Part II

Analysis of the developed MultiDD procedure for children with speech and language problems, compared to the regular MonoDD procedure

Part II examines the third research question: 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? Chapter 5 describes the selection of subjects and methods for analysing the two procedures, and Chapter 6 describes the results of this analysis.
5 Subjects and Methods

5.1 Objective
In contribution to the discussion about the different diagnostic procedures in children with language disorders, this study was performed. The study answers our third research question: When referred to a 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?

5.2 Research design
The study was a prospective explorative study in which two diagnostic procedures in children with speech and language problems were analysed.

The first group followed the developed MultiDD procedure, in which an otorhinolaryngologist, a child psychologist, an audiologist and a speech pathologist examined the child. The children were selected from the regular group of children who were referred to the Department of Otorhinolaryngology, University Hospital Groningen, Communication Disorders in Children section, when they met the inclusion criteria.

The second group, the MonoDD group, followed the regular referral pattern of the General Practitioner (GP). For the inclusion of these children, General Practitioners were asked to participate in this study. Depending on the local situation and professional preference, the referral selection can differ among GPs. For inclusion, the GPs gave the names and addresses of children who met the inclusion criteria. Then, they followed the normal referral process. The children included in this group were examined at home. In order to prevent interference with the current referral behaviour, there was no feedback to parents or GPs concerning the outcomes of the language examination and non-verbal screening.
Randomisation was not desirable because randomisation would influence the GP’s regular referral behaviour in common practice, and, therefore, bias our research. To prevent interference with the MultiDD group, we approached GPs who lived in North-Holland, Overijssel and South-Drenthe for participation in the study. If they wanted to refer the child to a hospital or MultiDD team, it was likely that they would refer the child to a nearby clinic.

5.3 Subjects: Inclusion criteria

The criteria for inclusion were the same for the MultiDD and the MonoDD group:
- The parents were concerned about the speech and language development of their child
- The child was 1;8 to 5;3 years old.
- The Dutch language was the primary language.

The parental concern about the language development of their child was the reason for visiting either the Department of Otolaryngology or their GP. The age range was chosen because of the characteristics of the selected standardised language tests. Moreover, as the language tests were standardised for Dutch-speaking children, only Dutch-speaking children were included. For both groups of children it was assumed that the same language abilities were found. Only the differentiation between specific and non-specific language problems and the resulting treatment recommendations were expected to differ.

5.4 Methods

Both groups were analysed using a research protocol at the start ($T_0$) and 12 months after inclusion ($T_1$), see Appendix C. At $T_0$, the information of children in the MultiDD group were deduced from the MultiDD protocol. The information of the children in the MonoDD group was gathered in an examination at home. Time points of examinations are shown in Table 5.1. The time span of twelve months was chosen, because it was
thought that recommended therapy could be finished within a year (Goorhuis-Brouwer & TenVergert, 1997). For instance, when speech therapy is recommended, for most children this is finished within 12 months (Goorhuis-Brouwer, et al. 1997). The following paragraphs specify the assessments as mentioned in Table 5.1.

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### 5.4.1 Background variables

At T₀, in all children, risk factors for developmental language problems were compiled, such as gender, birth weight (< 2000 or ≥ 2000 grams), attending a crèche or kindergarten, siblings, family composition, and SES. The SES is based on the highest parental education and divided into ‘low’, ‘middle’ and ‘high’ (van Eldik, et al. 1995; Schlichting, et al. 1995). In order to gain an insight into the sense of reality of the parental view of the language problems of their child and possible related problems,
parents were asked if they considered the language problem an isolated problem, or as part of a medical or a broader developmental problem.

5.4.2 Medical and audiological status in the MultiDD group

Children in the MultiDD group were medically and audiologically examined. Medical problems were diagnosed if during the medical or audiological examination abnormalities were found in hearing, ear, nose, mouth (tonsils, adenoids, palate and velum, pharynx), neck and throat, anatomy and movement of speech organs, or in the global medical screening.

5.4.3 Language skills

Language skills were measured by the Reynell test for language comprehension (RTB) (van Eldik, et al. 1995), the ‘Sentence Development Test’ of the Schlichting test for language production (STP) (Schlichting, et al. 1995), and the Groningen Diagnostic Speech norms (GDS) (Goorhuis-Brouwer & Schaerlaekens, 2000). The RTB and STP are standardised, reliable, and valid language measures, easy to administer (Eldik, 1998; Evers, et al. 2000; Resing, et al. 2002). Language skills as measured by the STP and RTB were translated in quotient scores (mean = 100; SD = 15): ZQ and TBQ scores. The GDS is a screening test in which spontaneous language production was deemed “adequate” when it minimally correlated with chronological age. Language production was deemed “inadequate” when the child’s language production was less than expected, based on chronological age.

In our study, language problems were diagnosed when language comprehension, language production, or both, were inadequate. Language comprehension was considered inadequate if the TBQ score was below 80 (1.3 SD below the mean). Analogous to language comprehension, language production is considered inadequate if the ZQ score is below 80. When the child was not able to take the STP, implying that there is no reliable score on the STP, an “inadequate” score on the GDS suggests a language production problem.
Improvement in language skills was calculated by subtracting the ZQ or TBQ scores at T0 from the scores at T1. An improvement of at least 1 SD is considered significant, which means an improvement of 15 points on the RTB or STP (van Eldik, et al. 1995; Schlichting, et al. 1995).

5.4.4 Global non-verbal development

The global non-verbal development was assessed with the DOS-R (Cools & Hermanns, 1986; Knijff, et al. 2002), together with observation of the child’s behaviour. The scores on the DOS-R are judged “adequate” or “inadequate. An “inadequate” score on the DOS-R always results in suspicion of developmental delay. An “adequate” score on the DOS-R, together with behavioural problems mentioned by parents or observed during the examination, can also result in suspicion of developmental problems. The number of children in the MonoDD and MultiDD group with an “adequate” or “inadequate” global non-verbal development at T0 and T1 was calculated. Global non-verbal development was considered improved if a child moved from an “inadequate” score at T0 to an “adequate” score at T1.

5.4.5 Questionnaires

In the questionnaires, which parents received every four weeks by mail, parents were asked to fill in the number of visits to all specialists the child visited for speech and language problems. With the questionnaires, the type and duration of the treatment was assessed.

5.4.6 Parental satisfaction

At T1, after the re-examination, in a short personal interview parents were asked their opinion about the diagnostic procedure and treatment their child received during the year. Parents were asked about their feelings of satisfaction and were given the opportunity to make personal remarks about preferable and less preferable aspects of the process and treatment. Also their opinion about the improvement of language skills of
their child was asked. When improvement was mentioned, parents were asked if they thought their child had overcome the language problem or not.

5.5 Statistics

In this explorative study, mainly descriptive statistics will be presented. In case p-values are presented, these should be interpreted in an explorative manner, i.e. in order to generate hypotheses for future research. Categorical variables were compared using the Chi-Square test. When sample size was too small or poorly distributed for use of asymptotic significance, the exact significance was used. In this study a two-tailed p-value of <0.05 was considered significant. Statistical analysis was performed using SPSS 10.0 for Windows (SPSS Inc.).