5 ◇ Case Studies in Comprehension Assessment

To illustrate how the model of comprehension assessment presented in this book can be implemented for children in each of the three developmental stages, the following case studies are provided. This chapter also addresses comprehension assessment for children with severe speech impairments.

THE EMERGING LANGUAGE STAGE

Jaime

When Jaime was 18 months old, his mother reported that he didn't say any words. Is this a problem? It may be or it may not be. Paul's (1993) data suggest that 18 months of age may be too young to decide whether a child with a circumscribed expressive delay has a problem. However, if both expression *and* comprehension are delayed, there may be more cause for concern. To determine whether Jaime has a language impairment that merits attention, we need to have his hearing tested carefully and then assess his receptive skills. Here is an outline of the assessment plan for Jaime and its results.

Assessment Plan: Step 1

Assess communicative ability by observing Jaime playing with a familiar person. Count the number of times he initiates communication, either verbally or nonverbally. (See Paul [1995] and Wetherby and Prizant [1990] for detailed communication assessment procedures.)

Does Jaime communicate and, if so, how? To answer this question, we must observe Jaime for gestures, vocalizations, gestures *and* vocalizations, and words. Jaime's range of communicative functions (e.g., requests, comments) should also be examined. It is useful to record frequencies of productions. During the emerging language stage of development, this can often be done without video recording equipment because productions are infrequent. (Wetherby, Cain, Yonclas, and Walker [1988] reported an average of two intentions per minute at 18 months and five per minute at 24 months in typically developing children.)

Results

Initial observation of Jaime confirmed his mother's observations. No intelligible words were observed, and only vowels were produced. We did observe, though, that Jaime was active and communicated a range of intentions, with normal frequency for his age.

Assessment Plan: Step 2

To assess Jaime's comprehension, the following steps should be taken:

1. Look at literal comprehension of single words using Procedures 2.3 and 2.5. If Jaime does not respond appropriately to any single

words, determine which, if any, response strategies he uses by asking for an item while pointing and looking at it. If he responds using a "look at what the adult looks at" strategy, credit him with the use of this strategy. If Jaime does not use this strategy, terminate receptive testing.

2.   If Jaime has literal comprehension for some single words, assess comprehension of word combinations using Procedure 2.6. If Jaime does not respond appropriately, examine responses for use of the "do what you usually do" (i.e., conventional use of objects) strategy. If he does not comprehend unusual two-word combinations and does not use this strategy, terminate comprehension assessment.

3.   If Jaime comprehends unusual two-word instructions or uses a "do what you usually do" strategy, test comprehension of three-word instructions using Procedure 3.3. If Jaime succeeds at this task, terminate comprehension assessment because comprehension is clearly ahead of production. If Jaime fails the two-word task, examine responses for evidence of the "child-as-agent" strategy. Use of this strategy indicates discourse-level comprehension because Jaime would, in using it, be responding to the discourse-level intent of the utterance (i.e., a request for action) even though he was not able to process all of the literal meaning of the utterance.

Results

Jaime's hearing was within normal limits. He demonstrated comprehension of object and person names and some verbs. He did not comprehend words for absent objects, but did understand two-word utterances, including possessor-possession. This is a common outcome where comprehension appears to be appropriate but production skills are marginal. Given the wide variability in rates of progress in production, it is not possible to determine whether production is delayed at this age. Jaime's relatively good comprehension is a reassuring sign. Before making a decision about intervention, we should review all the reasons this child's production may be lagging. Speech motor limitations should be assessed, for example. We might then provide his parents with some information about language stimulation techniques and suggest they try using scaffolded book reading and indirect language stimulation (see Paul [1995] for details) at home. We would want to see Jaime again when he is 24 months old. If production has not improved by then, the need for intervention should be reviewed with parents.

Ashley

Ashley is a 34-month-old girl with Down syndrome. Her mother reports that Ashley produces no intelligible words at this point.

We know that cognitive impairments are associated with Down syndrome and research has documented that comprehension skills are generally better than production (Miller, 1987b, 1988, 1992). Otitis media is frequent and persistent in this population, so ongoing hearing evaluation is especially important. To begin, we would review Ashley's production status, as we did with Jaime. We would also need information about her developmental level. If cognitive testing is not available, we can use play assessment to estimate cognitive level (see Paul [1995] for details of play assessment procedures). As a last resort, we can use the

rule of thumb for mental age being one half chronological age (Miller, Leavitt, & Leddy, in press). Previous testing had revealed Ashley's developmental age to be about 24 months. Here is an assessment plan for Ashley and its results.

Assessment Plan: Step 1

Assess communicative ability as we did in the first step of Jaime's plan. Because parents of children with Down syndrome often engage in routines to demonstrate their child's best performances, suggest at the outset, "We would like to see Ashley play on her own for a few minutes. Try to respond to her without leading the activity."

Results

Ashley was only producing two vowels. She exhibited intentional communication through gesture only. Only request intentions were observed, and these were low in frequency.

Assessment Plan: Step 2

Begin comprehension assessment with Procedure 2.2 because joint reference is critical for word learning. Procedure 2.3, comprehension of object and person names, will be the major focus. If Ashley is successful, move to Procedure 2.4, comprehension of action words. If verbs are understood, then Procedures 2.5 and 2.6 can be administered because for children with Down syndrome production may be very delayed relative to comprehension status. An estimate of language level based only on production may be an underestimate.

Results

Ashley demonstrated frequent joint reference to objects with her mother, and comprehension of a wide range of object and person names. Only the verbs "hug" and "kiss" were understood.

No success was observed on the initial items from Procedures 2.5 and 2.6. No strategies were observed; Ashley simply did not respond to words for absent objects or to two-word combinations. This suggests that her discourse-level comprehension is as impaired as her literal comprehension skills. In a case such as this, where communication, literal and discourse comprehension, and production are delayed relative to developmental level, we need to build a strong base in communicative intention and receptive skills before focusing on the formal aspects of production. We would concentrate first on increasing communicative attempts through communication temptations (Wetherby & Prizant, 1989) and building receptive skill through facilitative play and indirect language stimulation (Fey, 1986). If frustration with production is evident, we might evaluate the use of sign instruction with Ashley's parents and teachers. We would need to be aware of the limitations of sign instruction (Miller, 1992), though, and carefully review all other potential limitations on production performance (see Swift and Rosin [1990] for intervention advice). Children with Down syndrome frequently have low intelligibility for the first 3–4 years of life. We may want to concentrate on other areas of language development during this early period and focus on intelligibility when Ashley is 5 years old.

THE DEVELOPING
LANGUAGE STAGE

The developing language stage is probably the most active in terms of the amount of language learned, with vocabularies approaching 5,000 words, the majority of syntax being acquired, and discourse-level skills and semantic diversity expanding dramatically. Still, children in this age range are inconsistent in their ability to stay focused and respond consistently in testing situations. The procedures in Chapter 3 provide basic testing methods for the first half of this stage, as well as procedures that can supplement standardized testing for children at the later segment of this period. Assessing children at this level of development requires consideration across language domains, including discourse, syntax, and semantics.

Peter

Peter is a 5-year-old boy with hearing and cognitive skills within the normal range and an MLU of 2.3. He produces a restricted number of different words on a 100-utterance language sample (more than –2 SDs from the mean on both measures). Because both of these measures correlate highly with age, these data suggest a significant delay in acquiring production skills. In addition, Peter produces far less language per unit time than his peers, requiring more than 5 minutes longer to produce his language sample. We can expect that Peter's comprehension performance could range from being consistent with his production skills to equivalent or slightly better than his chronological age. We would proceed to evaluate Peter's comprehension as follows.

Assessment Plan

Begin with Procedures 3.1, understanding illocutionary intent in requests, and 3.2, inferring and continuing topics. Data from Procedure 3.2 can be taken from the language sample. Then move to Procedure 3.3 to evaluate two- and three-word S-V and S-V-O utterances. Administer Procedure 3.4. Use a free-play context for Procedure 3.8 because a structured format may seem too contrived to test Peter's question comprehension. If the role-playing task appears too cognitively demanding for Peter, Procedure 3.7 can be used. It will also give us some notion as to whether Peter can respond to a picture format. Attempt Procedures 3.10, 3.11, and 3.13. Review the language sample for evidence of success on Procedure 3.12 because several requests for clarification will be made.

Results

Peter had no difficulty with understanding the illocutionary intent of requests (Procedure 3.1) or following topics (Procedure 3.2) in natural conversation. All of his utterances were judged to follow the topic appropriately, placing him at or above the 3-year level of performance. He exhibited little difficulty with two- and three-word instructions (Procedure 3.3) and also passed 95% of the items on the word order comprehension task (Procedure 3.7), indicating syntactic comprehension at least at the 3- to 4-year-old level. Because he could perform with the picture format, other picture tests (e.g., *Peabody Picture Vocabulary Test–Revised [PPVT–R]*) could be used with him. Peter also performed the locative search task (Procedure 3.4) flawlessly, suggesting 4-year level performance. He was able to respond to questions (Procedure 3.8) appropriately through "how?" and "how much?", which are at a 4.0+

level of performance. He had no difficulty in responding to requests for clarification.

In summary, Peter is performing at least at the 4-year level of comprehension at all levels tested in syntax, semantics, and discourse. This suggests that language comprehension is synchronous across areas. Peter's comprehension skills are far better than his production skills. In light of these findings, we would need to evaluate his nonverbal cognitive status. It would also be useful to examine his vocabulary abilities using the *PPVT–R* (Dunn & Dunn, 1981) or a vocabulary definition task like that on the *Test of Language Development–2 Primary (TOLD–R)* (Newcomer & Hammill, 1988) because vocabulary problems cannot be ruled out by the data gathered so far. A small vocabulary was used deliberately in order to avoid underestimating general receptive skills on the basis of small vocabulary. There are remaining questions, including whether other factors, such as environmental events or speech motor limitations, might be responsible for Peter's limited production skills. After a thorough speech motor assessment, we might want to try some parent training and reevaluate results in 3 months. If improvement is not seen, more direct intervention can be considered.

THE LANGUAGE FOR LEARNING STAGE

Assessment at the L4L level generally includes some standardized testing, because children can perform both picture-pointing and object manipulation formats. In addition, judgment tasks can be added to the procedure repertoire. Judgment tasks provide considerable flexibility in developing assessment tasks, although they make greater cognitive demands than the other methods. Judgment tasks are particularly well suited for exploring semantic variation. Standardized tests are generally used to focus on syntax and vocabulary at the literal level of comprehension while the informal procedures in Chapter 4 can help in examining comprehension strategies and the all-important area of classroom comprehension. These procedures can be used to augment other types of assessment, to examine comprehension of higher-order language, and to look at classroom-based problems with comprehension.

James

James is an 8-year-old boy in the second grade whose production skills are characterized by an MLU that is higher than expected (+1 SD) for 8-year-olds. He displays a high number of repetitions and revisions and other forms of mazes (i.e., false starts and abandoned utterances) in his speech (52 utterances in a 100-utterance sample). His PPVT–R score is at age level, as is his *Test of Auditory Comprehension for Language–Revised (TACL–R)* (Carrow-Woolfolk, 1985) score. This suggests that basic literal comprehension is not a problem. If we examine the production data, however, concern emerges about James's knowledge of complex syntax. His MLU could be interpreted as a sign of better-than-average syntactic skills. When a high MLU is combined with a high number of mazes, the relationship between the two measures must be considered. An evaluation of James's language sample revealed the mazes occurred in the longer utterances. Frequently, several mazes occurred in these utterances, all of which were attempts at multipropositional (i.e., complex) utterances. Simple sentences rarely contained mazes. If we assume that

mazes occur either because James could not find the word he wanted or had trouble formulating the syntactic structure, then production data suggest a problem with complex syntax. With this in mind, we might ask whether James understands the syntax of complex sentences. The following assessment plan was developed with this question in mind.

Assessment Plan

Administer Procedure 4.1 to focus on the complex syntax items. Then move on to Procedures 4.2, to assess comprehension of passive sentences, and 4.4, to assess comprehension of center-embedded relative clauses. Procedure 4.3 may be given as a check on discourse-level comprehension skills.

Results

James performed well on the discourse-level comprehension task (Procedure 4.3), but failed all of the items evaluating complex syntax. It is hard to know whether this is due to limited memory or processing span, or to syntactic difficulty. In either case, intervention focusing on speaking in simple sentences is a logical first step. This will reduce revisions that are disruptive to intelligibility. Once simple sentences are established, we can address development of complex syntax in both receptive and expressive modes. James's good discourse-level skills will give him an advantage in this effort, because he already has a sense that different forms are appropriate for different social contexts. We can start from there, using sets of simple sentences, asking to whom it would be appropriate to say such sentences (e.g., a young child). We could then combine the two sentences into a complex one, pointing out differences in form and similarities in meaning between the simple and complex utterances. More practice with sentence combining, using curricular material and classroom literature, and focusing on using pragmatic contexts to choose between simple and complex forms could follow (see Paul [1995] for detailed procedures). When comprehension of complex forms has been strengthened, James might be encouraged to produce his own complex sentences by combining sentences or paraphrasing textbook material to include complex sentences. Word processing activities, or "talking" computer programs, can be used to vary these activities.

CHILDREN WITH SEVERE SPEECH IMPAIRMENTS

Assessing comprehension in children with severe motor or cognitive impairments presents significant challenges. In most cases, comprehension status is critical to understanding the child's language skill, because speech limitations make assessment of production extremely difficult. When evaluating an individual to determine the need for an augmentative or alternative communication (AAC) system, knowing about comprehension skills is especially important. Generally, the child's comprehension status will determine the type of symbols (concrete versus abstract) and the initial vocabulary set used. For children already using AAC devices, knowing comprehension status will help us to determine appropriate production targets, whether single symbol or symbol combinations. Finally, knowing when a child begins to comprehend some symbolic language can indicate readiness to move away from an iconic AAC system (e.g., a picture board) to a more symbolic one. For all of these rea-

sons comprehension assessment is a central part of our mission in evaluating children with severe speech production impairments (SSPI).

Several tests have provided adaptations for persons with physical and cognitive impairments; these include the *Sequenced Inventory of Communication Development (SICD)* (Hedrick, Prather, & Tobin, 1975), the *Reynell Developmental Language Scales* (Reynell, 1985), and the *Non-speech Test* (Huer, 1983). In addition, many of the procedures in this volume can be adapted for use with children with SSPI.

Our first task in adapting any procedure is to identify, usually by trial and error, some reliable response the child can make. This might include activating a switch by suck/puff or a small motor movement (e.g., pointing with a headstick, indicating a general direction with a hand movement, gazing at an object to indicate an "eye-point" response). Another method to try is "dependent auditory scanning." Here a child with limited pointing or eye-pointing skills can be given a sentence (e.g., "The girl has a dog") and asked to indicate the picture that represents it by having the clinician point to it and ask "Is it this one?" The clinician does this for each picture in the array until the child indicates a "yes" response with whatever movement is available. Once a reliable method of responding has been established, we can use it to have the child indicate a choice among two or four pictures, as a yes/no answer, or to indicate a judgment.

As with any child, the type of response we can expect will depend on general developmental level. If developmental level has not already been established, we can get an approximation by adapting a cognitive assessment. The *Raven's Coloured and Standard Progressive Matrices* (Raven, 1965) is especially helpful because it uses a pointing response. The choices can be placed on a child's communication board and he or she can indicate an answer by whatever response mode has been established. For children with developmental levels below 5 years, picture-pointing and yes/no responses are most appropriate. Judgment tasks, like those in Chapter 4, can be used with children whose nonverbal abilities are above the preschool level. The two most commonly used tasks for children with SSPI are eye pointing and yes/no judgments.

Eye Pointing to Pictures or Objects

Looking as a response for comprehension and recognition tasks has been used successfully for children as young as several weeks of age. It is used in testing infants' visual acuity (*Teller Visual Acuity Cards* [1989]), and has also been incorporated into the *Reynell Developmental Language Scales* (Reynell, 1985) adaptation for persons with physical impairments. Eye pointing is a powerful tool, but to use it successfully, we must be sure the individual being tested has adequate control of vision. This seems obvious, but we often assume visual competency without confirmation, something no clinician would assume about hearing. Any standardized picture comprehension test or any procedure in this volume using pictures can be adapted to an eye-pointing task. For example, in Procedure 3.7, simply copy the picture plates and cut them apart. Place the pictures at equal distances with enough separation to ensure identification of a distinct look. Distance and angle will vary for each individual. The clinician's ability to recognize a distinct looking response will determine the arrangement. Begin using the corners of a wheelchair lap tray, moving the pictures closer together as necessary. The further apart the pictures

are placed, the more time the child will need for scanning. Pictures can also be placed on an elevated plastic frame to provide the most direct visual angle, or we can ask the child to look toward the corner of the room that corresponds to the choice. This exaggerated response instruction provides a bigger target that is easily interpreted. If the child cannot eye point in all four directions, the dependent auditory scanning technique discussed earlier can be used. Remember: Developing the testing arrangement is a trial-and-error process. It may take a number of sessions to complete testing because of fatigue. Make a game of it, and remember that comprehension abilities of persons with severe impairments are usually estimations. This is not an exact science. Any reliable information about comprehension will help develop effective interventions for facilitating comprehension of verbal messages, as well as improved message production for children with SSPI.

Yes/No Judgment Tasks

Judgment tasks are ideal methods for testing the comprehension of a variety of forms and functions because they require minimal responding. Any way to indicate yes or no, first or second, or right or left will do. Eye blinks, switches, or expanded keyboards, for example, can be used, so long as cognitive level exceeds the preschool range. The method of indicating should be individualized. Follow the suggestions for adapting picture-pointing tasks in placing the choices for judgment procedures. Dependent auditory scanning, as discussed previously, can also be used. Procedure 4.4 provides one example of a yes/no response strategy. Try using this response method for the stimuli from the procedures in earlier chapters or items that you develop. The major task in evaluating comprehension in these populations is developing a consistent response system. Take your time. The payoff in information gathered and clinical implications drawn will be well worth the effort.

Max

Max is a 16-year-old boy who was struck by a truck while skateboarding. Because he was not wearing a helmet, he experienced severe head injury and was in a coma for 24 hours. When he awoke, he appeared responsive but did not speak. After 2 weeks in a rehabilitation hospital, he continued to show increases in his awareness of his surroundings, but still made no vocalizations. He seemed frustrated, too, with his inability to communicate.

Assessment Plan

An assessment was undertaken to determine if an AAC system could help Max, even if it were only a temporary expedient until some vocal skills were recovered. The first question to answer was what response could be elicited. After several trials, it was found that Max's hand movements were not reliable enough to indicate a choice, but he could use a headstick to point to pictures displayed on a wheelchair table. This response proved reliable, and Max was willing to proceed with more testing. His clinician first needed to learn how much intellectual ability Max retained, in order to decide whether a symbolic system (e.g., writing) or a simpler, more iconic system (e.g., a picturebook) would be most helpful to him. Items from the *Raven's Coloured and Standard Progressive Matrices* (Raven, 1965) were copied, enlarged, cut apart, and mounted on his wheelchair table. Max was able to complete this test, although he was

quite fatigued toward the end. The next day his literal comprehension was assessed, using the *TACL–R* (Carrow-Woolfolk, 1985), again copying and cutting up the pictures so he could indicate a choice with a headstick. To get an idea of his discourse-level comprehension, Procedure 4.3 was given. Max was able to indicate a yes/no response by raising his eyes for yes and closing them to indicate no. Reading skill was also assessed, using the *Peabody Individual Achievement (PIAT) Reading Recognition Test* (Dunn & Markwardt, 1981) and having Max point with his headstick to the written version of the word pronounced by the examiner.

Results

Max scored at an 8-year level on the *Raven's Coloured and Standard Progressive Matrices* (Raven, 1965), a decrement from his performance before the accident, but a level that would allow him to use a symbolic form of communication. His literal comprehension was at a similar level. However, he had trouble judging the appropriateness of speech in context on Procedure 4.3. Max was able to recognize many printed words, scoring at least at a third-grade level on the *PIAT*.

Because Max's literal comprehension and reading recognition were adequate, it was decided to introduce a letterboard with which he could spell out messages with his headstick. This greatly reduced Max's frustration, but he still had problems with pragmatic aspects of language, as his discourse comprehension assessment results indicated. As Max's recovery continued, work on improving his expressive communication was supplemented with attention to pragmatic and discourse-level aspects of his comprehension and production.