

Language Development After Extreme Childhood Deprivation: A Case Study.

Lisa Brown, John Locke, Peter Jones & Sandra Whiteside

Department of Human Communication Science, University of Sheffield, Claremont Crescent,
Sheffield S10 2TA

ABSTRACT

The atypical linguistic processing and cognitive development of previously institutionalised, adopted Romanian children who were socially deprived from birth are being researched using a neurolinguistic theory of development. Of particular concern is the Critical Period Hypothesis (C.P.H.) which holds that the capacity for language can only develop in response to relevant stimulation during a pre-determined period in childhood. The impetus for this research derives from the need to understand the course of human ontogenetic development in abnormal circumstances. The specific focus of the research is the process of *first language acquisition* in children who have suffered extreme social deprivation at an early age. The crucial research issue concerns the extent to which normal language acquisition is still possible given an initial social environment which is largely language-less and lacking in social stimulation and interaction. Therefore, the purpose of this paper is to attempt to analyse what these children can tell us about the potential for language development in the face of such deprived circumstances. In order to examine this, a theory of neurolinguistic development (Locke, 1994, 1996) will be applied to the case study of a previously institutionalised Romanian child, Maria. A key question will be addressed: Has Maria's early deprivation set for her an irreversible path in terms of attaining normal language development?

1. INTRODUCTION

There are very few well-documented cases charting the language development of a child after extreme early deprivation. The first such reported cases were those of "feral" children who had apparently lived their formative years in the complete isolation of the wilderness and who had then been discovered with subsequent attempts to rehabilitate them into civilised society. It has long been hoped by scientists that the study of such uniquely captivating cases of feral and socially isolated children would throw some light on the prognosis for human development in the face of extreme early social deprivation. Of particular interest has been the development of cognitive and linguistic capacities after such extreme privation. (Curtiss, 1977)

The first most widely known scientific study of a feral child was that of the early French psychologist, Itard with Victor the "wild boy" of Aveyron in the early eighteenth century. Also there is the intriguing case of Kaspar Hauser who mysteriously entered Copenhagen society in 1828 after having been socially isolated for the first seventeen years of his life. (Clarke and Clarke, 1976).

The most recent and famous scientific study of a severely deprived child is that of Genie who was discovered in 1970. Genie had been brutally neglected from infancy to adolescence and the case presents a unique insight into the developmental progress of a child after a cruelly deprived and isolated childhood of an unprecedented level. (Curtiss, preface, 1977)

The above cases of delayed language development in extremely socially deprived children raise a central debate: Do humans have an innate language faculty and is there a critical period for the normal development of language? Or is normal language acquisition primarily facilitated by social interaction? This raises important issues within the realms of psycholinguistics and neurolinguistics about the nature of language and language acquisition and development.

The biological determinist model states that language faculty is innate and that there is a critical or sensitive period for the normal development of language. The social interactionist model states that language acquisition is mostly facilitated by meaningful social interaction. At this point, one area of this debate will be focused upon; the notion of a critical period for the development of language.

From a biological perspective, the evidence from the infamous Genie case seems to suggest Lenneberg's hypothesis of a critical period of language, that extends from two to twelve years of age. (Clarke and Clarke, p29) Within this theory, the brain loses plasticity through maturation until a biologically determined point at around puberty. This would seem to account for Genie's relatively poor prognosis in terms of language development. Susan Curtiss found that her vocabulary was adequate but syntax and grammar seemed to be deficient. However, Genie's rare case is theoretically uncertain, since there is controversy about whether she was actually retarded from birth (Locke, 1996, personal communication):

There is a large but untapped section of children whose development if researched would be an important theoretical contribution to the existing knowledge of a language critical period. These children, normal from birth, were, in pre-revolution Romania, confined in orphanages and experienced the severest deprivation. During their formative years, no attempts were made to encourage their linguistic, social, cognitive or physical development. Indeed, they received little in the way of affection or stimulation from their carers. As a result, these children were severely delayed in language and all areas of development.

The purpose of this essay is to attempt to analyse what these children can tell us about the potential for language development in the face of extreme linguistic and social

deprivation. This will be set within the context of the present and future research of present authors with previously institutionalised Romanian children and a theory of neurolinguistic development will be applied to the case study of such a child: Maria. One question will be addressed; Has Maria's early deprivation set for her an irreversible path in terms of attaining normal language development?

To attempt to address the above question, the following, will recount Maria's background, education to date and aspects of her early language ability. Finally, there will be an overview of a neurolinguistic theory of development which will then be applied to the case study of Maria and an attempt will then be made to address the above key question.

2. SUMMARY OF THE CASE STUDY OF MARIA

2.1. Background

Maria was born 25.06.85. at Constanta Hospital, Romania. Her natural mother gave a false name and address and abandoned her one day after birth by running away from the hospital. She was then moved to an 'orphanage' for 1-3 year olds at Cernavoda, South Eastern Romania. She was kept in her cot for twenty-four hours a day and according to her Romanian paediatrician, "made no development". After eighteen months because of her lack of progress, she was again moved thirty miles away to an institution for special needs children at Negra Voda. Here again the children lived almost entirely in their cots and there was one staff member for every forty children. There is no evidence to suggest that Maria was retarded at birth or born with any physical abnormalities. During her time at the 'orphanages', Maria received no stimulation or interaction from her carers and no attempt was made to encourage any progress in terms of development. When Maria was adopted in Romania in 1991 by a British family, she could not walk, talk or eat solid foods due to her unwillingness to chew. She had never been weaned at the orphanage and had lived on a liquid diet. Maria came to England in October, 1991 and was adopted under British law in July 1992.

2.3. Education to Date

When Maria was adopted she was six years old and had a vocabulary of ten English and Romanian words that she had learnt from Western volunteers. During her first two years in England, she was educated at home with the full support of the Local Education Authority. During this time, the emphasis was on facilitating her physical, cognitive and language development. She was taught to walk with the aid of physiotherapists and swimming hydrotherapy and was introduced to solid food and toilet trained. She saw a speech therapist for an initial assessment and it was felt that needed to receive as much language input as possible in order to encourage her development in this area.

Maria was monitored every three months for a year until she started seeing a different speech therapist once a month. Programs involving reading and picture games were used to stimulate linguistic progress. It became apparent that Maria's

speech problems lay not particularly in phonology, but in her acquisition of grammar. For example, her omission of prepositions, determiners and auxiliaries and her difficulty with using verb tenses. At this stage, she was making spontaneous three word utterances with sentence structure evident.

In 1992, Maria was assessed by an educational psychologist for a statement outlining her special educational needs. According to this report, her language was telegraphic but functional and although her "language faculty" was limited, she was attempting to relate past, present and future events. Her level of language was reminiscent of speakers who have acquired English as a second language within syntax and speech delivery. For example, the utterance, "off coat".

In 1993, Maria's overall development was placed at between three and three and a half years old at a chronological age of nearly eight years. Previously, aged seven and a half, Maria had got a part-time placement at a nursery where she attended for one day a week, accompanied by her adoptive mother. Here, Maria had a one to one helper and was encouraged to integrate with the other children who were of nursery age to about four years old. She joined in with their level of education and participated in word and visual game activities that included sand and water play, bricks and colouring. Although her linguistic capabilities improved, her friendships were slow because of her delayed language. It was noticed also that she "internalised" her language and "conversed" with her dolls.

At nine years old, Maria was moved into the reception class of a main stream school (with a full-time helper) where the age range of the children was five to nine years old. At the age of ten, she was placed in year. At this time, Maria also had a part-time placement at a school for children with moderate learning difficulties and to where she attended for three afternoons a week. At this stage, there were worries that she could "plateau" her development, but this did not seem to be the case. At the age of eleven, Maria was at the M.L.D. school full-time and was in a class with children whose average age was eight.

3. DEVELOPMENTAL NEUROLINGUISTIC THEORY OF LANGUAGE DEVELOPMENT: AN OVERVIEW

Developmental neurolinguistic theory (Locke, 1994, 1996) states that species typical language development occurs in four critically timed phases that occur in an interdependent sequence. Each phase accomplishes a unique linguistic function through the "allocation" of neural resources specific to each phase (Locke, p.608, 1994).

During the affective first phase-which occurs from gestation to about 1 year of age-the child is oriented to the caregiver's face and voice and learns to (interpret) and respond to prosodic messages conveyed by the caregivers. The child learns about simple vocal characteristics and in appropriate social contexts may mimic or reproduce the intonation patterns.

The second phase is social and affective and its function to acquire utterances in the form of under-analysed segments of language is largely served by social cognition mechanisms located in the right hemisphere. The child learns to associate prosody with certain words and phrases but is not able to generate these prosodic patterns.

The third phase function involves the analysis of the previously acquired store of utterances which are "decomposed" into component parts; segments and syllables (Locke, p609, 1994). This process helps the discovery of regularities and structural rules in language and is thereby responsible for the child's discovery (and acquisition) of grammar/syntax. This phase, active for a timed period is primarily served by normal linguistic mechanisms in the left hemisphere that enable phonology, morphology and syntax.

The fourth phase involves the integration and elaboration of the previous phase functions and utilises linguistic resources in both cerebral hemispheres to enable the child considerable lexical learning.

So what causes language delay? Developmental neurolinguistic theory suggests that when children are language delayed, it is caused by a neuromaturational delay (responsible for deficits in social cognition resources) that delay storage of utterances and thereby hindering the development of grammatical capacities. Lexically delayed children do not have enough stored utterances to activate analytic devices that lead to the discovery of grammar (Locke, p612, 1994). Continued efforts to speak cause compensatory measures that involve the utilisation of less adept "species atypical" linguistic resources to take over the language functions that are normally controlled by the now under-powered linguistic mechanisms in the left hemisphere.

4. THEORY APPLIED TO THE CASE OF MARIA

The following, will attempt to use the neurolinguistic theory of development, outlined above, as a framework to show theoretically how Maria's deprivation would have delayed her in the normal stages of development therefore causing her subsequent language delay. However, the second half of the essay will attempt to show that Maria presents a special case that may not fit comfortably within the confines of such a theory for explaining the delayed language development.

The sensitive period for language learning according to Lennenberg (1967) extends from 2 to 12 years. However, according to Locke (1996), there have not been adequate tests of Lennenberg's original Critical Period Hypothesis and that much of the research projects that have dealt with this have "misconstrued" what a critical period really is; that it is a neurophysiological concept (Locke, personal communication, 1996). Developmental neurolinguistic theory suggests that a critical period concept for language involves the activation of specialised linguistic mechanisms involved in the control of language that will happen only once in a person's lifetime. And the development of formerly institutionalised Romanian children presents an intriguing test of this theory.

Present research projects, it seems, are addressing the wrong question in trying to establish whether children are able to learn languages at a later stage such as eight, ten, twelve or older as readily as they do during the normal years of language learning. The relevant issue is ascertaining how able are people to use again, an "acquisitive set of mechanisms" that is already functioning (Locke, personal communication, 1996). Also the questions about a critical period has to do with at what age /point do these linguistic mechanisms turn on?

New evidence suggests that the period actually starts from the child's first relevant experience until 6 to 8 years of age, followed by a period where language acquisition capacity atrophies towards adolescence (Locke, p2, 1996). However, it has also been suggested that the critical period may actually end nearer to five or six (Locke, personal communication, 1996).

Within the parameters of developmental neurolinguistic theory, it would seem that Maria was even deprived in the early stages of development that would have afforded her experience of vocal behaviour and that would have biased her to attend and respond to particular aspects of such behaviour.

As already stated (see overview), neuromaturational delay (that cause deficits in the mechanisms of social cognition) would have deprived Maria of the socially cognitive processes that would have oriented her to speech, thus helping her vocal learning and early production of words. These processes would have included her natural tendency for vocal turn-taking, mimicry of prosodic patterns, communicative gestures, meaningful interaction with interlocutors and ability to interpret their intentions. Also too, not only would she been deprived in her social/cognitive development, but also in *all* the distinct, critically timed phases of language development as outlined in the neurolinguistic theory described; "vocal learning, utterance acquisition, analysis and computation and integration and elaboration." (Locke, p5, 1996).

According to the theory, within the second phase of language (which may start as early as 5 months) Maria should have acquired a store of utterance material in the form of *formulaic* word sequences (Locke, p5, 1996). However, this did not happen in her case because during her socially isolated internment at the orphanage, there was *no* utterance material to be acquired. This therefore, had repercussions for the development of the functions of the third phase, namely that if there was an insufficient store of utterances, then there was no activation of her (species) specialised grammatical mechanisms and a critical period for this came and went without a heightened result. As Locke states:

"Children who are delayed in the second phase have too little stored utterance material to activate their analytic mechanism at the optimum biological moment and when sufficient words have been learned, this modular capability has already begun to decline. Inactivation has the same effect as *damage*." ("A Theory of Neurolinguistic Development", p2, 1996)

The fourth phase involving the integration of "analytical and computational" capacities with the system of acquired utterances would have also been denied to Maria (p5). The

analysis of these stored utterance forms-to produce systematic rules-would have facilitated the acquisition and production of a larger lexicon and thereby her grasp of syntax/grammatical rules.

So in Maria's case, she had been linguistically, cognitively, socially and nutritionally deprived and so was/is delayed in every area of development. She had been socially isolated from birth to six and so *is* it reasonable to assume that the sensitive period for the species typical development of language with her has come and gone? Hypothetically, if Maria had missed the critical period for the activation of species typical linguistic mechanisms then subsequent attempts to speak would involve compensation of atypical neural resources in the right hemisphere taking over from those orthodox linguistic resources in the left hemisphere. The path is thus set for a seemingly specific language impairment and a brain that would appear to have developed abnormally.

However a distinction needs to be made here between the evidence of cases of developmental language disorders in children who are otherwise being normally treated and Romanian orphans that have been severely deprived in all areas of development-not just linguistic. That they are delayed in *all* areas including nutritionally and physically may be a factor that delays the point at which linguistic mechanisms are turned on. This may mean that the time is not lost as far as brain development is concerned.

Evidence for this is derived from the from the observation that formerly *severely* deprived children sometimes exhibit "growth spurts" after rescue and varying degrees of "catch-up" in their developmental progress. This is something which is not normally evident in children who have been linguistically deprived but otherwise normally treated. Indeed, there is some evidence of this (catch-up) in Maria's case. A report entitled "Psychological Advice Regarding Special Educational Needs, 1993 states,

"Maria is functioning at a nursery level several years delayed for her age, but having shown not just progress but some degree of "catch up" i.e. though still very delayed, the degree of delay is less than before".

It could be said here then, that with previously institutionalised Romanian children, the language "clock" has not really started at the point it would if they were receiving linguistic stimulation. There is no evidence to suggest that Maria was mentally retarded at birth and so it is fairly certain that her delayed language cannot be attributed to a psychological disorder (such as autism) or a genetic pre-disposition for such. Quite simply upon her adoption she had no language because she had had virtually no linguistic experience during her important early language learning years. However, even though she did not develop at the orphanage due to the nature of her deprivation, is it possible that she could still go through the normal stages of development but at a later chronological age? And that eventually, her overall development would reach a level on par with her chronological age? Also as far as language is concerned, is it conceivable that she still retains the latent capacity to utilise species typical neural resources for language development i.e. those primarily located in the left hemisphere? If this were feasible, then it could be suggested

that Maria's later acquisition of language (and children like her) is analogous to filling an empty linguistic cupboard. To use a neuralinguistic theory, her store of utterance material was empty because within the orphanage there was no such utterance material to be acquired. And so if exposed to linguistic stimuli, her "cupboard" for utterance material would be filled to overflowing thus activating species typical linguistic mechanisms specialised for the (species typical) development of language. The above questions are intriguing, but, these issues may only be resolved through further research with formerly deprived Romanian children. At any rate, it may be tentatively suggested that the critical period for language for Romanian children with histories of extreme neglect might extend later than five or six (Locke, personal communication, 1996).

As far as predicting a prognosis is concerned, it may be prudent to say that formerly deprived children develop at different rates. Outcome may be variable according to the differences in how the children were treated in their early years and individual psychology. As far as Maria is concerned, phonology-as already seen-isn't likely to be a problem. Her ability to learn vocabulary should remain open, although she may not be able to learn new words at the same as other people. It is uncertain as to whether she would be able to learn a foreign language. Also, her ability with language games (such as pig Latin) which involve the "metaphonological" or "metalinguistic" actions of distinguishing sounds and syllables remains unclear. Reading and writing might be an area of concern and her ability to surmise regularities of syntax and morphology, since she was not taught structural rules in her early years. So the linguist's main concern as regards Maria's future language development would be in her grasp of grammatical rules and syntax.

However, the language outcome for Maria seems to be unclear. Or as Locke says it's, "a guarded prognosis" (personal communication, 1996). What does seem to be clear is that her case would present a discouraging picture to other psycholinguists because she reached the relatively late age of five without any linguistic experience. So perhaps the only prediction that developmental neurolinguistic theory can make for Maria at present is that she may or may not be language impaired for the rest of her life.

5. REFERENCES

1. Clarke, A.M. and Clarke, A.D.B., *Early Experience: Myth and Evidence*, Open Books Publishing Limited, 1976.
2. Curtiss, S., *Genie: A Psycholinguistic Study of a Modern-Day "Wild Child"*, Academic Press, INC, 1977.
3. Lenneberg, E.H., *Biological Foundations of Language*, John Wiley and Sons, Inc., 1967.
4. Locke, J.L., "Gradual Emergence of Developmental Language Disorders", *Journal of Speech and Hearing Research* 37: 605-620, 1994.
5. Locke, J.L., "A Theory of Neurolinguistic Development", *Brain and Language*: 397-434, 1996.