1 Introduction

1.1 Problem analysis and subject matter
In the Netherlands, diagnostic procedures in children with speech and language problems have been under discussion since 1990. This discussion was initiated by the parents of children with speech and language impairments, organised in the parental associations BOSK (association for parents of children with motor developmental problems) and FOSS (association for parents of children with hearing, speech and language problems). These organisations published three reports in which they concluded that the diagnostics procedures and treatment in language-impaired children were ambiguous (BOSK/FOSS, 1990; BOSK/FOSS, 1991; BOSK/FOSS, 1993). For instance, they concluded that various specialists can be consulted when a language problem is suspected, e.g. an otorhinolaryngologist, a speech therapist, an audiologist, a child psychologist, a paediatric neurologist, or a rehabilitation specialist. All these specialists have their own diagnostic procedures and definitions for speech and language disorders, which does not contribute to a uniform diagnosis and an adequate treatment strategy. The children are often seen by an average of five specialists before they receive adequate treatment. Furthermore, there is an average period of 33 months from the moment a speech and language problem has been identified to the moment when treatment is completed (BOSK/FOSS, 1993; van Balkom & Bakker, 1998). Therefore, the parental organisations concluded that “the current situation concerning the diagnostic procedure for children with speech and language problems is characterised by a lack of quality, efficiency and accessibility” (BOSK/FOSS, 1993). As a consequence, they pleaded for a multidisciplinary diagnostic procedure. The Dutch Federation of Centres for Audiology (FENAC) has supported the parents in their plea for multidisciplinary diagnostic procedures for speech and language-impaired children (KITS, 1997; NVLF, et al. 1998).

At about the same time, the Dutch Health Insurance Board expressed their concern about the amount of speech therapy resources consumed by young children.
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Children aged 0-10 utilise 40-60% of the Dutch National Health Service’s investment in speech and language therapy; 6% of all children aged 0-12 years receive speech therapy, and the number of therapy sessions varies between 2 and 90 (Bartelds, et al. 1992; Goorhuis-Brouwer, TenVergert, & Douw, 1997). Considering all these factors, speech and language therapy in young children is under discussion regarding efficacy and costs. The Health Insurance Board has formulated the following statement on the need for research in this area: “The efficacy of speech therapy is unclear. There are no protocols for diagnostic procedures and referrals or for treatment. It is unclear which criteria are being used to decide in favour of speech therapy. Furthermore, the diagnostic procedures followed by speech therapists themselves is under discussion because almost everyone who is referred is also treated. This could be an indication of overtreatment. Treatment procedures are unclear with regard to content, duration and evaluation moments. It is unclear whether individual or group therapy is required. The problems mentioned apply in particular to language disorders in children, aphasia and stuttering” (ZiekenfondsRaad, 1999). From this statement, it is clear that there is much uncertainty about how to handle language disorders. The lack of evidence-based fundamentals with regard to diagnostic and therapeutic procedures for speech and language disorders is not only a national problem, but also an international issue. Fundamental problems exist regarding diagnostic procedures. Moreover, it is unclear which children may benefit from speech and language therapy (Bishop & Edmundson, 1987; Enderby & Emerson, 1995; Bishop, 1997).

1.2 Diagnostic procedures

Considering the complex and multifactorial processes in language acquisition, uncertainty about diagnostics and treatment of speech and language problems is hardly surprising. A child’s capacity for language acquisition, the language input, as well as the medical and psychological status of a child are involved. In the Netherlands two diagnostic procedures are used, a monodisciplinary diagnostic procedure (MonoDD)
and a multidisciplinary diagnostic procedure (MultiDD) (Goorhuis-Brouwer & TenVergert, 1997; KITS, 1997).

In the MonoDD procedure, one specialist examines the child before treatment or further diagnostics. For instance, in many Dutch schools, speech therapists examine all five-year-old children on speech and language development. As a result, many children (25 - 40%) are referred for speech therapy; Kroon even cited a level of 79% (Coehoorn, 1995; Kroon, 1998). Moreover, when other specialists examine children with language problems, this often leads to referrals to speech therapists. For most of these children (99%), the speech therapists recommend speech therapy (Goorhuis-Brouwer, et al. 1997; ZiekenfondsRaad, 1999).

In a MultiDD procedure, a child is examined by at least two specialists before recommending further examination or treatment. Following a MultiDD procedure, therapy strategies are more varied than in a MonoDD procedure: more combinations of therapy interventions are suggested (de Ridder-Sluiter, et al. 1999). When a multidisciplinary approach is chosen, the procedure can differ on essential points. Some clinics prefer a broad procedure in which several specialists (at least four) examine the child before recommending therapy. Other clinics prefer a brief initial examination by two specialists (especially in cases of ambiguous referrals) and then determine which specialist should see the child at a later stage prior to recommending therapy (KITS, 1997).

Currently, it is broadly accepted that MultiDD is necessary in the diagnostic process for children with language disorders (KITS, 1997; ZiekenfondsRaad, 1999; de Ridder-Sluiter, et al. 1999). However, there is no consensus about the composition of a MultiDD team and procedure. Based on the KITS-report, the Dutch Health Insurance Board concluded that in diagnostic procedures, often personal preferences and practical considerations are leading. There is no unambiguous MultiDD protocol available (personal letter from the Dutch Health Insurance Board, 1999). Therefore, in practice a MonoDD procedure is often used (Welle Donker-Grimbrère, et al. 2000).
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1.3 Subject of research

The previous discussion indicates that a MultiDD procedure in children with speech and language problems is preferable to a MonoDD procedure, but in practice not often used. This mainly has to do with the uncertainty about the composition of a MultiDD team and the content of a MultiDD protocol. Our research is focused on the development and evaluation of a MultiDD protocol. The purpose of this study can be formulated as follows:

1. The development of a protocol for a multidisciplinary diagnostic procedure for children with speech and language problems.

2. Evaluation of the MultiDD protocol. Is the use of the MultiDD protocol feasible according to the co-operating disciplines, and useful to come to differentiation in diagnostics and treatment recommendations?

3. When referred to the MultiDD procedure or a regular MonoDD procedure for children with speech and language problems, are there differences regarding the background variables, therapy recommendations, therapy effect and parental satisfaction?

1.4 Outline of the thesis

This study consists of three parts, and is organised as follows to address the above-mentioned research purposes.

In Part I, containing the Chapters 2, 3, and 4, the first two research purposes are described. It describes the development and evaluation of a uniform diagnostic procedure for children with speech and language problems. Chapter 2 describes the many factors influencing language acquisition, which results in a choice for disciplines involved in the MultiDD procedure. Chapter 3 describes the development and content of the multidisciplinary diagnostic protocol within the Department of Otorhinolaryngology, University Hospital Groningen. It also describes a scheme in which the MultiDD leads to treatment recommendations. The evaluation of this MultiDD protocol and scheme for diagnosis related treatment recommendation
regarding feasibility and usefulness is examined in three explorative studies, described in Chapter 4.

In Part II, containing the Chapters 5 and 6, the outcomes of the MultiDD and MonoDD procedures are described: Chapter 5 describes the selection of subjects and methods for the analysis of the two procedures. Chapter 6 describes the results of this study.

In Part III, containing Chapter 7, a general discussion about the three research purposes are described, and recommendations for further research are formulated.