

# Metaphor-related figurative language comprehension in clinical populations: a critical review

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## Abstract

This paper aims to critically review current studies with respect to definitions, methods, and results on the comprehension of metaphor, metonymy, idioms, and proverbs under the following clinical conditions: aphasia, Alzheimer's disease, autism, brain injuries, specific language impairment, and Williams Syndrome. A comprehensive search of experimental psycholinguistic research was conducted using EBSCOhost, PsychInfo, PUBMED, and Web of Science databases. Thirty-eight studies met the review inclusion criteria. Results point to deficits in figurative language comprehension in all conditions considered, lack of clear definitions of the phenomena investigated, and varied methods throughout the sample. Patients' difficulties are attributed to multiple factors, such as a lack of Theory of Mind, executive dysfunctions, and poor semantic knowledge. The study of nonliteral aspects of language comprehension in clinical populations reveals a range of disparate impairments. There was no specific feature about metaphor-related phenomena identified that could, on its own, account for the difficulty some populations have to understand figurative language. Rather, metaphor-related language comprehension difficulties are often part of pragmatic, linguistic, and/or cognitive impairments.

Keywords: Figurative language. Metaphor. Metonymy. Proverb. Clinical populations.

## 1 Introduction

Metaphors, idioms, metonymies, and proverbs are frequent, play an important role in everyday conversation, and pose a challenge for certain populations that have a tendency to interpret figurative utterances literally. Unfortunately, to date,

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the nature of such difficulties and their potential relevance for theories concerned with metaphor-related phenomena have rarely been discussed in linguistics. In clinical circles, the millennial debate surrounding metaphor and its relevance for discursive and/ or cognitive abilities has also been largely disregarded.

It is beyond the scope of the present paper to provide a summary of this debate. It must be noted, nonetheless, that this study is presented largely under the Cognitive Linguistics framework, which has been dominant in figurative language studies since the 1980s. Under these accounts, metaphor is a critical aspect of language, thought, and action; and it can be defined as a cognitive mechanism in which one conceptual domain, the source, is systematically mapped onto another conceptual domain, the target. An important reason to conceptualize something in terms of something else is to facilitate the representation of abstract and/or complex concepts. Considering the domains IMPORTANCE and SIZE, for example, SIZE can be more readily grasped by our senses than IMPORTANCE. We often have precise ways to measure the size of something, but not to assess its importance; children understand and say words like ‘small’ and ‘big’ earlier than ‘important’ and so on. The utterance *He is big in the drug business* is, in this sense, a linguistic instantiation of the conceptual metaphor IMPORTANCE IS SIZE.

Like metaphor, metonymy is one of the constitutive forces of language and cognition, and not only a lexical phenomenon. Metonymy, from this perspective, is a cognitive process in which there is an asymmetric conceptual mapping from one domain, the source, onto another conceptual domain, the target, within the same cognitive model (BARCELONA, 2011; RADDEN; KÖVECSES, 1999). A linguistic metonymy, therefore, is seen as an instantiation of a conceptual metonymy. In the utterance *She likes to read Shakespeare*, for example, ‘Shakespeare’ instantiates the conceptual metonymy PRODUCER FOR PRODUCT.

Idioms are considerably fixed, institutionalized figurative constructions with two or more words that have a primarily discursive function and may also feature idiosyncrasies (LANGLOTZ, 2006). Many idiomatic expressions are systematically based on conceptual metaphors and metonymies. For example, *blow your lid* is based on the conceptual metaphor ANGER IS HOT FLUID IN A CONTAINER. This does not deny the fact that idioms are still very unpredictable and dependent on cultural factors, but it reinforces the CL tenet that (figurative) language is intertwined with general cognitive processes.

Just like idioms, proverbs have complex and disparate configurations, are highly dependent on cultural factors, and often motivated by a conceptual metaphor. Proverbs can be defined as familiar, fixed, sentential expressions that express well-known truths, social norms, or moral concerns (GIBBS; BEITEL, 1995). Thus, the proverb *don't judge a book by its cover*, which conveys the idea that one should not prejudge the worth of someone by its outward appearance only, is a linguistic instantiation of the conceptual metaphor ESSENTIAL IS INTERNAL.

All in all, metaphors, metonymies, idioms, and proverbs, as well as other types of figurative language, have important cognitive functions: to better conceptualize objects and events, and to ease language comprehension and production. That is why they are so prevalent in all kinds of discourse, and why their impairment is readily noticeable and may cause a strong impact in individuals with certain clinical conditions, as has been reported by the studies reviewed herein. Other more specific metaphor-related phenomena are similes, metaphonymies and one-shot metaphors. Although they will not be discussed here, it is still important define them.

Several studies have addressed figurative language comprehension in a range of clinical populations. Important questions, such as the origin of putative semantic/pragmatic difficulties, the possibility of differentiating figurative phenomena (e.g. simile and metaphor) on the basis of patients' performance, or the adequacy of figurative language as a tool for differential diagnosis in some clinical conditions, have already been raised. However, no review has summarized methods and findings in this area so far.

The main aim of this paper, therefore, is to review the current evidence on the comprehension of metaphor-related phenomena in individuals with the following clinical conditions: aphasia, Alzheimer's disease (AD), autism spectrum disorder (ASD), brain injuries, specific language impairment, and Williams syndrome (WS).

The main research questions that this paper asks are how each of those figurative phenomena is defined in studies involving the aforementioned clinical conditions, what methods have been used to conduct this kind of investigation, and what results have been found so far. In order to answer these questions, we employ the method described below.

## 2 Method

Relevant literature was identified using the databases EBSCOhost, PsychInfo, PubMed, and Web of Science, with the search terms *metaphor*, *idiom*, *metonymy*, and *proverb* in combination with *Alzheimer's*, *aphasia*, *autism*, *Asperger*, *brain injuries*, *specific language impairment*, and *Williams syndrome*. Citations for referenced articles were also taken into account to identify additional studies. Since the purpose of this work was to critically review the existing literature, we did not exclude any study on the basis of poor methodological quality, nor did we assess the quality of each study or the journals where it was published.

From a pool of 130 papers that had the potential to meet our broad criteria for eligibility, we selected 38 studies (see a table describing all the studies included in the review at [http://professor.ufrgs.br/maity/files/tabela\\_artigo\\_0.pdf](http://professor.ufrgs.br/maity/files/tabela_artigo_0.pdf)) meeting all the following inclusion criteria: reporting experimental psycholinguistic research; involving the study of at least one of the figurative phenomena under consideration, in at least one of the pathologies considered; and being written in English.

## 3 Results

In this section, data were compiled, organized, and presented according to the research questions: definitions, methods, and results presented by the studies reviewed.

### 3.1 On definitions

The highest proportion of studies on metaphor-related figurative language investigated the comprehension of metaphors (20 studies). The majority of these papers present no definition of metaphor whatsoever. Moreover, our sample reveals little consensus on what a metaphor is, as shown by the different expressions used as test items. *It's a piece of cake*, *lend a hand*, *as quiet as a mouse*, *you can feel the sunbeams*, *Robert is a bulldozer*, *you are a ship without a captain*, *the surgery is going to cost him an arm and a leg*, *waves of depression came over her*, *woman with jewels/city lit up at night*, and *cloudy/confused* are examples of different figurative phenomena, and even of literal expressions, that have been considered

metaphors. Note also that items of different levels of structure, ranging from words to sentences, are equally regarded as metaphors in these cases.

With regard to metonymy, our search identified five studies. Metonymy is the least investigated and the most recently approached of the metaphor-related figurative phenomena in clinical populations. It has been studied solely with relation to ASD and WS, and always in comparison to other tropes. Metonymy has been defined either as a mapping within one conceptual domain (e.g. ‘bus’ referring to the driver in *I told the bus to park behind the pub*), or in terms of a referential device (e.g. *Green corner, work quietly!*), but always structured at the lexical level. Only one study (LANDA; GOLDBERG, 2005) does not present a definition of metonymy. In fact, the authors do not explicitly state which figurative phenomenon they are investigating. We can suppose they are investigating metonymy by the example they use: *give me a hand*.

Unlike the case for metonymy, we found studies on idioms in all conditions considered. Twelve studies investigating idioms under clinical conditions of interest were identified. A peculiarity here is the large amount of research in Italian, particularly in connection with aphasia and AD. The Italian workgroup characterizes idioms as being semantically eccentric, since “their meaning is not a direct function of the meanings of their component words” (PAPAGNO et al., 2004, p. 226). They posit that idioms typically occur in certain syntactic constructions, but recognize that there is a large variability among them, in that they may vary in syntactic and semantic dimensions, such as transparency, decomposability, and ambiguity. Apart from the discussion of these dimensions in Italian studies (PAPAGNO et al., 2004; CACCIARI et al., 2006; PAPAGNO; CAPORALI, 2007), we found only the following extensional definition of idioms: “idioms are phrases such as *skate on thin ice* and *kick the bucket* that have fixed figurative meanings but may have an additional literal interpretation” (NORBURY, 2004, p. 1180). Most studies present no definition of the phenomenon under scrutiny. Furthermore, in the surveyed papers, there was no theoretical linguistic account of the phenomenon per se, but rather psycholinguistic models of idiom processing. As for the structure of idioms, this is the trope that presents the largest variation, including words, compound words, phrases, and sentences.

Similarly, most studies investigating proverbs in clinical populations provide examples (e.g. *Rome was not built in a day*) but no definition of the phenomenon. A couple of studies that do provide a definition treat proverbs as unitary,

fixed, and familiar expressions that convey well-known truths or social values (ULATOWSKA et al., 2010; KEMPLER; VAN LANCKER; READ, 1988). No theoretical perspective is explicitly embraced to account for the phenomenon. An exception in this regard is the study of Ulatowska et al. (2010, p. 227), which has an ethnographic point of view and defines proverbs as “manifestations of common cultural knowledge realized as collections of short, succinct texts”. As for their structure, proverbs are always considered on a sentential level. Our literature search identified seven studies on proverbs, four of which in AD, and one in each of the following conditions: aphasia, traumatic brain injury, and autism.

### **3.2 On methods**

As for the procedure used in measuring the ability to understand metaphor-related items, all of the studies were conducted by means of individual interviews. The tasks employed, on the other hand, varied greatly both in their form and in their content. No single, widely adopted test was found in studies on metaphor. However, an influential task was developed by Happé (1993) and later replicated (in a revised version) by Norbury (2005). Happé’s task was developed in order to test the idea that metaphor comprehension requires the consideration of speaker intentions and, more specifically, the ability to infer another person’s mental states, the so-called theory of mind (ToM). This task evaluated similes, metaphors and synonyms. In each condition, the subject had to choose a word from a list of six target words, to complete each of five items.

Despite the influence this study had on subsequent studies on figurative language in autistic people, it presented some methodological flaws. First, subjects’ age ranged from 9 to 38 years in a small sample (N=32, distributed in four different groups), with each autistic group consisting of only six participants. To deal with sample issues, Norbury (2005) compared data from 94 children of 8-15 years of age with ASD and language impairment to 34 age-matched controls. In addition, to avoid possible differences in conceptual complexity between items, the author mixed them randomly, simplified the vocabulary, and offered a choice of four words to complete each sentence.

The following five tests were adopted in some of the studies: the Metaphor Triads Task (KOGAN et al., 1980), the Figurative Language subtest of the Test of Language Competence (WIIG; SECORD, 1989), the Metaphor Comprehension

Task (PAPAGNO et al., 1995), the Junior Metaphor Comprehension Test (PINTO et al., 2008), and the Protocole Montréal d'Évaluation de la Communication (JOANETTE; SKA; CÔTÉ, 2004). Other studies contained different types of material developed by the authors or by their research groups.

When scrutinizing the aforementioned tests, we were unable to find many points in common between them, taking into account the various aspects under consideration. Different kinds of stimuli (visual or linguistic), levels of conventionality (idiomatic or new), context (stories, vignettes, or isolated sentences), and ways of eliciting answers (multiple, forced choice, or explanation) were found. Nevertheless, some generalizations can be made. Most studies in our sample investigated metaphors out of context, while some investigated them in a contextualized fashion, and few have taken context as an independent variable. Studies that presented metaphors in context did so through short stories, with half of them including drawings as a support. Studies presenting metaphorical expressions out of context invariably tested them with multiple or forced-choice tasks. Studies that contextualized metaphorical expressions, in turn, tested their comprehension mainly through open questions, requiring an explanation, but also through multiple and forced-choice tasks. Importantly, context could either ease (since it provides more information) or represent a burden (since it increases cognitive and linguistic demands). The way answers were requested brings another issue. From a statistical standpoint alone, forced choices are easier than multiple choice tasks and explanation tasks are more demanding, since there is no aid in finding the right answer. The main point here is that if each and every one of those aspects are of relevance when it comes to figurative language studies, it follows that different results may have been found depending more on the method chosen than on the specific difficulty one population may have in a particular trope.

The tasks used in measuring the ability to understand metonymies in clinical populations, on the other hand, showed little variance. The same format, consisting of short picture stories, was used in three studies that investigated metonymy comprehension. Visual aids (pictures) were provided to limit memory demands. Landa and Goldberg (2005) adopted the Figurative Language Subtest of the standardized Test of Language Competence (WIIG; SECORD, 1989). MacKay and Shaw (2004) developed their own picture story task. All studies investigated metonymy in context using verbal explanation tasks with pictures as visual aids.

The tasks used to assess the ability to understand idioms, in turn, varied greatly both in their form and in their content. Studies contained different tasks that do not allow many generalizations to be made, which prompts the same questions that the methods used in metaphor studies did. Most studies investigated idioms out of context: one examined idiomatic noun compounds in context, and two considered context as an independent variable. Studies that presented idioms out of context have tested them mainly with multiple choice tasks. Hillert (2004) presented German idiomatic noun compounds contextualized in a single sentence, followed by a yes/no question. Norbury (2004) manipulated context by testing out-of-context and context conditions through open questions. The context condition was verified after a delay and was followed by a forced-choice question as well. The other study that manipulated context (QUALLS et al., 2004) used a multiple choice task in the context condition, and a forced-choice task in the other condition.

As for the type of idiom considered, Hillert (2004), to avoid the difficulties that syntactic structures may cause to aphasic patients, used idiomatic noun compounds (*Bohnenstange*/‘beanpole’, meaning a very tall girl) in his study rather than the phrasal idioms all other studies used as test items (e.g. *dare del filo da torcere*/ ‘to give some thread to twist’, meaning to make things hard for someone, in Italian). The distinction between ambiguous (idioms that could have both literal and figurative interpretations) and nonambiguous opaque idioms is another aspect of interest that has been addressed by Papagno et al. (2004).

Although there was no single, widely-used test, most materials used to investigate proverbs include standardized and validated tests (e.g. Gorham’s Proverb Test, 1956; The Delis-Kaplan Executive System, 2001; Screening Test for Alzheimer’s Disease with Proverbs, SANTOS et al., 2009). Context was not explored in depth in proverb studies, with the work of Ulatowska et al. (2010) being the only one to investigate the effect of context on proverb comprehension. Most of the studies presented proverbs out of context. Familiarity, instead, is a commonly explored variable in proverb studies, either in comparison to literal sentences (KEMPLER et al., 1988; KAISER et al., 2013) or in comparison to other proverbs (CHAPMAN et al., 1997; CHAPMAN; HIGHLEY; THOMPSON, 1998). Rapp and Wild (2011), in fact, argue that the distinction between the type of question adopted is of relevance in proverb studies. In our sample, most studies combined spontaneous and multiple-choice tasks.



### **3.3 On results**

We shall begin the presentation of our results with the findings about metaphor in disorders of the autistic spectrum, since these are, respectively, the most studied phenomenon and condition when it comes to figurative language research in clinical groups. The studies we found on this theme agree that autistic individuals show difficulties in the comprehension of metaphor-related phenomena. The most common reasons raised for this difficulty are: lack of ToM ability, impairment of executive control functions, and poor semantic knowledge.

Although it is agreed that autistic individuals do have difficulties in metaphor comprehension, findings are not conclusive in some respects, such as the dependence upon ToM abilities and the relationship with executive functions. In a widely cited work, Happé (1993) found that speakers with no ToM abilities were significantly worse at metaphor comprehension than speakers with first-order ToM abilities. The findings Wagner and Nettelbladt (2005) on autism are consistent with those of Happé (1993), who found that only first-order ToM (inferences about others thoughts) is necessary to understand metaphors.

Rundblad and Annaz (2010) reached another finding, namely that there is no relationship between ToM abilities and metaphor comprehension in autism. By contrast, Norbury (2005) and Mo et al. (2008) found that second-order ToM (inferences about other's beliefs about a third participant) is necessary to understand metaphors. Furthermore, Norbury (2005) argued that although it is most likely a facilitating factor, ToM is not sufficient to understand metaphors. She concluded that broad semantic knowledge predicts metaphor comprehension better than ToM abilities or the severity of autistic symptoms, since in her study only participants with structural language deficits were impaired in the metaphor task, regardless of their clinical condition (ASD or language impairment).

Executive dysfunction is another factor that has been proposed in order to account for impairments in metaphor comprehension, in association (or not) with ToM abilities. A Canadian workgroup (CHAMPAGNE-LAVAU; JOANETTE, 2009; CHAMPAGNE-LAVAU; STIP, 2010) argues that executive dysfunctions coexist with poor metaphor comprehension and ToM deficits in brain damage. Landa and Goldberg (2005), however, did not find a significant correlation between executive functions and metaphor comprehension in high-functioning autistic patients. They found that verbal IQ correlates with metaphor and metonymy

comprehension instead, which reinforces the importance of linguistic knowledge to metaphor comprehension. Dennis; Lazenby; Lockyer (2001) and Gold and Faust (2010) also found that high-function autism and Asperger's Syndrome (which has no significant delay in language or in cognitive development) groups are significantly less able than controls to understand metaphors and idioms.

Yet another clinical group studied was that of right hemisphere (RH) damaged patients. Gagnon et al. (2003) concluded that there is a genuine deficit in their ability to process metaphoric relationships between words. They question whether RH damaged subjects' performance would reflect a semantic deficit or an inability to suppress the literal meaning in contexts where the metaphoric meaning is the best choice.

Another aspect has been raised by Annaz et al. (2009) and Van Herwegen et al. (2013) in their studies on figurative language in people with WS. There seems to be a dissociation between metaphor and metonymy comprehension, in that: (i) metonymy is superior to metaphor comprehension for both control and WS groups and (ii) metonymy comprehension is only delayed in WS, while metaphor comprehension is delayed and atypical in this population. Annaz et al. (2009, p. 972) argue that "metaphor comprehension is an ability that spans cognition and language, while metonymy falls more squarely within the language domain" and may be part of vocabulary, and treated as synonymy. All in all, results on metonymy comprehension (as assessed in AD and WS) point to patients' worse performance in comparison to control participants.

Regarding the comprehension of conventional and new metaphors and idioms in AD patients, Amanzio et al. (2008) found that while the comprehension of conventional metaphors and idioms was preserved, the comprehension of novel metaphors was impaired. They presented two main explanations for these results. The first is that additional processing from executive functions and reasoning abilities are involved in the processing of novel, but not of conventional, metaphors or idioms. Thus, the interpretation of non-lexicalized items might require additional processing that AD patients are not able to perform. The same rationale might explain AD patients' good performance in Papagno's (2001) study. In fact, the greater difficulty that individuals show in processing creative metaphors, as compared to idioms and metonymies in different studies, might be attributed to the fact that the latter can become lexicalized to a higher degree and consequently be retrieved from long-term memory. The second explanation is the inability to

suppress literal irrelevant meanings, as Gagnon et al. (2003) have described for aphasics.

Other studies also found impairment in idiom comprehension in AD subjects. In a multiple choice task, Papagno Lucchelli; Muggia; Rizzo (2003) found that AD participants, as compared to a control group, were significantly impaired when they had to choose between pictures representing figurative and literal meanings. However, their performance improved when there was no picture with the literal meaning among the choices. Rassiga et al. (2009) investigated idiom comprehension using sentence-to-picture and sentence-to-word matching tasks. AD patients were significantly impaired in both tasks. In sum, semantic and executive deficits combined can explain AD patients' difficulties in understanding idioms, which is consistent with results found with aphasic subjects and points to the relevance of methodological choices.

Many studies on idiom comprehension focus on aphasia. They challenge the right hemisphere hypothesis and argue that idioms are not only difficult for RH damaged patients, but also for those with left hemisphere damage. These results are in accordance with findings from Gagnon et al. (2003) on metaphor comprehension in the same population. As for the relevance of the brain lesion site, Cacciari et al. (2006) found a significant effect, with frontal patients more impaired in idiom comprehension than non-frontal ones. According to them, this points to the role of inhibition, since patients did show a good comprehension of single words, but found it difficult to suppress the literal interpretation of the string. Papagno and Caporali (2007) found that aphasic comprehension of idioms is related not only to the severity of language deficit in general, but also to the level of their executive functions. That is, apart from different brain lesion locations that are more or less closely connected to language areas that have been described as affecting figurative language comprehension, the executive control has been related to the processing of inferences required to understand idioms, as mentioned for metaphors.

In some cases, results could be more related to methodological choices than to cognitive or clinical aspects. The inclusion of context as an independent variable is a choice that might interfere with results. Studies on language-based learning disabilities and with specific language impairment analyzed idiom comprehension under out-of-context and in-context conditions, yielding inconsistent results. Context was found to be a facilitating factor for children with communication

disabilities (NORBURY, 2004) but not for adolescents with learning disabilities, since the stories in which idioms were embedded required more of their compromised processing resources (QUALLS et al., 2004). Different variables other than context may have contributed to reach these opposite findings. Whilst Qualls et al. (2004) manipulated familiarity, Norbury (2004) controlled familiarity and manipulated transparency. Despite divergent results, both studies convey the core idea that general language skills are determining factors for the understanding of idioms, that children and teenagers with poor general language ability do not benefit from context as much as typically developing peers, and that memory and processing resources (besides language skills) can account for difficulties in understanding idioms in texts.

Research on proverbs is also controversial, but a point of intersection between studies is the inclusion of cognitive functions as a possible source of disabilities. McCrimmon et al. (2012), in an attempt to identify specific aspects of executive functions affected in individuals with AS, found that participants have difficulties with verbally-based tasks, but even more so with visually-based tasks. Although their findings show that teenagers with AS were as capable as controls in proverb comprehension, they recognize that this may have been due to the adoption of an ineffective method rather than to the subjects' abilities. According to them, the task adopted probably does not mirror daily experiences with figurative language, when less common proverbs and different tropes are heard.

Moran et al. (2006), in turn, investigated the relationship between working memory (WM) and the comprehension of low-familiarity proverbs presented in context to adolescents with traumatic brain injury (TBI). Their results show that TBI participants understand fewer proverbs than controls and that WM capacity influenced performance for all participants.

Contrary to findings for TBI, Ulatowska et al. (2010) found that aphasic subjects with a mild level of language impairment have preserved the ability to process proverb meaning and to manipulate proverb form, especially when in context. It is worth noting that the proverbs they used were familiar, a variable that has been reported to affect results for different tropes.

As for AD, studies show divergent results. In a study on mild AD (LAFLECHE; ALBERT, 1995) no significant difference was found between controls and AD groups, while in other studies (KEMPLER; VAN LANCKER; READ, 1988; CHAPMAN et al., 1997; CHAPMAN; HIGHLEY; THOMPSON, 1998; KAISER

et al., 2013) poor performances were reported in later stages of the disease. While this result could be interpreted as being dependent on the severity of the disease, it is not the only variable to consider. Poor performance in proverb interpretation varied according to the way responses were elicited and to the familiarity of expressions. AD subjects invariably had more difficulty with verbal explanation tasks, unfamiliar proverbs, and novel phrases.

To summarize, the findings showed that figurative language comprehension presents difficulties for the studied clinical populations. It is evident from our sample that cognitive skills, clinical matters, and the method used are all aspects to be considered, and they contribute to specific findings that in some cases point in different directions.

## **4 Discussion**

In this section findings are discussed following the same order presented above, as follows: definitions, methods, and results.

### **4.1 On definitions**

Our count of the papers on metaphor-related phenomena in clinical populations shows that metaphor is the most investigated phenomenon, followed by proverbs, idioms, and metonymy, in that order. We shall begin our discussion with the very definition of metaphor, the phenomenon that has attracted the most interest across studies. It seems that authors either suppose that readers are familiar enough with the concept or that there is a consensus on what metaphor is. While it may be the case that specialized readers do know what a metaphor is, it is not the case that there is an agreement on this matter. Hence, under the ‘metaphor’ label, we can find instantiations of idioms, primary conceptual metaphors, X is Y metaphors, metaphonymies, one-shot image metaphors, and similes, as illustrated below. “Hold your horses” (in WAGNER; NETTELBLADT, 2005), for example, is an instantiation of an idiom. “She was boiling in anger” (in ELVEVÅG et al., 2011) is an instantiation of the ANGER IS HOT FLUID IN A CONTAINER primary conceptual metaphor. Both idioms and conceptual metaphors have already been described in this paper. In order to clarify matters, brief definitions of related figurative

phenomena will be provided here. For example, “Ian was very clever and tricky. He really was a fox” (in HAPPE, 1993) is an instantiation of an X is Y metaphor, also called resemblance metaphors in Cognitive Linguistics (GRADY, 1996). “Give me a hand” (in LANDA; GOLDBERG, 2005), is an instantiation of a metaphonymy, in which metaphor and metonymy interact in a conventionalized expression, where the linguistic action is the target domain (GOOSSENS, 1990). “Winding river/snake” (in MASHAL; KASIRER, 2012), on the other hand, is an instantiation of a one-shot image metaphor, where a river is compared to a snake regarding its form. Lakoff (1987) distinguishes this specific kind of metaphor from more general conceptual metaphors arguing that one-shot metaphors map image structure instead of propositional structure, they are not used to understand abstract in terms of concrete domains, and they are not systematic, since they do not generate figurative linguistic expressions. Finally, “The old car was as noisy as...” (in WOLGEMUTH et al., 1998) is an instantiation of a simile, which can be defined as an overtly signaled comparison of two categories, where the comparison is made by the use of *as* or *like*. As seen, there are subtle yet important differences between the above-mentioned phenomena. The differences pointed out here were due to a commitment with a common framework, that of Cognitive Linguistics.

Terminological inconsistencies regarding figurative language will probably not be solved at all, since they depend not only on different theoretical frameworks (there a number of different frameworks), but also on several dimensions (novelty, ambiguity, syntactic structure, etc.). In any case, if specific phenomena and tasks are described in detail, terminological issues can be handled, since researchers can still rename, reframe, and replicate it. This is precisely the kind of theoretical-methodological concern researchers must have so that results from different studies can be compared.

A lack of working definitions is patent in many studies involving all kinds of metaphor-related phenomena. We first ascribe it to the fuzzy nature of these phenomena, since several instances of figurative language are neither pure cases, nor readily distinguishable from non-figurative language (GIBBS; COLSTON, 2012). Moreover, a sharp distinction between literal and non-literal, and between metaphor and metonymy, between metaphor and idiom, and so on is neither clear nor theoretically unchallenged.

We also relate both terminological inconsistencies and the lack of definitions to a lack of theoretical commitments, as is often the case where papers that do not

define concepts are the same ones that do not assume any theoretical perspective. Many studies in our sample come from researchers with clinical backgrounds and only describe previous findings, not framing them or discussing their own findings under any theoretical account. Therefore, a possible explanation for the scarcity of metaphor-related definitions and theoretical approaches may be the lack of familiarity with the extensive work on figurative language in linguistics. Moreover, the fact that many medical concepts are so well delineated and established that everybody is in agreement on them, may lead scholars from medical backgrounds to underestimate the need of working definitions and theories concerning metaphor-related concepts. While there is little debate nowadays surrounding the definition of Williams syndrome or conflicting theories about it, there are plenty of definitions about metaphor, hot debates on how they are processed, and diametrically opposed theories on this theme. In fact, even for scholars who are more knowledgeable about several traditional and contemporary theories on the subject, it is difficult to conciliate theoretical considerations on the structure and processing of each metaphor-related phenomenon with empirical evidence brought by a myriad of experiments. It should, therefore, come as no surprise that many of the articles in our sample present their findings in comparison to previous studies, but these do not discuss them in terms of any theoretical account, nor do they, in most cases, clearly present hypotheses to be tested or justify why alternative explanations for their findings should be rejected.

#### **4.2 On methods**

As observed, there is no gold standard task to investigate metaphor, metonymy, idioms, or proverbs. This may be an important reason why researchers develop their own tasks as needed, for their specific purposes. Papagno and Caporali, (2007, p. 210) state that “the main problems in studying idiom comprehension in aphasic patients concern the type of test and the type of idiom”. Indeed, we can rephrase this and argue that the main problems in studying figurative language in clinical populations are related to the type of test and the type of figurative phenomena investigated in the test.

A detailed account of each methodological issue involved in all of the reviewed studies is beyond the scope of this paper. However, we can address some specific methodological aspects that were observed that might help researchers

to design future studies. First of all, we found that few validated tasks are being used to test metaphor-related comprehension. The availability of standardized and validated instruments to test metaphors, idioms, metonymies, and, to a lesser degree, proverbs, is limited in English, and probably in other languages as well. Once more, we attribute this lack partially to the very nature of figurative language phenomena, which renders a translation of any standardized test difficult, if not impossible. Only one study in our sample (MORAN et al., 2006) addressed the issue of construct validity in their materials.

Another noticeable factor rests on the syntactic structure of the figurative expressions used as test items across the studies. For instance, we found single simple words (*aigre/sour*), nominal compounds (*Bohnenstange/beanpole*), phrasal verbs (Let off steam), and whole sentences (It is raining cats and dogs) defined generally as idioms. Considering that the comprehension of those expressions have been tested in individuals frequently affected by impairments in executive functions and higher order cognitive functions, their syntactic structure should be taken into account. Surprisingly, studies addressing this kind of concern were rarely identified.

The structure of items, such as opens or closed sets, forced or multiple choices, including drawings or not, can also reverberate in participant performance. Happé (1993), for instance, formulated sets of five sentences for which the subject had to choose one word out of six options. We might argue that this could be a facilitating method, since participants could go through a process of elimination. Norbury (2005), while adapting Happé's study, modified the original version in many ways and reached different results. We recognize that task variations are sometimes inevitable, depending on specific populations and research questions. Our claim is that this is the kind of thing that must be addressed and discussed.

The issue of frequency of an expression in a certain linguistic community and its familiarity for a given individual is also of relevance. Studies have shown that novel figurative expressions are less understood across different tasks, in different clinical conditions. Thus, if familiarity with an expression facilitates the process of understanding its figurative meaning, this should also be taken into account in studies with clinical populations. Unexpectedly, few studies have controlled or manipulated this variable with clinical groups.

Our data also revealed that context is a major factor of relevance in figurative language understanding. As a matter of fact, it could hardly be otherwise,



since language understanding in real discourse is all about taking context into consideration. However, the question as to whether context facilitates or hampers figurative language comprehension, though this cannot be answered easily. In experimental studies with clinical populations, the answer will depend on the peculiarities of clinical conditions and experimental designs. In our sample of studies, context has proven both to ease figurative language comprehension and to obscure comprehension. Context can enlarge the amount of information conveyed in a test, overloading subjects' working memory. Furthermore, context can confound subjects that present an inability to suppress the literal meaning of a figurative expression, particularly in tasks having the literal meaning among the choices. Thus, in conditions where processing resources are impaired (e.g. learning disabilities), context will tend to worsen figurative language comprehension, whereas in conditions where processing resources are spared, context will tend to improve it.

### **4.3 On results**

As for conclusive results in the clinical conditions taken together, few generalizations can be made. First, results show that all clinical populations considered here have difficulties in comprehending figurative language, to a lesser or to a greater degree. However, given the heterogeneity of participants exhibited within each condition and between different conditions, impairments are attributed to multiple factors. The most recurrent ones are compromised ToM abilities, executive dysfunctions, and impaired verbal abilities, particularly poor semantic knowledge. Some authors highlight the role of each of these mechanisms, while others suggest that a combination of them better explains impairments. However, the degree to which each of these mechanisms takes part in impaired figurative language comprehension still remains unclear. It also remains to be established whether specific abilities (1<sup>st</sup> or 2<sup>nd</sup> order ToM, set shifting, flexibility, reasoning, working memory, verbal IQ, and semantic knowledge) have different roles in particular metaphor-related phenomena and in particular clinical conditions.

In addition to finding specific causes of impairment, what is of special interest is the evidence that figurative language comprehension impairments in the studied populations are often part of a more global disorganization process.

## 5 Final remarks and recommendations

Empirical research on figurative language comprehension in clinical populations, in its attempt to understand the functioning of fuzzy phenomena in samples with a wide range of variability as the norm, is always an effort to conciliate scientific rigor with chaos. Our specific pleas for a more scientific and less chaotic path to metaphor-related research involving clinical populations are as follows.

First, in order to enable comparisons between studies, it is important to reduce the terminological heterogeneity in the naming of metaphor-related phenomena. If the comprehension of similes, metaphors, metonymies, metaphonymies, and idioms is found to rely on different cognitive mechanisms (see ANNAZ et al., 2009), then it is important to clarify these matters. That is to say, there are specific features in each metaphor-related phenomenon, and even though there is no clear-cut differentiation between them, it is of relevance to consider those differences when asking participants to solve tasks involving different figures of speech. One possible way of avoiding unclear and nonconsensual cases is to choose prototypical cases of each phenomenon and of each controlled or manipulated variable.

Second, as suggested elsewhere (GIBBS; BEITEL, 1995), for psycholinguists working with proverbs, we suggest that more attention be paid to the extensive literature on this topic in linguistic studies. Pertinent research questions and hypotheses can only be addressed by appropriate methods if they are theoretically grounded. We favor theoretical models that account for the many dimensions involved in figurative language processing and comprehension. In this respect, contemporary models that “do not simply claim that figurative language is always or never more difficult to process than some other kind of meaning, perhaps nonfigurative meaning” (GIBBS; COLSTON, 2012, p. 127) seem more suited to be adopted in studies with clinical populations. In this respect, theories that take evidence from empirical data and from what is known about human cognition into account are more suitable. A multidisciplinary approach describing the organization of language as a comprehensive and complex behavior consisting of related domains rather than of the product of circumscribed and autonomous cognitive functions seems to us to be a good starting point for those who wish to investigate figurative language in clinical populations.

Third, we strongly recommend that researchers take their time to present

methods in greater detail in their studies, so that other researchers can replicate them. In studies with clinical populations, several findings show us that researchers need to specify whether an expression is plausible both in a figurative and in a literal sense or not, whether it is a familiar or a novel one, or whether it is presented in or out of context. Thus, experimental designs must be clearly presented, not only with detailed characterizations of linguistic aspects, but also with differentially affected patient subgroups.

Finally, findings should be presented in a way that relates them not only to previous findings, but also to the theoretical approach embraced. Obviously there is nothing new about advising researchers to use all the components of a canonical structure in their work. There is even an acronym in English for the basic format a scientific paper should have, IMRAD (introduction, methods, results, and discussion). Nevertheless, this is not a trivial matter, as a remarkable proportion of studies in our sample do not sufficiently convey one or more of these aspects. What we found is that papers are getting more and more succinct, to the point that in many of them no theory is embraced and/or methodological information is so scarce as to render it impossible to replicate or to compare their findings with other findings.

Apart from the more academic oriented goals studies have, when it comes to evaluating language comprehension in clinical populations, we must remember that this can help to provide better therapies for those who have language disabilities. Research on metaphor-related phenomena can definitely help clinicians to identify what it is, how it is, why that is so, and in which situation impairments occur in different conditions. In fact, it is only after linguistic phenomena and clinical conditions alike are known that a proper evaluation can be undertaken, which in turn is essential for planning and conducting an effective treatment.

Studies such as those reviewed here have two main intersecting outcomes: the first is to advance the understanding of figurative phenomena, and the other is to better understand specific difficulties of each pathology in language development. Regarding the latter, studying clinical populations can contribute to a better understanding of typical and atypical linguistic development, given the peculiarities each pathology has in relation to underlying linguistic, cognitive, sensorimotor, and social elements.

In this critical review, we have presented and discussed definitions, methods, and results found in 47 papers that appear to be relevant in order to have a better

picture of the comprehension of metaphor-related phenomena in some clinical populations. We have found an array of different definitions, methods, and results, many of which are convergent, many of which are divergent. All in all, the plurality of the phenomena considered, of the populations investigated, or of the tasks developed constitute problems per se. On the contrary, plurality might contribute to add new pieces to the puzzle that figurative language comprehension represents to both clinical and non-clinical populations. We believe that a more coherent and complete picture can emerge if articles present their results along with detailed methods and theoretical grounds.

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## Compreensão de fenômenos relacionados à metáfora por populações clínicas: uma revisão crítica

### Resumo

Este trabalho objetiva fazer uma revisão crítica das definições, métodos e resultados apresentados nos estudos sobre compreensão de metáforas, metonímias, expressões idiomáticas e provérbios nas seguintes populações clínicas: afasia, autismo, distúrbios específicos da linguagem, lesões cerebrais, mal de Alzheimer, e síndrome de Williams. Uma busca por pesquisas psicolinguísticas experimentais foi feita usando as bases de dados EBSCOhost, PsychInfo, PUBMED e Web of Science. Trinta e oito estudos foram selecionados, considerando os critérios de inclusão. Os resultados revelam uma falta de definições claras e métodos experimentais variados na amostra, mas consenso em relação à presença de déficits na compreensão de linguagem figurada em todos os quadros clínicos considerados. As dificuldades apresentadas pelos pacientes foram atribuídas a diversos fatores, tais como falta de Teoria da Mente, disfunções executivas, e pouco conhecimento semântico. O estudo de aspectos não literais da compreensão da linguagem em populações clínicas revela uma gama de distúrbios diversos, não havendo uma característica específica sobre os fenômenos relacionados à metáfora que possa dar conta, por si só, da dificuldade para compreender linguagem figurada que certas populações clínicas apresentam. As dificuldades na compreensão de fenômenos relacionados à metáfora são, frequentemente, parte de distúrbios pragmáticos, linguísticos e/ou cognitivos.

Palavras-chave: Linguagem figurada. Metáfora. Metonímia. Provérbio. Populações clínicas.

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