Metaphor and Schizophrenia: Research in the Outskirts of Linguistics
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Abstract

Impaired pragmatic language use is one of the main features of schizophrenia, such as comprehension of metaphor and irony. This field of research is naturally bordering both psychology and linguistics, but has until now been ignored by most linguists. This paper provides an introduction to schizophrenia and language as an interdisciplinary field of research, as a way of integrating linguistic theory with psychologic method. Several major issues are discussed, such as ill-formed definitions of metaphor, faulty reasoning, poverty of relevant sources of information and inaccurate assumptions of what schizophrenia is. My conclusion is that cross-disciplinary cooperation is badly needed for this field to reach its full potential.

Sammandrag

Nedsatt pragmatisk språkförmåga är kännetecknande för schizofreni, som till exempel förståelsen av metaforer och ironi. Detta vetenskapliga område gränsar till sin natur både till psykologi och lingvistik, men har hittills ignorerats av de flesta lingvister. Denna uppsats ger en introduktion till schizofreni och språk som ett tvärvetenskapligt fält, med syfte att integrera lingvistisk teori och psykologisk metod. De främsta problemen diskuteras, såsom undermåliga definitioner av metaforer, oriktiga resonemang, brist på informationskällor och felaktiga antaganden av vad schizophreni är. Min slutsats är att ett tvärvetenskapligt samarbete är nödvändigt för att fältet skall nå sin fulla potential.
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Appendix I
1.0 Introduction

1.1 Background

Metaphor research has had several teething troubles since Lakoff & Johnson launched their modern classic *Metaphors We Live By*. From the main focus being placing metaphor into cognitive science, and proving the former blind faith in literal language wrong, metaphor research has been scattered, and it is now part of many different areas with varying goals and methods. This has led to a burst of new theories, some rather short-lived while other are still prospering. The original question of metaphorical versus literal language has been put aside and is replaced by a more difficult and intricate one: is thinking and speaking metaphorically an important part of the human cognitive system? And if so, how does it work? These and similar questions cannot be answered by mere introspection and reasoning, but will have to rely on empirical research. This has proved more difficult than one might think. Also, by moving the theories of metaphor comprehension further away from traditional linguistics, the hypotheses must be supported by empirical evidence from other relevant fields. If one wants to prove that metaphorical thinking is a cognitive ability and not just a linguistic phenomenon, one must use non-linguistic evidence. The questions of what metaphor is, if it is one cognitive procedure or several, or if there is a difference in how we process different kinds of metaphor are all relevant in the research on schizophrenia and metaphor comprehension. This field can be part of psychology, neurology, medicine and linguistics, and the paradigm chosen might influence the outcome. Although some individuals, suffering from for example autism, might be unable to understand tropes such as irony, others, like for example synesthetes, might make extravagant metaphorical connections. Since research on schizophrenia has been performed in psychology and research on figurative language in linguistics, the study of figurative language of schizophrenics must integrate both disciplines. There is no point in inventing the wheel twice; psychological methods must be outlined in relation to previous linguistic understanding of metaphor, or the results will not be valid.
1.2 Method and questions

My goal is to evaluate the methods used in investigating metaphor comprehension of individuals diagnosed with schizophrenia. Giving a detailed description of every single method used in the field is of course beyond the scope of this essay, and the methods and theories mentioned here only serve as examples. I will discuss general methodological issues, like for example how preconceived expectations might influence the research done, and how researchers should deal with these issues. Because the field borders both psychology and linguistics, research is made in parallel in both paradigms, without too much interchange of ideas. Since psychology traditionally focuses more on research methods, while linguistics has a long history of theoretical models of language and communication, they supplement each other well, and the lack of interaction is unfortunate for both sides. In this essay I try to bring these two paradigms together by discussing psychological methods in the light of linguistic and scientific restraints. In order to understand the challenges psycholinguistic researchers faces it is important to know some things about the field. Therefore I introduce some basic concepts in metaphor research, epistemology, ontology, psychology and neurology. I try to give some insight in the state of schizophrenia as a disease today, and in what makes this disorder so interesting and problematic in metaphor research.

1.3 Linguistics, psychology, or both?

The research on schizophrenia is traditionally seen as something belonging to psychology, while the study of language belongs to linguistics. So where do one place research on the figurative language of schizophrenics? The logical answer would be: both (i.e. psycholinguistics or language psychology). Regrettably, more or less all of my references count themselves as psychologists or neurologists. Even the article named Schizophrenia and the structure of language: the linguist's view is made as a part of the project Computer Analysis of Speech for Psychiatric Research. This is a linguistic paper dealing with the issues relevant to linguistics, but more often than not do I find that these issues are the same for psychologists. If this had been a psychology essay, it would probably start in a different end, but would hopefully come to the same
conclusions. Because so few linguists enter this subject, I can only assume that the general opinion is that the language of schizophrenics says more about schizophrenia and the psyche than it says about metaphor and language. If this is the case, it is a great loss for both disciplins.

2.0 Metaphor research

2.1 Terminology

Metaphor in its most basic form consists of two concepts: the target (or tenor) and the vehicle, and follow the pattern A is B. The Shakespeare quote *Juliet is the sun* is perhaps the most frequently used example, where Juliet is the target, and thus the concept being described, and the sun is the vehicle. A (Juliet) is B (the sun). (Gibbs 2006:46) Not all instances of metaphor are clear cut. The sentence *I try to be good, but my depression is a poison that turns me rotten.*\(^1\) is an authentic example taken from a blog, where the depression is the target, and poison is the vehicle. But what about rotten? In this context it can be interpreted as the opposite of good, and is possibly understood in a literal sense. Or is the rottenness a consequence of the poison? Interpretations of complex metaphors is individual and cultural, and the more one think about a metaphor the more interpretations seem plausible (Blasko 1999:1676).

The easiest way to define metaphor, is to explain what it is not. Figurative language consists, metaphor aside, of a variety of different tropes, like for example synecdoche, irony and hyperbole. Two cousins usually mentioned in this context are similes and metonymy. A simile is a literal statement formed A is like B. If we turn our previous example into a simile (*Juliet is like the sun*) it suddenly becomes a literal statement that could be true or false, depending on our subjective opinion of Juliet. Metonymy has a lot in common with metaphor, but where a metaphor maps different domains, metonymy forms connections in a single domain. One type of metonymy is synecdoche, where the part stands for the whole, as in *we could use some more hands*

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\(^1\)Example collected from the blog *stiffen the sinews*, where the author writes about her experiences as a schizophrenic (Brown eyed girl, stiffenthesinews.blogspot.com)
where hands stand for people. There are many others, such as producer for the product
(He had a Picasso on the wall) or material for object (I could really need a glass).
(Saeed 2009:365-366) A painting by Picasso is arguably not Picasso himself, and is
therefore not literal, but it is not a mapping between two different domains either. It is
important to note that although all metaphors are figurative, figurative language is not
necessarily metaphorical. It is also possible to divide the concept of metaphor into
several different subcategories, like for example primary/complex or universal/cultural.
These distinctions are made separately by each researcher, and it is still controversial
which of the categories are psychologically real. (Eviatar & Just 2006:496, Coulson
2006:34)

2.2  History
Ever since Aristotle, philosophers have tended to view metaphor as a poetic tool which
should be used with caution. Tropes were thought to be parasitic on literal language.
(Steen 2006:51) They were studied in rhetorics as an ornamental part of language, but
nothing more (Nuessel 2006:447). This led to metaphor research being ignored by
most scientists until the end of the 19th century, when Breale brought up the subject.
Later Richards and Black continued to discuss metaphor as more than a rhetorical
device. (McGlone 2007:110) In the 1980s cognitive semanticists (notably Lakoff and
Johnson) started to do research on metaphor as an everyday linguistic feature and as an

Before that, there had been several models meaning to explain metaphor. The
most classical one, which can be traced back to ancient Greece, is the comparison
type. According to this view, a metaphor is simply a compressed simile. The
important difference between the two is that a simile can be literally true, while a
metaphor cannot. To say Juliet is the sun is a lie, but to say Juliet is like the sun might
very well be true. A version of this is the substitution theory, where the sun can be
paraphrased using a literal equivalent. In this case the sun might be replaced by for
example warm or unreachable. (Nuessel 2006:447) Max Black offered in the 60s an
alternative to the comparison theory, namely the interaction view. In this view, the
topic and the vehicle interacts and creates new meaning. Put another way, one see the
According to this view metaphor production and comprehension is a creative process, and not just an uneconomic paraphrasing of a literal sentence. Instead of looking for a semantic, rule-based definition of metaphor, it is possible to use the subjective interpretation of the sentence. Merrie Bergmann writes: *When does an expression count as a metaphor? Simple: when it has been given a metaphorical interpretation* (Bergmann 1979:214,215) Scholars are now not only interested in how speakers manage to make sense of metaphorical expression, but also how metaphorical reasoning contributes to the human cognitive system. (Blasko 1999:1677)

2.3 Literal language

From a modern point of view the distinction between literal and figurative is far from clear cut. On the contrary, finding a good definition for either is an almost impossible task. (Glucksberg 2001:3,12) Gibbs (2006:44,45) argues that if literal language is more basic than metaphor, it follows that metaphor should be harder (i.e. take longer) to understand, and that recent psychological evidence has shown that this is not the case, at least not in the presence of context. In contrast, new neuroimaging techniques have made it possible to find out which areas are involved in processing. Even though the time needed to interpret metaphor does not differ from literal statements, different parts of the brain might be activated. (Evitar & Just 2006:2348)

In many studies this clear distinction between literal and figurative language, where the latter is seen as deviant, is still present. For example, Gavilán & García-Albea (2011:55) state:

Verbal communication usually relies on the transmission of non-literal messages rather than on a *direct transmission of literal information* … although schizophrenics are able to understand literal language, they have problems understanding non-literal language …only *high level language processing* is affected in schizophrenia. That is, the level whereby *numerous cognitive systems* interact in order to succeed in communicative acts … Figurative language requires the pragmatic skills to process *more than the literal meaning* conveyed by an utterance in order to grasp the speaker’s intention in a given context, and to decide whether a sentence means *what is said or more than what is said.*
Literal language is thus seen as *direct* whereas non-literal language relies on *high level language processing*. There is arguably some truth in this. There is a difference, in degree if not in kind (Blasko 1999:1682) One might still object to the description of literal language as direct. Even a simple literal sentence can mean an infinite number of things depending on the context, and understanding it requires more than just ‘direct’ linguistic decoding. (Glucksberg 2001:17) Different kinds of figurative expression, and even subtypes of metaphor, may differ in processing. Discussing figurative and literal language is, in this context, too vague to be meaningful.

2.4 *Is there such a thing as a dead metaphor?*

Idiomatic expressions like *kick the bucket* are, at least by modern speakers, seen something arbitrary that has to be learnt as a whole. It has been suggested that highly frequent metaphors are processed as lexicalized entities, and has become dead metaphors. Some scholars discard most everyday metaphors as dead, while others deny the concept of dead metaphors altogether. Lakoff & Johnson (1980:55), for example, write this about conventional metaphorical expressions: *They are “alive” in the most fundamental sense: they are metaphors we live by. The fact that they are conventionally fixed within the lexicon of English makes them no less alive.* Unconventional metaphors are by some researchers seen as problematic, and researchers often take care not to use creative, so-called poetic, stimuli in experiments, like for example in the proverb test by Subotnik et al (2006). Others, like for example Rapp et al (2007) use highly creative metaphors such as *the lovers' words are harp sounds* (as opposed to the literal *the lovers' words are lies*). Proverbs are sometimes mistaken for metaphors, and that leads to some confusion. Maria Moutran Assaf (2005:17), for example, calls proverbs ‘unusual metaphors’:

Den andra typen av metaforer, de så kallade ovanliga metaforerna består av uttryck som är specifika för ett speciellt språk. Den består även av uttryck som inte har använts aktivt i ett språk på lång tid, gammaldags metaforer (*the other kind of metaphors, the so-called unusual metaphors contains of expressions that are specific to a specific language. It*
The distinction between metaphor and proverb has nothing to do with frequency, even though metaphors are more pervasive in everyday language. It is instead the difference in processing that is important. Expressions that are non-creative and learned as a whole, like the intranslatable *det gäller att mota Olle i grind* (literally *it's important to obstruct* Olle (a male name) *at the gate*, meaning that one should deal with problems as soon as possible) that Moutram Assaf uses, is not to be mistaken for alive, everyday metaphors.

### 2.5 Conceptual metaphor theory

Lakoff & Johnson stirred a lively metaphor discussion with their conceptual metaphor theory in the 80s. It revolts against what it calls objectivist semantics, where the notion of truth and reference are seen as important to meaning. They argue instead that the external world only exists in the eyes of the beholder. The truth of a sentence is a matter of viewpoint and not of reality. The goal is to investigate the cognitive functions that forms our understanding of the world, not the world itself. (Saeed 2009:357)

Metaphorical sentences like *I need to spend some time alone*, *I'll do it if I have some spare time* and *we're out of time* are all examples of the conceptual metaphor *time is money*. If we think that time is money, we can save it, use it well or lose it. Some abstract concepts, like for example emotions, time and development, is almost impossible to talk about without using metaphor. We are so used to talk about time as a concrete entity that we do not realize that it is a metaphor. When pondering several different examples we can see the theme clearly: *stop wasting my time, I'll give you five minutes, it takes an hour if you go by foot.*

Most newly created metaphors are, according to Lakoff & Johnson, variants of an established conceptual metaphor. It is possible to invent new conceptual metaphors, but it is unusual. Such a metaphor is also more difficult to understand. The appeal of this theory lies in it's ability to explain why some metaphors are easily understood, while others strike us as unnatural and extravagant. When we are used to think about
time as money, we can use many different money related terms and apply them to time without using more brain capacity than when we are actually talking about money.

3.0 Methodological issues

3.1 Introduction

Cognitive linguistics is a multi-disciplinary field, with a number of different methodological issues to deal with. For example, many theories concerning the language-mind connections are difficult or impossible to falsify (i.e. cannot be proven wrong by experimental evidence). (Gibbs 2007:7) It is problematic when researchers use language data to formulate a hypothesis about the brain, if they later claim to verify the thesis with the very same data. The risk for circular arguing is a natural part of cognitive science, since there is no direct way of gaining knowledge about the brain. This is of course true for every possible science dealing with the external world. Most scientists agree that there is no objective truth, the goal is rather to provide an explanation that is unlikely to be wrong. Gonzalez-Marques et al (2007:60) formulates it like this: Though some would disagree, we propose that science is our attempt as a species to approach the closest thing to objectivity that we can achieve as subjective beings. Therefore, no single theory should be regarded as an absolute truth, and can thus never be considered finished. One should always look for alternative explanations. (Gibbs 2007:7-8) The opinion that a scientific knowledge differs from nonscientific knowledge, and that scientific theses must be proven wrong through observation, is called ‘logical positivism’. A theory which cannot be proven wrong is in that sense not scientific.

One must then define what counts as a scientific proof. (Carr 2006:331) Traditional empiricists argue that experience is the primary source of information, and in its' most fundamentalist version that means knowledge can only be gained from what is known directly (Prinz 2006:130). Applying this to cognition, which cannot be directly observed, will mean that scientific knowledge is impossible. (Carr 2006:331)
So is cognitive science a true science? Do we even want it to be? Psychology combines the themes of the humanities and with the methods of the natural sciences. The combination is not without tension, since we are studying ourselves, and it is thus impossible to be objective. *We are inside our own self-referential being and have no place outside ourselves from which to gain an objective view for constructing the deductive laws basic to physical science.* (Hunt 2005:359,361) In psychology the methods available sometimes restricts the topics investigated, while it is possible to speculate and theorize in linguistics without being seen as unscientific. Many prominent linguistic scholars, such as for example Ferdinand de Saussure, have cared little for natural sciences. (Hunt 2005:363, Hammarström 1977:15) Chris Frith, who calls his field of research social cognitive neuroscience, explains his choice of focus in the symptoms of schizophrenia like this: *I shall concentrate primarily on delusions of control and the experience of limb movements. Thoughts and emotion do not lend themselves so readily to experimental study.* (Frith 2005b:753) As a neurologist, Frith avoids theorizing about abstract things such as thoughts and emotions. Although most linguists acknowledge the issue, they do not reject speculations.

3.1 Universality

Most studies are done on western culture, and without adopting a Whorfian attitude it is safe to say that there could be cultural differences which might be relevant for the research. (Anderson 2006:274, Love 2009:30) The dependence on English in scientific discourse can also be a problem, like for example the translation of ‘science’. Hammarström (1977:17) points out that this concept has two senses; a more general and narrower one. In English, science is more often used in the narrow sense, while it is the other way around in for example Swedish and German. The German *Wissenschaft* can be used to describe literary studies as well as biology, while the narrower sense is captured in compounds like *Naturwissenschaft* (nature science). It is a subject of discussion whether linguistics is a science or not, but it is definitely a *Wissenschaft*.

Linguistics has primarily focused on the perfect, native speaker, willfully
leaving the variation out. This is partly because in order to be a science in the narrower sense, the results must be globally generalizable. Thus one must see through the cultural and individual differences and establish a core which is true for everyone. Seeing variation and polyglottism as an issue is tied to a certain view of the world. This has recently met critique: ...it would be naïve to suppose that the modern ‘science of language’ is ideologically neutral ... it can be argued that much what has passed for a science of language over the last 150 years has been nothing but an exercise in culture maintenance. (Love 2009: 31) Schizophrenia manifests itself differently in different cultures. The use of pragmatic language, such as metaphor or irony, is tied to cultural conventions, and may differ between societies, families and individuals. Deciding what is normal and what is impaired in this context is easily biased toward a western academic perspective. Subotnik et al (2006) use interpretations of proverbs to test the ability to think. It can be argued that proverbs are something learned, that has little to do with the ability to think, but rather what kind of social environment one grows up with. Suppose that proverbs are more often used in written than in spoken text, and more in formal than in informal situations. Then children who read more (like for example the children with academic parents) will probably know more proverbs, especially the more obscure ones. There is a danger in leaving it to western academics to decide what is intelligent and what is not, since it is an abstract, culture specific concept.

When studying an uncommon group finding more than ten subjects might be hard, and if the study contains too few participants, the results might not be true for people in general. On the other hand can anecdotal evidence also be useful in research. For example is it possible to falsify a hypothesis formulated like a native speaker would never say x, with just one instance of someone saying x in spontaneous speech. Of course, falsifying a weaker version of the same hypothesis (a native speaker rarely says x) would require more evidence.

3.2 Poverty of relevant sources of information
How does one investigate something that cannot be observed? This is a question with many answers. For a conservative behaviorist objective data alone cannot prove the
existence of the mind, and therefore one cannot scientifically investigate something like cognition. It might exist, but that is for a behaviorist irrelevant. Most linguists today agree that language is a mental phenomenon, and should be investigated as such. Although it is not obvious which methods are reliable researchers can still formulate hypotheses that are clear and testable. Whether the methods used by linguists are scientific, or if scientific knowledge about language is possible, is not agreed upon by everyone. All the same, most linguists regard their field as scientific, if not in the same way as physics is scientific. (Clark 2006, Hall 1981:222) Scientists investigating objects in the external world often deal with similar problems as linguists do, since the structure of for example our brain and eyes constrain our perception. This applies to a biologist, a chemist or any other researcher performing ‘hard science’. In fact, some scientists argue that the difference between folk theories and scientific theories are a question of degree and not of kind. (Allan 2003:534,535)

3.3 Reliance on intuition

Even if there exists scientifically collected material, it is always interpreted by the researcher and the outcome is therefore not reliable, since one often finds what one is looking for (Allan 2003:534). And even though one might use a scientific model to test a hypothesis, it is not obvious where the inquiry comes from in the first place. Researchers use their intuition to formulate the questions, and the intuition relies on experiences and views of the world. There has been attempts to examine this initial stage of research, but very little can be concluded. (Merrell 2006:5)

When interpreting the data of for example a priming test, the differences in reading time must be traced back to one or several variables. Age, gender, education, cultural background, handedness, test setting and an infinite number of other things (some of them impossible for the researcher to know) can affect the data. The researcher must use a fair amount of intuition in order to choose which variables are relevant. (Schütz 2006:362)

3.4 Technical difficulties

Modern equipment has changed cognitive studies radically. The relationship between
behavior and mind can be viewed more ‘directly’ with for example functional MRI. (Skipper & Small 2006:496) It is easy to forget that even such concrete data needs to be interpreted by the researcher. (Allan 2003:534) Brain scanning, such as fMRI, is based on the assumption that increased blood flow in one part of the brain mirrors activation. (Skipper & Small 2006:497) Although fMRI arguably does not show brain activation, but blood flow, many scholars act like it does. For example, Eviatar & Just (2006:2348-2349) writes:

The present study examined patterns of activation levels as measured by fMRI in the brain ... The empirical question under investigation here has two parts: first, does the processing of literal and nonliteral statements result in activation of the same brain areas? Second, will the distribution of activation be the same for two types of figurative language, irony and metaphor?

Even though brain scanning techniques are better than ever, they are still not exact enough to be completely reliable. The subjects are scanned while performing certain tasks, and the outlining of these tasks play a crucial role in the results. fMRI is a good tool, but no more than that.

3.5 Methods
There are mainly two categories of methods used relevant to the field: behavioral and neurological. The two approaches are often combined, and although the similarities are striking, it is sometimes important to keep them apart. Priming is perhaps the most widely known behavioral method, along with the related stroop-test. Brain scanning in general, and Functional MRI in particular, is the most relevant neurological methods in this context. The type of data behavioral and neurological methods produce is different, but their interpretation faces similar problems (as described above).

One basic assumption widely used in psycholinguistics is that the longer time comprehension takes, the more complex the processing. Priming is for example used to investigate whether there is time differences in two different tasks, and if it differs with different participants. (Garrod 2006:252) On the other hand, the available
neuroimaging techniques are inaccurate when it comes to time, but can be used to establish in which areas of the brain processing takes place (Eviatar & Just 2006:2348). Both paradigms collect measurable, empirical data, but neuroimaging benefits from being more direct. The invention of new neurological methods have been widely perceived as a breaking point for cognitive studies. As George Lakoff (2008:17) puts it: The neural revolution is changing our understanding of the brain and the mind in radical ways, and that is no less true in the theory of metaphor. When Lakoff speaks of "the neural revolution", he does not only mean the new techniques, but also the theory that different parts of the brain have different functions, and that neurology can shed some light over these functions, for example by comparing levels of activation while performing tasks (Fiez 2001). This has been a successful way of studying language, especially speech production, which is now assumed to be mainly situated in the left parts of the brain (Indefrey & Levelt 2004:101). In traditional neurological research several methods are used. Some of them are ‘objective’, like for example neuroimaging, but there is also a wide-spread use of self-reports (i.e. subjective descriptions of personal experiences) (Harrison & Baron-Cohen 1995:160). There has been many neurolinguistic studies on acquired brain damage and aphasia, but as mentioned by Lakoff, the use of neurological methods in investigating metaphor is a fairly new development.

3.5.1 Behavioral methods
The most wide spread version of priming consists of decreased reaction time in deciding if two semantically related words are actual words, compared to two unrelated words, for example doctor and nurse compared to doctor and chair. The results have been assumed to reflect the structure of the mental lexicon (Rossell 2004:221, Foss 1982:590) The fact that a previously mentioned word affects language processing has been known for more than a century, but any exact measures of the differences require modern computers. (Foss 1982:590)

     Priming effects can be used in various studies, and do not necessarily have to be between words, or be used to investigate the lexicon directly. It is possible to prime actions, or to prime a certain view of the world, using for example pictures or words.
3.5.2 Neurological methods

There are several ways of scanning the brain, including positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) (Harrison & Baron-Cohen 1995:158). Both methods measure the local blood flow, which correlates with the level of activation. PET-scanning is a direct way of measuring blood flow by using radioactive substances. Functional MRI on the other hand uses magnetism to observe changes in blood oxygenation, and indirectly blood flow. (Fiez 2001:446-447) The latter is generally thought to be the most relevant method for investigating the relationship between mind and brain, since it with great accuracy establishes the area for a certain activity. Unfortunately, the technique is noisy, and less accurate regarding the time course of an activity. (Garrod 2006:256) Movement of the lips, tongue and larynx while speaking disturbs the brain-imaging techniques, and therefore studies on speech production often use 'inner' speech or whispering (Dogil et al., 2002:61). It is not obvious that the same parts of the brain are involved in both thinking and speaking, and results from such studies should be understood with that in mind.

These methodological issues have decreased with the modernization of the equipment used. Even though fMRI is not perfect, it is preferred over PET by most researchers. It is less expensive, more precise and does not involve injecting anything into the participant. (Fiez 2001:448-449, Anderson 2006:274)

4.0 Schizophrenia

4.1 The state of the disease

Although schizophrenia (meaning split mind) has been considered a disorder of its own for almost a century, its state as a discrete entity is strongly questioned. The distinction between schizophrenic and affective psychoses is not as clear cut as previously believed, and is better thought of as a continuum. (Crow 1997:127,128) Schizophrenia is a heterogeneous disorder, split into different subtypes and stages, but is often associated with symptoms such as hallucinations, delusions and impaired social
functioning. (Anselmetti 2009:278, Hooker et al 2011:99) Schizophrenia exists worldwide, but differs some between cultures, especially between developed and developing countries. It affects somewhere around 1.7 per 10,000 inhabitants every year, and the lifetime risk of developing the illness is estimated to 1%. The diagnosis shortens the expected life-span with 10 years, mainly due to suicide, but also as a result of smoking, lack of exercise, and obesity. Schizophrenia has a genetic aspect, but the exact nature of hereditariness is yet to be understood. (Rössler et al 2005:400, Frith 2005:170, van Os & Kampur 2009:635) Another group relevant to research on schizophrenia is schizotypy. Schizotypic individuals are more inclined to become psychotic or schizophrenic, and are regarded as eccentric, or different, by their community. It is not a psychiatric diagnosis and is not considered an illness, but their behavior vaguely resembles that of schizophrenics. (Humphrey 2010:290) It is important to note that other ways of thinking and behaving is not necessarily a disadvantage. Many successful artists, musicians and poets suffer from schizotypy or schizophrenia. Eccentric is not synonymous with sick, and although preventing and treating disorders are the main goal for many psychologists and psychiatrists, finding a ‘cure’ for unusual behavior is not always possible or even desirable.

4.1.1 Symptoms

Hallucinations and delusions (i.e. psychotic symptoms) is perhaps the most observable and least doubtful signs of schizophrenia, and are termed positive symptoms. Negative symptoms include lack of motivation and reduced social drive. The third dimension of symptoms is neurocognitive, characterized by difficulties in attention, memory and executive functions. (van Os & Kampur 2009:635) Cognitive impairments, often exemplified by reduced scores on standardized intelligence tests, affect most patients, but in varying degree. As opposed to brain damaged patients, it is rarely just one ability that is affected. It has been suggested that this is caused by dysfunctional connections between different parts of the brain. (Frith 1995:615) The onset of the illness is usually around early twenties for men and late twenties for women, with a more severe course for men. (Rössler et al 2005:405) The differences between men and women has led some researchers to believe that there is a connection between hormonal levels,
dominant brain hemisphere and schizophrenia.

Unfortunately, no objective tests exists for schizophrenia, and the diagnosis is made with respect to the key symptoms and the exclusion of other possible explanations. (van Os & Kampur 2009:639) (For an extensive list of the criterias used in DSM-IV, see Appendix I.)

4.1.2 Risk factors

Schizophrenia is hereditary, and having a first-degree relative with the diagnosis means a 10-fold increased risk of developing the illness, but many other factors influence the eventual outbreak or severeness. (Li et al 2007:15, Rössler et al 2005:400) Growing up in an urban environment and/or in an immigrant ethnic group in an area with few immigrants has shown to increase the risk of developing a psychotic disorder. The reason for this is uncertain, but it might be connected to social isolation. Another risk factor is intake of Dronabinol, a component of cannabis, which may lead to acute psychotic episodes that can be a pre-stage to schizophrenia. (van Os & Kampur 2009:637)

4.1.3 Treatment and prognosis

The main purpose of the antipsychotics used to treat schizophrenia is to block dopamine receptors (Frith 2005:170) Common side-effects from antipsychotic medication are uncontrolled movements and weight-gain. (Mittal et al 2006:351, van Os & Kampur 2009:640) Although the medication often reduces or even eliminates the positive symptoms, such as hallucinations and delusions, it is not as effective in treating negative symptoms.

Psychosocial intervention is an important tool in order to support patients and families. Long-term hospitalization is rarely required, and the goal is instead reintegration into society. This can put a lot of pressure on the families, and there is evidence that the family environment has a large impact on the success of the treatment. (Rössler et al 2005:402,404,406) Schizophrenia was previously thought to imply poor outcome for a majority of the patient, but according to modern research less than 50% of the patients with a first-time diagnosis experience a bad outcome after
more than one year. (van Os and Kampur 2009:639)

4.1.5 Research subjects

As previously mentioned, antipsychotic medication might have motor side effects, among other things. Depending on the nature of the study, medication might interfere with the results. One solution can be to use adolescent subjects, since they are often unmedicated. (Mittal et al 2006:351) It can be relevant to mention which sub-type of schizophrenia the subjects belong to, in order to see if the results differ between the groups. Since schizophrenia is such a heterogenous disorder it is important to note that the individual differences and the differences between groups may be considerable. (Torres et al 2004:37)

Research on schizotypics may also explain differences in cognitive processes connected with schizophrenia, and the evidence is reliable since the subjects are neither psychotic nor medicated. (Humphrey 2010:290) Positive schizotypy is related to increased use of the right hemisphere, for example in tasks normally placed in the left hemisphere, such as basic language comprehension. Priming tests also show that schizotypics typically do not inhibit unwanted information to the same extent. (Grimshaw et al 2010:130,131) Unaffected relatives of schizophrenic individuals are also important subjects of investigation, especially considering the hereditary nature of schizophrenia. (Anselmetti et al 2009)

4.2 Schizophrenia and language

Dysfunctional linguistic ability is an important part of schizophrenia. Andrea Marini et al (2008:144) writes:

Language disturbance is one of the main diagnostic features in schizophrenia and abnormalities of brain language areas have been consistently found in schizophrenic patients ... Language production in schizophrenia is impaired mainly at the macrolinguistic level of processing. It is disordered and filled with irrelevant pieces of information and derailments.
Schizophrenic individuals often experience difficulties comprehending metaphors and other non-literal expressions, such as irony, proverbs, humour and metonymy. Since these features are essential in communication, it tend to complicate social interaction. (Kircher et al 2007:281) Although schizotypics experience trouble understanding irony, their metaphor comprehension remain normal. (Langdon & Coltheart 2003:9) The troubles of pragmatic language production, like for example in schizophrenia, are sometimes referred to as ‘disorganized speech’. Some scholars argue that it is not an actual language related disorder, but rather a symptom of a disorganized thought process (i.e. formal thought disorder) (Marvel 2006:14) or a general cognitive decline. Another suggested cause has been an impaired theory of mind (i.e. capacity to attribute mental states to others), at least regarding irony, but also other pragmatic abilities. (Langdon & Coltheart 2004:9) The hypothesis that the language disorders of schizophrenics, sometimes called schizophasia, unlike aphasia is a result of a disorganized thought process rather than a faulty language faculty is hard to falsify, since it is impossible to decide the source of the impairment, and also because it is a controversial dilemma whether it is possible to reason without language. (Covington et al 2005:87)

Crow (1997) argues that the global nature of schizophrenia would mean that it evolved before we separated from our common ancestor, and possibly even before we became homo sapiens. If so, how come the disease did not disappear after a couple of generations of natural selection? Crow believes that the same cognitive development, in his theory lateralisation, that allowed us to have language caused schizophrenia, and that schizophrenia is the prize we pay for our linguistic ability. Little is yet known about the relationship between language and schizophrenia, and it might be more elaborate than what has been previously assumed.

4.3 Theories

It is regarded as a fact that schizophrenics differ in one or many cognitive abilities which makes their behavior, beliefs, and metaphor understanding deviant. Which cognitive ability is then affected, and which is not? Different theories have been proposed to answer this question, and different studies has then been executed, both to
verify and to falsify.

Formal thought disorder is characterized by grammatically correct speech but impaired pragmatic coherence (Marvel 2006:14). Scholars disagree on both terminology and cause. Linscott (2005:225), for example, argues that formal thought disorder is not synonymous with what he calls pragmatic language impairment, and that this second impairment is caused by a general cognitive decline. These two disorders have different causes, and can according to him appear independent of one another. Much about this formal thought disorder is still unknown, since knowledge about is only available through language. The diagnosis is made intuitively by the psychologist, and the data is thus not quantifiable. It seems as if formal thought disorder can, just like aphasia, be divided into several types, depending on which parts of speech or thinking that are affected. (Cuesta & Peralta 1992:151,157)

In a study by Subotnik et al (2006) interpretations of proverbs were used as an indirect measure of the ability to think. The proverbs used are preferably common ones like ‘when the cat's away the mice will play’. The interpretation was then rated on a scale from 1.0 to 3.0, where 3.0 stood for very severe bizarre responding, in order to be able to make statistics out of the results.

According to another theory regarding the communicational problems of schizophrenic patients, it is first and foremost the theory of mind that is affected. Theory of mind is the ability to recognize mental states in oneself and others and to understand behavior in a social context. (Gavilán & García-Albea 2011:55) Some researchers has ascribed dysfunctional theory of mind to low IQ, but although it certainly plays a role, it is not enough to explain the differences. It is also uncertain whether theory of mind is a single cognitive function, or if it is dependent on general cognitive functions such as working memory and general intelligence. (Anselmetti 2009:279) Episodic memory is especially important since that is where long-term associative information (regarding for example relationships) is stored (Badgayian 2009:321). Bosco et al (2009:323) argues that theory of mind is not a single concept, and that it is a problem that the division between forms is not done explicitly in the research. The tests used for evaluating theory of mind are often unreliable when it comes to schizophrenia because the test score is strongly influenced by other cognitive
variables. For such a heterogeneous disorder individual differences are standardized tests hard to employ. (Badgaiyan 2009:320)

Carter and Neufeld (2007) measured the ability to read emotional face expressions in schizophrenic patients from a connectionist perspective. Pictures depicting four different emotions - *happy*, *surprised*, *sad* or *disgusted*, were shown in pairs. The participants were asked to decide whether the emotions were the same or not. The results in time and accuracy were compared between different variables, for example gender, socioeconomical status, handedness, level of paranoia, hospitalization, vocabulary and medication. It was also compared to simulations of different computational models in order to clarify which explanation provided the best fit, and their results seemed to favour the additional subprocesses hypothesis, which states that patients with schizophrenia perform poorly on some tasks, such as decision making, because other processes take up working memory space.

Frith (2005a,b) suggests that there is sense in looking at the nature of the hallucinations and delusions in order to conclude which psychological processes are affected. Instead of chunking together behavior as ‘delusional’ he tries to outline what kinds of delusions schizophrenics tend to have, in order to prove that they follow a pattern.

### 5.0 Discussion

What underlying cognitive principles allows metaphor comprehension? That question is not for me to answer, but rather: how can we find out? The two questions are of course inescapably related. Even to define what metaphor is, or to write *principles* in plural, presupposes a specific paradigm. My two seemingly innocent questions contains information about my goal, my world view and what answers I will find plausible. Metaphor may have functions we could never dream of. Even so, every falsification takes us one step ahead. Modern metaphor research is a newborn that has yet to open its eyes, and every part investigated brings us a bit closer to the whole. Schizophrenia is essential to metaphor research for several reasons. Schizophrenic
individuals' use (or lack of use) of figurative language says something about metaphor. Unfortunately, it works both ways, in that it also says something about schizophrenia. It is unfortunate, because since neither schizophrenia nor metaphor are constants, the equation suffer from too many variables.

Keeping this in mind it is still true that if one has trouble understanding metaphor, but not irony, it is obvious that these two tropes do not rely on the same cognitive mechanisms. Although the difference between metaphor and irony is very straight-forward, a similar reasoning about different types of metaphor would make a re-definition of the concept necessary. The splitting of metaphor into several different cognitive abilities and defining their properties will have a great explanatory value and will provide future research with a better foundation for formulating hypotheses. Adressing questions of terminology, and not taking the concept of metaphor for granted, are crucial pieces to improve in future research. As long as different researchers have different categories of metaphor and schizophrenia, the results will be impenetrable for scholars from other disciplins, and prevent the field from being as cross-disciplinary as it ought to be. We need to consider different viewpoints in order to know what is special about schizophrenia and metaphor production and comprehension. All researchers grow up taking part of the folk theories of their community, and metaphor research is no exception. Culture, expectations and experiences give rise to the questions we ask and the answers we find. As mentioned, a neutral definition of metaphor is hard to find, if not impossible. A path around this is to use a prototypical metaphorical sentence, and explain how it differs from, for example, metonymical sentences. Most researchers avoid this complicated discussion by acting as if the concept of metaphor does not have to be explained. This lack of definition is unfortunate, since the definition of metaphor is a short-cut to understanding which paradigm the study is made in. Categories can be biasing, but they do not appear out of thin air. Researchers use their knowledge of the world to intuitively, and perhaps scientifically, form concepts. One must still keep in mind that categories are not natural entities, but rather human creations. Concepts like figurative language, schizophrenia and metaphor are all artificial categories, and although these categories have a function, our impulse to assort objects and phenomenons can sometimes delude
us into believing that the world is divided into discrete entities. This bias also applies to the conclusions we reach, even the ones we see as self-evident.

The interpretation of any given experiment depends on one’s ideological starting point. Like Gavilán & García-Albea already in their introduction concluded that there is a difference between processing literal and figurative language, and that the literal processing is more direct. Even though they had chosen their participants with care their study was biased towards a certain result. When science is facing such obstacles, is it true that scientific knowledge is worth more than other knowledge? There is arguably a difference between scientific knowledge and everyday knowledge, in that the first is testable, and the other is not. Untestable questions are not uninteresting, and just because we cannot investigate them scientifically at the moment does not mean that we should abandon them completely, but it is important to clarify that they are not scientific in the narrower sense of the word. No answers we can provide can be treated as absolute truths, not even scientifically reached ones. There is also a danger putting too much faith in empirical experiments. Empirical studies are dependent on theoretical reasoning for their validity, and vice versa. Some metaphor researchers, like for example Raymond Gibbs, especially emphasize the importance of empirical studies. Although studies is a great tool, even the results of a scientifically performed study may differ between different groups and different times. There may also be various variables that are overlooked. This does not mean that research on metaphor is pointless; rather the other way around. We can never have too much evidence, or too much reasoning, since every given piece contributes to the picture. A researcher who claims to have found the truth has to get off the high horse and realise that there is no such thing, especially not in cognitive semantics.

It should now be clear that the greatest issue in this field is the lack of cross-disciplinary cooperation. Psychological studies have a tendency to take concepts such as metaphor for granted, and pay little attention to the experimental stimuli used. From a linguistic perspective the difference between figurative and literal language remain a mystery, and students of psychology have no reason to believe otherwise. I have no critique on the linguistic research on schizophrenia, since it is practically invisible. The greatest mistake of linguistic scholars is therefore to leave this subject, with so much
valuable information about the human language faculty, all to psychology. Linguists must leave the safe warmth of their theories and do research on alien topics if linguistics is to fill its' purpose as a 21\textsuperscript{st} century disciplin.

Investigating the metaphors of schizophrenic individuals is no easy matter, and since the field borders both psychology and linguistics, it has suffered from ignorant researchers on both sides. It is not obvious from a linguists point of view what proverb comprehension says about general intelligence. A proverb is by definition a fixed sentence, learned as a whole, and its meaning is without proper context often opaque. In psychological studies the distinction between dead or alive metaphors is often ignored, along with questions of complex, basic or conceptual metaphor. These definitions are essential in linguistic papers on the subject, since they have the power to undo the result of a study. If proverb comprehension has little to do with general intelligence, but rather social environment, general knowledge and education, studies on formal thought disorder are made on false premises.

There is simply no reason to limit the study of metaphor to linguistics only. As shown by Lakoff & Johnson, metaphorical thinking can also be a cognitive ability. What if seeing something in the terms of something else is an overall structure of the brain? There is no reason to assume that metaphor is no more than a pragmatic language function. This does not mean that metaphor is no longer a linguistic concern. In my opinion any study on schizophrenia and metaphor should be examined by at least one linguist and one psychologist in order to be trustworthy. Research on schizophrenia has the power to improve our understanding of metaphor. Lakoff & Johnson theorize that some complex concepts, like for example love, can only be understood through metaphor. Does this mean that individuals with impaired pragmatic language are unable to understand their own emotions? Is this one of the reasons why they appear to have difficulties in their social life? It is necessary to extend the linguistic theories on cognition in this way in order for it not to be unfalsifyable speculations.

Just like research on aphasics has given linguistics invaluable knowledge of the brain, research on schizophrenia can shed light on pragmatic and figurative language and how it functions in human cognition. How do one use language without using
metaphor? A romantic would say not at all. Some kind of context sensitivity is probably necessary to communicate, but ability to use complex metaphors is not. Schizophrenics lie somewhere on the continuum between the two, with great individual differences.

Does the ability to think metaphorically have any evolutionary benefits, or did it evolve as a bi-product of something else, and in that case what? Timothy Crow is famous for the idea that schizophrenia is the prize we pay for language. Schizophrenia is a global and suspiciously similar in different cultures, just like language. It is not unthinkable that they share a common origin. If so, it will change evolutionary linguistics radically. It is not a coincidence that Crow is not a linguist, but a neurologist.

Schizophrenics' use of metaphor is of great relevance to linguistic research, as well as their general dysfunctions. If it is revealed that an ability correlates with metaphor understanding, it could mean that they rely on the same cognitive function. Linguistic scholars who find such evidence should not discard it as non-linguistic. It is probable that the human brain does not make the distinction between linguistics and psychology. It is just our vanity that makes us believe that our perfect categories could explain reality.

Sammanfattning på svenska

Sambandet mellan schizofreni och nedsatt pragmatisk språkförmåga har länge undersöks från ett psykologiskt perspektiv, men ignorerats av de flesta lingvister. Jag menar att detta ämne innehåller ovärderlig information om den mänskliga språkförmågan, och har därför försökt ge en helhetsbild av denna forskningsgren för att belysa vilka delar som är av intresse för lingvister och andra med liknande frågeställningar. Fältet skulle ha allt att vinna på ett tvärvetenskapligt samarbete. Många av de undersökningar som gjorts bygger på en felaktig uppfattning om vad metaforer är, och sådana falska premisser kan göra slutsatserna ogiltiga. Vår strikta uppdelning av vad som är lingvistik och inte leder till att kunskapen om både schizofreni och metaforiskt tänkande blir lidande. Vad detta ämne behöver är ett väl utvecklat samarbete mellan lingvister och psykologer, och ett ständigt ifrågasättande av
uppdelningen mellan dessa ämnen, om vi skall förstå något så komplettert som förmågan
till språk. Vi måste inse att det är vår fåfänga som får oss att tro att den mänskliga
hjärnan rättar sig efter våra konstruerade kategorier.
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Appendix I

General criteria
A. Characteristic symptoms: two (or more) of the following: delusions hallucinations, disorganized speech, grossly disorganized or catatonic behavior, negative symptoms during a 1 month period
B. Social/occupational dysfunction
C. Duration: continuous signs for at least 6 months
D. Schizoaffective and mood disorder exclusion
E. Substance/general medical condition exclusion
F. Exclusion of relationship to a pervasive developmental disorder

Schizophrenia subtypes

Paranoid type
A. Preoccupation with one or more delusions or frequent auditory hallucinations
B. None of the following is prominent: disorganized speech, disorganized or catatonic behavior, or flat or inappropriate affect

Disorganized type
A. Disorganized speech and behavior, flat or inappropriate affect
B. The criteria are not met for catatonic type

Catatonic type
At least two of the following:
1. Motoric immobility as evidenced by catalepsy or stupor
2. Excessive motor activity
3. Extreme negativism or mutism
4. Posturing, stereotyped movements, prominent mannerism, or prominent grimacing
5. Echolalia or echopraxia

Undifferentiated type
Schizophrenia symptoms meet Criterion A, but the criteria are not met for one of the above-mentioned subtype.(From Kircher & Thienel 2005)