

The Translated Echolalia of a Bilingual Child with Autism

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ABSTRACT

This study investigated the phenomenon of translated echolalia in a bilingual child with autism, who was between the ages of 7,11 and 8,2 years at the time of the study. She presented with instances of echolalia that were direct translations from her first language (Sotho) to her second language (English). In order to explore this phenomenon the subject's use of and proficiency in each language is described. The language assessment included an analysis of her receptive language, pragmatic ability, the language of her responses and an analysis of her echolalic responses (including her translated echolalia). Furthermore, a cognitive processing profile was obtained in order to determine how this related to her first and second language abilities. Moreover, her theory of mind/perspective-taking ability was assessed as her language selection and translated echolalia suggested poor communicative sensitivity. A model is presented to explain the phenomenon of translated echolalia in this child and the extent to which translation involves the conceptual/semantic system is discussed. It is suggested that under certain conditions translation may occur at a lexical rather than a semantic/conceptual level.

KEY WORDS: bilingualism, translation, autism, echolalia, theory of mind, cognitive processing

INTRODUCTION

For many bilingual children, translation is an everyday activity. However, the processes involved in translation are not yet well understood (Malakoff & Hakuta, 1991). While a number of studies have examined translation skill in adults, most of these have focussed on the normal population (Kroll & de Groot, 1997). There is very little information on translation skill in children or the development thereof, as well as translation ability in communicatively disordered populations. The few studies (summarised in Fabbro, 1999) that could be found on translation skill in communicatively disordered populations, have been conducted with adult neurogenic populations. Regarding translation skill in children, Malakoff and Hakuta (1991) studied this in a group of late elementary school students. They demonstrated that this group were extremely good translators and suggested that translation as a linguistic skill needs to be more rigorously studied in children. In particular, studying the functional aspects of translation and the role of metalinguistic ability in children was highlighted as requiring further study.

A number of models and theories have been put forward to account for the translation process, with no one model receiving unanimous support. According to Malakoff and Hakuta (1991) there are two, three and four level models of the translation process. The two stage model involves analysis of the source language and synthesis into the target language. The three stage model includes a level of comprehension of the meaning, while a four stage model also includes judgements of the adequacy of the trans-

lation. Malakoff and Hakuta (1991) use Catford's theory of meaning to explain the link between translation and comprehension. According to this theory, meaning in a text can be analysed at a number of different levels, e.g. words, phrases, clauses, sentences and the passage as a whole. Malakoff and Hakuta (1991) suggest that these levels represent windows through which the source language is processed. This would appear to account for the difference between what Fabbro (1999) describes as a word-for-word translation strategy versus a semantic translation strategy. In word-for-word translation, the translation is rather superficial and occurs at the level of linguistic form. In semantic translation, the meaning of chunks of the source language are stored and reproduced in the target language (Fabbro, 1999). This would suggest that it may be possible to translate without fully comprehending the message.

One of the greatest concerns in the present literature on translation appears to be to what degree the conceptual/semantic system is accessed and the relationship between lexical and conceptual processing. Potter, So, Von Eckardt and Feldman (1984, in Kroll & De Groot, 1997) put forward the word association and concept mediation models. According to the word association model, words in the weaker language access concepts via words in the stronger language. According to the concept mediation model, words from both languages have direct access to concepts. The research to date suggests that the word association model characterises translation of non-fluent bilinguals, while the concept mediation model characterises the translation of more fluent bilinguals (Kroll & De Groot, 1997).

Kroll and de Groot (1997) presented a revised hierar-

chical model to account for translation in the non-fluent bilingual individual. Because the weaker language depends initially on the stronger language for access to meaning the lexical level connections from the weaker to the stronger language will be stronger than *visa versa*. Moreover, the strength of the conceptual connections will be greater for the stronger than the weaker language. The strength of these links differs as a function of the fluency of the weaker language and the relative dominance of the stronger language. Translation from the stronger to the weaker language would be more likely to involve conceptual processing than translation from the weaker to the stronger language. As a result rapid lexical level translation from the weaker to the stronger language may occur without directly accessing meaning (Kroll & de Groot, 1997). It is stressed that this translation asymmetry is most evident in less fluent bilinguals and in the absence of context (Kroll & de Groot, 1997).

While a number of studies have shown support for the revised hierarchical model, some studies have questioned the claim that translation from the weaker to the stronger language is always accomplished lexically. Furthermore, this model was unable to account for the fact that bilinguals could translate concrete words and cognates faster than abstract words and noncognates (Kroll & De Groot, 1997). The distributed lexical/conceptual feature model was put forward to explain this (Kroll & De Groot, 1997). According to this model words in each of the two languages could activate conceptual features that may or may not be overlapping. Furthermore, for words that share aspects of lexical form, parallel activation of shared lexical units may occur. Whether or not this model can account for better translation from the weaker to the stronger language still needs to be demonstrated. None of these models appears to consider motivation and the pragmatic aspects of language, which have been highlighted as so important in bilingual language processing (Paradis, 1997).

Studying translation in bilinguals with impaired communication may provide insights into the processes involved. Fabbro (1999) summarises a number of single case studies with acquired language impairment, who presented with either an inability to translate or unusual translation skills. Fabbro (1999) suggests that by studying translation ability in communicatively disordered populations one should be able to gain a better understanding of the cerebral representation of languages, the processes involved in translation and an understanding of that particular communication impairment.

The present study reports on a bilingual child with autism who demonstrates two interesting features in her linguistic repertoire: a) There are instances of her echolalia that are direct translations from her first language (Sotho) into her second language (English); b) She appears to have a particular fascination with different languages and has shown a remarkable ability to acquire a second language (English) despite very little initial social interactive experiences in English. This fascination with other languages has been observed in other children on the autistic spectrum, with whom we have worked clinically. This case report will provide insights into the processes involved in translation and second language acquisition, as well as into the nature of echolalia and characteristics of language processing in autism. To what extent translation needs to involve the conceptual/semantic system will be highlighted in particular.

METHODOLOGY

SUBJECT SELECTION CRITERIA

Subject selection criteria included a verbal child with a developmental language disorder, who had been exposed to two languages from a young age and who presented with translation ability. The type of communication impairment was not a criteria, but rather the presence of unusual translation ability. A developmental language disorder was a criteria, as the translation phenomenon does not appear to have been previously studied in this group. The child needed to be verbal enough to demonstrate translation skill. That the child was still in the process of acquiring language was felt to be of more importance than his/her exact age, so that the translation phenomenon could be studied in a developing child. The subject was identified during a larger study assessing the underlying nature of various communication impairments.

DESCRIPTION OF SUBJECT

T, a female child diagnosed with autism, was identified for the study. She was between 7,11 and 8,2 years at the time of the study (as testing was conducted over a number of sessions). She had been exposed to both Southern Sotho and English from a young age. She demonstrated severe communication difficulties from a young age and had received a medical diagnosis of autism (made by a psychiatrist and later confirmed by a multi-disciplinary team) at the age of four years.

T. was born in Qwa-Qwa (a rural area in the Free State) into a Southern Sotho home. During her early years there were thirteen people living in her home, all of whom spoke Southern Sotho which was also the language of the larger community. T. was reported to have been a very quiet baby whose interaction with those around her was very limited. From an early age she demonstrated a fascination (which became an obsession) with television and later, magazines. It should be noted that, during T.'s early childhood, television in South Africa was predominantly through the medium of English and Afrikaans.

T. began speaking between three and a half and four years. According to her mother, this early speech was comprised almost entirely of immediate and delayed echolalia, consisting mainly of words and phrases from English television programmes. Despite T.'s apparent neglect of her home language, the family continued to communicate with her in Southern Sotho. She responded predominantly in English, usually at this stage through translated echolalia, demonstrating an understanding of Southern Sotho. Thus T. was using two types of echolalia: utterances repeated in English from television and utterances translated from Southern Sotho into English. As she moved from this emergent language acquisition stage to more advanced language, there was a reduction in echolalic speech, with an increase in responsive language. At this stage she was frequently responding to Sotho in English, although she occasionally used Sotho. This decreased use of echolalia is described as a feature of language acquisition in autism as the child acquires more advanced language (Prizant, Schuler, Wetherby & Rydell, 1997). At the time of this study she was using only some instances of translated and other echolalia.

At the time of the study T. was in a school for autism,

which she had been attending since she was five years of age. The language of instruction was English, with some Afrikaans also being used, particularly in the boarding school where she was a resident. She continued to be exposed to Southern Sotho at home on the weekends.

AIMS

The aim of the study was to investigate the phenomenon of translated echolalia and what this reveals about the development of translation ability. Sub-aims were threefold: Firstly, to describe T.'s communication interaction with respect to her use of and proficiency in each language. This was done in order to capture and analyse moments of translated echolalia and to determine which was her stronger language, in order to determine whether she was translating from her stronger or her weaker language. Secondly, to determine her cognitive processing profile, in order to establish how this related to her first and second language abilities, the phenomenon of translated echolalia and the extent to which the conceptual/semantic system was being accessed. Understanding a child's cognitive processing abilities has been shown to help explain the particular communication profile that the child is presenting with (Shaw-Ridley, Penn & Rosenthal, 1999). Thirdly, to assess her theory of mind/perspective taking ability since her language selection and the translated echolalia suggested poor communicative sensitivity.

RESEARCH DESIGN

A single subject research design of a qualitative, hypothesis-driven nature was utilized with a single subject, who presented with unusual translation ability. As this study was an exploratory study that aimed to explore the phenomenon of translated echolalia, an A-only type study was utilised (McReynolds & Kearns, 1983). An A-only study is a descriptive study in which a behaviour, in this case translated echolalia and its associated deficits, is carefully described (McReynolds & Kearns, 1983). The purpose of this design is to describe and explore a particular disorder in depth in order to allow for a better understanding of the phenomena being observed (McReynolds & Kearns, 1983).

COLLECTION AND ANALYSIS OF DATA

Language Assessment

Two separate interactions with T. and speech language pathologists (the first and third authors) who were fluent first language speakers of English and Sotho respectively, were video-recorded and analysed. In order to ensure that T. would use enough Sotho in the interaction (given her preference for communicating in English), she was told that the Sotho speaking therapist could only communicate in Sotho. As T.'s weaker language appeared to be Sotho the language assessment was first carried out in Sotho, as it was felt that conducting testing in her stronger language first may favourably influence the results of the assessment in the weaker language.

The following procedures were conducted during each of the interactions:

- **Receptive language** - The Reynell Developmental Language Scales: Verbal Comprehension Scale A

(Reynell, 1978) was administered in both languages. This was scored during the interactions. Any unclear responses were later watched on the video by the two raters (author one and three) and a decision was made regarding whether T.'s response indicated understanding of that item or not.

- **Expressive language** - A spontaneous language sample of approximately 20 minutes was obtained following the procedure suggested by Adams & Bishop (1989). This involves using photographs of situations of interest to children to stimulate conversation. The aim of the interaction is to encourage the child to describe his/her own similar experiences rather than simply to answer questions about the photograph. The photograph was removed when conversation had been initiated. This was transcribed and analysed from the video recording.

The expressive language sample was analysed in the following ways:

- A conversational and pragmatic rating using a combination of Prutting and Kirchner's (1987) Pragmatic Profile and Penn's (1988) Profile of Communicative Appropriateness was performed on both interactions. In this combined profile the categories from Prutting and Kirchner's (1987) Pragmatic Profile were utilised together with the rating scale from Penn's (1988) Profile of Communicative Appropriateness. This allowed an observation not only of whether or not a behaviour was inappropriate but the extent of the inappropriateness. It was decided to carry out a pragmatic rating as this provides a measure of the overall effectiveness of T.'s communication in each language. A combination of the above two pragmatic ratings has in previous studies (Shaw-Ridley et al., 1999; Sonnenberg, 1995) been found to be a valuable measure of pragmatic ability.
- An assessment of the proportion of responses that were given in the same language as the interlocutor was carried out. An initial analysis of the data revealed the following types of responses: initiations in the interlocutors language; responses in the interlocutors language; initiations in another language; responses in another language; mixed responses; "yes" responses ("ya"); gesture only responses; the absence of a response (no response) and echolalic responses. The responses from each interaction were classified into one of the above categories. A percentage of responses for each category was obtained based on the total number of responses. This analysis was carried out to determine to what extent her translated echolalia was occurring due to poor sociolinguistic sensitivity.
- An analysis was made of her echolalic utterances (including the translated echolalic utterances) using Prizant and Duchan's (1981) functional categories for immediate echolalia and Prizant and Rydell's (1984) categories for delayed echolalia. For the purposes of this study, an utterance was regarded as echolalic only when it met Prizant and Rydell's (1984) criteria of occurring as a rigid and routinised string. This was carried out in order to gain an understanding of the functions that the translated echolalia fulfilled for T., in relation to the functions that her general echolalia fulfilled for her. It was felt that understanding the functions of the translated echolalia would assist in understanding the translation processes involved.

The above ratings were carried out by two raters (the first and third authors). Inter-rater agreement was determined by considering the point-to-point agreement on each of the parameters. "This served to assess the extent to which different raters agree that they 'see' the same phenomena" (Henshilwood & Ogilvy, 1999, p. 49). In the case of disagreement, ratings were determined by general consensus.

Cognitive Processing Assessment

It has been suggested that a better understanding of a child's underlying cognitive processes, particularly memory processes, may help explain both the tendency to echolalia (Prizant, 1983; Prizant, 1996) and the ability to cope with more than one language (Baker, 1993). In order to obtain a better understanding of T's cognitive processing, The Cognitive Assessment System (Naglieri & Das, 1997) was administered. This measure was chosen as it had previously been found to provide valuable information regarding how children's cognitive processing can assist in explaining their communication impairment (Shaw-Ridley et al., 1999). The Cognitive Assessment System consists of four scales, assessing: planning, attention and simultaneous and successive processing:

- **The planning subscale** - This evaluates the individual's ability to determine, select, apply and evaluate solutions as well as to control the impulse of acting without careful consideration. The planning subtests consist of matching numbers, planned codes and planned connections (Naglieri & Das, 1997).
- **The attention subscale** - This evaluates the child's ability to focus on particular stimuli and to ignore responses to competing stimuli (Naglieri & Das, 1997). It assesses both sustained and shifting attention. The attention subtests consist of expressive attention, number detection and receptive attention (Naglieri & Das, 1997).
- **The simultaneous processing subscale** - This assesses the individual's ability to integrate separate stimuli into a perceptual or conceptual whole or group, consisting of strong spatial and logical-grammatical components (Naglieri & Das, 1997). The simultaneous processing subtests consist of nonverbal matrices, verbal-spatial relations and figure memory (Naglieri & Das, 1997). Simultaneous processing is felt to be more related to visual than auditory processing (Naglieri & Das, 1990).
- **The successive processing subscale** - This assesses the individual's ability to integrate stimuli into a specific serial order. Each element in the sequence is only related to that which precedes it and the elements are not interrelated. It is required for the serial organisation of spoken speech and syntax in language (Naglieri & Das, 1997). Successive processing is felt to be more related to auditory than visual processing (Naglieri & Das, 1990).

Although simultaneous processing may be more visually based and successive processing more auditorily based, it is stressed that these processes are interconnected and occur in all the modalities (Naglieri & Das, 1990). One of the aims of the development of this battery was to determine whether a relationship between an individual's cognitive processing and overall functioning exists (Das, Naglieri & Kirby, 1994). The cognitive processing assessment was conducted in

English, T's stronger language, due to the negative effects of testing a child's cognitive processing in their weaker language. The Cognitive Assessment System was administered, scored and interpreted according to the administration and scoring manual and interpretative handbook (Naglieri & Das, 1997).

Theory of Mind Assessment

A battery of tasks assessing T's understanding of theory of mind was conducted to establish whether the translated echolalia was related to poor perspective taking abilities and hence poor interlocutor sensitivity. Theory of mind has been described as the ability "to attribute mental states of oneself and other people and to understand and predict their behaviour" (Eisenmajer & Prior, 1991, p. 351). It involves being able to appreciate one's own and other people's mental states, such as their beliefs, desires, intentions, knowledge, pretence and perception; and to understand the links between mental states and action (Baron-Cohen & Swettenham, 1997). A theory of mind deficit in autism is said to result in an inability to: be sensitive to other people's feelings; take into account what other people know (presupposition); read intentions; read the listener's level of interest in one's speech; anticipate what others may think of your actions; understand misunderstandings; deceive or understand deception and understand the motives behind other people's actions (Baron-Cohen & Howlin, 1993). The lack of the theory of mind hypothesis has been said to account for the social and communication impairments of children on the autistic spectrum (Frith, 1989).

The following subskills of theory of mind were assessed:

- **Perceptual role taking** - This pertains to the child making an inference regarding another person's visual perception of the environment (Dawson & Fernald, 1987). The upside down person, face and cubes subtests from Dawson and Fernald's (1987) perceptual role-taking tasks were carried out. Children with no developmental difficulties are believed to develop these skills in early childhood (Dawson & Fernald, 1987).
- **Understanding the mental significance of the eyes** - This involves understanding that seeing leads to knowing and that the eyes carry meaning. Baron-Cohen and Goodhart's (1994) understanding whether seeing leads to knowing task; Baron-Cohen, Campbell, Kirmiloff-Smith, Grant and Walker's (1995) eye pointing task; and Baron-Cohen et al.'s (1995) thought detection task were carried out. Normal children have been shown to be able to complete these tasks correctly by four years of age (Baron-Cohen et al., 1995; Pratt & Bryant, 1990).
- **Understanding belief** - This was assessed through the understanding of false belief, which looks at the child's true belief and his/her understanding of someone else's different belief (Baron-Cohen, 1993). False belief was assessed by means of an unexpected identity task and an unexpected location/transfer task. The unexpected identity task (buttons in a smartie box and golf balls in an egg box) followed the procedure used by Symons, McLaughlin and Moore (1997). The unexpected location task followed the Sally-Anne experiment used by Peterson and Siegel (1995). Normal children have been shown to be able to pass false belief tasks at approximately four years of age (Peterson & Siegel, 1995).
- **Deception** - This assesses the child's ability to change

another person's belief. The ability to deceive someone successfully is said to rely on a fairly good understanding of that person's belief. The puppet task used by Sodian (1991) to assess deception was followed. Here a good king puppet and a bad robber puppet are used. In order to help the good puppet and to achieve what the child desires, he/she is required to deceive the bad puppet (Sodian, 1991). Children between four and five years have been shown to be able to deceive on a task such as this one (Sodian & Frith, 1993).

The studies referred to above should be consulted for a more detailed description of the procedures used. The theory of mind assessment was conducted in English, T.'s stronger language.

RESULTS

LANGUAGE

Receptive language

The results of the Verbal Comprehension Scale A of the Reynell Verbal Developmental Language Scales (Reynell, 1978) are shown in Table 1. T.'s scores indicate that she is significantly delayed in understanding language in both English and Sotho. However, her understanding of English is better than Sotho. Echolalia has been linked to receptive language difficulties and difficulty processing more complex language (Chung, 1998). This was observed in T. where a greater proportion of echolalia was used when communi-

TABLE 1: Results of the receptive language assessment

	English	Sotho
Number of correct responses (n=67)	51	30
Age equivalent score	4,0 years	2,6 years
Standard deviations from the mean	Greater than 3,3 standard deviations below the mean	Greater than 3,3 standard deviations below the mean

TABLE 2: Results of the pragmatic rating

COMMUNICATIVE ACT - VERBAL ASPECTS	Inappropriate	Mostly Inappropriate	Some inappropriate	Mostly appropriate	Appropriate
1) Speech act pair analysis			SOTHO	ENGLISH	
2) Variety of speech acts	SOTHO	ENGLISH			
3) Topic selection		SOTHO	ENGLISH		
4) Topic introduction		SOTHO	ENGLISH		
5) Topic maintenance	SOTHO	ENGLISH			
6) Topic change	SOTHO	ENGLISH			
7) Initiation of turns	SOTHO		ENGLISH		
8) Response to partner's turn		SOTHO	ENGLISH		
9) Repair/revision	ENGLISH SOTHO				
10) Pause time		SOTHO	ENGLISH		
11) Interruption/overlap			SOTHO	ENGLISH	
12) Feedback to speakers	ENGLISH SOTHO				
13) Adjacency	SOTHO		ENGLISH		
14) Contingency	SOTHO	ENGLISH			
15) Quantity/conciseness	SOTHO	ENGLISH			
16) Lexical specificity/accuracy			SOTHO	ENGLISH	
17) Cohesion	SOTHO	ENGLISH			
18) The varying of communication style	SOTHO		ENGLISH		

Table 2 continued on page 128

TABLE 2: Results of the pragmatic rating (Continued from page 127)

PARALINGUISTIC ASPECTS	Inappropriate	Mostly inappropriate	Some appropriate	Mostly appropriate	Appropriate
19) Intelligibility				ENGLISH SOTHO	
20) Vocal intensity				ENGLISH SOTHO	
21) Vocal quality				ENGLISH SOTHO	
22) Prosody		SOTHO	ENGLISH		
23) Fluency			SOTHO	ENGLISH	
NONVERBAL ASPECTS	Inappropriate	Mostly inappropriate	Some Inappropriate	Mostly appropriate	Appropriate
24) Physical proximity			ENGLISH SOTHO		
25) Physical contacts			ENGLISH SOTHO		
26) Body posture		SOTHO	ENGLISH		
27) Foot/leg and hand/arm movements			ENGLISH SOTHO		
28) Gestures		SOTHO	ENGLISH		
29) Facial expression	SOTHO		ENGLISH		
30) Eye gaze	SOTHO		ENGLISH		

cating in Sotho than English (refer to Figure 1). Furthermore, T. was reported to demonstrate a decrease in translated echolalia, with an increase in her understanding of Sotho. These results would suggest that T.'s translated echolalia could possibly be occurring due to receptive language difficulties, where she may be translating the message to assist her in understanding it. They also confirm that English is her stronger language.

Expressive language

Conversational and pragmatic rating

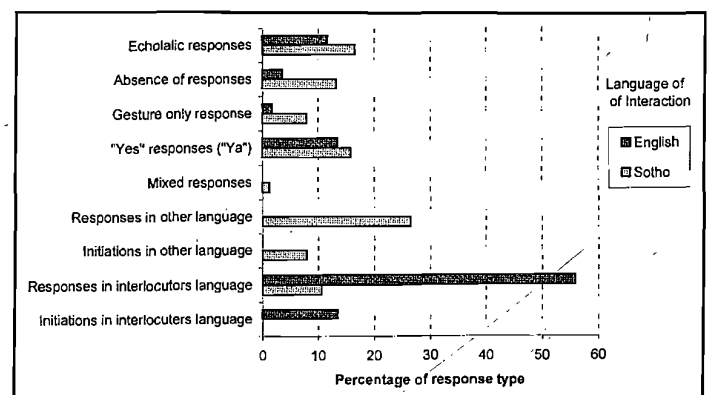
The results of the conversational and pragmatic rating are shown in Table 2. The results of the ratings indicate that although T. interacts inappropriately in both languages, she is more responsive and her interaction is more appropriate in English, further confirming communicative dominance in this language.

Proportion of responses in interlocutor's language in each interaction

The proportion of T.'s responses produced in the interlocutor's language in each interaction is reflected in Figure 1. T. responded more in the interlocutor's language in the English than the Sotho interaction. The low percentage of responses in Sotho during the Sotho interaction (10,6%) reflect her poor interlocutor sensitivity, i.e. the greater number of responses were in English even though she had been told that her interlocutor could only speak Sotho. This would

suggest that her translated echolalia may be occurring due to a deficit in the control of sociolinguistic rules for communication, an explanation previously put forward by Lebrun (1991, in Fabbro, 1999) for a bilingual patient with right hemisphere damage who presented with spontaneous translation in dictation tasks of written language. Lebrun (1991, in Fabbro, 1999) suggested that the difficulty with the control of the sociolinguistic rules for communication resulted in the patient inappropriately switching languages and translating for non-communicative purposes.

T.'s greater proportion of echolalic responses in the Sotho than the English interaction would suggest that communicating in Sotho is more demanding for her. An increase in echolalic responses in autistic children has been demonstrated in more demanding and challenging language

**FIGURE 1. Proportion of responses in interlocutors language**

tasks and communication situations (Chung, 1998; Rydell & Miranda, 1994). Furthermore, a greater proportion of echolalic language has been demonstrated in the early stages of language development in children with autism but to decrease as the child's language skills improve (Lord & Paul, 1997). This lends further support for her language skills in English being more developed than in Sotho.

These results confirm T.'s dominance in English and her clear preference for communicating in English. This would seem to account also for her ability to translate from Sotho to English but not visa-versa. Translation literature

suggests that it is usually easier to translate from the weaker into the dominant language (Fabbro, 1999; Kroll & de Groot, 1997; Malakoff & Hakuta, 1991), a phenomenon known as passive interpretation (Fabbro, 1999). These results also indicate her poor interlocutor sensitivity and greater difficulty communicating in Sotho.

Echolalia analysis

The results of the echolalic analysis are presented in Figures 2, 3 and 4. All the echolalia during the English interaction was in English while during the Sotho interaction 52% was Sotho echolalia, 16% was English echolalia (delayed echolalia) and 32% was translated echolalia (Figure 2). There was a significant difference in T.'s use of immediate versus delayed echolalia over the two interactions. In the English interaction 61,53% of her echolalia was delayed, while 38,46% was immediate (Figure 3). In the Sotho interaction 92% of her echolalia was immediate (with all Sotho and translated echolalia being immediate), while 8% was delayed (all these instances consisting of delayed situational echolalia in English) (Figure 4). Delayed echolalia is more likely to be produced with evidence of comprehension than immediate echolalia (Rydell & Miranda, 1994). Delayed echolalia has been linked to a long term memory store, while immediate echolalia uses reflex like echoic short-term memory (Prizant, 1983). This latter type of memory, sometimes referred to as the 'echo box' store, has been said to retain the physical rather than the semantic aspects of language (Fay, 1983). As all the translated echolalia was immediate this would suggest the use of a word-for-word rather than a deep semantic processing strategy. Delayed echolalia is more likely to be produced with evidence of comprehension than immediate echolalia (Rydell & Miranda, 1994) and may show development of more generative and creative language (Prizant & Rydell, 1984). Immediate echolalia is used more often when the child is confronted with language that taxes his/her linguistic competence (Prizant & Rydell, 1984). In this instance, T. may have used it as a primitive attempt to maintain social contact (Prizant & Rydell, 1984). The greater use of immediate echolalia in the Sotho interaction would again suggest T.'s greater difficulty with this language.

T. used a greater proportion of interactive than non-interactive echolalia in English across the two interactions (Figures 3 and 4). However, she used a greater proportion of non-interactive echolalia in Sotho than English during the Sotho interaction. This suggests that English echolalia was generally used with communicative intent, while Sotho echolalia was not. A greater proportion of translated echolalia was interactive (28%) than noninteractive (4%) (Figure 4), suggesting that the translated echolalia was being used with intent.

One may question whether the translated echolalia was being used as a type of mitigated echolalia, which has been shown to be used with more communicative intent than more conventional immediate echolalia (Schuler & Prizant, 1985). Mitigated echolalia consists of echolalic utterances (usually immediate) where some structural modifications are made (Prizant, 1983; Schuler & Prizant, 1985). This was first described by Pick (1924, in Roberts, 1989) for certain aphasic

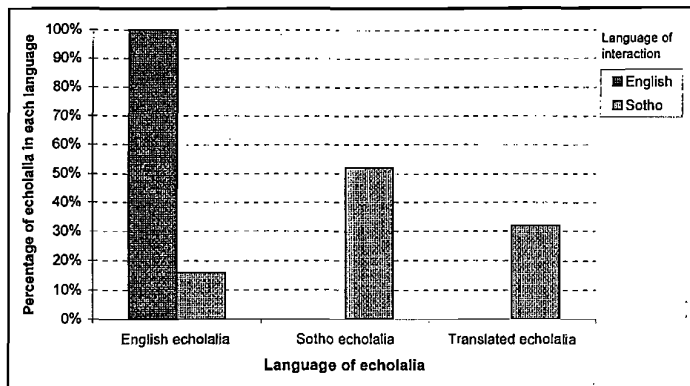


FIGURE 2. Percentage of echolalia in each language in each interaction

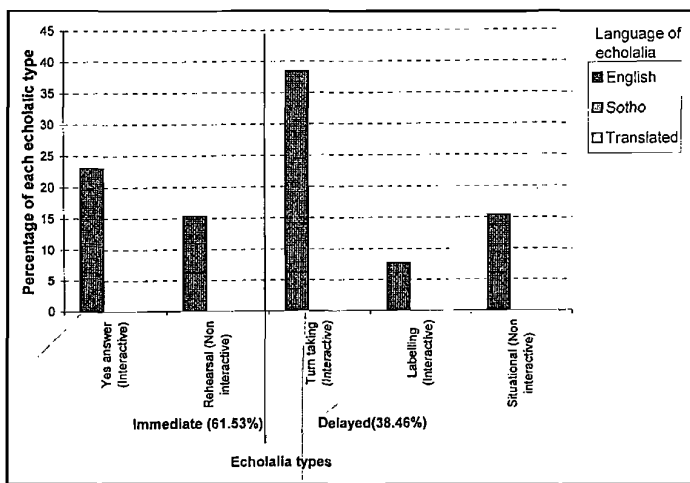


FIGURE 3. Echolalic types in English interaction.

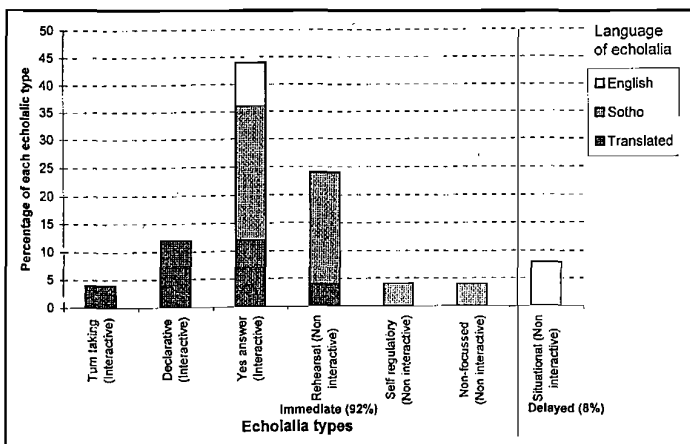


FIGURE 4. Echolalic types in Sotho interaction.

patients. Mitigated echolalia has been thought to reflect a possible discrepancy between structural versus semantic knowledge of language, with changes in mitigated echolalia focussing on the structural aspects of language (Schuler & Prizant, 1985). Whitaker (1976, in Schuler & Prizant, 1985) described a case of presenile dementia where a patient corrected syntactical or morphological errors in his echolalic utterances, but not semantic errors. The use of mitigated echolalia would suggest translating the structural but not necessarily the deep semantic aspects of language.

COGNITIVE PROCESSING

The results of the cognitive processing assessment are shown in Figure 5. T. presented with good successive and simultaneous processing and poor attention and planning. While both successive and simultaneous processing are involved with language processing (Das et al., 1994), simultaneous processing is related to the understanding of grammar, while the syntactic relationships among words and the organisation of speech relies on successive processing (Das et al., 1994). Successive processing appears

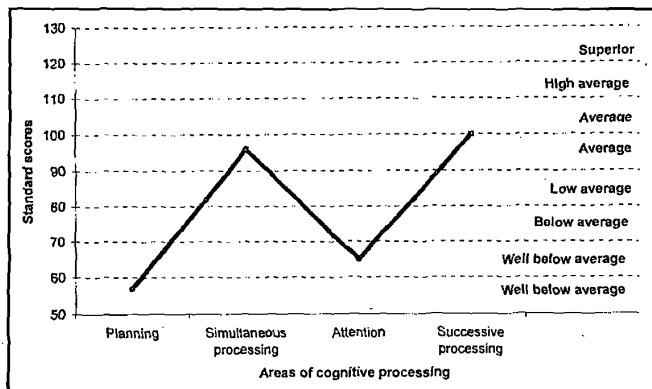


FIGURE 5. Cognitive assessment system

TABLE 3: Results of the theory of mind assessment

Theory of Mind Areas	Subtests	Raw Score	Total Score	Pass/Fail
Perception	Upside Down Person	0/2	1/14	Fail
	Spontaneous	0/4		
	Cubes	1/8		
Mental Significance of the Eyes	Seeing leads to Knowing	0/5	5/25	Fail
	Eye Pointing	1/12		
	Thought detection	4/8		
False Belief	Unexpected Identity	2/8	2/14	Fail
	Unexpected Location	0/4		
	Second Order False Belief	0/2		
Deception	Puppet game	0/4	0/4	Fail

to be linked to metalinguistic ability in that it is required for tasks such as spelling and decoding words phonetically (Das, 1992). A core skill related to successive processing is reciting or rote memory of auditory/verbal information (Das, 1992). Successive processing is linked to the processing and production of grammatical structures (Das et al., 1994).

It has been suggested that echolalia may be a function of good speech and auditory memory in the absence of generative (creative) language ability (Prizant & Rydell, 1984; Schuler & Prizant, 1985). This would be supported by the results of T.'s cognitive assessment battery. Her good successive processing underlies good speech and auditory memory skills. Her poor planning and attention suggests poor executive functioning needed for generative (creative) language use and discourse ability (Mega & Cummings, 1994).

THEORY OF MIND

The results of the theory of mind assessment are summarised in Table 3. These results indicate that T. has a very poor understanding of the thought processes of others. This would result in poor communicative sensitivity which would explain why she uses English with a Sotho-speaking interlocutor and translates Sotho into English during an interaction with this person. Echolalia has been linked to poor meta-representational ability and poor perspective taking (Frith, 1989) T.'s poor theory of mind ability appears to result in her missing the aim of translation, which Malakoff and Hakuta (1991) describe as replacing an utterance from the source language with an equivalent utterance in the target language to enhance communication. T.'s translated echolalia appears to have the opposite effect (i.e. instead of enhancing communication it hampers it).

DISCUSSION OF RESULTS

As is evident from the above results, in order to understand T.'s translated echolalia, many aspects of cognitive and linguistic functioning need to be

considered. Theories of second language acquisition suggest that there is a combination of factors that result in the outcome of the language learning process. These include the quality and quantity of input or language exposure, as well as the individual learner characteristics (personality, attitudes and motivation, and language acquisition aptitude or capabilities) (Spolsky, 1989). Figure 6 is a conceptualisation of the interaction of the variables involved. T's translated echolalia can therefore be explained by the complex interplay of:

- Her individual characteristics, including cognition, theory of mind and attitude/motivation
- Her learner opportunities, with English being more frequently used.
- Her language outcome, with English developing as her stronger and Sotho as her weaker language, as well as her good ability to learn the structural aspects of language, but poor ability to cope with the semantic and pragmatic aspects of language.

While this model helps to explain the development of T's translated echolalia, an issue that remains is to what extent the conceptual/semantic system is accessed during instances of translated echolalia. This will be discussed below.

How does T's language dominance help to explain the processes involved in her translated echolalia?

The results of the language assessment indicate that English is T's stronger language and that Sotho is her weaker language. According to Kroll and de Groot (1997) lexical level representations of words in two languages are functionally independent, while conceptual representations are shared. The issue of whether words in a second language access concepts via words in the first language, or whether concepts can be accessed directly for words in both languages has been debated (Kroll & De Groot, 1997). There is evidence that lexical mediation through the stronger language characterises the performance of non-fluent bilinguals, while concept mediation characterises the performance of more fluent bilinguals (Kroll & De Groot, 1997). A developmental process of lexical to conceptual mediation therefore occurs with increasing expertise in the weaker language. T's translated echolalia only occurred from her weaker to her stronger language and she experienced considerably more difficulty understanding

Sotho than English. If T. was using her translated echolalia to assist her in processing Sotho, this would suggest that lexical rather than concept mediation was being used. This is also reported by Veyrac (1931, 1983, in Fabbro, 1999) in a case with spontaneous translation from the less dominant to more dominant language due to a receptive aphasia.

T's ability to translate her echolalic utterances may suggest that she does in fact understand the interlocutor, despite her receptive language difficulties. If this is the case, it would seem a receptive language difficulty does not entirely explain the echolalic phenomenon. On the other hand it may imply that deep semantic processing is not required for direct translation. This would be supported by Catford's (1965, in Malakoff & Hakuta, 1991) theory of meaning, which argues that meaning can be analysed at a number of different levels and that it is possible to translate first and then understand. It would thus appear that T. is functioning within a two stage model, without necessarily understanding the message at a deeper level.

How do the functions of T's echolalia help to explain the phenomenon of translated echolalia?

T. used a greater amount of immediate than delayed echolalia during the Sotho interaction and all instances of translated echolalia consisted of immediate echolalia. This would suggest greater comprehension difficulties in Sotho than English, as well as the use of a word-for-word rather than a deep semantic processing translation strategy. T. may directly translate an utterance in her echolalia from Sotho to English in order to access the conceptual system. However, Kroll and de Groot (1997) suggest that it may be possible for non-fluent bilinguals to use conceptual information in comprehension and recognition tasks carried out in their weaker language, while the same information may not be used if production is required, such as in a translation task. It is possible that T. may have translated a Sotho utterance to English to facilitate understanding. However, an analysis of the functions of her translated echolalia indicated that in only 12,5% of the instances when it occurred did she appear to use it as a rehearsal strategy.

An analysis of the functions of T's echolalia did suggest that her translated echolalia was being used with some communicative intent, albeit as a type of mitigated echolalia. As the focus in mitigated echolalia is on the structural rather than the semantic aspects of language, this would provide further support for T. using a lexical rather than a concept mediation strategy for translation. The use of a type of mitigated echolalia would suggest the translated echolalia was being used due to poor generative/creative language ability.

What does T's cognitive processing profile tell us about her translated echolalia?

T's good successive processing explains her ability to process the structural aspects of language. Prizant (1983) has suggested that echolalia results from a gestalt strategy used by autistic children to acquire language. It appears that what is meant by gestalt is the ability to recite or repeat an utterance without analysing the meaning at a semantic level (Prizant, 1983) and has been described as the ability to remember multiword units (Schuler & Prizant, 1985). Gestalt processing can therefore be likened to successive processing. In fact, autistic children have been demon-

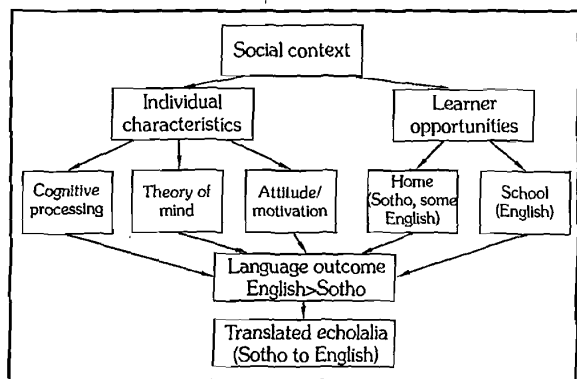


FIGURE 6. Explanation of T's translated echolalia

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strated to use a rote rather than a semantic memory strategy on different tasks (Summers & Craik, 1994; Prizant, 1996). Fay (1983) has suggested that these children have an age appropriate memory span coexisting with faulty semantic processing. It has been suggested that gestalt processing is due to strengths in episodic, rote, associative memory but deficits in semantic, declarative memory (Prizant, 1983, 1996; Roberts, 1989). Furthermore, relatively sophisticated speech skills have been reported to be necessary for echolalia (Schuler & Prizant, 1985) and good speech skills are seen as reflective of successive processing strength (Naglieri & Das, 1990).

Fillimore (1979, in Schuler & Prizant, 1985) demonstrated that children in the earlier stages of second language learning also use gestalt strategies to acquire language, where phrases are learnt as part of the contextual gestalt in which they were first produced. Carroll (in McLaughlin, 1990) suggested that the specific language learning capabilities that facilitate the acquisition of a second language are: a phonetic coding ability, grammatical sensitivity, a strong rote auditory memory and inductive learning ability. It appears that all aspects of the first three and some aspects of the fourth of these capabilities also underlie successive processing. T.'s cognitive processing profile, particularly her strength in successive processing, would therefore also explain her tendency to echolalia and her ability to assimilate the sound structure of a second language so rapidly despite minimal exposure.

T. performed very poorly on the attention and particularly the planning subtests. This suggests executive functioning difficulties. Executive functioning difficulties have been strongly linked to poor abilities in the areas of semantics, pragmatics and discourse (Fabbro, 1999). Executive functioning involves disengaging from the immediate context and instead guiding behaviours by mental models and internal representations (Ozonoff, 1995). Impaired ability to access and hold mental representations on line may result in the individual relying on cues in the external environment to guide behaviour (Ozonoff, 1995). Executive functioning difficulties may therefore account for poor generative language use and over reliance on utterances previously uttered in the environment, which in turn could result in the use of echolalia.

Paradis (1997) suggested that younger bilinguals are different from older bilinguals in their reliance on implicit linguistic competence, the pragmatic aspects of communication and metalinguistic knowledge. Implicit linguistic competence involves the rules of phonology, morphosyntax and to some extent searching the lexicon. These are not under conscious awareness and rely on procedural memory (Paradis, 1997). Paradis (1997) suggested that early bilinguals relied more on the pragmatic aspects of language and metalinguistic knowledge to compensate for gaps in their implicit linguistic competence. Autistic children have been shown to be able to develop implicit linguistic competence, i.e. the ability to develop the structural aspects of language incidentally. Frith (1989) comments on how many autistic children have demonstrated relatively high competence on a wide range of morphological rules and sentence types. Autistic individuals with relatively advanced syntactic and morphological abilities but extreme limitations in pragmatic and semantic development have been described (Tomlinson, 1982, in Schuler & Prizant, 1985). It would appear that autistic individuals may have the ability to develop implicit linguistic competence and

some metalinguistic knowledge. T.'s implicit linguistic competence in Sotho is weaker than in English. She is however, unable to compensate for this by relying on her pragmatic skills.

T.'s poor pragmatic and executive functioning ability, occurring in the presence of good successive processing and better implicit linguistic competence in English than Sotho would contribute towards explaining her translated echolalia. A good rote memory and metalinguistic awareness have been shown to be central to translation skill (Malakoff & Hakuta, 1991). There is some evidence that translation can take place based on implicit linguistic competence without deep semantic processing (Fabbro, 1999). Both echolalia (Roberts, 1989) and translation without concept mediation (Kroll & de Groot, 1997) appear to rely on associative rather than semantic memory. The results of the cognitive processing assessment therefore provide further support for a lexical rather than a concept mediation translation strategy.

How does T.'s poor theory of mind ability relate to her translated echolalia?

T.'s poor theory of mind abilities suggest poor interlocutor sensitivity. This would help to explain that she developed a language that was not the primary language of the home as her stronger language. This provides further support for T. focussing on the structural rather than the functional aspects of language. Her use of translated echolalia with a monolingual Sotho speaker would inhibit rather than enhance the communication.

Of particular interest in this case is the variable of attitude/motivation. Paradis (1997) suggests that motivation may have an influence on the cerebral representation of a language due to the involvement of the limbic system during its acquisition. Usually in first language acquisition, specific motivation to communicate accompanies every utterance. This may be absent in second language acquisition, particularly in the context of foreign language learning (Paradis, 1997). T. however was not motivated to learn her first language as social interactive experiences were not motivating for her. Rather a foreign language (English) became motivating due to its association with television, her obsession. T.'s abnormal learning of a second language over her first language stresses the importance of motivation in the learning process. Due to T.'s poor theory of mind skills, using language for communicative purposes was not motivating for her. Despite relatively little interactive exposure to English, T. developed this language at an early age from watching television. Her obsession with television possibly resulted in a positive association with English, increasing her motivation to use English to communicate in her own way. Her good successive processing occurring together with poor executive functioning and theory of mind ability suggests that the cognitive processes required for learning a second language at a structural level (phonology, morphology, syntax and aspects of the lexicon) were present with or without deep semantic processing necessarily having occurred. Her poor pragmatic ability would support this.

CONCLUSION

Explanations of spontaneous translation have included: an aid to comprehension, as an automatic process, due to

articulatory preservation with separation from other cognitive functions (Veyrac, 1931, 1983, in Fabbro, 1999), or poor control of sociolinguistic rules for communication (Lebrun, 1991 in Fabbro, 1999). T.'s language and cognitive profile could provide support for each of these. Her poor pragmatic skills may result in her being unable to inhibit English while interacting in Sotho. Furthermore, due to her learner opportunities of now being educated in English, English would be more available to her as a function of its frequency of use and recency of activation (Luria, 1974, in Paradis, 1997). Usually a bilingual speaker is able to activate the language he/she is required to speak (Paradis, 1997). However, T.'s poor pragmatic skills may result in her being unable to do this. Autism, by its nature, would not appear to encourage access to the conceptual/semantic system, thereby further strengthening lexical level translation. This would suggest that in language impaired populations the type of mediation used may depend on the type of processing most available to that individual. This case therefore provides support for translation being able to occur without access to the conceptual/semantic system.

Paraphrasing has been said to be the monolingual equivalent of translation (Malakoff & Hakuta, 1991). Paraphrasing, however, would appear to be difficult for autistic children based on their difficulty with generative/creative language use (Lord & Paul, 1997). It would therefore appear that in the absence of semantic processing the monolingual equivalent of translation is echolalia. In this paper a number of common processes have been identified to underlie both echolalia and translation, including gestalt processing, good auditory rote memory and reliance on associative memory. It would appear that as Prizant (1983) has previously said of echolalia, the processes involved in translation are far more complex than has previously been thought.

Studying the bilingual communicatively disordered population provides an unique opportunity to obtain a better understanding of the processes involved in bilingualism, translation, the processes affecting different communication disabilities and the interplay between these. This in turn should provide valuable information regarding intervention for these individuals. It would appear that in bilingual (as in monolingual) communicatively impaired individuals the type of intervention would be greatly influenced by the type of language impairment and underlying processes involved. In a case such as this (with poor semantic and pragmatic processing), the focus would be on further developing the communicative aspects of language. With this, one may continue to see a decrease in T.'s translated echolalia, which would stress the importance of capturing and researching interesting phenomena such as these at the time that they are first observed.

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