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## ESTABLISHING DIAGNOSTIC CRITERIA: THE ROLE OF CLINICAL PRAGMATICS

### **Abstract**

The study of pragmatic disorders is of interest to speech-language pathologists who have a professional responsibility to assess and treat communication impairments. However, these disorders, it will be argued in this paper, have a significance beyond the clinical management of clients with communication impairments. Specifically, pragmatic disorders can now make a contribution to the diagnosis of a range of clinical conditions in which communication is adversely affected. These conditions include attention deficit hyperactivity disorder (ADHD), the autistic spectrum disorders, schizophrenia and the dementias. Pragmatic disorders are already among the criteria used to diagnose some of these conditions (e.g. ADHD), although they are not described in these terms. In other conditions (e.g. the dementias), pragmatic disorders have potential diagnostic value in the absence of reliable biomarkers markers of these conditions and similar initial presenting symptoms. Using clinical data, and the findings of empirical studies, the case is made for the inclusion and/or greater integration of pragmatic disorders in the formal classificatory systems that are used to diagnose a range of disorders. A previously unrecognised role for pragmatic impairments in the nosology and diagnosis of clinical disorders is thereby established.

### **Keywords**

attention deficit hyperactivity disorder, clinical pragmatics, dementia, pragmatic disorder, schizophrenia, speech-language pathology

### **1. Introduction**

For nearly forty years, clinicians have been using insights from pragmatics to characterize the communication impairments of their clients. During that time, pragmatics has emerged from a position of clinical obscurity to become a key component of linguistic competence, a component which must be assessed and

treated alongside other aspects of language (e.g. syntax, semantics). Pragmatics is now included as standard in the assessment and treatment protocols of most clinics in speech-language pathology. Certainly, no competent clinician would proceed to work with a language disordered child or adult without first establishing the scope and extent of any pragmatic disorder. In the development of clinical pragmatics to date, pragmatic deficits have been used to characterize the nature and severity of a client's difficulties with communication. In this paper, I want to consider a new role for pragmatic deficits as criteria for use in the diagnosis of clinical disorders. This diagnostic function of pragmatic deficits is already in evidence in some clinical conditions. We will see below, for example, that pragmatic deficits are currently included in the diagnostic criteria of conditions such as attention deficit hyperactivity disorder (ADHD), although they are not labelled as pragmatic as such. In other conditions such as schizophrenia, pragmatic deficits have the potential to distinguish schizophrenic patients with different symptom profiles (e.g. negative versus positive symptoms) and at different stages of illness. In still other conditions like the dementias, pragmatic deficits appear to hold promise as diagnostic criteria, where they may prove to be reliable markers of these disorders. In contributing to diagnostic criteria and nosology, pragmatics assumes a new and significant role which goes beyond its traditional one in the characterization of language and communication disorders.

It is important to emphasize that pragmatics has for many years played its part in the nosology of language disorders. One need only consider the classification schemes of developmental language disorder advanced by Rapin and Allen (1983) and Bishop and Rosenbloom (1987) to see that this is the case. However, the proposal in this article goes further in suggesting that pragmatic criteria should be employed in the diagnosis of clinical disorders, rather than simply in the characterization of the language and communication impairments that are found in those disorders. That pragmatics should contribute to the diagnosis of clinical conditions is supported by the following factors. Nowadays, disciplines beyond speech-language pathology routinely examine pragmatic language disorders. These disciplines, which include psychology, psychiatry and neurology, have clinical goals which differ from those of speech-language pathology. The psychiatrist who is attempting a diagnosis of ADHD in a child, and the neurologist who must make a diagnosis of dementia in an adult are interested in the pragmatics of language to the extent that it can shed light on a client's medical condition. They are looking to pragmatic deficits to assist them in their medical diagnosis of a client's condition first and foremost, with a characterization of the communication difficulties of these clients a secondary aim at best. Pragmatic deficits so employed should form part of the diagnostic criteria of these conditions. Also, there is now an extensive body of research findings in relation to pragmatic disorders. These findings suggest that pragmatic deficits could have diagnostic value for clinicians, in the sense that

these deficits may reliably distinguish between different types of schizophrenia, or help clinicians make a diagnosis of dementia in a client. To this extent, it is at least reasonable to ask if pragmatic deficits can contribute to the development of diagnostic criteria for a range of such disorders.

In the sections to follow, the contribution of pragmatics to the development of diagnostic criteria will be addressed along the following lines. In the next section, several clinical conditions which currently have pragmatic language deficits among their diagnostic criteria will be examined. More often than not, these deficits are not characterized as pragmatic in nature. Nevertheless, it can be readily demonstrated that the criteria in question describe pragmatic language skills through and through. There is now evidence in the research literature that pragmatic deficits vary across symptom profiles in schizophrenia. Also, studies have revealed that schizophrenic patients at different stages of illness (e.g. first psychotic episode, chronic schizophrenia, schizophrenia in remission) manifest different pragmatic impairments. These findings will be examined in section 3 and their implications for the use of pragmatic deficits as diagnostic criteria will be explored. Studies have repeatedly demonstrated that of all language levels, pragmatics is uniquely sensitive to the neurodegenerative changes that occur in the dementias. Pragmatic skills are often first to reveal impairment of language functions, a deterioration which can precede disruption of structural language skills by months or even years. Also, behavioural symptoms and neuroanatomical findings are often not capable of distinguishing between different types of dementia. The combination of these factors finds pragmatic deficits ideally placed to assume diagnostic value for clinicians who must assess clients with dementia. This discussion will be developed in section 4.

## 2. Pragmatic deficits as diagnostic criteria

Clinicians who assess and treat clients with pragmatic disorders are not inclined to think of pragmatic deficits as criteria to be used in the diagnosis of psychiatric and other conditions. Yet, as I will demonstrate in this section, pragmatic deficits are already part of the diagnostic criteria of many of the clinical conditions that are encountered by speech-language pathologists. Typically, these deficits are described rather than explicitly identified as pragmatic in nature. Such is the case in attention deficit hyperactivity disorder (ADHD), a neurobehavioural disorder that is usually diagnosed in childhood (see Cummings (2009) for further discussion). A diagnosis of ADHD is based on criteria that are set out in the fourth edition of the *Diagnostic and Statistical Manual of Mental Disorders* (DSM-IV; American Psychiatric Association 2000). ADHD is diagnosed when an individual shows six or more symptoms of inattention that have persisted for at least six

months to a degree that is maladaptive and inconsistent with developmental level. In addition to these inattention symptoms, individuals must also show six or more symptoms of hyperactivity-impulsivity. Some hyperactive-impulsive or inattentive symptoms must be present before seven years of age and impairment from these symptoms must be evident in two or more settings (e.g. at school and at home). Clinically significant impairment in social, academic or occupational functioning must be clearly demonstrated and the symptoms must not occur during pervasive developmental disorder, schizophrenia or another psychotic disorder. Nor should they be better accounted for by another mental disorder (e.g. mood disorder). There are three main subtypes of ADHD — a combined type, a predominantly inattentive type and a predominantly hyperactive-impulsive type.

When symptoms of inattention and hyperactivity-impulsivity in ADHD are examined further, it becomes clear that diagnosing clinicians are being directed towards a number of pragmatic deficits. These deficits take the form of deviant conversational behaviours. According to DSM-IV, the individual with inattention displays frequent shifts in conversation, does not listen to others and does not keep his or her mind on conversations (American Psychiatric Association 2000: 86). Hyperactivity may be expressed by excessive talking (2000: 86). The impulsive individual may blurt out answers before questions have been completed, may “make comments out of turn, fail to listen to directions, initiate conversations at inappropriate times [and] interrupt others excessively” (2000: 86). These behaviours can be characterized in pragmatic terms as problems with conversational turn-taking, topic management, and adherence to Gricean maxims (particularly the quantity and relation maxims in the hyperactive individual who talks excessively). Several of these conversational anomalies are evident in the following exchange between an adult and an 8-year-old boy with a diagnosis of ADHD (Tannock 2005: 45). The exchange occurs 20 minutes after the start of a psycho-educational assessment:

- Child: “What are we gonna do next? Huh? What’s in there? What’s that?”  
(interferes by grabbing test materials)
- Adult: “You’ll see in a sec”  
(adult reaches into case for next set of test materials)  
– a few minutes later, child interrupts testing – (should this simply be a sentence with a period?)
- Child: “Where’s the um...the things...um...where’s the um...bugs?”  
(climbs on seat to peer into case)
- Adult: “Pardon? What bugs? There are no bugs here. Now, tell me what – ”  
– child interrupts again – (ditto)
- Child: (loud unmodulated voice) “ – The bugs. You said I’ll see the bugs. I don’t wanna do this. I wanna see the bugs...the...um...secs...the insects!”

In this short exchange, the child interrupts the adult's conversational turn on two occasions and creates two further, non-verbal interruptions (he grabs test materials and climbs onto the seat). His verbal contributions consist largely of questions which are delivered in quick succession and do not wait for responses from the adult. Even when presented with a direct command ("Now, tell me what..."), it is clear the child disregards the adult's instruction and continues to pursue a topic (the bugs) which the adult has indicated has no relevance to the exchange (the adult explicitly states, "There are no bugs here"). These conversational and pragmatic anomalies are compounded by structural language difficulties (see Cummings (2014) for further discussion). ADHD is only one of a number of disorders assessed and treated by speech-language pathologists. Yet, this case clearly demonstrates that there is a precedent for the view of pragmatic deficits as diagnostic criteria advanced in this paper.

It is not difficult to find other clinical conditions which have pragmatic deficits as part of their diagnostic criteria. Schizophrenia is a case in point. In DSM-IV, alogia and disorganized speech are listed as two of five "characteristic symptoms", at least two of which must be present for a significant portion of time during a 1-month period in order for a diagnosis of schizophrenia to be made (American Psychiatric Association 2000: 312). Alogia describes a type of reduced verbal output in schizophrenia that results from impoverished thinking. There are two forms of alogia in schizophrenia: poverty of speech (nonfluent empty speech) and poverty of content of speech (fluent empty speech). As Black and Andreasen (2011: 41) characterize poverty of speech, it is clear that it violates Gricean maxims, particularly of quantity. The schizophrenic patient with poverty of speech produces "a restricted *amount* of spontaneous speech". Replies to questions are "brief, concrete, and unelaborated". The speaker rarely provides "unprompted additional information". Moreover, replies tend to be "monosyllabic" and some questions may not be answered. These features are clearly evident in the following exchange between a doctor (DR) and a 53-year-old male patient (PQ) with schizophrenia and severe poverty of speech. This extract is taken from a longer interaction which takes place during a weekly ward round and lasts 90 seconds. Some indication of the extent to which PQ's verbal output is reduced can be gleaned from mean length of utterance (MLU), which is 9.4 and 3.4 for the doctor and patient, respectively.

- DR: What have you enjoyed doing this week on the ward PQ?  
 PQ: Possibly relaxation (pause of 2 seconds).  
 DR: What do you feel you benefit from by doing the relaxation sessions?  
 PQ: To relax, get a bit uptight (pause of 5 seconds).  
 DR: Do you feel uptight all the time?  
 PQ: Occasionally (pause of 3 seconds).  
 DR: Do you feel less anxious now than when you first came?

PQ: About the same (pause of 3 seconds).  
 DR: Can you tell me a bit more? Are you feeling less anxious than you were?  
 PQ: Could be a bit better ... (pause of 3 seconds) slightly ... (pause 4 seconds)  
 possibly.  
 (Clegg et al. 2007: 99)

In addition to PQ's much reduced MLU in comparison to the doctor, there are other features of this exchange which indicate that the patient falls short of a conversational expectation to be informative. As might be expected in the context of a doctor-patient exchange, the doctor is asking PQ a series of questions. The first two are open questions, which place a requirement on the listener to produce an extended response. Yet, these questions only succeed in eliciting brief responses from PQ. At one point in the exchange, the doctor explicitly indicates that he wishes to be given more information by asking, "Can you tell me a bit more?" Long pauses of between 2 and 5 seconds occur either at the end of PQ's utterances or in the middle of his utterances. These pauses arise as the doctor delays his taking of the next turn as a means of encouraging PQ to extend his responses. These pauses are largely ineffective in extending PQ's responses with the doctor in nearly all cases having to assume his turn in the absence of any further information from the patient. Although PQ's responses are relevant to the doctor's questions, they nonetheless fail to satisfy the doctor's informational needs and are thus under-informative.

Pragmatic anomalies also characterize poverty of content of speech (PCS), the second form of alogia found in schizophrenia. While the quantity maxim is not successfully adhered to in poverty of speech, a further maxim – the maxim of manner – is also disrupted in PCS. This is evident in the characterization of PCS given by Black and Andreasen (2011: 42). The schizophrenic speaker with PCS produces an adequate amount of speech, but it conveys "little information". This speaker's use of language is "vague, often overabstract or overconcrete, repetitive, and stereotyped". A listener may have the impression that the speaker has talked at length and yet has still not given sufficient information to answer a question. On other occasions, the speaker provides enough information but uses too many words to do so. Copious speech which conveys little information falls short of a conversational requirement to be informative (quantity maxim). Speech which is vague, repetitive and verbose leaves the listener with the impression that orderliness in conversation has not been observed (manner maxim). These pragmatic problems are evident in the following example of PCS from Black and Andreasen (2011: 42):

**Interviewer:** Why is it, do you think, that people believe in God?

**Subject:** Well, first of all because He, uh, He are the person that is their personal savior. He walks with me and talks with me. And, uh, the understanding that I have, um, a lot of people, they don't readily, uh, know their own personal self. Because, uh, they ain't, they all, just don't know their personal self. They don't, know that He, uh – seemed like to me, a lot of 'em don't understand that He walks and talks with 'em.

The interviewer has posed an open question that requires an extended response, so the length of the subject's contribution is not problematic. However, as a reply to a question about why people believe in God, it is not particularly informative. At no point does the subject articulate why someone might believe in God. Saying that God is one's personal saviour and that he walks with and talks to people are not reasons why someone might believe in God. These statements are largely irrelevant to the interviewer's question. Moreover, the points they express could be more succinctly expressed in one or two utterances. The subject's language is also repetitive. Repetition occurs on the noun phrase "personal self" and the verb phrases "walks and talks with" and "don't know". The subject's spoken output contains numerous fillers (e.g. uh, um) which serve to retain the subject's turn but don't convey information. In short, pragmatic maxims of quantity, relation and manner all appear to be problematic for this schizophrenic speaker with poverty of content of speech. Once again, a key diagnostic criterion for schizophrenia reflects deficits that are pragmatic in nature.

A second "characteristic symptom" of schizophrenia in DSM-IV – disorganized speech – also involves pragmatic anomalies. Disorganized speech, or positive formal thought disorder, is characterized by a number of linguistic features. These features include "derailment", disjointed speech in which the patient slips off one track onto another track that is obliquely related or completely unrelated; "tangentiality", in which the speaker with schizophrenia responds to questions in an oblique, tangential or irrelevant manner; "incoherence", in which speech is incomprehensible with sentences and clauses containing words and phrases that are joined incoherently; "illogicality", in which statements do not follow logically from each other and conclusions are based on faulty premises; "circumstantiality", in which indirect, excessively detailed speech is produced en route to reaching a goal or idea; "pressure of speech", in which the schizophrenic speaker produces loud, emphatic speech that is delivered at an increased rate (above 150 words per minute); "distractible speech", in which the speaker with schizophrenia changes the subject in response to a nearby stimulus; and "clanging", in which sounds govern the schizophrenic speaker's word choices (Black and Andreasen 2011: 37–40). Several of these linguistic features involve impairments in the pragmatics of language. The speaker with schizophrenia who displays circumstantiality fails to observe the maxims of quantity and manner, while the tangential speaker does not

adhere to the maxim of relation. The speaker who displays repeated derailments will fail to link successive utterances. This behaviour is manifested as a breakdown in the use of cohesive devices that normally link one sentence or utterance to another. In the rest of this section, two of these linguistic features will be examined in further detail with a view to revealing their pragmatic nature.

The schizophrenic subject in the following extract displays a series of derailments (Black and Andreasen 2011: 38). The effect of these derailments is that the subject moves further and further away from the topic of college which is introduced by the interviewer's question:

**Interviewer:** Did you enjoy college?

**Subject:** Um-hm. Oh hey well I, I oh, I really enjoyed some communities. I tried it, and the, and the next day when I'd be going out, you know, um, I took control, like, uh, I put, um, bleach on my hair in, in California. My roommate was from Chicago and she was going to the junior college. And we lived in the Y.W.C.A., so she wanted to put it, um, peroxide on my hair, and she did, and I got up and I looked at the mirror and tears came to my eyes. Now do you understand it – I was fully aware of what was going on but why couldn't I, I ... why the tears? I can't understand that, can you?

From an initial question about college, the subject moves through a number of derailments in which she talks about hair bleach, her roommate, living in a Y.W.C.A. and then back to hair bleach. The pragmatic and discourse processes that are disrupted in these derailments are the cohesive devices that normally link sentences and utterances together. The first derailment occurs between the interviewer's use of "college" and the subject's use of "communities". The listener is left to guess if the subject is talking about communities (e.g. clubs or societies) that she belonged to while she was at college, or if "communities" is being used as a substitute for "college". There is a lack of clear referent for the third person pronoun in "I tried *it*". It may well refer to "college" but in the absence of anaphoric reference, it is difficult to say with certainty. The introduction of "the next day" requires some prior temporal focus as a point of reference, but this is not present. We are not told what it is the subject took control of – her life, a particular situation, etc. California is introduced without a preceding explanation of its significance. This may be where the subject attended college, but we are not told. There is a brief return to the topic of college with the introduction of the subject's roommate. The use of the conjunction "so" suggests there is some logical connection between living in a Y.W.C.A. and the decision to use hair bleach. This connection is obscure, to say the least. The subject realizes she has not introduced a clear referent for the second pronoun in "she wanted to put *it*", but then moves to correct this by replacing "it" with "peroxide". But very quickly again there is another failure of pronoun reference in "do you understand *it*". The lack of

cohesive devices and other links (temporal and geographical) in this extract leaves the listener with the impression that information has been presented in a disjointed manner. Certainly, no listener would consider what the speaker has said above to be a clear, informative or relevant response to the interviewer's question.

The second feature of disorganized speech – tangentiality – is no less a pragmatic aberration than derailment. Tangentiality is exemplified by the following exchange taken from Black and Andreasen (2011: 38):

**Interviewer:** What city are you from?

**Subject:** Well, that's a hard question to answer because my parents...I was born in Iowa, but I know that I'm white instead of black, so apparently I came from the North somewhere and I don't know where, you know, I really don't know whether I'm Irish or Scandinavian, or I don't, I don't believe I'm Polish, but I think I'm, I think I might be German or Welsh.

The subject's response contains information that is obliquely related to the interviewer's question. One's birth place, racial identity and nationality may all have a bearing on the city from which the subject has come. Yet, these features still fail to identify the specific city in question and, in fact, the interviewer never receives an answer to his question. As well as producing a tangential response, the subject has produced a much longer response than is required. The one-word answer that would identify the city in question is replaced by an extended turn in which several clauses are linked through the use of coordinating and subordinating conjunctions (i.e. "and", "or", "but", "so"). So the maxim of quantity, as well as the maxim of relation, is compromised by this schizophrenic subject. Also, the subject begins his response by talking about his parents but then quickly abandons this point. It is difficult to say if he has lost his goal in speaking at this point or if he has revised how he wishes to pursue that goal. Finally, the subject's (dubious) conclusion that he must come from the North because he is white may be an indication that there is some degree of illogicality in his thinking and language.

### 3. The search for diagnostic criteria

As the discussion in section 2 demonstrates, pragmatic deficits are already integral to the criteria that are used to diagnose clinical conditions such as ADHD and schizophrenia. Other conditions such as the autism spectrum disorders could be examined along similar lines.<sup>1</sup> In this section, I want to extend the argument for using pragmatic deficits as diagnostic criteria by discussing research findings which indicate that pragmatic features may distinguish between subtypes of schizophrenia with different symptoms and between schizophrenic patients at varying stages of illness. This research is still at a formative stage. In the final

analysis, pragmatic deficits may not prove to have the specificity or reliability that is required in order to function as diagnostic criteria. Yet, initial research suggests that this is a worthwhile line of enquiry that may eventually establish an even greater role for pragmatics in the diagnosis of schizophrenia. Three lines of evidence will be integral to the development of this argument. The first will examine the results of studies which suggest that pragmatic impairments vary in accordance with the symptoms of schizophrenic patients. The second line of evidence will consider what is known about pragmatic impairments in schizophrenic patients at different stages of illness. The third line of evidence will examine the relationship between cognitive deficits and symptom profiles in schizophrenia. The cognitive deficits in question involve impairments of theory of mind (ToM) and executive function. Although this line of evidence is less direct than the first two, it is no less important. This is because researchers are increasingly demonstrating that pragmatic impairments are related to deficits in one or both cognitive domains.<sup>2</sup> For this reason, ToM and executive function must also be considered within an examination of pragmatic disorders as potential diagnostic criteria.

The relationship between symptoms of psychopathology in schizophrenia and impairments of structural language has been the focus of several studies. These studies have revealed significant correlations between ratings of psychomotor poverty (a negative symptom) and measures of semantic production in adults with schizophrenia (Vogel et al. 2009), reaction times to real word targets on a lexical decision task and positive and disorganized symptoms in outpatients with schizophrenia (Minzenberg et al. 2003), the construction of meaningful sentences using word associations and symptoms of disorganization in outpatients with schizophrenia (Shean 1999), and language comprehension performance and the negative symptom anhedonia-asociality in male patients with schizophrenia (Condray et al. 1995). To the extent that aspects of structural language are associated with symptoms of psychopathology in schizophrenia, it is relevant to ask if similar associations exist between pragmatic language impairments and clinical symptoms or symptom profiles in schizophrenia.

Although few in number, studies which have examined the relationship between psychopathology symptoms in schizophrenia and pragmatic impairments reveal that associations of this type can indeed be demonstrated. Stratta et al. (2007) examined irony appreciation and clinical symptoms in 20 Italian subjects with schizophrenia. Irony appreciation was found to correlate significantly with positive symptoms, that is, patients with more severe positive symptoms found less of the ironic jokes depicted in cartoons funny. There was no relationship between irony appreciation and negative symptoms in these patients. Langdon et al. (2002) studied irony and metaphor comprehension in 25 patients. Twenty-three of these patients had a diagnosis of schizophrenia and two a diagnosis of schizoaffective

disorder. These investigators found that poor understanding of metaphors predicted higher ratings of negative formal thought disorder (measured by means of a rating for alogia). Poor appreciation of irony predicted higher ratings of positive formal thought disorder (measured by means of individual items for derailment, tangentiality, incoherence, illogicality, circumstantiality, pressure of speech, distractible speech and clanging). Even when controlling for executive planning and inhibitory control, poor understanding of metaphors was still a moderately strong predictor of negative formal thought disorder, while poor appreciation of irony continued to predict positive formal thought disorder. Burbridge and Barch (2002) examined referential disturbances in 39 patients with schizophrenia. The severity of disorganization symptoms in these patients was found to predict increases in their use of reference errors in speech samples elicited in response to negatively valenced emotional questions.

It should be noted that studies have not always established a relationship between pragmatic impairments and clinical symptoms in schizophrenia. Brüne and Bodenstein (2005) examined proverb comprehension in 31 patients with schizophrenia. Although patients made significantly more proverb comprehension errors than healthy controls (they interpreted proverbs in a concrete way), no correlation was found between proverb comprehension and a measure of psychopathology (positive and negative symptoms) in these patients. Kiang et al. (2007) found that proverb interpretation difficulties in patients with schizophrenia were not significantly correlated with disorganization or other symptom factors. In a study of 48 schizophrenic patients, Docherty et al. (2003) found little or no association between referential disturbances and positive or negative symptom severity. Moreover, changes in psychotic symptoms over time were not accompanied by changes in referential disturbances. Notwithstanding the findings of these studies, there is increasing evidence within the clinical literature that pragmatic disorders are related to symptom profiles or clusters in schizophrenia, and that this relationship is likely to be direct in nature, i.e. it is not mediated by factors such as IQ or executive function. It is also worth remarking that several of the studies that have failed to establish a relationship between pragmatic aspects of language and symptoms in schizophrenia examine proverb interpretation. It is debatable if the comprehension of proverbs is typical of pragmatic utterance interpretation in general.<sup>3</sup> Also, there is concern among clinicians about the reliability and validity of tests of proverb interpretation in patients with schizophrenia, a concern which has resulted in their widespread abandonment in recent years (Brüne and Bodenstein 2005). It is with these considerations in mind that one should view the negative findings of some of the above studies.

Additionally, diagnostic criteria for schizophrenia in DSM-IV require clinicians to consider the longitudinal course of the disorder.<sup>4</sup> Psychopathology symptoms are known to vary during the longitudinal course of schizophrenia (Hori et al.

1999; Hughes et al. 2003). If pragmatic impairments are to become diagnostic markers of subtypes of schizophrenia based on symptom profiles, it is also important to consider if these impairments reflect changes in psychopathology symptoms over time. It is relevant to ask if patients at different stages of illness – the schizophrenia prodrome, first psychotic episode in schizophrenia, chronic schizophrenia, and schizophrenia in remission – can be distinguished by their pragmatic deficits. Although no single clinical study has ever charted the pragmatic deficits of schizophrenic patients over time, we are able to get some sense of how these deficits might vary by comparing the findings of studies on patients at different stages of their illness. To the extent that negative symptoms tend to predominate over positive symptoms with increasing duration of illness (Mancevski et al. 2007), we can predict how pragmatic impairments may vary over the longitudinal course of schizophrenia. Schizophrenic patients, who are experiencing their first psychotic episode, may appear verbose, display repeated failures of relevance and have problems with discourse cohesion, including referential disturbances (these pragmatic failures reflect features of positive formal thought disorder such as derailment, tangentiality, incoherence and circumstantiality). In patients with chronic schizophrenia, when negative symptoms predominate, different pragmatic features may come to the fore. These features might be expected to include a lack of informativeness in discourse, a failure to initiate conversation and to fulfil turns, and to introduce and develop topics in conversation (all pragmatic indicators of verbal poverty).

There is growing evidence that pragmatic impairments of patients with early-stage schizophrenia do indeed differ qualitatively from pragmatic impairments that occur in patients with chronic schizophrenia. (Early-stage schizophrenia includes individuals in the schizophrenia prodrome<sup>5</sup> and at the time of a first psychotic episode.) These differences reflect, by and large, the predictions described above. Bearden et al. (2011) examined transcribed speech samples elicited from 105 adolescents, 54 of whom were identified as being at clinical high risk for a first episode of psychosis. At follow-up one year later, these investigators found that youth who subsequently converted to psychosis used significantly less referential cohesion in their baseline speech samples than typically developing controls and youth who did not convert to psychosis. Anand et al. (1994) examined language impairment in 24 patients with early psychosis. Most patients exhibited psychosis in the presence of a DSM diagnosis of schizophrenia, schizophreniform disorder or schizoaffective disorder. All patients were examined within three weeks of their first psychiatric admission to hospital when florid psychotic symptoms were most evident. Compared to healthy controls, psychotic patients displayed significantly more errors on tests of cohesion and the interpretation of metaphorical language.

Bowie et al. (2005) examined 220 geriatric patients with chronic schizophrenia. The verbal underproductivity of these patients increased during a follow-up period

of 2.3 years. Scores for disconnected speech remained relatively stable during follow-up. Meilijson et al. (2004) examined the pragmatic skills of 43 subjects with chronic schizophrenia. To attain a general profile of pragmatic abilities in these subjects, Meilijson et al. used Prutting and Kirchner's (1987) pragmatic protocol. Among the pragmatic parameters that were rated as being more than 50% inappropriate in these patients were topic selection, introduction, maintenance and change; lexical specificity/accuracy; and turn-taking quantity/conciseness. (The use of non-specific vocabulary can contribute to a lack of informativeness in discourse.) Byrne et al. (1998) examined the narrative and conversational discourse of 35 adults diagnosed with chronic schizophrenia. Among a number of pragmatic anomalies, schizophrenic adults identified as having low overall functioning were found to produce less information in their narratives than adults with higher functioning. In a study of paranoid schizophrenic patients with duration of illness in excess of 20 years, Saavedra (2010) found that a lack of cohesion in narratives had decreased to the point of almost disappearing in a subgroup of patients who had been long-stay residents in a care home.

Although research on pragmatic deficits in schizophrenic patients with different symptom profiles and at different stages of illness is still at an early stage, many more studies have been undertaken of the cognitive impairments of these patients. Two groups of cognitive impairments in particular – deficits in theory of mind (ToM) and executive function – have been extensively investigated in clients with schizophrenia. The relevance of this body of work to the search for diagnostic criteria for schizophrenia based on pragmatics can be captured in the following terms. There is now substantial evidence that executive function deficits and ToM impairments make a significant (possibly causal) contribution to the pragmatic disorders of a range of clinical subjects, including subjects with schizophrenia (Cummings 2012, 2013a, 2013b). In fact, so close is the relationship between pragmatic disorders and ToM impairments that a number of tests of ToM examine the use and understanding of pragmatic aspects of language (e.g. the hinting task (Corcoran et al. 1995) in which a subject must indicate what a depicted speaker in a dialogue meant by a certain utterance). To the extent that these cognitive correlates of pragmatic disorders can be shown to be associated with psychopathology symptoms in schizophrenic patients, there is additional support for the claim that pragmatic disorders may have diagnostic value in distinguishing subtypes of schizophrenia.

There is now a sizeable literature demonstrating a relationship between ToM impairments and psychopathology symptoms in schizophrenia. With some exceptions, ToM impairments appear to be related to positive and disorganized symptoms in schizophrenia. Langdon et al. (2002) found that poor mind-reading was associated with high ratings of positive formal thought disorder in 25 patients with diagnoses of schizophrenia or schizoaffective disorder. In a study of 50

patients diagnosed with schizophrenia or schizoaffective disorder, Abdel-Hamid et al. (2009) found a significant association between ToM impairments and disorganized symptoms. There was no association between ToM impairments and positive symptoms in these patients. Stratta et al. (2007) reported a significant relationship between ToM performance and positive and cognitive symptoms in a sample of 20 Italian subjects with schizophrenia. There was no relationship between ToM performance and negative symptom scores in these patients. Marjoram et al. (2005) found that poor performance on a ToM hinting task in 15 patients with schizophrenia was significantly related to the presence of positive symptoms, specifically delusions and hallucinations. There was no relationship between poor performance on the hinting task and negative symptoms.

Social cognition and social perception, both of which involve ToM aspects, have also been linked to positive symptoms in schizophrenia. Mancuso et al. (2011) used five tasks to examine social cognition in 85 psychotic outpatients with diagnoses predominantly of schizophrenia or schizoaffective disorder. No correlations were found between social cognitive factors and negative symptoms. Higher tendencies in these patients to blame and respond with hostility in ambiguous social situations correlated significantly with positive symptoms. Toomey et al. (2002) examined symptomatology and nonverbal social perception in 28 patients with schizophrenia. The ability to decode nonverbal cues was significantly poorer in schizophrenic patients than in normal (control) subjects. Nonverbal social perception did not significantly correlate with summary scores for positive symptoms. However, social perception scores did significantly correlate with the individual positive symptom of conceptual disorganization.

Studies have demonstrated that executive function deficits in schizophrenia are predominantly associated with negative symptoms. Clark et al. (2010) examined the relationship between positive, negative and cognitive symptoms in schizophrenia and executive function components. Negative and cognitive symptoms were associated with impairments in inhibition/set shifting. Cognitive symptoms were additionally associated with mental flexibility. Positive symptoms were not related to either executive function component. Thoma et al. (2007) reported impairments of inhibition and multitasking in schizophrenic patients with high negative symptom scores. Villalta-Gil et al. (2006) assessed symptoms and cognitive performance on measures of verbal memory, attention, operative memory and abstraction and flexibility functions in 113 individuals with a diagnosis of schizophrenia. Higher ratings for negative symptoms were associated with more cognitive deficits. Negative symptoms significantly predicted performance on an inhibition task in a study of 32 patients with schizophrenia (Donohue et al. 2006). High ratings of negative formal thought disorder were associated with executive dysfunction in the patients with schizophrenia or schizoaffective disorder studied by Langdon et al. (2002).

In a review of published literature, Nieuwenstein et al. (2001) found statistically significant relationships of negative symptoms with poor performance on the two most widely applied tests of executive functioning and sustained attention, the Wisconsin Card Sorting Test and the Continuous Performance Test. Scores for positive symptoms did not correlate with either measure.<sup>6</sup> Heinrich and Vaz (2004) found that intrusion errors during verbal memory tasks contributed significantly to the prediction of negative, but not positive, symptoms in 55 patients with schizophrenia. Cameron et al. (2002) examined the relationship between working memory deficits and positive, negative and disorganised symptoms in 52 outpatients with schizophrenia. Severity of negative and disorganised symptoms was related to performance on several tests of working memory function. However, the severity of positive symptoms did not correlate with performance on any of these tests. Reduction in negative (but not positive) symptoms is significantly correlated with executive function improvements in patients with schizophrenia (Schuepbach et al. 2002).

It emerges that ToM impairments and executive function deficits are related to positive and negative symptoms in schizophrenia, respectively. The robustness and consistency of these findings across many clinical studies suggest that these cognitive skills have the potential to act as markers of symptom subtypes in schizophrenia. To the extent that pragmatic language skills depend upon theory of mind abilities and executive functions, it is reasonable to conclude that pragmatic skills might share with their cognitive substrates the capacity to distinguish symptom subtypes of schizophrenia. Along with clinical findings that pragmatic impairments are significantly correlated with symptomatology in schizophrenia, these cognitive results lend further weight to a possible diagnostic role for pragmatic disorders in schizophrenia. However, if pragmatic disorders are to display the reliability and validity that are required in order for them to function as diagnostic markers of clinical disorders, then they must demonstrate their diagnostic value beyond the single disorder of schizophrenia. To this end, we consider in the next section how pragmatic disorders may also have a role to play in the diagnosis of dementia.

#### **4. Beyond schizophrenia**

Thus far, discussion has focused largely on the contribution of pragmatic disorders to the diagnosis of schizophrenia. This focus should not be taken to indicate that pragmatic disorders have no role to play in the diagnosis of clinical conditions other than schizophrenia. In developed countries, the relentless increase in the number of adults who develop one of the dementias presents a number of clinical and social challenges.<sup>7</sup> Chief amongst these challenges is the accurate

diagnosis of the dementias. The absence of reliable biomarkers of the dementias and the similarity of their initial presenting symptoms make it difficult for clinicians to pursue a differential diagnosis of these conditions.<sup>8</sup> To address the issue of diagnosis, clinicians are increasingly looking to establish behavioural markers of the dementias. The most reliable of these markers to date are speech and language characteristics (Reilly et al. 2010). In this section, I want to argue that the particular language characteristics which are likely to prove most valuable in the diagnosis of the dementias involve impairments in the pragmatics of language. There are a number of reasons why impairments of the pragmatic domain are likely to be especially important in a diagnosis of the dementias. Although this is not the context in which to undertake a detailed discussion of these reasons, we can at least consider in the space that remains the potential contribution of pragmatics to the diagnosis of this significant group of neurodegenerative disorders.

There are several reasons why clinicians and researchers should give serious consideration to pragmatic language skills in dementia. For example, there is evidence that in Alzheimer's disease (AD), pragmatic behaviours are used as compensatory devices as language declines (Ripich et al. 2000). Pragmatics thus has the potential to play an important role in dementia therapies. Apart from intervention, pragmatic aspects of language also appear to be particularly sensitive indicators of the neurodegenerative changes that occur in the dementias. As a result, pragmatic aspects are likely to play a more significant role within a diagnosis of these disorders than other aspects of language. Pragmatic impairments are often the first sign of language disruption in the dementias. These impairments can occur in the early stage of Alzheimer's disease when syntax and phonology are typically spared (Norman et al. 2007). This is because of a well attested phenomenon called retrogenesis in Alzheimer's disease and other neurodegenerative disorders (Reisberg et al. 2002). Applied to language, retrogenesis describes how the order in which language skills deteriorate in Alzheimer's disease is the reverse of the order in which these skills are acquired during normal child development.<sup>9</sup> Many pragmatic language skills are acquired late by normally developing children. As such, these skills are often the first aspects of language to become disrupted in Alzheimer's disease (but see Moos (2011) for evidence against retrogenesis in language). This pattern of linguistic deterioration is well supported, with clinical studies revealing early pragmatic deficits in AD often in the absence of significant cognitive impairments or other language disorders (e.g. Carlomagno et al. 2005, Feyereisen et al. 2007). This early sensitivity of pragmatics to the neurodegenerative changes that occur in the dementias confers diagnostic significance on pragmatic impairments.

There is a further reason why clinicians and researchers should look to pragmatic disorders for criteria that can be used in a differential diagnosis of the

dementias. Disrupted language and communication in the dementias reflect underlying deterioration of cognitive skills. (It is for this reason that problems with language and communication in clients with dementia are called *cognitive-communicative impairments*.) Clinical studies have reported theory of mind (ToM) deficits and executive dysfunction in a range of dementias including semantic dementia (a type of frontotemporal dementia), Alzheimer's dementia, vascular dementia and dementia with Lewy bodies (Kao et al. 2009; Nordlund et al. 2010; Castelli et al. 2011, Duval et al. 2012). Pragmatic language skills are particularly sensitive to the ToM and executive function deficits that are found in the dementias. In this way, Yamaguchi et al. (2011) demonstrated that problems with proverb comprehension in subjects with dementia are related to cognitive disinhibition. Cuerva et al. (2001) reported significantly more severe pragmatic deficits – measured by means of a test of indirect requests and conversational implications – in a consecutive series of 34 patients with probable Alzheimer's disease than in age-comparable healthy controls. Moreover, there was a significant association between the pragmatic deficits of these AD patients and their performance on a second-order false belief story (a test of ToM). These studies suggest that pragmatic disorders may have sufficient specificity to distinguish different cognitive profiles in the dementias. To the extent that sufficient specificity can indeed be demonstrated, pragmatic disorders may usefully contribute to the differential diagnosis of the dementias. This particular line of enquiry awaits more extensive investigation into the cognitive correlates of pragmatic disorders in the dementias than that which has been undertaken to date.

## 5. Summary

It has been argued in this paper that pragmatic impairments can make a valuable contribution to the diagnosis of a range of disorders. These disorders include developmental and acquired conditions such as attention deficit hyperactivity disorder, the autistic spectrum disorders, schizophrenia and the dementias. Pragmatic impairments are already a feature of the diagnostic criteria of some of these disorders (e.g. ADHD), although these impairments are not described in pragmatic terms. In disorders such as the dementias, pragmatic impairments have the potential to play an important role in differential diagnosis in the absence of reliable biomarkers of these neurodegenerative disorders. In all cases, further research is needed before it can be claimed that pragmatic impairments display the reliability and specificity that are required in order to function as diagnostic criteria. But as the above discussion demonstrates, there are strong grounds for believing that pragmatics will make an increasingly important contribution to the development of diagnostic criteria in years to come.

## Notes

1. The diagnostic criteria in DSM-IV that describe the communication impairment in the autism spectrum disorders (ASDs) include “marked impairment in the ability to initiate or sustain a conversation with others” and “stereotyped and repetitive use of language or idiosyncratic language” (2000: 75). Like ADHD and schizophrenia, these problems with communication in ASDs can be shown to result from pragmatic anomalies.

2. It is interesting to note that Mazza et al. (2008: 260) identify pragmatic disorders *and* ToM as “promising bio-behavioural markers” of conditions like schizophrenia and autism.

3. It has been argued that in interpreting proverbs and other fixed expressions (e.g. idioms), hearers do not first access a literal meaning of the expression which they then reject. Rather, they immediately access the non-literal meaning of the expression. Gibbs (2002: 457) remarks that “[m]ost...psycholinguistic research shows...that given sufficient context people understand nonliteral meanings without first analyzing the complete literal meaning of an expression (i.e. the direct access view)”. To the extent that hearers access standard or conventional meanings of proverbial expressions, they are more likely to draw upon semantic knowledge during the interpretation of proverbs rather than use skills and knowledge that are pragmatic in nature.

4. In DSM-IV, provision is made for the longitudinal course of schizophrenia through a number of “specifiers” which can be applied only after one year has elapsed since the initial onset of active-phase symptoms (American Psychiatric Association 2000: 303). The six specifiers which can be additionally applied are (1) episodic with interepisode residual symptoms; (2) episodic with no interepisode residual symptoms; (3) continuous; (4) single episode in partial remission; (5) single episode in full remission; and (6) other or unspecified pattern.

5. The prodromal stage of schizophrenia describes the period leading up to frank psychosis. Approximately 80% of schizophrenic patients experience prodromal symptoms which include dysphoric moods, attenuated positive symptoms and functional decline. The average length of time between the onset of prodromal symptoms and frank psychosis is 3 years (Perkins 2005).

6. Some studies have linked executive function deficits to positive symptoms in schizophrenia. Donohue et al. (2006) reported that positive symptoms in a subgroup of schizophrenic patients with predominantly negative symptoms were significantly predicted by performance on a set-shifting task. Guillem et al. (2008) reported a relationship between delusions, disorganization and inhibition in 96 patients with stable schizophrenia. Hallucinations were related to interference sensitivity in these patients. However, these relationships were complex and involved in some cases interactions between symptoms.

7. Hebert et al. (2003) estimate that by 2050, there will be 13.2 million people with Alzheimer's disease – the most common cause of dementia – in the US. This large figure would be larger still if one included individuals with one of the non-Alzheimer's dementias.
8. Reilly et al. (2010: 439) state that “[d]ifferential diagnosis is...complicated by a high degree of overlap in the initial presenting symptoms of the dementias. Specificity is further complicated by the lack of a definitive, non-surgically invasive biomarker that can confirm in vivo diagnosis. Current diagnostic protocols for dementia rely upon probabilistic weighting of a number of factors, including protein and genetic biomarkers, assays of metabolic functioning, neuroimaging, and behavior.”
9. In a review of studies of language impairment in Alzheimer's disease spanning 40 years, Emery (2000) found that language forms learned last in the sequence of language development appear to be first to deteriorate.

## References

- Abdel-Hamid, Mona, Caroline Lehmkämpfer, Claudia Sonntag, Georg Juckel, Irene Daum and Martin Brüne. 2009. Theory of mind in schizophrenia: The role of clinical symptomatology and neurocognition in understanding other people's thoughts and intentions. *Psychiatry Research* 165. 19–26.
- American Psychiatric Association. 2000. *Diagnostic and Statistical Manual of Mental Disorders*. Washington, DC: American Psychiatric Association.
- Anand, Amid, R.J. Wales, H.J. Jackson and D.L. Copolov. 1994. Linguistic impairment in early psychosis. *Journal of Nervous and Mental Disease* 182. 488–493.
- Bearden, Carrie E., Keng Nei Wu, Rochelle Caplan and Tyrone D. Cannon. 2011. Thought disorder and communication deviance as predictors of outcome in youth at clinical high risk for psychosis. *Journal of the American Academy of Child and Adolescent Psychiatry* 50. 669–680.
- Bishop, Dorothy and Louise Rosenbloom. 1987. Classification of childhood language disorders. In William Yule and Michael Rutter (eds.), *Language Development and Disorders*, 16–41. London: MacKeith Press.
- Black, Donald W. and Nancy C. Andreasen. 2011. *Introductory Textbook of Psychiatry*. 5th edn. Arlington, VA: American Psychiatric Publishing, Inc.
- Bowie, Christopher R., Irene Tsapelas, Joseph Friedman, Michelle Parrella, Leonard White and Phillip D. Harvey. 2005. The longitudinal course of thought disorder in geriatric patients with chronic schizophrenia. *American Journal of Psychiatry* 162. 793–795.

- Brüne, Martin and Louise Bodenstern. 2005. Proverb comprehension reconsidered – “theory of mind” and the pragmatic use of language in schizophrenia. *Schizophrenia Research* 75. 233–239.
- Burbridge, Jennifer A. and Deanna M. Barch. 2002. Emotional valence and reference disturbance in schizophrenia. *Journal of Abnormal Psychology* 111. 186–191.
- Byrne, Marie E., Thomas A. Crowe and Pamela S. Griffin. 1998. Pragmatic language behaviors of adults diagnosed with chronic schizophrenia. *Psychological Reports* 83. 835–846.
- Cameron, Allison M., Joanne Oram, Gina M. Geffen, David J. Kavanagh, John J. McGrath and Laurie B. Geffen. 2002. Working memory correlates of three symptom clusters in schizophrenia. *Psychiatry Research* 110. 49–61.
- Carlomagno, Sergio, Anna Santoro, Antonella Menditti, Maria Pandolfi and Andrea Marini. 2005. Referential communication in Alzheimer’s type dementia. *Cortex* 41: 520–534.
- Castelli, Ilaria., Alessandra Pini, Margherita. Alberoni, Olga Liverta-Sempio, Francesca Baglio, Davide Massaro, Antonella Marchetti and Raffaello Nemni. 2011. Mapping levels of theory of mind in Alzheimer’s disease: A preliminary study. *Aging & Mental Health* 15. 157–168.
- Clark, Laura K., Debbie Warman and Paul H. Lysaker. 2010. The relationships between schizophrenia symptom dimensions and executive functioning components. *Schizophrenia Research* 124. 169–175.
- Clegg, Judy , Shelagh Brumfitt, Randolph W. Parks and Peter W.R. Woodruff. 2007. Speech and language therapy intervention in schizophrenia: A case study. *International Journal of Language & Communication Disorders* 42. 81–101.
- Condray, Ruth, Daniel P. van Kammen, Stuart R. Steinhauer, Annette Kasperek and Jeffrey K. Yao. 1995. Language comprehension in schizophrenia: Trait or state indicator? *Biological Psychiatry* 38. 287–296.
- Corcoran, Rhiannon, Gavin Mercer and Christopher D. Frith. 1995. Schizophrenia, symptomatology and social inference: Investigating theory of mind in people with schizophrenia. *Schizophrenia Research* 17. 5–13.
- Cuerva, Agustina Garcia, Liliana Sabe, Gabriela Kuzis, Cecilia Tiberti, Flavia Dorrego and Sergio E. Starkstein. 2001. Theory of mind and pragmatic abilities in dementia. *Neuropsychiatry, Neuropsychology, and Behavioral Neurology* 14. 153–158.
- Cummings, Louise. 2009. *Clinical Pragmatics*. Cambridge: Cambridge University Press.
- Cummings, Louise. 2012. Clinical pragmatics and theory of mind. In Alessandro Capone, Franco Lo Piparo and Marco Carapezza (eds.), *Perspectives on Pragmatics and Philosophy*. Dordrecht: Springer.

- Cummings, Louise. 2013a. Clinical pragmatics. In Yan Huang (ed.), *Oxford Handbook of Pragmatics*. Oxford: Oxford University Press.
- Cummings, Louise. 2013b. Pragmatic disorders and theory of mind. In Louise Cummings (ed.), *Handbook of Communication Disorders*. Cambridge: Cambridge University Press.
- Cummings, Louise. 2014. *Communication Disorders*. Houndmills, Basingstoke: Palgrave Macmillan.
- Docherty, Nancy M., Alex S. Cohen, Tasha M. Nienow, Thomas J. Dinzeo and Ruth E. Dangelmaier. 2003. Stability of formal thought disorder and referential communication disturbances in schizophrenia. *Journal of Abnormal Psychology* 112. 469–475.
- Donohoe, Gary, Aiden Corvin and Ian H. Robertson. 2006. Evidence that specific executive functions predict symptom variance among schizophrenia patients with a predominantly negative symptom profile. *Cognitive Neuropsychiatry* 11. 13–32.
- Duval, Céline, Alexander Bejanin, Pascale Piolino, Mickael Laisney, Vincent de La Sayette, Serge Belliard, Francis Eustache and Beatrice Desgranges. 2012. Theory of mind impairments in patients with semantic dementia. *Brain* 135. 228–241.
- Emery, V. Olga. 2000. Language impairment in dementia of the Alzheimer type: A hierarchical decline?. *International Journal of Psychiatry in Medicine* 30. 145–164.
- Feyereisen, Pierre, Joelle Berrewaerts and Michel Hupet. 2007. Pragmatic skills in the early stages of Alzheimer's disease: An analysis by means of a referential communication task. *International Journal of Language & Communication Disorders* 42. 1–17.
- Gibbs, Raymond W. 2002. A new look at literal meaning in understanding what is said and implicated. *Journal of Pragmatics* 34. 457–486.
- Guillem, Francois, Melissa Rinaldi, Tania Pampoulova and Emmanuel Stip. 2008. The complex relationships between executive functions and positive symptoms in schizophrenia. *Psychological Medicine* 38. 853–860.
- Hebert, Liesi E., Paul A. Scherr, Julia L. Bienias, David A. Bennett and Denis A. Evans. 2003. Alzheimer disease in the US population: Prevalence estimates using the 2000 census. *Archives of Neurology* 60. 1119–1122.
- Heinrichs, R. Walter and Stephanie McDermid Vaz. 2004. Verbal memory errors and symptoms in schizophrenia. *Cognitive and Behavioral Neurology* 17. 98–101.
- Hori, A., K. Tsunashima, K. Watanabe, Y. Takekawa, I. Ishihara, T. Terada and M. Uno. 1999. Symptom classification of schizophrenia changes with the duration of illness. *Acta Psychiatrica Scandinavica* 99. 447–452.

- Hughes, Catherine, Veena Kumari, William Soni, Mrigendra Das, Brendon Binneman, Sonia Drozd, Shaun O'Neil, Vallakalil Mathew and Tonmoy Sharma. 2003. Longitudinal study of symptoms and cognitive function in schizophrenia. *Schizophrenia Research* 59. 137–146.
- Kao, Aimee W., Caroline A. Racine, Lovingly C. Quitania, Joel H. Kramer, Chadwick W. Christine and Bruce L. Miller. 2009. Cognitive and neuropsychiatric profile of the synucleinopathies: Parkinson disease, dementia with Lewy bodies, and multiple system atrophy. *Alzheimer Disease and Associated Disorders* 23. 365–370.
- Kiang, Michael, Gregory A. Light, Jocelyn Prugh, Seana Coulson, David L. Braff and Marta Kutas. 2007. Cognitive, neurophysiological, and functional correlates of proverb interpretation abnormalities in schizophrenia. *Journal of the International Neuropsychological Society* 13. 653–663.
- Langdon, Robyn, Max Coltheart, Philip B. Ward and Stanley V. Catts. 2002. Disturbed communication in schizophrenia: The role of poor pragmatics and poor mind-reading. *Psychological Medicine* 32. 1273–1284.
- Mancevski, Branislav, John Keilp, Matthew Kurzon, Robert M. Berman, Vladimir Ortakov, Jill Harkavy-Friedman, Gorazd Rosoklija and Andrew J. Dwork. 2007. Lifelong course of positive and negative symptoms in chronically institutionalized patients with schizophrenia. *Psychopathology* 40. 83–92.
- Mancuso, Francesco, William P. Horan, Robert S. Kern and Michael F. Green. 2011. Social cognition in psychosis: Multidimensional structure, clinical correlates, and relationship with functional outcome. *Schizophrenia Research* 125. 143–151.
- Marjoram, Dominic, Clare Gardner, Johnatan Burns, Patrick Miller, Stephen M. Lawrie and Eve C. Johnstone. 2005. Symptomatology and social inference: A theory of mind study of schizophrenia and psychotic affective disorder. *Cognitive Neuropsychiatry* 10. 347–359.
- Mazza, Monica, Vittorio Di Michele, Rocco Pollice, Massimo Casacchia and Rita Roncone. 2008. Pragmatic language and theory of mind deficits in people with schizophrenia and their relatives. *Psychopathology* 41. 254–263.
- Meilijson, Sra R., Asa Kasher and Avner Elizur. 2004. Language performance in chronic schizophrenia: A pragmatic approach. *Journal of Speech, Language, and Hearing Research* 47. 695–713.
- Minzenberg, Michael J., John H. Poole, Sophia Vinogradov, Gregory K. Shenaut and Beth A. Ober. 2003. Slowed lexical access is uniquely associated with positive and disorganised symptoms in schizophrenia. *Cognitive Neuropsychiatry* 8. 107–127.
- Moos, Inger. 2011. Humour, irony and sarcasm in severe Alzheimer's dementia – a corrective to retrogenesis? *Ageing and Society* 31. 328–346.

- Nieuwenstein, Mark R., Andre Aleman and Edward H. de Haan. 2001. Relationship between symptom dimensions and neurocognitive functioning in schizophrenia: A meta-analysis of Wisconsin card sorting test and continuous performance test studies. *Journal of Psychiatric Research* 35. 119–125.
- Nordlund, Arto, Sindre Rolstad, Matias Göthlin, Ake Edman, Stefan Hansen and Anders Wallin. 2010. Cognitive profiles of incipient dementia in the Goteborg MCI study. *Dementia and Geriatric Cognitive Disorders* 30. 403–410.
- Norman, Michelle L., Jennifer Horner and Danielle N. Ripich. 2007. Dementia: Communication impairments and management. In Alex F. Johnson and Barbara H. Jacobson (eds.), *Medical Speech-language Pathology: A Practitioner's Guide*. 2nd edn., 110–128. New York: Thieme Medical Publishers, Inc.
- Perkins, Diana O. 2005. Evaluating and treating the prodromal stage of schizophrenia. *Current Psychosis & Therapeutics Reports* 3. 79–85.
- Prutting, Carol A. and Diane M. Kirchner. 1987. A clinical appraisal of the pragmatic aspects of language. *Journal of Speech and Hearing Disorders* 52. 105–119.
- Rapin, Isabelle and Doris A. Allen. 1983. Developmental language disorders: Nosologic considerations. In Ursula Kirk (ed.), *Neuropsychology of Language, Reading, and Spelling*, 155–184. New York: Academic Press.
- Reilly, Jamie, Amy D. Rodriguez, Martine Lamy and Jean Neils-Strunjas. 2010. Cognition, language, and clinical pathological features of non-Alzheimer's dementias: An overview. *Journal of Communication Disorders* 43. 438–452.
- Reisberg, Barry, Emile H. Franssen, Liduin E.M. Souren, Stephanie R. Auer, Imran Akram and Sunnie Kenowsky. 2002. Evidence and mechanisms of retrogenesis in Alzheimer's and other dementias: Management and treatment import. *American Journal of Alzheimer's Disease & Other Dementias* 17. 202–212.
- Ripich, Danielle N., Thomas Fritsch, Elaine Ziol and Ellen Durand. 2000. Compensatory strategies in picture description across severity levels in Alzheimer's disease: A longitudinal study. *American Journal of Alzheimer's Disease & Other Dementias* 15. 217–228.
- Saavedra, Javier. 2010. Quantitative criteria of narrative coherence and complexity in persons with paranoid schizophrenia. *Journal of Nervous and Mental Disease* 198. 349–355.
- Schuepbach, Daniel, Matcheri S. Keshavan, Julie A. Kmiec and John A. Sweeney. 2002. Negative symptom resolution and improvements in specific cognitive deficits after acute treatment in first-episode schizophrenia. *Schizophrenia Research* 53. 249–261.
- Shean, Glenn D. 1999. Syndromes of schizophrenia and language dysfunction. *Journal of Clinical Psychology* 55. 233–240.

- Stratta, Paolo, Ilaria Riccardi, Daniela Mirabilio, Silvia Di Tommaso, Annerita Tomassini and Alessandro Rossi. 2007. Exploration of irony appreciation in schizophrenia: A replication study on an Italian sample. *European Archives of Psychiatry and Clinical Neuroscience* 257. 337–339.
- Tannock, Rosemary. 2005. Language and mental health disorders: The case of ADHD. In Willy Østreg (ed.), *Convergence: Interdisciplinary Communications 2004/2005*, 45–53. Oslo: Centre for Advanced Study.
- Thoma, Patrizia, Diana Zoppelt, Burkhard Wiebel and Irene Daum. 2007. Context processing and negative symptoms in schizophrenia. *Journal of Clinical and Experimental Neuropsychology* 29. 428–435.
- Toomey, Rosemary, David Schuldberg, Patrick Corrigan and Michael F. Green. 2002. Nonverbal social perception and symptomatology in schizophrenia. *Schizophrenia Research* 53. 83–91.
- Villalta-Gil, Victoria, Miriam Vilaplana, Susana Ochoa, Joseph M. Haro, Montserrat Dolz, Judit Usall, Jorge Cervilla and NEDENA Group. 2006. Neurocognitive performance and negative symptoms: Are they equal in explaining disability in schizophrenia outpatients. *Schizophrenia Research* 87. 246–253.
- Vogel, Adam P., Helen J. Chenery, Catriona M. Dart, Binh Doan, Mildred Tan and David A. Copland. 2009. Verbal fluency, semantics, context and symptom complexes in schizophrenia. *Journal of Psycholinguistic Research* 38. 459–473.
- Yamaguchi, Haruyasu, Yohko Maki and Tomoharu Yamaguchi. 2011. A figurative proverb test for dementia: Rapid detection of disinhibition, excuse and confabulation, causing discommunication. *Psychogeriatrics* 11. 205–211.

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