A Grammatical analysis of the spontaneous language use of schizophrenic versus normal L2 speakers of English

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Thesis presented in partial fulfilment of the requirements for the degree of
Master of Arts in Linguistics for the Language Professions

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December 2009

Declaration

By submitting this thesis electronically, I declare that the entirety of the work contained therein is my own, original work, that I am the owner of the copyright thereof (unless to the extent explicitly otherwise stated) and that I have not previously in its entirety or in part submitted it for obtaining any qualification.

Mathilda Smit

December 2009

Acknowledgements

for my sisters

erika and inge

Abstract

It is well-known that there is an important relationship between language and schizophrenia, given that many of the primary symptoms of schizophrenia are language related (Cutting 1985; Wróbel 1990; Sadock & Sadock 2003; Paradis 2008). Furthermore, research has shown that certain schizophrenic bilinguals exhibit different symptoms in their first language (L1) than in their second language (L2) (De Zulueta 1984; De Zulueta, Gene-Cos & Grachev 2001; Paradis 2008; Southwood, Schoeman & Emsley 2009). This thesis investigates the L2 use of schizophrenic bilinguals to determine whether there are significant differences between the types and frequency of errors made in spontaneous L2 use by schizophrenic versus normal (i.e. non-schizophrenic) bilinguals. Four schizophrenic bilinguals and four normal bilinguals (the control group) participated in this study. The controls were matched to the schizophrenics in terms of age, gender, level of education, L1 (Afrikaans) and L2 (English). Informal, thirty minute interviews were conducted with each of the eight participants, recorded on video (for the schizophrenics) or audio tape (for the controls) and carefully transcribed. Each participant's speech sample was then analyzed grammatically by means of Morice & Ingram's (1982) assessment tool. This analysis involved determining the complexity of utterances (with reference to mean length of utterance, lexical density, and number of sentence-initial and sentence-medial conjunctions) and identifying phonological, morphological, lexical, syntactic and semantic errors. In this way a language profile was created for each participant and the differences between the two groups (schizophrenics and controls) were tested for statistical significance. On the basis of the results of these statistical tests, it is argued that the locus of differences between schizophrenic and normal L2 use is semantics, rather than any of the other aspects of grammar. The thesis concludes with a discussion of the main findings of the study, some criticisms of the assessment tool and suggestions for future research in this field.

Opsomming

Navorsing dui op 'n belangrike verhouding tussen taal en skisofrenie, aangesien baie van die primêre simptome van skisofrenie taalverwant is (Cutting 1985; Wróbel 1990; Sadock & Sadock 2003; Paradis 2008). Verder dui navorsing ook daarop dat sekere skisofreniese tweetaliges verskillende simptome toon in hul eerstetaal (T1) as in hul tweedetaal (T2) (De Zulueta 1984; De Zulueta, Gene-Cos & Grachev 2001; Paradis 2008; Southwood, Schoeman & Emsley 2009). Hierdie tesis ondersoek die T2 gebruik van skisofreniese tweetaliges om vas te stel of daar beduidende verskille tussen die tipe en die gereeldheid van die foute is wat in spontane T2 gebruik deur skisofreniese teenoor normale (d.w.s nie-skisofreniese) tweetaliges gemaak word. Vier skisofreniese tweetaliges en vier normale tweetaliges (die kontrolegroep) het deelgeneem aan hierdie studie. Die skisofreniese groep en die kontrolegroep is eenders in terme van ouderdom, geslag, vlak van skoolopleiding, T1 (Afrikaans) en T2 (Engels). Informele dertig-minuut lange onderhoude is gevoer met elk van die agt deelnemers, opgeneem op video (vir die skisofrene) en op band (vir die kontrolegroep) en noukeurig getranskribeer. Elke deelnemer se spraakdata is hierna grammatikaal geanaliseer deur middel van Morice & Ingram se (1982) assesseringsinstrument. Hierdie analise het die volgende ingehou: die vasstel van die kompleksiteit van uitinge (met betrekking tot gemiddelde uitingslengte, leksikale digtheid, en die getal van sinsinisiële en sinsinterne voegwoorde) en die identifisering van fonologiese, morfologiese, leksikale, sintaktiese en semantiese foute. Op hierdie wyse is 'n taalprofiel vir elke deelnemer opgestel en die verskille tussen die twee groepe (skisofreniese- en kontrolegroep) is getoets vir statistiese beduidendheid. Op grond van die resultate van hierdie statistiese toetse word daar geargumenteer dat semantiek, eerder as enige van die ander aspekte van grammatika, die lokus van die belangrikste verskil tussen skisofreniese en normale T2 gebruik is. Die tesis sluit af met 'n bespreking van die belangrikste bevindinge van die studie, enkele kritiese opmerkings oor die assesseringsinstrument, asook voorstelle vir verdere navorsing in hierdie veld.

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CHAPTER 1

INTRODUCTION

The term "schizophrenia" refers to a heterogeneous group of mental disorders involving "severe, chronic, and disabling disturbance of brain function" (Paradis 2008:201). Several studies have suggested an important connection between language and schizophrenia, since patients with this disorder "show numerous abnormalities related to language function, including symptoms of disorganised speech, auditory hallucinations, thought disorder, and verbal memory impairments" (Sadock & Sadock 2003). A number of studies have also investigated the phenomenon of varying symptomatology in the two languages of schizophrenic bilinguals (cf. the overviews in De Zulueta 1984 and Paradis 2008), i.e. cases in which a schizophrenic bilingual exhibits different symptoms in his/her first language (L1) than in his/her second language (L2) or appears more ill when interviewed in one of the languages than when interviewed in the other. A better understanding of the language related symptoms of schizophrenia is therefore important to accurately diagnose this type of psychosis in bilingual patients. This is especially necessary in multilingual countries such as South Africa because it often happens that the patient and the psychiatrist have different L1s and, as explained above, whether the patient is then interviewed in his/her L1 or L2 might affect the accuracy of the diagnosis.

Southwood, Schoeman & Emsley (2009) report on a case study of a schizophrenic patient who expressed a preference for his L2 when he started presenting with psychotic symptoms. Even though he preferred to communicate in his L2 and also communicated more effectively in his L2 than in his L1, he made more grammatical errors in his L2 use than in his L1 use and was also clearly less proficient in his L2 than in his L1. Southwood et al. (2009) note that

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the majority of the errors made by this patient in his L2 use are typical of normal L2 learner language use. The study reported in this thesis aimed to investigate, with a larger corpus (including the patient referred to in Southwood et al. 2009) whether the errors made by schizophrenic bilinguals in their L2 use are indeed typical L2 learner errors.

This research question was broken up into the following three questions:

(i)   What are the types and frequency of errors typical of normal L2 use?

(ii)   What are the types and frequency of errors typical of schizophrenic L2 use?

(iii)   What are the differences between the errors referred to in (i) and those referred to in (ii)?

To provide answers to the above questions I compared the L2 use of four schizophrenic bilinguals with the L2 use of four normal bilinguals (where "normal" simply means "non-schizophrenic") using Morice & Ingram's (1982) grammatical assessment tool.

This thesis is organized as follows: Chapter 2 provides a discussion of second language acquisition, error analysis and schizophrenic language use, defining important concepts and referring to previous research on these topics. The study itself - participants, methodology and results - is discussed in detail in chapter 3, and chapter 4 provides (i) a discussion of the conclusions drawn on the basis of the results, (ii) some criticisms regarding Morice & Ingram's (1982) assessment tool, and (iii) suggestions for future research.

CHAPTER 2

LITERATURE REVIEW:

BACKGROUND ON SECOND LANGUAGE ACQUISITION, ERROR ANALYSIS

AND SCHIZOPHRENIC LANGUAGE USE

In this chapter, I will briefly outline the second language acquisition framework within which the research reported on in this thesis was conducted (2.1), explain what error analysis entails in the field of second language acquisition (2.2) and then move on to schizophrenic language use (2.3), specifically providing an overview of research on the language use of schizophrenic bilinguals (2.4).

2.1   Second language acquisition

The research reported on in this thesis was conducted within a generative framework, assuming that first language acquisition (L1A) proceeds on the basis of (something like) Universal Grammar (UG). UG is proposed as part of an "innate biologically endowed language faculty" (White 2003). UG is taken to consist of certain principles and parameters. The principles constrain the form of grammars and encode the properties that all human languages have in common, whereas parameters account for differences across languages (White 2007:42). The idea is that in L1A, the child starts out with some advance knowledge of the language (provided by the principles of UG) and uses the data which he is exposed to, to determine the parameter settings of his language.

The term "L2 acquisition" (L2A) refers to the acquisition of an additional language, i.e. a language that is not a person's L1, and this includes both naturalistic acquisition, as well as

classroom acquisition (Ellis 1997:3). Krashen (1981) distinguished between "acquisition" and "learning", saying that we acquire a language unconsciously by being exposed to the language (in much the same way as children acquire their L1, i.e. naturalistically) and that we learn a language by paying conscious attention to, specifically, the form and "rules" of the language (for example, when being taught the language in a classroom setting). However, in this thesis, I am not concerned with this distinction and I will use the two terms interchangeably. The first question one needs to ask is what the initial state of L2A is, i.e. what linguistic knowledge the L2 learner starts out with. There are a few hypotheses that advocate different initial states. As mentioned above, because I work within a generative framework, I assume that in L1A the learner starts out with UG. However, even researchers who agree that UG constitutes the initial state of L1A, differ as to what constitutes the initial state of L2A. Some researchers claim that UG does not play any role in L2A because (at least older) L2 learners do not have access to UG anymore. This hypothesis is supported by Clahsen & Muysken (1986) who are of the opinion that L2 learners make use of general problem-solving skills when acquiring an L2.

Another hypothesis on the initial state that an L2 learner starts out with is the Minimal Trees hypothesis proposed by Vainikka & Young-Scholten (1994, 1996) which suggests that L2 learners only transfer lexical categories (including headedness) from their L1 and that L2 learners start out with only this. They thus imply that functional categories are not transferred from the L1 and must be acquired gradually with the aid of UG and L2 input. The Initial hypothesis of Syntax (Platzack 1996) is also a hypothesis on the initial state of L2A and advocates that the L1 grammar is not implicated at all in the acquisition of an L2. Other researchers support the notion that the L2 learner begins with a clean slate of UG, as in L1A, and that nothing is transferred from the L1 (Epstein, Flynn & Martohardjono 1996). The

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learner thus supposedly "builds" a grammar from scratch, as (s)he would in L1A.

Yet another group of researchers claim that the initial state of L2A is the final state / steady state of L1A, so that the learner transfers all of the parameter settings from his/her L1 in the initial stages of L2A and starts out with the L1 grammar as a sort of template (Schwartz & Sprouse 1994, 1996; White 1989, 2003). This is referred to as the Full Transfer hypothesis because the learner is assumed to transfer all of the abstract properties from the L1 grammar (excluding, of course, specific lexical items). A number of studies have provided evidence for transfer from the L1 grammar, including Hazdenar 1997; Schwartz & Sprouse 1994, 1996; Slabakova 2000; White 1985, 1986; and Yuan 1998. For the purposes of this thesis, I will also assume Full Transfer.

The version of an L2 that someone is attempting to acquire is that version of the grammar that native speakers of the language have in their heads, and is referred to as the target L2. Because learners start out with their L1 grammar and then make changes to this grammar as they receive exposure to the target language, the grammar that L2 learners have in their heads is not the target L2 grammar, and is referred to as an interlanguage grammar. The term "interlanguage" was first introduced by Selinker in 1972. He recognized that L2 learners construct a linguistic system that "draws, in part, on the learner's L1 but is also different from it and also from the target language" (Ellis 1997:33). He was the first to describe the separate linguistic system that exists between L1 competence and the target L2. This interlanguage system is thus a unique linguistic system where the L2 learner constructs a separate system of abstract linguistic rules that makes comprehension and production in the L2 possible. The interlanguage grammar is open to influence from the outside (through input) and the inside (through transfer and overgeneralization) and it is thus subject to change. The interlanguage

grammar is influenced by both the L1 and the L2 and has features of each, as illustrated by the diagram below.

$$L1 \rightarrow interlanguage \leftarrow L2$$

(O'Grady, Dobrovolsky & Katamba 1997:504)

The Critical Period (CP) hypothesis of L1 acquisition proposes that children have to receive sufficient exposure to a language before the end of the CP (around 7 years – although there is a lot of debate about the exact "cut-off point"), otherwise they will never be able to acquire any language to the level of a mother tongue speaker. Some researchers have argued that such a CP also exists for L2 acquisition – if learners do not start receiving sufficient exposure to a particular language before puberty (although, again, the exact "cut-off" point is still being debated), they will not be able to acquire native-like proficiency in the language (cf. Johnson and Newport 1991). One such proposal is the Fundamental Difference hypothesis, proposed by Bley-Vroman (1990). The central claim of this hypothesis is that in L1A the child makes use of (something like) Universal Grammar (i.e. a module of the brain which is specifically designed for language acquisition) to acquire his L1 but that this module becomes inactive/inaccessible after a certain age (around puberty) and that, therefore, the older learner has to make use of his general problem-solving skills and his knowledge of his L1 to acquire the L2. The role of age in L2A is still being debated, as evidenced by the fact that the journal *Studies in Second Language Acquisition* recently devoted an entire volume (*SSLA* volume 31(2)) to revisiting the Fundamental Difference hypothesis – see contributions by Bley-Vroman, Belikova and White, Montrul, and Song and Schwartz. Although the role of age at the onset of L2 acquisition is thus still a hot topic, it is not referred to again in this thesis, given that all of the participants are late L2 learners, i.e. learners who started acquiring the L2

after puberty. This means that whatever the effects of age are, they would have played a similar role in the L2 acquisition of the normal and the schizophrenic participants.

The next question is *how* the interlanguage grammar develops and here researchers who assume that L1A is constrained by UG again differ as to whether or not UG is involved in L2A and if it is, to what extent. Stated differently, what kind of access, if any, does the L2 learner have to UG? Some researchers argue that the L2 learner, just like the L1 learner, has full access to UG, most importantly to all of the parameter settings of UG (Schwartz & Sprouse 1994, 1996; White 1989, 2003). This means that, where necessary, L2 learners can reset parameters from their initial, transferred L1 setting to the setting which is correct for the target L2 (provided that the required evidence is available in the L2 input). Other researchers claim that the L2 learner only has access to UG via his/her L1 and, therefore, does not have access to those aspects of UG which are not instantiated in the L1 (Hawkins & Chan 1997; Tsimpli & Smith 1991). This means that even when parameter resetting is necessary, it will not be possible, because the learner only has access to the parameter settings of the L1. Selinker's views actually align with this latter hypothesis in that he believed that L2 development can only take place up to a certain point before the interlanguage grammar fossilizes. Lightbown & Spada (1999) define fossilization as instances involving "interlanguage patterns which seem not to change, even after extended exposure to or instruction in the target language". This means that there are certain errors which persist in the learner's L2 use despite continued exposure to and/or instruction in the language. The nature of these errors is discussed in section 2.2.

2.2   Error analysis

In the 1950's and 1960's the focus in L2A research was purely pedagogical; however, there came a shift in interest in the late 1960's with the publication of an article by Corder (1967) entitled "The Significance of Learner Errors". This article suggested that learner errors could provide some evidence of a system underlying them, as well as the knowledge already possessed by the L2 learner. In the above mentioned article Corder distinguished between 'errors' and 'mistakes'. He explained that L2 learners' mistakes could be viewed on the same level as L1 speakers' slips of the tongue and are therefore one-time-only events. Errors, on the other hand, are systematic and thus occur frequently and are also not recognized by the learner as errors (Gass & Selinker 1994:67). Errors thus reflect gaps in the learner's knowledge about the L2, whereas mistakes are occasional lapses in performance as the learner cannot produce what (s)he already knows due to performance factors (i.e. because, for example, (s)he was thinking of something else, was tired or was talking too fast) (Ellis 1997:17).

Gass & Selinker (1994:67) describe error analysis as "a type of linguistic analysis that focuses on the errors learners make"; it is not like contrastive analysis (which involves a comparison with the learner's L1) and rather compares the errors that the learner produces in his/her L2 with the target language itself. Gass & Selinker (1994) are of the opinion that because of this, error analysis provides a broader range of explanations. Language learning errors do not only result from the influence of the L1 but can give a view on the "strategies [that – MS] are employed by the learner in the acquisition of the target language and also from the mutual interference of items within the target language" (Schachter 1974:205). Once the errors in a learner's language have been identified, they can be categorized. O'Grady et al.

(1997:506) discuss three types of errors, namely transfer errors, developmental errors and idiosyncratic errors. Transfer errors can account for errors occurring because of the influence of the L1, while developmental errors occur because learners are still in the process of acquiring the L2. Errors that cannot be categorized as either transfer or developmental errors are called idiosyncratic errors as they differ from individual to individual. For example, if an L1 speaker of German were acquiring English as an L2, (s)he might produce ungrammatical utterances such as those in (1) to (3) below.

(1)   *Yesterday went I to school.

(2)   *She walk to school everyday.

(3)   *That shop opening at nine o'clock on Sundays.

The error in (1) would be categorized as a transfer error since it involves transfer of the verb-second word order from the learner's L1 German (cf. the grammatical German utterance *Gestern ging ich zur Schule* 'Yesterday went I to school'). The error in (2) cannot be due to transfer since German has agreement morphology on its verbs; it is instead a developmental error – the learner is still in the process of acquiring agreement morphology on the verb in the target L2 English, and variable production and omission of the third person singular *–s* in English is characteristic of the L2 use of many learners of English, regardless of their L1. The error in (3) is not due to transfer (using the form *opening* instead of the grammatical form *opens* is not related to a property of German) and neither is it a developmental error (since it is not a type of error which is frequently observed in the L2 use of English by learners from various L1 backgrounds). This error would thus be categorized as idiosyncratic (provided, of course, that the learner makes this type of error – using the present continuous form of the verb when the simple present form is required – frequently).

The two main types of errors that Gass & Selinker (1994:68) refer to are 'interlingual errors' and 'intralingual errors'. Interlingual errors are due to the influence of the L1 (i.e. transfer from the L1), whereas intralingual errors occur because of the developmental state of the interlanguage grammar and are thus independent of the L1 (Gass & Selinker 1994:68). In this way, transfer errors are interlingual in nature, whereas developmental errors are intralingual. It must, however, be kept in mind that the learner's linguistic behaviour consists not only of errors but also of nonerrors and that both errors and nonerrors must be taken into account when investigating the nature of the learner's interlanguage grammar.

The types of errors that occur in the learner's production of the L2 can also be categorized in terms of which aspects of grammar are involved. In this categorization, errors are phonological, morphological, lexical, semantic or syntactic. An example of each of these error types is provided in (4) to (8) below.

	Ungrammatical form	**Target form**	**Type of error**
(4)	*[dəs]	[ðəs]	phonological
(5)	*She walk fast.	She walks fast.	morphological
(6)	*I loaned it from her.	I borrowed it from her.	lexical
(7)	*He didn't engage them.	???	semantic
(8)	*Yesterday went I to school.	Yesterday I went to school.	syntactic

As will be explained in the next chapter, in analysing the schizophrenic and normal participants' L2 use, I identified all errors in their speech samples and categorized each error

in terms of which aspect of the grammar was involved.[1] Before turning to this error analysis, however, an introduction to schizophrenic language use is provided below, with specific reference to work which has been done on bilingualism in schizophrenia.

2.3   Schizophrenic language use

The term "schizophrenia" refers to a heterogeneous group of mental disorders. The symptoms normally involve a "severe, chronic, and disabling disturbance of brain function" (Paradis 2008:201). According to Vetter (1969:41) there are quite a few behavioural manifestations of schizophrenia that include some or all of the following: withdrawal from, and retraction of interest in, the environment, disturbances of thought, increased daydreaming and autistic behaviour. Schizophrenics can also present an alteration of overt behaviour with a tendency toward excess, distortion or inappropriateness of affect.

It has been proposed that schizophrenia can be categorized into two different syndromes based on phenomenological profiles. The type 1 or "positive syndrome" is composed of florid symptoms such as "delusions, hallucinations, and disorganized thinking". The type 2 or "negative syndrome" is characterized by "deficits in cognitive, affective, and social functions, including blunting of affect and passive withdrawal" (Stanley 1987:261). The most general characteristic of schizophrenic behaviour is perhaps the divergence between feeling and thinking (Vetter 1969:141). Every schizophrenic exhibits some positive and some negative symptoms, although no single schizophrenic will exhibit all the mentioned symptoms (as is the case with most disorders). Schizophrenic patients may thus experience "delusions,

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[1] As the controls were matched to the schizophrenics according to their dialect and three members of each group spoke Cape Flats English as their L2, the features of this dialect were also taken into consideration when the analysis was done – see discussion in chapter 3.

hallucinations, disorganised speech, grossly disorganised behaviour and negative symptoms" (Langdon, Davies & Coltheart 2002:77). The fact that a schizophrenic patient's communication is disrupted suggests an important link between language and schizophrenia.

Patients with schizophrenia show "numerous abnormalities related to language function, including disorganised speech, auditory hallucinations, thought disorder and verbal memory impairment" (Sadock & Sadock 2003). Language use and verbal expression can be used as tools that allow a better understanding of the nature of schizophrenia, "for insight into the nature of schizophrenia" and more knowledge can be gained regarding the cognitive processes involved in schizophrenia (Wróbel 1990:1). Matulis (1977:9) suggested that when diagnosing schizophrenia, the patient's language use should play the most significant role as it will clearly "reflect the pertinent degree of psychopathology". According to Matulis (1977), the language of the schizophrenic patient will provide insight into interpersonal relationships, the organization of the mind on a perceptual and cognitive level, as well as the mind's capacity for concentration and attention. The discourse that schizophrenics produce may include passages of "reduced semantic value because sequences are based on alliteration, assonance, rhyme, and formal associations (glossomania); denotation is weakened for the benefit of word play" (Paradis 2008:201).

Matulis (1977) describes schizophrenic speech patterns as being eccentric and difficult to understand. Schizophrenic speech can be described as disconnected, irrelevant, illogical and full of stereotypes. According to Matulis (1977), it can also be full of "abstractions, metaphors, neologisms, perseverations, echolalia, paralogia and long chains of associations, sometimes totally irrelevant" that can be accompanied by occurrences of "mutism, negativism, delusions and absence of need to communicate with the environment".

Brown (1973) suggested that there is no such thing as 'schizophrenic speech' but only 'schizophrenic thought' and as speech (or language) is the main tool for making one's thoughts public, it is the only concrete thing one could study if interested in the way schizophrenics think. Research on schizophrenic language has, however, shown that schizophrenic speech has a few defining characteristics. Cutting (1985:253-259), for example, found that abnormalities were not marked on the phonetic level but that there was some experimental evidence of "change in the perception of expression of the prosodic of phonemes". Cutting (1985) also noted that, while there was some variation between schizophrenic patients, their syntax seemed normal, and their semantics was "not obviously deranged". Cutting (1985) concluded that, in terms of communication, schizophrenics seem to struggle the most on a pragmatic level as they fail to understand "the meaning of words in context, cannot communicate their intended meaning to others, produce insufficient internal cohesion in their own speech, do not cater for the listener's needs and talk irrelevantly rather than incompetently" (Cutting 1985:264-265).

There are a few different approaches to the analysis of schizophrenic language. Some researchers believe that schizophrenic utterances do not create a separate linguistic system, such as a normal person's linguistic system and that schizophrenic language, instead, represents manifestations of highly individualized speech acts. It is widely assumed that schizophrenic language is pathological and that this is the result of a disturbed manner of thinking. The chaotic and incoherent verbal production of some schizophrenic patients is also senseless and incomprehensible, so that Wróbel (1994) argues that both the psychiatrist and the linguist need to describe and classify this phenomenon. The question asked in all of the above mentioned research is whether the schizophrenic's language system is completely

different from or just a distorted version of normal language. In this thesis however, the focus will not be on whether or not schizophrenic language use suggests a separate language system. Instead, this thesis offers an investigation into the types of errors that schizophrenics make in their L2 use and whether these errors are quantitatively and qualitatively similar to or different from those referred to as "typical L2 errors", i.e. errors made by normal L2 learners.

2.4   Bilingualism and schizophrenia

Bilingualism profoundly impacts psychiatric diagnosis and psychotherapy because language is the primary tool of both processes (Paradis 2008:200). The term "bilingualism" can be defined in a number of different ways. Weinreich (1953) defined it as "the practice of alternatively using two languages", which implies that there is a degree of fluency in both languages and that the speaker can alternate between languages without a problem. There are also a number of different types of bilingualism. Hughes (1981), for instance, distinguishes between a balanced bilingual, who has native proficiency in both languages, and a dominant bilingual, who has a higher level of proficiency in one of his/her languages. If a speaker has the two languages organized as separate systems (s)he is referred to as a coordinate bilingual, whereas if the speaker utilises one system for both languages, (s)he is referred to as a compound bilingual. Patients with more than one language offer an opportunity to study the relationship between language and schizophrenia even more thoroughly. It has been convincingly demonstrated that language is organized differently in the brain of a bilingual than in the brain of a monolingual (Hughes 1981). Different areas of the brain are used for different languages - Broca's area separates primary languages spatially from secondary languages, for example (Kim, Relkim, Lee & Hirsch 1997). Since the L2 activates a different part of the brain than the L1, the use of the L2 may protect the bilingual patient from

"psychotic phenomena taking place in the L1" (De Zulueta 1984).

There have been reports that psychotic manifestations can occur in either one or all of the patient's languages. This raises the question of which language to use in therapy and counselling sessions. When a patient can choose between more than one language, the decision should rest on which symptoms are exhibited in each language. One language can be more affected than the other - for example, some patients experience auditory hallucinations and thought disorder only in their L1 (Castillo 1970; Hemphill 1971). Some patients even lose their ability to communicate in their L2 during episodes of psychosis while the symptoms still occur in their L1 (Heinemann & Assion 1996; Hughes 1981). These kinds of phenomena are based on different biological underpinnings, as the L1 and L2 are activated differently in the brain – see above. De Zulueta, Gene-Cos & Grachev (2001) note that some patients seem to present with different or less psychotic symptoms depending on the language they use. Research on the symptoms which bilingual schizophrenics exhibit in their two languages, has yielded diverse results, as discussed below.

There have been some reports that patients with schizophrenia use their L1 almost exclusively during acute episodes of psychosis even though they are fluent in their L2 (Del Castillo 1970; Heinemann & Assion 1996; Hughes 1981; Segovia Price & Cuellar 1981). There have also been reports of patients exhibiting significantly greater psychopathology when interviewed in their L2 (Marcos, Alpert, Urcuyo, Kesselman 1973). There is, for example, a case report of a Wolof-French bilingual patient whose speech in his L2 French was choppy, disconnected, incoherent and violent, while his speech in his L1 Wolof was coherent, calm, fluid and without schizophasia (Dores, M'Bodj & N'Dao 1972). Other research shows that patients appear "obviously psychotic during native-language interviews"

but much less so, or not at all, when the interview is conducted in their L2 (Paradis 2008:204).

It can thus be concluded that for some schizophrenics the L2 appears to be affected to "a different degree and in a different way than the first language" (Oquendo 1996). There are a number of possible reasons why the L2 is the language of choice for some patients in psychotherapy sessions. The L1 is the dominant language regarding the emotional structure, so that patients "may use a second language as a form of resistance to avoid intense affect" (Paradis 2008:204). Another reason could be that because understanding and responding in the L2 requires more effort, using the L2 during therapy can act as a stimulus that "shakes them up and puts them in closer touch with reality" (Del Castillo 1970).

In an article on the differing symptomatology of polyglot patients, De Zulueta et al. (2001) note that some case studies have been done on the intricate relationship between bilingualism and schizophrenia. De Zulueta et al. (2001:281) report on a case study of a 46-year-old Canadian man (Mr P) that illustrates how "different symptoms can be elicited in polyglot patients depending on which language they are speaking". Mr P was arrested for being verbally aggressive and was diagnosed with paranoid schizophrenia shortly after. When a bilingual psychiatrist asked if he knew any other languages he said that he spoke Portuguese. Only when the psychiatrist interviewed Mr P in Portuguese could he give any information on his personal background and history. Mr P was interviewed first in English, then in Portuguese and only the third time in both languages. The bilingual psychiatrist became aware that he gave differing accounts of his life "depending on which language he used" (De Zulueta et al. 2001:282).

Another case study reported on in the above mentioned article is that of a 48-year-old Polish man (Mr Q) who was first thought to be suffering from personality disorders but was later diagnosed as schizophrenic. This was because when he was interviewed in his L2 English (the language he acquired from age 8) the psychiatrist did not pick up any symptoms. When interviewed in his L1 Polish, however, Mr Q admitted that he heard voices (in Polish) that he believed to be the voice of God or the Devil. He was not aware of his different mental states in the two languages. It is thus of cardinal importance to interview polyglots in all their languages as some important psychotic symptoms may be missed when they are only interviewed in one language.

The next chapter reports on an investigation into the types and frequency of errors in schizophrenic bilinguals' L2 use and how this compares to the types and frequency of errors in normal bilinguals' L2 use. Although the focus in this thesis is thus not on the differences between L1 versus L2 use by schizophrenic bilinguals, the above discussion was included as an introduction to differential symptomatology, a phenomenon which one does need to keep in mind when analyzing the L2 speech of schizophrenic bilinguals.

CHAPTER 3

THE STUDY

In this chapter I will first provide some background (personal and linguistic) for each of the eight participants (3.1), describing first the schizophrenic group (3.1.1) and then the control group (3.1.2). In Section 3.2 the methodology of the research will be described in detail and finally, in Section 3.3, the results of the study will be presented.

3.1   Participants

The study's eight participants belong to two groups, each containing four people. The first group consists of the schizophrenic patients while the second group acts as the control group (thus non-schizophrenics). All participants are late bilinguals, i.e they acquired their L2 after the CP (cf. section 2.1), with L1 Afrikaans and L2 English. The control group was matched to the schizophrenic group in terms of age, gender, L1 and L2 dialect, level of schooling and age at the onset of L2 acquisition. There were three schizophrenic patients who spoke a non-standard dialect of Afrikaans, namely Cape Flats Afrikaans or Kaaps, and a non-standard dialect of English, namely Cape Flats English (CFE). For this reason, three of the members of the control group were also L1 speakers of Cape Flats Afrikaans with CFE as their L2. Before turning to the participants, a brief diversion is necessary regarding the L2 dialect spoken by these participants, namely CFE.[2]

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[2] Because I only analyzed the participants' use of their L2, I will not discuss features of Cape Flats Afrikaans here. The reader is referred to McCormick (1989) for a discussion of this dialect.

CFE originated in the area which used to be referred to as District Six and this dialect is still mostly spoken by coloured people in the greater Cape Peninsula area (Stone 1995). The dialect originated due to language contact between Afrikaans and English in these communities. The contact between these two languages continues to change the situation from Afrikaans monolingualism to Afrikaans-English bilingualism, which, in turn, sometimes rapidly leads to English monolingualism. Many Afrikaans-speaking parents in these areas, for example, believed that native speakers of English had access to better opportunities than native speakers of Afrikaans (both locally and internationally) and therefore spoke only English to their children.[3] The children thus received "second language input" at home (McCormick 1993:66) and this led to the rise of a new variety of English, CFE, which is no longer only an L2 variety but is rapidly gaining L1 speakers (because of the context set out above). This non-standard dialect has features of Standard South African English (SSAE) and features which have been transferred from Afrikaans, as well as some unique features. Some of the differences between SSAE and CFE are briefly illustrated with the aid of examples below (the examples are taken from McCormick 1989). Firstly, Afrikaans loan-words that cannot be translated accurately into English are frequently used as fillers (cf. the use of *maar* in example (9)).

(9) He had maar a brown jacket on.

Calques can also occur when children are brought up in English by L1 Afrikaans parents who speak an L2 variety of SSAE in their homes (cf. the use of a direct translation from Afrikaans in example (10)).

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[3] For a discussion of the on-going shift from Afrikaans to English, see Anthonissen & George 2003; De Klerk & Bosch 1998; and Dyers 2008a, 2008b.

(10)   Buy for you also that. (directly from the Afrikaans *koop vir jou ook dit*)

Tense, aspect and modal auxiliaries are often omitted in CFE where they are obligatory in SSAE (cf. the omission of the auxiliary in example (11)).

(11)   They trying to spend it on me.

Double negation may occur in CFE, something which might well have been transferred from Afrikaans (cf. the use of *don't* in combination with *nowhere* in example (12)).

(12)   She don't want to write nowhere.

Some CFE speakers substitute *what* for *which* and *much* for *many* (cf. examples (13) and (14)).

(13)   Kevin, what side is this?
(14)   How much pages was here?

Example (14) also illustrates the optionality of overt morphological agreement in number between the subject of a clause and its finite verb. CFE speakers would, for example, alternate between *The books were expensive* and *The books was expensive*. All non-SSAE features of CFE can differ in frequency of occurrence as the CFE dialect is not consistent and may differ from area to area or with regard to age (McCormick 2002).

Keeping the focus of this thesis in mind – i.e. a comparison of schizophrenic L2 use and normal L2 use – I will not discuss the features of CFE in more detail. For more information on this dialect, the interested reader is referred to McCormick (1989, 1993) and Stone (1995). However, I did take dialect variation into account by matching the three schizophrenic speakers of L2 CFE with three speakers of L2 CFE in the control group. Whenever necessary, I also took dialect variation into account in my analysis of the participants' L2 use, as will become clear from my discussion of the results in section 3.3. Firstly, however, I will briefly introduce the eight people who participated in the study.

3.1.1 Schizophrenic group

All four of the schizophrenic patients were in- or out-patients at Stikland Psychiatric Hospital in Cape Town at the time that the interviews were conducted. All of the participants were interviewed by a psychiatrist in their L1 and L2 and were diagnosed with schizophrenia. In all cases the participant was tested with the Positive and Negative Symptom Scale or SCI-PANSS (Kay, Fiszbein & Opler 2004). The language background questionnaire of Fernandez (2003) was completed for all schizophrenic patients (see Appendix A). All of the participants were more ill in their L1 than in their L2 according to the results of the SCI-PANSS. This was particularly true for positive symptoms such as hallucinations and delusions. One of the patients even declared that the auditory hallucinations in his L1 were clear while in his L2 he merely described the symptoms as "noise" (Southwood et al. 2009:165).

The four schizophrenic participants were given the pseudonyms Mr A, Mr B, Mr C and Mr D, respectively. Mr A is a 21-year-old coloured male from Blue Downs on the Cape Flats. His L1 is Afrikaans and his exposure to English began at age 10 although he only started

using the language in high school (and even then still preferred to use Afrikaans). He completed Grade 11. He continued to prefer Afrikaans over English, although his family reported that he was using English more frequently than Afrikaans when they brought him to Stikland.

Mr B is a 27-year-old coloured male from Voorbrug, Delft. His L1 is Afrikaans and he only spoke Afrikaans while growing up, also attending an Afrikaans primary school and an Afrikaans high school. Mr B's exposure to English started at age 9, but he only started using the language in high school. He completed Grade 10. After school, he used Afrikaans at home and with friends and he only used English in social contexts. At the time of the interview his family reported that he was using English more frequently than Afrikaans.

Mr C is a 24-year-old white male originally from Moorreesburg. Mr C started his schooling in Afrikaans and only began receiving substantial exposure to English (at school) at the age 15 (owing to the fact that he grew up in an Afrikaans-speaking community). In primary school as well as in high school the language of instruction was Afrikaans. Mr C completed Grade 12 and went on to study at a tertiary institution, during which time he used English more than Afrikaans for academic as well as social purposes. From age 21 he also started attending an English-medium church. He switched from Afrikaans to English as language of preference six months before his admission to Stikland, noting that his thoughts seemed to be "better organised" in English and that he could "talk more easily" in this language.

Finally, Mr D is a 22-year-old coloured male who spoke only Afrikaans while growing up, and attended an Afrikaans primary school and an Afrikaans high school (completing Grade 9). He started receiving exposure to English at age 9 (at school) but only started using the

language at high school. Afrikaans remained his language of preference at home, at school and in social contexts. When he was brought to Stikland by his family, they reported that he had started speaking only English since he had fallen ill (i.e. since he had started exhibiting symptoms of schizophrenia). After Mr D was diagnosed with schizophrenia, an attempt was made to interview him for 30 minutes in Afrikaans and 30 minutes in English (see section 3.2 on methodology). However, even though the interviewer tried to get him to speak Afrikaans, he spoke only English. He seemed to be willing to cooperate but simply unable to speak Afrikaans. When reminded by the interviewer that they should be conversing in Afrikaans, he would apologize, produce at most one sentence in Afrikaans and then revert to English. On the psychiatrist's recommendation, the interview was cut short and another interview was attempted a week later (i.e. following an additional week's medical treatment and therapy). During this second interview, Mr D was able to speak Afrikaans and English and it is this interview which was analysed for the purposes of this thesis.

3.1.2   Control group

The four participants in the control group were given the pseudonyms Mr W, Mr X, Mr Y and Mr Z, respectively. All four participants completed a language background questionnaire (see Appendix B). Mr W is a 22-year-old, bilingual coloured male who grew up in Kuilsriver. His L1 is Afrikaans and although he was exposed to English through family and the media he still preferred to use Afrikaans as his academic language when he attended a double medium (Afrikaans-English) high school. Mr W is very comfortable in both languages and uses both Afrikaans and English in social settings.

Mr X is a 25-year-old coloured male originally from Napier. He received both his primary

and high school education in Afrikaans but was exposed to English as an L2 in high school. Mr X uses Afrikaans as his preferred language in a social environment but he is also very comfortable switching to English if the situation requires it and he prefers to use English for his creative writing.

Mr Y is a 23-year-old white male who was born in Johannesburg. He moved to Stellenbosch at age 16. Mr Y was exposed to English in primary school but only used Afrikaans at home and as his language of instruction in primary and high school. Mr Y is now using English as an academic language while studying for his Master's degree in Electronic Engineering. In social settings Afrikaans is still Mr Y's preferred language and although he does have some English friends, he does not often socialize in English.

Finally, Mr Z is a 27-year-old coloured male from Cloetesville. His L1 is Afrikaans and he used only Afrikaans at home while growing up. Mr Z received his primary and high school education in Afrikaans and although he was exposed to English via the media since primary school he still prefers using Afrikaans in every area of his life. He does use English sometimes while working with English clients and when socializing with English friends. Mr Z is comfortable in both languages.

3.2   Methodology

Spontaneous speech samples were collected from each of the eight participants by means of informal interviews. The interviews involved informal conversation on topics such as where the participant had grown up and gone to school, what their hobbies or interests were, where they were working or had worked previously and, for some of the schizophrenic participants,

what their perceptions were of their illness and the treatment that they were undergoing. One of the interviews with the schizophrenics was conducted by a psychiatrist (the interview with Mr B) while the other three were conducted by a linguist. All four of these interviews took place in the research unit at Stikland Hospital and each interview lasted about one hour, consisting of 30 minutes' conversation in the participant's L1, followed by 30 minutes in their L2. The whole hour's conversation was recorded on a video camera and transcribed orthographically but only the 30 minute L2 conversation was analysed for the purposes of the current study.[4]

The schizophrenic group's interviews were recorded on a video camera because these data were meant to be used for an assessment of the pragmatic skills of the schizophrenics, as well (see footnote 4). The control group's interviews were conducted by myself and recorded on a Dictaphone (video recordings were unnecessary because I was not interested in the participants' pragmatic skills). These interviews also did not involve an L1-part because I was only interested in the participants' L2 use. The control group's speech samples thus consist of about 30 minutes' informal conversation in their L2, per participant. The recorded speech was transcribed orthographically by myself.

Following transcription, the data for each participant were carefully divided into T-units. This was done by pre-established linguistic rules using syntax, intonation and meaning. A T-unit, according to Hunt (1970:4), is "one main clause plus whatever subordinate clause and non-clausal expressions are attached to or embedded within it". Conjunctions such as *because* and *and* were thus taken to introduce a new T-unit. These T-units were then analysed

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[4] See Theron (2009) for a pragmatic assessment and comparison of each of these four participants' L1 versus L2 use.

grammatically using Morice & Ingram's (1982) model, which was designed to analyse the language use of schizophrenics. For each of the participants, a language profile was put together that was comprised of variables "reflecting the complexity, integrity and fluency of spoken language" (Morice & Ingram 1982).

Semantic, syntactic and word level errors were identified and counted. The word level errors consisted of phonological errors, morphological errors (inflectional and derivational), as well as neologisms. Counts were also done to reflect length and density, the nature and frequency of pauses and the frequency of conjunctions such as *and*, *or* and *because* (both sentence-medially and sentence-initially).

For each of the participants who spoke CFE, every word, phrase or utterance that deviated from SSAE in some way was categorized as "ungrammatical in SSAE but grammatical in CFE" or "ungrammatical in both SSAE and CFE".

Table 1 (on the next page) represents the variables that Morice & Ingram (1982) proposed for the analysis of schizophrenic speech. The variables refer to unintelligibility, disfluency, semantic and syntactic deviance, word level errors, and conjunctions.

Table 1. Morice & Ingram (1982)

Utterance type or measure	#	Percentage
1. Total number of utterances		
2. Mean length of utterance (all words)		
3. Mean length of utterance (major lexical items)		
4. Mean lexical density		
5. Utterances containing uncomfortable pauses		
6. Utterances containing pause fillers		
7. Utterances containing repeated single words, syllables, or sounds		
8. Utterances containing repeated words (multiple)		
9. Utterances containing false starts retraced, revisions, or abandoned sentence fragments		
10. Utterances containing unintelligible parts		
11. Syntactically deviant utterances		
12. Semantically deviant utterances		
13. Number of neologisms		
14. Number of phonological errors		
15. Number of errors in derivational morphology		
16. Number of errors in inflectional morphology		
17. Total number of word level errors		---
18. Mean number of word level errors per utterance	---	
19. Utterances containing sentence-initial *en/and*		
20. Utterances containing phrasal *and*		
21. Utterances containing sentence-initial *or*		
22. Utterances containing phrasal *or*		
23. Utterances containing *but*		
24. Utterances containing *because*		

The total number of utterances [1] was used to determine the mean length of utterance (MLU) [2] by taking the total number of words and dividing it by the total number of utterances.[5] The number of major lexical items was determined by excluding the following items from the word count:

(i)   fillers such as *mm*, *um*, *uh*, or *oh* (cf. Brown 1973:54);

(ii)   unintelligible words (cf. Unsworth 2005:200);

(iii)   words constituting false starts;

(iv)   words which were direct repetitions of the previous ones, like the second *it's* in *It's it's her foster parents*;

(v)   formulaic phrases, such as *you know*, *you know what I'm saying*, *see*, *you see*, and *how can I say*;

(vi)   phrases such *all of those things*, *all of those facts*, and *all of that* (cf. Unsworth 2005:201);

(vii)   address forms, such as *missus*, *my brother*, *old friend* and *man*; and

(viii) exclamations, such as *well*, *hey*, *hell* and *wow* (cf. Southwood et al. 2009).

A second MLU [3] was then calculated by dividing the number of major lexical items by the number of utterances. The mean lexical density [4] was determined by dividing the second MLU (based on the number of major lexical items) [3] by the first MLU (based on the total number of words) [2].

The uncomfortable pauses counted for [5] were all at awkward places in the utterance or even inside a word, as in example (15) below.

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[5] The numbers in square brackets refer to the numbers in Table 1.

(15)   …it's nothing…really…uh PAUSE out of the extraordinary (Mr C)

For number [6] the following were counted as pause fillers: *uhm, well, ja, né, like,* and *now*, as in example (16).

(16)   to develop our uhm uhm interest ja (Mr W)

Repeated words, syllables and/or sounds were counted for [7] (instances in which the repeated item consisted of a single word/syllable/sound) (see example 17) and [8] (instances in which the repeated item consisted of more than one word) (see example 18).

(17)   to-today we're doing this (Mr D)

(18)   people are people are living on the borderline (Mr X)

The count in [9] involved utterances that contained false starts (19), retraces and revisions (20) or abandoned sentence fragments (21).

(19)   and then in high when I went to high school (Mr X)

(20)   but to up the..a..community and but most of my family lives in Stellenbosch, though (Mr W)

(21)   um uh and we would also um from that events um (the next line reads "we were not really um into the money") (Mr C)

For [10] all utterances containing unintelligible parts (indicated by "xxx" in the transcripts)

were counted.

(22) because it was blue xxx (Mr Y)

Utterances were considered syntactically deviant [11] if their word order was incorrect (23) and if a word was either incorrectly inserted (24) or incorrectly omitted (25).

(23) I'm born in Stellenbosch and staying currently in Cloetesville (Mr Z)

Target: I was born in Stellenbosch and am currently staying in Cloetesville

(24) and they went to the rehabilitation centrum on when I've while I was working for my father (Mr C) (insertion of the preposition *on*)

(25) like parking lot for planes (Mr Y) (omission of the article *a)*

Utterances were counted as semantically deviant [12] if their meaning was unclear (26) or if they seemed to be meaningless (27).

(26) because your car was busy with the uhm some compression (Mr Z)

(27) it's uh a visual showcase of um visual art and uh or contemporary art (Mr C)

The number of neologisms [13] in each speech sample involved all words which were not real/existing words of the English language (see example (28)).

(28) I find it unregrettable (Mr D)

Phonological errors were counted for [14] and involved any deviances from SSAE. In the

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transcripts, each such deviant pronunciation produced by a speaker of CFE was marked as either CFE (i.e. involving a typical feature of CFE pronunciation) or incorrect (involving a pronunciation that deviates from both SSAE and CFE). However, because of the large overlap between (i) pronunciations that are typically CFE and (ii) pronunciations that are typical for L1 speakers of Afrikaans with L2 SSAE, it was not possible to distinguish between these two types of deviant pronunciations (where "deviant" refers to "non-SSAE"). This is illustrated by the fact that both Mr A (an L2 speaker of CFE) and Mr C (an L2 speaker of SSAE) pronounced *church* as [tʃœrtʃ], which is the CFE-pronunciation but is also a typical L2 SSAE-pronunciation for L1 speakers of Afrikaans. For this reason, the count in [14] for each participant includes both types of deviances from SSAE.

Morphological errors were divided into those involving derivational morphology [15] and those involving inflectional morphology [16]. An example of a derivational error is provided in (29). By far the majority of inflectional errors involved tense (as in (30)) or agreement (as in (31)).

(29)   I get very attach (Mr X)

(30)   so I'm gonna stood like a man (Mr D)

(31)   the plane's mechanical components wasn't really working (Mr Y)

The count in [17] involves the total number of word level errors (the sum of all neologisms, phonological errors and morphological errors) and [18] provides the mean number of word

level errors per utterance (the total number of word level errors divided by the total number of utterances).[6]

For [19] to [24] a count was done of the relevant conjunctions used by each participant, noting how many utterances contained sentence-initial *and* [19], phrasal/sentence-medial *and* [20], sentence-initial *or* [21], phrasal *or* [22], *but* [23] and *because* [24], respectively.

3.3   Results

Table 2 contains the results for each of the eight participants (Mr A to Mr Z) as well as for the two groups (schizophrenics and controls). (The Morice & Ingram table was, of course, completed for each participant individually. These individual tables – which include actual counts for each of the measures in addition to the percentages given in Table 2 - are provided in Appendix C.) As mentioned above, six of the participants are L2 speakers of CFE while the other two are L2 speakers of SSAE. For the purposes of this thesis, the most significant differences between the two dialects are phonological and syntactic. As explained in section 3.2 above, it was not possible to distinguish between (i) pronunciations that are typically CFE and (ii) pronunciations that are typical for L1 speakers of Afrikaans with L2 SSAE. For this reason the counts in [14] include both of these types of deviances from SSAE pronunciation. With respect to syntactically deviant utterances, it is, however, possible to distinguish between (i) syntactic constructions that are ungrammatical in SSAE but grammatical in CFE (cf. example (32) below) and (ii) syntactic constructions that are ungrammatical in both

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[6] In my discussion of the results (3.3), I collapsed the two counts in [17] "Total number of word level errors" and [18] "Mean number of word level errors per utterance" into one count [17] headed "Total word level errors", which is presented as a percentage (percentage of utterances containing word level errors), so that it is more easily comparable to the other measures. The numbering of the table is adapted accordingly.

SSAE and CFE (cf. example (33) below). Only utterances that are syntactically deviant in both SSAE and CFE were included in the counts provided in [11].

(32)   and you talking to your mother (Mr B)

(33)   people is throwing stones at the hokkie I what I there (Mr B)

Table 2. Individual and group results of grammatical analysis

Utterance type or measure	Mr A	Mr B	Mr C	Mr D	Schizo group	Mr W	Mr X	Mr Y	Mr Z	Control group
1. Total number of utterances	264	395	201	416	**319**	396	340	319	155	**302.5**
2. Mean length of utterance (all words)	8.250	7.754	11.124	6.774	**8.476**	8.442	8.4	9.489	6.555	**8.221**
3. Mean length of utterance (MLI)	6.989	6.974	8.776	5.947	**7.172**	7.639	7.238	8.743	5.994	**7.404**
4. Mean lexical density	0.847	0.8994	0.789	0.877	**0.853**	0.905	0.861	0.921	0.914	**0.9**
5. Utterances containing uncomfortable pauses	2.273	3.038	1.99	0	**1.825**	0	0	0	0	**0**
6. Utterances containing pause fillers	24.242	7.848	76.119	15.384	**30.898**	21.212	39.412	30.408	14.194	**26.307**
7. Utterances containing repeated single words, syllables, or sounds	14.394	7.595	18.905	6.25	**11.786**	8.333	23.824	15.361	6.452	**13.493**
8. Utterances containing repeated words (multiple)	6.439	2.785	3.98	1.923	**3.782**	0.758	6.176	2.821	5.806	**3.89**
9. Utterances containing false starts retraced, revisions, or abandoned sentence fragments	17.803	7.089	23.881	3.125	**12.975**	4.04	7.647	4.389	5.806	**5.471**
10. Utterances containing unintelligible parts	4.545	2.532	3.98	25.962	**9.255**	27.273	9.706	9.091	16.129	**15.55**
11. Syntactically deviant utterances	4.545	5.063	12.438	4.808	**6.714**	6.313	4.412	9.091	9.032	**7.212**

Table 2. Individual and group results of grammatical analysis (continued)

Utterance type or measure	Mr A	Mr B	Mr C	Mr D	Schizo group	Mr W	Mr X	Mr Y	Mr Z	Control group
12. Semantically deviant utterances	11.742	6.582	9.95	25.481	**13.439**	2.02	1.765	2.194	4.516	**2.624**
13. neologisms	0	0.759	2.488	1.202	**1.112**	0	0	0	0.645	**0.161**
14. phonological errors	12.879	13.924	6.468	6.49	**9.94**	10.859	5.0	3.762	3.871	**5.873**
15. errors in derivational morphology	0	0.506	0	0.721	**0.307**	0.505	0.588	0.94	0	**0.508**
16. errors in inflectional morphology	13.636	1.266	15.423	4.087	**8.603**	9.596	7.353	6.897	7.742	**7.897**
17. Total: word level errors	26.515	1.456	24.378	12.5	**19.962**	20.96	12.941	11.599	12.258	**14.44**
18. Utterances containing sentence-initial *and*	22.727	12.405	41.791	6.25	**20.793**	19.697	18.529	36.364	8.387	**20.744**
19. Utterances containing phrasal *and*	8.333	7.595	10.448	5.529	**7.976**	12.121	13.529	7.524	8.387	**10.39**
20. Utterances containing sentence-initial *or*	0	1.266	0	1.442	**0.677**	0.253	0.294	0	0	**0.137**
21. Utterances containing phrasal *or*	0.379	1.519	4.975	0.721	**1.899**	2.273	0.294	1.567	0.645	**1.195**

Table 2. Individual and group results of grammatical analysis (continued)

Utterance type or measure	Mr A	Mr B	Mr C	Mr D	Schizo group	Mr W	Mr X	Mr Y	Mr Z	Control group
22. Utterances containing *but*	6.818	3.291	2.488	6.01	**4.652**	13.889	11.176	11.285	7.097	**10.862**
23. Utterances containing *because*	1.894	5.57	0.498	7.452	**3.854**	4.293	5.294	5.016	4.516	**4.78**

Note: The numbers in rows 1-4 are counts and the numbers in rows 5-23 represent percentages. The numbers (rows 1-4) and the percentages (rows 5-23) in the "Schizo Group" and the "Control Group" columns are the means for each group on each measure.

The total number of utterances [1] was highly comparable for all eight participants after an interview of a half an hour each. This is also true for both MLUs ([2] and [3]) as well as the mean lexical density [4].

The percentage of utterances containing uncomfortable pauses [5] is much higher for the schizophrenics (1.825%) than for the controls (0%), as the control group did not produce pauses that could be categorized as "uncomfortable". As mentioned above, the pauses counted for [5] were really long and occurred mostly in awkward places in the utterance – see examples (34) to (36).

(34)   and I went PAUSE and I went with the two pastors (Mr A)

(35)   ja that was my life PAUSE using the tik (Mr B)

(36)   ....it's nothing...really uhm PAUSE out of the extraordinary (Mr C)

These types of pauses can mainly be explained by the patients' problems with word finding, especially when trying to order their thoughts or explain something emotionally loaded.

For [6] the pause fillers were counted and the percentage for the schizophrenic group (30.898%) is not much higher than that for the control group (26.307%). Note, however, that 76.119% of Mr C's utterances contained pause fillers, which is almost double the second highest percentage – namely 39.412% for Mr X (see Figure 1). Mr C was also the participant who seemed to experience word finding problems most frequently.
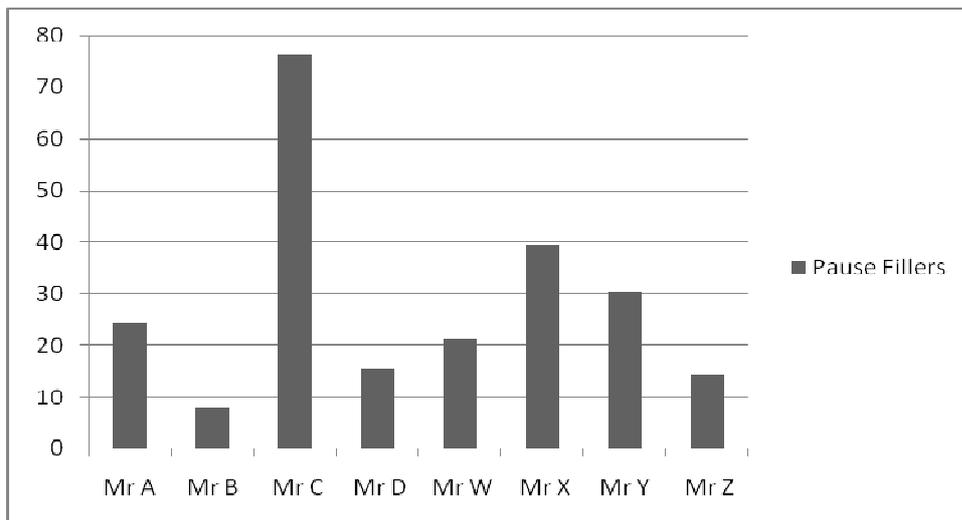
Figure 1. Percentage of utterances containing pause fillers

The percentages for repeated single words, syllables and sounds [7] were very similar for the two groups - 11.786% of the schizophrenics' utterances and 13.493% of the controls' utterances contained such repetitions (see Figure 2 and examples (37) to (44)).
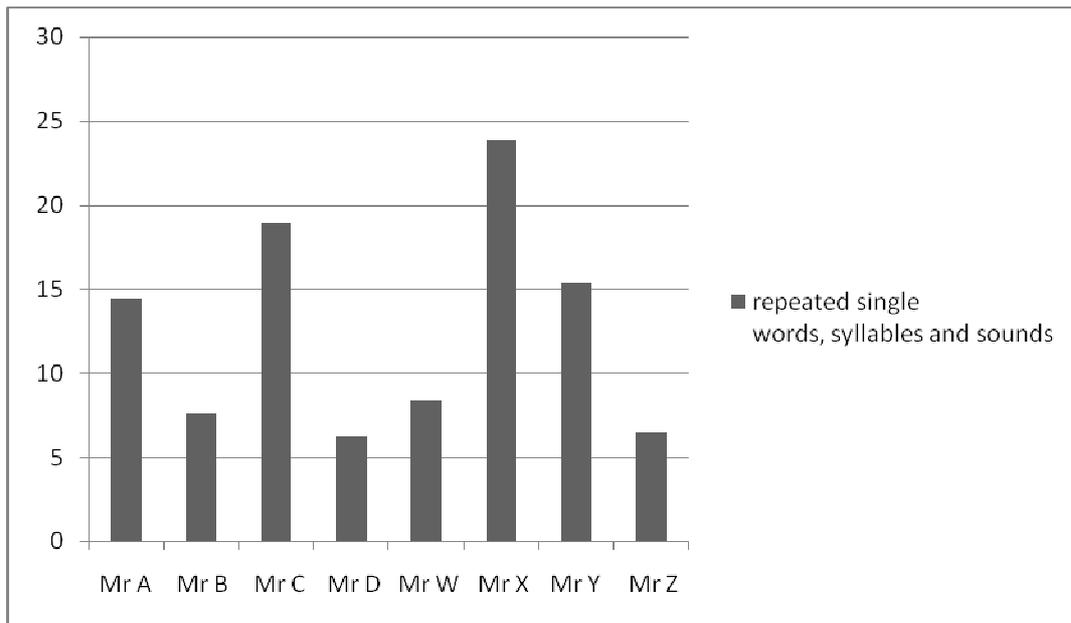
Figure 2. Percentage of utterances containing repeated single words, syllabels or sounds

(37) they would go to to a mall or something (Mr A)

(38) not not at the moment (Mr B)

(39) no there there was a script (Mr C)

(40) righto, to-today we're doing this (Mr D)

(41) but I I got it now (Mr W)

(42) I love my my community (Mr X)

(43) we started seriously about about two months ago (Mr Y)

(44) because I'm I'm six days at work (Mr Z)

The percentages for repeated multiple words [8] were even more comparable for the two groups - 3.782% for the schizophrenic group and 3.89% for the control group (see examples (45) to (52)).

(45)   ja there is there is things that I watch (Mr A)

(46)   I saw I saw that few guys there (Mr B)

(47)   I was I was feeling very in a high (Mr C)

(48)   and you do it, and you do it correctly (Mr D)

(49)   did you get sick because of the of the pollution (Mr W)

(50)   I think that is that is the big reason why (Mr X)

(51)   it was always like just a hobby at the at the end (Mr Y)

(52)   I really I really miss him sometimes (Mr Z)

However, a much higher percentage of the schizophrenic group's utterances contained false starts, retraces, revisions and/or abandoned sentence fragments [9] (see Figure 3) – 12.975% of the schizophrenics' utterances vs. 5.471% of the controls' utterances. And again Mr C's language use stands out as the least fluent, with almost 24% of his utterances containing false starts, revisions and/or abandoned sentence fragments. Examples from the participants' speech are provided in (53) to (60) below.
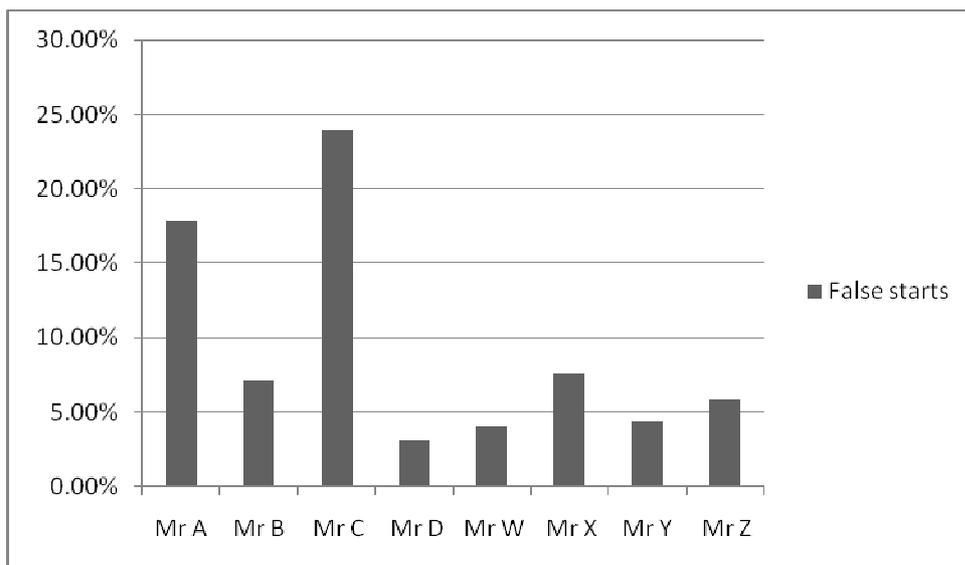
Figure 3. Percentage of utterances containing false starts, revisions or abandoned sentence fragments

39

(53)   and my then two pastors came two friends of my father (Mr A)

(54)   I wanna um make um build on a room there at the back (Mr B)

(55)   and uh I was I felt then um very um weak and dehydrated (Mr C)

(56)   it's what you make of uhm uhm I can say (Mr D)

(57)   I went I was a bit crazy on Friday (Mr W)

(58)   getting my getting a sense of freedom (Mr X)

(59)   he's not like he really doesn't know where he is or where he was (Mr Y)

(60)   I was I had three crash courses (Mr Z)

Interestingly, a higher percentage of the controls' utterances (15.55%) than the schizophrenics' utterances (9.255%) contained unintelligible parts [10]. However, I believe that this can be ascribed to the fact that I did not use sophisticated equipment to record the interviews with the controls. Therefore, the transcription of their speech was more difficult and more utterances were marked as containing unintelligible parts.

As was mentioned at the beginning of this section, dialect variation was taken into consideration in counting the syntactically deviant utterances produced by the six CFE speakers (schizophrenic participants Mr A, Mr B and Mr D, as well as controls Mr W, Mr X and Mr Z). Therefore, for [11] in Table 2, all deviations from SSAE are included in the percentages for the SSAE participants, Mr C and Mr Y. The percentages for [11] for the six CFE speakers, however, do not include utterances that are syntactically deviant in SSAE but grammatical in CFE; the percentages only include those deviations from SSAE which are ungrammatical in SSAE *and* CFE. It should be noted that if this dialect variation were not taken into account, the percentage of syntactically deviant utterances would be considerably

higher for the CFE speakers. This is indicated by Table 3 below, which shows the increase in percentages for the CFE-speakers when dialect variation is not taken into account.

Table 3. Effect of dialect variation on percentages of syntactically deviant utterances

	Mr A	Mr B	Mr C	Mr D	Schizo Group	Mr W	Mr X	Mr Y	Mr Z	Control Group
Syntactically deviant utterances (ignoring dialect variation)	9.848	10.12	12.438	9.135	10.387	6.566	5	9.091	9.032	7.422
Syntactically deviant utterances (taking dialect variation into consideration)	4.545	5.063	12.438	4.808	6.714	6.313	4.412	9.091	9.032	7.212

This table shows that whether or not one takes dialect variation into account, has a significant effect on the percentage of utterances regarded as syntactically deviant for speakers of CFE. Therefore, if the schizophrenic group consisted of three CFE speakers and one SSAE speaker (as it did), and the control group consisted of four SSAE speakers, a significant difference might have shown up between the two groups purely because of dialect variation. This is the reason why three CFE speakers and one SSAE speaker were picked as members of the

control group for this study – so that the dialect variation observed within the schizophrenic group could be matched to dialect variation within the control group. As a result, ignoring dialect variation in the count of syntactically deviant utterances leads to higher percentages for both the schizophrenic group *and* the control group, and taking dialect variation into account leads to lower percentages for both the schizophrenic group *and* the control group. Importantly, regardless of whether or not one takes dialect variation into account, the percentages of syntactically deviant utterances for the two groups remain very similar: cf. 6.714% (schizophrenics) and 7.212% (controls) (when dialect variation is taken into account) vs. 10.387% (schizophrenics) and 7.422% (controls) (when dialect variation is ignored).[7] The percentages in Table 3 are also presented visually in Figures 4 and 5 below.
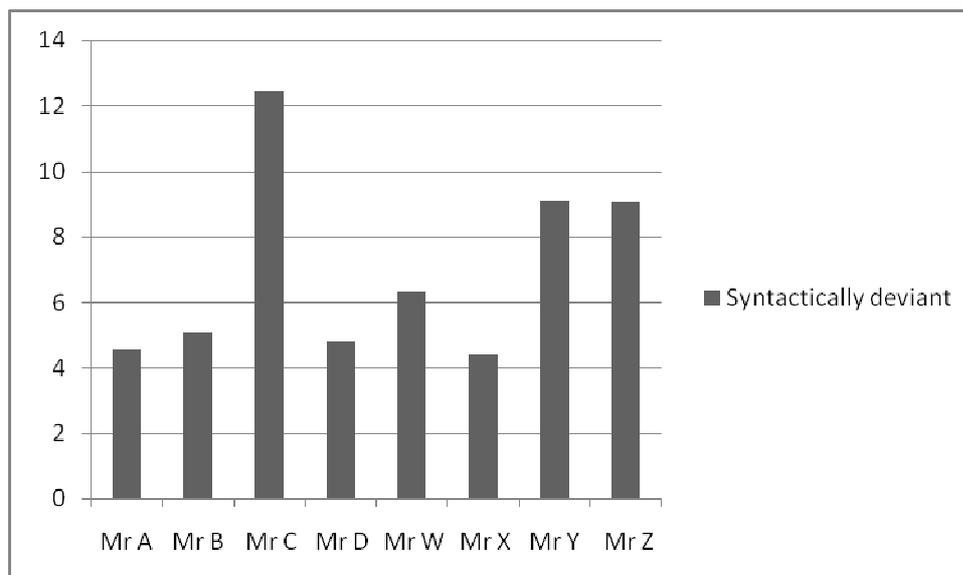
Figure 4. Percentage of syntactically deviant utterances (dialect variation taken into account)

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[7] Note that dialect variation is the reason why Mr C's and Mr Y's percentages of syntactically deviant utterances are so much higher than the other six participants' percentages: Whenever one of these speakers of SSAE produced an utterance that, for example, had a missing auxiliary, this was counted as a syntactically deviant utterance; whenever one of the other six participants produced such an utterance, it was regarded as a feature of their dialect of English, namely CFE, and not counted as a syntactically deviant utterance.
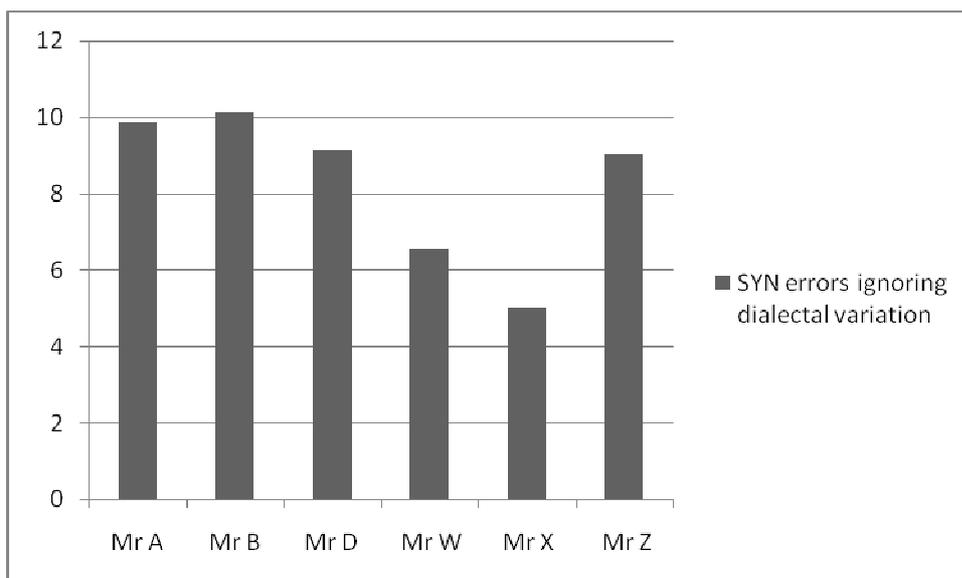
Figure 5. Percentage of syntactically deviant utterances (dialect variation ignored)

Mr A produced 12 utterances (constituting 4.545% of his utterances) that are ungrammatical in both CFE and SSAE. However, only two of these errors were typical for an L2 speaker of English with L1 Afrikaans (see example (61) which has an Afrikaans word order). The other ten errors belong to another category and can be classified as "weird" or at least idiosyncratic (see example (62)).

    (61)   ja I can still remember I was with them in Sunday school

    (62)   ja more comfortable I feel

Mr A also produced 14 utterances that can be regarded as ungrammatical in SSAE but are typical of CFE (see examples (63) and (64)).

    (63)   and how the animals just walking pass (auxiliary omitted)

    (64)   I was thinking like working up to a manager (reflexive pronoun missing)

Mr B produced 20 utterances (constituting 5.063% of his utterances) that are syntactically deviant in both SSAE and CFE. Some of these errors are typical of those produced by L2 speakers of English with L1 Afrikaans (see example (65), which has an Afrikaans word order) but the majority of the errors are untypical and, again, seem idiosyncratic (see example (66)). Mr B also produced 20 utterances that can be regarded as ungrammatical in SSAE but are typical of CFE (see examples (67) and (68)).

(65)   no ma'am I wasn't once at the movies

(66)   well then something you can do life about that

(67)   because I once take my life almost

(68)   and you talking to your mother

Recall that Mr C is an L2 speaker of SSAE. Mr C produced 25 syntactically deviant utterances, constituting 12.438% of his utterances. Mr C made four types of syntactic errors, involving the following: (i) the insertion of a function word where no function word is required (example (69)), (ii) the omission of a function word when a function word is required (example (70)), (iii) Afrikaans word order (example (71)) and (iv) utterances with a deviant word order that is not due to transfer from Afrikaans (example (72)).

(69)   and uh and they went to the rehabilitation centrum on when I've while I was
        working for my father
        Target: and they went to the rehabilitation centre when I was working for my father

(70)   and uh I dropped out of film school second year
        Target: and I dropped out of film school in second year

(71) uh I know I was for two years off the drugs

      Target: I know I was off the drugs for two years

(72) uh xxx I was I was feeling very in a high on the stage what I was doing

      Target unclear

Mr D produced 20 utterances that deviated syntactically from both SSAE and CFE, constituting 4.808% of his utterances. The three types of errors that occurred most frequently in his data involved (i) the omission of prepositions (see example (73)), (ii) the omission of verbs (see example (74)), and (iii) incorrect word order (see example (75)). Mr D produced an additional 18 utterances that are ungrammatical in SSAE but acceptable in CFE (see example (76)).

(73) they came parties

      Target: they came to parties

(74) that they don't want near me

      Target: that they don't want to be near me

(75) I'm gonna be now open with you

      Target: I'm gonna be open with you now

(76) because they awesome business persons, work in business

      Target: because they are awesome business people

Turning to the control group, 25 (6.313%) of Mr W's utterances were syntactically deviant in both SSAE and CFE. Mr W's syntactic errors mostly involved incorrect word order (example (77)), the omission of *do* (example (78)) or the omission of prepositions (example (79)). Mr W also produced one error that can be regarded as typical of CFE, i.e. the omission of an

auxiliary verb (see example (80)).

(77)   his sister moved again back

Target: his sister moved back again

(78)   so we have lunch on Friday

Target: so we did have lunch on Friday

(79)   till I come home eleven in the evening

Target: till I come home at eleven in the evening

(80)   and they they still a very developing ja very much a developing country

Target: and they are still very much a developing country

4.412% of Mr X's utterances were syntactically deviant in both SSAE and CFE. He produced 15 utterances that are ungrammatical in both SSAE and CFE and only two that are typical of CFE (namely those in (81) and (82) below). The most frequently occurring errror in Mr X's data involved incorrect word order (example (83)). A very interesting idiosyncratic syntactic error that Mr X made more than once involved the omission of an article (example (84) and (85)) or the insertion of an article (example (86)).

(81)   I lived in Helderberg for the past six years

Target: I've lived in Helderberg for the past six years

(82)   what else can I tell?

Target: what else can I tell you?

(83)   I shouldn't probably tell you this

Target: I probably shouldn't tell you this

(84)   I'm uncle fifteen times

Target: I'm an uncle fifteen times

(85)   that dog was crazy dog

Target: That dog was a crazy dog

(86)   one year overseas just doing the English

Target: One year overseas just doing English

Recall that Mr Y is a speaker of L2 SSAE. Mr Y made 29 syntactic errors, constituting 9.091% of his utterances. He made typical L2 learner errors such as word order errors (example (87)), and the omission of the auxiliary (example (88)).

(87)   he tried to manoeuvre his plane suddenly

Target: he suddenly tried to manoeuvre his plane

(88)   so we just playing on the words a little

Target: so we are just playing on the words a little

9.032% of Mr Z's utterances were syntactically deviant in both SSAE and CFE. He made a total of 14 errors. Mr Z sometimes incorrectly inserts a preposition (example (89)), or omits it (example (90)) or uses the incorrect word order (example (91)). Although Mr Z is an L2 speaker of CFE, he did not produce any errors that are typical of CFE. (I will return to the question of why the CFE schizophrenic participants produced more CFE utterances than the CFE controls in chapter 4.)

(89)   put in a new engine in there

Target: put a new engine in there

(90)   and the doubles we ended up second

Target: and in the doubles we ended up second

(91)   staying currently in Cloetesville

Target: currently staying in Cloetesville

It might be noted that the schizophrenic participants produced more instances of typically CFE utterances than the control group. This might be because in each case the interviewer was a speaker of L2 SSAE and the control group (unconsciously) accommodated to this dialect during the interview, speaking an English that is "less typically CFE" than the English they might use to another CFE speaker. The reason why the schizophrenics did not accommodate to the interviewer's SSAE dialect in the same way might be because they have less control over dialect or stylistic variation than non-schizophrenics, given that such stylistic variation is part of one's pragmatic skills and is thus most likely influenced negatively by schizophrenia (cf. the references to impaired pragmatic skills in section 2.3).

The variable of semantically deviant utterances is the one for which there was the largest difference between the schizophrenic group and the control group: 13.439% of the schizophrenic group's utterances were semantically deviant while only 2.624% of the control group's utterances were semantically deviant. This is not just a group effect as every single schizophrenic participant had a higher percentage of semantically deviant utterances than any of the controls. Note also the considerable difference between the highest schizophrenic percentage (Mr D's 25.481%) and the highest control percentage (Mr Z's 4.516%).
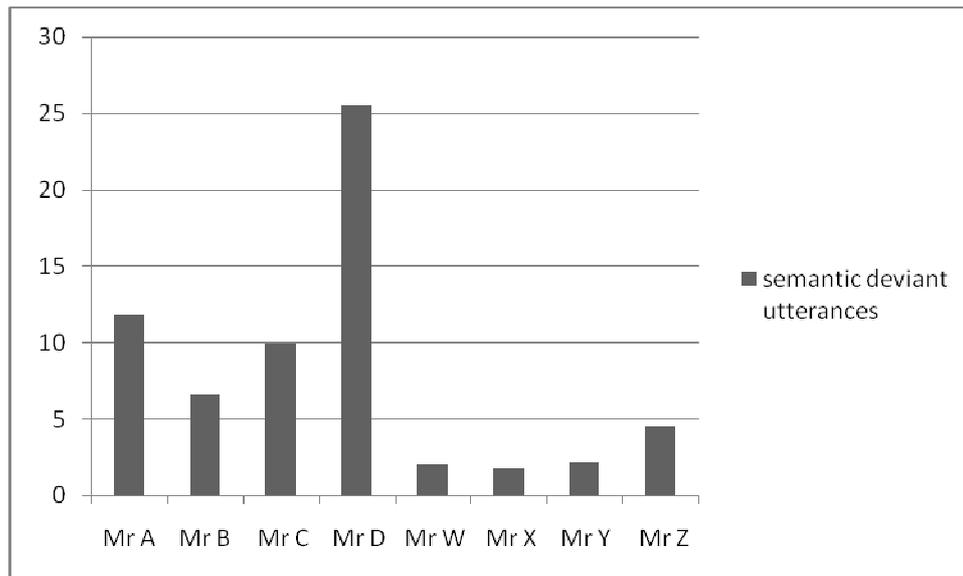
Figure 6. Percentage of semantically deviant utterances

Furthermore, there was not only a quantitative difference between the semantically deviant utterances of the schizophrenic group and those of the control group but also a qualitative difference. The schizophrenics' utterances that were identified as semantically deviant were by far more confusing that the control group's. The schizophrenics produced considerably more semantically deviant utterances that made no sense at all (see examples (92) to (95)) while the semantically deviant utterances of the control group (see examples (96) to (99)) were usually simply a bit unclear rather than completely nonsensical.

(92) I'm starting to develop myself in the into the church (Mr A)

(93) my mind was consumed (Mr B)

(94) I will confine in the the second course (Mr C)

(95) I'm not a person (Mr D)

(96) and we have a marginal family (Mr W)

  Meaning: and we have a very diverse family (in terms of cultures)

(97)   people are living on the borderline (Mr X)

Meaning: people are living under the breadline

(98)   but he didn't engaged them (Mr Y)

Meaning: but he didn't interact with them

(99)   she's from my other father (Mr Z)

Meaning: she's my biological father's daughter (not my stepfather's daughter)

The only other variable for which the schizophrenic group fared significantly worse than the control group involves neologisms [13] – 1.112% of the schizophrenics' utterances contained a neologism whereas only 0.161% of the controls' utterances contained a neologism. Of the schizophrenics only Mr A did not produce a neologism, and of the controls, only Mr Z produced a neologism. This makes sense if one considers the fact that the creative use of language is a symptom of schizophrenia.

Mr B produced three neologisms that included (i) *I was light-minded* meaning *I was trustworthy*, (ii) *caking business* meaning *(cake) baking* and (iii) *sleeping inhosted* meaning *sleeping wrapped tightly in my jacket.* Mr C produced five instances of neologisms that consisted of (i) *over-reasoning* (produced once) referring to the fact that he tried to reason with himself about everything too much, and (ii) *(rehabilitation) centrum* (produced four times) referring to the rehabilitation centre. Mr D produced five neologisms including (i) *unregrettable* meaning that he did not regret something, (ii) *laughingness* instead of *happiness*, (iii) *equipmentally* that has no clear meaning, as well as (iv) *graphist* instead of *graphic artist* and (v) *well doing* that means something like *fortune* or *good luck*. In the control group, only one participant (Mr Z) produced a single neologism, using *second-to-new* to mean *second hand*.

Recall that because of the large overlap between (i) pronunciations that are typically CFE and (ii) pronunciations that are typical for L1 speakers of Afrikaans with L2 SSAE, it was not possible to distinguish between these two types of deviant pronunciations (where "deviant" refers to "non-SSAE"). For this reason, the count in [14] for each participant includes both types of deviances from SSAE, which means that the percentages for the CFE-speakers are slightly inflated by the fact that many of their "deviant" pronunciations are actually not errors but instead involve the correct CFE pronunciation. These percentages are represented in Figure 7 and each participant's non-SSAE pronunciations are discussed in some detail below.
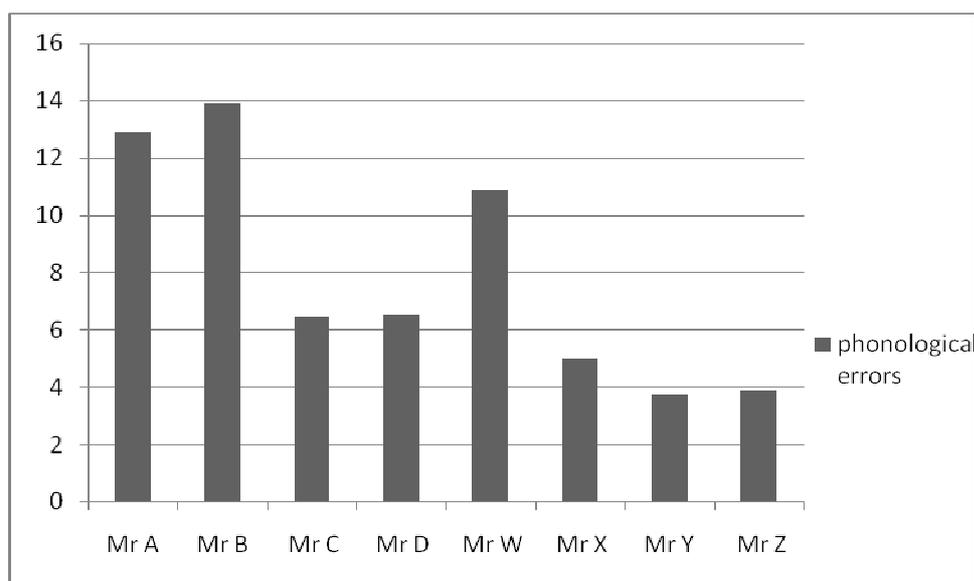
Figure 7. Utterances containing phonological errors

12.879% of Mr A's utterances contained pronunciations that are non-SSAE. However, of the 33 deviant pronunciations that he produced only one is non-CFE, namely *pressure* being pronounced as [pɹɛʒə]. Many of Mr A's non-SSAE pronunciations were due to the following features of CFE-pronunciation (i) the deletion of word-final [t] (in words such as

connect, *difficult* and *past*), (ii) the deletion of word-final [ɹ] (in words such as *brother*) and (iii) the use of the Afrikaans [r] (in words such as *friends*, *wrong* and *children*). Some other pronunciations that were identified as typically CFE by a qualified speech therapist are given in examples (100) to (107) below.

(100) [tʃərts] for *church*

(101) [inʤɛkʃəns] for *injections*

(102) [tiːts] for *teach*

(103) [prufɛʃənəl] for *professional*

(104) [inʤzɔi] for *enjoy*

(105) [wats̺in] for *watching*

(106) [nə̞uliːd̺s] for *knowledge*

(107) [siː] for *she*

Of the 60 non-SSAE pronunciations that Mr B produced (involving 13.924% of his utterances), only five are non-CFE. These exceptions to CFE-pronunciation are given below in examples (108) to (112).

(108) [invɔːlvd] for *involved*

(109) [iʒu] for *issue*

(110) [stalə̞u] for *Stallone*

(111) [kɔnzi̞um] for *consume*

(112) [grəms] for *grimace*

Mr C is a speaker of SSAE and the question of CFE-features therefore does not come into play in an analysis of his phonological errors. 6.468% of Mr C's utterances contained phonological errors. 12 of the 13 phonological errors that he made are typical of the L2 English of L1 Afrikaans speakers. The untypical error is given in (113). Typical L2 errors produced by L1 Afrikaans speakers include (i) pronouncing [ʃ] as [s] (examples (114), (115) and (116)); (ii) pronouncing [θ] as [f] (example (117)); (iii) hypercorrection in the form of pronouncing some instances of [f] as [θ] (examples (118) and (119)); (iv) pronouncing the vowel sound in *than* as [ɛ] so that it sounds like *then* (example (120)); (v) pronouncing the [ɹ] in English words as the Afrikaans [r] (example (121)); (vi) voicing devoiced sounds or devoicing voiced sounds (examples (122) and (123)); and (vii) omitting the word-final [t] when it forms part of a consonant cluster (example (119)).

(113) [nɛgəti:f] for *negative*

(114) [tʃœrts] for *church*

(115) [rihæbəlitəisən] for *rehabilitation*

(116) [səukəis] for *showcase*

(117) [ɛvrifiŋ] for *everything*

(118) [inθiərijər] for *inferior*

(119) [θərs] for *first*

(120) [dɛn] for *than*

(121) [dɹagz] for *drugs*

(122) [ɔf] for *off*

(123) [kɔlt] for *called*

Mr D produced 27 non-SSAE pronunciations (involving 6.49% of his utterances), all of which can be ascribed to him being a speaker of CFE. Some examples of his CFE-pronunciations are given in (124) to (128) below.

(124) [kɛmistri] for *chemistry*

(125) [driːmən] for *dreaming*

(126) [kɒndisən] for *condition*

(127) [dɛːr] for *there*

(128) [ʤɜrni] for *journey*

The quantity and quality of non-SSAE pronunciations produced by the control group are highly comparable to those produced by the schizophrenic group. Mr W produced 43 non-SSAE pronunciations (so that 10.859% of his utterances contained non-SSAE pronunciations). Eight of Mr W's non-SSAE pronunciations are also non-CFE and thus constitute genuine phonological errors - these are given in examples (129) to (136) below.

(129) [diʤətəlfɔːrtəs] for *digital fortress*

(130) [finɑːli] for *finale*

(131) [ɛlivə̯itər] for *elevator*

(132) [prɒpabli] for *probably*

(133) [skidʒəl] for *schedule*

(134) [rilidʒən] for *religion*

(135) [əs] for *is* (pronounced like the Afrikaans *is*)

(136) [imiːrəli] for *immediately*

Mr X made 17 phonological errors that deviated from SSAE (involving 5% of his utterances) and only one can be classified as non-CFE (example (137)). This error involves metathesis, as two sounds are switched around in a word. All Mr X's other non-SSAE pronunciations are due to CFE features.

(137) [pairɔrəti] for *priority*

Mr Y (a speaker of SSAE) only made 12 phonological errors (involving 3.72% of his utterances) with only 6 words that he pronounced incorrectly more than once. All of his errors are due to transfer from his L1 Afrikaans and involve pronouncing the English [ɹ] as the Afrikaans [r] (see examples (138)-(140)).

 (138) enginee**R**ing
 (139) Af**R**ican
 (140) **R**eally

Mr Z made only 6 phonological errors (involving 3.871% of his utterances) and only one of

these errors can be classified as non-CFE (example (141))[8].

(141)   [prɒpabli] for *probably*

Following this discussion regarding the participants' non-SSAE pronunciations, it is important to note that, as was the case with syntactic deviance, whether or not one takes dialect variation into account, makes a considerable difference to the counts of "phonological errors" but that disregarding dialect variation increases these counts for three of the four schizophrenic participants *and* for three of the four controls. Therefore, the difference between the percentages for the schizophrenic group (9.94%) and the control group (5.873%) on this measure is not due to dialect variation (as dialect variation affects both groups equally) and is probably due to internal variation within the groups.

There are also some differences between SSAE and CFE in terms of inflectional morphology. For example, the third person singular *–s* is obligatory in SSAE but optional in CFE when the subject of the verb is a third person singular noun or pronoun. For this reason every inflectional error in the CFE-speakers' data was marked as either "CFE" or "error", so as to take into account the effect of dialect variation. Therefore, the percentages for the CFE-speakers in [16] do not include forms that are ungrammatical in SSAE but grammatical in CFE. The percentages of utterances containing errors in derivational morphology are represented in Figure 8 and the percentages of utterances containing errors in inflectional morphology are represented in Figure 9.

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[8] It might be noted that Mr W made the same error as Mr Z (namely pronouncing *probably* as [prɒpabli]), although this does not mean that this (type of) pronunciation is a regular occurrence in CFE.
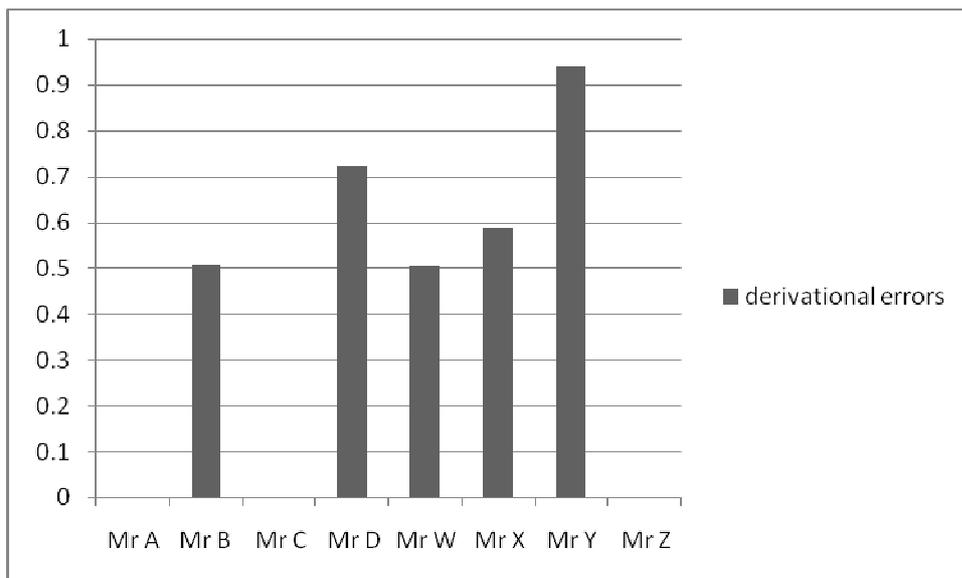
Figure 8. Percentages of utterances containing derivational errors
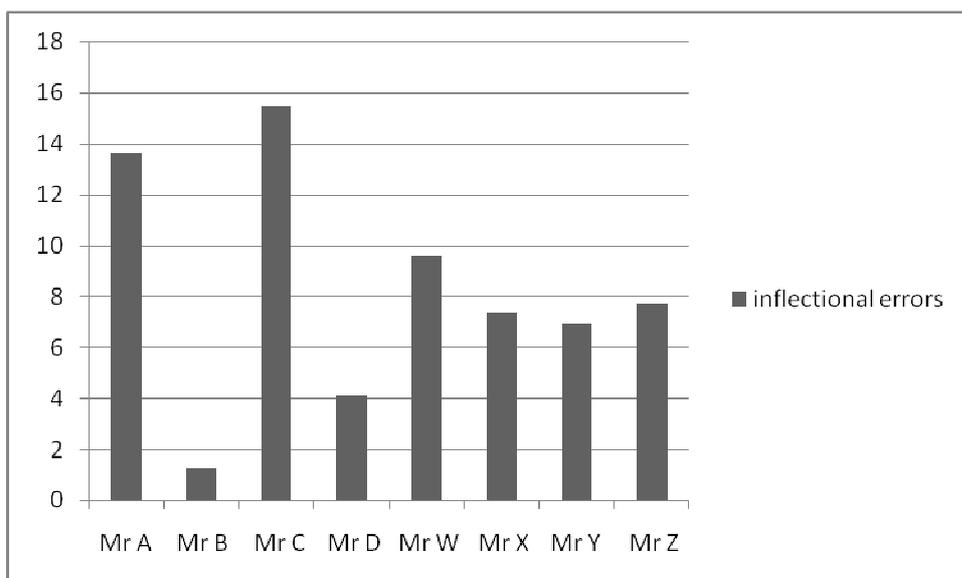
Figure 9. Percentages of utterances containing inflectional errors

The results for the two groups were highly comparable for both derivational and inflectional morphology. 0.307% of the schizophrenic group's utterances and 0.508% of the control group's utterances contained errors in derivational morphology. 8.603% of the schizophrenic group's utterances and 7.897% of the control group's utterances contained errors in

inflectional morphology. The most significant difference is the much higher number of errors in inflectional morphology compared to derivational morphology for both groups. This is unsurprising as inflectional morphology is an area in which even advanced L2 speakers often still make errors (see, for example, Lardière 1998).

Examples of errors in derivational morphology are given in (142) to (146) below.

(142)   I can laugh myself out sometimes if I think about my **stupidness** (Mr B)

(143)   The **baddest** things is is the drug (Mr D)

(144)   we know about **diversity** cultures and stuff like that (Mr W)

(145)   I get very **attach** (Mr X)

(146)   he started it of basically by saying it's **truth** (Mr Y)

Examples of errors in inflectional morphology are given in (147) to (154) below.

(147)   the way he **play** with the children (Mr A)

(148)   the only places I go to **is** here and Bellville (Mr B)

(149)   so I tried to **got** loose (Mr C)

(150)   so they stood up they **learn** there is something in my life (Mr D)

(151)   Ja, so **that's** my plans (Mr W)

(152)   because the bursaries or the fees **is** a lot (Mr X)

(153)   it's been a while since I actually **spend** some time reading (Mr Y)

(154)   he **hitted** that (Mr Z)

Measures [18] to [23] involve counts of the conjunctions *and* (occurring sentence-initially

and sentence-medially), *or* (occurring sentence-initially and sentence-medially), *but* and *because.* The frequency of occurrence of these conjunctions can of course be related to the complexity of the participants' utterances. All of the percentages for the two groups are highly comparable except the percentage of utterances containing *but* – 4.652% for the schizophrenics versus 10.862% for the controls. I will return to the question of why this might be so in chapter 4.

Statistical tests were conducted to determine which of the differences mentioned above between the schizophrenic group and the control group were significant. In the next chapter, the results of these statistical tests are presented, the study's main findings are discussed and I return to the research question, namely whether there are quantitative and/or qualitative differences between the errors made by schizophrenic L2 speakers and those made by normal L2 speakers.

CHAPTER 4

CONCLUSION

In this final chapter of the thesis, I will first discuss the results presented in the previous chapter (4.1) and then critically evaluate Morice & Ingram's (1982) assessment tool on the basis of my experience in conducting the study (4.2). Section 4.3 provides a brief conclusion and some suggestions for further research.

4.1   Discussion of the results

In section 3.3, the results of the grammatical analyses of the eight participants' speech samples were presented as counts or percentages for each of the measures in Morice & Ingram's (1982) model. In this section, I will present the results of statistical tests that were conducted on some of the measures to determine whether any of the differences observed between the two groups were actually statistically significant. The results of the statistical tests are presented in Table 4 below. For each measure, Table 4 provides the number or percentage for each of the two groups (repeated from Table 2), the p-value that was obtained from statistical tests (specifically one-way ANOVAs) and an indication as to whether or not each difference between the groups was statistically significant. Statistical significance (α) was set at 0.05, so that any p-value smaller than 0.05 was taken to indicate a statistically significant difference.

Table 4. Statistical tests: p-values

Utterance type or measure	Schizophrenic Group	Control Group	p-value	Significant Yes/No
2. Mean length of utterance (all words)	8.476	8.221	0.83	No
3. Mean length of utterance (major lexical items)	7.172	7.404	0.79	No
4. Mean lexical density	0.853	0.9	0.14	No
6. Utterances containing pause fillers	30.898	26.307	0.79	No
7. Utterances containing repeated single words, syllables and sounds	11.786	13.493	0.74	No
8. Utterances containing repeated words (multiple)	3.782	3.89	0.95	No
9. Utterances containing false starts, retraced, revisions, or abandoned sentence fragments	12.975	5.471	0.17	No
11. Syntactically deviant utterances	6.714	7.212	0.83	No
12. Semantically deviant utterances	13.439	2.624	0.04	**Yes**
14. Number of phonological errors	9.94	5.873	0.17	No
15. Number of errors in derivational morphology	0.307	0.508	0.48	No
16. Number of errors in inflectional morphology	8.603	7.897	0.85	No
17. Total: Word level errors	19.962	14.44	0.21	No

As indicated in Table 4, the only measure on which there was a statistically significant difference between the two groups was semantically deviant utterances: the schizophrenic group produced significantly more semantically deviant utterances than the control group.

This significant difference is presented visually in the scatter plot in Figure 10 below.

Figure 10. Scatter plot of semantically deviant utterances

group; LS Means
Current effect: $F_{(1, 6)}=6.6222$, p=0.04 Mann-Whitney U p=0.03
Effective hypothesis decomposition
Vertical bars denote 0.95 confidence intervals
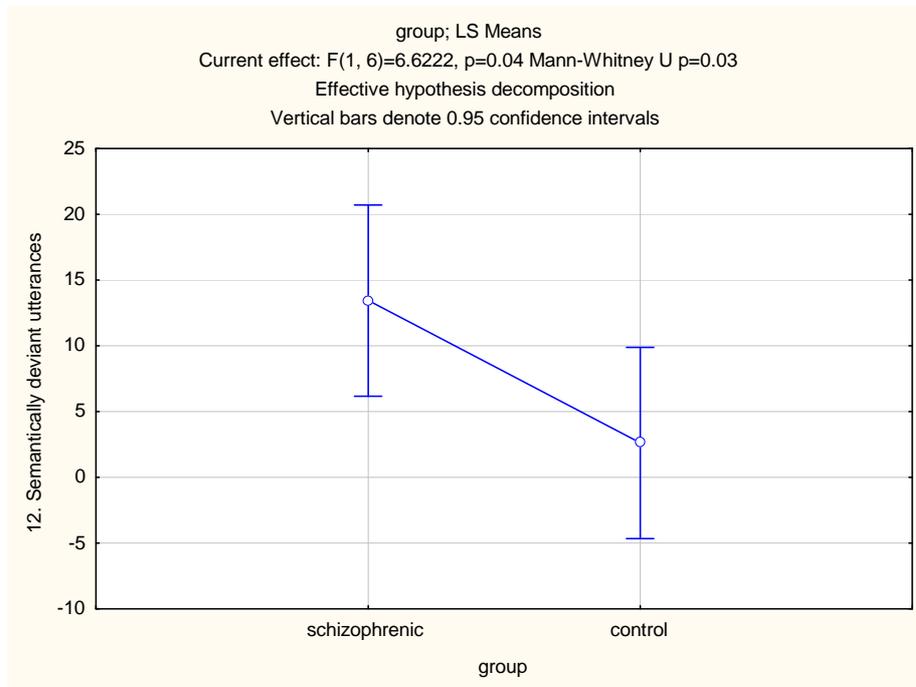
Returning to the research question set out in chapter 1, on the basis of the results of the current study it can thus be concluded that there are no significant differences between the type or frequency of phonological, lexical, morphological or syntactic errors made by schizophrenics versus non-schizophrenics in their spontaneous L2 use but that there is a significant difference between the type (see section 3.3) and the frequency (see Table 4 and Figure 10 above) of the semantic errors made by schizophrenics versus non-schizophrenics in their spontaneous L2 use. This provides support for Brown's (1973) claim that because schizophrenics experience the world differently than normal people and their "understanding of the world is reflected in semantics", semantics is the locus of language related problems in schizophrenia.

The measures in [18] to [23] relate to the percentage of utterances containing conjunctions, which, as mentioned earlier, could be taken as an indication of the complexity of utterances. Statistical tests were also conducted on the differences between the two groups' percentages for each conjunction and these showed that the only statistically significant difference between the groups involved their use of the conjunction *but*: the controls used this conjunction significantly more frequently than the schizophrenics ($p = 0.01$). It is not clear what this means but it probably has to do with the fact that *but* signals a more complex semantic relationship between two utterances than do the other conjunctions. If this is true, it would make sense that this conjunction would appear less frequently in schizophrenic speech, given schizophrenics' problems with semantics.

4.2   Morice & Ingram's (1982) assessment tool

Morice & Ingram's (1982) assessment tool was designed for the grammatical analysis of schizophrenic language and is indeed a useful tool in assessing both schizophrenic and normal L2 use, especially because it covers length and density, complexity, phonology, morphology, syntax and semantics. However, in terms of lexical errors, it only calls for a count of neologisms. I would like to propose that an additional measure needs to be included under "word level errors", namely what I term "incorrect lexical selection", to capture cases in which a participant uses an existing word (i.e. not a neologism) in an incorrect or unconventional way. During the data analysis, I noticed that all the participants (in the schizophrenic group, as well as the control group) made such incorrect lexical selections. Examples of such errors are presented in (155) to (162) below.

(155)   and I'm starting to **develop** myself into the church (Mr A)

(156)   He can **come right** if he have um the right help you see (Mr B)

(157)   but it it **fixed** my mind of drugs (Mr C)

(158)   I cannot go and speak to children if I not **correctly** feels (Mr D)

(159)   and the class will **criticize** you on it (Mr W)

(160)   that is like the final **preserved** doing media writing (Mr X)

(161)   it was not very **defined** where the horizon was at all (Mr Y)

(162)   when the water mix with the portholes and it **gets** with the oil (Mr Z)

The examples above all involve the incorrect lexical selection of a content word. All the participants also made incorrect lexical selections involving function words (see examples (163) to (170).

(163) and I looked him **into** the eye (Mr A)

(164) because, to be **as** that guys (Mr B)

(165) and uh I'm still uh **in** medication (Mr C)

(166) to be honest, I would like to work **on** patients (Mr D)

(167) so if you go **onto** contiki tours now... (Mr W)

(168) it is a it's a hundred percent thesis hmm research only **at** Sanlam (Mr X)

(169) he just went **towards** a patrol at the harbour like he was told to (Mr Y)

(170) but for a year I've got to stay on **on** this trade (Mr Z)

Table 5 below indicates for each participant, as well as for the two groups, which proportion of their incorrect lexical selections involved function words and which proportion involved content words (presented as actual numbers, with percentages given in brackets). The last column indicates (i) how many incorrect lexical selections each participant made in total and

(ii) what percentage of his utterances contained incorrect lexical selections (in brackets).

Table 5. Incorrect lexical selections: function words versus content words

	Function Words	**Content Words**	**Total**
Mr A	5 (55.556%)	4 (44.444%)	9 (3.409%)
Mr B	6 (18.75%)	26 (81.25%)	32 (8.101%)
Mr C	11 (40.741%)	16 (59.26%)	27 (13.433%)
Mr D	7 (19.444%)	29 (80.556%)	36 (8.654%)
Schizo Group	**29 (27.885%)**	**75 (72.115%)**	**Mean = 8.399%**
Mr W	16 (39.024%)	25 (60.976%)	41 (10.354%)
Mr X	8 (36.364%)	14 (63.636%)	22 (6.471%)
Mr Y	17 (58.621%)	12 (41.38%)	29 (9.404%)
Mr Z	6 (37.5%)	10 (62.5%)	16 (10.323%)
Control Group	**47 (43.519%)**	**61 (56.481%)**	**Mean = 9.138%**

Table 5 shows that the mean percentage of utterances containing incorrect lexical selections

is very similar for the two groups – 8.399% for the schizophrenics and 9.138% for the controls, although there is some internal variation within each group. If one only looks at the group results, the controls seem to select an incorrect function word almost as frequently as an incorrect content word (cf. 43.519% versus 56.481%), while the schizophrenics select an incorrect content word much more frequently than an incorrect function word - 72.115% of their incorrect lexical selections involve content words and only 27.885% involve function words. One could thus conclude that both schizophrenic and non-schizophrenic L2 speakers select incorrect function words and incorrect content words but that schizophrenics have a greater problem than normal L2 speakers with the incorrect lexical selection of content words. However, the group results hide some internal variation which actually leads to tendencies that cross the two groups, so that Mr A, Mr C and Mr Y select an incorrect function word almost as frequently as an incorrect content word, while all of the other participants select an incorrect content word much more frequently than an incorrect function word.

When taking individual results into account, it is, therefore, not possible to draw any conclusions regarding the incorrect lexical selection of function words versus content words. However, it remains that incorrect lexical selection (function words plus content words) seems to be quite a common type of error made by schizophrenic and normal L2 learners (see the percentage of utterances containing such errors per participant (last column of Table 4), especially in relation to the percentages of other error types included in Morice & Ingram's assessment tool (Table 2)). Furthermore, this error type is not restricted to L2 use as it also occurred in the L1 Afrikaans speech of the four schizophrenics (data which are not discussed here – see footnote 4). For this reason, I believe that it is necessary that this type of error also be measured in the future as part of a detailed grammatical analysis of L2 speech (as well as

(schizophrenic) L1 speech).

A second, less serious criticism, has to do with the labels of some of Morice & Ingram's measures. For example, [2] is headed "Mean length of utterance" (MLU) and [3] is headed "Major lexical items" in their original table, while both [2] and [3] are actually MLUs and they are simply calculated on the basis of different word counts. This is why I renamed them "[2] MLU (all words)" and "[3] MLU (major lexical items)". As mentioned in footnote 6, for the sake of convenience, I also collapsed the two counts in [17] "Total number of word level errors" and [18] "Mean number of word level errors per utterance" into one count [17] headed "Total: word level errors", which is presented as a percentage, so that it is more easily comparable to the other measures.

Finally, in the paper on their assessment tool, Morice & Ingram (1982) clearly explicate what the relevance or meaning is of each measure in [1] to [18]; however, they do not provide a clear explanation of what the relevance is of the measures in [19] to [24], i.e. the counts of utterances containing the various conjunctions. Although it is clear to me that such counts fit well into an assessment tool which measures length, density and complexity, I was not sure what the counts for these measures were supposed to indicate, i.e. what I could conclude on the basis of the counts. Before making use of this assessment tool in future, I would therefore like to investigate what exactly conjunction type and frequency in spontaneous speech indicate and how to interpret counts on this measure.

4.3   Conclusion

As set out in chapter 1 of this thesis, the research question was whether or not there are

differences between the types of grammatical errors and their frequency in the spontaneous language use of schizophrenic versus normal L2 speakers of English. After grammatically analysing the spontaneous L2 speech data of four schizophrenics and four controls and comparing the results for the two groups with each other by means of statistical tests, it was concluded that there were no significant differences between the two groups in terms of type or frequency of grammatical errors in phonology, morphology, lexicon or syntax. However, the semantic errors produced by the two groups differed significantly, both quantitatively (in terms of frequency – see 4.1 above) and qualitatively (in terms of type – see 3.3). On the basis of the current study's results, I therefore conclude that the phonological, morphological, lexical and syntactic errors that schizophrenics make in their L2 spontaneous speech are typical L2 errors and that semantics seems to be the locus of non-typical errors made by schizophrenics. Admittedly, these conclusions are based on a very small sample size (due to circumstances beyond my control) and one would want to analyse speech samples from larger schizophrenic (and control) group(s) to determine whether the findings of the current study hold for the larger schizophrenic population.

Given the close link between semantics and pragmatics, it is necessary to investigate the pragmatic skills of schizophrenic bilinguals (in their L1 and L2), something which is not covered by the grammatical analysis reported on in this thesis. Along these lines, Theron (2009) investigates the pragmatic skills of the four schizophrenic individuals who participated in the current study, in both their L1 and their L2.[9]

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[9] Theron also employed three different pragmatic assessment tools in order to determine which, if any, of these tools would be most useful in examining schizophrenic bilinguals' pragmatic skills.

Finally, it should be noted that the study reported in this thesis focused on schizophrenic *L2* use. Future research should thus investigate the question of whether the findings reported above also hold true for schizophrenic *L1* use: are there significant differences between the types and frequency of errors (or, strictly speaking, "mistakes" – cf. section 2.2) produced by schizophrenic versus normal individuals in their spontaneous L1 speech? Is the locus of difference between schizophrenic and normal individuals also semantics in the case of L1 use? Given the phenomenon of differential symptomatology in certain schizophrenic bilinguals (cf. section 2.4), such research would make a valuable contribution to our understanding of schizophrenic language use.

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LANGUAGE BACKGROUND QUESTIONNAIRE (FERNANDEZ 2003)

(SCHIZOPHRENIC PARTICIPANTS)

Language Background (Fernandez, 2003)

A.General use of language **(always L1; 2: L1>L2; 3: L1=L2; 4: L2>L1; 5: always L2)**	
L1	
L2	
First exposure to L2	
Other languages	
Educational background	
Elementary school	
High-School	
College	
Childhood active language use	
At home, parents	
At home, brothers/sisters	
At home, grandparents	
At home, other relatives	
To friends	
Other social contexts	
Childhood passive language use	
Parents	
Brothers/sisters	
Grandparents	
Other relatives	
Friends	
Other people	
Teenager active language use	
At home, parents	
At home, brothers/sisters	
At home, grandparents	
At home, other relatives	
To friends	
To teachers	
Other social contexts	
Teenager passive language use	
At home, parents	
At home, brothers/sisters	
At home, grandparents	
At home, other relatives	
To friends	
To teachers	

Other social contexts		
Current active use of language		
At home, relatives		
To friends		
To colleagues		
Other social contexts		
Current passive use of language		
At home, relatives		
To friends		
To colleagues		
Other social contexts		
B. Self rating on a 5 point-scale (1:very good; 5:very poor)	**L1**	**L2**
Speaking		
Reading		
Writing		
Comprehension		

LANGUAGE BACKGROUND QUESTIONNAIRE (CONTROLS)

All information on this questionnaire will remain confidential

A. Personal Information

- Surname: _____ First name: _____

- Telephone number: _____ Best time to contact: _____

- Address: _____

  _____

- E-mail: _____

- Sex:　○ Male　○ Female

- Year of birth: _____

- Place of birth: City _____ Country _____

- If you were not born in South Africa, how long have you been living here? _____

B. First Language (mother tongue)

What is your first language? _____

What is the first language of:　your mother? _____ your father? _____

Which language(s) did you speak at home as a child? _____

Is your first language the language with which you are the most comfortable?　○ Yes ○ No

If you answered "No" to the question above, please explain:

_____

_____

C. Education and Language Use

Which language(s) were you formally educated in? Where (i.e. city - country)?

	Language	**Where**
Primary/Elementary School	_____
High School	_____
College/University	_____

Which language(s) do you use:

at home	
in social situations	
at school	

D. Second Languages: English

For how long have you been exposed to English? _____

For how long have you been receiving instruction in English as an additional language? _____

Approximately how many hours a week do you use English outside the classroom? _____

Approximately how many hours a week are you exposed to English outside the classroom?

_____

Are you using any other means for learning English (for example, grammar books, educational video or audio tapes, television)? If yes, please specify:

_____

_____

Please rate your linguistic ability in English and any other languages you know (eg. Afrikaans), excluding your mother tongue (please specify these).

(Use the following abbreviations: L=low; I=intermediate; A=advanced; NN=near native.)

	English	_____	_____	_____	_____
Reading					
Writing					
Speaking					
Listening					
Overall Competence					

Thank you for your time!

APPENDIX C

INDIVIDUAL RESULTS

Mr A:

Utterance type or measure	#	Percentage
1. Total number of utterances	264	---
2. Mean length of utterance	8.250	---
3. Major lexical items	6.989	---
4. Mean lexical density	0.847	---
5. Utterances containing uncomfortable pauses	6	2.273
6. Utterances containing pause fillers	64	24.242
7. Utterances containing repeated single words, syllables, or sounds	38	14.394
8. Utterances containing repeated words (multiple)	17	6.439
9. Utterances containing false starts retraced, revisions, or abandoned sentence fragments	47	17.803
10. Utterances containing unintelligible parts	12	4.545
11. Syntactically deviant utterances	12	4.545
12. Semantically deviant utterances	31	11.742
13. Number of neologisms	0	0
14. Number of phonological errors	34	12.879
15. Number of errors in derivational morphology	0	0
16. Number of errors in inflectional morphology	36	13.636
17. Total number of word level errors	70	---
18. Mean number of word level errors per utterance	---	26.515
19. Utterances containing sentence-initial *and*	60	22.727
20. Utterances containing phrasal *and*	22	8.333
21. Utterances containing sentence-initial *or*	0	0
22. Utterances containing phrasal *or*	1	0.379
23. Utterances containing *but*	18	6.818
24. Utterances containing *because*	5	1.894

Mr B:

Utterance type or measure	#	Percentage
Total number of utterances	395	---
Mean length of utterance	7.754	---
Major lexical items	6.974	---
Mean lexical density	0.8994	---
Utterances containing uncomfortable pauses	12	3.038
Utterances containing pause fillers	31	7.848
Utterances containing repeated single words, syllables, or sounds	30	7.595
Utterances containing repeated words (multiple)	11	2.785
Utterances containing false starts retraced, revisions, or abandoned sentence fragments	28	7.089
Utterances containing unintelligible parts	10	2.532
Syntactically deviant utterances	20	5.063
Semantically deviant utterances	26	6.582
Number of neologisms	3	0.759
Number of phonological errors	55	13.924
Number of errors in derivational morphology	2	0.506
Number of errors in inflectional morphology	65	---
Total number of word level errors	---	16.456
Mean number of word level errors per utterance	0.03797	
Utterances containing sentence-initial *and*	49	12.405
Utterances containing phrasal *and*	30	7.595
Utterances containing sentence-initial *or*	5	1.266
Utterances containing phrasal *or*	6	1.519
Utterances containing *but*	13	3.291
Utterances containing *because*	22	5.57

Mr C:

Utterance type or measure	#	Percentage
1. Total number of utterances	201	---
2. Mean length of utterance	11.124	---
3. Major lexical items	8.776	---
4. Mean lexical density	0.789	---
5. Utterances containing uncomfortable pauses	4	1.99
6. Utterances containing pause fillers	153	76.119
7. Utterances containing repeated single words, syllables, or sounds	38	18.905
8. Utterances containing repeated words (multiple)	8	3.98
9. Utterances containing false starts retraced, revisions, or abandoned sentence fragments	48	23.881
10. Utterances containing unintelligible parts	8	3.98
11. Syntactically deviant utterances	25	12.438
12. Semantically deviant utterances	20	9.95
13. Number of neologisms	5	2.488
14. Number of phonological errors	13	6.468
15. Number of errors in derivational morphology	0	0
16. Number of errors in inflectional morphology	31	15.423
17. Total number of word level errors	49	---
18. Mean number of word level errors per utterance	---	24.378
19. Utterances containing sentence-initial *and*	84	41.791
20. Utterances containing phrasal *and*	21	10.448
21. Utterances containing sentence-initial *or*	0	0
22. Utterances containing phrasal *or*	10	4.975
23. Utterances containing *but*	5	2.488
24. Utterances containing *because*	1	0.498

Mr D:

Utterance type or measure	#	Percentage
1. Total number of utterances	416	----
2. Mean length of utterance	6.774	----
3. Major lexical items	5.947	----
4. Mean lexical density	0.877	----
5. Utterances containing uncomfortable pauses		
6. Utterances containing pause fillers	64	15.384
7. Utterances containing repeated single words, syllables, or sounds	26	6.25
8. Utterances containing repeated words (multiple)	8	1.923
9. Utterances containing false starts retraced, revisions, or abandoned sentence fragments	13	3.125
10. Utterances containing unintelligible parts	108	25.962
11. Syntactically deviant utterances	20	4.808
12. Semantically deviant utterances	106	25.481
13. Number of neologisms	5	1.202
14. Number of phonological errors	27	6.49
15. Number of errors in derivational morphology	3	0.721
16. Number of errors in inflectional morphology	17	4.087
17. Total number of word level errors	52	---
18. Mean number of word level errors per utterance	---	12.5
19. Utterances containing sentence-initial *and*	26	6.25
20. Utterances containing phrasal *and*	23	5.529
21. Utterances containing sentence-initial *or*	6	1.442
22. Utterances containing phrasal *or*	3	0.721
23. Utterances containing *but*	25	6.01
24. Utterances containing *because*	31	7.452

Mr W:

Utterance type or measure	#	Percentage
1. Total number of utterances	396	---
2. Mean length of utterance	8.442	---
3. Major lexical items	7.639	---
4. Mean lexical density	0.905	---
5. Utterances containing uncomfortable pauses	0	0
6. Utterances containing pause fillers	84	21.212
7. Utterances containing repeated single words, syllables, or sounds	33	8.333
8. Utterances containing repeated words (multiple)	3	0.758
9. Utterances containing false starts retraced, revisions, or abandoned sentence fragments	16	4.04
10. Utterances containing unintelligible parts	108	27.273
11. Syntactically deviant utterances	25	6.313
12. Semantically deviant utterances	8	2.02
13. Number of neologisms	0	0
14. Number of phonological errors	43	10.859
15. Number of errors in derivational morphology	2	0.505
16. Number of errors in inflectional morphology	38	9.596
17. Total number of word level errors	83	---
18. Mean number of word level errors per utterance	---	20.96
19. Utterances containing sentence-initial *and*	78	19.697
20. Utterances containing phrasal *and*	48	12.121
21. Utterances containing sentence-initial *or*	1	0.253
22. Utterances containing phrasal *or*	9	2.273
23. Utterances containing *but*	55	13.889
24. Utterances containing *because*	17	4.293

Mr X:

Utterance type or measure	#	Percentage
1. Total number of utterances	340	---
2. Mean length of utterance	8.4	---
3. Major lexical items	7.238	---
4. Mean lexical density	0.861	---
5. Utterances containing uncomfortable pauses	0	0
6. Utterances containing pause fillers	134	39.412
7. Utterances containing repeated single words, syllables, or sounds	81	23.824
8. Utterances containing repeated words (multiple)	21	6.176
9. Utterances containing false starts retraced, revisions, or abandoned sentence fragments	26	7.647
10. Utterances containing unintelligible parts	33	9.706
11. Syntactically deviant utterances	15	4.412
12. Semantically deviant utterances	6	1.765
13. Number of neologisms	0	0
14. Number of phonological errors	17	5
15. Number of errors in derivational morphology	2	0.588
16. Number of errors in inflectional morphology	25	7.353
17. Total number of word level errors	44	---
18. Mean number of word level errors per utterance	---	12.941
19. Utterances containing sentence-initial *and*	63	18.529
20. Utterances containing phrasal *and*	46	13.529
21. Utterances containing sentence-initial *or*	1	0.294
22. Utterances containing phrasal *or*	12	0.294
23. Utterances containing *but*	38	11.176
24. Utterances containing *because*	18	5.294

Mr Y:

Utterance type or measure	#	Percentage
1. Total number of utterances	319	---
2. Mean length of utterance	9.489	---
3. Major lexical items	8.743	---
4. Mean lexical density	0.921	---
5. Utterances containing uncomfortable pauses	0	0
6. Utterances containing pause fillers	97	30.408
7. Utterances containing repeated single words, syllables, or sounds	49	15.361
8. Utterances containing repeated words (multiple)	9	2.821
9. Utterances containing false starts retraced, revisions, or abandoned sentence fragments	14	4.389
10. Utterances containing unintelligible parts	29	9.091
11. Syntactically deviant utterances	29	9.091
12. Semantically deviant utterances	7	2.194
13. Number of neologisms	0	0
14. Number of phonological errors	12	3.762
15. Number of errors in derivational morphology	3	0.94
16. Number of errors in inflectional morphology	22	6.897
17. Total number of word level errors	37	---
18. Mean number of word level errors per utterance	---	11.599
19. Utterances containing sentence-initial *and*	116	36.364
20. Utterances containing phrasal *and*	24	7.524
21. Utterances containing sentence-initial *or*	0	0
22. Utterances containing phrasal *or*	5	1.567
23. Utterances containing *but*	36	11.285
24. Utterances containing *because*	19	5.016

Mr Z:

Utterance type or measure	#	Percentage
1. Total number of utterances	155	---
2. Mean length of utterance	6.555	---
3. Major lexical items	5.994	---
4. Mean lexical density	0.914	---
5. Utterances containing uncomfortable pauses	0	0
6. Utterances containing pause fillers	22	14.194
7. Utterances containing repeated single words, syllables, or sounds	10	6.452
8. Utterances containing repeated words (multiple)	9	5.806
9. Utterances containing false starts retraced, revisions, or abandoned sentence fragments	9	5.806
10. Utterances containing unintelligible parts	25	16.129
11. Syntactically deviant utterances	14	9.032
12. Semantically deviant utterances	7	4.516
13. Number of neologisms	1	0.645
14. Number of phonological errors	6	3.871
15. Number of errors in derivational morphology	0	0
16. Number of errors in inflectional morphology	12	7.742
17. Total number of word level errors	19	---
18. Mean number of word level errors per utterance	---	12.258
19. Utterances containing sentence-initial *and*	13	8.387
20. Utterances containing phrasal *and*	13	8.387
21. Utterances containing sentence-initial *or*	0	0
22. Utterances containing phrasal *or*	1	0.645
23. Utterances containing *but*	11	7.097
24. Utterances containing *because*	7	4.516