

# Failure in Attaining Adult's Comprehension of Intentions in Japanese Children with Severe to Profound Mental Retardation

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Prelinguistic children with severe to profound mental retardation were compared to matched infants without disabilities in regard to attaining adult's comprehension of child's communicative intentions by repairing communication and accepting correct interpretations. The results showed no group difference in the rate of repairing, but the types of repair produced were different between the two groups. The children with mental retardation were offered fewer interpretations to their initiations and repairs and accepted these at a far lower rate compared to the infants. Adults responded to intentions of these children at far higher rates compared to the infants even when these children repaired the adult's comprehension failure. The relations among the type of repair, type of intended effect in communication, and adult's response to child's initiation and repair were discussed. Need for some compensatory strategy to help these children operate with some junior version of the Gricean cycle was suggested.

*Keywords:* severe to profound mental retardation, comprehension of intention, repair, Gricean cycle

M, Oi: Attaining adult's comprehension of intentions in children

## **Introduction**

As Grice (1975) has shown, communication can be defined as a complex kind of intention achieved just by being recognized. To realize the intention, the sender should let the receiver recognize it by way of signaling clearly, monitoring the receiver's comprehension, and indicating whether it is correct. When the receiver fails to comprehend, the sender is supposed to repair communication, and to express his or her acceptance when the interpretation is correct. This definition is crucial to analyzing early communicative behaviours as well as to conversation. Golinkoff (1986) classified communication between preverbal infants and their mother during lunch into 'immediate success' and 'negotiation on failed messages'. In the former, infants accepted tacitly mother's interpretations to their initiation. In the latter they attained mother's comprehension by repairing communication with a few failures. The skills seen in the infants can be critical to communication in children with severe disabilities for the following two reasons. First, insufficiency in the skills may cause communication failures leading to their behavior problems (Brady, McLean, and McLean, 1995). The second is that these children might benefit from responding to adult's interpretation or clarification request to their initiation, as infants without disabilities are assumed to do from having their signals got reformulated by the mother (Bruner, 1983), or practicing to repair comprehension failure (Golinkoff, 1986).

Communication repair in individuals with severe disabilities has been hardly studied. For adults with severe disabilities, McLean,

McLean, Brady, and Etter (1991) found a small number of repairs relative to that of initiations while Brady et al. reported that adults with severe disabilities repaired at high rates when experimental procedures to evoke initiations were used. For children with severe disabilities, Oi (1993) reported high rates of child's repair when a few restricted types of initiation were evoked repetitively. Sugasawa and Oi (1994) found, however, preschoolers with severe mental retardation repaired at relatively lower than matched infants without disabilities. These preschoolers produced as many repetition type repairs as the infants, but the rate for adding/substituting signals for repairing was lower in these children. These studies, contradicting each other and all conducted in some experimental settings, can hardly help in clarifying whether children with severe disabilities are skilled in repairing as well as infants without disabilities in communication in natural contexts. Child's acceptance of a partner's interpretation has not been paid attention by researchers except Golinkoff and Gordon (1988). Their subjects indicated acceptance of mother's interpretations by stopping signaling, resuming prior activities, switching topics to move-on, or following through on the mother's interpretation. Subjects of Oi (1993), however, only followed through their educator's immediate provision of objects or services they demanded. These educators satisfied child's demand without offering interpretation at excessively higher rates compared to the mothers of Golinkoff and Gordon's study. However, the results cannot be compared directly to those of Golinkoff and Gordon (1988)

due to the varying sampling procedures and coding systems. Besides, the lack of match between the two groups of subjects is critical.

Studying early repair and acceptance in children with severe disability would get constrained in regard to some parameters. Subjects would be at five years of age at youngest as it was in Ogletree, et al (1992). Children at this age generally spend the daytime in facilities, so that samples would be collected in their classroom, and accordingly, educators of the facilities would be their partners of communication. The present study was designed to compare children with severe to profound mental retardation to matched infants without disabilities in regard to attaining educator's comprehension of their initiations using an unstructured communication sampling procedure. The following four questions were addressed : (a) Was there a difference in the rate of child's repair: (b) Were there differences in the way of repairing in children: (c) Were there differences in the way adult respond to child's initiation and repair: and (d) were there differences in the way child respond to interpretation offered by adult?

## **Method**

### ***Subjects.***

Ten subjects with mental retardation were from a day-care center and ten without disabilities were from three nurseries. The subjects with mental retardation, consisting of seven boys and three girls ranging in age from 4; 6 to 6; 5, communicated intentionally with no real expressive language system. They were with normal vision,

hearing, and motor ability, bearing no evidence of the syndrome of autism. The subjects without disabilities were in the first half of their second year, consisting of four girls and six boys ranging in age from 12 to 17 months (mean, 14.1; SD, 1.58). The two groups were matched in developmental age (Mann-Whitney U, 41,  $p = 0.506$ , twotailed, corrected for ties) by their relative status in the language and social domain of the Kyoto Scale of Psychological Development (Shimazu, Ikuzawa, and Nakase, 1983). The mean developmental age in this domain for the subjects without disability was 13.8 months (SD, 1.47; range 12-17mos.) and for those with mental retardation, 13.6 months (SD, 2.42; range 11-20 mos.). In the cognitive-adaptive domain of the scale, the mean developmental age for the subjects without disability was 14.4 months (SD, 1.66; range 12-18 mos.), and significantly lowered than that for those with mental retardation, 18.0 months (SD, 2.49; range 14-22 mos.;  $U = 15.5$ ,  $p = 0.001$ , twotailed, corrected for ties).

### ***Sampling Procedure.***

Communication of each subject was sampled under an unstructured condition as the subject interacted with a familiar educator and peers in their classroom. All the educators were female and had known the subjects more than six months before the study began. Each educator was in charge of two or three children. The mean educator-child ratio for the subjects without disabilities was 2.70 SD 0.48, and for those with mental retardation 2.80 SD 0.42, with no group difference ( $t = 0.49$ ,  $p = 0.63$ ). Two 45-minute samples were

collected over a period of two days in free play lasting approximately one hour every morning both in the day-care center and the nurseries. Each educator was asked to interact in her usual style. College seniors in special education videotaped all samples. Sound was recorded with a camera-mounted microphone.

***Identifying child-initiated communicative events.***

Two graduate students in special education completed communication identification and transcription. First, each videotaped sample was viewed to identify the occurrence of communicative events initiated by the child. This was determined by consensus between the two student assistants in line with a definition of communicative event given by the author. A communicative event was defined as follows. (1) A child-initiated event occurred when the child introduced a new topic using some communicative means to signal his or her intent with not precedence of an adult's initiation. (2) The event ended when the child ceased to signal on the topic. Transcribed were vocalization, speech, gesture, action, and gaze.

***Coding.***

The author coded the discourse function of the participants' communicative behaviors using the system described in figure 1 and table 1, a modified version of the one used by Golinkoff (1986) and Golinkoff and Gordon (1988). As depicted in figure 1, the child initiation is followed by the adult's first response that is to be classified into one of the four ways described in table 1. Immediately after this the child may make a closing move. If the child repairs at the

point, the sequence is extended until the child makes a closing move. In this case, the adult's final response to the final repair of the child in the event was also coded. The closing move of the child, wherever made, is classified into one of the four types shown in table 1. Additionally following three types were coded for the child's final repair; (1) 'repetition' was defined as child's using the same means for both the initiation and the repair; (2) 'substitution' was defined as child's replacing the old means with totally new ones; and (3) 'augmentation' was defined as using the same means observed in the initiation plus additional ones. Finally the two types of intended effect in the event were coded according to Bates (1976): proto-declarative type in which the child makes an effort to direct the adult's attention to some event or object in the world; and proto-imperative type in which the child uses means to cause the adult to do something.

#### ***Measuring the length of extended sequence.***

The number of turns was counted for the adult and child in all to measure the length of each extended sequence. A single extended one includes at least following 5 turns: the child's initiation, the first response of the adult, the child's repair, another response of the adult, and the child's closing move. Another two turns are added after the child's every single repair.

#### ***Rate for attainment of child's intended goal***

The rate of attainment of goal intended by the child in the event was calculated dividing total number of initiation by the number of child's closing moves that were not 'abandonment of intended goal'.

*Insert figure 1 and table 1 about here*

### **Reliability**

Interrater reliability was determined by using a second coder who was a speech-hearing therapist. The second coder independently rated 126 events, which were 37% of 345 identified, and included 79 events for all the subjects with mental retardation and 47 events for the randomly chosen two subjects without mental retardation. 126 child's initiations, 126 adult's responses to child's initiation, 64 child's first repairs, 64 adult's responses to child's final repair, and 126 child's closing moves were second-coded. Point-by-point reliability was obtained across the samples. The percentage of interrater agreement was computed by dividing the number of agreements by the total number of agreements plus disagreements and multiplying by 100. Then kappa-coefficients  $\kappa$  (Cohen, 1960) were calculated. The average reliability was 77% for the four types of the adult's response ( $\kappa = 0.81$ ), 79% for the four types of the child's closing moves and repair ( $\kappa = 0.86$ ), 87% for the types of repair ( $\kappa = 0.97$ ), and 81% for the types of intended effect ( $\kappa = 0.78$ ). All the kappa coefficients indicated significant probability beyond 0.0001.

## **Results**

### ***Number of child's initiation***

The mean number of events produced for subjects with mental retardation was 7.9, which was significantly fewer than that, 26.6, for subjects without mental retardation ( $U = 4$ ;  $p = 0.0006$ ).



### ***Rate of child's repair and length of extended sequence***

The average rate of repair was 0.54 for subjects with mental retardation and 0.46 for subjects without mental retardation. The mean number of turns which make up an extended sequence was 6.27 for subjects with mental retardation, 5.71 for subjects without mental. No group difference was obtained on these two measures.

### ***Type of child's repair***

Out of 43 repairs produced firstly in each extended sequence by subjects with mental retardation, 19 were identified as repetition, 23 were as substitution, and only 1 was as augmentation while subjects without mental retardation produced 53 repetitions, 47 substitutions, and 24 augmentations. A group difference was obtained for the proportion of augmentation to the total repairs ( $U=9$ ,  $p=0.0013$ ).

### ***Adult's response to child's initiation and repair***

The rate of adult's 'offer of interpretation' to the child's initiation for subjects with mental retardation was lower than that for subjects without mental retardation ( $U=13$ ,  $p=0.0056$ ). This was the same for the rate of that to the child's final repair ( $U=6$ ,  $p=0.001$ ). The rate of adult's 'response to child's intent' after the child's final repair was higher in subjects with mental retardation than subjects without mental retardation ( $U=0.5$ ,  $p=0.0002$ ) (see table 2).

*Insert table 2 about here*

### ***Child's closing move to adult's interpretation***

The rate for 'acceptance of interpretation' both to the adult's first ( $U=0$ ,  $p=0.0002$ ) and final ( $U=12$ ,  $p=0.0037$ ) interpretation in the event

in subjects with mental retardation was far lower than that in subjects with no disabilities (see table2).

### ***Type of intended effect***

In only 2 out of 79 events produced by subjects with mental retardation proto-declarative type was intended and for the rest proto-imperative-type was intended, whereas subjects without mental retardation intended proto-declarative type in 99 events and proto-imperative type in 167 events.

### ***Attainment of intended goal***

The rate of attainment of child's goal intended was 0.76 for subjects with mental retardation and 0.78 for subjects without mental retardation. No group difference was obtained for this measure.

## **Discussion**

Although the rate of repairing communication failure was not different between children with severe to profound mental retardation and matched infants without disabilities, the way to repair was different between them. The former hardly produced augmentation type repair whereas the latter produced that as well as repetition type and substitution type ones. There is need for investigation how very little production of augmentation repair in children with mental retardation affected educator-child communication. Far fewer interpretation offers and far more responses to intent by adults to repairs in these children may have to be examined in relation to their very little production of augmentation repair. This also has to be studied in relation to their little production of proto-declarative type act,

because fewer interpretation offers and more responses to intent were seen in adult's response to initiation of these children. Far lower rates of accepting adult's interpretation in these children compared to the infants with no disabilities indicate need for investigating whether adult's way of providing interpretation and child's ability to receive it were different between the two groups.

The results of the present study suggest that children with severe to profound mental retardation seem to fail in operating with some junior version of Gricean cycle. They seem to have difficulty engaging in 'negotiation on intention' (Bruner, 1983) where the child is supposed to learn how to make his or her intention clearer with adult's assistance. Some compensatory strategy might be needed. Adult's frequent use of responding to intent of these children could be the one, by which actually they have got as much attainment of goals intended as infants without disabilities. But, that would not provide them opportunity to play a more active role in learning communication.

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Table 1. Definitions of adult's response and child's closing move

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<b>Adult's response</b>	
<b>Offer of interpretation.</b>	The adult acknowledges the child's signal by offering some interpretation verbally or nonverbally including reformulation of child's signal and continuation of the child's topic
<b>Response to child's intent.</b>	The adult satisfies the child's demand by providing the child's with an object or service, or just by paying attention to what the child is interested.
<b>Comprehension failure.</b>	The adult expresses her failure in comprehending the child's signal verbally or nonverbally. Feigned failure is included as well as true failure.
<b>No response.</b>	The adult does not pick up the child's signal.

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#### **Child's closing move**

**Acceptance of interpretation.** The child expresses acceptance of adult's interpretation

of his or her initiation tacitly by stopping to signal.

**Follow-through.** The child continues a topic after the adult's response to his or her child's intent by some instrumental action.

**Direct manipulation.** The child attain his or her intended goal through manipulating the adult or an object with direct motor act or some instrumental action.

**Abandonment of intended goal.** The child abandons his or her intended goal by changing or discontinuing the topic.

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Table 2 Numbers of initiated events, repaired events, adult's response, and child's closing move

	Children with mental retardation	Infants with no disabilities
Initiated event	79*	266*
Non-repaired event	36**	142**

Repaired event	43***		124***	
<b>Adult's response to</b>	<b>initiation</b>	<b>final repair</b>	<b>initiation</b>	<b>final repair</b>
Offer of interpretation	17	8	131	75
Response to child's intent	14	21	19	13
Comprehension failure	31	9	64	19
No response	17	5	51	17
<b>Child's closing move to adult's</b>	<b>first response</b>	<b>final response</b>	<b>first response</b>	<b>final response</b>
Acceptance of interpretation	7	4	102	57
Follow-through	14	21	19	13
Direct manipulation	7	7	7	9
Abandonment of intended goal	8	11	13	45

\*The number of initiated event equals the sum of the numbers of adults responses to initiation.

\*\*The number of non-repaired events equals the sum of the numbers of child's closing moves to the first response.

\*\*\*The number of repaired event equals the sum of the numbers of adult's responses to child's final repair as

well as the sum of the numbers of child's closing moves to adult's final response.



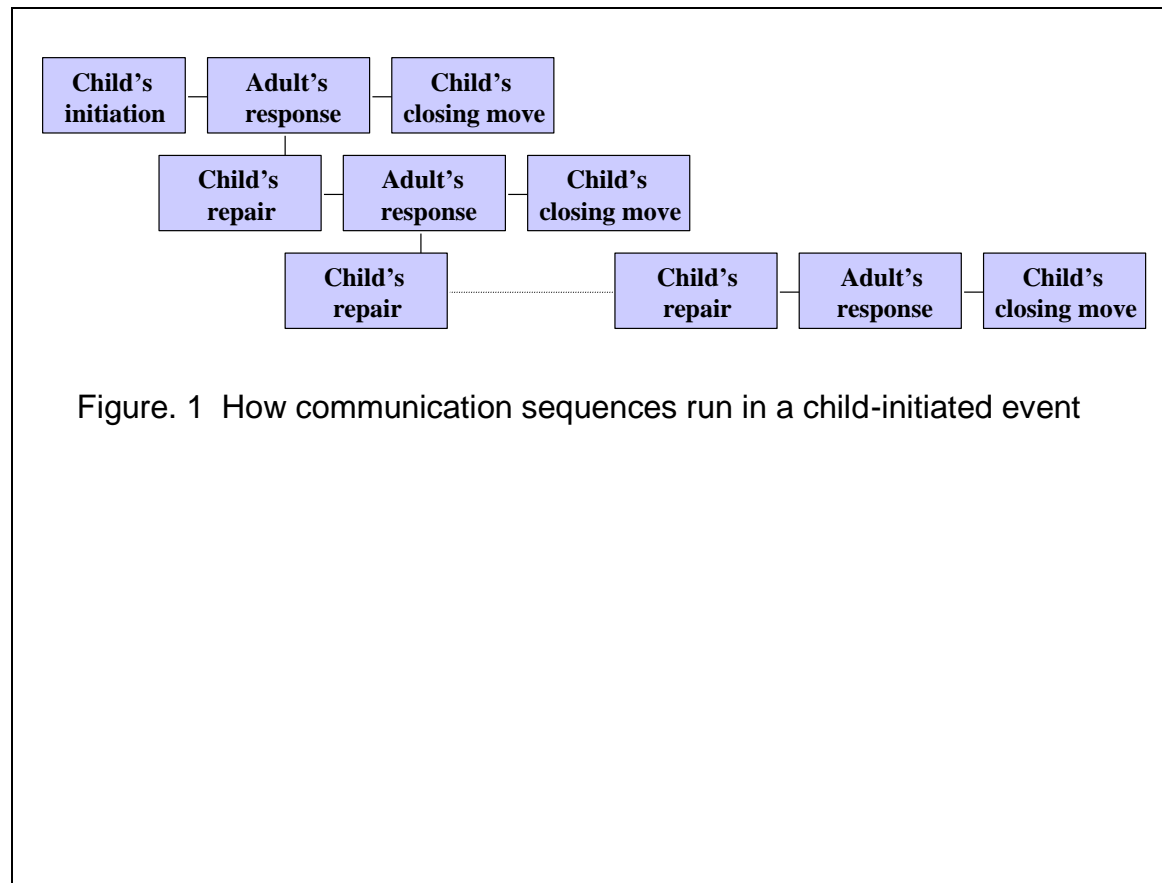


Figure. 1 How communication sequences run in a child-initiated event