

A Preliminary Study on Evaluation of Interpersonal Relationships between a Child with Severe Multi-handicap and a Teacher in the Teaching Situation

Taeko Teramoto

Tokyo Medical and Dental University

Michiyo Kobayashi

National Institute of Special Education

Abstract :Although the importance of good teacher-child relationships or rapport has been emphasized previously in the teaching of children with language and communication disorders, little effort has been made to analyze and evaluate the structure of these relationships. In the present study, a preliminary evaluation of the interpersonal relationship between a child with severe multi-handicap and a teacher in a teaching situation was made.

The relationship was defined as an encoding ("feeling" and "expression") and decoding ("perception" and "interpretation") process in the teacher-child interaction and was based on previous research by Tickle-Degnen and Rosenthal (1992). In this preliminary study, focus was only on the encoding process and the relationship between the teacher's subjective impression of the teaching interaction with the child (that is, the "feeling" process) and the corresponding behavioral aspects of teacher and child (that is, the "expression" process).

Teaching sessions analyzed aimed to promote development of the child's motor skills. Teaching interactions between the teacher and the child in each session were videotaped and classified into three categories (Positive, Negative and Neutral) according to the teacher's self-reports about impressions of the interaction with the child (that is, the teacher's "feeling" process). The Positive interaction was defined as an interaction in which the teacher felt smoothness (unimpeded/ relaxed/ satisfied) in teaching the child and a good relationship was presumed to have been established. The Negative interaction, on the other hand, was defined as an interaction in which the teacher had difficulty in teaching the child and a good relationship was presumed to have not been established.

The behaviors of both the teacher and child in each type of interaction (Positive or Negative) were systematically observed (partial interval recording/ 1 interval = 1 second) and further analyzed by utilizing lag sequential analysis.

Differences in behavioral aspects (that is, the "expression" process) between the Positive and Negative interactions were found in (1) the content of the behaviors exhibited and their frequencies (expressed as a percentage), (2) the relationship and direction of behaviors, and (3) the timing of behaviors. The relationship between the "feeling" and "expression" process was discussed taking into consideration these three points.

Key Words :child with severe multi-handicap, interpersonal relationships in the teaching situation, lag sequential analysis

1. Introduction

Most therapeutic or teaching researches are concerned with outcome and tend to demonstrate the effectiveness of teaching techniques or teaching devices. Interpersonal relationships in the teaching situation, on the other hand, are rarely explored although their importance is commonly recognized. Recently, however, researches about such relationship have focused on the teaching of children with language and communication disorders and the importance of building a good relationship between teacher and child has been emphasized (Nagasawa, 1999; Watabe, 1996).

The concept of a "good relationship", which resembles "reliance" or "rapport" indicating a positive emotional bond between teacher and child, is not completely clear. Although these concepts are important in teaching or therapeutic contexts and easy to understand (Altman,

1990; Bernieri, 1988; Harrigan & Rosenthal, 1986; Koss & Rosenthal, 1997; Tickle-Degnen & Rosenthal, 1990, 1992), they are difficult to operationalize and may lead to more confusion on the issue. Moreover, assessing whether or not a relationship is "good" is purely subjective and the impressions of the teacher, child and observer may not be the same. Difficulty in operationalizing these concepts and disagreement in subjective judgment place limits on our understanding of how to define a "good relationship".

Taking account of the difficulties described above, building a good relationship in the teaching situation is still considered to be one of the important factors in teaching success. Consequently, an effort should be made to evaluate the nature of the relationship.

If this is so, what aspect of the relationship should be focused on? Gelso and Carter (1985) suggested two perspectives: inside states and outside behaviors. The

former is defined as feelings that participants in teaching situations (e.g. child and teacher) have toward one another, and the latter is defined as the manner in which these feelings are expressed.

Tickle-Degnen and Rosenthal (1992) pointed out that the idea proposed by Gelso and Carter (1985) only referred to an encoding process (that is, "feeling" and "expression"), and lacked mention of a decoding process in which the "perception" of behavioral cues of each participant and an "interpretation" of these cues would be included. Tickle-Degnen and Rosenthal (1992) regarded the interpersonal relationship in therapy or in teaching situations as one of interaction between therapist (or teacher) and client (or child), which was supposed to involve their decoding process as well as encoding process. A schematic representation of this model was shown in Figure 1.

Based on previous research by Tickle-Degnen and Rosenthal (1992), the interpersonal relationship in teaching situations was defined as an "encoding and decoding process in the teacher-child interaction", and relationship between a girl with severe multi-handicap in pre-linguistic stage and a male teacher was analyzed in the present study. A "good relationship" was defined as one in which positive impressions such as "easy to interact with a partner" would be gained in the "feeling" process. In this study processes corresponding to the positive "feeling" process, that is, the case of a "good relationship," were examined and evaluation of the teacher-child relationship in teaching situations was made. Although all processes shown in Figure 1 should be analyzed to achieve a complete evaluation, only the encoding process, that is, "feeling" and "expression" was the focus of this preliminary study.

To analyze the teacher's encoding process, two

methods were used: self-reports and systematic observation. The former was regarded as a relevant method to clarify the teacher's impression of the interaction with the child and was used to analyze his "feeling" process. The latter was regarded as a relevant method for objective measurement of the teacher's behavior and was used to analyze his "expression" process. These observed behaviors were examined sequentially, namely they were examined in temporal relation to the child's behaviors. For this purpose, lag sequential analysis (Bakeman & Gottman, 1997; Bakeman & Quera, 1995) was utilized.

As for the child's encoding process, her "expression" process was analyzed and examined by systematic observation and lag sequential analysis in the same way as the teacher's encoding process. The child's "feeling" process, on the other hand, could not be analyzed by utilizing self-reports in which verbal responses were required, because the child was at the pre-linguistic stage. As the only accessible process for the child was "expression", it is suggested that her "expression" process be analyzed cautiously to compensate for the failure of analyzing her "feeling" process.

After analyzing and examining each process described above, the interpersonal relationship between the teacher and the child in teaching situations was discussed.

2. Purpose

Most children with severe multi-handicaps have problems in development of language and communication as well. They are at the pre-linguistic stage in many cases and their non-verbal cues are not clear so that communication with others is difficult. To establish a good relationship with these children in

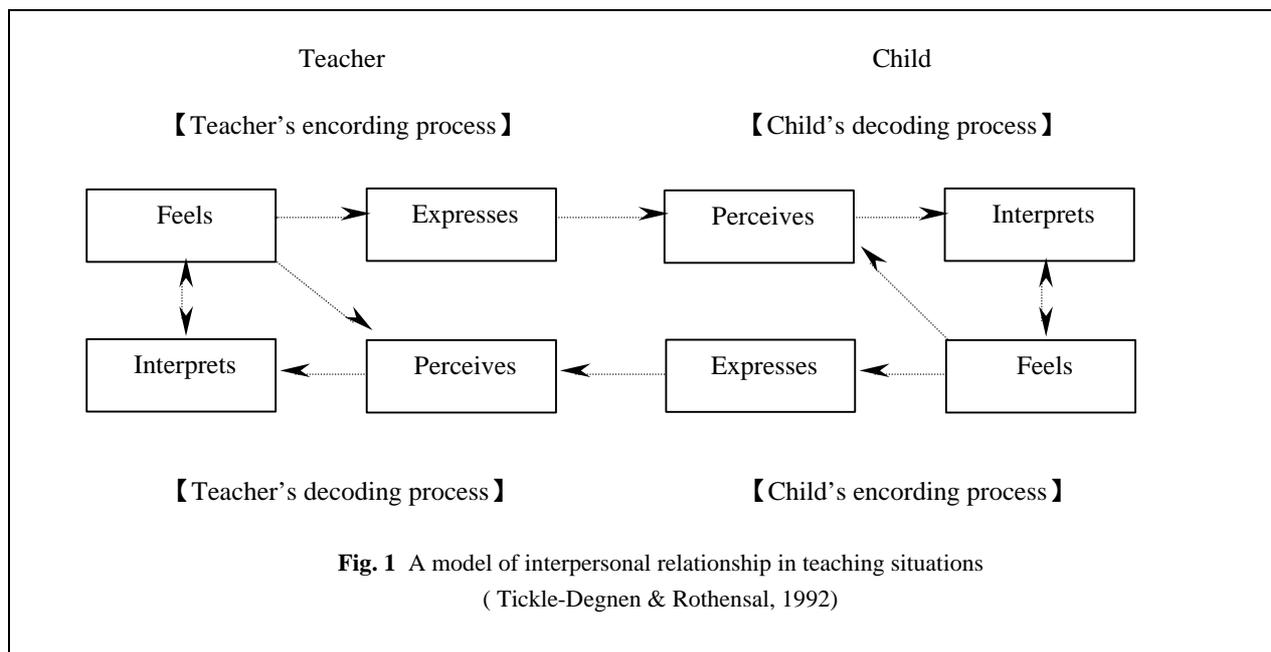


Fig. 1 A model of interpersonal relationship in teaching situations
(Tickle-Degnen & Rothensal, 1992)

teaching situations is regarded as one of the most important teaching objectives and the first step is to evaluate and understand the relationship properly.

In the present study, analysis of the interpersonal relationship between a child with severe multi-handicap and a teacher in the teaching situations was made according to the theoretical framework outlined in the Introduction to this paper. That is to evaluate and understand the relationship. The purpose of this study was to clarify the teacher's subjective impressions of the interaction with the child (i.e. the teacher's "feeling" process), and to illustrate corresponding behavioral aspects in the teacher-child interaction, that is, their "expression" process.

3. Methods

3-1. Subjects

3-1-1. Child

A girl with severe multi-handicap in the second grade of an elementary school for children with disabilities participated in the teaching sessions. The child's intellectual and motor skill development was severely delayed. She was paralyzed on the left side and had poor coordinated movement of arms and legs. Her means of communicating was mainly non-verbal (e.g. vocal expressions, pointing, nods, and touch). Although she sometimes nodded or shook her head indicating "yes" or "no", these responses were not stable. She hit herself or banged her own head on the wall when her intentions were not clear to others. She could understand routine verbal cues (e.g. "sit down on the chair" and "go to the toilet") and preferred initiating interaction with others. Results of the Enjoji Developmental Test for this child could be seen in Table 1.

Table 1 Result of Enjoji Developmental Test

Motor skills	Moving	2:09
	Manipulating	1:09
Social skills	Daily routines	2:03
	Interpersonal relationship	2:00
Language	Utterance	0:10
	Understanding	1:09

3-1-2. Teacher

A male teacher with 15 years of experience in the field of special education participated in the teaching sessions. He had been teaching the child for 1 year.

3-2. Procedure

3-2-1. Teaching sessions

Teaching sessions aimed to promote the development of the child's motor skills. The teacher attempted to touch and tap the child's arms and legs in time with music with the objective of synchronizing the child's responses. As the child disliked being touched on her paralyzed left arm, the teacher had to be careful not to upset her. Each session lasted for about 10 minutes and sessions were conducted several times per week. When the child showed strong refusal to participate in the session, the teacher stopped the session immediately.

3-2-2. Self-report

The teacher made a self-report on relationship with the child after each session. The self-report was made according to a newly constructed questionnaire for this study and consisted of twelve 5-point rating items (1-Not at all, 2-Not so much, 3-Neutral, 4-A little, 5-Very much) and two open-question items as shown in Table 2.

Results of 5-point rating items were scored from 1 to 5 (e.g. 1-Not at all, 5-Very much). High scores were seen

Table 2 Contents of Teacher Self-reports

	Items	Format
1	I (Teacher) enjoyed interaction with child.	5-point rating scales 1 – Not at all 2 – Not so much 3 – Neutral 4 – A little 5 – Very much
2	Child seemed to enjoy interaction .	
3	Teacher could regulate behaviors according to rhythm and pace of child.	
4	Teacher could understand intention and feeling of child.	
5	Child seemed to pay attention to surroundings (persons and objects).	
6	Teacher could stimulate child after careful observation .	
7*	Teacher experienced difficulty in communicating with child.	
8	Teacher could wait for child's initiation of interaction.	Open questions
9	Teacher frequently talked to child.	
10	Teacher frequently gave non-verbal cues to child.	
11	Teacher initiated and led interaction in most cases.	
12	Teacher could adjust behavior to child's by doing same thing.	
13	Condition of child during session?	
14	Did interaction with child proceed smoothly?	

Note: In Item 7 rating scores were reversed: For example, "Very much" scored 1 point.

as an indication of a good relationship between the teacher and the child (Note that in Item 7, rating scores were reversed: e.g. 1-Very much and 5-Not at all). Judging from these rating results and the descriptive contents of Items 13 and 14, teaching interactions were classified into three categories: Positive interactions in which a good relationship was presumed to have been established, Negative interactions in which a good relationship was not presumed to have been established, and Neutral.

3-2-3. Video recording

Each teaching session was videotaped (SONY, CCD-SC55NTSC) and video recordings were made five times. From these sessions typical Positive and Negative interaction were selected and the first 4 minutes of these tapes were systematically observed.

3-2-4. Systematic observation and lag sequential analysis

In setting coding categories, verbal and non-verbal aspects of behaviors were taken into account and three levels ("Vocal or Verbal cues", "Approach-Avoidance", and "Attention") were specified. Although such classification seemed to be rather simplistic, it was considered to be appropriate for measurement of the child's primitive behaviors and exploration of the relations between the teacher's and child's behaviors. Coding categories and their definitions were shown in Table 3.

As for sub-categories of the child's "Vocal cues", "Negative vocal cues", "Positive vocal cues", and "Others" were settled. "Approach to" and "Avoidance of" the teacher and "Others" were specified for "Approach-Avoidance". "Attention" to the teacher and "Others" were specified for sub-categories of the child's "Attention".

As for the teacher's "Verbal cues", two sub-categories were specified: "Speech" and "Others." Sub-categories of the teacher's "Approach-Avoidance" and "Attention" were specified in the same way as those of the child.

According to the coding categories shown in Table3, behaviors of both the teacher and child were coded using partial interval recording (1 interval = 1 second) (Bakeman & Gottman, 1997). Coded data were taken into further analysis using lag sequential analysis (Bakeman & Gottman, 1997; Bakeman & Quera, 1995).

Lag sequential analysis is commonly regarded as a useful method to capture the dynamic temporal aspects of inter-individual interaction. In the present analysis the *p* value was set at .05 and lag positions were settled from 0 to 5, which meant that the temporal gap between behaviors was examined from 0 to 5 seconds.

4. Results

4-1. Results of self-report

Positive contents of open questions in self-report (Item 13 and 14) (e.g. "the child's condition was good" or "interaction with the child was smooth") were regarded

Table 3 Coding Categories

Categories	Definition	
Child	Vocal cues	
	Negative vocal cues	Cry or unpleasant vocal expressions
	Positive vocal cues	Laugh or pleasant vocal expressions
	Others	No vocal expressions
	Approach-Avoidance	
	Approach	Approach, reach, or touch teacher
	Avoidance	Avoid or refuse teacher
	Others	Others
	Attention	
	Attention	Pay attention or turn head toward teacher
	Others	Others
	Teacher	Verbal cues
Speech		Verbal expressions directed to child
Others		No verbal expressions
Approach-Avoidance		
Approach		Pull, embrace, or approach child
Avoidance		Avoid or go away from child
Others		Others
Attention		
Attention		Pay attention or turn head toward child
Others		Others

as indicators of the Positive interaction. On the other hand, negative contents (e.g. "the child's condition was not so good" or "interaction with the child did not go smoothly") were regarded as indicators of the Negative interaction.

Results of items on the 5-point rating scales (Items 1-12) were shown in Figure 2. Higher scores (i.e. greater than 4) were gained on all items in the Positive interaction. Lower scores, on the other hand, were prominent in the Negative interactions, especially on items concerning "the child's enjoyment in interaction" (Item 2), "difficulty in communicating with the child" (Item 7 in which rating scores were reversed), and "waiting for the child's initiation of interaction" (Item 8). Items in which the same scores were gained both in Positive and Negative interactions were concerned with "understanding of the child's intention" (Item 4), "talking

to the child" (Item 9), and "the teacher's lead in interaction" (Item 11).

4-2. Results of systematic observation

As for the coded data, 90% intra-observer agreement and .65 Cohen's kappa were achieved, so it was suggested that the data was reliable for this preliminary study (see Cohen, 1960; Fleiss, 1981; Hartmann, 1982, 1984; Martin & Bateson, 1993).

Observed frequencies and percentages of each behavioral category were shown in Table 4. Frequencies in Table 4 indicated total number of observed intervals and percentages indicated observed intervals divided by total intervals (i.e. 224 intervals). The teacher's "Avoidance" which was not observed at all and "Others" were omitted from this table.

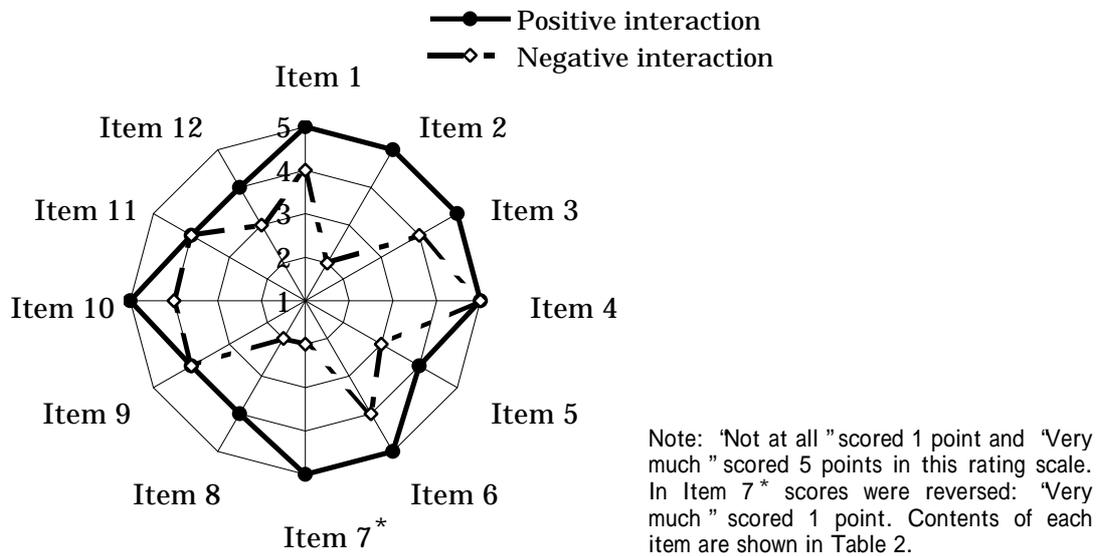


Fig. 2. Result of Items for 5-point Rating Scales in Teacher Self-reports.

Table 4 Observed Frequencies and Percentage of Each Behavioral Category

Behavioral categories		Positive interaction		Negative interaction	
		Frequency	(%)	Frequency	(%)
Child	Negative vocal cues	0	(0.00)	206	(91.96)
	Positive vocal cues	13	(5.80)	0	(0.00)
	Approach	14	(6.25)	33	(14.73)
	Avoidance	0	(0.00)	52	(23.21)
	Attention	78	(34.82)	17	(7.59)
Teacher	Speech	52	(23.21)	40	(17.86)
	Approach	7	(3.13)	92	(41.07)
	Attention	173	(77.23)	125	(55.80)

Note: Frequencies indicate total number of observed intervals and percentages indicate observed intervals divided by total intervals (224 intervals). Teacher's "Avoidance" was not observed at all, and "Others" are not included.

Specific behaviors of two types of interactions, for example, the child's "Positive vocal cues" in the Positive interaction and the child's "Negative vocal cues" and "Avoidance" in the Negative interaction, were prominent. The child's "Approach" to the teacher in the Negative interaction and the child's "Attention" to the teacher in the Positive interaction were more frequent. Although the teacher's "Approach" to the child in the Negative interaction was more frequent than in the Positive interaction, the teacher's "Speech" and "Attention" did not differ prominently in frequencies between two types of interactions.

4-3 .Results of lag sequential analysis

4-3-1 .Relation between behaviors

The results of lag sequential analysis were shown in Figure 3, in which temporally related behaviors ($p < .05$) were connected by solid or dotted arrows (difference between these arrows were explained below). Numbers in Figure 3 indicated lag positions with statistic significance ($p < .05$), which was also explained below.

In the Positive interaction, temporal relations were seen between the teacher's "Approach" and the child's "Approach" or "Attention", and between the teacher's

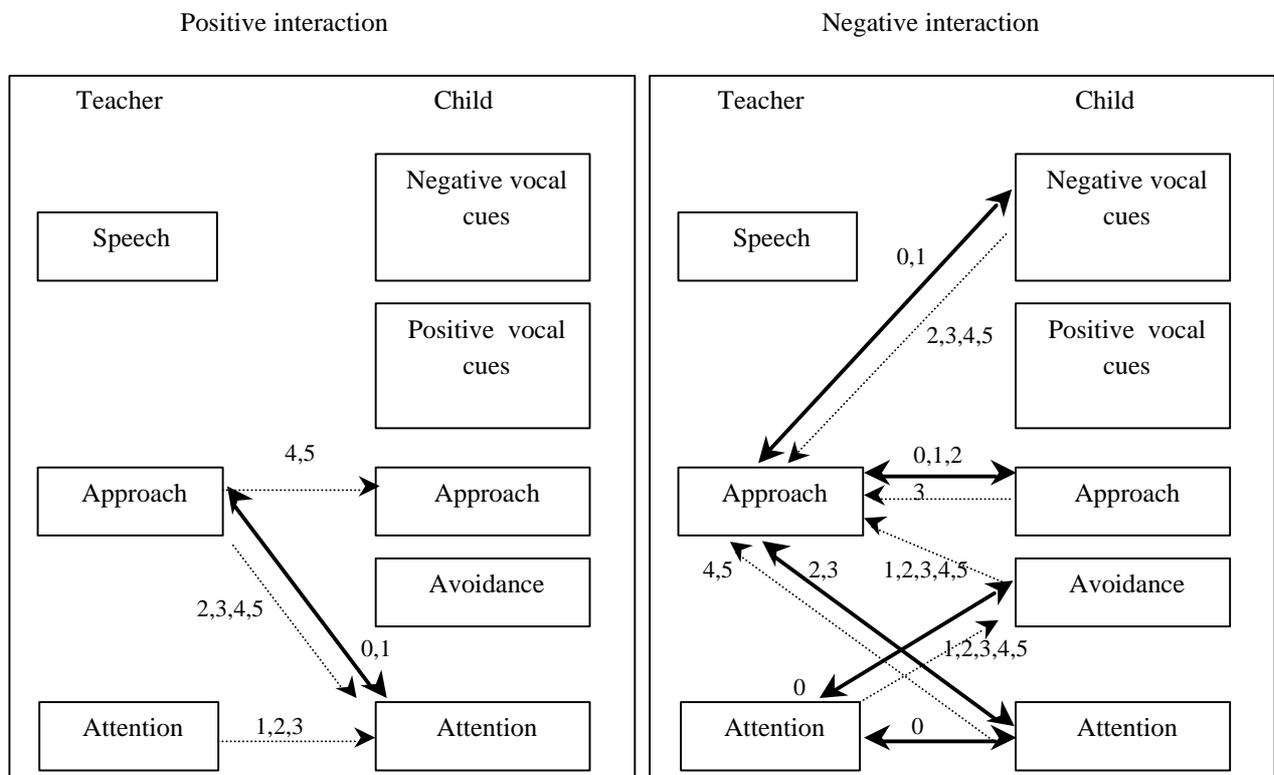
"Attention" and the child's "Attention". In the Negative interaction, on the other hand, these relations were seen between the teacher's "Approach" and the child's "Negative vocal cues" or "Approach" or "Avoidance" or "Attention", and between the teacher's "Attention" and the child's "Avoidance" or "Attention".

These findings showed that, (1) temporal relations between behaviors were more prominent in the Negative interactions than in the Positive interactions and, (2) the teacher's "Speech" was not related to any behaviors of the child in either type of interaction.

4-3-2 .Directions of behaviors

Arrows in Figure 3 indicated direction of behaviors ($p < .05$). Dotted arrows to the right indicated uni-directional temporal patterns in which only one-way behavioral cues from the teacher to the child were prominent. Dotted arrows to the left, on the other hand, indicated uni-directional patterns from the child to the teacher. Solid arrows indicated bi-directional temporal patterns in which behavioral cues were mutually exchanged between the teacher and the child.

Bi-directional temporal patterns were prominent in the Negative interactions and uni-directional temporal patterns from the teacher to the child were prominent in



Note: Arrows indicate direction of interaction: Solid arrows indicate bi-directional temporal patterns and dotted arrows indicate uni-directional temporal patterns. Numbers indicate lag positions ($p < .05$).

Fig. 3. Temporal Relationship of Behaviors Detected by Lag Sequential Analysis.

the Positive interactions. In the Negative interactions, most uni-directional temporal patterns were from the child to the teacher with the exception of the pattern from the teacher's "Attention" to the child's "Avoidance".

Negative), but within directional patterns (i.e. uni-directional or bi-directional).

5. Discussion

4-3-3 .Timing of behaviors

Temporal patterns shown in Figure3 were re-examined in terms of lag positions, that is, timing of behaviors (Table 5).

From results of this study the differences in behavioral aspects (the "expression" process), between types of interaction (Positive and Negative), classified according to the teacher's subjective impression ("feeling" process) were found in (1) the content of behaviors and their frequencies (or percentages), (2) relations and direction of behaviors, and (3) timing of behaviors. The relationship between the "feeling" and "expression" process was discussed taking these three points into consideration.

Arrows in Table5 indicated the direction of interactions. Filled-in circles indicated bi-directional temporal patterns and open circles indicated uni-directional interactions ($p < .05$).

5-1 .Content of behaviors and percentages

Most bi-directional temporal patterns expressed with filled circles in both types of interaction were seen in lower lag positions from 0 to 2, except the pattern between the child's "Attention" and the teacher's "Approach" in the Negative interactions. This finding showed that the timing of most bi-directional temporal patterns was fast.

Differences in behavioral aspects between the two types of interaction were found in the behavioral contents and their percentages (Table 4). Generally frequencies and percentages are familiar information about behavioral aspects of interaction. For example the child's "Positive vocal cues" in the Positive interaction, or "Negative vocal cues" or "Avoidance" in the Negative interaction were direct indicators of each type of interaction and seemed to be understandable cues for the teacher. Such information about frequencies, however, only showed times of occurrence and did not refer to the relationship between the teacher's and child's behaviors. Moreover, frequent behaviors were not always influential in the relationship with others. Therefore, efforts to evaluate and understand the interpersonal

Most uni-directional temporal patterns expressed with open circles in both types of interaction, on the other hand, were seen in relatively higher lag positions (i.e. greater than 2), with the exception of the pattern from the teacher's "Attention" to the child's "Attention" in the Positive interactions, the pattern from the child's "Avoidance" to the teacher's "Approach" and from the teacher's "Attention" to the child's "Avoidance" in the Negative interactions. This finding showed that timing of most uni-directional temporal patterns was delayed.

In conclusion, significant trends in lag positions were not observed within types of interaction (Positive or

Table 5 Temporal Patterns of Behaviors and Lag Positions

Temporal patterns of behaviors				Lag positions					
				0	1	2	3	4	5
Positive interaction	Bi-directional	C's Attention	T's Approach						
		T's Approach	C's Approach						
	Uni-directional	T's Approach	C's Attention						
		T's Attention	C's Attention						
Negative interaction	Bi-directional	C's N vocal cues	T's Approach						
		C's Approach	T's Approach						
		C's Avoidance	T's Attention						
		C's Attention	T's Approach						
	Uni-directional	C's Attention	T's Attention						
		C's N vocal cues	T's Approach						
		C's Approach	T's Approach						
		C's Avoidance	T's Approach						
		C's Attention	T's Approach						
		T's Attention	C's Avoidance						

Note: 'C' indicates the child and 'T' indicates the teacher. Arrows indicate direction of the interaction. Filled circles indicate bi-directional temporal patterns and open circles indicate uni-directional temporal patterns ($p < .05$).

relationship between teacher and child should not be done only from frequencies of their behaviors. Following further analysis about relation between the teacher's behaviors and the child's would be appropriate and necessary.

5-2 .Relationships and direction of behaviors

The relationship between the teacher's and the child's behaviors was observed and differences in the direction of the interaction were found between two types of interaction (see Figure 3). The direction of interaction was either bi-directional or uni-directional. The former patterns were prominent in the Negative interactions, which seemed to indicate that the teacher-child interaction was more reciprocal, active, and web-related in this type of interaction.

As for the latter, patterns from the teacher to the child were prominent in the Positive interactions and the reversed pattern, that is, patterns from the child to the teacher were prominent in the Negative interactions. These findings suggested that teacher-initiated patterns, in which the teacher initiated the interaction and smoothly influenced the child, were prominent in the Positive interactions. The reversed pattern, that is, child-initiated patterns, on the other hand, seemed to develop in the Negative interactions and the teacher appeared to follow the child.

Although bi-directional interaction and child-initiative patterns are commonly considered to be preferable in teaching situations, these patterns were seen in the Negative interactions in the present study. Commonly preferable patterns could be found in negative interpersonal relationships, which seemed to be one example of the gap between subjective impressions (the "feeling" process) and behavioral aspects (the "expression" process) of interaction. Therefore, these gaps should be taken into account and treated cautiously in evaluating interpersonal relationships in teaching situations.

5-3 .Timing of behaviors

Differences in temporal aspects of interactions, that is, timing of related behaviors were found between bi-directional and uni-directional patterns, but not between two types of interaction (Positive or Negative) (see Table 5).

Bi-directional temporal patterns were seen in lower lag positions, which implied that these patterns were in fast tempo. Uni-directional temporal patterns, on the other hand, were found in higher lag positions, which implied that responses to others were delayed in these patterns.

Timing is an important aspect in interaction. Tune in tempo with each other and synchronization of behaviors

are regarded as indicators of good interpersonal relationship (Tickle-Degnen & Rosenthal, 1990). To respond immediately to others is one example of these indicators. Such responding patterns in fast tempo were found in bi-directional temporal patterns in this study. Bi-directional temporal patterns were immediate patterns in terms of timing of the interaction and both patterns were regarded as indicators of a good interpersonal relationship. These patterns, however, were found in the Negative interactions in this study, which also implied one of gaps between the subjective impressions (the "feeling" process), and behavioral aspects (the "expression" process) of interaction. The need to interpret the nature of these gaps with care was again emphasized here.

6. Conclusion

From results of the present preliminary evaluation of interpersonal relationships in teaching situations according to the theoretical framework proposed by Tickle-Degnen and Rosenthal (1992), implications about the relation between components of the encoding process, that is, "feeling" and the "expression" process were gained.

Although only the encoding process of interpersonal relationships was investigated in this preliminary study, considering that the only accessible process to the child at the pre-linguistic stage is her "expression", the teacher's high-developed ability to "perceive" and "interpret", that is, high decoding ability of the child's "expression" was required. Therefore, to promote better understanding of interpersonal relationship in teaching situations, further analysis of the decoding process as well as encoding process is necessary.

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