



Ten Principles of Grammar Facilitation for Children With Specific Language Impairments

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Although they often have significant difficulties in other areas, most children with specific language impairment (SLI) have special difficulties with the understanding and use of grammar. Therefore, most of these children will require an intervention program that targets comprehension or production of grammatical form. Language interventionists are faced with the difficult task of developing comprehensive intervention programs that address the children's grammatical deficits while remaining sensitive to their other existing and predictable social, behavioral, and academic problems. The purpose of this article is

to present and justify 10 principles that we regard as essential for planning adequate interventions for children with language-learning problems. These principles are relevant for all children with problems in the use of grammar, but they are especially appropriate for 3- to 8-year-old children with SLI. Although all of our examples are from English, the principles we have chosen are sufficiently broad to cut across many linguistic and cultural boundaries.

Key Words: specific language impairment, language intervention, grammar

Compared to their age-level peers, children with specific language impairment (SLI) may have deficits in any or all domains of language (Bishop, 1992; Johnston, 1988; Leonard, 1998). This includes phonology (Leonard, 1982; Roberts, Rescorla, Giroux, & Stevens, 1998), lexical and relational semantics (Ellis Weismer & Hesketh, 1996; Kail & Leonard, 1986; Leonard et al., 1982; Leonard, 1975; McGregor & Leonard, 1995; McGregor & Waxman, 1998; Oetting, Rice, & Swank, 1995; Schwartz & Leonard, 1985), syntax (Fletcher, 1992; Morehead & Ingram, 1973), morphology (Bedore & Leonard, 1998; Leonard, 1989; Leonard & Bortolini, 1998; Leonard, Bortolini, Caselli, & Sabbadini, 1993; Miller & Leonard, 1998; Rice, 1994; Rice, Buhr, & Nemeth, 1990), and pragmatics (Brinton, Fujiki, & Higbee, 1998; Brinton, Fujiki, & McKee, 1998; Craig, 1991; Craig & Evans, 1993). These problems exist in the absence of mental retardation or of frank neurological, sensory, or psychosocial factors that might adequately explain the extreme difficulties these children exhibit in language acquisition and development.

Although linguistic functions are most severely disturbed, children with SLI also have been shown to perform poorly on many tasks of cognitive functioning, including symbolic play, haptic recognition, temporal processing of auditory and visual signals, and mental rotation. Several of these tasks do not appear to reflect underlying verbal abilities (see Johnston, 1994). These children also are reported frequently to be generally clumsy or slow and to have problems on visual discrimination tasks (Miller, Kail, Leonard, & Tomblin, 2001; Powell & Bishop, 1992; Windsor & Hwang, 1999).

The language impairments of children with SLI typically are noted first in conversational contexts during the preschool years. They also manifest themselves in older children in the comprehension and production of textual forms, such as narrative and exposition, in both spoken and written modalities (Gillam, McFadden, & van Kleeck, 1995; Liles, Duffy, Merritt, & Purcell, 1995; Scott, 1995). Because of their verbal and nonverbal deficits, children with language impairments are at great risk for

school failure. For example, they may have problems in social and behavioral adjustment in school (Beitchman et al., 1986; Brinton, Fujiki, Campbell Spencer, & Robinson, 1997; Brinton, Fujiki, & Higbee, 1998; Brinton, Fujiki, & McKee, 1998; Redmond & Rice, 1998; Rice, 1993; Windsor, 1995). They are also highly likely to have problems in learning to read and write (Catts, 1991, 1993; Catts, Fey, Zhang, & Tomblin, 2001; Fey, Catts, & Larrivee, 1995; Padget, 1988).

Despite investigators' awareness of deficits in many different areas of linguistic and nonlinguistic functioning, use of grammar clearly has received the most theoretical and empirical attention to date. This focus on grammar and, especially, grammatical morphology is well deserved, because this is the one area in which developmental patterns of children with SLI have been shown to differ consistently from those of younger, typically developing children who are matched on some linguistic criterion, such as mean length of utterance (MLU; Leonard, 1994, 1998; Rice & Wexler, 1996; Rice, Wexler, & Hershberger, 1998). The profile of atypical syntax and morphology learning is characterized by late onset of grammatical forms and by protracted periods from first uses to mastery of these same forms (Johnston & Schery, 1976; Rice et al., 1998). Thus, at the same time that children with SLI are omitting grammatical morphemes, such as articles, copulas, auxiliaries, and regular tense inflections, they may occasionally use sentences that are longer and syntactically more complex than those commonly found among younger typical children at the same stage of morphological development (Johnston & Kamhi, 1984; Leonard, 1972).

Because of the pervasiveness of delays in grammar and the especially slow development of grammatical morphology among children with SLI, language interventionists frequently are called upon to develop language intervention programs to facilitate grammatical development in these children. Although this task appears circumscribed on the surface, it is always far more complex in reality. We believe that effective intervention requires clinicians to follow four steps. They must carefully (a) examine the child's existing speech and language patterns, (b) evaluate the linguistic knowledge presumed to underlie those patterns, (c) evaluate the impact of these patterns on the child's current social-behavioral-cognitive performance, and (d) evaluate the potential impact of the child's existing speech and language problems on future deficits in language, social, academic, and cognitive development, and behavioral adjustment. Failure to consider this broad assortment of factors can oversimplify the problem for the child, the child's family, and the interventionist. Intervention based on such oversimplification is not likely to serve what we regard as the primary purpose or basic goal of language intervention: to facilitate communication functioning and to minimize the existing or potential social, behavioral, and academic penalties associated with children's language deficits (Fey et al., 1995).

One problem confronting language interventionists, then, is how best to facilitate the child's development of grammar in a manner that is mindful of other problems the child has or can be projected to develop. The purpose of

this article is to present 10 principles that we regard as essential in developing state-of-the-art grammatical interventions for children with SLI and to offer some examples of how those principles might be implemented clinically. These principles are listed in Table 1.

Our own theoretical position on SLI is most consistent with general processing limitation hypotheses, such as the so-called surface account of Leonard (1998). Leonard's hypothesis holds that children with SLI develop adult-like representations of morphosyntactic forms more slowly than do children with typical language because they are generally slow in processing of language and other types of information and sensory-motor operations (Leonard, 1998; Miller et al., 2001). Their problems with language are more significant than deficits in other areas because of the rapid sensory, perceptual, and computational processing required for language acquisition. According to this view, language difficulties should be greatest for language forms that are weak in phonetic form, sparsely or irregularly represented on the surface, opaque with respect to their underlying semantic properties, and/or complex with respect to their linguistic computational requirements. For English-speaking children, this includes virtually all bound and free grammatical morphology. Not all morphemes should pose the same degree of difficulty for children with SLI, however, because not all grammatical morphemes are

TABLE 1. Ten principles of grammatical intervention for children with SLI.

1. The *basic goal* of all grammatical interventions should be to help the child to achieve greater facility in the comprehension and use of syntax and morphology in the service of conversation, narration, exposition, and other textual genres in both written and oral modalities.
2. Grammatical form should rarely, if ever, be the *only* aspect of language and communication that is targeted in a language intervention program.
3. Select *intermediate goals* in an effort to stimulate the child's language acquisition processes rather than to teach specific language forms.
4. The *specific goals* of grammatical intervention must be based on the child's "functional readiness" and need for the targeted forms.
5. Manipulate the social, physical, and linguistic context to create more frequent opportunities for grammatical targets.
6. Exploit different textual genres and the written modality to develop appropriate contexts for specific intervention targets.
7. Manipulate the discourse so that targeted features are rendered more salient in pragmatically felicitous contexts.
8. Systematically contrast forms used by the child with more mature forms from the adult grammar, using sentence recasts.
9. Avoid telegraphic speech, always presenting grammatical models in well-formed phrases and sentences.
10. Use elicited imitation to make target forms more salient and to give the child practice with phonological patterns that are difficult to access or produce.

equally weak, sparsely or irregularly distributed, or semantically opaque, nor are they equivalent in their computational processing requirements. To be successful, then, grammatical intervention should function to increase the frequency, saliency, meaningfulness, and opportunity to make use of target grammatical constructions in pragmatically felicitous contexts. Our own theoretical position notwithstanding, we believe the 10 principles in Table 1 should apply for any individual who holds the basic assumption that language-specific features of grammar can be facilitated through intervention.

The principles presented here also are relevant for children of all ages, although our focus is clearly on children from preschool through approximately the second grade (3–8 years). The principles are grouped into those involving the selection of goals (i.e., Principles 1–4) and those related to intervention procedures and activities (i.e., Principles 5–10). We view the first six principles discussed as crucial intervention elements that generally are not considered controversial within the field of language intervention; therefore, less empirical support is offered for these principles. However, the last four principles discussed have received greater focus by the research community; thus, more supporting data are provided.

Principles Related to Goal Selection

The first task for the language interventionist is to decide on the general and specific areas on which the intervention program will be focused. Fey (1986) proposed that goals are best conceived as a set of hierarchical objectives, beginning most broadly with *basic goals*, which provide a general focus for the intervention. For example, a child with a specific developmental phonological disorder would have a basic goal of improving intelligibility. Similarly, a child with a deficit in morphosyntax would have the basic goals of acquiring grammatical forms currently absent from the child's system and of mastering those forms currently used inconsistently. Subordinate to the basic goals are *intermediate goals*. Intermediate goals reflect theoretically or empirically derived categories of linguistic targets with which the child is having problems. Thus, a child who substitutes stops for fricatives might have an intermediate goal to maintain the continuant feature or to eliminate the stopping of all affected fricatives. A child with problems on bound and free grammatical morphology might have auxiliary forms and nominative case pronouns as intermediate goals. *Specific goals*, in contrast, reflect the individual sounds or grammatical forms that compose the intermediate-level categories or classes. Thus, the clinician may choose to focus intervention on the production of /s/ and /t/ or /θ/ to achieve the intermediate goal of continuance. If production of auxiliary verbs is an intermediate goal, the clinician may choose to focus on certain specific exemplars, such as *is* and *are*, or *do* and *does*, rather than targeting all types of auxiliaries at the same time.

The main point here is that there are many degrees of freedom in the selection of intervention goals, and clinicians should set about the goal-selection task in a principled manner. Four principles strike us as being most critical in this process.

Principle 1. The *basic goal* of all grammatical interventions should be to help the child to achieve greater facility in the comprehension and use of syntax and morphology in the service of conversation, narration, exposition, and other textual genres in both written and oral modalities.

This first principle reflects more of a general clinical philosophy than the assumptions of any particular developmental theory. By this principle, if facilitation of grammatical performance is selected as a basic goal of intervention, a clinician must decide that improvements in grammatical performance will have a positive influence on the child's development in communication and/or in other areas of life functioning (Fey, 1986; Gillam et al., 1995; Nelson, 1989; Scott, 1995). To some clinicians, this may mean that intervention is best carried out in contexts in which the need for the forms arises naturally. For example, interventionists who practice milieu language-teaching approaches (cf. Kaiser, Yoder, & Keetz, 1992) carry out grammar facilitation in children's homes and classrooms rather than in a room specifically designed for clinical purposes. More dramatically, proponents of whole language focus their efforts on the production of meaningful textual units, such as narratives. In most whole language approaches, no specific goals are ever selected and some clinicians appear not even to select intermediate objectives. Contrary to most other approaches, isolation of specific linguistic targets for direct instruction is contraindicated in whole language, because such didactic tasks typically emphasize language form to the relative exclusion of the meaning found in coherent, cohesive text (Hoffman, Norris, & Monjure, 1993, 1996; see Gillam et al., 1995, for a different whole language perspective).

In our view, even highly decontextualized grammatical intervention methods may be appropriate or even necessary in some cases (Connell, 1986a, 1986b, 1987; Connell & Stone, 1992; Fey, Cleave, Long, & Hughes, 1993; see Principle 10 below). Still, by Principle 1, success can be claimed only when the intervention facilitates the child's use of grammatical targets in meaningful oral or written communication activities.

Principle 2. Grammatical form should rarely, if ever, be the *only* aspect of language and communication that is targeted in a language intervention program.

Principle 2 is drawn from two assumptions. First, as we discussed at the outset, even children with highly specific and disproportionate deficits in grammatical comprehension and production (e.g., van der Lely & Ullman, 2001) tend to have problems in other linguistic and nonlinguistic areas that will require careful clinical attention (Bishop, Bright, James, Bishop, & Van Der Lely, 2000; Miller et al., 2001). Principle 2 recognizes that these problems must be addressed as an adjunct to or as an inherent part of intervention that is designed to facilitate grammatical performance.

Second, intervention that successfully facilitates grammar will not necessarily result in spontaneous

improvements in other areas of deficiency. This is a controversial assumption. There are strong arguments that inability to use morphosyntactic form flexibly interferes with performance in other areas (Johnston, 1988; Panagos & Prelock, 1982). Thus, one might hypothesize from several different theoretical perspectives that early successful facilitation of grammar would reduce or eliminate problems in the other areas as well.

The evidence in support of such a hypothesis, however, is not strong. In the area of phonology, three studies (Hoffman et al., 1993, 1996; Matheny & Panagos, 1978) have found that language interventions leading to improvements in grammatical production also resulted in significant gains in phonological production, even when no phonological intervention procedures were used. In contrast to these reports, Fey et al. (1994) failed to observe improvements in phonology among a group of children with SLI who had completed a successful grammatical intervention. The 27 participants with phonological impairments in that study were culled from a group of 4- to 6-year-old children with language impairments (mostly SLI). Thus, these children's problems had persisted much longer and were more severe than those of the children studied by Hoffman and his colleagues (Hoffman et al., 1993, 1996). Half of the children had received a 5-month grammatical intervention that led to more complex and more well-formed sentence productions in spontaneous conversations with their parents (Fey et al., 1993). Contrary to clinical expectations, however, the gains in phonology made by the children who received the grammatical intervention were no greater than the gains made by control participants who received no intervention over the treatment period. Thus, there was no observable relationship between improvements in grammatical and phonological production.

This lack of generalization from grammar to other areas may extend farther than phonology. Intervention targeting speech and language form has long been presented to preschool children under the assumption that this would minimize the risks of later academic and behavioral problems. There are very few studies that have addressed the long-term outcomes of early language intervention, and none of these have done so in an adequate manner. On the basis of the weak evidence that is available, however, Fey et al. (1995) argued that standard interventions focusing on preschool and kindergarten children's speech and language in conversation do not eliminate and probably do not minimize the risks of later social and literacy deficits among preschool children with SLI.

In sum, children with SLI who have deficits in grammar often will need intervention targeting other areas of weakness. In some cases with young children, this may involve little more than using literacy materials, like storybooks, as the source of appropriate grammatical models or to increase the number of opportunities to use target forms (see Principle 6 below). In other cases, intervention might include indirect or direct efforts to enhance social (e.g., Schuele, Rice, & Wilcox, 1995), lexical (McGregor & Leonard, 1994), conversational (Brinton & Fujiki, 1995), narrative (Hoffman et al., 1993, 1996), and literacy (Scott, 1995) skills.

Principle 3. Select *intermediate goals* in an effort to stimulate the child's language acquisition processes rather than to teach specific language forms.

When children with SLI are identified, they typically are able to produce and/or comprehend some language, suggesting that these children do possess language-learning resources that enable them to learn from the ambient environment. More important, these observations suggest that a basic goal of intervention should be to stimulate the child's existing resources and/or trigger changes in the child's grammatical system so that the child can learn more efficiently and rapidly from the ambient environment (Bates, Thal, & MacWhinney, 1991; Cleave & Fey, 1997; Rice, Wexler, & Cleave, 1995). In other words, rather than using methods that help the child to learn specific language targets within intervention sessions in response to clinically delivered stimuli, clinicians should seek methods that will help children learn language more effectively both inside and outside the intervention context.

One way of doing this may be to select intermediate goals that reflect grammatical categories, principles, and operations. If intervention could lead the child to such a broad intervention target, then the language-specific manifestations of the target should be more readily accessible and learnable by the child. For example, a clinician might target the entire class of nominative case pronouns (e.g., *we, he, she, they*) for a child who substitutes the accusative (e.g., *me, him, her, them*) forms in subject position. Or, a clinician might focus on the use of ordinal adjuncts to organize narratives chronologically (e.g., *first, next, last*) for a child who fails to use these forms in story production or in reporting events.

Theoretical proposals in linguistics often suggest broader, more abstract relationships among specific morphosyntactic forms than those found in the categories of structural grammars. Consequently, the potential for generalized learning might be even greater than assumed previously. For example, on the basis of a principles and parameters approach, such as Hyams (1986), a clinician might select changes in parameter settings, such as the null subject parameter. Because of the setting of this parameter in English, grammatical subjects are obligatory, even if they bear no semantic content (e.g., *It is raining; There's a snake over there*). Other languages, with the opposite setting of the null subject parameter, such as Italian and Spanish, allow sentences with no overt grammatical subject (e.g., *Raining. A snake over there*). If a clinician could help an English-speaking child to trigger the appropriate setting in this parameter, the child would be in an appropriate position to learn a broad array of forms and operations related to grammatical subjects, such as (a) obligatory use of grammatical subjects, (b) nominative case pronouns (*he/she* vs. *him/her*), (c) auxiliary forms (e.g., *do/does; am/are/is*), (d) subject-auxiliary inversion for interrogatives, and (e) subject-verb agreement (e.g., *Seth walks home*).

As a final example, a clinician might take the position that a child's problems with morphosyntax are due, in part, to prosodic constraints on output. Such a position can be predicated on the finding from numerous studies indicating

that English-speaking children, including those with SLI, are most likely to omit weakly stressed syllables when they immediately precede (and do not simultaneously follow) strong syllables (Gerken & McGregor, 1998; Leonard & Bortolini, 1998; McGregor & Leonard, 1994; Sahlen, Reuterskiold Wagner, Nettelbladt, & Radeborg, 1999). This bias toward strong–weak, or trochaic, metrical patterns appears to contribute to the finding that pronouns and articles are omitted more frequently in subject position than in object position. For example, a child would be more likely to omit the article and pronoun in the following sentences (strong syllables are capitalized): “a BOY ate COOKies” or “he LIKES them” than in the sentences, “he ATE a COOKie” or “we THINK he’s FUNny”. An appropriate intermediate goal from this theoretical position would be to facilitate the production of weak syllables that immediately precede strong syllables. Meeting this objective could decrease the frequency with which forms that frequently fall in such positions (e.g., articles, pronouns, auxiliaries, copulas) are omitted (see Shea & Tyler, 2001, for a related intervention example). Principle 3 encourages clinicians to seek ways in which specific attainments within the intervention context result in system-wide grammatical changes. It is not known which, if any, of the types of intermediate intervention targets we have provided as examples lead to the broadest and most efficient learning outside the primary clinical context. The answer to this question depends in large part on the validity of the theoretical relationships assumed to exist among the specific forms that the intermediate target comprises. In other words, clinicians’ hypotheses with respect to intermediate goals can be no better than the theoretical assumptions on which they are based.

Principle 4. The specific goals of grammatical intervention must be based on the child’s “functional readiness” and need for the targeted forms (Bates et al., 1991; Johnston, 1985).

Principle 4 suggests that clinicians should expect intervention effects only for those forms for which the child is cognitively, socially, and linguistically prepared. If the child does not currently produce messages obligating the use of targeted forms, it is unlikely that intervention can help the child develop a productive rule that then is implemented in functional contexts. On the basis of this principle, appropriate specific goals would be (a) grammatical forms and operations that the child uses correctly on occasion but either omits or uses incorrectly on other occasions (i.e., partially mastered forms) or (b) developmentally appropriate forms that the child never uses, despite producing sentences and texts that call for their use (i.e., forms that the child may know to some extent but rarely or never uses).

Camarata and Nelson and their colleagues (Camarata, Nelson, & Camarata, 1992, 1994; Nelson, Camarata, Welsh, Butkovsky, & Camarata, 1996) have demonstrated that, with intervention, 4- to 6-year-old children with SLI can learn to produce absent but developmentally appropriate grammatical forms, sometimes after a single session.

Thus, it is clear that specific goals may be reached even when they are forms that are never attested in the child’s output prior to intervention. On the other hand, Fey and Loeb (2002) studied the effects of yes–no question recasts containing the auxiliaries, *is* and *will*, on the development of children who were not yet using any auxiliaries (e.g., Child: daddy drive. Adult: Is daddy driving?). They found no evidence that these recasts facilitated auxiliary use for children with SLI or for children with typical language. It may be that the recasts used by Fey and Loeb would have been effective for children already producing at least one nontargeted auxiliary in some contexts.

Nelson et al. (1996) demonstrated that targets that were partially mastered prior to intervention were rapidly acquired even *without* direct intervention. These findings led Nelson et al. (1996) to suggest that partially mastered targets may not require direct intervention attention. This conclusion appears premature, however. For example, Connell and Stone (1992) argued that the primary difficulty for children with SLI is not the acquisition of grammatical rules, which these children may learn adequately in comprehension. According to these investigators, the problem lies in an inability to access the phonological representations for grammatical forms quickly and consistently enough so that they appear regularly in output. Therefore, to reach levels of mastery of already acquired grammatical forms, these children may require many opportunities to produce the targets. These opportunities can be provided through intervention.

Leonard (1994) reported cases in which children with SLI overregularized the use of *-ed* (e.g., *breaked*), yet still produced the past tense morpheme in as few as 9% of obligatory contexts. Whereas Connell and Stone (1992) might explain such a finding on the basis of the child’s retrieval and other output processes, Leonard’s (1994) hypothesis was based on the child’s failure to develop appropriate representations for the past tense. He suggested that children with SLI may insert the bare stem form (e.g., *walk*, *play*) into their morphological paradigms where the past tense form (e.g., *walk + ed*, *play + ed*) should reside. Thus, when a child seeks a past tense form for a particular verb, the bare stem is found and produced instead of the appropriately inflected form. To overcome this misidentification of bare stem forms as past tense forms, Leonard (1994) argued that children with SLI need more exemplars of target forms in input than do children developing typically. Again, intervention could be designed to provide such opportunities.

Finally, according to the extended optional infinitive theory of Rice and her colleagues (Rice & Wexler, 1996; Rice et al., 1995, 1998), the especially protracted period during which children waffle between accurate use and omission of tense-related forms is a phenotypic marker of the disorder. Although some children with SLI may never master the use of tense-related morphology, others are presumed to reach mastery through a process of maturation.

Given these theoretical proposals and the evidence on which they are based, it seems unlikely that most children with SLI can master the spontaneous use of partially acquired morphemes without specific clinical focus on

these forms or on intermediate goals to which these morphemes are subordinated. Consequently, at present, it seems well justified to focus intervention on partially mastered forms as well as on unused forms for which the child demonstrates cognitive and linguistic readiness and functional need.

Principles Related to Intervention Procedures and Activities

The remaining six principles pertain to intervention procedures, or techniques, that are presumed to have a causal effect on the development of grammatical forms and the activities, or social/linguistic contexts, within which the procedures can best be implemented. It should be clear that we make no claims that these procedures are necessary to ensure eventual development of the grammatical forms targeted in intervention among children with SLI. On the other hand, we believe that these principles, taken together, lead to the creation of environmental conditions that are sufficient to hasten the acquisition of new forms and the development and mastery of forms already acquired in these children.

Principle 5. Manipulate the social, physical, and linguistic context to create more frequent opportunities for grammatical targets.

Many grammatical targets are difficult to address because they do not occur frequently in typical clinical settings. In these cases, the clinician must plan and modify activities that will increase the need for target productions to levels well beyond those found in the ambient environment. Ideally, the child will seize clinician-designed opportunities to produce an utterance and, in so doing, will either use the target form or make an error in its use. These cases give the clinician the chance to operate on the child's utterance by producing corrective or noncorrective recasts (see Principle 8 below). Even when the child fails to communicate or communicates using some unanticipated grammatical option, however, these contexts give the clinician a chance to produce pragmatically appropriate models of target structures for the child's benefit.

There are a number of different ways to manipulate activities to increase the number of opportunities for the child's specific target form. In many, the clinician takes on the role of the saboteur, disrupting the physical environment and routines within the environment. Devices that may be used by the clinician include (a) violation of routine events, (b) withholding of objects and turns (or giving extremely small portions, increasing the need for another child act), (c) violation of object function or manipulation, and (d) intentional misplacement of objects (Lucas, 1980). Similarly, the clinician can create felicitous contexts for many forms by becoming less cooperative as a conversationalist. Misnaming objects or describing events incorrectly can reduce the child's grammatical options dramatically, resulting in some meaningful attempt at the target structures. Some clinicians worry that children will see them as silly or error-prone when they perform these

acts, minimizing their effectiveness as models. To address this concern, puppets or dolls that sometimes "get mixed up" and need to be corrected by the child can be excellent conspirators in such cases.

As an example of these techniques, making a peanut butter sandwich could be an excellent activity for a child working on negative forms. Instead of typical ingredients, however, the clinician might have on hand things like noodles, cheese, dog food, or even a pencil, as ingredients for the sandwich. Such unlikely choices will create opportunities for sentences like, "You can't eat that," "That wouldn't taste good," or "We don't need noodles/cheese/hot dogs." When the proper ingredients are used and the activity has been completed, recapping the entire process can create numerous obligatory contexts for the target forms in a very short time.

Clinician: "We used/ate/needed peanut butter. We also used cheese."

Child: "No, we not use cheese."

Clinician: "Right, we didn't use cheese. What about dog food?"

Principle 6. Exploit different textual genres and the written modality to develop appropriate contexts for specific intervention targets.

Principle 6 builds upon Principle 5 in three important ways. First, there is evidence that individuals who perform well during conversations with the support of a cooperative partner often exhibit grammatical weaknesses in other genres, such as narratives, or in the written modality (Gillam & Johnston, 1992; MacLachlan & Chapman, 1988; Scott, 1995). Thus, clinicians interested in the grammatical deficits of children with SLI must adequately challenge these children's systems in evaluations and in intervention (Lahey, 1990; Nippold & Schwartz, 1996). Failure to do so would violate Principle 1, which requires grammatical intervention to result in grammatical gains that significantly influence the child's ability to communicate in different genres in both oral and written modes.

Second, for many forms, obligatory contexts occur more frequently in some genres and modalities than others. For example, Leadholm and Miller (1992) reported that in narratives, preschoolers produce past tense forms approximately two times more often and possessives three times more often than they do in conversation. Moreover, Hsieh, Leonard, and Swanson (1999) reported that third person singular forms (3S; e.g., *Lincoln looks funny*) were infrequent in both conversation and story contexts. On the basis of this evidence, listening to and creating stories most likely will provide more opportunities for clinician models and for the child to produce *-ed* and possessive *-s*. For 3S, simple expository texts probably would be more suitable than conversation during play or narratives, because the simple present is more common in informational discourse (e.g., "What does a fireman/a mailman/mommy do?").

Third, using similar logic, clinicians can exploit language modality to the child's benefit. For example, for older children learning higher level language forms,

written language can and should be utilized in listening and production activities. For example, certain forms, like appositives (e.g., “John, *the barber*”), nonfinite adverbial clauses (e.g., “*Bleeding from his nose*, Jack wandered home”), and passives (e.g., “The mouse was eaten by the cat”) are rare in the oral mode but occur more frequently in written texts (Perera, 1986; Scott, 1995). Principles 5 and 6 encourage clinicians to take advantage of these natural tendencies for some grammatical forms to occur more often in certain contexts than in others.

Principle 7. Manipulate the discourse so that targeted features are rendered more salient in pragmatically felicitous contexts.

The most straightforward way to increase the salience of grammatical intervention targets, especially grammatical morphemes, is to stress them by making them longer and louder and producing them with more dynamic pitch changes. This makes the grammatical targets stand out, but it also can result in sentences that sound anomalous, as in the following examples.

That boy *is* working hard.

The seed *will* grow into a flower.

It is possible, however, to manipulate the linguistic context in ways that increase the phonetic substance of grammatical morphemes in pragmatically acceptable ways (cf. Bedore & Leonard, 1995; Cleave & Fey, 1997). Two techniques are especially useful in this regard. First, the clinician can present models in elliptical contexts in which target forms appear in sentence- or phrase-final position.

That boy is working hard. He really *IS*.

The seed will grow into a flower. We just know it *will*.

Who can mix the batter? John *can*.

In these contexts, the targets typically are lengthened and may receive nuclear stress, especially in speech to young children (Hsieh et al., 1999).

The second technique forces a contrast between one assertion and another so that the target form is highly informative and, therefore, naturally receives greater stress.

Don't put it *INSIDE* the fence. Put it *OUTSIDE*.

I like the *BLUE* dress. Suzy likes the *PINK* one.

You want *THAT* fast car. We want *THIS* fast car.

John *WASN'T* laughing, but Suzy *WAS*.

These contrastive episodes are easy to create if the clinician disagrees with or teases the child in a playful way and allows the child to disagree as well (see also Principle 5). Note from the following example how this technique can be used to create contexts in which the child needs the target form or some alternative to it.

Child: We do that now.

Clinician: Oh, no, you *won't*.

Child: Yeah.

Clinician: You *won't* do it. WE *will*.

Child: No, WE *will*.

Clinician: Oh, you *will*, huh? Okay, you do it now. I *will* do it later.

In keeping with Principle 6, this type of contrastive discourse is easily generated by creating stories that highlight the child's target forms (Cleave & Fey, 1997; Fey et al., 1993). In addition, these contexts can be created during shared reading of published literature by disagreeing with assertions made in the text.

It should be noted that additional stress, achieved through manipulation of the discourse, will be most helpful if one assumes that children with SLI have weak or missing representations of the target morphemes. However, if the problem of grammatical production is believed to stem from the metrical context in which the forms occur, then little benefit should be expected to occur unless children practice the forms in contexts in which they are weakly stressed and bear a limited informational load or pragmatic force. In fact, practice with the grammatical morphemes when they are represented by weakly stressed forms followed by strongly stressed forms may be useful, if not necessary, to speed mastery of the forms in production (see Principle 10 below).

Principle 8. Systematically contrast forms used by the child with more mature forms from the adult grammar, using sentence recasts.

Increasing the frequency and perceptual salience of target syntactic and morphologic forms in input probably is not sufficient to facilitate grammatical learning and use for many children with SLI. In addition, steps must be taken to clarify the relationship between the target forms and their semantic/pragmatic/grammatical function (Bates et al., 1991; Bunce & Watkins, 1995; Johnston, 1985). This can be done effectively by contrasting the child's current, less mature production (e.g., sentences with grammatical morphemes omitted) with a more mature adult alternative.

The most thoroughly studied method for contrasting a child's current form with a target form is the use of sentence recasts in the child's input (Baker & Nelson, 1984; Camarata et al., 1992; Nelson, 1977, 1989; Nelson et al., 1996; Nelson, Welsh, Camarata, Butkovsky, & Camarata, 1995). Recasts maintain the meaning of children's utterances while modifying their structure. Their effectiveness hinges on four assumptions. First, because recasts are based on the child's own utterances, they are highly focused on the objects and relationships to which the child is attending. Second, because recasts are similar in so many respects to the child's original, or platform, utterance, they are easy for the child to parse and comprehend. Third, because recasts pose such limited sentence-processing challenges, the child is more likely to notice the

target features that distinguish the recast from the platform sentence. Fourth, under conditions of joint caregiver–child attention, the sometimes subtle relationship between target features and semantic/pragmatic/grammatical functions may be rendered more transparent. Thus, an intervention that increases the frequency of recasts and focuses them on grammatical forms for which a child was “functionally ready” would be fully consistent with all of the principles put forward in this article. Consequently, such an intervention should be effective in enhancing children’s acquisition and development of the targeted grammatical forms.

There is a large body of evidence that supports this conclusion and the assumptions on which it is based. For example, several investigators have observed that recasts facilitate the production of both previously unused and partially mastered forms (Camarata et al., 1992, 1994; Farrar, 1990, 1992; Nelson et al., 1996). They also have been shown to affect the acquisition of relatively early-developing as well as late-developing structures among children who are typically developing (Baker & Nelson, 1984; Farrar, 1990, 1992; Nelson, 1977) and among those with SLI (Camarata et al., 1992, 1994; Nelson et al., 1995, 1996).

There may be some clear limits to the effectiveness of some forms of recasts, however. For example, recasts can vary according to the level of complexity of the adult’s contrasting sentence and in the extent to which the adult’s recast corrects the child’s previous utterance. The simplest recasts add or modify grammatical details of a single clausal constituent (e.g., subject, verb, object). More complex sentence recasts modify more than one clausal constituent, or add or embed new clauses into the child’s core utterance. These different possibilities are illustrated in the following three episodes.

- (1) Child: Our dog bite that man.
Clinician: Yeah, your dog *bit* that man.
- (2) Child: Our dog bit that man.
Clinician: No, your dog *didn’t bite* that man.
- (3) Child: Our dog bit that man.
Clinician: Your dog bit the man *who was teasing him*.

Nelson, Bonvillian, Denninger, Kaplan, and Baker (1984) observed a relationship between early parental use of simple recasts and later child use of auxiliaries. No such relationship was found between complex recasts and child auxiliary use. As Examples 2 and 3 above show, recasts do not necessarily correct the child’s previous utterance. Nevertheless, there is some evidence that corrective recasts contingent on children’s grammatical errors may be most facilitative. For example, Saxton (1997) found that typically developing children were far more likely to correct their ungrammatical sentences immediately after corrective adult recasts than after adult input that was not corrective or contingent on child errors. Additionally, Fey and Loeb (2002) attempted to foster development of auxiliaries among children not yet producing them. Child declarative utterances that omitted auxiliaries (e.g., “me [will] get it”) were followed systematically with interrogative recasts (e.g., “Oh, *will* you get it?”). They found

no evidence that these noncorrective interrogative recasts facilitated auxiliary development for children with SLI or younger children developing typically. There are a number of possible explanations for this lack of efficacy. Two strong possibilities, however, are (a) that the interrogative recasts did not correct the children’s auxiliary omissions and (b) that the interrogative recasts made too many changes in the children’s utterances (i.e., they were too complex).

Another area of uncertainty involves the frequency with which recasts must occur to spark acquisition of grammatical forms among children with SLI. Careful examination of data from Fey, Cleave, and Long, (1997); Fey et al. (1993); Fey, Krulik, Loeb, and Proctor-Williams (1999); and Proctor-Williams, Fey, and Loeb (2001), as well as data from Camarata et al. (1994); Conti-Ramsden (1990); and Conti-Ramsden, Hutcheson, and Grove (1995), suggests that the overall rate of recasts must be approximately twice per minute or more to receive uptake by children with SLI. This rate is approximately two times that commonly found in the environments of young children (Fey et al., 1999).

Recasts have special appeal because they can be used in naturally occurring contexts that do not intrude on the child’s agenda. Thus, they can be used effectively by parents in homes or, conceivably, by teachers and teacher aides in classrooms. In intervention studies, Fey et al. (1993, 1997) have shown that parents can be trained to increase their use of sentence recasts to two per minute or higher in parent–child conversations during play, at least when their children are in the relatively early stages of language development.

Principle 9. Avoid telegraphic speech, always presenting grammatical models in well-formed phrases and sentences.

In grammatical interventions targeting semantic (e.g., agent–action, possessor–possessed) and syntactic (e.g., subject–verb, verb–object) relations, it is common for clinicians to model target forms in telegraphic form, stripped of grammatical functors (Gray & Ryan, 1974; Waryas & Stremel-Campbell, 1983). The logic behind this technique is simple: By filtering out grammatical functors, the clinician can eliminate potentially distracting elements and highlight relationships that obtain between the content words in the sentences. Although this seems logical, and some evidence indicates the approach may be viable (Loeb & Armstrong, 2001), we believe that other evidence argues strongly against the practice. Five of the reasons to avoid telegraphic speech in favor of well-formed and naturally produced grammatical models are reviewed here.

First, the comprehension abilities of children with SLI may exceed their expressive abilities. In these cases, telegraphic models may remove grammatical morphemes the child already understands and utilizes in comprehension, thus limiting the child’s potential. Second, there is evidence that children developing typically and children with language impairments are sensitive to grammatical morphemes in the speech stream even before they produce them and possibly before they fully comprehend them (Duchan & Erickson, 1976; McNamara, Carter, McIntosh, & Gerken, 1998; Shipley, Smith, & Gleitman, 1969). For example, Duchan

and Erickson found that children with mental retardation who had MLUs between 1 and 2 understood semantic relations better in well-formed constructions than in telegraphic forms, although this difference was not statistically significant. Well-formed sentences were understood significantly better than sentences in which functors were replaced by nonsense syllables (e.g., “daddy um fallum”), however. Thus, there is no evidence that comprehension is facilitated by the use of telegraphic speech, and there is evidence that grammatical functors are not interpreted as noise, even if their grammatical roles are not fully appreciated.

A third reason for avoiding telegraphic models in favor of well-formed ones is that, in telegraphic speech, weak syllables are associated with content words only. This may compound the difficulty children with SLI have in learning to use weakly stressed function words, a task in which these children already are known to be especially deficient (Bedore & Leonard, 1995). Fourth, the sparseness or irregularity of grammatical morphology is associated with slower morphological acquisition and mastery (Bedore & Leonard, 1995; Berman, 1986; Dromi, Leonard, & Shteyman, 1993; Leonard, Sabbadini, Leonard, & Volterra, 1987). For example, languages such as Hebrew and Italian have morphological paradigms that include far more forms than do those of English but are far more consistent and regular. Whether they have typical language or SLI, children learn English bound morphology more slowly than do children acquiring these morphologically rich languages. Thus, although telegraphic input is presumed to simplify the learning task, it may make learning even more difficult by making regular bound and free grammatical morphemes in input seem even less regular, if not truly optional.

Finally, there is evidence that grammatical functors are used by young children as cues to the grammatical class of words that the child does not yet know (Maratsos, 1982; Maratsos, Kuczaj, Fox, & Chalkley, 1979). For example, a word ending in *-ing* or *-ed* or following words like *is*, *will*, and *didn't* has a high probability of being a verb. Repeated alternations of phonetic strings in these morphosyntactic contexts should help the child to recognize that the word is a verb. Stripping these content words of these grammatical functors to “highlight” grammatical relations may have the unfortunate and opposite consequence of removing the very distributional cues children can use to assign new forms to their appropriate grammatical categories. In sum, there now seem to be no good reasons for stripping phrases and sentences of grammatical morphemes and numerous reasons to ensure they are included in adult stimuli, even when the child is at a developmental point when these morphemes are sometimes or always omitted.

Principle 10. Use elicited imitation to make target forms more salient and to give the child practice with phonological patterns that are difficult to access or produce.

Elicited imitation is a far more intrusive technique than recasting that has been used to contrast linguistic elements and to highlight the relationship between form and function for children with language impairments (Cleave & Fey,

1997; Connell, 1986a, 1986b, 1987; Connell & Stone, 1992). We view imitation not as the means through which the child learns language (e.g., stimulus–response learning) but as a mechanism that can ensure the child’s attention to and production of grammatical features that may be difficult for the child to perceive and/or produce (e.g., weak syllables that precede strong syllables). Connell and Stone made the additional argument that imitative practice assists the child with SLI in gaining access to the phonological forms of target grammatical morphemes.

Imitation can be used as part of a grammar facilitation approach administered by a clinician (Cleave & Fey, 1997; Fey et al., 1993, 1997). Rather than teaching each grammatical form in isolation, each form (e.g., *-ed*) is systematically contrasted with another semantically and/or morphosyntactically related form. This yields sequences such as the following:

Clinician: (holding Dad doll and a dirty plate)
Say, “Daddy *will* wash a plate.”

Child: Daddy *will* wash a plate.

Clinician: (makes Dad doll wash dishes)
Say, “Daddy *washed* the plate”

Child: Daddy *washed* the plate.

This imitative practice of alternating targets is designed to focus the child’s attention on the target (e.g., *will*, *-ed*), to give the child practice in realizing the segmental and metrical features of the target, and to clarify the relationship between the target form and its underlying meaning or grammatical function.

Contrastive imitation practice has been part of highly efficacious interventions in studies in which it was the primary intervention procedure (Connell, 1986a, 1986b, 1987; Connell & Stone, 1992) and in investigations in which it was only a small part of a broader intervention (Fey et al., 1993, 1997). Nevertheless, the value of elicited imitation in language intervention has been questioned by many clinicians and investigators for decades (Camarata et al., 1994; Courtright & Courtright, 1976, 1979; Nelson et al., 1996). Most recently, Camarata et al. (1994) and Nelson et al. (1996) suggested that, for most forms, growth recasts in conversational contexts are preferable to elicited imitation procedures to facilitate children’s acquisition or development of grammatical form. In studies such as these, we believe that imitation approaches were not evaluated in their most potent form—that is, when they are consistent with Principle 7 and are used to contrast competing grammatical targets. Until such comparisons are made, approaches that use imitation and recasting in isolation or in combination (e.g., Fey et al., 1993, 1997) are still justifiable on empirical and logical grounds. This is especially so when imitative practice is only part of a broader program that exemplifies the other principles discussed in this article.

Conclusion

In this article, we have claimed that most children with SLI are not as specifically impaired as the label used to

identify them suggests. Professionals dealing with these children must recognize existing and potential problems outside the realms of syntax and morphology in their preparation and implementation of language intervention and ensure that such problems receive sufficient direct or indirect attention.

Despite this perspective, we believe that at some point in educational planning, special emphasis must be placed directly on problems in the development of grammar for the majority of children with SLI. The principles we have identified in this article should assist in developing programs that are at once sufficiently focused on grammar to foster grammatical development yet broad enough to ensure that gains noted are manifested in the child's overall communicative, behavioral, social, and academic performance. As we have shown throughout the article, how the principles are implemented often depends on the theoretical perspective one takes. Thus, careful investigations of children's responses to intervention based on these principles not only have the potential to identify the most successful clinical procedures, but also can contribute to the development of theories of language learning in children with SLI and those developing typically.

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Received February 4, 2002

Accepted July 9, 2002

DOI: 10.1044/1058-0360(2003/048)

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Erratum

In the November 2002 issue of *AJLSP*, the article, “Typical and Atypical Language Development in Infants and Toddlers Adopted From Eastern Europe,” by Sharon Glennen and M. Gay Masters, contained errors in Table 3 (p. 105). Under the heading **Expressive Vocabulary**, the $\pm SD$ values for ages 22–24 months should have been **8.6–126.66** and the values for ages 25–27 months should have been **12.25–110.93**.

We regret any inconvenience or confusion that this misprint may have caused.