On describing the residential care process: social interactions between care workers and children according to the Structural Analysis of Social Behavior (SASB) model

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3 Method of the empirical study

3.1 Introduction

The present chapter explains how the empirical research was conducted. In paragraph 3.2 the setting of the study is described. The identification of the research participants is presented in paragraph 3.3. Paragraph 3.4 is a section on the data collection; the procedures for video recording, transcribing and coding according to the Structural Analysis of Social Behavior (SASB) model are outlined. In paragraph 3.5 the subquestions asked are presented. Finally, paragraph 3.6 describes the analysis and statistical tests.

3.2 Setting: The Widdonck

This study is carried out in conjunction with the Widdonck, a residential orthopedagogical treatment center for children with severe behavioral and emotional problems.

The Widdonck is situated in the south of the Netherlands in a little village called Heibloem. The buildings of the institution, including the unit houses (pavilions, cottages), the therapy buildings, the administration building, a school for special education, a sports hall and a shop, are spread over the large grounds, which are planted with trees and lawns.

This residential treatment center houses a maximum of 106 children in the age group of 6 to 16. Most of these children suffer from a combination of severe behavioral and emotional problems together with learning disabilities. A majority originates from severely disturbed families. Contra-indications for admission are mental retardation, a serious physical or sensory handicap and behavioral problems due exclusively to organic disorders.

The Widdonck has 10 living units or living groups, each of which houses 7 to 11 children. In these living units the daily upbringing and treatment of the children takes place by residential child care workers. A team of 5 or 6 residential child care workers is attached to each living unit. They rotate and work in shifts. There is one behavioral scientist for every two teams, who is responsible for the supervision of the residential child care workers and for maintaining contacts with the parents of the children. Final responsibility for the treatment is in hands of the treatment or pedagogical director. Besides this treatment director there is a financial director. There is one staff member who is responsible for the recording and selecting of videotapes in the living units, since video recordings of social interactions between the children and the child care workers play an important role in weekly supervision meetings. In addition there is a motor therapist who treats individual children, a social worker who is responsible for visiting the parents at their homes, a general coordinator who has an organizational function, and several auxiliary services.

Residential child care institutions in the Netherlands are required by law to prepare institutional documents, so-called working plans, in which they describe and account for all their activities. In such institutional documents of the Widdonck it is explained: how the
intake procedure is carried out, what the fundamental treatment philosophy of the institution is, and which specific types of care are provided (De Widdonck, 1993, 1995, 1996).

An intake committee, consisting of the treatment director, the behavioral scientist and the school principal, conducts the intake procedure. Usually, many diagnostic reports are available already. If a child’s needs seem to match the capabilities of the treatment environment in the institution, an introduction meeting in the environment of the child is arranged, which usually is another care center. During such a visit especially the way in which the child is interacting is judged. On the basis of an evaluation of the introduction meeting it is decided whether the child will be admitted to the Widdonck and to which living unit (s)he will be allocated.

During the intervention period, continuous assessment is carried out in order to determine whether the definition of the child’s problems and needs are still adequate, and also whether the treatment goals and method are still adequate.

The fundamental treatment philosophy of the Widdonck is based on two basic elements. These form the underlying dynamics of the therapeutic milieu.

The first basic element concerns the dynamic or functional approach of the maladaptive child behaviors. It is assumed that these children who suffer from severe problems have a reason for behaving themselves the way they do, which is surviving. For that reason the residential child care workers not only have to pay attention to overt symptoms or verbally expressed problems. More importantly, they must take notice of covert needs of the child and the meaning of the child’s behavior. They have to make considerable effort to understand the child’s behavior and needs by continuously answering the question of what kind of request for help a child is expressing through the behavior. Care workers have to be able to vary their interventions depending on this request for help. This means that they have to meet the children’s dependency needs and create opportunities for the children to have positive experiences. In that way the children will experience that the reasons for their maladaptive behaviors no longer exist and they will feel challenged to start showing more adaptive behaviors. In addition, it is important that the care workers guarantee basic security, which means both physical safety and psychological safety. Care workers have to be able to incorporate the interventions in daily treatment, in their close and daily contact with the children. In this respect evaluating the interventions on the basis of video recordings of the social interactions between care workers and children are important. Video recordings help the residential care workers to assess their relationship with the children in the living unit.

The second basic element in the treatment philosophy of the Widdonck concerns the system approach. Any child is part of different systems, of which the most important are the family, school, the peer group. It is important to incorporate these systems in the residential treatment. Good and bad communication patterns between the child and important others are of central concern. This also means that the care process not only is directed at the behavioral and emotional problems initially presented by the child; also past and present social environmental influences are considered.

Two major types of living units are distinguished in the Widdonck, each with a specific type of care: those primarily providing structure and those primarily providing emotional and
affective care. Depending on the characteristics and needs of the children, the children are allocated to one of these treatments.

The care in residential living units where child care workers primarily provide structure aims at children who show externalizing behaviors as in conduct disorder, attention deficit disorder, and hyperactivity. Structure refers to boundaries that are adequate for healthy development. The most important forms of structure are rules and daily routines. Care workers teach the children to structure the world around them, to understand it and to make it predictable.

The care in residential living units where child care workers primarily provide emotional and affective care aims at children who have experienced abuse, neglect, disrupted family relationships, or other trauma. These children have difficulties with developing attachments. The relationship between care worker and child is considered to be a critical therapeutic element. The care worker must try to build a relationship based on mutual trust with these children, since this is supposed to become the motivation for a child to start behaving more adaptively.

In the present research project it is studied whether these different approaches can be detected by observing the social interactions between care workers and children.

### 3.3 Research participants

In principle, all logically possible care worker/child dyads in each living unit are eligible for being included in the research project. However, not all residential living units, all child care workers, and all children of the *Widdonck* could be included in the study. The reasons are the following. The SASB is microscopic and requires video recording. Therefore the application of the SASB is time-consuming. Benjamin et al. (1986) report an average time of one hour in order to code one minute of videotape and samples of 10 to 20 minutes are recommended. These specifications, together with the wish of including a significant part of the institution, were considered in restricting the number of participating residential living units, child care workers, and children.

The study is conducted in 4 living units of the *Widdonck*; 2 living units where primarily structure is provided, and 2 living units where primarily emotional and affective care is provided.

Note that, in order to improve readability, residential living units where primarily structure is offered are referred to as type STR living units. The residential child care workers who are attached to these living units are referred to as STR child care workers, and the children who live in these units are referred to as STR children. Comparatively, residential living units where primarily emotional and affective care is provided are referred to as type EAC living units. The residential child care workers who are attached to these living units are referred to as EAC child care workers, and the children who live in there are referred to as EAC children.

The 4 participating living units were selected out of all 10 living units in the *Widdonck* on the basis of the judgement of the treatment director. According to his professional
judgement, structure or emotional and affective care would be provided in these living units in the most explicit way. In addition, reasons that are connected with the data collection played a role in selecting the participating living units. In the Widdonck video recordings are used to help the residential care workers to assess their relationship with the children in their living unit, as is explained in paragraph 3.2. The participating living units are those units that most frequently use video recordings in their supervision meetings. This implies that the staff member of the Widdonck who is responsible for recording the videotapes at least once a week visits the living unit in order to make video recordings. Therefore the child care workers and children of these participating living units to a large extent are used to a camera man being around and to the knowledge of being recorded. This was a major advantage in connection with the data collection.

A team of 5 residential child care workers was attached to each living unit at the time the data collection took place, which was in October-December 1993. It was decided to involve 4 child care workers of each team in this study. As exclusion criteria the following criteria were applied:

- being a substitute child care worker;
- being at work in the institution for less than 6 months;
- having a pregnancy/parental leave or a special leave for 3 or more weeks.

In both a type STR and a type EAC living unit one child care worker met one of the exclusion criteria. In the other STR unit and the other EAC unit no single child care worker met the exclusion criteria and here the participants were randomly selected. A total of 8 STR residential child care workers and 8 EAC residential child care workers participated in the study.

The STR living units housed respectively 10 and 11 children at the time the data collection took place; 7 children of both living units were involved in the study. The EAC units housed 7 and 4 children; respectively 7 and 3 children were involved in the study. As exclusion criterion the following criterion was applied:

- child is leaving the institution within 3 weeks from the start of the data collection.

Only one STR child and one EAC child met this exclusion criterion.

As the selection criterion the admission date was laid down; the children with the most recent admission date were selected. In total 14 STR children and 10 EAC children participated in the study.

All residential child care workers of one residential living unit interacted with all children housed in that particular living unit. Obviously, in each living unit child care workers interact between themselves, and so do children. Furthermore, child care workers and children of one living unit meet care workers and children of other living units in the large grounds of the institution. Also care workers and children interact with other practitioners, visitors, and teachers. These social interactions are left aside in the present study. Each child care worker was paired with each child as a couple or interaction dyad in each single residential living unit that was involved in the study. Since care workers have to address the needs of each individual child despite the interests of the whole group, the social interactions are explored per interaction dyad. In table 3 the total number of interaction dyads in both types of living units is shown.
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TABLE 3:
Number of interaction dyads involved in the study.

<table>
<thead>
<tr>
<th>Type of care</th>
<th>Type STR</th>
<th>Type EAC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Living unit</td>
<td>unit 1</td>
<td>unit 2</td>
</tr>
<tr>
<td>Number of child care workers</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Number of children</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Number of interaction dyads</td>
<td>28</td>
<td>28</td>
</tr>
<tr>
<td>Total of interaction dyads</td>
<td>56</td>
<td>40</td>
</tr>
</tbody>
</table>

Note. STR = primarily structure is provided; EAC = primarily emotional and affective care is provided.

Demographic characteristics of the residential child care workers
Table 4 presents the main demographic characteristics of the residential child care workers that participated in the study.

TABLE 4:
Demographic characteristics of the residential child care workers.

<table>
<thead>
<tr>
<th>Demographic characteristics</th>
<th>Type of care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type STR</td>
</tr>
<tr>
<td></td>
<td>( (n = 8) )</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Man</td>
<td>5</td>
</tr>
<tr>
<td>Woman</td>
<td>3</td>
</tr>
<tr>
<td>Mean age</td>
<td>38.6</td>
</tr>
<tr>
<td>Level of education</td>
<td></td>
</tr>
<tr>
<td>Secondary professional</td>
<td>3</td>
</tr>
<tr>
<td>Higher professional</td>
<td>5</td>
</tr>
<tr>
<td>Mean time of service in months</td>
<td>161.1</td>
</tr>
</tbody>
</table>

Note. STR = primarily structure is provided; EAC = primarily emotional and affective care is provided.

Since the present study is focused on the way in which STR residential child care workers carry out the treatment compared to the way in which EAC child care workers do this, it is explored whether there are significant differences between both types of care workers with respect to their main background characteristics.

No significant differences were found between STR child care workers and EAC child care workers with respect to sex, age, level of education, and time of service in the Widdonck. To both types of living units almost equal numbers of male and female care workers are attached (Fisher’s exact test, \( N = 16, p = .5 \)) and the level of education was exactly equally spread. The mean age of STR child care workers (\( M = 38.6, SD = 9.5; \) range: 23-51 years) was higher than the mean age of EAC care workers (\( M = 34.1, SD = 7.1; \) range: 24-45 years), but the difference was not significant, \( t(14) = 1.08, p = .29 \). The mean number of months that STR child care workers have been working in the institution (\( M = 161.1, SD = 92.1; \) range: 8-311 months)
was higher than the number of months that EAC child care workers have been working in the institution ($M = 114.5$, $SD = 97.1$; range: 12-285 months), but the difference was not significant, $t(14) = .99, p = .34$.

**Demographic and diagnostic characteristics of the children**

In order to describe the demographic and diagnostic characteristics of the participating children, the dossiers of all children were analyzed on the basis of a standardized measurement, the so-called *Chart for Scoring of Dossiers* by Veerman (Veerman and Tates, 1987; Veerman, 1990). Table 5 presents the major results of the dossier analysis (Hoogstraten, 1994).

**TABLE 5: Demographic and diagnostic characteristics of the children.**

<table>
<thead>
<tr>
<th>Demographic and diagnostic characteristics</th>
<th>Type of care</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Type STR $(n = 14)$</td>
</tr>
<tr>
<td>Sex*</td>
<td></td>
</tr>
<tr>
<td>Boy</td>
<td>14</td>
</tr>
<tr>
<td>Girl</td>
<td>1</td>
</tr>
<tr>
<td>Mean age**</td>
<td>11.4</td>
</tr>
<tr>
<td>Ethnic designation</td>
<td></td>
</tr>
<tr>
<td>Dutch</td>
<td>10</td>
</tr>
<tr>
<td>Other designation</td>
<td>4</td>
</tr>
<tr>
<td>Duration of admission</td>
<td></td>
</tr>
<tr>
<td>Short ($&lt;18$ months)</td>
<td>10</td>
</tr>
<tr>
<td>Long ($&gt;18$ months)</td>
<td>4</td>
</tr>
<tr>
<td>Parent’s marital status*</td>
<td></td>
</tr>
<tr>
<td>Single, divorced</td>
<td>4</td>
</tr>
<tr>
<td>Married</td>
<td>10</td>
</tr>
<tr>
<td>Behavioral and emotional problems*</td>
<td></td>
</tr>
<tr>
<td>Externalizing</td>
<td>13</td>
</tr>
<tr>
<td>Externalizing and internalizing</td>
<td>1</td>
</tr>
</tbody>
</table>

*Note. STR = primarily structure is received; EAC = primarily emotional and affective care is received.*

*p < .05 for $\chi^2(1)$. **p < .01 for t(22).*

From the intake policy of the *Widdonck* it logically can be concluded that children who are placed in type STR living units have other characteristics than children who are placed in type EAC living units, as explained in paragraph 3.2. This policy is confirmed by the results of the dossier analysis. As expected, the children in type STR living units differed significantly from the children in type EAC units with respect to the following characteristics: sex, age, the marital status of the parents, and behavioral and emotional problems.
STR children were only boys, whereas the EAC children were both boys and girls. $\chi^2(1, N = 24) = 6.72, p = .01$. STR children ($M = 11.4, SD = 1.16$) were older than type EAC children ($M = 8.9, SD = 0.99$), $t(22) = 5.58, p = .000$.

EAC children more often came from broken families; parents of EAC children more often were single or divorced than parents of type STR children, $\chi^2(1, N = 24) = 4.03, p = .045$. The problems of EAC children are more complex than those of STR children. EAC children not only have externalizing problems like hyperactivity, overt and covert antisocial and aggressive behaviors, but also internalizing problems, like social withdrawal, loneliness, depression, and anxiety $\chi^2(1, N = 24) = 7.89, p = .005$.

No significant difference between type STR and type EAC children existed with respect to their ethnic designation and the length of their admission in the Widdonck. The majority of the children in the Widdonck are Dutch. Some belong to an ethnic minority, such as Moroccan, Surinamese, or Antillean.

### 3.4 Data collection

To describe and explore the social interactions between care workers and children in the residential treatment center the Widdonck, the present evaluation study can more or less be characterized as a Static-Group Comparison (Campbell & Stanley, 1963), diagrammed as follows:

\[
\begin{array}{c}
X_1 & O \\
\hline
X_2 & O
\end{array}
\]

in which $X$ is the treatment and $O$ is the measurement. As the present study is a process evaluation study, measurement is not at one single point in time, but consists of a lot of separate ‘shots’. The dashed lines in the diagram indicate that the groups are not achieved by randomization. As the children are being selected for admission to the treatment approaches on the basis of different properties, it is clear from the beginning that the design is far from random. The groups to compare are the living groups that primarily provide structure (STR living units) versus the living groups that primarily provide emotional and affective care (EAC living units). Note that this design is used in order to answer the central research question and not for answering the secondary research question. This additional question is answered by elaboration on the data collection and difficulties arising from it. It is presented as part of the discussion in the last chapter.

The measurement procedure is systematic observation. As described in chapter 2, the decision to make use of systematic observation implies that a number of interrelated decisions have to be made to design the study.

The first decision was the choice for social interactions or interpersonal behavior as the kind of behavior that was going to be observed, since this reflects the nature of the research problem. Interpersonal behavior of residential care workers and children is described on the basis of the 1986 cluster version of Benjamin’s Structural Analysis of Social Behavior (SASB) model, presented in figure 3 and figure 5. By using the SASB cluster model some of the richness of the full SASB model inevitably is lost, but the greater simplicity of the cluster model has advantages (Benjamin, 1987). The SASB clusters are molar behavioral units.
These are small enough to gain appropriate detail for a fine-grained analysis and simultaneously these higher-level units are broad enough to minimize the risk of unnecessary detail and overwhelming quantities of data that are hard to interpret (Alpher, 1988).

The type of data that are described yield frequencies of the interpersonal behaviors of all participants of the social interactions, that is:

- frequencies of each different kind of interpersonal behavior, and
- frequencies of predefined successions or sequences of interpersonal behaviors.

Furthermore, the focus of behavior is described, since this is incorporated in the SASB model. With respect to the measurement of intensity of behavior the ratings on the horizontal and vertical ratings of the SASB model include the degree of affiliation and interdependence. However, as soon as these ratings on the axis are used to define the final SASB cluster for an utterance, information about the intensity is lost.

It was decided to exclude the measurement of duration and latency. Technically it would be possible to record duration of each verbal or nonverbal interaction. However, without doing so, SASB coding is already complex.

The unit of analysis is each complete thought or psychologically meaningful utterance or action, including both verbal and nonverbal behaviors.

Application of the SASB requires video recording, which immediately sets the medium to record the behavioral observations. The SASB coding procedure is too microscopic to accomplish in real time (Benjamin et al., 1986).

Systematic rules were set up in order to regulate the recording of social interactions between child care workers and children. Focal sampling (sampling rule) was used, that is observing one individual or dyad for a specified amount of time and recording all instances of the behavior. Furthermore, continuous recording (recording rule) without preservation of time information was used, that is each occurrence in the passing stream of behavior is captured. This provides an exact record of the behavior with true frequencies and makes sequential analysis possible (Martin & Bateson, 1993).

First several pilot video recordings were made as try-outs. On the basis of these pilot recordings, it was possible to decide upon the best way of recording.

The residential child care worker was determined as the focal individual. Considering his professional task, it is to be expected that a child care worker spends a major part of his time with the children. Therefore it was efficient to follow each residential child care worker with the video camera in order to catch each interaction of that residential child care worker with every other person (mostly children) around.

The video recordings were made in the daily life situations inside the unit houses. Autumn was chosen as season of the year for the shooting in order to have the children more inside the unit houses. For observing the full richness of the whole interactional repertoire the children's spare time appeared to be an appropriate time of the day to observe. Free time is rich in social interactions between residential child care workers and children (De Ruyter, 1971).

In the living units where 7 children were involved in the study (the 2 STR living units and 1 EAC living unit), each residential child care worker was videotaped six times. In 1 EAC living unit 3 out of the 4 children were involved in the study (see table 3). Since in this living unit the care workers could spend more time per child, each residential child care worker was
videotaped four times. Intentionally it was assured that the separate observation sessions were equally spread across the total recording period, across the days of the week, and across the chosen moments during the day.

Each observation session was chosen to continue for exactly 15 minutes, so the social interactions between a focal child care worker and all children around him/her was uninterruptedly recorded for 15 minutes. Note that with such a recording schedule it was assumed that in both types of living units about the same amount of time would be recorded per interaction dyad, that is per couple of a child care worker and a child. In the STR living units 13 minutes videotape would be recorded per interaction dyad (8 care workers x 6 recordings x 15 minutes = 720 minutes; 720 / 56 interaction dyads = 12.9 minutes per dyad), whereas in the EAC living units 15 minutes videotape would be recorded per interaction dyad (4 x 6 x 15 + 4 x 4 x 15 = 600; 600 / 40 = 15). By counting the seconds and minutes per interaction dyad at the pilot video recordings, it was tested whether these estimations were realistic, which they appeared to be.

The recorded behavior necessarily has to be transcribed and then coded by means of both video recordings and transcriptions. The actual data gathering procedure was effected through successively video recording, transcribing, and coding. These procedures are explained below.

### 3.4.1 Video recording

The video recording took place in the period October 5. to December 8. 1993 during the children's spare time. This included the weekends and during the week days the afternoons between the moments the children left school (3.30 PM) and started dinner (5.30 or 6.00 PM), and the evenings between the moment dinner was over (6.00 or 6.30 PM) and the time the children went to bed (varied per child from 7.00 to 9.30 PM).

The equipment consisted of a full-size S-VHS camcorder of Panasonic, type AG-455E, and a transmitter-receiver microphone for the recording work, and a S-VHS video cassette recorder of Panasonic, type AG-7350, for plating the tapes. In order to learn how to use this equipment properly and also to learn the most important technical details of the camera work, the researcher followed a short course at the audio-visual unit of the University of Amsterdam. Also the cameraman of the Widdonck advised her. The pilot recordings were used to evaluate and improve the technical aspects of the shooting.

A protocol for the shooting was set up in advance. A predetermined recording schedule was fixed on the basis of duty rosters of the residential child care workers as well as schedules of each living unit with their dinner times, the children's bedtimes and times for outdoor activities. Times at which each 15 minute recording session started and stopped were determined in advance. All care workers were in possession of this recording schedule.

Previous to each recording session inside the unit house, the researcher had to hand over the transmitter-receiver microphone to the care worker. Therefore, the researcher had the chance to exchange a few words with the care worker and to assess the situation for the moment in the living unit. Immediately after each shooting the researcher took notes. First about which research participants were present during the shooting. Second about which things took place in the living unit during the shooting. Third about significant and
insignificant events in the living unit, about which the residential care worker usually told shortly before or after the shooting.

Serious efforts were made to minimize the potentially disruptive influence of the recording process on the research participants. First of all, the participating living units were selected because care workers and children in these units already were highly used to being recorded, since one staff member of the institution routinely records videotapes there. Other efforts to minimize the disruptive influence of the recording process involved the following:

More than a year before the recording started the researcher was introduced to the child care workers and children. She spent a week (day and night) in each living unit and took part in the daily routine. In this way child care workers, and also children, got time to become familiar with the researcher. Also at that time the research project was explained carefully and truthfully to the child care workers. It was explained that the aim of the research project concerns describing, explicating, and comparing the residential care process in different types of living units, meaning that no outcome evaluation was going to take place. In addition, both care workers and children were allowed all the time to watch the videotapes recorded in their own living units. The rules concerning the protection of the privacy were emphasized:

- The researcher will take responsibility that no other persons than herself, her supervisors, the coders and staff and children of the Widdonck are able to watch the videotapes.
- Every time the researcher wants to use videotapes for a presentation, permission needs to be asked in the Widdonck.
- The researcher will introduce the coders to the treatment director of the Widdonck.
- All analyses will be carried out anonymously.
- Once the research project has ended, the videotapes will be stored in the Widdonck.

The child care workers could volunteer to participate, which they all did.

Shortly before the recording started the researcher was introduced to a new child care worker and to new children. The recording procedure was thoroughly explained to both child care workers and children. The predetermined recording schedule was showed. Also the technical aspects of the recording were explained, in particular the transmitter-receiver microphone. Several pilot recordings were made in order to give the participants time to get used to the recording equipment. The researcher tried to be as unobtrusive as possible during the recording in the unit houses. She did not carry too much equipment and stood in a corner of the room as often as possible. Furthermore, she never participated in any interaction during the shooting, and respected the child care worker’s privacy during phonecalls by disconnecting the transmitter-receiver microphone.

3.4.2 Transcribing

The pilot video recordings were used to practice the process of making transcripts of the recordings. On the basis of these exercises, together with instructions pointed out in the SASB literature (Benjamin et al., 1986; Grawe-Gerber & Benjamin, 1989), a protocol for preparing transcripts in this research project was set up. Transcripts were prepared of all video recordings according to these predefined rules. The guiding principle was who speaks/acts towards whom and what does this person say or do? All verbal utterances by a speaker literally were written down. All accompanying nonverbal information was not written down,
though these nonverbal aspects of a message definitely were taken into account in the coding process. All isolated nonverbal actions (e.g., a child clammers onto a residential child care worker's lap without saying a word) were written into the transcript.

As an illustration a part of a transcript is presented below. The names of the care worker(s) and the two boys are replaced by fictitious names.

*Example of (a part of) a transcript.*

**Situation:**
Two boys, Tom and Ben, are in the garden. They are fighting about a hammer. Care worker Sara is inside the unit house. She is talking to care worker Paul. Once Sara hears the boys fighting she walks outside towards the boys.

43 Sara:  A) Hey, hey, stop fighting, both of you! while she grasps the boys. B) Tom, you are going to tell Ben what he had to do, and Ben, you are going to tell Tom what you wanted Tom to do. C) Ben, what did you want Tom to do?

44A Ben: I only wanted to give that hammer to Paul.

45A Sara: While she keeps hold of Ben, she looks at Tom and talks to Tom about what Ben just said.

111 Sara:  A) Hey, hey, stop fighting, both of you! while she grasps the boys. B) Tom, you are going to tell Ben what he had to do, and Ben, you are going to tell Tom what you wanted Tom to do. C) Ben, what did you want Tom to do?

112A Tom: He listens to Ben and Sara.

113A Sara So?..What do you think of what Ben tells you?

114A Tom: Paul doesn’t need the hammer, I wanted to put everything away and that one too.

115 Sara:  A) And that one too. B) But Ben wanted to give it to Paul.

116A Tom: But Paul doesn’t need it, but Paul doesn’t need it.

117 Sara:  A) But Ben wanted to give it to Paul, B) so you don’t need to hold it so tight. C) She turns her head towards another child, which is Ben.

46 Ben:  A) Looks at Tom and Sara and listens to them. B) He looks and waves at Paul who is walking into the garden.

47A Sara Hold on a moment, Ben.

48A Ben: He is standing still and he looks down.

49 Sara:  A) Alright you can go to Paul now. B) She turns her head back towards the other child, which is Tom.

50A Ben: Runs towards care worker Paul.

Since the social interactions are explored per interaction dyad (a couple of a child care worker and a child), for each interaction dyad involved in the study the interactional behaviors were written down in alternating series (utterances 43 - 50 for one interaction dyad and utterances 111 - 117 for the other interaction dyad). Note the following. First, in case a care worker spoke to more or
even all children at the same time this utterance was written down into the transcript as often as the total number of children that were around (utterance 43 and 111). In this way it is possible to code the general utterance of the care worker in relationship to each single child. Also the reaction of each individual child to such a general utterance was written down into the transcript (utterance 44 and 112).

Second, in case a child care worker was interacting with (for example) child Tom and during this interaction turned to child Ben the process between the child care worker and child Tom was interrupted. This particular utterance of the child care worker was literally written into the alternating series with child Ben and also this utterance was written into the alternating series with child Tom as child care worker turns his/her head towards another child or talks to another child (utterance 117C).

Third, the moments at which an interaction between the participants of an interaction dyad ended were indicated as split ups. Such a split up could be seen in two different ways. Both participants could split up at the same time. In this case the last verbal or nonverbal utterance of both participants were written down. One of the participants could initiate a split up. In this case the last utterance of this initiator of the split up was written down (utterance 49) and as last utterance of the other participant always the reaction of this other participant to the split up had to be written down (utterance 50).

As also is visualized in the example of a transcript, each transcript was broken into separate units, according to the SASB model. A unit is an uninterrupted utterance by a speaker or an uninterrupted act by an actor. If an uninterrupted utterance was long it was divided in more than one unit. With each new speaker/actor a new unit started. Each unit was broken into elements. An element is defined as a complete thought or a psychologically meaningful interaction (Benjamin et al., 1981; Grawe-Gerber & Benjamin, 1989). For the reason that the available SASB computer programs only allow for three elements per unit, a given unit was divided up into maximum three elements.

The units received a number. The elements were indicated by the letters A, B and C. Per interactional dyad the units were numbered in chronological order. The chronological numbering was interrupted by leaving out one number after a split up and between the last unit of one tape and the first unit of the next tape. By this gap in the numbering the corresponding gap in the stream of behaviors of an interaction dyad was reflected in the analysis. In the example of the transcript presented above it is illustrated how a transcript was broken into units and elements and how these units and elements were numbered per interaction dyad.

Note that the first four coders tested if they could demonstrate agreement with respect to what constitutes a unit. Two by two they prepared a transcript from the same video recording. It could be concluded that once a person is well trained, it is not too hard to determine the unit boundaries. Moreover, the transcriptions are a help to code the videotapes. Before the actual coding of an utterance was carried out the observers first carefully watched and listened to the corresponding utterance on the recording. Consequently, incompleteness of a transcription or inaccuracy of unitizing always came to light during the coding. Of course, in such cases first the transcription was corrected before the coding was continued.

On average it took a full day (almost 8 hours) to precisely transcribe one video recording of 15 minutes.
3.4.3 SASB coding

With the help of the transcripts, all videotapes were coded element by element on the basis of the SASB cluster model (see figure 3 and figure 5).

Coder training
Before the actual coding could start, coders had to be trained in the use of the SASB coding system. The main observer of this research project first watched a series of instruction tapes from Professor Benjamin and her colleagues that demonstrated how to code on the basis of the SASB model. Secondly, she was trained to use the SASB by Professor Benjamin and two of her Ph.D. students at the University of Utah in Salt Lake City, where Professor Benjamin has a position as Professor of Psychology. Back in the Netherlands, the main coder selected one postdoc and 14 graduate students from pedagogical sciences and trained them. None of the coders was yet adhered to some specific clinical orientation. The basic coder training consisted in reading several articles about the SASB model, reading the Grawe-Gerber & Benjamin (1989) procedure manual, doing several exercises in making dimensional and focus ratings, coding transcripts until the interrater reliability was satisfying. During the coding period every two weeks a supervision meeting was held to discuss coding problems.

Coding procedure
In total eight coding couples were formed. So all coding work was done two by two; one coder wrote the ratings down on coding sheets (see appendix C), and one coder entered the ratings into a personal computer. An average time of 65 minutes was needed to code one minute of the videotapes. The coders started with watching the videotape in total, with reading the notes of the researcher from the shooting, and with completing the list with referents, that is the research participants that took part in the interactions on the videotape. In order to protect privacy of the research participants, on the coding sheets the participants were indicated by numbers: the referent numbers. All graduate students were blind for the condition type of care.

The SASB coding procedure, described in chapter 2, consists of several coding steps that have to be carried out in chronological order. Below a summary of the coding procedure is presented.

- Write down the unit number.
- Indicate the element by A, B or C.
- Identify referent X (speaker or actor) and referent Y (receiver of the message) and write down their numbers.
- Decide on the focus: other (coded as 1) or self (coded as 2).
- Determine the degree of affiliation on a 18-point scale (-9 to +9).
- Determine the degree of interdependence on a 18-point scale (-9 to +9).
- Combine the judgements on focus, affiliation, and interdependence to identify the SASB cluster. The judgement on focus indicates on which surfaces the final cluster will be located. The ratings on the horizontal and the vertical dimensions have to be plotted on the surface. This results in a point \((x, y)\) on the SASB diagram. Drawing a line from the
center through this point, the resulting vector will intersect the border of the surface and point to the final SASB cluster.

![Diagram of SASB cluster model with example of coded point plotted on the surface with a vector to indicate the SASB cluster.]

**FIGURE 5:**
The SASB cluster model with an example of a coded point plotted on the surface with a vector to indicate the SASB cluster.

**Global judgement check**
As the last step in the coding process the coders must determine whether the selected SASB cluster accurately describes the coded interaction by means of a global judgement check. Also in case the ratings on the dimensions result in a vector that appears to be a cluster boundary (e.g., +2, -6 on each surface exactly is the border between cluster 4 and cluster 5), this global judgement check must be used to make the final decision. Benjamin calls this global judgement check the *final clinical test*. It may be considered as a *face validity check*. 
In order to carry out this judgement check, the coders must use the descriptions of all the SASB clusters, as presented in appendix B. The coders must read aloud the description of the selected SASB cluster and determine whether this description is a good representation of the element just coded. In case of doubt, the coders must read all the descriptions of the items that belong to the particular cluster (see appendix A). If the description fitted the interpersonal behavior in the coded element, the cluster could be confirmed and written down at the coding sheet as the consensus code. If the description failed to fit the interpersonal behavior in the coded element, the coders had to go through the whole coding procedure again or they should consider a complex code.

Complex codes
An element could convey a complex message. A complex message means that the utterance captures two or more inextricable messages. In this case two or three clusters are coded to describe the interpersonal process. In case a cluster was part of a complex message it should be indicated as such on the coding sheet by entering a 2 (whereas entering a 1 indicated a single message).

Uncodable elements
An element was uncodable if a final cluster judgement could not be made due to uncertainty on one of the three basis SASB dimensions (focus, affiliation, or interdependence) or if the X or Y referent could not be identified. If an element was uncodable, 99 (missing value) was entered in the cluster columns. Mostly this happened when the focal individual was partially obscured or moved completely out of sight.

Context information
Although the social interactions are coded unit by unit - or more precisely, element by element - it might be necessary to take some contextual information into account. Sometimes a statement or an action can only be understood if the coder has context information. For example, a care taker sends a boy earlier to bed as usual. The reason is that the boy has to do an important exam the next morning. If the coder does not have this context information, the coder mistakenly could interpret the care worker's interpersonal behavior as a punishment.

In the SASB procedure manual (Grawe-Gerber & Benjamin, 1989) four types of contextual information are distinguished, which are discussed below.

First, the immediate context of an utterance, which is the preceding statement or nonverbal action. Except for the first utterance on the videotape, the coders always had this immediate context information.

Second, the therapy context, which in the present project is the context of the residential care process. By means of the notes from the main researcher made during the shooting, the coders had information about significant events that happened in the day or days before the video was recorded. Because the coders were blind for the type of care, the coders had no information about treatment goals for the children. In case this information was crucial for the interpretation of a statement the main researcher provided it. Note that the main
researcher quickly scanned all the codings accomplished by other coders. In this way she has seen all the research material herself and she could correct misinterpretations.

Third, the context of the therapy setting in general, which in this case is the residential care institution *The Widdonck* as a whole. The main researcher was familiar with all the staff members of and the daily routine in the *Widdonck*. All coders were familiar with the basic elements of the therapeutic milieu in the institution. Furthermore, a treatment setting differs from an everyday social interaction situation in the sense that the participants are in defined roles: in this case in roles as care taker and child that is cared for. The coders were trained to keep these roles in mind.

Fourth, the cultural context can be important. Although conceptually the two dimensions (i.e., affiliation and interdependence) are simple enough, the impact of cultural confusion makes the task of coding more difficult than it might seem (Benjamin, 1986). In the present project sometimes information about a specific culture, especially the Moroccan culture, had to be taken into account.

**Interrater and intrarater reliability**

*Interrater reliability* was calculated between the coders of each coding couple by means of weighted kappa (Cohen, 1968). The logic according to which the weights were generated is explained in appendix D. In total ten reliability probes were taken during the actual coding of the data; two coding couples took each two probes and the other six couples all took one probe. Kappas, together with the number of judgements on which they are based, are presented in table 6. The mean kappa (Popping, 1983) was .76. Generally, a recommended minimum for kappa is .60 to .75 (e.g., Grotevant & Carlson, 1987). So this kappa of .76 reflects adequate reliability.

<table>
<thead>
<tr>
<th>Number of probe</th>
<th>Number of Judgements</th>
<th>Kappa</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>201</td>
<td>.87</td>
</tr>
<tr>
<td>2</td>
<td>239</td>
<td>.73</td>
</tr>
<tr>
<td>3</td>
<td>57</td>
<td>.73</td>
</tr>
<tr>
<td>4</td>
<td>63</td>
<td>.80</td>
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<tr>
<td>5</td>
<td>120</td>
<td>.71</td>
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<tr>
<td>6</td>
<td>108</td>
<td>.82</td>
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<tr>
<td>7</td>
<td>120</td>
<td>.71</td>
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<tr>
<td>8</td>
<td>124</td>
<td>.92</td>
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<tr>
<td>9</td>
<td>121</td>
<td>.70</td>
</tr>
<tr>
<td>10</td>
<td>140</td>
<td>.73</td>
</tr>
</tbody>
</table>

Three main sources of confusion between coders could be identified.

The first source was confusion of adjacent clusters, especially of cluster 1 and 2, cluster 4 and 5, and cluster 5 and 6 of both SASB surfaces.
The second was confusion of friendly autonomy-giving (cluster 1-2) with friendly controlling (cluster 1-4) behavior, and also of friendly autonomy-taking (cluster 2-2) with friendly submissive (cluster 2-4) behavior.

The third source was confusion about whether or not an element needs a code for complex communication.

_Intrarater reliability_ was tested for the main observer only. In order to assess this intrarater reliability the main observer recoded a transcript a year after she coded it for the first time. The calculation of Cohen's kappa on these two data sets resulted in a kappa of 0.91.

**Split-half analysis**

An important issue is whether enough data points have been collected. A way of checking this is to divide the data randomly into two halves and analyze each half separately. Sufficient results have probably been obtained if the two sets of data generate conclusions that are in agreement (Martin & Bateson, 1993). The data set is then said to be reliable.

In the present study sufficient data must have been collected per type of care. In STR living units in total 16206 interpersonal behaviors are collected, which is a mean of 289 interpersonal behaviors per interaction dyad. In EAC living units in total 12570 interpersonal behaviors are collected, which is a mean of 314 interpersonal behaviors per interaction dyad. To check whether this is sufficient, for each type of care the data were divided randomly into two halves and per type of care it was tested whether the two sets of data showed differences in the frequencies of the interpersonal behaviors of the residential child care workers and the children. No significant differences were found between the two data sets, neither for STR living units \[\chi^2(13, N = 16206) = 18.93, p = .13\], nor for the EAC living units \[\chi^2(13, N = 12570) = 4.82, p = .98\]. More detailed information is presented in appendix D.

### 3.5 Subquestions

The main research question of the present study was outlined in chapter 1 as:

What are the social interaction patterns between child care workers and children in a Dutch residential treatment center in:

- living units that primarily provide structure (STR living units), and in
- living units that primarily provide emotional and affective care (EAC living units)?

In order to adequately answer this research question the social interactions between the care workers and the children in both types of residential living units are first described, and, secondly, compared.

The social interactions are described in terms of interpersonal behaviors according to the SASB model. SASB explores frequencies and sequences of interpersonal behaviors of all participants of social interactions. Furthermore, SASB explores complex communication.

Note that social interactions are interpersonal processes, consisting of the interpersonal behaviors of the participants of the interaction.
For the purpose of systematically describing and comparing the interpersonal behaviors of care workers and children the following series of subquestions is formulated.

Subquestions for describing and comparing child care workers:

With respect to frequencies:
1) With what kinds of interpersonal behaviors and in what frequency do child care workers act towards children?
2) What are the differences between the frequencies in interpersonal behaviors of STR versus EAC child care workers?

With respect to sequences:
3) By which kinds of interpersonal behaviors and in what frequency do the child care workers follow each separate kind of interpersonal behavior of the children?
4) What are the differences between interpersonal behaviors of type STR versus type EAC child care workers that follow at the interpersonal behaviors of the children?

With respect to complex communication:
5) What kinds of complex messages and in what frequency do child care workers show in relation to children and how do children respond to these complex messages?
6) What are the differences in complex communications of STR versus EAC child care workers?

Subquestions for describing and comparing children:

With respect to frequencies:
7) With what kinds of interpersonal behaviors and in what frequency do children act towards child care workers?
8) What are the differences between the frequencies in interpersonal behaviors of STR versus EAC children?

With respect to sequences:
9) By which kinds of interpersonal behaviors and in what frequency do the children follow each separate kind of interpersonal behavior of the child care workers?
10) What are the differences between interpersonal behaviors of type STR versus type EAC children that follow at the interpersonal behaviors of the child care workers?

With respect to complex communication:
11) What kinds of complex messages and in what frequency do children show in relation to child care workers and how do child care workers respond to these complex messages?
12) What are the differences in complex communications of STR versus EAC children?
3.6 Data analysis

Sets of different computer programs are available for analyzing SASB research codings of recorded and observed interactions. Benjamin developed software for generating parameters useful in clinical and research analyses (Benjamin et al., 1986). These programs were adapted to a more user-friendly version by Hartkamp (Hartkamp & Benjamin, 1994). From this computer software the programs PROCESS, COMPLEX, and FOLLOW are used in the present research project.

The program PROCESS is the most basic one. It counts process interactions or interpersonal behaviors. The computer scans each element to identify the speaker/actor (in process coding the speaker/actor always is referent X), the person to whom the speaker/actor addressed a message to (referent Y), and then reports the absolute frequency and the relative frequency (percentage) of interpersonal clusters used by this speaker/actor in relation to each Y-referent present. PROCESS analyses the here and now interactions and is particularly appropriate for treatment or care situations wherein the relationship between the participants has a major conceptual role. The results show which behaviors are most characteristic in each relationship (Grawe-Gerber & Benjamin, 1989).

The program FOLLOW traces one-step sequences in the interpersonal process; a transition matrix is created for each person in relation to each other person present. FOLLOW provides per reported cluster of a child care worker an outline of the absolute and the relative frequency of each cluster by which a child follows and visa versa. In case a unit has more than one element, FOLLOW counts the transitions from each element to each element in the next unit.

The program COMPLEX records elements coded as complex messages. All units in which a complex message was coded are reported and the absolute frequencies of each different kind of complex message are presented.

Note that the programs PROCESS and FOLLOW ignore whether the clusters reported are part of complex communication.

In order to describe the social interactions between care workers and children in the different types of living units, the interpersonal processes are analyzed per interaction dyad, thus per couple of a care worker and a child. The interpersonal behaviors of all STR child care workers are added, as well as those of all STR children. Also the interpersonal behaviors of all EAC child care workers are added, as well as those of all EAC children.

It was tested whether there were differences between type STR and type EAC child care workers, respectively type STR and type EAC children. Differences were tested with respect to 1) the frequencies of the interpersonal behaviors, 2) the frequencies of the predefined successions or sequences and 3) the frequencies of the complex communications. In addition, differences between interpersonal behaviors of individual child care workers and also differences between interpersonal behaviors of individual children were tested.

For the purpose of testing the differences, the chi-square test was used with an alpha level of 0.05, computed by means of the computer program MULTISTAT (Van de Hoef & Hox, 1994). The chi-square test assesses the degree of correspondence between observed and expected observations of nominal-scale variables in a crosstabulation. In order to have fewer
than 20 percent of the expected frequencies with a value smaller than 5, in some crosstabulations adjacent categories were combined into a single pooled category (Siegel and Castellan, 1988).

In order to determine where the differences were within each table, the residuals were analyzed. That is, Allison and Liker standard z-scores were computed to assess discrepancies between observed and expected values in each cell, and to determine which are larger than might be expected by chance. The expected frequency of a cell is estimated as the product of the corresponding row and column totals divided by the total number of observations. The formula for computing an Allison and Liker z-score is (Allison & Liker in Bakeman & Gottman, 1986):

\[ z = \frac{f(r, c) - f(r)p(c)}{f(r)p(c)[1 - p(c)][1 - p(r)]} \]

in which, 
- \( f(r, c) \) = observed value or frequency in cell
- \( f(r) \) = frequency in row
- \( p(c) \) = frequency in column divided by the total, \( N \)
- \( p(r) \) = frequency in row divided by the total, \( N \).

The z-scores were evaluated at the 0.01 level of significance.

In addition, effect sizes and Cramer's phi were examined. Effect size refers to the magnitude of the difference found (Cohen, 1988; Lipsey, 1990). Cramer's phi is a measure of association and measures the degree of association or relation between two sets of scores or observations (Siegel and Castellan, 1988). These specifications are important for evaluating how meaningful the differences were that were found to be statistically significant (Van Peet, Van den Wittenboer & Hox, 1997).

Furthermore, with respect to the transition matrices or transitional frequency matrices (as the results from FOLLOW), it was tested whether the observed frequencies differ from expected frequencies. The chi-square with an alpha level of 0.05 was used. The expected frequencies were computed on the basis of the totals in the rows and the columns. In case chi-square was significant, z-scores of the cells were interpreted. A problem with the transition matrices was that not all cells contained sufficient observations to have expected frequencies that are large enough. However, the values of the chi-square were so extremely high, that it was safe to interpret the z-scores. But, each z-score was evaluated at the 0.01 level of significance.

Note that in the sequential analysis of observational data the researcher wants to detect dependency in the observations. Therefore, dependency in the data is not a problem, it is what the researcher is trying to study (Bakeman & Gottman, 1986).