of understanding this form of communication, being one of the relevant areas of study in the context of the psychology of communication. education and development.

After all linguistic adaptation procedures, we present the first results resulting from the use with 95 students. Although very exploratory, these are promising data. In fact, we believe that work in this area is justified for two reasons:–the absence of valid evaluation and intervention resources, on this dimension, for European Portuguese;–the pertinence of investigating and intervening at the level of understanding, or metalinguistic capacity, in general, and, roughly speaking, and, in the present case, the understanding of figurative, metaphorical language.

Method

The present investigation has the ultimate purpose of contributing to the adaptation and validation of the Metaphor Comprehension Test (TCM). Collect data with a view to its standardization. According to Cronbach and Meehl,[11] the Committee of the American Psychological Association (APA) considered four types of validation to publish a test. Predictive validity; concurrent validity; content validity and construct validity. Predictive validity occurs when the criterion is obtained after applying the test. If the test and criterion results are obtained simultaneously, we are dealing with concurrent validity. These two types of validity are grouped together because they are oriented towards criterion validity.[11] Criterion validity is related to the evaluation of external criteria,[11] being evaluated by another type of resource. The test of these factors should be performed using already validated instruments.[12] Construct validity means that it has constructs based on theoretical concepts, but transformed into items that enable measurement, thus being operationally defined.[12] Content validity involves checking whether the test has evidence, through semantic analysis, that they are understandable and credible.[12] Later, Campbell and Fiske[13] considered other types of additional validities: convergent validity and discriminant validity. Convergent validity is only verified if there is a high correlation with a test that evaluates a theoretically related trait. In turn, discriminant validity is verified if it shows a null correlation with a test that evaluates a distinct trait.[13,14]

Sample

The sample consists of 97 subjects from a teaching establishment in the region of Coimbra, aged between 9 (4th year) and 15 (9th year), 50 (51.5%) being male and the remaining 47 (48.5%) female. Of these, there are 9 subjects aged 9 years (9.3%); 20 subjects aged 10 years (20.6%); 16 subjects aged 11 years (16.5%); 21 subjects aged 12 years (21.6%); 12 subjects aged 13 years (12.4%); 15 subjects aged 14 years (15.5%) and 4 subjects aged 15 years (4.1%) (Table 1). Of the sample selected to participate in the investigation (143 students), as previously mentioned, only 97 accepted.

Resources or instruments used

The Metaphor Comprehension Test (TCM) is an instrument intended for subjects aged 9 to 14 who attend from the 4th to the 9th grade of basic schooling, intending to assess the subject's ability to understand metaphors and to make interpretations more literal and concrete in metaphorical and abstract meanings.[6] The test, in its first version, in Italian, was divided into two parts distinguished by two types of metaphors. The first part, consisting of 6 metaphors, was called physical-psychological (MFP) and the second part, also consisting of 6 metaphors, was called conceptual (MC).[4,16] This test had an evolution, whose final version is also divided into two parts, however, the first part now consists of 5 metaphors, called physical-psychological and the second part is now composed of 7 metaphors, called from conceptual.[4] The test is divided into two parts, for two types of metaphors, each with 6 metaphors: physical-psychological (MFP) and conceptual (MC).[4,16] The test score/quotation is attributed by four levels: level 0, level 1, level 2 and level 3. This attribution varies according to the explanation given by the subject for each item. This explanation can be pre-metaphorical, being assigned level 0 or 1, or metaphorical, being assigned level 2 or 3.[6] In the case of level 0, all responses that distance themselves from the identification of common ground between T and V are considered; responses centered exclusively on one of these two domains; answers that are not relevant to decoding the connection that is intended to be established; and, mainly, "I don't know" answers.[6] In level 1 responses, still considered a pre-metaphorical zone, the subject manages to establish a legitimate connection between the two constructs, however, the connection is of a physical nature and therefore it is still considered a response that did not reach the metaphor.[6]

Level 2 responses are already considered metaphorical level responses, that is, the common ground between T and V is identified, however, it lacks a little depth and precision.[6] Level 3 answers, also considered in the metaphorical zone, differ from the answers of the previous level, for having in a clearer and deeper way the intended connection of a certain metaphor.[6] In its original version, the score of given subjects can vary between 0 and 36 points (18 points in physical-psychological metaphors and 18 points in conceptual metaphors, both with a potential average of 9 points), depending on the levels attributed to each of the answers. However, in the case of this specific study, the maximum score is slightly modified, as two more

physical-psychological metaphors have appeared and thus the maximum score goes from 18 to 24 (potential average of 12 points) adding to the 18 of the conceptual metaphors, that is, with a potential average of 9 points and culminating in 42 points (potential average of 21 points).

Table 1: Sample distribution, by age and sex

Age	Male	Female
9	4	5
10	6	14
11	8	8
12	9	12
13	6	6
14	14	1
15	3	1
Total students by gender	50	47
total number of students	97	

Thus, in potential and total terms, respondents can reach a score between 0-36, with a potential average of 18.

Procedures

The Informed Consents were delivered, for ethical reasons, with the purpose of requesting authorization from the Guardian for the participation of his student in the investigation, allowing the collection and processing of the intended data. Subsequently, with the due authorizations, the TCM was applied, lasting for approximately two months (March 30, 2022 to May 24, 2022). Due to the students' workload, the decision was made to apply the tests in groups, during a period of the class, in order to guarantee that it did not interfere with the contents that were previously programmed. Even so, some tests were applied individually, either due to the delay in giving informed consent, or due to the absence of the subject in the class in which the task was to be performed. The space was, considered, with the use of the room where the class took place, guaranteeing some characteristics considered decisive in obtaining more satisfactory results, such as a good work space, silent and without distractions. The application began with the distribution of TCM statements face down in order to ensure that all students started at the same time. Subsequently, the header was completed in which a code was requested (consisting of the class number–year of schooling), age, year, gender and date of completion. The time spent was timed and noted on the sheet after the end of each one. The code was present in the statement to allow the researcher to identify each participant in the investigation in order to obtain the detailed results, and, if requested by the guardian, always considering confidentiality issues. Instructions for carrying out the test were presented, exposing the example present in the technical manual and ensuring that all subjects had the necessary information for an efficient performance of the instrument.

Results obtained

The results obtained, from the TCM and the AI, were carefully quoted and entered into a database (IBM SPSS Statistics program) and, subsequently, the data were processed and analyzed, which were then presented and discussed.

About descriptive analysis

Regarding the results of the TCM, the tables were prepared with the four levels of quotation, in Word format, with two columns, one with age and school year and another with the answer given by the subject. The document was subsequently sent to the advisor for review. Then (cf. table 2) the sum data of the physical-psychological metaphors, the conceptual metaphors and the TCM in general, according to age, are presented. With regard to 9-year-old students, they scored slightly higher on physical-psychological metaphors (MFP) than on conceptual metaphors (MC), with 40 and 30 respectively. In relation to 10-year-old students, they obtained a significantly higher score in the MFP (143) in relation to the MC (70).

Table 2: Total MFP, MC and TCM score, according to age

Age	MFP	MC	TCM
9	40	34	74
10	143	70	213
11	121	65	186
12	176	107	283
13	121	76	197
14	130	103	233
15	41	29	70
Total	**772**	**484**	**1256**

Students aged 11 scored higher on the MFP (121) than on the MC (65).

Students aged 12 scored higher on the MFP (176) than on the MC (107).

Students aged 13 scored higher on the MFP (121) than on the MC (76).

Regarding students aged 14, they obtained a higher score in the MFP (130) compared to the MC (103).

Students aged 15 scored higher on the MFP (41) than on the MC (29).

In short, it was possible to observe in all age groups an ease in responding to physical-psychological metaphors to the detriment of conceptual metaphors.

The following table (cf. Table 3) presents a description of the mean scores for the physical-psychological metaphors and the conceptual metaphors. The MFP that reveals the highest average response is metaphor 4 with 1.63, which demonstrates the response trend between level 1 and 2. The MC with the highest average response is MC1 with an average of 1, 04, that is, the most frequent response is level 1. On the other hand, the MFP with the lowest mean is 8 with 0.45, that is, where the most frequent response level is between 0 and 1. In turn, MC 5 has the lowest mean of the MC with 0.68, also with the most frequent response varying between 0 and 1. We therefore conclude that in all age groups, the average of the results obtained by the subjects is lower than the instrument's potential average, however, it is possible to watch an approximation of the instrument's potential average as the age group increases.

Table 3: Average quotation level by type of metaphor, according to age

	9	10	11	12	13	14	15	Total
MFP 1	0,89	1,40	1,38	1,29	1,38	1,62	2,00	1,38
MFP 2	0,44	1,15	1,25	1,05	0,92	0,92	1,00	1,01
MFP 3	1,11	0,45	0,69	0,95	1,00	1,23	1,20	0,88
MFP 4	0,56	1,55	1,50	1,52	2,00	2,08	2,60	1,63
MFP 5	0,67	0,65	0,81	0,86	0,92	1,15	1,20	0,86
MFP 6	0,11	0,80	0,81	1,14	1,46	1,23	1,40	0,99
MFP 7	0,33	0,75	0,88	1,14	0,85	0,46	0,20	0,76
MFP 8	0,33	0,40	0,25	0,43	0,77	0,54	0,60	0,45
MC 1	0,78	0,75	0,88	1,14	1,31	1,38	1,20	1,04
MC 2	0,44	0,75	0,37	0,76	1,08	1,15	2,00	0,82
MC 3	0,89	0,50	0,81	1,10	0,92	1,15	1,20	0,90
MC 4	0,67	0,55	0,44	0,90	0,92	1,31	1,40	0,81
MC 5	0,56	0,55	0,75	0,48	0,77	1,31	0,20	0,68
MC 6	0,44	0,40	0,81	0,71	0,85	1,08	1,20	0,73

In terms of results, it was possible to conclude that the level of quotation of responses increases with age. The exploratory nature of the present study is assumed, thus highlighting the importance of carrying out further studies with even more representative samples of the Portuguese population. We therefore conclude that in all age groups, the average of the results obtained by the subjects is lower than the instrument's potential average, however, it is possible to watch an approximation of the instrument's potential average as the age group increases. The Figure 1 makes it possible to understand the growth trend of the mean scores of the MFP, the MC and the sum of both, in comparison with the increase in the age of the subjects. It is also possible to see that the average of conceptual metaphors is always lower than that of physical-psychological metaphors, which may indicate that conceptual metaphors are more difficult to interpret (cf. Figure 1).

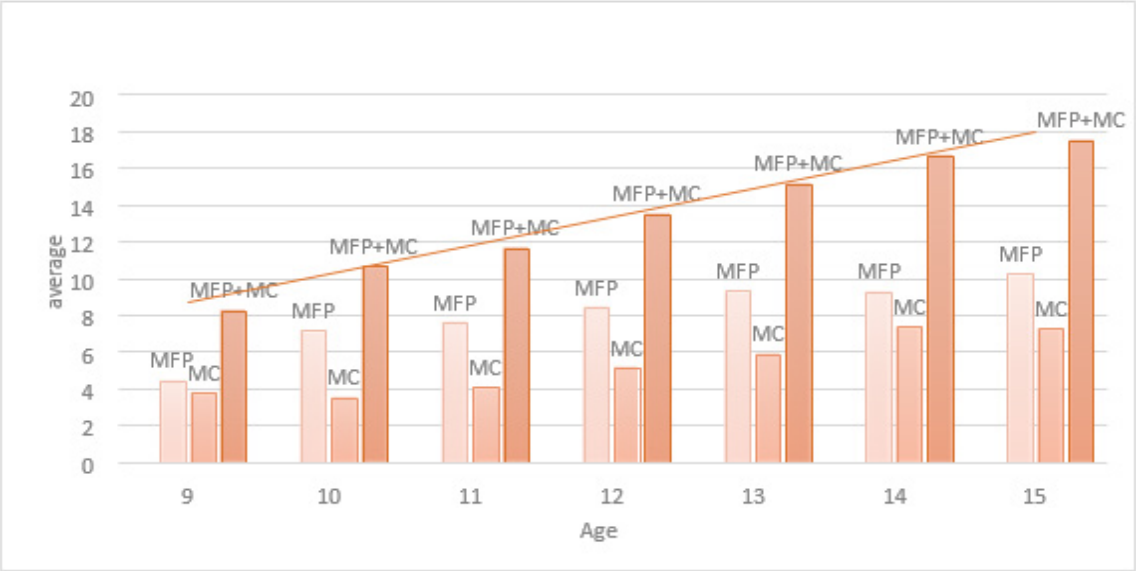

Figure 1: Average of the scores obtained in the metaphors, according to age

Discussion

In the study carried out with the original TCM, there were 874 participants in public and private schools, male and female and between 9 and 14 years of age.[6] On the other hand, in this investigation, subjects from the 4th to the 9th grade were asked to participate in the study. Using the original study,[6] it is possible to compare the percentages of the most frequent responses for each level. In the case of the study carried out on the Italian population, no metaphor was found without level 3 responses. However, the metaphor with the least level 3 responses was conceptual metaphor 5 ("Intelligence is a skyscraper"), with only 39 subjects out of 874 participants.

Conclusions

The feedback from the TCM application provided by the subjects was quite positive, however, it is noticeable that the percentage of adherence decreased as the school year progressed, since in the first three years the percentage of adherence was around 80%, starting to decrease and reaching 50% in the 9th grade. Therefore, although the majority of students showed great satisfaction after completing the task, the truth is that it proved to be much more difficult to motivate older students to respond to the test. With this study, it was possible to realize the importance of metalinguistic awareness, this concept that even led several authors to consider it fundamental during the first years of a child's life in cognitive development. In this sense, it is necessary to validate an instrument, previously existing in an Italian version,[4] which is able to assess the ability to understand metaphors of children between 9 and 14 years old and which is duly adapted for the Portuguese population. This study, with the objective of contributing to this validation, has a very acceptable number of responses (N=97), however there is a certainty that it is not enough, since the number of subjects present in the Italian study was nine times more (N= 874), the need for further studies is demonstrated.

In this investigation, the age variable was considered for data analysis, contrary to the original study,[4] whose analysis was carried out according to the school year. However, it is possible to verify that, despite the variable being different in both studies, there was an increase in the average quotation. In this way, and since in most cases the increase in the school year is accompanied by an increase in age, it is possible to conclude a gradual increase in the average of responses to the instrument. What differs in the two studies is the average, which is slightly lower in this study (for example, the average of the subjects varies between 8.22 and 17.5) compared to the original instrument (for example, the average of the subjects varies between 12.41 and 18.94), and this tendency can have several factors, listed below. The TCM is an instrument that, in addition to the answers requiring elaboration, the truth is that it demonstrates a great dependence on the examiner's abilities. The

instrument begins with a test/training item ("That nurse is a cup of chocolate.") in which the examiner must try to explain how an appropriate response to this item would be, thus providing a concrete example of how the subject should proceed. However, as there is no guide for the application of the instrument, this test item may not be duly deepened, resulting in more direct responses from the subjects.

Another of the limitations observed and which may explain the results is the application of the test in a classroom group. This decision was taken due to the high number of subjects and with the clear objective of not creating any kind of embarrassment to the educational establishment. Thus, a specific class was chosen that would not harm the student, where the instrument was applied to all those who agreed to participate, with due informed consent. However, the students who did not adhere to the study continued in the classroom to carry out their homework and, although the teacher remained in the classroom helping the examiner to maintain the silence required for this task, the truth is that there was some distraction. The elaboration capacity that is required of the subjects in this instrument was also sometimes compromised, due to the assigned class schedule. Sometimes, the instrument was applied in the morning, but it was also applied towards the end of the school day and, as is quite predictable, the results could be affected by this time difference.

In terms of scoring responses, it was found that the existence of 4 levels made this task difficult at levels 1 and 2, raising doubts in the choice of scoring. The alteration to 3 levels would solve this difficulty in the sense that there would be a lower degree of subjectivity and, therefore, the data would not be compromised. But, like at another study, in this exploratory study, it appears that the average of the sum of the scores at each age tends to increase with age. The results of level 3 responses indicate the difficulty of differentiating the quotation between levels 2 and 3, given the similarity between the correction criteria for the same. This sample is not representative, but should not be underestimated, as all results are important in these exploratory studies.

In general, students were interested and motivated to take the TCM.[6] It was found, informally, that preferences in certain scientific areas, namely Exact Sciences and Social Sciences, are not determinant for the motivation factor.

This study made it possible to assess the need and relevance of validating the TCM for the Portuguese population, due to the need to create more instruments that can help both in the evaluation and in the intervention process in subjects of different age groups, in the specific case of the metalanguage area, using metaphors. As this is just an exploratory study, the data are not representative of the Portuguese population, so more studies should continue to be carried out to rigorously validate the TCM, proceeding to collect more protocols that allow the performance of more robust analyses, namely, internal consistency, factorial and correlation analyses.[16,17]

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None.

Conflicts of interest

The authors declare that there are no conflicts of interest.

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